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Environmental Protection Technology Series

OIL SPILL AND OIL POLLUTION REPORTS May 1975 - July 1975

Industrial Environmental Research Laboratory
Office of Research and Development
U.S. Environmental Protection Agency
Cincinnati, Ohio 45268

RESEARCH REPORTING SERIES

Research reports of the Office of Research and Development, U.S. Environmental Protection Agency, have been grouped into five series. These five broad categories were established to facilitate further development and application of environmental technology. Elimination of traditional grouping was consciously planned to foster technology transfer and a maximum interface in related fields. The five series are:

1. Environmental Health Effects Research
2. Environmental Protection Technology
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This report has been assigned to the ENVIRONMENTAL PROTECTION TECHNOLOGY series. This series describes research performed to develop and demonstrate instrumentation, equipment, and methodology to repair or prevent environmental degradation from point and non-point sources of pollution. This work provides the new or improved technology required for the control and treatment of pollution sources to meet environmental quality standards.

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OIL SPILL AND OIL POLLUTION REPORTS

May 1975 - July 1975

by

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FOREWORD

When energy and material resources are extracted, processed, converted, and used, the pollutional impact on our environment and even on our health often requires that new and increasingly more efficient pollution control methods be used. The Industrial Environmental Research Laboratory - Cincinnati (IERL-CI) assists in developing and demonstrating new and improved methodologies that will meet these needs both efficiently and economically.

This report is one of a series on oil spills. It cites current events, literature, research patents, and other material relevant to oil pollution abatement and is published in an abstract format on a quarterly basis. As such, it serves as a reference document for those interested in oil spills and oil pollution control. These reports are part of the continuing program of the Oil & Hazardous Materials Spills Branch, IERL-CI, to assess the environmental impact of oil spills and to help in providing the methodologies and tools to prevent spills and to minimize their effects when they do occur.

David G. Stephan
Director
Industrial Environmental Research Laboratory
Cincinnati

A B S T R A C T

The May 1975 - July 1975 Oil Spill and Oil Pollution Reports is the fourth quarterly compilation of oil pollution report summaries.

The following topics are included in the report:

a) Summaries and bibliographic literature citations;
b) Current status of some of the research projects as listed in previous reports;
c) Summaries of additional current research projects; and,
d) Patent summaries.

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INTRODUCTION

The purpose of the "Oil Spill and Oil Pollution Reports" series is to present a concise, comprehensive information source on oil pollution events, current research and oil pollution related publications. This is the fourth quarterly edition of "Oil Spill and Oil Pollution Reports." Included are bibliographic citations and summaries of articles from the scientific and technical literature (Section I), the status and results of Current Research Project entries listed in previous reports (Section II), additional Current Research Projects (Section III), and oil pollution related patents (Section IV).

The sources of the bibliographic citations and summaries of articles presented in Section I are scientific, technical and abstract journals. A list of the periodicals reviewed is provided in the appendix. The summarized material is grouped according to subject and then arranged alphabetically by senior author within each subject division.

Section II lists Current Research Project entries appearing in previous reports and includes descriptive project information provided upon request by the principal investigators and/or performing organization. All reports and publications are entered in summary form. The entries in Section II are not complete in that status information is not given for all research projects listed in previous reports. Some responses to request letters were not received prior to publication date. At the end of each entry, the name and address of the project information source are given.

Current Research Project summaries (Section III) are grouped according to subject and then arranged alphabetically by senior principal investigator within each subject division. Some of the Current Research Projects listed in previous Oil Pollution Reports have been recently renewed. These projects have been relisted and are headed by the same serial number as originally reported, followed by the word (Renewal). All the research project information was obtained from the Smithsonian Science Information Exchange (SSIE).

Patent summaries are divided into United States and foreign subsections and arranged alphabetically by inventor in each section. All patent information is obtained from abstract journals. Illustrations of United States patented devices are obtained from the U.S. Patent Office Official Gazette.

All report entries are serialized. Each section has its own number series. The serial numbers in this report are a continuation of the numbering system appearing in Reports I, II, and III. The letters preceding the serial numbers designate the following sections: C, citations from the literature; R, research projects; P, patents. Many of the entries can be included under more than one subject heading. Following each summary are listed any other topics under which the entry can be categorized. A subject cross index is provided at the end of the report.

SECTION I. PUBLICATIONS AND REPORTS

A. OIL POLLUTION DETECTION AND EVALUATION

1. REPORTING

C-788-74
BIG LEAKER

Anonymous. 1975.
National Fisherman 56(1):20-A.

The 560 ft. Cypriot tanker, "Athenian Star," dumped 500,000 gallons of oil in the mid-Atlantic, half due to rough seas tearing off a bow plate and half to overcome a list. Later, 2200 barrels were dumped off the New Hampshire coast.

Citation Source: Citation Journal.

C-789-74
HOW THE COAST GUARD SAVED A SHIP, ITS CARGO AND THE ENVIRONMENT

Anonymous. 1975.
Ocean Industry 10(3):56-57.

The Coast Guard quickly pumped large quantities of oil from a Liberian tanker, "Aeolus," which sank near New York. The pumping floated the vessel and it was towed to safety. A few years ago, salvage would have been left to the owners, resulting in a time delay that would increase the chances of the ship breaking up and polluting the area.

Citation Source: Citation Journal.

C-790-74
(no title)

Anonymous. 1975.
Ocean Oil Weekly Report 9(33):1.

Reported are the findings of Dames & Moore Consulting firm concerning the proposed offshore Southern California oil and gas lease sale, as stated during a three-day public hearing in early May, 1975. The firm estimated the maximum potential average spillage from petroleum industry operations offshore Southern California to be about 50 bbls per day, contrary to the spillage of 227 to 318 bbl/day estimated by the Bureau of Land Management in its draft environmental statement.

Citation Source: Citation Journal.

C-791-74
TANKSHIP ACCIDENTS AND RESULTING OIL OUTFLOWS, 1969-1973

Card, J. C., P. V. Ponce, and W. D. Snider. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 205-213.

Statistics on the occurrence of breakdowns, collision, explosions, fire, groundings, rammings, and structural failures in 3,183 accidents during 1969-1973 are presented. The consequences of these accidents and data on ship size, age and location are tabulated. Once analyzed, the data should be useful in evaluating preventive measures and risks entailed with oil transport.

Research
Oil handling

Citation Source: Citation Journal.

C-792-74
RESIDENCE TIME OF NON-METHANE HYDROCARBONS IN THE ATMOSPHERE

Duce, A., G. Quinn, and L. Wade. 1974.
Marine Pollution Bulletin 5(4):59-61.

Data on global hydrocarbon production and concentration in the atmosphere in marine and non-urban areas are reviewed. Atmospheric residence times of these hydrocarbons are estimated.

Citation Source: Abstracts on Health Effects of Environmental Pollutants. 1975. 4(3). Entry #3042.

C-793-74
VLCC 'METULA' OIL SPILL

Hann, R. W., Jr. 1974.
Final Report, USCG-CG-D-54-75, Contract DOT-CG-42444-A. 69 p.

The report reviews: the history of the oil spill caused by the grounding of the "Metula" in the Straits of Magellan, Chile, August, 1974; deposition of oil on the shore; impact of oil on the shore; comments regarding containment feasibility, cleanup or stabilization.

General effects of oil pollution
Biological effects of oil pollution, Cleanup and recovery

Citation Source: Government Reports Announcements. 1975. 75(6). Entry #AD/A-003 805/9GA.

C-794-74
IT'S TIME TO STOP KILLING THE OCEANS

Kamlet, K. S. 1975.
National Wildlife 13(3):19-21.

The author discusses the critical problem of the unloading of waste materials, including oil, acids, arsenic, mercury and other hazardous chemicals, in U.S. Coastal waters. The biological effects of waste contamination are outlined; regulation of ocean dumping is discussed.

Regulations, standards and planning
Biological effects of oil pollution

Citation Source: Citation Journal.

C-795-74
SPILLAGES FROM OIL INDUSTRY CROSS-COUNTRY PIPELINES IN W. EUROPE: STATISTICAL SUMMARY OF REPORTED INCIDENTS 1972

King, E. M., and P. Rogier. 1974.
Stichting CONCAWE. Report 1/74. 16 p.

In Western European oil pipelines, spillage was only .006% of the total oil transported and most spills were cleaned up within one week. The spills in 1972 from oil industry pipelines did not lead to the pollution of potable waters.

Oil handling

Citation Source: Pollution Abstracts. 1975. 6(2).
Entry #75-01973.

C-796-74
THE UNITED STATES COAST GUARD'S POLLUTION INCIDENT REPORTING SYSTEM: ITS USE IN PROGRAM MANAGEMENT

Leotta, J., and W. A. Wallace. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 201-204.

The Pollution Incident Reporting System (PIRS) contains information as to where and when the discharge occurred, the type of operation in progress, the cause of the spill, cleanup response and penalty actions. PIRS helps to evaluate the effectiveness of the Marine Environmental Protection Program.

Research

Citation Source: Citation Journal.

C-797-74
JAPANESE OIL SPILL HAS WIDE REPERCUSSIONS

McAbee, M. K. 1975.
Chemical and Engineering News 53(22):13.

The Japanese oil spill accident, occurring December, 1974, in which 270,000 bbl of heavy fuel oil were released into the compounds of Mizushima refinery and into Mizushima Harbor, is reported. The physical and financial dimensions of the spill are discussed and the massive cleanup effort is described.

Physical effects of oil pollution
Economic effects of oil pollution
Cleanup and recovery

Citation Source: Citation Journal.

C-798-74
THE AGE OF THE OILBERG

Mostert, N. 1975.
Audubon 77(3):18-43.

A report of the oil spill disaster of the Shell supertanker, "Metula," which went aground in the Strait of Magellan on August 9, 1974, is given. A discussion of the events following the accident and the effects of oil pollution from VLCC's on the world's oceans is presented.

Biological effects of oil pollution
General effects of oil pollution

Citation Source: Citation Journal.

C-799-74
CAUSES OF POLLUTION IN A SHALLOW ALMOST LAND-LOCKED GULF

Noye, B. J., and R. G. Taaffe. 1974.
Australian Marine Science Bulletin 46:15-16.

Among the sources of pollution in Spencer Gulf are untreated effluent, zinc, arsenic from the smelters and oil spills. Oil is considered to be the major potential source of pollution.

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(2). Entry #5Q2002.

C-800-74
PETROLEUM IN THE MARINE ENVIRONMENT

Ocean Affairs Board, National Research Council. 1975.
Bulletin of the Ecological Society of America 56(1):4-6.

An estimate of the total quantity of petroleum hydrocarbons entering the ocean today is provided and the sources of inputs are listed. Input from tankers, terminal and ship operations represent the major sources of accumulation of petroleum, both in the ocean and along coasts. The fate of petroleum in the sea, biodegradation and uptake of hydrocarbons by organisms are discussed.

General fate of oil in the environment
Biological degradation

Citation Source: Citation Journal.

C-801-74
MASSIVE OIL SPILLAGE IN BANTRY BAY

O'Sullivan, A. J. 1975.
Marine Pollution Bulletin 6(1):3-4.

On October 21, 1974, a massive oil spill of 2600 tons occurred in Bantry Bay. Dispersants, gulley emptiers, peat moss, straw and skimmers were used to retrieve the oil. Damage was limited due to calm weather, the non-use of dispersant to clean the rocky shores and the minimal presence of seabirds due to the time of year. The herring fishery may suffer, however.

Biological effects of oil pollution
Economic effects of oil pollution

Citation Source: Citation Journal.

C-802-74
OIL SPILLS: CAUSES, QUANTITIES, SOURCES - THE MAGNITUDE OF THE PROBLEM

Porricelli, J. D. 1974.
Assessing the Social Impacts of Oil Spills, Rensselaerville, New York, 1973. p. 3-6.

The current sources of oil pollution in the marine environment are discussed, with the contribution to the oil pollution problem by tankers emphasized. Means for reducing the probability of oil spillage from tankers such as segregated ballasting, double-side, double-bottom design and traffic control systems are suggested.

Design and engineering

Citation Source: Citation Journal.

C-803-74
RUSSIAN SURVEY

Rich, V. 1974.
Marine Pollution Bulletin 5(12):179-180.

The results of the 1972-1973 research expedition of the "Shkval" in the North Atlantic reveal high levels of petroleum products, detergents and mercury. Areas of concentration are due both to the site of discharge and to oceanic circulation.

Sampling

Citation Source: Citation Journal.

C-804-74
OIL POLLUTION AT THE GEULHEM PUMPING WORKS

Schellekens, G. A. D. 1974.
H_2O (Rotterdam) 7(8):140-143.

In October, 1972, drinking water originating from the Geulhem pumping works, The Netherlands, was reported to be polluted. An investigation revealed that the ground water pollution was caused by a leaking underground oil tank in the area of the water source. The necessity of intensive control in areas around water sources is stressed.

Regulations, standards and planning

Citation Source: Environmental Health and Pollution Control. 1974. 6(9). Entry #3237.

2. MONITORING

C-805-74
OIL IN MARINE ORGANISMS AND SEDIMENTS: SAMPLING AND ANALYTICAL METHODS

Anonymous. 1974.
IOC-UNESCO, WMO, U.S. Department of Commerce. Petroleum Marine Pollution Symposium, May 13-17, 1974. p. 89-126.

Ten papers are presented discussing various marine pollution sampling and monitoring methods for measuring levels of petroleum contamination in organisms and sediments.

Analysis
Sampling

Citation Source: Environment Abstracts. 1975. 5(2).
Entry #75-01551.

C-806-74
SAMPLING METHODS AND TECHNIQUES: OIL SLICKS, TAR BALLS, AND PARTICULATES

Anonymous. 1974.
IOC-UNESCO, WMO, U.S. Department of Commerce. Petroleum Marine Pollution Symposium, May 13-17, 1974. p. 1-26.

Nine papers are presented which deal with various methods and techniques to monitor oil spills, tar balls and particulate pollution in the oceans. Oil sampling apparatus and techniques are evaluated.

Sampling

Citation Source: Environment Abstracts. 1975. 5(2).
Entry #75-01548.

C-807-74
STANDARDS AND INTERCOMPARISON CRITERIA

Anonymous. 1974.
IOC-UNESCO, WMO, U.S. Department of Commerce. Petroleum Marine Pollution Symposium, May 13-17, 1974. p. 69-78.

The importance of standard procedures and criteria in monitoring, analyzing and determining the fate of oil in the marine environment is considered in six papers.

Analysis
General fate of oil in the environment

Citation Source: Environment Abstracts. 1975. 5(2).
Entry #75-01550.

C-808-74
SURVEILLANCE AND DETECTION

Anonymous. 1974.
National Conference on Control of Hazardous Material Spills, San Francisco, 1974. p. 251-313.

Nine papers are presented which describe the techniques for detecting and monitoring hazardous materials spills. The steps in a program for prediction, control and recovery of toxic substances spreading in subsurface waters are described. Bioluminescence, analytical chromatography, crude static bioassay and immobilized enzyme product are some methods and materials used to detect and monitor spills.

Analysis

Citation Source: Environment Abstracts. 1975. 5(4).
Entry #75-02829.

C-809-74
SHIPBOARD OIL-IN-WATER CONTENT MONITOR BASED ON SMALL ANGLE FORWARD LIGHT SCATTERING

Batutis, E., R. Boericke, and H. Sadjian. 1974.
Final Report, USCG-32-75, Contract DOT-CG-32370A. 123 p.

The real-time shipboard oil-in-water content monitor uses the concept of spatial filtering of small angle forward scattering laser light to allow discrimination of oil particles only. A test program involving the detector-performance of the monitor, and studies of the effects of oil types, mixtures, concentrations, salinity, solids, air and detergents are described in this report.

Design and engineering
Waste water treatment

Citation Source: Government Reports Announcements. 1975. 75(6).
Entry #AD/A-003 863/8GA.

C-810-74
SHIPBOARD OIL-IN-WATER CONTENT MONITOR BASED ON LIGHT SCATTERING AT NINETY DEGREES

Bochinski, J. H., and A. R. Hansen. 1974.
Final Report, USCG-D-49-75, Contract DOT-CG-34170-A. 132 p.

An oil-in-water monitor for shipboard applications consists of a sample handling system designed to remove suspended solids from the sample stream and to homogenize the oil to uniform droplet size, and a nonfouling scattered light sensor. The monitor response is linear from 0 to 200 ppm oil concentration.

Design and engineering

Citation Source: Government Reports Announcements. 1975. 75(6). Entry #AD/A-003 854/7GA.

C-811-74
MARINE OIL SPILLS: A PROBLEM IN ENVIRONMENTAL MANAGEMENT

Bradley, P. G. 1974.
Natural Resources Journal 14(3):337-359.

The author used an economic model to consider ways to remedy the oil spill problem, in particular the 35% of the total oil spilled from ocean transported petroleum and offshore production sources. The model indicates that total elimination is unlikely due to the unpredictability of oil spills, and that detection is an important function because in many spills, only the responsible operator is aware of the spill.

Analysis

Citation Source: Petroleum Abstracts. 1975. 15(8). Entry #201,218.

C-812-74
PHOTOMICROGRAPH TECHNIQUES FOR CHARACTERIZATION AND MONITORING OIL WASTE STREAMS

Churchill, R. J. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 79-85.

Photomicrograph techniques can be used to assess the success of existing facilities for waste water treatment, and to provide rational design data for oil-water separation systems. Examples of treatment efficacy and waste water characterization are given for tanker ballast, stormwater runoff and process waste waters.

Waste water treatment
Analysis

Citation Source: Citation Journal.

C-813-74
OIL POLLUTION ALONG THE INDIAN COASTLINE

Dwivedi, S. N., and A. H. Parulekar. 1974.
IOC-UNESCO, WMO, U.S. Department of Commerce. Petroleum Marine Pollution Symposium, May 13-17, 1974. p. 157-161.

Studies have been conducted to determine the areas, seasons and intensity of deposition of tar balls which wash ashore along Indian beaches. The tar balls have been found to originate from oil wastes and ship spillage discharged by passing ocean-going ships.

Analysis

Citation Source: Environment Abstracts. 1975. 5(2). Entry #75-01558.

C-814-74
A GAS LIQUID GAS CHROMATOGRAPHIC METHOD FOR THE IDENTIFICATION OF SOURCES OF OIL POLLUTION

George, A. E., G. T. Smiley, D. S. Montgomery, and H. Sawatzky. 1973.
Canadian Department of Energy and Mines Resources Research Report R267. p. 1-15.

The development of a two-step gas chromatographic fingerprinting technique for the identification of oil pollution sources is reported. The method has been applied to oil spills from Arrow and Irving Whale to demonstrate the method's potential usefulness.

Analysis

Citation Source: Environmental Health and Pollution Control. 1974. 6(5). Entry #1700.

C-815-74
IN-SITU DETECTION OF OIL SLICKS UTILIZING DIFFERENTIAL EVAPORATION: PHASE I FEASIBILITY STUDY

Horvath, R. 1974.
Final Report, ERIM-103900-5-P, Environmental Research Institute of Michigan, Ann Arbor, CG-4241.2/11. 101 p.

An empirical-analytical investigation to determine the feasibility of applying an evaporative technique for in-situ detection of oil slicks is described.

Citation Source: National Academy of Sciences Marine Research Information Service Abstracts. 1974. Vol. 10. Entry #057698.

C-816-74
OIL POLLUTION DETECTION, MONITORING AND LAW ENFORCEMENT, QUARTERLY PROGRESS REPORT, AUG, 1974

Horvath, R. 1974.
E74-10027; NASA-CR-140740; ERIM-101800-14-P.

No author-identified significant results are contained in this report.

Citation Source: Scientific and Technical Aerospace Reports. 1975. 13(4). Entry #N75-13343.

C-817-74
A CANADIAN VIEW OF MONITORING ACTIVITIES

Inhaber, H. 1975.
Environmental Science and Technology 9(3):206-209.

The Smithsonian Institution tabulated data on pollution monitoring programs around the world. An Environment Canada scientist discusses Canada's strengths and weaknesses in light of the worldwide data. For example, Canadian programs form 1/6 or more of world programs for the measurement of petroleum hydrocarbons.

Citation Source: Citation Journal.

C-818-74
VALUE OF OIL POLLUTION MONITORING IN MARINE ORGANISMS

LaRoche, G. 1974.
IOC-UNESCO, WMO, U.S. Department of Commerce.Petroleum Marine Pollution Symposium, May 13-17, 1974. p. 142-143.

The author reports that two requirements are necessary to monitor petroleum products that enter the marine environment: there must be monitoring of relevant tainting of products so as to identify harmful fractions, and a range of biologically or aesthetically tolerable concentrations of tainting products must be determined.

Economic effects of oil pollution

Citation Source: Environment Abstracts. 1975. 5(2). Entry #75-01553.

C-819-74
AN OPTIMAL PREVENTION AND DETECTION MODEL FOR POLLUTION PATROL

Olson, D. G., and G. P. Wright. 1973.
Conference on Prevention and Control of Oil Spills, Washington, D.C., 1973. p. 145-152.

This paper presents a flight scheduling model for sensor equipped aircraft for the detection and prevention of harbor and coastal oil and hazardous material pollution. The objective of the model is to maximize the expected number of pollution incidents detected per pollution flight. Input parameters required for the model are described.

Remote sensing

Citation Source: Environmental Health and Pollution Control. 1975. 7(1). Entry #112.

C-820-74
TAR BALLS IN THE SEA; A NEW SOURCE CONCEPT

Sweet, W. 1974.
Offshore Technology Conference, 6th, Houston, 1974. Preprints Vol. 1. p. 651-655.

Tar balls found in most of the oceans originate from human activities and natural seepage. A new source concept is developed in this paper concerning the amount of natural hydrocarbon seepage into the marine environment. The author contends that natural seepage could actually account for a major portion of the tar balls found in marine waters.

Citation Source: Citation Journal.

C-821-74
LOCAL AREA POLLUTION SURVEILLANCE SYSTEMS: A SUMMARY OF THE COAST GUARD'S RESEARCH AND DEVELOPMENT ACTIVITIES

White, G. P., and A. V. Arecchi. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 123-127.

The Coast Guard has concentrated on developing and evaluating oil pollution sensors as a first step in establishing local area pollution surveillance systems. The basic operating characteristics of remote sensors and in situ sensors are explained. The next step is to establish sensor site selection procedures.

Remote sensing
Research

Citation Source: Citation Journal.

C-822-74
IGOSS MARINE POLLUTION MONITORING PILOT PROJECT

Zachariason, R. A. 1974.
NOAA-74111803-3.5 p. Included in Mariner's Weather Log 18(6): 370-373.

A worldwide system for monitoring petroleum in the oceans is scheduled to begin in January, 1975. The classes of pollutants include oil slicks, tar balls, tar on beaches and dissolved hydrocarbons in surface waters. The aim of this pilot project is to develop the organization and experience necessary to coordinate marine pollution monitoring.

Citation Source: Government Reports Announcements. 1975. 75(4). Entry #COM-74-90018-11-03/GA.

3. REMOTE SENSING

C-823-74
REMOTE SENSING OF OIL POLLUTION BY ULTRAVIOLET FLUORESCENCE

Campbell, C. E. 1973.
Society of Photo-Optical Instrumentation Engineers, Annual Technical Symposium, 1973. Vol. 27. p. 85-90.

The advantages of ultraviolet fluorescence as a more sensitive technique in detecting oil pollution than UV or visible photography are demonstrated.

Citation Source: Environmental Health and Pollution Control. 1974. 6(5). Entry #1726.

C-824-74
DEVELOPMENT OF AN EXPERIMENTAL AIRBORNE LASER REMOTE SENSING SYSTEM FOR THE DETECTION AND CLASSIFICATION OF OIL SPILLS

Fantasia, J. F., and H. C. Ingrao. 1974.
International Symposium on Remote Sensing of Environment, 9th, Ann Arbor, 1974. Vol. 3. p. 1711-1745.

Laser-excited oil fluorescence can be used to detect and classify oil spills. The study compared laboratory and N_2 laser remote sensor measurements of fluorescence properties of oils and oil slicks on the sea surface. The system is limited by the conditions.

Citation Source: Petroleum Abstracts. 1975. 15(6). Entry #200,601.

C-825-74
CRUDE AND REFINED PETROLEUM OIL STRUCTURED LUMINESCENCE SIGNATURES INDICATED BY UV LASER OR LAMP AND THEIR REMOTE SENSING APPLICATIONS

Gross, H. G., and M. Muramoto. 1974.
International Symposium on Remote Sensing of Environment, 9th, Ann Arbor, 1974. Vol. 3. p. 1747-1759.

The structured luminescence spectra of 10 virgin crude oils and one refined fuel oil were produced. The as-measured spectra had one principal peak; spectrally corrected spectra have two or more peaks and a wider range. Oil spills could be mapped and classified using as few as four broad band photometer channels.

Citation Source: Petroleum Abstracts. 1975. 15(6). Entry #200,602.

C-826-74
A PRACTICAL OIL SENSOR

Kambu, G. S., Jr. 1974.
International Symposium on Remote Sensing of Environment, 9th, Ann Arbor, 1974. Vol. 3. p. 1685-1694.

A two-wavelength active monostatic infrared sensor detects anomalous dispersion in petroleum products. The ratio of the reflected power at the two wavelengths is proportional to reflectivity but independent of range and surface roughness. Performance has no dependence on weather, time of day, oil type or oil thickness.

Citation Source: Petroleum Abstracts. 1975. 15(6).
Entry #200,599.

C-827-74
THE APPLICATION OF SPECTROMETRIC AND POLARIZATION TECHNIQUES FOR REMOTE SENSING OF OIL ON SEA WATER

Kondraty'ev, K. Ya., A. A. Buznikov, D. V. Pozdnyakov, J. A. Ivanyan, and G. A. Lakhtanov. 1974.
International Symposium on Remote Sensing of Environment, 9th, Ann Arbor, 1974. Vol. 3. p. 1793-1802.

Using a hand-held spectrograph RSS-2, a polarimeter and two cameras operating in four spectral regions, complex data on the optical properties of a sea surface polluted with an oil film can be gathered. The investigators determined the optimal spectral intervals and polarization regimes to get contrasting pictures of oil films.

Citation Source: Petroleum Abstracts. 1975. 15(6).
Entry #200,598.

C-828-74
OIL SLICK DETECTION BY X-BAND SYNTHETIC APERTURE RADAR

Kotlarski, J. R., and H. R. Anderson. 1974.
International Symposium on Remote Sensing of Environment, 9th, Ann Arbor, 1974. Vol. 3. p. 1775-1790.

The two cases of oil slick detection using x-band real time synthetic aperture radar were both concerned with small slicks (0.2 to 0.6 km^2), calm seas and wind speeds of less than 5 kt.

Citation Source: Petroleum Abstracts. 1975. 15(6).
Entry #200,603.

C-829-74
FLIGHT EVALUATION OF U.S. COAST GUARD AIRBORNE OIL SURVEILLANCE SYSTEM

Maurer, A., and A. T. Edgerton. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 129-141.

The multisensor airborne system has the capabilities of detecting, mapping and documenting oil spills at sea in all kinds of weather and at all times of day. The surveillance data gathered during the test were from natural seeps, controlled oil spills and routine shipping. Testing revealed each sensor to be "blind" under certain environmental conditions, reaffirming the necessity of a multisensor system.

Monitoring

Citation Source: Citation Journal.

C-830-74
A STUDY OF A DUAL POLARIZATION LASER BACKSCATTER SYSTEM FOR REMOTE IDENTIFICATION AND MEASUREMENT OF WATER POLLUTION

Sheives, T. C. 1974.
NASA-CR-140665, RSC-53. Contracts NGL-44-001-001, DOT-CG-34017-A. 148 p.

Analytical models describing the backscatter from smooth surface turbid water were used to identify and measure subsurface water turbidity and oil on water. Ground observations and remote observations of water quality are compared.

Citation Source: Government Reports Announcements. 1975. 75(5).
Entry #N75-10563.

C-831-74
REMOTE MEASUREMENTS OF WATER POLLUTION WITH A LIDAR POLARIMETER

Sheives, T. C., J. W. Rouse, Jr., and W. T. Mays, Jr. 1974.
International Symposium on Remote Sensing of Environment, 9th, Ann Arbor, 1974. Vol. 3. p. 1695-1708.

Laser backscatter field measurements from natural waterways can be used to observe water quality parameters such as turbidity, suspended soils and transmittance. With the use of analytical models describing backscatter from turbid water and oil on turbid water, the dual polarization laser backscatter system can measure oil spills on water.

Citation Source: Petroleum Abstracts. 1975. 15(6).
Entry #200,600.

C-832-74
PREDICTION OF THE FRAUNHOFER LINE DETECTIVITY OF LUMINESCENT MATERIALS

Watson, R. D., W. R. Hemphill, T. D. Hessin, and R. C. Bigelow. 1974.
International Symposium on Remote Sensing of Environment, 9th, Ann Arbor, 1974. Vol. 3. p. 1959-1980.

The luminescence of crude and refined oils, crude oil films, oil shales, phosphate, effluents and in vivo chlorophyll was quantified at six Fraunhofer lines. The luminescence of petroleum stimulated by the sun is detectable with the Fraunhofer Line Detector.

Citation Source: Petroleum Abstracts. 1975. 15(6).
Entry #200,604.

4. SAMPLING

C-833-74
OIL IN WATER: SAMPLING AND ANALYTICAL METHODS

Anonymous. 1974.
IOC-UNESCO, WMO, U.S. Department of Commerce. Petroleum Marine Pollution Symposium, May 13-17, 1975. p. 27-68.

Ten papers are presented on various methods for sampling and analyzing the effects in water of oil slicks due to accidental spills. Techniques for monitoring and measuring hydrocarbon content in aqueous systems are evaluated.

Analysis

Citation Source: Environment Abstracts. 1975. 5(2). Entry #75-01549.

C-834-74
MEASUREMENT AND INTERPRETATION OF NONVOLATILE HYDROCARBONS IN THE OCEAN. PART I. MEASUREMENTS ON ATLANTIC, MEDITERRANEAN, GULF OF MEXICO AND PERSIAN GULF

Brown, R. A., T. D. Searl, J. J. Elliott, P. H. Monaghan, and D. E. Brandon. 1974.
AID.1DJB.74, EPR.4EX.74 MA-RD-900-75009. 221 p.

Water samples were taken from tankers and oceanographic research vessels. Petroleum derived hydrocarbons are found in locations where petroleum input is likely, i.e. along tanker routes.

Analysis

Citation Source: Government Reports Announcements. 1975. 75(3). Entry #COM-74-11634/4GA.

C-835-74
EVALUATION OF THIN FILM OIL SAMPLERS

Chang, W. J., and W. A. Saner. 1974.
Marine Technology Society, Proceedings, 1974. p. 909-920.

Tests were conducted on four prototype thin film oil samplers to evaluate their operational characteristics, efficacy and ability to maintain the chemical integrity of samples. All four samplers utilized an oleophilic sorbent as the oil collecting medium and two samplers also utilized a surfactant to aid in oil collection.

Analysis

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #071907.

C-836-74
THE ALERT BAY OIL SPILL: A ONE-YEAR STUDY OF THE RECOVERY OF A CONTAMINATED BAY

Green, D. R., C. Bawden, W. J. Cretney, and C. S. Wong. 1974. Canada. Marine Sciences Directorate. Pacific Region. Pacific Marine Science Report 74-79. 46 p.

Alert Bay was visited five times during the year following heavy contamination by an oil spill to observe natural degradation of the oil and the ecological effects of the oil. Biodegradation by bacteria was the major mechanism of changing the oil's chemistry; 90 to 95% of the oil was degraded after one year. No permanent effects on the biological community were observed.

Biological degradation
Biological effects of oil pollution

Citation Source: Pollution Abstracts. 1975. 6(2). Entry #75-01644.

C-837-74
DEVELOPMENT OF A FIXED SITE SURFACE FILM OIL SAMPLER

LeVantine, A. D., and D. L. Curtis. 1974. Special Reports, NTIS Report AD-784 106/7WP. 101 p.

An oil sampler design for surface oil collection from a known surface area of water during a finite sampling interval was examined and evaluated. The design system consists of a weir to provide a self-adjusting means of skimming surface water at a rate determined by a screw pump, and a sorbent material placed between the weir and the pump to collect the oil.

Cleanup and recovery
Design and engineering

Citation Source: Environment Abstracts. 1975. 5(4). Entry #75-03120.

C-838-74
QUANTITATIVE SAMPLING OF PELAGIC TAR IN THE NORTH ATLANTIC, 1973

Sleeter, T. D., B. F. Morris, and J. N. Butler. 1974.
Deep-Sea Research 21(9):773-775.

Pelagic tar has been quantitatively collected in the western Sargasso Sea and the eastern North Atlantic. Heyerdahl observed exceptionally large amounts of tar in 1969 and 1970; Langmuir currents may have concentrated the tar into windrows.

Citation Source: Citation Journal.

5. ANALYSIS

C-839-74
INCIDENCE AND SIGNIFICANCE OF POLYNUCLEAR AROMATIC HYDROCARBONS IN THE WATER ENVIRONMENT

Andelman, J. B., and J. E. Snodgrass. 1974.
CRC Critical Reviews in Environmental Control 4(1):69-83.

The analysis, origin, source and transport of PAH (polynuclear aromatic hydrocarbons), the removal of PAH, and the possible health (carcinogenic) effects are considered. One of the most carcinogenic PAH, 3,4-Benzopyrene, is the dominant example.

Biological effects of oil pollution

Citation Source: Pollution Abstracts. 1975. 6(2).
Entry #75-01459.

C-840-74
NEW LAB METHODS IDENTIFY OIL SPILL ORIGINS

Anonymous. 1975.
World Oil 180(1):111-112,114.

Gas chromatography produces a detailed profile of an oil's components. Weathering may change this profile, however. A fluorescence spectrophotometer identifies and measures unaffected aromatic compounds, adding more sensitivity to the task of comparing spill material to fingerprint files.

Citation Source: Petroleum Abstracts. 1975. 15(9).
Entry #201,633.

C-481-74
OIL SPILL IDENTIFICATION SYSTEM

Anonymous. 1974.
Interim Report, CGR/DC-31/74, USCG-D-41-75. 96 p.

The U.S. Coast Guard Research and Development Center has developed a system for forensic identification and classification of oil spills. The system includes sampling and sample transmittal procedures and the following four techniques: infrared and fluorescence spectroscopy, gas chromatography and thin-layer chromatography. The success of the system in identifying the sources responsible for oil spills is discussed.

Citation Source: Government Reports Announcements. 1975.
75(6). Entry #AD/A-003 803/4GA.

C-842-74
TAR BALLS AND PARTICULATE MATTER: ANALYTICAL METHODS

Anonymous. 1974.
IOC-UNESCO, WMO, U.S. Department of Commerce.Petroleum Marine Pollution Symposium, May 13-17, 1974. p. 127-141.

Of the passive fingerprint methods available for the identification of oil and oil spill origins, the method of field ionization mass spectrometry is reported to be most effective. Methods for estimating the modern oil pollution of the North Atlantic are presented.

Monitoring

Citation Source: Environment Abstracts. 1975. 5(2).
Entry #75-01552.

C-843-74
MULTI-FREQUENCY RADIOMETRIC MEASUREMENTS OF FOAM AND A MONOMOLECULAR SLICK

Au, B., J. Kenney, L. U. Martin and D. Ross. 1974.
International Symposium on Remote Sensing of Environment, 9th, Ann Arbor, 1974. Vol. 3. p. 1763-1773.

"Measurements have been made of a surf zone and ocean region where roughness was suppressed by an artificial monomolecular slick." The existence of the slick on the ocean surface had the same effect as a decrease in surface roughness. Various foam measurements are given.

Physical effects of oil pollution

Citation Source: International Aerospace Abstracts. 1975.
15(5). Entry #A75-17208.

C-844-74
PROCESS CHROMATOGRAPHY FOR THE SELECTIVE MEASUREMENT OF HYDROCARBONS IN THE SCOPE OF ENVIRONMENTAL PROTECTION [English summary]

Ball, H., and F. Mueller. 1974.
Siemens-Zeitschrift 48(9):622-625.

The measurement of environmental hydrocarbon pollutants in the parts-per-billion range is made with the use of a process chromatograph combined with a storage system. The method of hydrocarbon measurement is outlined.

Citation Source: Chemical Abstracts. 1975. 82(10).
Entry #63713y.

C-845-74
DETERMINATION OF THE THICKNESS OF PETROLEUM FILMS ON WATER

Barger, W. R., D. R. Sherard, and W. D. Garrett. 1974.
AD-786 353; NRL-MR-2883. 18 p.

Two devices have been developed to determine the thickness of petroleum films on water, both of which collect oil from a known surface area and weigh it. One device uses polyurethane foam discs on an open-ended cylinder to absorb oil; the other device is a hydrophilic Teflon sheet which removes thin layers of oil from water on contact. The Teflon sheet is useful for oil identification and analyses because of its chemical inertness.

Citation Source: Scientific and Technical Aerospace Reports. 1975. 13(6). Entry #N75-15207.

C-846-74
THE DETERMINATION OF VOLATILE ORGANIC COMPOUNDS AT THE UG/L LEVEL IN WATER BY GAS CHROMATOGRAPHY

Bellar, T. A., and J. J. Lichtenberg. 1974.
EPA-670/4-74-009. 31 p.

The details of the design, construction and use of an apparatus to quantitatively analyze volatile hydrocarbon and chlorinated hydrocarbon solvents in water are presented. The method can be used for organic compounds with less than 2% solubility in water and that boil below 150°C, and is useful in water pollution prevention.

Citation Source: Government Reports Announcements. 1975. 75(3). Entry #PB-237 973/3GA.

C-847-74
WATER AND WASTE WATER CHEMISTRY

Blangetti, M., D. Donnert, and S. H. Eberle. 1974.
Report, KFK-1969-UF. 124 p.

Investigations in pollution chemistry in 1972 and 1973 are reviewed. One of the topics is mineral oils on Lake Constance.

Citation Source: Chemical Abstracts. 1975. 82(20). Entry #128919s.

C-848-74
SOLUBILITY BEHAVIOR OF NO. 2 FUEL OIL IN SEA WATER

Boehm, P. D. 1974.
Marine Pollution Bulletin 5(7):101-105.

The solubility of No. 2 fuel oil in seawater was examined using gas chromatography. Several hydrocarbon components (accommodated, solubilized and soluble) were present in the mixtures.

Physical changes of oil in the environment

Citation Source: Chemical Abstracts. 1975. 82(18). Entry #115711.

C-849-74
RAPID IDENTIFICATION OF OIL AND GREASE SPILLS FROM PULP AND PAPER MILLS BY INFRARED SPECTROSCOPY

Bogatie, C. F. 1974.
TappI 57:130-134.

An infrared absorbence ratio tree for the identification of oil or grease spills in water was developed, using a technique which compared ratios of infrared absorbency of grease and oil for specific frequency bands. Rapid identification using this method should aid in locating the source of the spill and in selecting a cleanup procedure.

Monitoring

Citation Source: Selected Water Resources Abstracts. 1974. 8(4). Entry #W75-02006.

C-850-74
POLYCYCLIC AROMATICS IN SURFACE AND GROUND WATER

Borneff, J. 1974.
EPA-TR-498-74. 22 p. Translations of Schriftenreihe des Vereins fuer Wasser-,Boden- und Lufthygiene 40:53-65. 1973.

Polycyclic aromatics are carcinogenic. The present levels of pollution derived from natural and industrial sources are reported and their significance analyzed. Techniques for pollutant removal are discussed.

Citation Source: Government Reports Announcements. 1975. 75(4). Entry #PB-237 786-T/GA.

C-851-74
METHODS OF MEASURING THE SOLUBILITIES OF HYDROCARBONS IN AQUEOUS SOLUTIONS

Brown, R. L., and S. P. Wasik. 1974.
U.S. National Bureau of Standards, Journal of Research, Physics and Chemistry 78A:453-460.

A gas-liquid chromatography analysis is described which measures the equilibrium of a hydrocarbon between a gas phase and a liquid water phase. The technique used is called headspace gas analysis and involves the analysis of only the vapor phase. Analyses of benzene, toluene and ethylbenzene in distilled water (5° to 20° range) and artificial seawater (0° to 20° range) were made.

Citation Source: Citation Journal.

C-852-74
QUALITATIVE DETERMINATION OF PETROLEUM SAMPLE TYPE FROM GAS CHROMATOGRAMS USING PATTERN RECOGNITION TECHNIQUES

Clark, H. A., and P. C. Jurs. 1975.
Analytical Chemistry 47(3):374-378.

A set of 42 gas chromatograms of petroleum samples was coded using 19 descriptors. Using a set of binary pattern classifiers, samples were classified and unknowns predicted. Predictive abilities are 87 to 100%. Only a small fraction of the descriptors contained the information necessary for classification and prediction.

Citation Source: Citation Journal.

C-853-74
THE HAZARDS OF OIL SPILL SAMPLING

Cole, B. J. 1974.
Marine Technology Society Journal 8(2):13-14.

A technique using infrared spectroscopy to fingerprint oil and determine oil spill source has been developed. The method identifies the type of oil in a slick and also produces unique fingerprints for the same type of oil from different well sources.

Citation Source: Environmental Health and Pollution Control.
1974. 6(6). Entry #2109.

C-854-74
PROPERTIES OF PETROLEUM AND HYDROCARBONS. 3. CURRENT ANALYTICAL METHODS

Conrad, M. 1973.
Ing. Prelucrarii Hidrocarburilor 1:135-152.

This is a review with 319 references.

Citation Source: Chemical Abstracts. 1975. 82(20).
Entry #127185n.

C-855-74
MULTICLIMENT TRUE BOILING POINT GAS CHROMATOGRAPH FOR MONITORING OIL POLLUTION

Davis, C. E., A. E. Krc, J. J. Szakasits, and R. L. Hodgson. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 93-96.

A true boiling point gas liquid chromatograph (GLC) has been designed which generates both carbon and sulfur boiling point profiles up to 538°C. The nonvolatile organics are measured by backflushing and combusting. These data are acquired in a single rapid analysis and are quite effective in identifying oil pollution sources.

Analysis

Citation Source: Citation Journal.

C-856-74
IDENTIFICATION OF PETROLEUM PRODUCTS IN NATURAL WATER BY GAS CHROMATOGRAPHY

Dell'Acqua, R., J. A. Egan, and B. Bush. 1975.
Environmental Science and Technology 9(1):38-41.

Trace amounts of common petroleum products, such as kerosine, diesel fuel, common fuel oils, transmission fluid and lubricating oils, can be identified using high-efficiency packed columns and gas chromatography. Concentrations as low as 0.25 μl/l can be detected.

Analysis

Citation Source: Petroleum Abstracts. 1975. 15(9).
Entry #201,632.

C-857-74
HYDROCARBONS ASSOCIATED WITH SUSPENDED PARTICULATE MATTER IN SAN FRANCISCO BAY WATERS

DiSalvo, L. H., and H. E. Guard. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 169-173.

A double settling tube called the "biosampler" was used to collect suspended sediments; bay mussels in one of the tubes were used to actively entrap the particles. Analysis for total alkane and total aromatic hydrocarbons in the sediments was made by thin layer chromatography. Using the minimum values, it was calculated that 13.5 metric tons of presumably pollutant hydrocarbons were associated with the suspended particulates in the bay.

Citation Source: Citation Journal.

C-858-74
EVALUATION OF SOME METHODS OF ANALYSIS FOR PETROLEUM HYDROCARBONS IN MARINE ORGANISMS

Farrington, J. W., and G. C. Medeiros. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 115-121.

Three methods of extracting hydrocarbons from marine organisms were found statistically different but practically the same. The composition and concentration of hydrocarbons in clams from areas of three different pollution levels were determined. After spiking a clam homogenate with 10 ppm API No. 2 fuel oil, only 5 to 6 ppm of the spike were detected. Hydrocarbons already in the clams interfered with the tagging parameters of the spike.

Citation Source: Citation Journal.

C-859-74
IDENTIFICATION OF PETROLEUM OILS BY FLUORESCENCE SPECTROSCOPY

Frank, U. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 87-91.

Oil fluorescence spectra have a three-dimensional character which can be used to identify the source of an oil spill. This method was tested for its ability to match weathered and unweathered portions of nine petroleum oils and to discriminate among them. Fluorescence quenching, Raman scatter, and solvent impurities do not weaken the method.

Monitoring

Citation Source: Citation Journal.

C-860-74
POLYCYCLIC AROMATIC HYDROCARBONS IN THE ENVIRONMENT: ISOLATION AND CHARACTERIZATION BY CHROMATOGRAPHY, VISIBLE, ULTRAVIOLET AND MASS SPECTROMETRY

Giger, W., and M. Blumer. 1974.
Analytical Chemistry 46(12):1663-1671.

Increasing use of fossil fuels and the importance of coal and oil shale, whose pyrolytic processes create a rich spectrum of aromatic hydrocarbons, are cause for environmental and health concern. The paper reports methods for the isolation, fractionation and analysis of polycyclic aromatic hydrocarbons from environmental samples. Analyses of marine sediments have uncovered a previously undocumented compositional complexity of these hydrocarbons.

Citation Source: Citation Journal.

C-861-74
OIL/WATER INTERFACIAL RHEOLOGY OF AN OIL SLICK

Gladden, G. P., and E. L. Neustadter. 1973.
Chem., Phys. Chem. Anwendungstech. Grenzflaechenaktiven Stoffe, Ber. Int. Kongr., 6th, 1972. 2, Teil 2. p. 535-546.

Interfacial rheology experiments studying the effects of oil-soluble surfactants (substances used to disperse oil slicks at sea) have shown that the presence of such surfactants has marked effects on rheological properties of the oil-water interfaces. These effects contribute to the resulting type and stability of the slick dispersion.

Cleanup and recovery

Citation Source: Chemical Abstracts. 1975. 82(10).
Entry #64023k.

C-862-74
ESTIMATES OF OIL IN AQUATIC SEDIMENTS BY FLUORESCENCE SPECTROSCOPY

Hargrave, B. T., and G. A. Phillips. 1975.
Environmental Pollution 8(3):193-215.

Aromatic substances were extracted from various sediments and analyzed by fluorescence spectroscopy. Fluorescence contour diagrams were constructed to compare fluorescence patterns in the sample extracts and standard oils. This analysis confirmed the presence of petroleum residues in Bermuda beach sand, intertidal sand from an inlet near a refinery in Nova Scotia and in sand from Chedabucto Bay contaminated by the "Arrow" stranding in 1970.

Citation Source: Citation Journal.

C-863-74
POLYNUCLEAR AROMATIC HYDROCARBONS IN RAW, POTABLE AND WASTE WATERS

Harrison, R. M., R. Perry, and R. A. Wellings. 1975.
Water Research 9(4):331-346.

The paper reviews the subject of polynuclear aromatic hydrocarbon (PAH) presence in waters, giving particular attention to analytical techniques used to monitor these compounds. The effects of water and waste water treatment processes on PAH levels and the probable sources of these compounds in the aqueous environment are reviewed.

Monitoring

Citation Source: Citation Journal.

C-864-74
DETECTION AND PRESENT SCOPE OF CONTAMINATION CAUSED BY MINERAL OIL IN OUR SURFACE WATERS

Hellmann, H. 1974.
Oberflächengewässern 64(7-8):218-222.

Details are given of an investigation which determined the hydrocarbon content of surface waters of the GFR during 1972 and 1973. It was found that the biogenous hydrocarbons outweighed the mineral oils in some surface waters; however, the effects of mineral oil contamination could be detected in almost all waters.

Reporting

Citation Source: Environmental Health and Pollution Control. 1975. 7(2). Entry #357.

C-865-74
THE EVALUATION AND DEVELOPMENT OF PASSIVE TAGGING PROCEDURES FOR THE IDENTIFICATION OF CRUDE OIL SPILLED ON WATER

Hunt, G., D. Horton, J. Levine, D. Mayo, D. Donovan, W. Shelley, L. Jang, R. Crane, and R. Johnson. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 143-148.

Four passive tagging techniques comparing gas chromatograms, V-Ni ratios, S-N ratios and infrared spectra, were evaluated for use in identifying mystery oil spills and upholding Maine's Oil

Conveyance Law. Crude oils were subjected to weathering and were subsampled at several intervals up to 15 days. The most powerful approach appears to be comparing high resolution gas chromatograms and V-Ni, S-N ratios.

State legislation

Citation Source: Citation Journal.

C-866-74
QUANTIFICATION OF ENVIRONMENTAL HYDROCARBONS BY THIN-LAYER CHROMATOGRAPHY

Hunter, L. 1975.
Environmental Science and Technology 9(3):241-246.

Low levels of hydrocarbons can be analyzed by both gravimetric and densitometric thin-layer chromatography. Alkanes and aromatics are easily separated. The gravimetric procedure produces more quantitatively precise results. These methods are being used in chronically polluted San Francisco Bay and may be used for marine sediments as well.

Citation Source: Citation Journal.

C-867-74
MARINE POLLUTION BY OIL. CHARACTERIZATION OF POLLUTANTS, SAMPLING, ANALYSIS AND INTERPRETATION

Institute of Petroleum Oil Pollution Analysis Committee. (rec'd 1975).
Applied Science Publishers Ltd: Barking Essex, England, Pr.L.8.ISBN 0-85334-452-3. 198 p.

The book consists of detailed descriptions and recommendations for techniques to analyze and sample petroleum-derived pollutants in marine environments. Also included is a discussion of the types of oil pollutants and the effects of weathering on petroleum oils in the sea.

General fate of oil in the environment

Citation Source: Biological Abstracts. 1975. 59(9).
Entry #52082.

C-868-74
THE DETERMINATION OF METALLIC ELEMENTS IN WASTES AND WATERS WITH THE GRAPHITE FURNACE

Kahn, H. L. 1973.
International Journal of Environmental Analytical Chemistry 3(2):121-131.

Flame atomic absorption can be used to detect metallic elements in many types of water. However, the HGA-2000 graphite furnace improved detection limits 1000 times compared to the flame. This improvement is of value in analyzing oil spills on seawater to help identify the source of the spill.

Citation Source: Biological Abstracts. 1975. 59(7). Entry #39773.

C-869-74
MOVEMENT AND EFFECTS OF SPILLED OIL OVER THE OUTER CONTINENTAL SHELF - INADEQUACY OF EXISTENT DATA FOR THE BALTIMORE CANYON

Knebel, H. J. 1974.
U.S. Geological Survey Circular No. 702. 20 p.

A deductive approach is used to determine and predict the movement and effects of spilled oil. While some factors that determine oil movement are adequately known (i.e. variations in the water's thermohaline structure and suspended matter distribution), other factors (i.e. insufficient wind and storm statistics and lack of quantitative understanding of the relationship between nontidal drift and its driving mechanisms) make spill movement and effect predictions unreliable.

General fate of oil in the environment

Citation Source: Petroleum Abstracts. 1975. 15(3). Entry #202,790.

C-870-74
DETERMINATION OF THE MOLECULAR SOLUBILITY OF NAVY OILS IN WATER

Lai, M. G., and C. E. Adams. 1974.
NTIS Report AD-784 414/5WP.

This method is based on the principle of osmotic pressure and is capable of measuring actual hydrocarbon concentration in the presence of dispersed hydrocarbons in water. Solubility of Navy oils was found to depend on the water-to-oil ratio and the dissolution rate was a function of agitation of the water-oil mixture.

Citation Source: Environment Abstracts. 1975. 5(3). Entry #75-02318.

C-871-74
PROFILES OF THE POLYNUCLEAR AROMATIC FRACTION FROM ENGINE OILS OBTAINED BY CAPILLARY-COLUMN GAS-LIQUID CHROMATOGRAPHY AND NITROGEN-SELECTIVE DETECTION

Lee, M. L., D. K. Bartle, and M. V. Novotny. 1975.
Analytical Chemistry 47(3):540-543.

High resolution fingerprints of different oil samples were obtained by extracting the oils and analyzing the $MeNO_2$ fraction by means of a petroleum concentration method and a high-efficiency glass capillary column. The method is rapid.

Citation Source: Chemical Abstracts. 1975. 82(20).
Entry #127264n.

C-872-74
PRELIMINARY RESULTS ON THE USE OF TENAX® FOR THE EXTRACTION OF PESTICIDES AND POLYNUCLEAR AROMATIC HYDROCARBONS FROM SURFACE AND DRINKING WATERS FOR ANALYTICAL PURPOSES

Leoni, V., G. Puccetti, and A. Grella. 1975.
Journal of Chromatography 106:119-124.

Under optimal conditions and in the absence of other contaminants, over 90% of organochlorine or organophosphorous pesticides or polynuclear aromatic hydrocarbons were recovered by Tenax GC®. Research on the effectiveness of Tenax in natural waters contaminated with surfactants, fats and oils is in progress.

Cleanup and recovery

Citation Source: Citation Journal.

C-873-74
HYDROCARBONS IN THE MARINE ENVIRONMENT

Mackie, P. R., K. J. Whittle, and R. Hardy. 1974.
Estuarine and Coastal Marine Science 2(4):159-174.

The amount and distribution of hydrocarbons have been determined in samples of water, surface film, sediment, plankton and fish from the Firth of Clyde. Hydrocarbons were present at low levels, but accumulation of hydrocarbons at higher levels in the food chain was not proven. Neither could the biogenic or non-biogenic origin of the hydrocarbons be determined.

Sampling

Citation Source: Citation Journal.

C-874-74
MEASUREMENT OF HYDROCARBONS IN WATER: APPLICATION TO CASES OF SURFACE WATER POLLUTION

Mallevialle, J. 1974.
Water Research 8(12):1071-1075.

Measurement of hydrocarbons at a concentration of 0.1 mg/l water can be accomplished with a method utilizing carbon tetrachloride extraction, florisil chromatography and measurement of absorption. The method is highly competitive with other techniques because of its high sensitivity, rapidity and simplicity.

Citation Source: Selected Water Resources Abstracts. 1975. 8(9). Entry #W75-04709.

C-875-74
IDENTIFICATION OF C.I. SOLVENT RED 24 IN HYDROCARBON OIL MIXTURES AS AN AID IN OIL POLLUTION INVESTIGATIONS

Matthews, P. J. 1975.
The Analyst 100(1186):29-32.

Certain oils are exempt from customs and contain markers such as C.I. Solvent Red 24. The marker is useful in the accurate identification of the source of contamination in pollution incidents. In this paper a method is described that separates and identifies C.I. Solvent Red 24 using dry column chromatography and thin-layer chromatography.

Citation Source: Citation Journal.

C-876-74
THE ESTIMATION OF THE AMOUNT OF EMPIRE MIX CRUDE OIL IN MULLET, SHRIMP AND OYSTERS BY LIQUID CHROMATOGRAPHY

Miles, D. H., M. J. Coign, and L. R. Brown. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 149-154.

The amount of oil taken up by small (0.1 g) samples of specific tissues from animals exposed to crude oil in the laboratory was determined by both conventional gas chromatography and liquid chromatographic techniques. Both are valid for large samples of tissue, but the liquid chromatography technique, as described in this paper, detects lower concentrations than gas chromatography. More replicates are therefore possible for a given amount of biological material.

Biological effects of oil pollution

Citation Source: Citation Journal.

C-877-74
CHEMICAL AND PHYSICAL CHARACTERIZATION OF TAR SAMPLES FROM THE MARINE ENVIRONMENT

Mommessin, P. R., and J. C. Raia. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 155-168.

Samples of tar collected by the U.S. Coast Guard from the northwestern Atlantic Ocean were characterized using microscopy, chromatography, infrared and other analytical methods. Two distinct types of tar samples were indicated: urban and industrial, and weathered. Other characteristics also helped to relate tars to their origin and history.

Sampling

Citation Source: Citation Journal.

C-878-74
TRACE ANALYSIS OF PHENOLS IN WATER BY GAS CHROMATOGRAPHY

Murray, D. A. J. 1975.
Journal of the Fisheries Research Board of Canada 32(2):292-294.

A rapid method using a minimum of sample manipulation was developed to analyze low concentrations of phenols, cresols and xylenols in water. The internal standard, o-xylene, is added to the sample, and after extraction, the analysis is completed with gas chromatography.

Citation Source: Citation Journal.

C-879-74
ASSESSMENT OF ENVIRONMENTAL DAMAGES FOLLOWING AN OIL SPILL - A PROSPECTUS

Nadeau, R. 1974.
Assessing the Social Impacts of Oil Spills, Rensselaerville, New York, 1973. p. 11-14.

Through the use of the example of the March, 1973, Cabo Rojo oil spill, Environmental Protection Agency assessment procedures are documented. Immediately after a spill has occurred, EPA biologists do "eyeball" assessments, recruit local biologists for help and take samples of biota for analysis. Photodocumentation is also done.

Biological effects

Citation Source: Citation Journal.

C-880-74
CHEMICAL SUBSTANCES AND TOXICOLOGICAL TESTS

Nakayama, S., Y. Nagano, K. Aoyagi, and S. Ohbayashi. 1974.
Rodo Eisei 15(10):6-24.

The design and characteristics of a toxicological test for a certain class of chemical substances are discussed. Tests for oils, surfactants and organotin compounds are given as examples.

Biological effects of oil pollution

Citation Source: Chemical Abstracts. 1975. 82(15).
Entry #93741y.

C-881-74
ANALYTICAL METHODS FOR POLYNUCLEAR AROMATIC HYDROCARBONS IN CRUDE OILS, HEATING OILS, AND MARINE TISSUES

Pancirov, R. J., and R. A. Brown. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 103-113.

The three-to six-ring polynuclear aromatic (PNA) hydrocarbons are potentially carcinogenic and therefore of concern in assessing the impact of oil pollution. Few data exist on the concentrations of PNA hydrocarbons. The study reported in this paper included analyzing four different oils for individual PNA hydrocarbons and preliminary work on marine tissues, where detectability at present is 1 ppb. The method used is explained.

Biological effects of oil pollution

Citation Source: Citation Journal.

C-882-74
STUDIES OF THE AROMATIC COMPOUNDS CONTENT IN SEA WATER [English summary]

Redkin, Yu.R., A. M. Voitenko, and P. A. Teplyakov. 1973.
Okeanologiya 13(5):908-913.

Pollution of the Black Sea with polynuclear aromatic hydrocarbons was studied using the luminescent spectroscopy method based on Shpolsky's effect. The hydrocarbons were quantitatively determined in the seawater, bottom sediments and fish tissue, with photoelectric and photographic recording of the spectrum for the straight chain paraffins.

Analysis
General fate of oil in the environment

Citation Source: Biological Abstracts. 1975. 59(7).
Entry #39775.

C-883-74
USE OF LOW-TEMPERATURE LUMINESCENT SPECTROSCOPY TO DETERMINE THE CONTENT OF AROMATIC COMPOUNDS IN SEA WATER

Redkin, Yu.R., A. M. Voytenko, and P. A. Teplyakov. 1974.
Oceanology, Academy of Sciences, USSR, English Edition 13(5): 751-755.

Polycyclic aromatic hydrocarbons can be quantitatively determined in seawater, bottom sediments, ooze and animal tissue using fluorescent and phosphorescent techniques. The results of a study of the coastal waters of the Black Sea are given. Some preventive measures against pollution are presented.

Analysis

Citation Source: Petroleum Abstracts. 1975. 15(11).
Entry #202,226.

C-884-74
POLLUTION OF THE SEA BY PETROLEUM

Riera, J. A. 1974.
EPA-TR-63-75. 27 p. Translation of Oilgas (Spain) 75:5-14. 1974.

The pollutants in Spanish coastal waters are identified and analyzed. The characteristics of the residues of the principal crude and refined products are also identified.

Citation Source: Government Reports Announcements. 1975.
75(4). Entry #PB-237 804-T/GA.

C-885-74
ORGANIC MATTER IN THE COASTAL WATERS OF THE GERMAN DEMOCRATIC REPUBLIC. III. DETERMINATION OF ORGANIC SUBSTANCES WITH PHENOLIC STRUCTURES IN SEA WATER BY NITROANILINE REACTION

Schlungbaum, G., and A. Behling. 1974.
Acta Hydrochim. Hydrobiol. 2(5):423-431.

The nitroaniline reaction in determining phenolic structures in seawater is described. Results of a survey of the Baltic Sea by this method are tabulated.

Citation Source: Chemical Abstracts. 1975. 82(22).
Entry #144742j.

C-886-74
CHROMATOGRAPHIC DETECTION OF SMALL AMOUNTS OF MINERAL OIL IN CHILLIES

Sen, A. R., P. Sengupta, N. Ghosedastidar, and T. V. Mathew. 1973.
Research and Industry 18(3):97.

The detection of mineral oil in chillies by silica gel thin-layer chromatography is described.

Citation Source: Chemical Abstracts. 1975. 82(21).
Entry #137860t.

C-887-74
RANDOM MOVEMENT OF OIL PATCHES

Shukla, D. K., and R. M. Stack. 1974.
Science of the Total Environment 3(1):117-125.

From analyses of simple models of oil slick movements, the total drift of an oil patch is expressed as the sum of the random displacement for several periods. A knowledge of the physics of oil movements should aid in the planning of offshore facilities and tanker routing patterns.

Citation Source: Environment Abstracts. 1975. 5(3).
Entry #75-02295.

C-888-74
AN EXAMINATION OF THE CONCENTRATION OF ORGANIC COMPONENTS WATER-EXTRACTED FROM PETROLEUM PRODUCTS

Sniegoski, P. J. 1975.
Water Research 9(4):421-423.

The discharge of effluent water containing dissolved organics into the sea after shipboard oily waste water separation presents a serious pollution problem. Using total carbon analysis, a study was conducted which examined the solubility characteristics of petroleum products found in naval vessels. An estimate was made of the relative quantities of polar compounds and hydrocarbons present in the water phase of the oil-water system. Results demonstrate that in general, an oil contains small amounts of substances which are much more water-soluble than the bulk oil.

Citation Source: Citation Journal.

C-889-74
PETROLEUM POLLUTANTS IN SURFACE AND GROUNDWATER AS INDICATED BY THE CARBON-14 ACTIVITY OF DISSOLVED ORGANIC CARBON

Spiker, E. C., and M. Rubin. 1975.
Science 187(4171):61-64.

Fossil carbon due to petrochemical chemical effluents is lower in C^{14} than modern organic carbon due to domestic wastes. Polluted rivers show a depression of DOC-C^{14} activity, indicating that fossil carbon can be as much as 40% of the total Dissolved Organic Carbon.

Chemical effects of oil pollution

Citation Source: Petroleum Abstracts. 1975. 15(8).
Entry #201,231.

C-890-74
DETERMINATION OF PHENOL IN MARINE ORGANISMS

Stilinovic, L., K. Munjko, and B. Vukic. 1974.
Arhiv za Higijenu Rada i Toksikologiju 25(2):247-252.

Samples of marine organisms and seawater were collected from coastal waters of Kvarner Bay and the Island of Vis for phenol determination. Methods of sample preservation and phenol analysis are given. A relationship between the PhOH concentration in marine organisms and increased seawater PhOH concentration was observed.

Citation Source: Chemical Abstracts. 1975. 82(21).
Entry #133601m.

C-891-74
A TREATMENT OF THE EQUILIBRIUM OF AN OIL LAYER ON WATER FLOW

Tamiya, S., H. Kato, Y. Watanabe, and T. Komura. 1974.
Journal of Society of Naval Architects 135:71-80.

A study of the equilibrium of an oil layer on flowing water in low- and high-velocity regions is presented.

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #071546.

C-892-74
EXTRACTION OF PETROLEUM HYDROCARBONS FROM OIL-CONTAMINATED SEDIMENTS

Walker, J. D., R. R. Colwell, M. C. Hamming, and H. T. Ford. 1975.
Bulletin of Environmental Contamination and Toxicology 13(3): 245-248.

Benzene is the most effective solvent of the three used in this study to extract petroleum hydrocarbons. Reciprocal shaking with benzene is the most efficient way to extract hydrocarbons from estuarine or marine sediments.

Citation Source: Citation Journal.

C-893-74
DETERMINATION OF SULFUR-CONTAINING PETROLEUM COMPONENTS IN MARINE SAMPLES

Warner, J. S. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 97-101.

Sulfur-containing petroleum compounds are usually present in low concentrations in aromatic hydrocarbon fractions. A sulfur-specific flame photometric detector in a gas chromatograph can identify sulfur components and provide a more definitive fingerprint of an oil source. These compounds may be preferentially concentrated in the marine environment.

General fate of oil in the environment

Citation Source: Citation Journal.

C-894-74
DETERMINATION OF HYDROCARBONS IN SEAWATER USING AN ELECTROLYTIC STRIPPING CELL

Wasik, S. P. 1974.
Journal of Chromatographic Science 12(12):845-848.

The dissolved hydrocarbons are stripped from seawater by small bubbles of hydrogen gas. After a given amount of hydrogen has bubbled through the cell, the hydrocarbon concentration is determined from the volume of the seawater and the hydrocarbon concentration in the headspace of the cell.

Citation Source: Citation Journal.

C-895-74
QUANTITATIVE DETERMINATION OF PETROLEUM PRODUCTS IN GROUND AND WATER TESTS

Weber, R. 1974.
Chemische Rundschau 27(46):35.

Carbon tetrachloride is used to extract the petroleum products from the samples. Then, interfering substances are removed by adsorption on a Florisil resin column and the petroleum products concentrations are measured by infrared spectroscopy.

Citation Source: Chemical Abstracts. 1975. 82(18).
Entry #115795y.

C-896-74
OCCURRENCE AND ANALYSIS OF PETROLEUM HYDROCARBONS IN THE AQUATIC ENVIRONMENT

Yates, M. L. 1974.
U.S. Department of the Interior, Geological Survey, Menlo Park, California. 40 p.

The sources of oil pollution and both visible and non-visible effects are reviewed. The analytic techniques for both qualitative and quantitative assessments of hydrocarbons are discussed. Weathering and biological degradation pose problems for these assessments.

General effects of oil pollution
General fate of oil in the environment

Citation Source: Aquatic Sciences and Fisheries Abstracts.
1975. 5(2). Entry #5Q2038.

C-897-74
THE INFRARED STUDIES OF SANTA BARBARA CHANNEL OIL SPILL

Yu, T. C. 1974.
Ph.D. Thesis, Cincinnati University. 136 p.

During the 12-month study, supported by Western Oil and Gas Association, an attempt was made to establish the effects of this oil spill. The study evaluated: (1) the infrared analysis for quantitative identification of different oils and background hydrocarbon concentrations; (2) oil movement and deposition due both to spills and natural seeps; (3) the effect of sediment parameters on oil movement; and (4) the correlation of currents, sediment formations and oil movement.

Remote sensing

Citation Source: Petroleum Abstracts. 1975. 15(12). Entry #202,505.

C-898-74
THE RELATIVE DISTRIBUTION OF NON-AROMATIC HYDROCARBONS IN THE BALTIC IN SEPTEMBER 1971

Zsolnay, A. 1972/1973.
Marine Chemistry 1(2):127-136.

The author discusses the results of a study determining the relative distribution of non-aromatic hydrocarbons in the Central Baltic Sea. It was found that dissolved hydrocarbons that enter into the sediment have most likely been produced at the sediment-water interface.

Citation Source: Selected Water Resources Abstracts. 1975. 8(4). Entry #W75-01871.

C-899-74
DETERMINATION OF TOTAL HYDROCARBONS IN SEAWATER AT THE MICROGRAM LEVEL WITH A FLOW CALORIMETER

Zsolnay, A. 1974.
Journal of Chromatography 90(1):79-85.

A description is given of the analytic procedure to measure hydrocarbon concentrations in seawater. The equipment required for such a method is fairly inexpensive and can readily be taken to sea.

Citation Source: Environmental Health and Pollution Control. 1974. 6(6). Entry #2105.

C-900-74
HYDROCARBON CONTENT AND CHLOROPHYLL CORRELATION IN THE WATERS BETWEEN NOVA SCOTIA AND THE GULF STREAM

Zsolnay, A. 1974.
IOC-UNESCO, WMO, U.S. Department of Commerce. Petroleum Marine Pollution Symposium, May 13-17, 1974. p. 148-149.

Previous studies have indicated that a certain amount of hydrocarbons found in the ocean is produced by phytoplankton, and a correlation between hydrocarbon and chlorophyll content should exist. A method for determining such a correlation has revealed only a casual relationship between hydrocarbon and chlorophyll concentrations in the euphotic zone.

Citation Source: Environment Abstracts. 1975. 5(2).
Entry #75-01555.

B. OIL POLLUTION

1. CONTAINMENT

C-901-74
BOOM PROTECTS AGAINST OIL-SPILL POLLUTION

Anonymous. 1975.
Oil and Gas Journal 73(12):81.

Thick vertical vinyl sheets, a vinyl-foam flotation unit, polyurethane ribs and connectors comprise a new oil containment apparatus called Seaboom. Seaboom works in high current and storm conditions.

Citation Source: Citation Journal.

C-902-74
CONSTRUCTION OF A SPILL CHANNEL AND EXPERIMENTAL DETERMINATION OF SPILL SPREADING RATES OF FOUR NON-HAZARDOUS CHEMICALS ON WATER

Anonymous. 1974.
Lowell Technological Institution, Massachusetts, DOT/TST-75-18. Contract DOT-05-30109. 59 p.

The spreading rates of soybean oil, tetrahydronaphthalene, dioctyl phthalate and 1-hexadene were determined in a 40-foot long spill channel. The spreading rate was studied with timed photographs and as a function of spill fluid viscosity and density, spill release rate and water surface conditions.

Cleanup and recovery

Citation Source: Government Reports Announcements. 1975.
75(2). Entry #PB-237 491/6GA.

C-903-74
CONTAINMENT, CLEANUP, AND REMOVAL

Anonymous. 1974.
National Conference on Control of Hazardous Material Spills, San Francisco, 1974. p. 188-248.

Thirteen papers are presented which discuss the technology that exists for the containment, cleanup and recovery of hazardous materials from spill sites. A short contact time physical-chemical treatment system for waters contaminated by hazardous materials is described.

Cleanup and recovery

Citation Source: Environment Abstracts. 1975. 5(4). Entry #75-02828.

C-904-74
SUBMERSIBLE BARRIER CONTAINS OIL SPILLS

Anonymous. 1974.
Petroleum Engineers International 46:17.

A new submersible oil barrier technique developed by Bridgestone Tire Company, Japan, provides for the fast and effective containment of oil spills. The barrier consists of a flexible rubber skirt, supported by two inflatable hoses, which extends above and below the surface of the water. The fence can be stored on the sea bottom surrounding a fixed oil handling location and, when needed, can be inflated and floated to the surface to contain the spill.

Design and engineering

Citation Source: Citation Journal.

C-905-74
THE PORT OF EMDEN SAFEGUARDED AGAINST THE OIL MENACE BY MEANS OF A NATIONALLY PRODUCED COMPRESSED AIR OIL BARRIER

Anonymous. 1974.
Z. Binnenschiffahrt Wasserstr. 101(6):243-245.

A 175 m long oil barrier has been developed which prevents oil from spreading out of the oil port of Emden, West Germany, in the event of an oil disaster. A diverging water current is produced at the water surface by air streaming from a perforated compressed air tube located along the bottom of the port basin. The apparatus can control the streaming of oil within a period of 45 seconds.

Design and engineering

Citation Source: Environmental Health and Pollution Control. 1975. 7(1). Entry #242.

C-906-74
PROTECTING THE NORTH SEA ENVIRONMENT

Baldwin, A., and E. Cowell. 1974.
New Scientist 63(916):792-794.

The development of new, less toxic oil dispersants, oil skimmers, oil booms and an ecological monitoring system are included among the projects undertaken by British Petroleum in an effort to protect the North Sea environment from oil spills. Cases of environmental protection in company oil developments are discussed.

Cleanup and recovery

Citation Source: Environment Abstracts. 1975. 5(3).
Entry #74-02305.

C-907-74
STANDARDIZED HARDWARE FOR OIL SPILL CONTAINMENT BOOMS

Campbell, F. J. 1974.
U.S. Navy Civil Engineering Laboratory, CEL-TN-1343, AD-781, 645/7GA. 54 p.

The standardized hardware consists of a boom connector, a towing assembly and a boom-bulkhead attachment. Various oil booms can be quickly interconnected and distributed using this hardware.

Design and engineering

Citation Source: Petroleum Abstracts. 1975. 15(7).
Entry #200,890.

C-908-74
UNITED STATES COAST GUARD HIGH SEAS OIL CONTAINMENT SYSTEM (HSOCS)

Dennis, S. J. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 365-368.

A technical description is given of the High Seas Oil Containment System (HSOCS), presently being acquired by the U.S. Coast Guard for use on the high seas. The five major subsystems of the HSOCS--the barrier subsystem, container subsystem, mooring subsystem, handling subsystem and air delivery equipment--are described in detail. Fifteen of the systems were scheduled to be completed by March, 1974.

Citation Source: Citation Journal.

C-909-74
HIGH CURRENT CONTROL OF FLOATING OIL

Dorrler, J. S., R. Ayers, and D. C. Wooten. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 347-353.

The Environmental Protection Agency awarded contracts to Ultrasystems, Inc. (Newport Beach) to design and develop a streamlined boom utilizing hydrofoil concepts for oil spill containment, and to Shell Development Company to develop a boom profile utilizing a perforated incline plate as a baffle upstream of a flow barrier. An analysis of the present oil containment problem is presented and a description of the progress being made in each of the boom's development is given.

Cleanup and recovery

Citation Source: Citation Journal.

C-910-74
CHARACTERISTICS OF THE AREAS IN WHICH FAST CURRENT OIL CONTROL IS NEEDED

Hammer, W. F., C. W. Koburger, and D. S. Jensen. 1973.
Final Report, No. USCG-D-103-74. 102 p.

In currents with velocities over 0.8 to 1.0 knots, present oil spill control techniques are ineffective. The Coast Guard has identified 44 high risk areas in the Atlantic, Pacific and Gulf coasts, the Inland Area and the Great Lakes. The high risk label was based on the combination of oil concentration and spill frequency; environmental characteristics are also identified and analyzed.

Cleanup and recovery

Citation Source: Government Reports Announcements. 1975. 75(1). Entry #AD/A-000 452/3GA.

C-911-74
LABORATORY EVALUATION OF OIL HERDERS

Nagy, E. 1974.
AIChE Symposium Series 70(144):243-246.

Oil herders were evaluated by measuring the following: the concentrations necessary to reduce water surface tension and to "herd" oil, the maximum oil thickness produced with two different oils, the ease of application before and after spreading, and the oil aging effect. Oil aging decreases herder effectiveness; the herder should be applied before the oil has spread.

Research

Citation Source: Chemical Abstracts. 1975. 82(18).
Entry #115786.

C-912-74
OIL BOOMS AT A TIDAL INLET

Newman, D. E., and N. I. Macbeth. 1973.
Hydraulics Research Station, Wallingfords, Berks, United Kingdom, INT 118. 40 p.

The problems of transporting and deploying oil pollution booms in a tidal estuary are described. The trial run carried out at Burnham Overy for the Nature Conservancy has provided some useful recommendations on the use of booms in tidal estuaries.

Research

Citation Source: Aquatic Sciences and Fisheries Abstracts.
1975. 5(2). Entry #5Q2107.

C-913-74
A REVIEW OF OIL HANDLING PROBLEMS AT OFFSHORE TERMINALS - PART II - PROGRAM FOR EXPERIMENTALLY EVALUATING ADVANCED OIL BARRIERS

Schneider, I. L., R. C. Asher, and C. R. Mainville. 1974.
ISBN: NMRC-272-23100-R1a. 171 p.

An engineering review of four barrier designs (pneumatic barrier, skirt barrier, raisable skirt barrier, fixed flotation and skirt/pneumatic barrier) is presented and an evaluation program is developed. In order to evaluate the designs, testing will be conducted over a three-year period on the containment/removal concept, the dynamic model and its components, and the offshore performance of a prototype.

Research

Citation Source: Aquatic Sciences and Fisheries Abstracts.
1975. 5(2). Entry #5Q2121.

C-914-74
A HYDRODYNAMICALLY EFFECTIVE HORIZONTAL OIL BOOM

Wilcox, J. D. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 363-364.

The PACE boom is a horizontal oil boom that uses natural forces of flowing water to contain spilled oil or direct its recovery. When in operation, boom sections are placed across the current; surface oil flows under a flotation device, up through a segment of netting and over a fabric through which water passes but not oil; and then is trapped against a second flotation device. The float then carries the oil to a recovery area.

Cleanup and recovery

Citation Source: Citation Journal.

2. CLEANUP AND RECOVERY

C-915-74
PETROLEUM EMULSIONS AND PETROLEUM SULFONATES AS EMULSIFYING AGENTS

Abdelkader, M. H., and M. M. Abdelkader. 1974.
Chemistry and Industry (London) 20:831-834.

Oil-water mixtures could be emulsified using sodium and calcium sulfonate derivatives of diesel, gas, light neutral oils and light water distillates. Casein and emulsifying agents were also investigated.

Citation Source: Chemical Abstracts. 1975. 82(18). Entry #113912.

C-916-74
AN OIL RECOVERY SYSTEM UTILIZING POLYURETHANE FOAM--A FEASIBILITY STUDY

Anonymous. 1974.
Marine Technology Society, March, 1974.

Described is an oil recovery system, developed by Shell Development Company, using polyurethane foam as a sorbent for spilled oil. The system can recover all types of spilled oil from water surfaces under varied conditions. A recovery rate of 9,000 gallons per hour was achieved.

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #071892.

C-917-74
EXPERIMENTAL OIL SKIMMER

Anonymous. 1974.
Mechanical Engineering 96(8):48.

An oil skimmer built by Lockheed under U.S. Coast Guard contract was towed for four hours at speeds up to 10 kts in a sea state 5 to test open-sea survivability. The test proved successful. The skimmer works inside an oil containment barrier and sweeps up to 100 gallons/min using a paddle wheel disc-drum. The machine can be flown to an oil spill site, assembled and towed to the spill area.

Citation Source: Citation Journal.

C-918-74
GUIDE TO WATER CLEANUP MATERIALS AND METHODS

Anonymous. 1974.
Arthur D. Little, Incorporated. 350 p.

This guide contains information on preventive and remedial pollution control equipment and materials. In addition to listing manufacturers of water cleanup equipment and 500 products (booms, barriers, skimmers, separators, sorbents, oil/water monitors, etc.), contingency planning and water pollution laws and regulations are described.

Regulations, standards and planning

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1975. Vol. 10. Entry #071651.

C-919-74
LOCKHEED CLEAN SWEEP DELIVERED TO JAPAN

Anonymous. 1975.
Pacific Oil World 68(4):24.

The article reports the sale of a pair of portable Lockheed oil sweepers to Japan which will aid in keeping Japanese waters clean. The oil sweeper device can recover 760 liters/minute of spilled oil from harbors, estuaries, bays and offshore areas.

Citation Source: Citation Journal.

C-920-74
MECHANICS OF HANDLING OIL SPILLS

Anonymous. 1974.
Electrical World 182(5):79.

Several cleanup devices were demonstrated in the Columbia River. An inflatable boom for containment of an oil spill, a variety of oil absorbents and a styrofoam boom were tested.

Citation Source: Citation Journal.

C-921-74
SKIMMER LESSENS TRASH INTAKE DIFFICULTIES

Anonymous. 1975.
Oil and Gas Journal 73(12):84-85.

Oilhawg, a skimmer, can be operated from the edge of a pier or on a boat. The skimming depth is determined by placing a serrated rest on the edge of the working platform. The pump passes most trash and is capable of pumping 100 gpm.

Information Source: Parker Systems, Inc., Box 1652, Norfolk, Virginia 23501.

C-922-74
WILLIAMETTE STREAKER CLEANS UP OIL SPILLS FAST

Anonymous. 1974.
Marine Engineering/Log 79:66A.

Summary not available.

Citation Source: Applied Science and Technology Index. 1975. 63(3).

C-923-74
DEVELOPING AN OPEN-SEAS SKIMMER

Ayers, R. R., J. P. Fraser, and L. J. Kazmierczak. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 401-408.

An open-seas skimming apparatus contains within it a "quiescent pool," achieved by flow diffusion of the water and oil entering the skimmer, and of the water leaving it. The oil is removed from the pool using commercially available oil-removal devices. Efficient oil collection and recovery is possible at vessel speed up to two knots in swells or wind-driven seas up to low sea state four (18 knot winds, 6 foot significant waves).

Design and engineering

Citation Source: Citation Journal.

C-924-74
EFFECT OF SOME NONIONIC DETERGENTS ON OIL-WATER EMULSIONS STABILIZED BY LAURYL PYRIDIUM CHLORIDE

Bahadur, P., and S. N. Srivastava. 1974.
Indian Journal of Technology 12(11):489-491.

The effect of the addition of a nonionic detergent on the δ potential of an emulsion of 1% petroleum ether in 0.005% lauryl pyridium chloride is described.

Citation Source: Chemical Abstracts. 1975. 82(16). Entry #100584e.

C-925-74
DEVELOPMENT OF A HIGH SEAS OIL RECOVERY SYSTEM. PHASE II. PROTOTYPE DESIGN, FABRICATION SYSTEM, AND TESTING. APPENDIX III. SYSTEMS TESTS. VOLUME I.

Beach, R. L., F. A. March, L. S. Brown, T. S. McMahon, and J. Papp. 1973.
Final Report, USCG-D-84-74, Contract DOT-CG-22651-A. 100 p.

The Phase-II report covers the design, construction and test of a prototype 2000 gpm oil recovery system. The subsystems and equipment comprising the prototype system are outlined, and subsystems tests, component assembly, air transport and oil recovery operations in a test pond are described.

Design and engineering

Citation Source: Government Reports Announcements. 1975. 75(6). Entry #AD/A-003 933/9GA.

C-926-74
DEVELOPMENT OF A HIGH SEAS OIL RECOVERY SYSTEM. PHASE II. DESIGN STUDIES AND SPECIFICATIONS. APPENDIX I. SYSTEMS TESTS. VOLUME II.

Beach, R. L., F. A. March, L. S. Brown, T. S. McMahon, and J. Papp. 1973.
Final Report, USCG-D-84-74-Vol-2, Contract DOT-CG-22651-A. 150 p.

See C-925-74 for summary.

Design and engineering

Citation Source: Government Reports Announcements. 1975. 75(6). Entry #AD/A-003 934/7GA.

C-927-74
DEVELOPMENT OF A HIGH SEAS OIL RECOVERY SYSTEM. PHASE II. APPENDIX II. MATERIALS AND COMPONENT TESTS. VOLUME III.

Beach, R. L., F. A. March, L. S. Brown, T. S. McMahon, and J. Papp. 1973.
Final Report, USCG-D-84-74-Vol-3, Contract DOT-CG-22651-A. 207 p.

See C-925-74 for summary.

Design and engineering

Citation Source: Government Reports Announcements. 1975. 75(6). Entry #AD/A-003 946/1GA.

C-928-74
DEVELOPMENT OF A HIGH SEAS OIL RECOVERY SYSTEM. PHASE II. APPENDIX III. SYSTEMS TESTS. VOLUME IV.

Beach, R. L., F. A. March, L. S. Brown, T. S. McMahon, and J. Papp. 1973.
Final Report, USCG-D084-74-Vol-4, Contract DOT-CG-22651-A. 292 p.

See C-925-74 for summary.

Design and engineering

Citation Source: Government Reports Announcements. 1975. 75(6). Entry #AD/A-003 947/9GA.

C-929-74
OIL POLLUTION CONTROL

Bennett, J. A. 1974.
Chemical Economy and Engineering Review 6(3):44-45.

The various techniques being used by Bennett Pollution Controls Ltd. (Vancouver) to control and clean up accidental oil spills are described.

Citation Source: Environmental Health and Pollution Control. 1974. 6(7). Entry #2660.

C-930-74
CLEAN GULF ASSOCIATES UNVEILS A NEW GENERATION OF OIL-SPILL CLEANUP EQUIPMENT

Berry, W. L., and J. W. Wolfe. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 323-327.

The organization and capabilities of Clean Gulf Associates, established by petroleum operators in the Gulf of Mexico to provide for fast and effective cleanup of oil spills in coastal and offshore waters, are reviewed. New cost participation areas, planned new equipment additions and equipment improvements are discussed.

Citation Source: Citation Journal.

C-931-74
A REVIEW OF THE UTILITY OF SELF-MIXING DISPERSANTS IN RECENT YEARS

Canevari, G. P. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 337-342.

The development in the last two years of self-mixing chemical dispersants to prevent damage from oil spills is reviewed. Laborious mixing is eliminated when using these dispersant systems, and submicron diameter size oil droplets are formed after their application to oil slicks. The significance of droplet size on dispersed oil movement and behavior is discussed.

Citation Source: Citation Journal.

C-932-74
UTILIZATION OF DIVING AND SALVAGE EXPERTISE IN THE PREVENTION OF OIL POLLUTION

Chambers, B. E., and H. D. Williams. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 369-371.

Diving and salvage have played a significant role in the effective removal of oil and hazardous substances from the seas and consequently have been incorporated into the National Strike Force, as specified by the National Contingency Plans.

Regulations, standards and planning

Citation Source: Citation Journal.

C-933-74
COMPUTER SIMULATION OF OFFSHORE OIL-SPILL CLEANUP OPERATIONS

Cochran, R. A., G. A. Manney, and J. P. Fraser. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 293-300.

Using a computer simulation program, oil-spill events and cleanup operations can be simulated many times under different weather conditions. The effectiveness of oil-spill recovery equipment can be predicted as a function of weather conditions. Simulations stress the need for rapid response and containment due to rapid thinning of uncontained oil.

Citation Source: Citation Journal.

C-934-74
NEW CLEANUP SYSTEM CHECKS SPILLS AT SEA

Cranfield, J. 1975.
Petroleum International 15(1):36-39.

The spill control system, designed by British Petroleum, is composed of a boom and a skimmer for oil containment and removal from the sea surface. Tests have proved that Vikoma is capable of operating in waves up to 8 feet and can remove oil at a rate of 100 ton/hr.

Containment
Design and engineering

Citation Source: Petroleum Abstracts. 1975. 15(15).
Entry #203,528.

C-935-74
OIL CONTAMINATED BEACH CLEANUP

Der, J. J. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 431-436.

A review of beach cleanup operations of the past, and identification of the various cleanup methods and equipment that have been used are included in this paper. A classification of beaches, along with the most effective cleanup procedure for each type, was produced. Factors such as beach slope, type of beach, amount of oil and type of oil are considered.

Citation Source: Citation Journal.

C-936-74
THE CASCO BAY OIL SPILL: PROBLEMS OF CLEANUP AND DISPOSAL

Eidam, C. L., E. V. Fitzpatrick, and J. F. Conlon. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 217-221.

The Casco Bay oil spill provided unique problems for cleanup personnel; chief among these was moving cleanup equipment to affected offshore islands and disposing of oil-soaked seaweed and sand. Damage from the spill and the effectiveness of the cleanup were studied up to one year after the spill.

Restoration

Citation Source: Citation Journal.

C-937-74
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY'S TEST FACILITY OHMSETT: THE FIRST SIX MONTHS

Farlow, J. S., and F. J. Freestone. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 343-346.

The U.S. Environmental Protection Agency has begun operation of its Oil & Hazardous Materials Simulated Environmental Test Tank (OHMSETT). The purpose of the test facility, located in Leonardo, New Jersey, is to help solve the problem of the safe, effective cleanup of oil and hazardous material spills. A description of the facility and the experiences during the first six months of operation are given.

Design and engineering

Citation Source: Citation Journal.

C-938-74
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY RESEARCH IN HIGH SPEED DEVICES FOR THE RECOVERY OF THIN-FILM OIL SPILLS

Freestone, F. J., R. A. Anderson, and N. P. Trentacoste. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 409-414.

Two devices have been developed that operate on the principle of deflecting moving oil with an air jet so that the resulting oil and water spray can be separated and captured. Both devices achieve recovery efficiencies of over 80% at 6 FPS; both are insensitive to waves but one is somewhat sensitive to oil viscosity.

Citation Source: Citation Journal.

C-939-74
UNITED STATES COAST GUARD ARCTIC OIL-POLLUTION PROGRAM

Getman, J. H. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 259-264.

In 1970 and 1971, field experiments in the Arctic were conducted by the Coast Guard to determine the behavior of oil spilled on, under and among ice. Other spill problems such as detection, logistics, recovery, and disposal are also being investigated. Off-the-shelf equipment has been evaluated and a number of conclusions about oil recovery systems and personnel have been drawn.

Research

Citation Source: Citation Journal.

C-940-74
OIL RECOVERY SYSTEM USING SORBENT MATERIAL

Gumtz, G. D., and T. P. Meloy. 1973.
Meloy Laboratories, Incorporated. Technical Report. 148 p.
NTIS Report PB-229 576/4.

A total system concept for optimal oil recovery from slicks using sorbent materials was developed. It was based on laboratory modeling and general equations formulated for basic sorption properties, sorbent pickup and oil recovery from the sorbent and the system. One inch cubical sorbent particles distributed in a shrouded rectilinear screw-fed system were concluded to be optimal and a 4:1 compression ratio of the slick by a boom herding the sorbent and oil to the channel would work under any wave conditions.

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #057208.

C-941-74
WATERBORNE DEBRIS IN MARINE POLLUTION INCIDENTS

Hancock, J. A., and D. Jensen. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 223-229.

Floating debris can impair oil spill cleanup and present a materials handling and disposal problem. This paper includes a review of debris types, where debris has or could complicate spill cleanups, factors influencing local debris concentration, current debris handling practices and requirements, and the effect of debris on pollution-response equipment.

Citation Source: Citation Journal..

C-942-74
OAKLAND ESTUARY OIL SPILL CLEANUP: A REVIEW OF A MAJOR OIL SPILL CLEANUP IN A TRASH-LADEN ESTUARY EMPHASIZING SMALL BOAT HARBOR CLEANUP

Hanson, J. R., and D. M. Kochis. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 233-240.

A 171,000 gallon oil spill in January, 1973, cost $1.2 million and took 7-1/2 days to clean up. An industry-sponsored oil spill cooperative, Clean Bay, Inc., was in charge of the operation. Included in this paper are an evaluation of procedures, especially in trash-laden waters, and a discussion of the experience gained in the cleanup of 16 small boat harbors.

Restoration

Citation Source: Citation Journal.

C-943-74
ENERGY DISSIPATIVE DEVICES TO CONTROL OIL SLICKS IN FAST-CURRENT ENVIRONMENTS

Jensen, D. S., W. Lindenmuth, and D. J. Norton. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 355-362.

The energy dissipation concept to control and recover oil slicks in potential water current velocities of 10 knots is presented. The concept involves the slowing down of the fast-moving oil slick and the layer of water flowing beneath, such that the critical velocity at the oil-water interface is never reached.

As the slick slows down, the oil layer thickens to a point where conventional recovery techniques can be used to remove the oil. Research programs investigating the concept's applications are described.

Citation Source: Citation Journal.

C-944-74
INLAND OIL SPILL CLEAN-UP MANUAL, REPORT NO. 4/74 AND CONDENSED INLAND OIL SPILL CLEAN-UP MANUAL, REPORT NO. 4a/74

Jenkins, S. H. 1975.
Water Research 9(5/6):602.

Two manuals have been prepared by Stichting CONCAWE, 60 Van Hogenhouklaan, The Hague, The Netherlands, which deal with the behavior and cleanup of oil on the ground, in subsoil, in groundwater and in surface water. Report No. 4/74 contains oil spill cleanup advice, information on types of equipment required to carry out cleanup operations, and a list of references and organizations concerned with these specific problems. Report No. 4a/74 is a condensed version of report 4/74 and gives rapid guidance in selecting oil spill cleanup methods.

Citation Source: Citation Journal.

C-945-74
DISPOSAL OF OIL SPILL DEBRIS

Jones, R. G. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 231-232.

A landfill was constructed to dispose of the debris collected during the cleanup of a major spill in Rhode Island. Alternating layers of one foot of debris (sand, gravel, logs, large rocks and tires) and six inches of clean fill were placed in a cell with a sandy-salt base. Groundwater samples as yet show no increase in total organic carbon or phenolic content.

Citation Source: Citation Journal.

C-946-74
ENERGETICS OF CLEANING ACTION

Koretskii, A. F. 1974.
Isvestiya Sibirskogo Otdeleniya Akademii Nauk SSSR Seriya Khimicheskikh Nauk 6:28-34.

"Mathematical analysis is given for the removal of oil droplets from a solid surface by detergents." Oil is removed by the adsorption of hydrophilic-hydrophobic particles on oil droplets and the subsequent abstraction of the oil droplets from the solid.

Citation Source: Chemical Abstracts. 1975. 82(16). Entry #100580.

C-947-74
ON-LINE COMPUTER SYSTEMS FOR ENVIRONMENTAL EMERGENCY MANAGEMENT

McNeil, C. S. L. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 255-257.

The Environmental Emergency Branch in Canada has developed an on-line computer system to answer questions concerning oil spills such as: What countermeasures and special precautions need to be taken? Where are the nearest suitable equipment and materials to combat the spill, and whom does one contact?

Citation Source: Citation Journal.

C-948-74
DEVELOPMENT AND PRELIMINARY DESIGN OF A SORBENT-OIL RECOVERY SYSTEM

Miller, E., L. Stephens, and J. Ricklis. 1973.
Conference on Prevention and Control of Oil Spills, Washington, D.C., 1973. p. 291-308.

The preliminary designs of a Sorbent Recovery System are presented, including descriptions of system components, operating instructions and costs. The system is able to recover 90% of the oil in a 1.5 mm slick, with a water content of $<10\%$.

Citation Source: Environmental Health and Pollution Control. 1975. 7(1). Entry #247.

C-949-74
THE DESIGN AND DEMONSTRATION OF A REMOTELY-CONTROLLED HIGH-SEAS OIL RECOVERY SYSTEM

Neal, R. W., R. A. Bianchi, and E. E. Johanson. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 395-399.

Results of a program, conducted by JBF Scientific Corporation, to demonstrate and test a spilled-oil recovery system under offshore conditions are given. A skimmer was designed with complete remote control capability. In a test, a relatively unmanned skimmer in remote control successfully recovered oil in sea state 3.

Design and engineering

Citation Source: Citation Journal.

C-950-74
AN OIL RECOVERY SYSTEM FOR SAN FRANCISCO BAY AREA

Norton, R. W., and D. W. Lerch. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 317-322.

In the paper, the recovery system acquired by Clean Bay, Incorporated, designed specifically to clean up oil spills in the San Francisco Bay area, is described. The following areas are described: the system's performance specifications, comparison of wave tank predictions of hull performance with operating experience, the impact of the requirements for U.S. Coast Guard tank vessel certification on design and operation of the recovery system, and Clean Bay's operating experience with the system.

Design and engineering

Citation Source: Citation Journal.

C-951-74
PREVENTION OF POLLUTION FROM CHEMICAL TANKERS

Page, R. C. 1973.
Symposium on Marine Pollution, National Physical Laboratory, Teddington, England, 1973. Paper 73. 6 p.

Recommendations for better control of marine pollution caused by tanker accidents and discharges of cleaning liquids or ballast are presented. Design and equipment to reduce marine pollution are proposed.

Design and engineering
Waste water treatment

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #054853.

C-952-74
THE CYCLONET: A DEVICE FOR PICKING UP OIL SLICKS FROM THE SEA SURFACE

Pichon, J. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 387-394.

Alsthom-Techniques des Fluides Group has developed a device for recovering oil slicks straight from the water surface, called the CYCLONET. Floating oil and water are forced into a tangential slit inlet of the CYCLONET due to the velocity of the boat; the flow causes the contents of the system to rotate and separate out into two components; lighter oil moves inward and upward and is pumped out to a holding tank and the heavier water flows downward and outward and is discharged at the bottom.

Design and engineering

Citation Source: Citation Journal.

C-953-74
DEVELOPMENT OF OFFSHORE OIL SPILL PICK-UP SYSTEM IN FRANCE

Ricci, R. J., and M. J-C. Amande. 1975.
Seventh Annual Offshore Technology Conference, Houston, 1975.

The Vortex Oil drinker, developed by ELF-ERAP and Bertin et Cie, is based on a concept which utilizes a vortex unit in a device which can increase the concentration of fluid floating as a thin layer on the surface of a heavier, nonmiscible fluid to a thick layer zone, from which it is then pumped. Because of past research on the system, it is considered capable of combating large offshore spills.

Design and engineering

Citation Source: Ocean Industry. 1975. 10(5):77.

C-954-74
A PRACTICAL OIL SPILL CONTROL TRAINING SCHOOL

Robinson, J. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 75-76.

Texas Engineering Extension Service of Texas A & M University offers a practical oil spill control training course. The

American Petroleum Institute defined the basic characteristics of this course in "hands-on" training for first line supervisors and higher positions. Experience will be provided with modern techniques under a variety of oil spill situations.

Personnel training and education

Citation Source: Citation Journal.

C-955-74
OIL SPILL TECHNOLOGY DEVELOPMENT IN CANADA

Ross, S. L. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 329-335.

The responsibility of the Environmental Emergency Branch of the Canadian Department of the Environment is to protect and prevent activities related to emergency pollution events including oil spills. The spill technology group is divided into two programs; the testing, evaluation and development of oil spill control equipment, materials and techniques; and the design and development of various countermeasures systems for specific high risk areas in Canada.

Design and engineering

Citation Source: Citation Journal.

C-956-74
OIL-SPILL CONTINGENCY PLANS FOR THE ALYESKA PIPELINE SYSTEM

Sartor, J. D., W. D. Corich, and D. S. Kauffman. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 281-286.

Alyeska has aimed for zero oil spillage in the design of its pipeline, but is also preparing comprehensive oil-spill contingency plans. These plans assign immediate what-to-do and how-to-do-it actions to individuals in order to protect the environment, contain and clean up any spill and to restore any affected areas. Organizational charts are included.

Restoration
Regulations, standards and planning

Citation Source: Citation Journal.

C-957-74
DISPERSANTS FOR OIL SPILL CLEAN-UP OPERATION: CARRIAGE AND CONTAINMENT AT SEA

Shuttleworth, F., and P. G. Jeffrey. 1973.
In: LR 195(OP), UK Department of Trade and Industry. 17 p.

Originally, dispersants came in drums of 40/50 gallon capacity. These drums were difficult to load, unload and use from tugs and other vessels. Now, tank storage below deck and pillow tanks are recognized as considerable improvements. Advantages and disadvantages are discussed.

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(2). Entry #5Q2108.

C-958-74
OIL SPILL PREVENTION AND REMOVAL HANDBOOK

Sittig, M. 1974.
Noyes Data Corporation.

The author organizes and clarifies the current ways and means of preventing or cleaning up oil spills. Methods for cleanup of any marine environment and their relationships to pollution, energy and ocean technology are discussed. The handbook is based largely on government reports and 320 U.S. and five foreign patents.

Citation Source: Sea Frontiers. 1975. 21(1).

C-959-74
CONDENSED INLAND OIL SPILL CLEANUP MANUAL

Stichting CONCAWE Secretariet. 1974.
Stichting CONCAWE. Report 4a/74. 32 p.

The question of selection of the proper method of oil spill cleanup is considered. The proposed measures are either emergency actions or methods that must be used in an early stage. The equipment described provides inexpensive protection against the majority of inland oil spills.

Regulations, standards and planning

Citation Source: Pollution Abstracts. 1975. 6(2). Entry #75-01974.

C-960-74
TRAINING A CLEANUP RESPONSE TEAM

Tibbetts, A. M. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 59-63.

The five major steps necessary to train an oil spill cleanup response team are explained with the help of charts. The training of a 300 person team can be accomplished in about three months. Steps include an organization chart, detailed job descriptions, seminars to acquaint the team members with all techniques, and a practice session.

Personnel training and education

Citation Source: Citation Journal.

C-961-74
REMOVING OIL FROM RIVERS

Toms, R. G. 1974.
Pollution Monitoring 17:21-22.

A discussion is presented concerning the equipment, services and planning required to deal with the growing number of oil spill incidents in rivers of the United Kingdom.

Regulations, standards and planning

Citation Source: Environmental Health and Pollution Control. 1974. 6(7). Entry #2659.

C-962-74
DEVELOPMENT OF HARBOR OIL SPILL REMOVAL-RECOVERY SYSTEMS: PHASE I

Widawsky, A. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 379-386.

The effectiveness of various oil spill cleanup and recovery equipment was tested in rivers, tanks and on land; the systems which rated highest on these tests were assembled into two harbor oil spill removal-recovery systems, one for confined areas and one for open areas. Findings from tests measuring the oil removing capabilities of the two systems are described in detail.

Design and engineering

Citation Source: Citation Journal.

C-963-74
NAVY HARBOR OIL SPILL CLEANUP: A PROGRESS REPORT

Wilson, J. E., P. F. Nadeau, and J. S. Premack. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 373-378.

Employing the systems analysis approach, the Navy has developed effective oil spill cleanup systems utilizing the best commercially available equipment with Navy-developed techniques. The paper reports the progress made by the Navy inland waters oil spill program in areas of containment, removal, and storage-transfer of spilled oil.

Containment

Citation Source: Citation Journal.

C-964-74
WATER HYACINTHS FOR REMOVAL OF PHENOLS FROM POLLUTED WATER

Wolverton, B. C. 1975.
NASA-TM-X-72722. 18 p.

Water hyacinths are able to absorb 100 mg of phenol per plant per 72 hours from distilled water, river water and bayou water. Potentially one hectare of water hyacinths can remove 150 kg of phenol per 72 hours from polluted water.

Restoration

Citation Source: Scientific and Technical Aerospace Reports. 1975. 13(7). Entry #N75-16128.

C-965-74
THE MAKING OF A LOCAL CONTINGENCY PLAN

Yates, R. A. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 307-313.

The COTP Portland Oil and Hazardous Substances Pollution Contingency Plan covers 1200 miles of Oregon and Washington coastline and rivers. The 1350 page document is designed to be used in the field and to be quickly updated. Successful usage of the plan in fighting both small and large spills is described.

Regulations, standards and planning

Citation Source: Citation Journal.

C-966-74
OIL-DEBRIS REMOVAL BOAT SAMUEL WILKESON

Ziegler, R. C., and T. J. Lyons. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 449-453.

Buffalo has developed a boat with special equipment, such as two separators and two 800-gallon tanks for storing recovered oil, to retrieve floating debris and surface oil from the Buffalo River. A winch, a specially designed basket and a floating Dinosaur Dumpster serve to retrieve and store debris.

Citation Source: Citation Journal.

3. RESTORATION

C-967-74
REHABILITATING OILED AQUATIC BIRDS

Smith, D. C. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 241-247.

A technology of oiled-bird rehabilitation is being developed, resulting in an increase in the percentage of treated birds being successfully released and a decrease in the cost per bird. A 95% failure rate and $900 per bird cleanup cost for the 1971 San Francisco oil spill contrast with the 41% survival rate and $15 per bird cost in 1973. The physiological and population effects of oil pollution on birds and the recommended treatments are reviewed.

Cleanup and recovery
Biological effects of oil pollution
Economic effects of oil pollution

Citation Source: Citation Journal.

C. EFFECTS OF OIL POLLUTION

1. BIOLOGICAL EFFECTS

C-968-74
EFFECTS OF PETROLEUM AND PETROLEUM DERIVATIVES ON AQUATIC ORGANISMS

Abadzhiev, V. 1974.
Priroda (Sofia) 23(4):66-68.

A review with no references.

Citation Source: Chemical Abstracts. 1975. 82(19).
Entry #119616p.

C-969-74
THE HISTORY OF FARALLON ISLAND MARINE BIRD POPULATIONS, 1854-1972

Ainley, D. G., and T. J. Lewis. 1975.
Condor 76(4):432-466.

The authors report the history of population changes of marine birds of the Farallon Islands (California), noting an increase in population stability in the last 20 years. The Islands are located in one of the busiest shipping lanes in a region of large refineries and increasing oil tanker traffic. Oil pollution after 1900 caused sharp declines in populations of tufted puffins, pigeon, guillemots and murres.

Citation Source: Biological Abstracts. 1975. 59(9).
Entry #47749.

C-970-74
THE EFFECTS OF OIL ON ESTUARINE ANIMALS: TOXICITY, UPTAKE AND DEPURATION RESPIRATION

Anderson, J. W., J. M. Neff, B. A. Cox, H. E. Tatum, and G. M. Hightower. 1973.
Effects of Pollutants on the Physiological Ecology of Estuarine Organisms, University of South Carolina, 1973. p. 285-310.

The research is concerned with short-term toxicity studies to determine the range of tolerance of organisms to oil, rates of accumulation and release of oil, and to measure the extent and nature of physiological changes of organisms exposed to sublethal oil concentrations.

General fate of oil in the environment

Citation Source: Senior author.

C-971-74
SUBLETHAL EFFECTS OF OIL, HEAVY METALS, AND PCB'S ON MARINE ORGANISMS

Anderson, J. W., J. M. Neff, and S. R. Petrocelli. 1973.
Survival in Toxic Environments, Houston, 1973. p. 83-128.

A review is presented of the research conducted on the sublethal effects of three major pollutant classes commonly found in estuarine environments. Results indicate that levels of petroleum hydrocarbons in animal tissues may act to temporarily alter the regulatory ability of test individuals; the class of hydrocarbons accumulated to the greatest extent and retained the longest in animals were the naphthalenes.

Citation Source: Senior author.

C-972-74
PETROLEUM HYDROCARBONS AND OYSTER RESOURCES OF GALVESTON BAY, TEXAS

Anderson, R. D. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 541-548.

Significant amounts of petroleum-derived hydrocarbons were detected in oysters collected at the lower end of the Houston Ship Canal. Once transferred to oil-free seawater, oysters released saturated chains and most aromatic fractions rapidly, with depuration to less than 0.1 ppm within 52 days. Transfer of oysters may improve the overall quality of this shellfish resource.

Economic effects of oil pollution

Citation Source: Citation Journal.

C-973-74
EFFECTS OF OILS ON BALTIC LITTORAL COMMUNITY, AS STUDIED IN AN OUTDOOR MODEL TEST SYSTEM

Anonymous. 1974.
IOC-UNESCO, WMO, U.S. Department of Commerce. Petroleum Marine Pollution Symposium, May 13-17, 1974. p. 144-147.

A method which uses an outdoor model test system to measure the effects of oil pollution on Baltic littoral fauna is evaluated. The procedure was found to be rapid and sensitive in measuring oil effects.

Biological effects of oil pollution

Citation Source: Environment Abstracts. 1975. 5(2). Entry #75-01554.

C-974-74
EFFECTS OF CRUDE OIL AND DISPERSANTS ON BIVALVES

Avolizi, R. J., and M. Nuwayhid. 1974.
Marine Pollution Bulletin 5(10):149-153.

The respiration and mortality of two species of bivalves exposed to crude oil, a dispersant, and mixtures of the two were measured. The crude oil was most toxic to one species, the dispersant was most toxic to the other. The respiration rate of the mussel was significantly decreased at sublethal oil concentrations.

Cleanup and recovery

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(2). Entry #5Q2069.

C-975-74
EFFECTS OF PHYSICAL DISTURBANCE ON ARCTIC VEGETATION IN THE ELIZABETH ISLANDS

Babb, T. A., and L. C. Bliss. 1974.
Journal of Applied Ecology 11(2):549-562.

Manipulation and sampling at a high Arctic site have shown that the plants have only a small effect on thawing and that natural revegetation is slow. The recovery of the vegetation from diesel fuel spills is discussed.

Citation Source: Biological Abstracts. 1975. 59(6). Entry #30670.

C-976-74

TOXICITY TESTS FOR PREDICTING THE ECOLOGICAL EFFECTS OF OIL AND EMULSIFIER POLLUTION ON LITTORAL COMMUNITIES

Barker, J. M., and G. B. Crapp. 1974.
In: Ecological Aspects of Toxicity Testing of Oils and Dispersants, Institute of Petroleum, London. Beynon, L. R., and E. B. Cowell (eds.). p. 23-40.

Some tests were made in order to bridge the gap between laboratory and field studies on the relative toxicity of oils and emulsifiers and their effects on salt marshes and rocky shores. Predictions of the long- and short-term effects of emulsifiers are made, based on laboratory tests and field and lab correlations. Factors affecting the accuracy of this prediction are discussed.

Cleanup and recovery

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(2). Entry #5Q2082.

C-977-74

TOXICITY TESTING AT THE STATION MARINE D'ENDOUME

Bellan, G. L. 1974.
In: Ecological Aspects of Toxicity Testing of Oils and Dispersants, Institute of Petroleum, London. Beynon, L. R., and E. B. Cowell (eds.). p. 63-67.

The effects of several pollutants, including emulsifiers and detergents, on various invertebrates have been studied using both short- and long-term bioassays. The test animals represent all different trophic levels and come from waters ranging from highly polluted to clean.

Cleanup and recovery

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(2). Entry #5Q2085.

C-978-74

EFFECT OF AN OIL SPILL ON BENTHIC ANIMALS IN THE LOWER YORK RIVER, VIRGINIA

Bender, M. E., et al. 1974.
IOC-UNESCO, WMO, U.S. Department of Commerce. Petroleum Marine Pollution Symposium, May 13-17, 1974. p. 150-153.

A study was conducted to measure the effect of an accidental oil spill on the intertidal benthic fauna of the Lower York River. The study incorporates information obtained from field survey data as well as from laboratory bioassay studies.

Citation Source: Environment Abstracts. 1975. 5(2). Entry #75-01556.

C-979-74
ECOLOGICAL ASPECTS OF TOXICITY TESTING OF OILS AND DISPERSANTS

Beynon, L. R., and E. B. Colwell (eds.). 1974.
Applied Science Publishers Ltd., Barkiny, Essex, viii + 149.

Articles are individually abstracted. This volume is a review of toxicity testing research in Europe. The discussion is fully reported. Emphasis is placed on experimental procedures, the choice of biological materials and the interpretation of results.

Cleanup and recovery

Citation Source: Journal of Marine Biological Association of the United Kingdom. 1975. 55(2):507.

C-980-74
HYDROCARBON RESIDUES IN IVORY COAST WATERS

Binet, D., and E. Marchal. 1974.
Report No. EPA-TR-69-75. 11 p. Translations of mono.: Sur la Presence de Residus d'Hydrocarbures dans les Eaux Ivoiriennes, Ostrom (1970).

The presence of hydrocarbon residues on the beaches, in plankton net hauls and fish stomachs has increased. The oil may be partially responsible for the decrease in numbers of fish eggs and larvae. Tankers should be forced to respect international rules on tank cleaning.

International legislation

Citation Source: Government Reports Announcements. 1975. 75(3). Entry #PB-237 797-T/GA.

C-981-74
CARCINOGENIC ACTIVITY OF ISOPROPYL OIL [English summary]

Bittersohl, G. 1975.
Archiv fuer Geschwulstforschung 43(13):250-253.

Isopropyl alcohol alone is probably not carcinogenic; but in combination with oil or fusel oil, it may act as a carcinogen.

Citation Source: Biological Abstracts. 1975. 59(3).
Entry #15451.

C-982-74
AROMATIC HYDROCARBONS AND THE GROWTH OF MARINE ALGAE

Boney, A. D. 1974.
Marine Pollution Bulletin 5(12):185-186.

Cancerous growth in certain seaweeds can be stimulated by a single contact with aromatic compounds found in marine muds. In this study, some aromatic hydrocarbons are found to stimulate algal growth. Not all of these compounds have been identified as carcinogenic when using mammals as test organisms.

Citation Source: Citation Journal.

C-983-74
UPTAKE, DISTRIBUTION AND EFFECTS OF OUTBOARD MOTOR EXHAUST EMISSIONS IN GOLDFISH (CARASSIUS AURATUS)

Brenniman, G. R. 1975.
Dissertation Abstracts International B 35(7):3374.

It was concluded from laboratory experiments that toluene can enter into the systems of the fish, be distributed throughout the body, and be cleared in a short period of time. Such rapid clearance indicates the unlikelihood of any hazards to man from toluene or related exhaust hydrocarbons.

Citation Source: Chemical Abstracts. 1975. 82(19).
Entry #119784s.

C-984-74
A STUDY OF THE EFFECTS OF THE SAN FRANCISCO OIL SPILL ON MARINE LIFE. PART II: RECRUITMENT

Chan, G. L. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 457-461.

A comparison of intertidal transect data from before and after a Bunker C oil spill in January, 1971, indicated that 4.2 to 7.5 million marine invertebrates, mainly mussels, returned to normal numbers in 1972 to 1974 observations. Heavy recruitment in these years indicates that the oil spill had no lingering effects.

Monitoring

Citation Source: Citation Journal.

C-985-74
LONG-TERM CHEMICAL AND BIOLOGICAL EFFECTS OF A PERSISTENT OIL SPILL FOLLOWING THE GROUNDING OF THE *GENERAL M. C. MEIGS*

Clark, R. C., Jr., J. S. Finley, B. G. Patten, and E. E. De Nick. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 479-487.

Petroleum residues were detectable in certain marine animals for nine months after the initial wreck. All differences in population counts were attributable to seasonal variation, although the sea urchin population was damaged. Long-term effects on speciation or numerical abundance were not apparent.

Monitoring

Citation Source: Citation Journal.

C-986-74
MARINE POLLUTION IN THE NORTH EAST ATLANTIC

Cole, H. A. 1973.
Nature Focus 17:10-13.

A review is given of the effects of sewage, wastes, oil, heavy metals and persistent organic substances on the production of fish and shellfish in the North East Atlantic. Marine pollution control measures are suggested.

Citation Source: Environmental Health and Pollution Control.
1974. 6(7). Entry #2422.

C-987-74
QUALITATIVE STUDIES ON THE METABOLISM OF NAPHTHALENE IN *MAJA SQUINADO*

Corner, E. D. S., C. C. Kilvington, and S. C. M. O'Hara. 1973.
Journal of the Marine Biological Association, United Kingdom 53(4):819-832.

The identification of certain naphthalene-related substances in the urine of M. squinado following naphthalene administration is discussed.

Analysis

Citation Source: Chemical Abstracts. 1975. 82(21).
Entry #133706z.

C-988-74
A CRITICAL EXAMINATION OF PRESENT PRACTICE

Cowell, E. B. 1974.
In: Ecological Aspects of Toxicity Testing of Oils and Dispersants, Institute of Petroleum, London. Beynon, L. R., and E. B. Cowell (eds.). p. 97-104.

Toxicity tests are conducted for ranking or predictive purposes. The choice of test species must be carefully made. Other problems, such as emulsion particle size, poor mixing, and bacterial hazards, are discussed and the importance of field trials stressed.

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975.
5(2). Entry #5Q2088.

C-989-74
AN EXPERIMENTAL OIL SPILL: THE DISTRIBUTION OF AROMATIC HYDROCARBONS IN THE WATER, SEDIMENT, AND ANIMAL TISSUES WITHIN A SHRIMP POND

Cox, B. A., J. W. Anderson, and J. C. Parker. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 607-612.

A high aromatic No. 2 fuel oil was experimentally spilled on a shrimp pond. Mortalities of shrimp and other invertebrates were observed over 96 hours. Peak mortality coincided with a peak in the concentration of naphthalenes. After 10 days, shrimp released naphthalenes in the laboratory at near background levels; oysters took 47 days to 96 days to depurate to background naphthalene levels.

Citation Source: Citation Journal.

C-990-74
SOME RESPONSES OF PLANKTONIC ORGANISMS TO [sic] ENVIRONMENTAL POLLUTION

Crisafi, P. 1973.
International Colloquium of Medical Oceanography, 6th, Portoroz, Yugoslavia, 1973.

A new morphological structure, a muff-shaped form on the anal segments of copepods, may be due to hydrocarbons in the food or changes in feeding habits promoted by environmental fluctuation. Discussion of whether the plankton stay in a polluted area long enough to study the effects of pollution is included.

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(2). Entry #5Q2094.

C-991-74
INFLUENCE OF OIL ON NUCLEIC ACIDS OF ALGAE

Davavin, I. A., O. G. Mironov, and I. M. Tsimbal. 1975.
Marine Pollution Bulletin 6(1):13-14.

The effects of oil on biologically active compounds such as DNA and RNA were studied using Black Sea algae and Lomastikinskaya oil. Inhibition of biosynthesis in these organisms and modification of the degree of polymerization of deoxyribonucleic acids were observed.

Citation Source: Citation Journal.

C-992-74
THE EFFECTS OF OILS ON GROWTH OF FRESHWATER PHYTOPLANKTON

Dennington, V. N., J. J. George, and C. E. Wyborn. 1975.
Environmental Pollution 8(3):233-237.

Studies demonstrated that the freshwater alga _Euglena gracilis_ Klebs will grow in cultures containing up to 10% diesel and lubricating oils, whereas the presence of lubricating oil and diesel oil reduces and halts the growth of _Scenedesmus quadricauda_ (Turpin) Brébisson. The photosynthetic metabolism of species may be affected by oils.

Citation Source: Citation Journal.

C-993-74
TISSUE HYDROCARBON BURDEN OF MUSSELS AS POTENTIAL MONITOR OF ENVIRONMENTAL HYDROCARBON INSULT

DiSalvo, L. H., H. E. Guard, and L. Hunter. 1975.
Environmental Science and Technology 9(3):247-251.

Data are presented on the hydrocarbon content of mussels collected from stations in San Francisco Bay and clean water. Hydrocarbon uptake by unpolluted mussels, hydrocarbon loss when polluted mussels were transferred to clean water, and the result of placing these transports back in their home waters were examined.

Analysis

Citation Source: Citation Journal.

C-994-74
OILS AND DISPERSANTS: CHEMICAL CONSIDERATIONS

Dodd, E. N. 1974.
In: Ecological Aspects of Toxicity Testing of Oils and Dispersants, Institute of Petroleum, London, 1974. Beynon, L. R., and E. B. Cowell (eds.). p. 3-9.

The toxicity of oils lies in the short-term acute effects of low boiling aromatics, the potential long-term effects of higher molecular weight polynuclear species, and physical effects. The chemical characteristics, action, administration, and toxicity characteristics of dispersants are discussed.

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(2). Entry #5Q2053.

C-995-74
THE ACUTE TOXICITY OF THREE NEW SURFACTANT MIXTURES TO A MAYFLY LARVAE

Dolan, J. M., B. C. Gregg, J. Cairns, Jr., K. L. Dickson, and A. C. Hendricks. 1974.
Archiv fuer Hydrobiologie 74(1):123-132.

The toxicity of three surfactants, DBS, 7BS and a nonionic surfactant, were determined using static bioassays under comparable conditions. The EC50 and ET50 values were obtained.

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(1). Entry #5Q834.

C-996-74
EXPERIMENTAL DATA ON THE EFFECT OF MERCURY, CADMIUM AND DISSOLVED PETROLEUM PRODUCTS ON THE COASTAL PHYTOPLANKTON OF THE CASPIAN SEA [English abstract]

Doroshev, S. I. (ed.). 1973.
Trudy Vsesoyuznogo Nauchno-Issledovatel'skogo Instituta Morskogo Rybnogo Khozyaistva i Okeanografii 94:75-79.

The three pollutants were added to samples of phytoplankton, which were then incubated for 5-6 days under a day/night light regime. The relative photosynthetic rate as measured by C^{14} indicated the inhibition or stimulation of the algae and depended on the toxic products content.

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(1). Entry #5Q847.

C-997-74
ASPECTS OF ORGANIC MARINE POLLUTION

Duursma, E. K., and M. Marchand. 1974.
In: Oceanography and Marine Biology. Barnes, H. (ed.). Vol. 12:315-431.

Studies of the geochemical and bio-effects of organic pollutants are reviewed with emphasis on the chemical methods used. This review includes topics such as world quantities and production, herbicides, PCB's, oil and hydrocarbons, sewage, detergents and pulp mill effluents.

Chemical effects of oil pollution

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(2). Entry #5Q2055.

C-998-74
LATENT EFFECTS OF IRANIAN CRUDE OIL AND A CHEMICAL OIL DISPERSANT ON RED SEA MOLLUSKS

Eisler, R. 1973.
Israel Journal of Zoology 22(2-4):97-105.

Predation rate of the gastropod drill, Drupa granulata, on the mussel, Mytilus variabilis, was determined for 28 days after adults had been exposed to seawater solutions containing high sublethal concentrations of Iranian crude oil. The predation rate was 3 times higher in control groups than in groups where adults had been initially exposed. Experiments measuring the fecundity of drills and mussels exposed to oil dispersants are described.

Citation Source: Chemical Abstracts. 1975. 82(11). Entry #68976w.

C-999-74
TOXIC, SUBLETHAL, AND LATENT EFFECTS OF PETROLEUM ON RED SEA MACROFAUNA

Eisler, R. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 535-540.

The action of crude oil and of chemical oil dispersants on the survival, metabolism and behavior of some Red Sea macrofauna was studied. Species were more resistant to toxicants in large tanks and at depths beyond 1.0 m. Sublethal effects include reduction in feeding rate and reproduction, interference with substrate attachment and bioaccumulation of crude oils.

Citation Source: Citation Journal.

C-1000-74
ELIMINATION OF HYDROCARBONS BY MUSSELS

Fossato, V. U. 1975.
Marine Pollution Bulletin 6(1):7-10.

Mussels were transferred from a petroleum polluted area to a relatively clean area and the elimination of hydrocarbons was monitored. During the first 10-15 days, elimination was rapid with a biological half-life of 3-1/2 days. But then elimination slowed; 12% of the initial content was still present after 8 weeks.

Citation Source: Citation Journal.

C-1001-74
EFFECTS ON COMMUNITY METABOLISM OF OIL AND CHEMICALLY DISPERSED OIL ON BALTIC BLADDER WRACK, <u>FUCUS VESICULOSUS</u>

Ganning, B., and U. Billing. 1974.
In: Ecological Aspects of Toxicity Testing of Oils and Dispersants, Institute of Petroleum, London, 1974. Beynon, L. R., and E. B. Cowell (eds.). p. 53-61.

Algal metabolism, measured by O_2 changes, was correlated to various concentrations of oil and dispersed oil in in situ experiments. Community metabolism increased with increasing concentrations. Gross primary production decreased with increasing concentrations, a significant effect at lower concentrations of emulsified oil. The algae were also not as able to recover from the effects of emulsified oil.

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(2). Entry #5Q2084.

C-1002-74
MORPHOLOGICAL ANOMALIES IN ADULT OYSTER, SCALLOP, AND ATLANTIC SILVERSIDES EXPOSED TO WASTE MOTOR OIL

Gardner, G. R., P. P. Yevich, and P. F. Rogerson. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 473-477.

Morphological anomalies developed in adult oyster, bay scallop and Atlantic silversides exposed to waste motor oil in concentrations of 20 ppm and higher. Lesions in the vascular or gastrointestinal system developed. These lesions, however, are not comparable to lesions in these species following exposure to either crude or fuel oil.

Citation Source: Citation Journal.

C-1003-74
DECREASE OF NET CARBON FLUX IN TWO SPECIES OF MUSSELS CAUSED BY EXTRACTS OF CRUDE OIL

Gilfillan, E. S. 1975.
Marine Biology 29(1):53-57.

The net carbon flux was determined for two species of common mussels under various combinations of salinity and crude oil concentration. Both crude oil presence and decreased salinity decreased the net carbon flux. The two stresses interacted in their effects.

Citation Source: Citation Journal.

C-1004-74
TOXICITY TESTING AT THE BIOLOGISCHE ANSTALT HELGOLAND, WEST GERMANY

Grinkel, W. 1974.
In: Ecological Aspects of Toxicity Testing of Oils and Dispersants, Institute of Petroleum, London, 1974. Beynon, L. R., and E. B. Cowell (eds.). p. 75-85.

Experiments demonstrating the limitations of the LD_{50} method for determining toxicity are described. Bacteria from freshly sampled seawater were more sensitive to three emulsifiers than laboratory cultures. Herring larvae are also sensitive to very low concentrations of oil emulsions.

Cleanup and recovery

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(2). Entry #5Q2087.

C-1005-74
BIOLOGICAL ASPECTS OF LAND REHABILITATION FOLLOWING HYDROCARBON CONTAMINATION

Gudin, C., and W. J. Syratt. 1975.
Environmental Pollution 8(2):107-112.

The respiratory activity of four different soil types which had accidentally or intentionally received hydrocarbons over a one- to four-year period was studied. Incorporation of hydrocarbon material causes an increase in microbial oxygen uptake and competition occurs between microorganisms and higher plants for available soil nitrogen. Proposals for the rehabilitation of oil spill sites are given.

Restoration

Citation Source: Citation Journal.

C-1006-74
THE STATUS OF OILED WILDLIFE: RESEARCH AND PLANNING

Hay, K. G. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 249-253.

Substantial efforts and progress have been made in oiled-wildlife research. This status report discusses new techniques leading to higher survival rates, preventive measures to keep birds out of spill areas, and the development of contingency plans. Biological problems are assessed.

Regulations, standards and planning

Citation Source: Citation Journal.

C-1007-74
EXPERIMENTAL CRUDE OIL SPILLS ON A SMALL SUBARCTIC LAKE IN THE MACKENZIE VALLEY, N.W.T.: EFFECTS ON PHYTOPLANKTON, PERIPHYTON, AND ATTACHED AQUATIC VEGETATION

Hellebust, J. A., B. Hanna, R. G. Sheath, M. Gergis, and T. X. Hutchinson. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 509-515.

Neither phytoplankton composition nor abundance was affected by the presence of crude oil, although laboratory experiments indicated growth inhibition. Most members of the periphyton were inhibited. Macrophytes showed immediate reduction in chlorophyll and a later reduction in biomass after exposure to crude oil.

Citation Source: Citation Journal.

C-1008-74
THE "JULIANA" OIL POLLUTION ON SHORE LIFE AND EFFECTS OF SEVERAL OIL-SPILL REMOVERS ON SOME FISHES AND SEA URCHIN EGGS IN THE LABORATORY

Honma, Y., and T. Kitami. 1974.
Annual Report of the Sado Marine Biological Station, Niigata University 4:5-13.

The sequence of events, the movement of oil on the water and the effects of crude oil and oil spill removers on sea life were observed continuously after the tanker "Juliana" spilled 64,000 tons of oil in the Japan Sea. The median tolerance limits for the oil spill detergents used were determined in the lab for several species of fish and fertilized sea urchin eggs. The effects of the oil spill were not considered severe.

Physical changes of oil in the environment

Citation Source: Biological Abstracts. 1975. 59(7).
Entry #40471.

C-1009-74
EFFECTS OF EXPERIMENTAL CRUDE OIL SPILLS ON TAIGA AND TUNDRA VEGETATION OF THE CANADIAN ARCTIC

Hutchinson, T. C., and W. Freedman. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 517-525.

Short- and long-term effects of summer and winter oil spillage have been observed over three growing seasons. Although species varied, little recovery was apparent even after the third summer after direct oil contact. Damage increased the second year after a spill due to winter killing factors. The taiga was more susceptible than the tundra.

Citation Source: Citation Journal.

C-1010-74
THE EFFECTS OF THE INTERACTION OF OUTBOARD MOTORS WITH THE AQUATIC ENVIRONMENT: A REVIEW

Jackivicz, T. P., Jr., and L. N. Kuzminski. 1973.
Environmental Research 6(4):436-454.

The effects of various compounds discharged by outboard motor exhausts on water quality and aquatic organisms are reviewed. Sufficiently high concentrations of outboard motor exhausts can be toxic to fathead minnows and bluegills, taints flesh of various fish and may affect their reproduction. Current related research is presented.

Chemical effects of oil pollution

Citation Source: Selected Water Resources Abstracts. 1975. 8(9). Entry #W75-04816.

C-1011-74
STUDIES ON OIL POLLUTION AND SEABIRDS IN DENMARK 1968-1971

Joensen, A. H. 1973.
Danish Review of Game Biology 6(9):1-32.

Studies of five major oil spills and numerous small incidents led to an evaluation of the extent of oil pollution and an estimate of the resulting number of birds killed during June, 1968 to June, 1971. Maintaining a diverse population of seabirds necessitates regulations against oil pollution.

Reporting

Citation Source: Biological Abstracts. 1975. 9(4). Entry #23085.

C-1012-74
IMPACT OF OIL REFINERY WASTES ON A SMALL TROUT STREAM

Johnson, W. G., and R. L. Glazer. 1974.
Minnesota Department of Natural Resources, Division of Game and Fish Section of Technical Services, Investigational Report No. 323. p. 1-21.

Results are given of an investigation which examined stream conditions in Little Silver Creek (Minnesota), which receives oil refinery wastes in its south branch. Substantial differences were noted in estimated standing crops for fish and benthic fauna from the north and south branches of the creek, and higher concentrations of total phosphorus and ammonia-nitrogen were measured in water samples from the south branch.

Chemical effects of oil pollution

Citation Source: Abstracts on Health Effects of Environmental Pollutants. 1974. 3(12). Entry #12201.

C-1013-74
BIOASSAYS INDICATIVE OF SOME SUBLETHAL EFFECTS OF OIL POLLUTION

Kittredge, J. S., F. T. Takahashi, and F. O. Sarinana. 1974. Conference of the Marine Technology Society, 10th, Washington, D. C., 1974. p. 891-898.

Investigations were conducted examining the effects of the water soluble component of crude oils on chemically triggered behavioral responses of crabs. Exposure to water-soluble extracts of two crude oils completely inhibited both the "feeding response" and the "mating stance" response of males when presented with a female sex pheromone.

Chemical effects of oil pollution

Citation Source: National Academy of Sciences Marine Research Information Service Abstracts. 1974. Vol. 10. Entry #071901.

C-1014-74
EFFECTS OF TWO CYCLE OUTBOARD ENGINE EXHAUSTS ON PHYTOPLANKTON

Kumar, I. J. 1974.
Dissertation Abstracts, International B 35(5):2229.

The aim of the study was to measure the growth response of algae to the exhaust from two-cycle engines, including crankcase drainage and gaseous exhausts. Results show that addition of 1-3 ppm crankcase drainage increased the algal growth potential, whereas higher concentrations of crankcase drainage (10 ppm or more) reduced it. Reduction of the algal growth potential by 50% was observed after operation of a two-cycle engine and release of exhausts.

Citation Source: Citation Journal.

C-1015-74
EFFECT OF SELECTED SURFACTANTS ON THE GROWTH CHARACTERISTICS OF GYMNODINIUM BREVE

Kutt, E. C., and D. F. Martin. 1975.
Marine Biology 28(4):253-259.

Anionic as opposed to cationic and non-ionic surfactants are most unfavorable to the initial response, growth rate and maximum cell numbers of Gymnodinium breve. The greatest decrease in growth rate was at 12.5 ppb. When tested in a mixed natural red tide sample, the surfactant did not disturb the other algae or zooplankton but killed 78% of the G. breve.

Citation Source: Citation Journal.

C-1016-74
EFFECTS OF THREE EMULSIFYING AGENTS AGAINST CRUDE OIL ON THE PRIMARY PRODUCTIVITY OF AN EXPERIMENTAL COMMUNITY OF BENTHIC DIATOMS

Lacaze, J. C. 1972-73.
EPA-TR-56-75. 19 p. Translation of Vie Milieu (France) 23 Pt. 1, Series B:51-57. 1972-1973.

Laboratory populations of micro-algae were exposed to three emulsifying agents for various time periods. Two of the three showed no toxicity, whereas the third, which was used in the Torrey Canyon disaster, ended primary productivity five days after a 30 minute exposure. A new community then developed and doubled the original level of primary productivity in 30 days.

Citation Source: Government Reports Announcements. 1975. 75(3). Entry #PB-237 812-T/GA.

C-1017-74
ECOTOXICOLOGY OF CRUDE OILS AND THE USE OF EXPERIMENTAL MARINE ECOSYSTEMS

Lacaze, J. C. 1974.
Marine Pollution Bulletin 5(10):153-156.

The experimental set-up consisted of five non-polluted units, five units polluted with 100 ml of crude oil and five units polluted with 100 ml of a crude oil emulsion plus a dispersant. Primary production in the polluted units decreased to almost zero, but after 17 days primary production increased to half that of the controls. The dispersant increased the toxic effect.

Cleanup and recovery

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(2). Entry #5Q2012.

C-1018-74
MARINE MOLYSMOLOGY: THE PRIMARY PRODUCTION OF EXPERIMENTAL ECOSYSTEMS SET UP IN THE RANIE RIVER ESTUARY

Lacaze, J. C. 1974.
EPA-TR-86-75. 9 p. Translation of Academie des Sciences, Paris. Comptes Rendus (France) 278:2531-2534. 1974.

Crude oil initially decreased primary production by 50%. The effect disappeared by day three, but toxic effects began on day four and increased until production was almost totally inhibited one week after pollution. This phase lasted 10 days; then production increased to half that of the controls.

Citation Source: Government Reports Announcements. 1975. 75(3). Entry #PB-237 777-T/GA.

C-1019-74
USE OF A SIMPLE EXPERIMENTAL DEVICE TO STUDY WATER POLLUTION IN SITU: COMPARATIVE EFFECTS OF 3 ANTI-PETROLEUM EMULSIVE AGENTS

Lacaze, J. C. 1974.
EPA-TR-87-75. 23 p. Translation of Tethys (France) 3(4): 705-716. 1971.

Experiments on three emulsive agents were done in an oyster culture lagoon. Of the three products, one produced only weak and temporary changes, one acted as a fertilizer and the third caused almost complete inhibition of photosynthesis in the experimental ecosystems during the 15-day experiment.

Citation Source: Government Reports Announcements. 1975. 75(3). Entry #PB-237 784-T/GA.

C-1020-74
CHANGE IN ENZYME ACTIVITY AND PROTEIN QUANTITY OF YEAST DURING VARIOUS CONTENT OF RESIDUAL HYDROCARBONS IN BIOMASS [English summary]

Latysheva, N. N., N. D. Koshtoyants, A. M. Chopyak, and A. D. Gololobov. 1974.
Prikladnaya Biokhimiya i Mikrobiologiya 10(3):385-389.

The activity of NAD- and NADP-dependent glutamate dehydrogenases and fumarase in yeast cultivated on paraffin decreased when a definite level of residual hydrocarbons was achieved.

Citation Source: Biological Abstracts. 1975. 59(9).
Entry #48830.

C-1021-74
FATE OF PETROLEUM HYDROCARBONS IN MARINE ZOOPLANKTON

Lee, R. F. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 549-553.

Several groups of zooplankton from the northwest North American coast rapidly took up various hydrocarbons. Crustaceans metabolized these hydrocarbons but jellyfish did not. The benzopyrene ingested by a copepod was depurated to 1×10^{-5} µg in 17 days; no further loss occurred.

Citation Source: Citation Journal.

C-1022-74
THE EFFECTS OF ALASKAN CRUDE OIL AND SELECTED HYDROCARBON COMPOUNDS ON EMBRYONIC DEVELOPMENT

Legore, R. S. 1975.
Dissertation Abstracts International, Section B 35(7):3168-B.

In an effort to assess the potential danger of accidental oil spills, the toxicity of Prudhoe Bay crude oil and several hydrocarbon fractions of petroleum to the Pacific oyster, C. gigas, was investigated. It was found that the toxicity of pure hydrocarbons increased as the boiling point increased and hydrocarbon toxicity seemed unrelated to their solubility in water.

Citation Source: Petroleum Abstracts. 1975. 15(15).
Entry #203,485.

C-1023-74
A SYSTEM FOR THE DETERMINATION OF CHRONIC EFFECTS OF POLLUTANTS ON THE PHYSIOLOGY AND BEHAVIOR OF MARINE ORGANISMS

Livingston, R. J., C. R. Cripe, C. C. Koenig, F. G. Lewis III, and B. D. DeGrove. 1974.
Florida Sea Grant, 4NOAA-74092302. 19 p.

Quantitative changes in behavior due to pollutants in the water can be observed in a sound-proof controlled environment room with close circuit television. This system may contribute to knowledge about sublethal effects of pollutants on key animals in order to better understand the significance of residues in the environment.

Citation Source: Government Reports Announcements. 1975. 75(3). Entry #COM-74-11705/2GA.

C-1024-74
POSSIBLE EFFECTS OF WATER POLLUTION ON THE COMMUNITY STRUCTURE OF RED SEA CORALS

Loya, Y. 1975.
Marine Biology 29(2):177-185.

Before a low tide killed 90% of the corals, a control reef and a reef chronically polluted by oil had the same community structure. Three years after the kill, the control reef was "blooming," but the polluted reef had almost no coral recolonization. Chronic oil spills may prevent normal settlement and/or development of coral larvae, or damage the reproductive system of corals.

Citation Source: Citation Journal.

C-1025-74
FATE AND EFFECTS OF CRUDE OIL ON AN ESTUARINE POND

Lytle, J. S. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 595-600.

Both short- and long-term effects of crude oil were observed on salt marsh plants, fish populations, and zooplankton. Oil migrated 42 cm beneath the sediment surface, carried both by benthic organisms and tidal percolations. Sediment analyses indicate slow degradation of the crude oil.

General fate of oil in the environment

Citation Source: Citation Journal.

C-1026-74
SUSCEPTIBILITY OF BLUEGILL SUNFISH (LEPOMIS MACROCHIRUS) TO NONIONIC SURFACTANTS

Macek, K. J., and S. F. Krzeminski. 1975.
Bulletin of Environmental Contamination and Toxicology 13(3): 377-384.

The toxicities of a wide variety of nonionic surfactants, under both static and dynamic conditions, to bluegill sunfish were determined. Alcohol ethoxylates are more lethal than alkylphenol ethoxylates. Increasing the ethoxylate chain length increases toxicity.

Cleanup and recovery

Citation Source: Citation Journal.

C-1027-74
RELATIVE TOXICITY OF SEVEN OIL-SPILL EMULSIFIERS

Maggi, P. 1974.
Translations of Revue des Travaux Institut des Peches Maritimes (France) 36(1):121-124. 1974.

The direct toxicity of seven emulsifiers on several marine animals was studied. Not all products were equally toxic.

Cleanup and recovery

Citation Source: Government Reports Announcements. 1975. 75(4). Entry #PB-237 791-T/GA.

C-1028-74
ENERGY METABOLISM OF OILED MUSKRATS

Mcewan, E. H., N. Aitchison, and P. E. Whitehead. 1974.
Canadian Journal of Zoology 52(8):1057-1062.

Results are presented of a study which measured the heat production of muskrats 0, 1 and 3 days after being oiled with varying quantities of crude oil at -5°, 5°, and 10°C. Data indicated the unlikelihood of muskrat survival under exposure to moderate amounts of oil and natural conditions.

Citation Source: Abstracts on Health Effects of Environmental Pollution. 1975. 4(3). Entry #2652.

C-1029-74
LONG-TERM EFFECTS OF AN OIL SPILL AT WEST FALMOUTH, MASSACHUSETTS

Michael, A. D., C. R. Van Raalte, and L. S. Brown. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 573-582.

The status of the benthic fauna in the fourth and fifth year after a small spill of fuel oil is documented in this paper. Hydrocarbons typical of weathered fuel oil were found in the sediments of the marsh, boat basin and two offshore stations. Recovery for the total benthos has reached a plateau but individual areas and species are still in the process of recovery.

Sampling

Citation Source: Citation Journal.

C-1030-74
EFFECTS OF WATER DISPERSIONS AND WATER-SOLUBLE FRACTIONS OF TWO CRUDE AND TWO PROCESSED OILS ON THREE MARINE ALGAL SPECIES

Mills, E. R., Jr. 1974.
Ph.D. Thesis, Texas A & M University. 102 p.

A haptophyte, a dinoflagellate and a diatom were exposed to four oils, either as dispersions or solutions in water. Population growth rates and chlorophyll a levels were measured in 72-hour static cultures.

Citation Source: Petroleum Abstracts. 1975. 15(18).
Entry #204,501.

C-1031-74
BREEDING OF NUMBERS AND REPRODUCTIVE RATE OF EIDERS AT THE SANDS OF FORVIE NATIONAL NATURE RESERVE, SCOTLAND

Milne, H. 1974.
IBIS 116(2):135-152.

The paper reports the changes in the total population of eiders at the Nature Reserve, Aberdeenshire, between the period 1961 and 1970. The effects of oil pollution on eider size at the winter grounds in 1968 are indicated.

Citation Source: Abstracts on Health Effects of Environmental Pollutants. 1975. 4(3). Entry #2279.

C-1032-74
DEVELOPMENT OF CERTAIN BLACK SEA FISHES IN SEA CONTAMINATED BY PETROLEUM PRODUCTS

Mironov, O. G. 1974.
Report No. EPA-TR-31-175. 10 p. Translation of Monograph, Razvitie Nekotorykh Chernomorskikh Ryb y Morskoi Vode, Zagryazennnoi Nefteproduktami, n.p., n.d.

Fertilized eggs of three species of fish were placed in seawater containing petroleum, solar oil and mazut. The species had differing sensitivities to the oil, but death of the organisms occurred at concentrations of 0.001 ml/l. Lower concentrations were also toxic.

Citation Source: Government Reports Announcements. 1975. 75(3). Entry #PB-237 904-T/GA.

C-1033-74
SUMMARY REPORT ON EFFECTS OF OIL DISCHARGES, DOMESTIC AND INDUSTRIAL WASTEWATERS IN THE FISHERIES OF LAKE MARACAIBO, VENEZUELA

Moore, H. J. 1974.
In: Lake Maracaibo Ecology. Published by Creole Petroleum Corporation. 1974.

A three-year study acquired data on sources and effects of pollution on the fishery resource. The report concludes that although oil spills have occurred, discernable damage has not occurred. Volatilization, biodegradation and sedimentation decrease potential effects. The fish were not accumulating hydrocarbons.

General fate of oil in the environment
Economic effects of oil pollution

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(2). Entry #5Q2095.

C-1034-74
ECOLOGICAL ASPECTS OF OFFSHORE EXPLORATION AND EXPLOITATION

Moore, S. F., G. R. Chirlin, C. J. Puccia, and B. P. Schrader. 1974.
Offshore North Sea 1974 Safety and Environmental Protection Conference, Stavanger, Norway, September 3-6, 1974. Paper No. S-II/5. 23 p.

This paper summarizes a recent MIT report on the potential impact of oil discharges in the outer continental shelf region of the U.S. Atlantic Coast and the Gulf of Alaska. The authors conclude that spills from Atlantic offshore platforms will not create great biological damage; the primary effect would be tar balls on beaches. However, more southerly states have a higher probability of experiencing significant coastal biological damage.

General effects of oil pollution

Citation Source: Petroleum Abstracts. 1975. 15(12). Entry #202,512.

C-1035-74
LIPID COMPOSITION OF SURFACE FILMS AND ZOOPLANKTON FROM THE EASTERN MEDITERRANEAN

Morris, R. J. 1974.
Marine Pollution Bulletin 5(7):105-109.

Petroleum hydrocarbons pollute the natural surface films in the Eastern Mediterranean and also form subsurface oil/water emulsions. Surface living zooplankton have high levels of non-natural hydrocarbons in their lipid store, suggesting that the animals store and concentrate petroleum hydrocarbons.

Analysis
Sampling

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(1). Entry #5Q843.

C-1036-74
A SALT MARSH MICROCOSM: AN EXPERIMENTAL UNIT FOR MARINE POLLUTION STUDIES

Nadeau, R. J., and T. H. Roush. 1973.
Conference on Prevention and Control of Oil Spills, Washington, D.C., 1973. p. 671-684.

A salt marsh microcosm was established and monitored to study the fate and effects of oil spills upon coastal salt marshes. No significant differences were observed in the growth of low and high marsh grass species when comparing growth in the microcosm to a nearby native salt marsh. Gas chromatography, ultraviolet and fluorescent spectrophotometry were used to monitor the fate of oil released into one side of the microcosm.

General fate of oil in the environment

Citation Source: Environmental Health and Pollution Control. 1975. 7(1). Entry #248.

C-1037-74
TOXICITY OF FOUR OIL DISPERSANTS TO SOME ANIMALS FROM THE BALTIC SEA

Nagell, B., M. Notini, and O. Grahn. 1974.
Marine Biology 28(4):237-243.

Three water-base dispersants and one oil-base dispersant were tested on two species of fish, two species of bivalves and two species of crustaceans. Significant differences in toxicity of the water base dispersants were found at high concentrations, probably due to the solvent type and concentration. The oil- and water-base dispersants differed in toxicity for the different animal groups.

Cleanup and recovery

Citation Source: Citation Journal.

C-1038-74
ACCUMULATION, RELEASE AND DISTRIBUTION OF BENZO [A] PYRENE-C^{14} IN THE CLAM RANGIA CUNEATA

Neff, J. M., and J. W. Anderson. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 469-471.

After a 24-hour exposure to 0.0305 ppm benzo [a]pyrene-C^{14}, clam tissues were 200 times above the ambient level; most of the radioactivity was in the viscera. Release began as soon as the clams were placed in clean seawater. After 30 days, only .07 ppm remained; release was complete in 58 days.

Citation Source: Citation Journal.

C-1039-74
BENTHIC MACROINVERTEBRATES AS INDEXES OF WATER QUALITY IN WHETSTONE CREEK, MORROW COUNTY, OHIO (SCIOTO RIVER BASIN)

Olive, J. H., and C. A. Dembach. 1973.
Ohio Journal of Science 73(3):129-148.

Benthic macroinvertebrates were collected from six sampling stations in Whetstone Creek, a tributary of the Olentangy River, which, in 1966, received sewage wastes from a secondary sewage treatment plant, septic tank drainage, stormwater runoff from agricultural lands, and brines from oil field operations. Pollution-sensitive and facultative organisms were collected from the relatively unpolluted upstream waters. Pollution-tolerant tubificids, leeches, chironomids and pulmonate snails increased in abundance and percentage composition at the lower, pollutant affected stations.

Citation Source: Biological Abstracts. 1975. 59(8).
Entry #46008.

C-1040-74
OILED SEABIRDS SUCCESSFULLY CLEANING THEIR PLUMAGE

Phillips, J., and J. R. Mather. 1974.
British Birds 67(11):483-484.

One author presents a report confirming that adult seabirds can clean their oiled feathers. He suggests the birds can tolerate moderate levels of oil in the digestive system. The second author feels that molting may be a possible explanation for the complete and quick disappearance of the oil.

Citation Source: Citation Journal.

C-1041-74
MICROBIOLOGICAL AND ALGOLOGICAL SURVEY OF A PRIMARY STAGE OF EUTROPHICATION IN A STREAM [English summary]

Pierre, J.-F., and G. Kilbertus. 1974.
Bulletin de la Societe Botanique de France 120(7/8):293-302.

A low level of petroleum appears to cause eutrophication. In this study on the consequences of a low level of petroleum on the quantity and quality of bacterial and algal flora, species indicative of eutrophication existed in areas with traces of petroleum.

Citation Source: Biological Abstracts. 1975. 59(5).
Entry #24678.

C-1042-74
A CONTINUOUS FLOW KINETIC MODEL TO PREDICT THE EFFECTS OF TEMPERATURE ON THE TOXICITY OF OIL REFINERY WASTE TO ALGAE

Reynolds, J. H., and E. J. Middlebrooks. 1973.
Research Report, W75-01408, OWRT-B-070-UTAH (2). 44 p.

Since oil refinery wastes may range from 22°C to 41°C, the effects of increased temperature on the toxicity of the wastes is of interest. Equations using chemostat and enzyme kinetics have been developed to describe the effect on algae. The equations were tested with data from a phenol algae system, and the results suggest phenol has a competitive inhibition effect on growth.

Waste water treatment

Citation Source: Government Reports Announcements. 1975. 75(4). Entry #PB-237 699/4GA.

C-1043-74
THE EFFECT OF PRUDHOE BAY CRUDE OIL ON SURVIVAL AND GROWTH OF EGGS, ALEVINS, AND FRY OF PINK SALMON, ONCORHYNCHUS GORBUSCHA

Rice, S. D., D. A. Moles, and J. W. Short. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 503-507.

The 96-hour median tolerance limit of fry was 0.4 ml/l of oil in freshwater and 0.04 ml/l in seawater. Growth in alevins was affected by 10-day sublethal exposures of the water-soluble fraction, and was most severely affected if exposure occurred during developmental stages. Susceptibility of the early life stages of pink salmon is greatest at the time of emergence and of fry migration.

Citation Source: Citation Journal.

C-1044-74
BOONE CREEK OIL SPILL

Schultz, D., and L. B. Tebo, Jr. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 583-588.

A biological survey was conducted on the effects of a diesel fuel spill in a small stream. About 90% of the fish community was destroyed by the initial spill. Hydrocarbons were still present in substrate sediment samples 13 months after the spill.

Sampling

Citation Source: Citation Journal.

C-1045-74
AN HISTORICAL REVIEW OF OIL SPILLS ALONG THE MAINE COAST

Shenton, E. H. 1973.
TRIGOM Report 3.

Observations of the 451 reported oil spills occurring along Maine's coast and spill effects are presented. The most important biological impacts of the spill events are assessed. The data show long-term oil persistence and biological impacts in two cases.

Citation Source: Environment Abstracts. 1975. 5(3).
Entry #02315.

C-1046-74
EFFECTS OF TEMPERATURE ON THE TOXICITY OF OIL REFINERY WASTE, SODIUM CHLORATE, AND TREATED SEWAGE TO FATHEAD MINNOWS

Shifrer, C. C., E. J. Middlebrooks, D. B. Porcella, and W. F. Sigler. 1974.
Report for 1 July 1971 - 31 October 1973, PRWG 105-4W75-01333, OWRT-B-070-UTAH(6). 84 p.

Forty percent of the total toxic action of oil refinery waste at the TL-50 level was from phenol. The assumption was that the toxicities of all substances in the oil refinery waste were additive.

Biological effects of oil prospecting and production

Citation Source: Government Reports Announcements. 1975.
75(2). Entry #PB-237 516/OGA.

C-1047-74
EFFECTS OF EFFLUENTS FROM THE CANADIAN PETROCHEMICAL INDUSTRY ON AQUATIC ORGANISMS. LITERATURE REVIEW.

Smith, A. L. 1974.
Technical Report - Fisheries Marine Services (Canada), 472. 68 p.

A review with many references.

Bibliographies

Citation Source: Chemical Abstracts. 1975. 82(9).
Entry #52253x.

C-1048-74
THE EFFECT AND FATE OF CRUDE OIL SPILT ON TWO ARCTIC LAKES

Snow, N. B., and B. F. Scott. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 527-534.

In addition to the toxic and entrapment effect of the oils on each lake, changes also occurred in the water chemistry, phytoplankton and periphyton after an oil spill. Blue-green algal growth was stimulated. The degree of toxicity and duration of the period of physical effects will depend on the characteristics of the oil.

Chemical effects of oil pollution

Citation Source: Citation Journal.

C-1049-74
FIGHTING THE BATTLE OF THE OIL SPILL

Spooner, M. 1974.
Australasia-Southeast Asia Oil Gas 20(12):27-28.

Discussed is the public concern which arises over the biological damage incurred by oil spilt at sea. It is highly undesirable to disperse toxic oils, such as marine diesels and No. 2 fuel oils, through a body of water where plankton, fishes and crustaceans, and eggs and larvae of fishes and crustaceans may be affected.

Citation Source: Petroleum Abstracts. 1975. 15(15).
Entry #203,527.

C-1050-74
A METHOD FOR TESTING THE TOXICITY OF SUSPENDED OIL DROPLETS ON PLANKTONIC COPEPODS USED AT PLYMOUTH

Spooner, M. F., and C. J. Corkett. 1974.
In: Ecological Aspects of Toxicity Testing of Oils and Dispersants. Beynon, L. R., and E. B. Cowell (eds.). Institute of Petroleum, London. p. 69-74.

Vessels being slowly inverted provide an even dispersion of oil droplets. Using fecal pellet counts as a measure of activity, it was found that the usual effects were sublethal. Ingestion of oil droplets or contact as a solute may have narcotic effects.

Citation Source: Aquatic Sciences and Fisheries Abstracts.
1975. 5(2). Entry #5Q2086.

C-1051-74
PRELIMINARY OBSERVATIONS ON THE MODE OF ACCUMULATION ON #2 FUEL OIL BY THE SOFT SHELL CLAM, <u>MYA ARENARIA</u>

Stainken, D. M. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 463-468.

Young clams were exposed to dyed #2 fuel oil at different concentrations and for different time periods. The clams treat the oil globules as food, and serve to concentrate the oil. Eventually, the effects of the accumulated oil can cause death and the oil in the clam then contaminates its predators or the sediments.

General fate of oil in the environment

Citation Source: Citation Journal.

C-1052-74
A REVIEW OF SOME EFFECTS OF CONTAMINANTS ON MARINE ORGANISMS

Steinberg, M. A. 1974.
In: Indo-Pacific Fisheries Council, 15th, Wellington, New Zealand, 1972. p. 8-23.

The effects of several toxic substances, including oil, on aquatic organisms are reviewed. The mode of action and possible synergistic effects of these pollutants must be investigated. The design of research on the effects of sublethal doses is discussed.

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(2). Entry #5Q2092.

C-1053-74
MARINE POLLUTION BY CARCINOGENIC HYDROCARBONS

Sullivan, J. B. 1974.
IOC-UNESCO, WMO, U.S. Department of Commerce. Petroleum Marine Pollution Symposium, May 13-17, 1974. p. 154-156.

Seafood contaminated by polycyclic aromatic hydrocarbons from oil pollution of oceans is associated with increased incidence of lung cancer. The need to monitor hydrocarbon levels in fishing areas and contaminated areas is discussed.

Monitoring

Citation Source: Environment Abstracts. 1975. 5(2). Entry #75-01557.

C-1054-74
PERSISTENCE AND EFFECTS OF LIGHT FUEL OIL IN SOIL

Swader, F. N. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 589-593.

Soil contamination by light refined oils, as observed at Big Flats, New York, interferes with the water uptake mechanism in the plant root and will kill the seedling. Soil microflora assimilate the oil quickly and may cause a nitrogen deficiency. Recommendations for enhancing the assimilation process are given.

Citation Source: Citation Journal.

C-1055-74
TOXICITY TESTING AT KRISTINEBERG ZOOLOGICAL STATION

Swedmark, M. 1974.
In: Ecological Aspects of Toxicity Testing of Oils and Dispersants, Institute of Petroleum, London. Beynon, L. R., and E. B. Cowell (eds.). p. 41-51.

The toxicity testing done at Kristineberg Station has two purposes: to determine standard relative toxicities, and to predict the ecological consequences of marine pollution. The studies involve adult and developmental stages of fish, crustaceans and bivalves and include short-term (96 hrs) and long-term studies. The actions of surface-active agents on the respiration, osmoregulation and accumulation in tissues are also measured.

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(2). Entry #5Q2083.

C-1056-74
THE TOXICITY OF FOUR OILS TO '<u>PALAEMONETES PUGIO</u>' (HOLTHUIS) IN RELATION TO UPTAKE AND RETENTION OF SPECIFIC PETROLEUM HYDROCARBONS

Tatem, H. E., and J. W. Anderson. 1973.
American Zoologist 13(4):261.

Results are given from studies measuring the effects of water-soluble fractions (WSFs) of Southern Louisiana, Kuwait, No. 2 Fuel and Bunker C oils on <u>P. pugio</u>. It was found that more toxic oils contained higher proportions of naphthalene, methylnaphthalene and dimethylnaphthalene, which are rapidly accumulated by Palaemonetes. However, these substances are readily released if the initial exposure is not lethal.

Citation Source: Government Reports Announcements. 1975. 75(6). Entry #PB-238 515/1GA.

C-1057-74
THE EFFECTS OF PH, PHENOL AND SODIUM CHLORIDE ON SURVIVAL AND CALORIC, LIPID AND NITROGEN CONTENT OF A LABORATORY POPULATION OF CHIRONOMUS ATTENUATUS (WALK.)

Thornton, K., and J. Wilhm. 1974.
Hydrobiologica 45(2/3):261-280.

pH, phenol and sodium chloride are all possible products of oil refining, drilling and pollution. There was an optimum pH for chironomid survival (7.2). An increase in phenol levels resulted in increased caloric content, whereas an increase in NaCl increased the lipid content of the organisms.

Biological effects of oil prospecting and production

Citation Source: Biological Abstracts. 1975. 59(5). Entry #28855.

C-1058-74
EFFECTS OF SURFACTANTS ON FISH

Tomiyama, S. 1974.
Bulletin of the Japanese Society of Scientific Fisheries 40(12): 1291-1296.

Surfactants were adsorbed onto the gill surface of fish. Death was delayed if protein was added to the surfactant solution. The toxicity of surfactants to fish may therefore be due to formation of a surfactant-protein complex.

Cleanup and recovery

Citation Source: Citation Journal.

C-1059-74
EFFECTS OF OIL AND CHEMICALLY DISPERSED OIL ON SELECTED MARINE BIOTA - A LABORATORY STUDY

Vaughan, B. E. 1973.
API Publication No. 4191. 105 p.

The results of a two-year study on the acute, chronic and sublethal effects of oil on marine organisms are presented. The flow-through bioassay system was kept at 8° to 10°C and oil concentration profiles were measured. No evidence for pathology or slow depuration rates was found.

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(2). Entry #5Q2093.

C-1060-74
EFFECTS OF PETROLEUM ON ESTUARINE BACTERIA

Walker, J. D., P. A. Seesman, and R. R. Colwell. 1974.
Marine Pollution Bulletin 5(12):186-188.

The experiments reported in this paper indicate that physiological groups of bacteria in the samples of water and mud exposed to oil did not reach the population numbers of the controls. The crude and refined oil limited the total viable numbers and probably the activity of ecologically important bacterial groups.

Citation Source: Citation Journal.

C-1061-74
OIL IN THE OCEANS: FATES AND EFFECTS

Weiss, F. T. 1974.
Ecolibrium 3(3):10-14.

Studies are being undertaken to determine the toxicity of the natural oil seeps north of Santa Barbara to marine life. Results have indicated that the hydrocarbon content of areas of high petroleum activity is low; certain hydrocarbons are indigenous to the life cycle of marine organisms; and natural processes exist which metabolize the contaminants of oil polluted areas.

Citation Source: Environment Abstracts. 1975. 5(3). Entry #75-02298.

C-1062-74
TOXICITY TESTING FOR RANKING OILS AND OIL DISPERSANTS

Wilson, K. W. 1974.
In: Ecological Aspects of Toxicity Testing of Oils and Dispersants, Institute of Petroleum, London. Beynon, L. R., and E. B. Cowell (eds.). p. 11-22.

In order to establish a standard technique for testing the toxicity of oil dispersants and to rank them, many factors must be considered. Different methods may be necessary for estimating toxicity to offshore animals exposed to low concentrations and littoral animals exposed to high concentrations of oil dispersants.

Cleanup and recovery

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(2). Entry #5Q2081.

C-1063-74
SIGNIFICANCE OF THE SOIL IN ENVIRONMENTAL QUALITY IMPROVEMENT: A REVIEW

Zwerman, P. J., and F. A. M. DeHaan. 1973.
Science of the Total Environment 2(2):121-155.

The impact of agriculture and industry on plant and animal ecology is indicated. The major forces bringing about soil instability are defined. Oil spills as a pollutant on land are described in quantitative terms and remedial measures are given.

Citation Source: Biological Abstracts. 1975. 59(8). Entry #46014.

2. PHYSICAL EFFECTS

C-1064-74
HYDROCARBON DISPERSION IN GROUND WATER: SIGNIFICANCE AND CHARACTERISTICS

Osgood, J. O. 1974.
Ground Water 12(6):427-438.

The effect of hydrocarbon spills on ground water can be significant. The hydrogeologic characteristics at the drill site determine whether hydrocarbons, once they reach the water table, will flow with the ground water flow system or diverge from it.

Citation Source: Petroleum Abstracts. 1975. 15(8).
Entry #201,217.

C-1065-74
DETERMINATION OF PERMEABILITY PROFILE OF SURFACE TERRAIN

Smith, T. N., and C. R. Phillips. 1974.
Environmental Science and Technology 8(12):1020-1023.

In order to evaluate the magnitude of oil spills in permafrost regions, the profile of permeability must be determined. A simple method was developed to determine permeability and was tested in the Northwest Territories, Canada. The initial moisture content of the surface cover does not affect permeability to oil.

Reporting

Citation Source: Biological Abstracts. 1975. 59(7).
Entry #39722.

C-1066-74
EFFECTS OF OIL UNDER SEA ICE

Wolfe, L. S., and D. P. Hoult. 1974.
Journal of Glaciology 13(69):473-488.

Laboratory studies were conducted to determine the effects of crude and diesel oils on the porous substructure of Arctic sea ice. It was found that the extent of oil entrapment in the ice-brine matrix is negligible, that the ice does not grow through a layer of oil, and that oil is neatly pocketed by the ice as more ice forms under it. The pool of oil acts as an insulating layer between the cold air and the warmer seawater and causes a change in the temperature distribution in the ice.

General fate of oil in the environment

Citation Source: Selected Water Resources Abstracts. 1975.
8(7). Entry #W75-03646.

3. SOCIAL EFFECTS

C-1067-74
ECONOMIC AND SOCIAL IMPACT OF SPILLS

Enk, G. A. 1974.
National Conference on Control of Hazardous Material Spills, San Francisco, 1974. p. 143-147.

A program was initiated by the Institute on Man and Science to clarify the impacts of hazardous material spills. The study concluded that now is the time for legislative, economic, political and sociological systems to take action in assessing the social response to such spills.

Economic effects of oil pollution

Citation Source: Environment Abstracts. 1975. 5(4).
Entry #75-02826.

C-1068-74
ROLE OF ENVIRONMENTAL ORGANIZATIONS IN CLARIFYING SOCIAL IMPACTS OF OIL SPILLS AND OIL POLLUTION

Evans, B. 1974.
Assessing the Social Impacts of Oil Spills, Rensselaerville, New York, 1973. p. 73-75.

For the environmentalist, the impact on the physical environment cannot logically be separated from the social impact on human societies. Difficulties in assessing damages lie in obtaining financial resources, funding good local expert testimony and circumventing oil's political influence.

Citation Source: Citation Journal.

C-1069-74
THE OIL COMPANY'S POSITION IN AN OIL SPILL

Haxby, L. P. 1974.
Assessing the Social Impacts of Oil Spills, Rensselaerville, New York, 1973. p. 41-42.

Shell Oil Company's response to oil pollution problems is reported to not only settle claims brought against it, but also to discover ways of minimizing the impacts and occurrences of spills. Management practices, such as training programs and improved planning, will improve oil handling techniques.

Economic effects of oil pollution
Personnel training and education
Regulations, standards and planning

Citation Source: Citation Journal.

C-1070-74
THE APPLICATIONS OF SYSTEMS ANALYSIS TECHNIQUES TO SOCIAL IMPACTS DUE TO OIL SPILLED IN THE MARINE ENVIRONMENT

Pizzo, J. 1974.
Assessing the Social Impacts of Oil Spills, Rensselaerville, New York, 1973. p. 49-55.

Fault trees can be used to establish cause and effect relationships. Then a risk model analysis can help pinpoint where the fault lies and what actions can be taken to minimize the impacts of oil spills. The Delphi method, using a group of experts to develop a rating system, could be utilized to assign values to non-economic factors.

Economic effects of oil pollution

Citation Source: Citation Journal.

C-1071-74
CONSIDERATIONS ON THE GOVERNMENTAL RESPONSES TO ENVIRONMENTAL CRISIS OR DISASTER

Swanson, B. 1974.
Assessing the Social Impacts of Oil Spills, Rensselaerville, New York, 1973. p. 81-82.

Work currently being done in the area of community studies is described. A voluntary prototype emergency response team to describe the social impacts of oil spills was suggested. Bureaucratic considerations should be small and immediate response to an oil spill should be stressed.

Citation Source: Citation Journal.

4. ECONOMIC EFFECTS

C-1072-74
OPERATIONAL DUMPING AND THE POLLUTION OF THE SEA BY OIL: AN EVALUATION OF PREVENTIVE MEASURES

Burrows, P., et al. 1974.
Journal of Environmental Economics and Management 1(3):202-218.

The conclusions drawn from a cost-effectiveness evaluation of alternative methods for preventing operational dumping of oil are: (1) the technology that minimizes internal costs (favored by oil companies) does not minimize the social costs of pollution prevention, and (2) the cost of pollution-prevention processes is very small as compared to the price of oil.

Citation Source: Environment Abstracts. 1975. 5(4).
Entry #75-03106.

C-1073-74
ROLE OF THE OIL SPILL CLAIMS ADJUSTER - THE MIDDLEMAN

Denoville, R. 1974.
Assessing the Social Impacts of Oil Spills, Rensselaerville, New York, 1973. p. 43-45.

Insurance companies rarely become involved in oil spill claims because the spiller is often self-insured. Ways in which insurance companies classify claims and the question of compensation for such things as property values are discussed.

Social effects of oil pollution

Citation Source: Citation Journal.

C-1074-74
THE TRUE ECONOMICS OF OIL SPILL CLEANUPS: WHAT DO WE GET FOR EACH DOLLAR

Dorrler, J. S. 1974.
Assessing the Social Impacts of Oil Spills, New York, 1973.
p. 15-16.

The on-scene coordinator determines the extent of cleanup and damage assessment after a spill. Assessing biological damage in economic terms is difficult. The actual cost of cleanup ($.50 to $14 per gallon) does not include damage to a beach or to microorganisms.

Biological effects of oil pollution

Citation Source: Citation Journal.

C-1075-74
COMPENSATION FOR OIL POLLUTION DAMAGES

Lundquist, T. R. 1974.
Assessing the Social Impacts of Oil Spills, Rensselaerville, New York, 1973. p. 107-114.

Neither United States anti-pollution statutes nor concepts of tort liability provide guaranteed compensation for oil pollution damage. No international oil pollution damage compensating plan currently exists but two recent international conventions, if ratified, would do much to insure compensation.

National legislation
International legislation

Citation Source: Citation Journal.

C-1076-74
DIFFERENTIATION BETWEEN NATURAL HYDROCARBONS AND LOW LEVEL DIESEL OIL CONTAMINATION IN COOKED LOBSTER MEAT

Paradis, M., and R. G. Ackman. 1975.
Journal of the Fisheries Research Board of Canada 32(2):316-320.

In order to confirm a low level diesel oil contamination in cooked lobster meat, a combination of total lipid extraction, column chromatography and temperature-programmed gas chromatography was necessary. The concentrations of identifiable components of the diesel oil were close to those in normal lobster meat.

Biological effects of oil pollution

Citation Source: Citation Journal.

C-1077-74
THE ECONOMICS OF THE WEST COAST OIL SPILL CLEAN-UP INDUSTRY

Stone, C. M. 1974.
Master's Thesis. 78 p.

In this thesis, the industrial structure in oil spill cleanup activity is examined. The roles of the various sectors which make up the total cleanup effort are also examined.

Citation Source: Government Reports Announcements. 1975. 75(6). Entry #AD/A-003 860/4GA.

C-1078-74
PRIVATE DAMAGES FROM OIL SPILLS IN A MARINE ENVIRONMENT

Sweeney, J. C. 1974.
Assessing the Social Impacts of Oil Spills, Rensselaerville, New York, 1973. p. 27-33.

The law's interpretation of a variety of claims arising from an oil pollution incident is described in detail. Some economic criteria receive more judicial consideration than others. Beach front property owners and shellfish bed owners are in a better position to receive compensation than those losing revenues from an oil spill.

Social effects of oil pollution
National legislation

Citation Source: Citation Journal.

C-1079-74
ECONOMIC DAMAGES FROM OIL SPILLS: MEASUREMENT TECHNIQUES AND EMPIRICAL RESULTS

Tihansky, D. P. 1974.
Assessing the Social Impacts of Oil Spills, Rensselaerville, New York, 1973. p. 57-65.

Eight theoretical economic techniques that could be utilized in assessing the cost of pollution damages are described. These empirical techniques must be applied selectively to specific water uses. Cost-benefit tradeoffs among welfare recipients, the environmental habitat and the original polluter are necessary in assessing pollution damage.

Social effects of oil pollution

Citation Source: Citation Journal.

5. GENERAL EFFECTS

C-1080-74
ENVIRONMENTAL DAMAGE

Anonymous. 1974.
National Conference on Control of Hazardous Material Spills, San Francisco, 1974. p. 349-372.

Discussions of the environmental damages caused by hazardous material spills are presented in five papers. The importance of waterway dilution capacity in hazardous material spills and its inclusion in risk decision frameworks are examined.

Citation Source: Environment Abstracts. 1975. 5(4).
Entry #75-02831.

C-1081-74
OIL SPILLS AND THE MARINE ENVIRONMENT

Boesch, D. F., C. H. Hershner, and J. H. Milgram. 1974.
Papers prepared for Energy Policy Project of the Ford Foundation, Ballinger Publishing Co., Cambridge, Massachusetts. xv + 144 p.

The reviewer of this book states that the book's objective (i.e., bringing together a critical review of current knowledge about the effects of oil spills and the efficiency of preventative safeguards) is not achieved. The paper on the effects of oil spills is considered better than that on prevention, control and cleanup.

Citation Source: Marine Pollution Bulletin. 1974 5(12).

C-1082-74
PROPERTIES AND EFFECTS OF NONPETROLEUM OILS

Crump-Wiesner, H. J., and A. L. Jennings. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 29-32.

Approximately five percent of the oil spills reported to the Environmental Protection Agency are nonpetroleum oils. Based on the data in this report, the conclusion is drawn that the adverse effects of nonpetroleum and petroleum oils are similar. Case histories illustrate the similarity of behavior. Guidelines for distinguishing between oil and other hazardous materials are given. EPA includes nonpetroleum oils under section 311 of the FWPCA.

National legislation
Regulations, standards and planning

Citation Source: Citation Journal.

C-1083-74
ENERGY AND ENVIRONMENT: A COLLISION OF CRISES

Goodwin, I. (editor). 1974.
Washington Journalism Center Critical Issues Series. Acton, Massachusetts: Publishing Sciences Group.

The 1969 Santa Barbara oil spill is described. The problems involved in defining a national energy environment policy and developing clean energy are discussed. Factors presented include the threat of monopoly, antipollution laws, atomic power and reconciling energy and environmental demands.

Social effects of oil prospecting and production

Citation Source: Pollution Abstracts. 1975. 6(2). Entry #75-02012.

C-1084-74
AGAINST POLLUTION AND HUNGER

Hilton, A. M. 1974.
International Pollution Control Conference, Proceedings. Halsted Press. 312 p.

This book contains papers on many aspects of pollution. Included are the physical and chemical aspects, radiation and human health, genetic damage and chemical and biological warfare.

Citation Source: Science News. 1975. 107(17). p. 266.

C-1085-74
EXPLOSION HAZARDS ASSOCIATED WITH SPILLS OF LARGE QUANTITIES OF HAZARDOUS MATERIALS. PHASE I

Lind, C. D. 1974.
Final Report, USCG-D-30-75. Contract DOT-CG-34095. 63 p.

The object of the program is to quantify the explosion hazards associated with spills of liquified natural gas or petroleum gas or ethylene. Phase I describes a spill, examines the explosive properties of methane, and plans Phase II.

Citation Source: Government Reports Announcements. 1975. 75(2). Entry #AD/A-001 242/7GA.

C-1086-74
ENVIRONMENTAL POLLUTION BY HYDROCARBON COMPOUNDS IN ITS RELATION WITH ECOTOXICOLOGY

Merian, E. 1974.
Chemische Rundschau 27(42):5,7,9,11.

The paper reviews CO, SO_2, hydrocarbon, NO_x, dust and Pb pollution of the environment, including annual emission levels and relative toxicity.

Citation Source: Chemical Abstracts. 1975. 82(14).
Entry #89600j.

C-1087-74
EFFECT OF OIL REFINERY EFFLUENT ON THE SHALLOW GRAVEL AQUIFER IN ZERQA AREA-JORDAN

Mudallal, U., and I. Najjar. 1973.
Water for the Human Environment, Volume II, Country Reports; Proceedings of the First World Congress on Water Resources (Vol. 4), Chicago, Illinois, September 24-28, 1973. p. 248-272.

Data on the hydrochemistry of the shallow gravel aquifer were examined to evaluate the degree of groundwater contamination by the Jordan Refinery, located within the same province. Analyses have shown that waste water, containing high concentrations of hydrogen sulfide, sodium sulfide, sodium hydroxide, phenol and crude oil, has polluted the aquifer.

General effects of oil prospecting and production

Citation Source: Selected Water Resources Abstracts. 1975. 8(5). Entry #W75-02455.

C-1088-74
THE MEDITERRANEAN AS A SYSTEM: PART II - SMALL ECOSYSTEMS

Onuf, C. P., and W. W. Murdoch. 1974.
International Journal of Environmental Studies 6(1):29-34.

The effects of pollution from heavy metals, PCB's, acids, radioactivity, oil, pesticides, and organic pollutants were studied in the coastal Mediterranean. These waters are low in productivity, have free exchange with the open sea and have a narrow shelf, so they can take a relatively high load of some pollutants.

Citation Source: Pollution Abstracts. 1975. 6(2).
Entry #75-01288.

C-1089-74
MARINE POLLUTION

Portmann, J. E. 1974.
Effluent Water Treatment Journal 14(11):655-661.

Subjects covered in the review of literature dealing with modern pollution control include: sources of pollution, fate of pollutants in the sea, effects of pollutants on marine life, and effects of oil and treatment.

Citation Source: The Engineering Index Monthly. 1975. 13(2). Entry #013866.

C-1090-74
THE PROBLEM OF POLLUTION OF THE MEDITERRANEAN SEA

Proc, P. I. 1974.
Umwelthygiene 25(1):7-10.

A brief summary is given of the talks delivered at the International Informative and Protest Meeting held at Bastia, Corsica, June, 1973, on the dumping of red mud, heavy metals and crude oil in the Mediterranean area.

Citation Source: Environmental Health and Pollution Control. 1974. 6(8). Entry #2816.

C-1091-74
WATER POLLUTION. MARINE AND ESTUARINE POLLUTION

Reish, D. J., and T. J. Kauwling. 1974.
Journal Water Pollution Control Federation 46(6):1437-1451.

The 1973 literature dealing with marine and estuarine pollution is reviewed. Topics covered include: monitoring, surveys, oil pollution, phytoplankton, dredging, effects on temperature and salinity, bioassays, residues, microorganisms, and physical and chemical oceanography.

Citation Source: Environmental Health and Pollution Control. 1975. 7(1). Entry #77.

C-1092-74
KEEPING THE BALTIC SEA CLEAN: ACHIEVEMENTS OF SOCIALIST ENVIRONMENT PROTECTION

Schubert, O. 1974.
Technik 29(6):375-377.

The problems associated with the maintenance of water quality of the Baltic Sea are discussed and the pollution prevention measures established by the Socialist countries in this area are described. Pollution problems include the accumulation of heavy metals from industrial waste water in fishes and water pollution by oil.

Citation Source: Environmental Health and Pollution Control. 1975. 7(4). Entry #1015.

C-1093-74
INTERNATIONAL POLITICS OF MARINE POLLUTION

Shinn, R. A. 1974.
Praeger, New York, v + 200 p.

Many aspects of marine pollution are surveyed including the types, sources, quantities and effects, the international laws, contending forces, the organizations concerned, proposals, forums for discussion and decision, intellectual models and policy implications.

International legislation

Citation Source: Citation Journal.

C-1094-74
THE FUTURE DIRECTIONS OF ASSESSMENTS OF IMPACTS

Snyder, H. 1974.
Assessing the Social Impacts of Oil Spills, Rensselaerville, New York, 1973. p. 7-8.

The assessment process of the Environmental Protection Agency has to date been a biological, scientific, quasi-research effort with the use of basic ordering agreement contractors. The options for the future include covering physical damages, recreational damage, human health hazards and recovery rate. The Environmental Protection Agency needs to know how much detail people want and who the people will accept as an authority.

Citation Source: Citation Journal.

D. OIL POLLUTION PREVENTION

1. DESIGN AND ENGINEERING

C-1095-74
GIANT FLOATING CAPSULE TO STORE OIL ON NORTH SEA

Anonymous. 1973.
Marine Engineering/Log 78(12):64.

A 470 foot long storage and tanker loading facility will float in 520 feet of water. A submerged pipeline feeds oil into six oil storage tanks. If any two compartments are damaged, the facility will still float and operate. Such damage will not cause oil spills.

Oil handling

Citation Source: Petroleum Abstracts. 1975. 15(7). Entry #200,830.

C-1096-74
SELECTION OF ENVIRONMENTAL CRITERIA FOR OFFSHORE PLATFORM DESIGN

Bea, R. G. 1974.
Journal of Petroleum Technology 26:1206-1214.

Two factors, environmental uncertainty and variability, are unavoidable considerations in selecting design criteria for offshore platforms. Possible hazards can only be minimized in accord with information that is available.

General effects of oil prospecting and production

Citation Source: The Engineering Index Monthly. 1975. 13(2). Entry #011330.

C-1097-74
TANKERS WILL BE SAFER IN THE FUTURE

Cashman, M. 1975.
Ocean Industry 10(3):44-46.

Collision Avoidance Systems, which greatly reduce the chances of tanker collisions, are radar-linked, computer-assisted automated plotters. These precautionary systems possess a "trial-maneuver" feature with the turning characteristics of the vessel to allow the watch officer to see the results of an intended course before he makes his decision.

Citation Source: Citation Journal.

C-1098-74
TIDAL AQUARIUM FOR LABORATORY STUDIES OF ENVIRONMENTAL EFFECTS ON MARINE ORGANISMS

Clark, R. C., Jr., and J. S. Finley. 1974.
Progressive Fish-Culturist 36(3):134-137.

A laboratory test chamber was developed to study the uptake and effects of sublethal levels of paraffinic hydrocarbons from crude oils and petroleum products on marine organisms. The chamber consists of a test and control tank, a siphon assembly, a pump assembly and an aeration system.

Biological effects of oil pollution

Citation Source: Environment Abstracts. 1975. 5(3).
Entry #75-02290.

C-1099-74
THE 1973 IMCO CONVENTION: A TANKER OPERATOR'S VIEWPOINT

Gray, W. O. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 15-21.

Exxon studies of the IMCO provisions that are relevant to oil tanker technology form the basis of this report. These elements include ships' operational and equipment features, design changes for tankers ordered after December 31, 1975, and shore reception facilities. The status of each of these elements and of progress toward ratification is reviewed. A table of comparisons of the 1973 and 1954 conventions is included.

Citation Source: Citation Journal.

C-1100-74
HANDLING REFINERY WASTES

Reno, G. 1973.
Extr. of Minerolog. and Energy: Today's Dilemmas, International Workshop on Environmental Problems of the Extract Industries, Papers, Dayton, Ohio, June 10-13, 1973. Paper 17. p. 203-210.

Measures taken to abate all forms of pollution at the Houston Refinery of Shell Oil Company are discussed.

Waste water treatment

Citation Source: The Engineering Index Monthly. 1975. 13(2).
Entry #011651.

C-1101-74
THE MARITIME ADMINISTRATION PROGRAM FOR THE PREVENTION AND CONTROL OF OIL POLLUTION FROM VESSELS

Steinman, G. C., and W. B. Chappel. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 177-185.

The goal of the Maritime Administration program is to prevent oil pollution through cost effective measures. Some pollution prevention features discussed are oil discharge monitoring systems, oily waste slop tanks and collision avoidance radar. The impact of IMCO segregated ballast requirements, Load-On-Top, and port reception facilities is reviewed.

Monitoring
Waste water treatment

Citation Source: Citation Journal.

C-1102-74
FIRST SAN CLEMENTE CLASS DOUBLE-BOTTOM TANKER DELIVERED BY NASSCO: GOLDEN DOLPHIN

Uberti, G. A. 1974.
Marine Engineering/Log 79:50-53.

This ship has been designed to comply with the new U.S. Coast Guard regulations. Segregated clean ballast tanks, provisions for cargo oil or fuel oil spills, retention of bilge water slops and a monitor for tank washings overboard discharge are among the pollution prevention features.

Oil handling

Citation Source: Citation Journal.

2. OIL HANDLING

C-1103-74
ENVIRONMENT ASKS FOR LAW ON CHEMICAL WASTE MATERIALS

Anonymous. 1974.
Metaal Kunststof 12(8):18-20.

A discussion of the problems and existing regulations pertaining to waste oil disposal in the Netherlands is given. Differences in provisions for the disposal of used oil in various countries of Europe are also indicated.

Citation Source: Environmental Health and Pollution Control. 1974. 6(7). Entry #2528.

C-1104-74
LITERATURE SEARCH ON USED OILS - DISPOSAL FEBRUARY 24, 1972 TO AUGUST, 1974

Anonymous. 1974.
Lubrication Engineering 30(10):486-487.

A literature search on the treatment, reclamation and disposal of used or waste oils is presented. Citations from the literature have been taken from major sources of such information up to August, 1974.

Citation Source: Citation Journal.

C-1105-74
MILLION TON CARRIER

Anonymous. 1974.
Super Ocean Carrier Conference, Proceedings, New York, New York, January 16-18, 1974. 696 p.

The Proceedings is composed of 36 papers concerned with the problems associated with the development of VLCC's, ULCC's, and the proposed million ton carrier, including cargo handling, port facilities and water pollution.

Citation Source: The Engineering Index Monthly. 1975. 13(2). Entry #013449.

C-1106-74
POLLUTION CONTROL IN THE MARINE INDUSTRIES--1974

Anonymous. 1974.
International Conference of the International Association for Pollution Control, 4th, Washington, D. C., 1974.

Included in the Proceedings, which describes international efforts to control marine pollution, are discussions about tanker pollution prevention and port facilities programs to handle oily wastes and spills, and the environmental impact of oil spills and dry bulk transfer facilities.

General effects of oil pollution

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #057581.

C-1107-74
PREVENTION

Anonymous. 1974.
National Conference on Control of Hazardous Material Spills, San Francisco, 1974. p. 85-142.

Ten papers deal with methods of preventing hazardous material spills. Analysis of spill data indicates that many small spills occur in transport or transfer of hazardous materials, a number of spills involving leaking covers and broken valves may be prevented, transfer system failures and overflows may be checked through properly designed hardware, and many in-plant incidents involving personnel error could be avoided with fail-safe process instrumentation.

Citation Source: Environment Abstracts. 1975. 5(4). Entry #75-02825.

C-1108-74
SYMPOSIUM ON MARINE POLLUTION, 1973

Anonymous. 1973.
Symposium on Marine Pollution, National Physical Laboratory, Teddington, England, 1973.

The following marine pollution-related topics are covered in nine papers presented at the Symposium: the "Load-On-Top System";

prevention of pollution from chemical tankers; segregated ballast tankers; ship sewage treatment; routing, traffic control and crew training; oil pollution handling techniques; and pollution risks in offshore drilling, production and storage.

General effects of oil prospecting and production
Personnel training and education

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #054861.

C-1109-74
SINGLE POINT MOORING SYSTEM

Black, J. 1974.
Marine Engineering Review, May, 1974. 4 p.

Necessary parameters to be considered in the design of the single point mooring system for the safe berthing and unberthing of large oil tankers and ore-slurry-oil vessels are reviewed. Three types of single mooring systems are described; and a quick-disconnect self-sealing coupling system and monitoring equipment for oil spills are outlined.

Design and engineering

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #057771.

C-1110-74
THE ISOLATION OF OIL FROM SEAWATER IN COMPENSATED TANKS USING IMPERMEABLE MEMBRANES

Carmichael, A. D., J. W. Slacks, and S. L. Smith. 1973.
Massachusetts Institute of Technology No. 73-24.

A study investigated the possible application of impermeable membranes in compensated fuel and cargo tanks. Results have indicated that several problems arise from this procedure, including the flexing and continual movement of the membrane in a seaway.

Research

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #057112.

C-1111-74
TANKER TANK CLEANING RESEARCH PROGRAM

Cooper, W. J. 1974.
Final Report, MSA Research Corporation No. MSAR-74-36 Phase 1. 474 p. NTIS Report COM-74-111 23/8.

A state-of-the-art review of crude oil tankship tank cleaning and related operations is presented. Recommendations/guidelines are provided which will increase tank cleaning operation safety, reduce oil pollution and reduce the cost and effort of tank cleaning.

Cleanup and recovery

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #057767.

C-1112-74
A TECHNICAL AND ECONOMIC STUDY OF WASTE OIL RECOVERY. PART I: FEDERAL RESEARCH ON OIL FROM AUTOMOBILES

Cukor, P. M., M. J. Keaton, and G. Wilcox. 1973.
Final Report, EPA/530/SW-90.1, Contract EPA-68-01-1806. 99 p.

This report contains both a summary of Federal research and regulations concerning waste oil from cars and also an annotated bibliography on waste oil disposal.

Citation Source: Government Reports Announcements. 1975. 75(4). Entry #PB-237 618/4GA.

C-1113-74
A TECHNICAL AND ECONOMIC STUDY OF WASTE OIL RECOVERY. PART II: AN INVESTIGATION OF DISPERSED SOURCES OF USED CRANKCASE OIL

Cukor, A. M., M. J. Keaton, and G. Wilcox. 1973.
Final Report, EPA/530/SW-90c.2, Contract EPA-68-01-1806. 67 p.

Part II studies the buying attitudes and disposal practices of people who change their own oil. A copy of the questionnaire, the results and the analyses of the results are included in the report.

Citation Source: Government Reports Announcements. 1975. 75(4). Entry #PB-237 619/2GA.

C-1114-74
A TECHNICAL AND ECONOMIC STUDY OF WASTE OIL RECOVERY. PART III. ECONOMIC, TECHNICAL AND INSTITUTIONAL BARRIERS TO WASTE OIL RECOVERY

Cukor, P. M., M. J. Keaton, and G. Wilcox. 1973.
Final Report, EPA/530/SW-90c.3, Contract EPA-68-01-1806. 136 p.

The economic, technical and institutional barriers to waste oil recovery are emphasized in this report on the waste oil refining industry.

Citation Source: Government Reports Announcements. 1975. 75(4). Entry #PB-237 620/OGA.

C-1115-74
A COMPARATIVE EVALUATION OF NEW, USED, AND REFINED LUBRICATING OILS

Goetzinger, J. W., F. O. Cotton, and M. L. Whisman. 1975.
Oil and Gas Journal 73(9):130-135.

Waste lubricating oil is a serious pollutant. Research is underway to evaluate new technology for more efficient refining, to develop simple tests for evaluation of lube oil quality, and to offer standards for both new and used oils to promote the marketability of recycled lubricating oil.

Research

Citation Source: Citation Journal.

C-1116-74
PUMPING SYSTEM FOR TRANSFERRING HIGH-VISCOSITY OILS

Hackman, D. J., et al. 1974.
NTIS Report AD-784 876/5WP. 79 p.

An investigation into the problems dealing with the emergency off-loading of high viscosity oils from damaged tankers is reported. The operation and energy efficiency of pumping oils from damaged tankers are evaluated and two systems for the transfer of low viscosity and high viscosity oils are recommended.

Citation Source: Environment Abstracts. 1975. 5(4). Entry #75-03122.

C-1117-74
CRUDE OIL AND KEEPING WATERWAYS CLEAN

Hellmann, H. 1974.
Wasserwirtschaft-Wassertechnik 64(7-8):199.

A discussion is presented on the protection of water from oil pollution occurring during the transport of oil or by the incorrect disposal of oil wastes.

Citation Source: Environmental Health and Pollution Control. 1975. 7(3). Entry #767.

C-1118-74
SPENT OIL RECLAMATION

Institut Francais du Petrole. 1974.
Hydrocarbon Processing 53(9):189.

A process to re-refine spent crankcase oils and motor oils is described, and the economic aspects are included. The method lowers the amounts of acid and clay needed, reduces sludge formation and therefore pollution, and also improves product quality.

Citation Source: Citation Journal.

C-1119-74
USED OIL LAW IN THE UNITED STATES

Irwin, W. A., and R. A. Liroff. 1974.
Environmental Protection Agency, Report EPA-600/5-74-025. 289 p.

State and federal laws and the laws of other industrialized nations governing the collection and disposal of used oils are described. Existing information for used oil handling is reviewed.

State, National, Foreign legislation

Citation Source: Selected Water Resources Abstracts. 1975. 8(9). Entry #W75-04575.

C-1120-74
BS & W REDUCED TO LESS THAN 1% WITH AID OF EMULSIFIER

Johnson, R. A., et al. 1974.
Chemical Processing 37(9):12-13.

A demulsifying agent, composed of a blend of liquid organic surface materials which promotes rapid separation of water in water-in-oil emulsions, reduced bottom sediment and water in waste oil receipts within maximum limits for number 5 and 6 oils.

Citation Source: Environment Abstracts. 1975. 5(4). Entry #75-02854.

C-1121-74
DESIGN CRITERIA FOR SINGLE-POINT MOORING TECHNIQUES

Langeveid, J. M. 1974.
ASCE Journal of Waterways, Harbors and Coastal Engineering Division 100(WW4):305-323. ASCE Paper No. 10931.

The various parameters which must be considered in the design, construction and site selection of safe single-point moorings are discussed. Single-point mooring can be operated without causing environmental pollution and without detrimental effect on the local marine life.

Design and engineering

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #072436.

C-1122-74
PROBLEMS COVERING THE ACCUMULATION OF USED OIL AND ITS REMOVAL IN WESTERN EUROPE

Lille, R. H. 1974.
Wasserwirtschaft-Wassertechnik 64(7-8):210-214.

Over one million tons of used oils have been estimated to be disposed of in an uncontrolled manner in Western Europe. The author discusses the need to organize a suitable collection and disposal system for the solution of the used oil problem. The importance of recycling methods for used oil is emphasized.

Citation Source: Environmental Health and Pollution Control. 1975. 7(2). Entry #496.

C-1123-74
SEAS MUST BE CLEAN

Matov, I. 1974.
Translated from Russian, BLL-M-23509-(5828.4F). 3 p.

Oil pollution by marine transportation and oil shipping is prevented in the U.S.S.R. by "chemical/mechanical closed flushing cycles on ships" and by collection vessels that transfer oily wastes from the ships to purification systems.

Waste water treatment

Citation Source: Scientific and Technical Aerospace Reports. 1975. 13(8). Entry #N75-17009.

C-1124-74
WASTE OIL DOWN THE DRAIN

Morrison, E. 1975.
Environmental Action 7(1):8-10.

The author discusses the significant environmental dangers caused by the indiscriminant disposal of waste oils and the need to bring about a public awareness of the critical problem. The present status of waste oil recycling activities is reviewed.

Citation Source: Citation Journal.

C-1125-74
HARMLESS DISPOSAL OF EMULSIONS BY THE DECATOX PROCEDURE

Quillmann, H. 1973.
CZ-Chemie-Technik 2(10):389-391.

Two procedures for the disposal of oily emulsions used for cooling and lubrication in the processing of metals are described. Installation costs, energy requirements and necessary separating agents for emulsion incineration and emulsion fractioning are given.

Citation Source: Environmental Health and Pollution Control. 1974. 6(6). Entry #2240.

C-1126-74
SOME PROBLEMS AND PROSPECTS FOR MARINE TRANSPORTATION OF OIL IN THE 1970'S

Zannetos, Z. S. 1973.
MIT Symposium, Cambridge, February 12-14, 1973. p. 403-416.

The problems associated with and financial resources required for ocean oil transportation in the 1970's are discussed.

Citation Source: Environment Abstracts. 1975. 5(2). Entry #75-01310.

3. WASTE WATER TREATMENT

C-1127-74
A LARGE CAPACITY OIL WATER SEPARATION SYSTEM [English translation available]

Anonymous. (undated)
Mitsubishi Juko Gibo 10(5). 3 p.

A review of studies on the "Load-On-Top System" in Japan is given. Success of this system is dependent on the development of an oily water separation method, which is one of the projects being carried out by Mitsubishi Heavy Industries, Ltd.

Oil handling

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #057125.

C-1128-74
KEENE DISCHARGE CONTROL SYSTEM AFFORDS OPERATOR PERMANENT PROOF OF LAW COMPLIANCE ON OIL SPILLS

Anonymous. 1974.
Maritime Reporter and Engineering News 36(8):18.

A new automatic system for the removal of oily wastes from bilgewater is described. The system is based on filtration; separation filters and coalescing units are engineered into an automatic unit which removes oily wastes from bilges and discharges the cleaned bilgewater overboard.

Cleanup and recovery

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #056713.

C-1129-74
TREATMENT FOR OILY WASTE WATER USING MAGNETIC POWDER

Anonymous. 1974.
Water Purification and Liquid Waste Treatment 15(7):37-44.

When fine magnetic powder is added to chemical coagulation processes for the treatment of oily waste water, flocks of oil droplets are produced which contain these magnetic powders. The flocks are tightened and sedimented in a magnetic field and then removed by movement of a magnetic belt or drum.

Citation Source: Selected Water Resources Abstracts. 1975. 8(7). Entry #W75-03551.

C-1130-74
MAINTENANCE CONTRIBUTES TO ENVIRONMENTAL PROTECTION

Barna, P., D. O. Chrismer, L. G. Diehl, et al. 1974.
Oil and Gas Journal 72(30):170-178.

This paper is the seventh in a series of reproductions of the transcript of NPRA's recent maintenance question and answer session conducted at the NPRA Refinery and Petrochemical Plant Maintenance Conference, Houston, January, 1974. Several issues on environmental control were examined. Waste water, waste solids disposal and noise suppression were areas covered in the session.

Citation Source: Environmental Health and Pollution Control. 1975. 7(3). Entry #747.

C-1131-74
SEPARATION PROCESSES FOR OIL-WATER EMULSIONS

Brenner, W. J. 1974.
Industrie-Anzeiger 96(69):1544-1545.

The Emuperm process for ultrafiltration of emulsions is discussed.

Citation Source: Chemical Abstracts. 1975. 82(10). Entry #60799v.

C-1132-74
ICI'S OIL/WATER SEPARATOR FEATURES NEW FIBRE FILTERS

Butler, P. 1974.
Process Engineering. November. p. 7.

This process is based on the filtration of oily waters through new ICI-researched open-pored materials. Oil droplets coalesce as they pass through the material and then rise rapidly to the surface where the oil is removed.

Citation Source: Citation Journal.

C-1133-74
AN ECOLOGICAL APPROACH TO THE PROBLEM OF BIODEGRADATION OF PHENOLIC WASTES

Cobb, H. D. 1973.
NTIS Report AD-770 750. 16 p.

A study was conducted to isolate and identify cresol-metabolizing microorganisms from industrial waste waters of Kelly Air Force Base. Eight isolates from the waste waters were able to degrade cresol, utilizing it as an energy source. One isolate, 'HB', was found to degrade all three cresol isomers at concentrations exceeding that presently entering the treatment plant (900 ppm).

Biological degradation

Citation Source: Selected Water Resources Abstracts. 1975. 8(6). Entry #W75-03125.

C-1134-74
SHIPS WASTE OFFLOAD SYSTEM STUDY. SENSITIVITY ANALYSIS

Davis, E. J. 1974.
Supplement to report dated May, 1973, AD-763 454, Johnson Bernard Incorporated. NTIS Report AD-777480/5.

The report contains results of studies of five alternative combinations of ships' waste offload system components applied in actual field conditions on ships at the San Diego Naval Complex. The ships' wastes were best handled by the offload systems when divided into three waste streams: sanitary plus hotel, oily, and containerized industrial plus solid.

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #057248.

C-1135-74
THE INTERRELATIONSHIP OF BIOLOGICAL CARBON ADSORPTION SYSTEM FOR THE TREATMENT OF REFINERY AND PETROCHEMICAL WASTEWATERS

Ford, D. L., and M. A. Buercklin. 1973.
Advances in Water Pollution Research. Proceedings 6th International Conference, Jerusalem, 1972. Pergamon Press. p. 709-718.

A technical and economic review is given of the fixed bed carbon and biological systems for the treatment of refinery petrochemical waste waters.

Citation Source: Environmental Health and Pollution Control. 1974. 6(8). Entry #E2959.

C-1136-74
REVIEW OF U.S. ENVIRONMENTAL PROTECTION AGENCY RESEARCH IN OIL-WATER SEPARATION TECHNOLOGY

Freestone, F. J., and R. B. Tabakin. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 437-441.

One project involves developing a chemically assisted, back-washable coalescer which is designed for use on offshore production platforms. Tests on large volumes show less than 10 ppm oil in the effluent water. The other device, still in the laboratory phase, depends on the concept of adsorption of oil-contaminated water into a regenerable coked surface.

Citation Source: Citation Journal.

C-1137-74
A FILTER COALESCER DEVICE FOR OIL-WATER SEPARATION

Gollan, A., and D. H. Freeman. 1974.
Offshore Technology Conference, 6th, Houston, 1974. Vol. 2. p. 967-978.

Reticulated polyurethane foams make good filter-coalescer media that is simple to regenerate. Using simulated oily ballast as a test, the filter coalescer can reduce influent of several 1000 ppm oil to effluent of less than 30 ppm. A large-scale unit is now being field tested.

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(2). Entry #5Q2118.

C-1138-74
FIGHT FLOATABLES WITH CHEMICALS

Gray, A. C., Jr. 1975.
Water Wastes Engineering 12(1):33-36.

The review covers oily and greasy waste waters.

Citation Source: Chemical Abstracts. 1975. 82(16). Entry #102723y.

C-1139-74
LABORATORY EVALUATION OF THE EMULSIFYING CHARACTERISTICS OF PUMPS

Harvey, A. C., A. R. Guzdar, and D. R. Friswell. 1973.
Foster-Miller Associates, Incorporated. 119 p. Final Report, NTIS Report AD-779 629/5.

The program conducted laboratory investigations on the emulsifying characteristics of various pumps used to pump shipboard bilge and ballast water oily wastes. The tests examined the effects of oil type, input oil concentration, detergent, pump operating characteristics (pressure and flow rate), and salt versus freshwater on emulsification.

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #057699.

C-1140-74
BALLAST TREATMENT EFFLUENT DISPOSAL PROBLEM IN PORT VALDEZ, ALASKA

Hood, D. W. 1974.
Marine Technology Society, Proceedings, 1974. p. 867-880.

A review of the disposal problem of effluent from a ballast treatment plant at the Alyeska Pipeline terminal facility is given. Topics covered include physical circulation and dispersion, flushing rates at the Port, effect of crude oil on primary productivity rates, biodegradation of hydrocarbons, benthic biology and sedimentary geology.

Biological degradation

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #071899.

C-1141-74
ADVANCED TREATMENT FOR PETROLEUM REFINERY WASTE WATER

Isohata, Y. 1974.
Nenryo Oyobi Nensho 41(11):961-974.

An apparatus has been designed which contains a sand filter and coalescer which removes dispersed oil droplets and suspended matter. Adsorption with granular active carbon removes oily odor and phenolic substances.

Citation Source: Chemical Abstracts. 1975. 82(12). Entry #76836r.

C-1142-74
BILGE WATER OIL SEPARATOR IN THE RIVER RHINE AREA

Klosterkemper, H. 1974.
Wasserwirtschaft-Wassertechnik 64(7-8):214-217.

The goals and activities of a cooperation established in 1965 in Düsseldorf, G. F. R., to collect used oil from the bilges of motor vessels are described. The operation of the system of bilge water oil separation is discussed.

Oil handling

Citation Source: Environmental Health and Pollution Control. 1975. 7(2). Entry #497.

C-1143-74
ENVIRONMENTAL PROTECTION R & D APPLIED TO SHIPS AND WATERCRAFT

Lehr, W. E. 1973.
Naval Engineers Journal 85(6):25-32.

Legal requirements for shipboard pollution prevention and the status of research and development to provide shipboard waste treatment devices are summarized. Research and development are emphasized in the area of vessel traffic systems, bilge/ballast water separators, sewage treatment and ship exhaust emission.

Research
National legislation

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #054970.

C-1144-74
ROTATING DISK LOOKS PROMISING FOR PLANT WASTES

Mueller, J. C. 1975.
Oil and Gas Journal 73(2):66-68.

The design and operating results of the rotating biodisk, a new alternative waste-treatment technique for refinery effluent waters, are described. Advantages of the disk include short retention times, low power requirements, BOD removal proceeding stage by stage, no foam problems and little maintenance.

Design and engineering

Citation Source: The Engineering Index Monthly. 1975. 13(3). Entry #018710.

C-1145-74
DEPHENOLIZATION OF WASTE WATERS OF AN ORGANOCHEMICAL INDUSTRY IN ZAGREB

Munjko, I., and R. Miklican. 1974.
Arhiv za Higijenu Rada i Toksikologiju 25(2):265-273.

The purification system for the industrial effluent by phenol-oil separation and biological degradation of the effluent by aerated active sludge is discussed.

Citation Source: Chemical Abstracts. 1975. 82(12). Entry #76794a.

C-1146-74
ULTRAFILTRATION IN WASTE WATER TREATMENT

Oswald, E. 1974.
Metalloberflaeche-Angew. Elektrochem. 28(5):165-167.

Emulsions and oil are removed from waste waters using an ultrafiltration DE-AQUATOR plant consisting of eight cellulose acetate membrane tubes connected in series. One thousand liters of waste water containing 1% oil was treated to give 980 liters of oil-free waste water and 20 liters of oil concentrate composed of 50% oil and 50% residual water.

Citation Source: Chemical Abstracts. 1975. 82(16). Entry #102757n.

C-1147-74
REMOVAL OF PHENOL IN WASTE WATER BY WET AIR OXIDATION

Pruden, B. B., and D. R. Ferguson. 1973.
In: Water Pollution Research in Canada 8:148-167.

The wet air oxidation process is described, as applied to the continuous oxidation of phenol in dilute solutions. The process was effective in converting up to 99.5% of the phenol to carbon dioxide and water.

Citation Source: Selected Water Resources Abstracts. 1975. 8(7). Entry #W75-03778.

C-1148-74
OIL-WATER SEPARATION WITH NONCELLULOSIC ULTRAFILTRATION SYSTEMS

Schatzberg, P., L. R. Harris, C. M. Adema, D. F. Jackson, and C. M. Kelly. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 443-447.

Ultrafiltration membrane systems with different noncellulosic active separation surfaces and different configurations were examined for their ability to separate emulsified and suspended oil from water. The ultrafiltrate oil concentration was less than 15 mg/l, but an irreversible cumulative fouling of the membrane occurred.

Citation Source: Citation Journal.

C-1149-74
RECOVERY AND TREATMENT OF SPENT ROLLING SOLUTIONS AT THE STEEL COMPANY OF CANADA, LTD, HILTON WORKS OPERATION

Schuldt, A. A., and V. A. Suffoletta. 1974.
Proceedings, Ontario Industrial Waste Conference, 21. p. 220-230.

Oil-water emulsions were separated by treatment with Fe^{3+} and pH control to produce minimal solid matter and a solidified oil suitable for use as fuel.

Citation Source: Chemical Abstracts. 1975. 82(12).
Entry #76783w.

C-1150-74
CONTROLLING PHENOLS IN REFINERY WASTE WATERS

Short, T. E., Jr., B. L. Prater, and L. H. Myers. 1974.
Oil and Gas Journal 72(47):119-124.

The efficiency of treatment systems for the removal of phenols from refinery waste waters was analyzed and evaluated. The biological systems were found to have a high capacity for phenol removal but upset easily with change in phenol concentration or for no apparent cause. The activated carbon system also demonstrated high phenol removal capacities if pH was controlled.

Citation Source: Chemical Abstracts. 1975. 82(12).
Entry #76797d.

C-1151-74
CONTROL OF LIQUID EFFLUENTS FROM CHEMICAL/PETROCHEMICAL PLANTS

Sidwick, J. M., and D. W. Hayward. 1974.
Chemistry and Industry 19:756-769.

General approaches to the principal waste treatment problems and techniques of the chemical and petrochemical industries are categorized and discussed in this paper. Oil removal methods for treating oily wastes are included.

Citation Source: Citation Journal.

C-1152-74
POSSIBILITY OF THE FLOTATION SEPARATION OF THE DISPERSE PHASE FROM DILUTE EMULSIONS OF THE OIL-WATER TYPE

Skrylev, L. D., and V. A. Artemova. 1974.
Colloid Journal of the USSR 36(3):552-554.

Dilute emulsions of oil are often encountered in the purification of waste waters. Flotation, i.e. blowing with air to separate the emulsion, is only effective when combined with the use of cationic or cationic-anionic surfactants. The completeness of the separation is determined by the nature of the emulsion and the collector.

Citation Source: Citation Journal.

C-1153-74
NEW METHOD FOR REMOVAL OF OIL AND OTHER COLLOIDAL IMPURITIES FROM FEEDWATER AND CONDENSATE

Strzelczyk, W. 1974.
Gospodarka Paliwami i Energia 22(5):17-19.

A technique for the removal of oil and phenol from water using filtration materials such as active coals, various types of cellulose, asbestos and silica is described.

Cleanup and recovery

Citation Source: Chemical Abstracts. 1975. 82(10).
Entry #64258r.

C-1154-74
MODEL TREATABILITY STUDY OF REFINERY PHENOLIC WASTE WATER

Volesky, B., N. Czornyj, T. A. Constantine, J. E. Zajic, and K. Yu. 1974.
AIChE Symposium Series 70(144):31-38.

A laboratory scale model of biological treatment of refinery waste water was built to discover the optimal design parameters for a fuel scale unit. With a 24 hour bioreactor detention time, phenol was reduced by 99.7%, COD by 55% and BOD by 93%.

Citation Source: Chemical Abstracts. 1975. 82(18). Entry #115777u.

C-1155-74
STUDY OF THE EFFICIENCY OF THE REMOVAL OF BENZO-(A)PYRENE FROM URBAN WASTE WATER BY BIOLOGICAL PURIFICATION [English summary]

Yershova, K. P., Y. I. Nefedov, L. S. Kanunnikova, and M. G. Krylova. 1974.
Gigiyena i Sanitariya 2:102-103.

Total biological treatment of benzo (a)pyrene and ether soluble hydrocarbons in waste water resulted in removal efficiencies ranging from 77.5 to 98.6% and 69.2 to 88.4% respectively.

Citation Source: Selected Water Resources Abstracts. 1975. 8(4). Entry #W75-01766.

C-1156-74
REMOVAL OF PHENOLS FROM POLLUTED WATERS

Zogorski, J. S., and S. D. Faust. 1974.
Final Report, W75-01857, OWRT-A-033-NJ(1). 96 p.

Activated carbons can remove phenolic compounds from water. Equilibrium kinetic and adsorption studies were done in the best of nine granular activated carbons in order to evaluate variables such as contact time, temperature, phenol solubility, initial phenol concentration and molecular structure of the phenol.

Citation Source: Government Reports Announcements. 1975. 75(3). Entry #PB-237 859/4GA.

4. PERSONNEL TRAINING AND EDUCATION

C-1157-74
BOSTON HARBOR IS CLEANER NOW AS OIL SPILLS DROP

Brodersen, C. 1975.
National Petroleum News 67(4):23-24.

The amount of oil spilled in Boston Harbor decreased by 75% between 1973 and 1974. Improved maintenance and training procedures for oil industry employees were largely responsible. The Boston Harbor Oil Spills Cooperative and the Tri-City Industrial Anti-Pollution Committee were also helpful in engineering the decrease.

Citation Source: Citation Journal.

C-1158-74
AN OIL POLLUTION CONTROL OFFICER TRAINING COURSE

Cormack, D., and P. G. Jeffrey. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 69-72.

The aim of the course is to develop in oil pollution officers an understanding for the available techniques and practices. The 10-day training program contains lectures, films, demonstrations and practical work. The course topics include prevention of beach pollution, beach cleaning and oil recovery.

Cleanup and recovery

Citation Source: Citation Journal.

C-1159-74
STREAM PRESERVATION TRAINING

McMillan, W. W. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 73-74.

One inland manufacturing facility, affiliated with General Motors, improved its oil handling abilities by providing stream preservation training, i.e., to foster a positive attitude toward oil spill cleanup. The trainees learned whom to notify in case of an oil spill, how to choose the correct methods of containment and recovery, and how to handle on-site public relations.

Cleanup and recovery

Citation Source: Citation Journal.

C-1160-74
PREPARATION OF AN OIL SPILL PREVENTION TRAINING PROGRAM

Mossteller, T. L. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 65-68.

In order to develop a packaged learning program on oil spill prevention, several factors needed to be considered. Through on-site interviews, generalizations were developed about terminal operators' backgrounds, skills and present knowledge of oil spill prevention. Combining this data with what management wanted the operators to know, two audio tape and workbook sets were developed - for prevention and for cleanup procedures.

Cleanup and recovery

Citation Source: Citation Journal.

5. REGULATIONS, STANDARDS, AND PLANNING

C-1161-74
AN ORGANIZATION PLAN FOR MINIMIZING THE DAMAGE EFFECTS OF A MAJOR OIL SPILL

Alberts, D. A., Sr., and W. C. Park. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 275-279.

Without prior preparation for a major oil spill, cleanup can be costly, inefficient and ineffective. A typical line diagram organizational chart, job descriptions of key personnel, and basic requirements of the response plans for effective cleanup are included in this paper.

Cleanup and recovery

Citation Source: Citation Journal.

C-1162-74
CONTINGENCY AND RESPONSE

(Author not given). 1974.
National Conference on Control of Hazardous Material Spills, San Francisco, 1974. p. 38-84.

Contingency planning for controlling hazardous materials spills on national, statewide, local and industrial levels is discussed in 12 papers. The hazards associated with bulk sea transport of liquefied gases are examined and management of hazardous spills in wastewater systems is evaluated.

Oil handling

Citation Source: Environment Abstracts. 1975. 5(4).
Entry #75-02824.

C-1163-74
FIRST AID FOR A HALF DEAD SEA

Anonymous. 1975.
The Ecologist 5(3):103.

This report describes the agreement made by the "Convention for the Protection of the Baltic Sea's Environment" to impose environmental regulations protecting the Baltic Sea from the devastating pollution from industry, coastal towns and shipping. One rule prohibits the discharge of oil and oil mixtures from oil tankers and ships of 400 tons and above into the sea.

International legislation

Citation Source: Citation Journal.

C-1164-74
GUIDELINES ON THE USE AND ACCEPTABILITY OF OIL SPILL DISPERSANTS

Anonymous. 1973.
EPS 1-EE-73-1. Environment Canada. 59 p.

Dispersants must meet certain specifications before they can be used in the recommended way in Canada. Procedures for placing a dispersant on the approved list and recommended methods for determining toxicity, biodegradability and effectiveness are given.

Cleanup and recovery

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(2). Entry #5Q2106.

C-1165-74
LIABILITY LIMITS FOR SMALL ONSHORE OIL STORAGE FACILITIES - PROPOSED RULES

Anonymous. 1973.
Federal Register 38(90):12,339-12,340.

The Environmental Protection Agency has established size classifications and liability limits for storage facilities of 1000 bbl or less capacity. When a discharge occurs and is cleaned up by the federal government, liability ranges from $4,000 to $200,000, depending on the capacity of the above ground storage; below ground limits range from $5,200 to $260,000.

Oil handling

Citation Source: Petroleum Abstracts. 1975. 15(11). Entry #202,162.

C-1166-74
OPERATION PREPAREDNESS--CANADIAN PLANNING FOR OIL SPILL EMERGENCIES

Anonymous. 1974.
Oil Spill Control Association of America Newsletter 1(2). 2 p.

"Operation Preparedness" was a Canadian government project to test ways to handle oil spills and to collect information to aid in effective decision-making during countermeasure operations in case of a major spill in the Detroit and St. Clair Rivers. Information collected is in the form of an "Action Plan," and will be available to those involved in contingency planning.

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #071954.

C-1167-74
REGIONAL OIL AND HAZARDOUS SUBSTANCES POLLUTION CONTINGENCY PLAN. REGION V INLAND

Anonymous. 1974.
Environmental Protection Agency. 147 p.

This regional contingency plan provides a mechanism to coordinate response to a spill of oil or other hazardous substance in the Great Lakes or its shores. The federal and state response systems are coordinated and local developments are encouraged to handle such spills.

Citation Source: Government Reports Announcements. 1975. 75(4). Entry #PB-237 540/OGA.

C-1168-74
SUEZ CANAL FACES FUTURE FULL OF QUESTIONS

Anonymous. 1975.
Chemical and Engineering News 53(23):12-13.

It is reported that the reopening of the Suez Canal will increase oil pollution of the Mediterranean Sea and Red Sea, both of which are enclosed pollution-free zones. Pollution is likely to occur in these bodies of water due to massive oil spills and small discharges of oily water from bilges, ballast tanks and oil tank washings from tankers passing through the canal. Plans to protect the Mediterranean from oil pollution are discussed.

Oil handling
Reporting

Citation Source: Citation Journal.

C-1169-74
CONVENTION FOR THE PROTECTION OF THE MARINE ENVIRONMENT OF THE BALTIC

Besser, R. 1974.
Schiff und Hafen 26(6):518-519.

The following stipulations were included in the convention held in Helsinki, May 22, 1974: security of navigation routes, protection of the Baltic from oil pollution by oil discharges and drilling towers, control of sea shipment of hazardous substances, waste disposal from ships, and the institution of a commission for the observance of the agreement of new regulations and proposals.

International legislation

Citation Source: Environmental Health and Pollution Control. 1975. 7(1). Entry #207.

C-1170-74
ANALYSIS OF OIL SPILL INCIDENTS FOR ENVIRONMENTAL IMPACT STATEMENTS

Beyaert, B. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 39-45.

When an environmental impact statement (EIS) is prepared for oil-handling projects, the statement should include the probable frequency of oil spills, the impact of spills on all phases of the environment and measures to prevent, contain and clean up oil spills. This paper is intended to serve as a guide for anyone preparing or reviewing an EIS for a project involving a high oil spill risk.

General effects of oil prospecting and production

Citation Source: Citation Journal.

C-1171-74
PLANNING AND DEVELOPING A COMPANY OIL SPILL CONTINGENCY PLAN

Beynon, L. R., G. J. Brockis, T. E. Lester, and P. D. Holmes. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 271-274.

The purpose of the contingency plan is to develop a capability to deal with a large spill anywhere in the world arising from

British Petroleum Group operations. Oil spill cleanup and containment equipment was chosen and located in certain world areas. The plan must be interfaced with the local representative and national planning.

Cleanup and recovery
Containment

Citation Source: Citation Journal.

C-1172-74
DETERMINATION OF AN OIL EFFLUENT GUIDELINE FOR INDUSTRIAL DISCHARGES IN THE STATE OF NEW JERSEY: IS 1 PPM REALISTIC AND OBTAINABLE?

Birns, K. F. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 47-49.

From the data in this paper, it can be shown that 1 ppm of oil can be measured, taints fish and shellfish, is detectable by humans, can be toxic to fish and crab eggs, and can be removed from waste water. The state has the authority to determine water quality standards and to enforce these regulations.

State legislation

Citation Source: Citation Journal.

C-1173-74
SPILL PREVENTION: THE SPCC APPROACH

Charlton, T. J., and J. M. Cunningham. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 187-188.

All non-transportation-related facilities with a certain level of oil storage are required to prepare a Spill Prevention Control and Countermeasure plan. Environmental Protection Agency procedures on reviews, amendments, appeals and penalty procedures for SPCC's are discussed.

Citation Source: Citation Journal.

C-1174-74
NORTH SEA OIL: NEW CIVIL ENGINEER SPECIAL REVIEW

Cottrill, A. 1974.
New Civil Engineering No. 95. 72 p.

This review includes material on subjects ranging from license to drill, to the law on certification and pollution and surveying the undersea.

Citation Source: Petroleum Abstracts. 1975. 15(11). Entry #202,213.

C-1175-74
AN INVESTIGATION OF THE FEDERAL, STATE, AND LOCAL OIL SPILL CONTINGENCY PLANS FOR THE LONG ISLAND SOUND AREA

Low, S. T. 1973.
NTIS Report COM-73-11041. 63 p.

Several contingency plans for action in oil spill events in the Long Island Sound area are examined for their legal authority, the geographic area of jurisdiction, operation procedures, and their possible interaction with other contingency plans. Biological effects of oil pollution and control techniques are also discussed.

Biological effects of oil pollution

Citation Source: Selected Water Resources Abstracts. 1975. 8(6). Entry #W75-03002.

C-1176-74
PLANNING FOR MINIMUM OIL-SPILL RISK: ESTERO BAY DEEPWATER TERMINAL AND PIPELINE

Mayer, J. F. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 287-291.

The Estero Bay deepwater terminal and pipeline project design aims for no spillage. All personnel, including operators and mooring masters, will be trained to operate and maintain equipment to avoid all oil spills. A contingency plan for possible spills is also provided.

Design and engineering
Personnel training and education

Citation Source: Citation Journal.

C-1177-74
PRODUCTION OF CRUDE OIL AND KEEPING WATERWAYS CLEAN

Rottgardt, D. 1974.
Wasserwirtschaft-Wassertechnik 64(7-8):200-206.

The infiltration behavior of German crude oils in the soils has been studied. Measures undertaken to avoid oil pollution incidents in the oil fields are described. The importance of contingency plans for pollution control is emphasized.

Citation Source: Environmental Health and Pollution Control. 1975. 7(2). Entry #358.

C-1178-74
MARYLAND'S EXPERIENCE IN OIL SPILL PREVENTION AND CONTROL

Silbermann, H., and E. C. Weber. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 51-55.

Maryland's spill prevention and response program involves the Water Resources Administration, petroleum industry representatives, local volunteer fire departments, and a small coordinating staff. Licensing fees from oil terminal facilities form a contingency fund for cleanup, but the emphasis is on prevention. A 24-hour a day response capability exists with equipment and supplies stockpiled all over the state.

Citation Source: Citation Journal.

C-1179-74
TANKER COLLISION EMPHASIZES NEED FOR TOUGH REGULATIONS

Townes, B. 1975.
National Fisherman 55(12):20-A.

An American chemical tanker rammed a Liberian tanker which was unloading at a refinery dock on the Delaware River. Even with prompt action by the Coast Guard, oil sheen was present on the river and the sludge was thick on the beaches. The more stringent tanker regulations urged by Congress and environmentalists could perhaps have helped avoid this pollution incident.

Reporting

Citation Source: Citation Journal.

6. RESEARCH

C-1180-74
HOW GURC ESTABLISHES A CONTROL PROFILE OF OFFSHORE ENVIRONMENT: INTERVIEW WITH J. M. SHARP

Anonymous. 1974.
Petroleum Engineering 46:20-28.

The article consists of a question-answer discussion of the activities and responsibilities of the Gulf Universities Research Consortium (GURC). A report of the Offshore Ecology Investigation, in which the research consortium examined the environmental impact of marine oil operations off Louisiana, is given.

General effects of oil prospecting and production

Citation Source: Citation Journal.

C-1181-74
PREVENTION OF POLLUTION THROUGH ISOLATION OF OIL FROM SEAWATER BALLAST IN TANKERS

Carmichael, A. D. 1974.
New England Section Meeting of the Society of Naval Architects and Marine Engineers, April, 1974. 41 p.

The use of impermeable membranes for isolating ballast water from oil cargo is evaluated in (1) very large crude barriers and (2) in the operation of compensated tanks which are always filled.

Oil handling

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #071676.

C-1182-74
BEACH PROTECTION BY A DEGRADABLE, SPRAYED FILM

Dailey, J. J., P. E. Cassidy, and B. J. Yager. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 415-423.

Of 18 resin systems initially screened for their solution and film properties, two were used in mock-beach protection tests.

One coat of 55% polyvinyl acetate protects the sand against oil permeation and rock and wood against staining. The film is nontoxic and clear, but slow to degrade in laboratory conditions.

Citation Source: Citation Journal.

C-1183-74
PROBING THE PORT OF VALDEZ

Dedera, D. 1974.
Petroleum Today 1974/three.

Baseline studies of the Port of Valdez have resulted in a 500-page book titled Environmental Studies of Port Valdez. Major findings include the facts that the inlet flushes fairly rapidly and contains bacteria which feed on hydrocarbons.

Biological degradation

Citation Source: Citation Journal.

C-1184-74
SLOP TANK DESIGN FOR IMPROVED LOAD-ON-TOP

Fiocco, R. J., and V. W. Redley. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 195-200.

Research on the design of slop tanks for the Load-On-Top system produced guidelines on capacity, structure, inlets, outlets, system design and waste water handling procedures. Both the degree of oil-water mixing and the dispersion of separated oil during feeding and discharging operations are minimized.

Design and engineering

Citation Source: Citation Journal.

C-1185-74
OIL SPILLS: AN INDUSTRY APPROACH

Haxby, L. P. 1974.
Ecolibrium 3(3):8-10.

The author discusses the oil spill research program being conducted by the American Petroleum Institute. Improved efforts in the industry's ability to cope with oil spill events and sophisticated technologies associated with oil spill prevention are discussed.

Citation Source: Environment Abstracts. 1975. 5(3).
Entry #75-02297.

C-1186-74
OIL SPILL PROBLEMS IN COLD CLIMATES: THE COAST GUARD ATTACKS THE ALASKAN OIL SPILL PROBLEM

Koburger, E. W., and J. H. Getman. 1974.
Naval Engineers Journal 86:59-64.

The paper is a review of the Coast Guard's Arctic Pollution Response Program, a research effort whose objective is to determine the behavior of oil spilled on, under and among ice. Work is being conducted on the detection, logistics, recovery and disposal of Arctic oil spills; the program aims to provide an interim detection and response capability by 1976 and a total capability by 1980.

Citation Source: Citation Journal.

C-1187-74
A RISK-ANALYTIC APPROACH TO CONTROL OF LARGE-VOLUME OIL SPILLS

Paulsen, A. S., A. D. Schumaker, and W. A. Wallace. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 301-306.

Large-volume oil spills happen more often than is predicted using traditional methods. Long, thick-tailed probability distributions fit the U.S. Coast Guard data files on oil spills much better. Accurate predictions of oil spill volumes will enable the Coast Guard marine environmental protection program management to more effectively allocate resources and devise operational guidelines for field units.

Regulations, standards and planning

Citation Source: Citation Journal.

C-1188-74
CONSIDERABLE DAMAGE DONE BY OIL - COUNTLESS SPILLS UNDETECTED

Sauve, J. 1975.
Western Fisheries 39(6):18-25.

The Canadian Minister of the Environment outlines the problems facing Canada in her attempt to maintain clean seas. The threats of blowouts from the Arctic and the East Coast increased tanker activity require that baseline research be increased, up to date hydrographic charts be made and spill technology be advanced. Close cooperation with industry and with other departments will be necessary to minimize spills.

Citation Source: Citation Journal.

C-1189-74
NAVY SHIPBOARD INVESTIGATION OF OILY WASTES

Smookler, A. L., and J. W. Harden, Jr. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 189-193.

Results of a questionnaire survey of almost 500 ships are that 10% of all shipboard oily waste is from ballast waters, mostly from oilers. Other sources of oily waste, such as bilge fluid, and generation rates of oily wastes are discussed. The next step of the Navy's oil pollution abatement program should be to develop shipboard oil-water separators.

Oil handling
Waste water treatment

Citation Source: Citation Journal.

C-1190-74
MICROBIOLOGICAL AND NATURAL PRODUCT SYSTEMS FOR THE PROTECTION OF COASTAL SHORELINES FROM OIL SPILLS AND OIL CONTAMINATION

Stewart, W. S. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 425-430.

Physical forms of certain microorganisms and several plant polysaccharides are able to protect the surfaces of dry rocks from being wet by oil. Data are presented on effective dosage, application methods, temperature effects, the duration of the protection and the overall efficiency of this natural system.

Design and engineering

Citation Source: Citation Journal.

E. EFFECTS OF OIL PROSPECTING AND PRODUCTION

1. BIOLOGICAL EFFECTS

C-1191-74
ARE SUPERTANKERS HAZARDS TO THE ENVIRONMENT?

Abrahamsen, E. 1974.
Veritas 20(81):3-7.

The article includes a discussion of the extreme dangers to the tanker crews and to the environment of large tankers, due to poor construction and structural unreliability. It is claimed that the accident rate for supertankers is soaring and that cumulative pollution from oil leaks, spills and dumpings from these ships is worse than possible supertanker wrecks.

Oil handling

Citation Source: Petroleum Abstracts. 1975. 15(5).
Entry #203-471.

C-1192-74
ATLANTIC AND ALASKAN OIL DRILLING PROSPECTS

Anonymous. 1974.
Marine Technology Society Journal 8(5):8-13.

The article contains excerpts from the Council on Environmental Quality report "OCS Oil and Gas--An Environmental Assessment," submitted April, 1974. The report assesses the environmental vulnerabilities of the potential oil-producing areas, and recommends procedures, requirements and restrictions for protection and development.

General effects of oil prospecting and production

Citation Source: Petroleum Abstracts. 1974. 15(5).
Entry #203,476.

C-1193-74
SUSCEPTIBILITY TO ENVIRONMENTAL IMPACT IN THE QUEEN ELIZABETH ISLANDS

Babb, T. A., and L. C. Bliss. 1974.
Arctic 27(3):234-236.

The effect of physical disturbances from oil and gas exploration on the soils and vegetation of Queen Elizabeth Islands is discussed.

Areas of sparse plant cover are susceptible to sheet and gully erosion. Softening of slightly disturbed surfaces on moist fine-grained substrates occurs.

Physical effects of oil prospecting and production

Citation Source: Environment Abstracts. 1975. 5(4). Entry #75-03018.

C-1194-74
OCS OIL AND GAS: AN ENVIRONMENTAL ASSESSMENT, VOLUME 5

Council on Environmental Quality. 1974.
April. 583 p.

The biological effects of potential oil discharges resulting from oil production on the Atlantic and Alaskan outer shelves are examined. The effects of small-volume continuous oil discharges are considered in this report as well as the impacts and recovery from occasional large-volume accidental oil spills.

Citation Source: Scientific and Technical Aerospace Reports. 1975. 13(9). Entry #N75-17840.

2. PHYSICAL EFFECTS

C-1195-74
PRIMARY, PHYSICAL IMPACTS OF OFFSHORE PETROLEUM DEVELOPMENTS: REPORT TO COUNCIL ON ENVIRONMENTAL QUALITY

Devanney, J. W., III, and J. B. Lassiter, III. 1974.
Massachusetts Institute of Technology, Report, MITSG-74-20.

Four studies are compiled in this report to the Council on Environmental Quality as part of its studies on oil exploration and drilling in the Atlantic and Alaskan continental shelves: I. Simulation of Hypothetical Offshore Petroleum Developments; II. Analysis of Oil Spill Statistics; III. Oil Spill Trajectory Studies for Atlantic Coast and Gulf of Alaska; and IV. The Role of Mass Transport in Oil Slick Weathering.

Physical changes of oil in the environment

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #057122.

C-1196-74
PRIMARY PHYSICAL IMPACTS OF OFFSHORE PETROLEUM DEVELOPMENTS

Massachusetts Institute of Technology. 1974.
Technology Report, MITSG-74-20 NOAA-74050602, COM-74-11125/3GA.
449 p.

The probability of oil spills and spill volume for a range of hypothetical oil finds from the Atlantic and Gulf of Alaskan shelves is determined. The spreading route of the oil spills and the weathering of the oil is examined.

Physical changes of oil in the environment

Citation Source: Petroleum Abstracts. 1975. 15(3). Entry #199,493.

3. CHEMICAL EFFECTS

C-1197-74
HYDROCARBON CONCENTRATION DETECTED BY FLUORESCENCE SPECTROSCOPY IN SEAWATER OVER THE CONTINENTAL SHELF OF ATLANTIC CANADA - BACKGROUND

Gordon, D. C., Jr., and P. D. Keizer. 1974.
Technical Report, Fisheries Research Board Canada No. 448. 24 p.

The concentration of hydrocarbons in water samples from various sites, including exploration sites, was measured using fluorescence spectroscopy. Higher concentrations were observed in exploration areas; if real, these concentrations decreased soon after exploration activity decreased.

Citation Source: Petroleum Abstracts. 1975. 15(6).
Entry #200,555.

4. SOCIAL EFFECTS

C-1198-74
SUPERPORTS

Barrett, A. C. 1974.
Vital Speeches, September 15, 1974, 40(23):712.

National reactions to superport development include support by the Gulf Coast states and environmental opposition on the East Coast. Government action on deepwater port facilities is reviewed.

National legislation

Citation Source: Environment Abstracts. 1975. 5(2).
Entry #75-01528.

C-1199-74
METHODOLOGICAL AND POLITICAL PROBLEMS INVOLVED IN EVALUATING SOCIAL ACTION POLICY

Cook, T. J., and F. P. Scioli, Jr. 1974.
Assessing the Social Impacts of Oil Spills, Rensselaerville, New York, 1973. p. 67-69.

Some of the problems in assessing the social aspects of oils are outlined from the standpoint of the political scientist. Workable methodologies must have adequate measurement, design and analysis components and also be standardized. Political problems include time, cost and the autonomy of the social scientist in evaluating public policy.

Citation Source: Citation Journal.

C-1200-74
SPORT FISHERIES AND OFFSHORE OIL

Jensen, A. C. 1974.
New York Fisheries Journal 21(2):105-116.

The marine sports fishery resources in the northeast (U.S.A.) are discussed with regard to the suspected petroleum reserves under the continental shelf. Talk about exploration and production drilling on the shelf has created concern among the fishermen there.

Economic effects of oil prospecting and production

Citation Source: Biological Abstracts. 1975. 59(3).
Entry #13775.

C-1201-74
THE COASTAL ZONE AND OIL SPILLS: CULTURAL SPLITS

Marx, W. 1974.
Assessing the Social Impacts of Oil Spills, Rensselaerville, New York, 1973. p. 77-78.

In coastal communities, the traditional view of accepting the undesirable effects of marine oil development because of the need for oil conflicts with a newer perspective which tries to reduce or prevent such side-effects by changing demands. Social values are being incorporated into political processes.

Economic effects of oil prospecting and production

Citation Source: Citation Journal.

C-1202-74
THE ENERGY CRISIS: HOW TO SURVIVE UNTIL WE RUN OUT OF OIL

Sanders, N. K. 1974.
Assessing the Social Impacts of Oil Spills, Rensselaerville, New York, 1973. p. 97-99.

The solution to the energy crisis lies in eliminating the use of non-renewable energy supplies, and reducing consumption. Using alternate modes of transportation, designing appliances and goods to conserve energy, and finding alternate sources of energy are reviewed. The oil industry is portrayed as a pusher to American energy addicts.

Economic effects of oil prospecting and production

Citation Source: Citation Journal.

C-1203-74
OUTLOOK BLEAK FOR REVIVAL OF CALIFORNIA OIL ACTIVITY

Wilson, H. M. 1975.
Oil and Gas Journal 73(2):15-18.

Political developments in 1974 have changed the attitude toward oil activity. Governor Brown emphasizes the environment rather than energy. An all-new California State Lands Commission appears to be anti-oil development. Delays, antitrust suits and opposition to offshore lease sales are mounting.

Citation Source: Petroleum Abstracts. 1975. 15(15).
Entry #200,087.

5. ECONOMIC EFFECTS

C-1204-74
A SURVEY OF THE ECONOMIC AND ENVIRONMENTAL ASPECTS OF AN ONSHORE DEEPWATER PORT AT GALVESTON, TEXAS. PART I AND PART II

Bragg, D. M., R. W. Haan, and W. P. James. 1974.
Texas A & M University, Sea Grant Program No. TAMU-SG-74-213,214.
NTIS Report COM-74-11031/3; COM-74-11030.

Part I includes a discussion of the economic effects of onshore deepwater port facilities. In Part II, the environmental implications of such development are discussed.

General effects of oil prospecting and production
Biological effects of oil prospecting and production

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #057261.

6. GENERAL EFFECTS

C-1205-74
BEAUFORT SEA DRILLING MAY BE FEASIBLE

Anonymous. 1975.
Offshore 35(3):128-133.

Offshore drilling in the Arctic must be based on research under its own unique conditions of low temperatures and ice. The worst damage to the Arctic environment could come from underwater pipeline rupture rather than blowouts. Cleanup in some situations would be impossible. Two of the 32 studies in the Beaufort Sea Project focus on oil spills.

Citation Source: Citation Journal.

C-1206-74
DRAFT ENVIRONMENTAL STATEMENT. OCS SALE NO. 32

Anonymous. 1974.
U.S. Department of the Interior, Washington, D. C. 660.
(unnumbered)

The tracts proposed for leasing are offshore Mississippi, Alabama and Florida. Some degree of pollution from accidental or chronic oil spillage is associated with all tracts.

Citation Source: Petroleum Abstracts. 1975. 15(7).
Entry #200,860.

C-1207-74
FINAL ENVIRONMENTAL STATEMENT. FES 73-19

Anonymous. 1974.
U.S. Department of Interior, Washington, D. C. 610 p.
(unnumbered)

The 129 tracts proposed for leasing are offshore Texas. All tracts entail some risk of environmental damage due to oil spillage. Alternatives are considered.

Citation Source: Petroleum Abstracts. 1975. 15(7).
Entry #200,864.

C-1208-74
FINAL ENVIRONMENTAL STATEMENT. OCS SALE NO. 36 FES 74-41
[Book]

Anonymous. 1974.
U.S. Department of Interior, Washington, D. C. Vol. 1,
356 p.; Vol. 2, 373p.; Vol. 3, 437 p.

Volume 1 discusses the pollution risk due to the proposed leasing of 295 tracts offshore Louisiana. Volume 2 discusses offshore oil and gas operations, environmental impact of the proposed sale and measures included to lessen the impact, unavoidable adverse environmental effects, irreversible commitment of resources and alternatives. Volume 3 discusses the consultation and coordination processes necessary to write the draft statement and final statement. Review comments are attached.

Citation Source: Petroleum Abstracts. 1975. 15(7).
Entries #200,865; #200,866; #200,867.

C-1209-74
FINAL ENVIRONMENTAL STATEMENT: PROPOSED 1974 OUTER CONTINENTAL SHELF, OIL AND GAS GENERAL LEASE SALE, OFFSHORE TEXAS, FES74-14

Anonymous. 1974.
U.S. Government Printing Office, Washington, D. C. Vol. 1,
438 p.; Vol. 2, 414 p.; Vol. 3, 240 p.

Volume 1 discusses the potential risk of adverse effects on the environment due to oil spillage if the 245 tracts are leased. Volume 2 details OCS operating regulations and orders to stop oil spillage and to provide contingency procedures in case of spills. Measures related to oil spills, offshore structures and pipelines are discussed. Volume 3 discusses the consultation and coordination processes that were involved in preparing the draft environmental statement and final environmental statement. Review comments are included.

Citation Source: Petroleum Abstracts. 1975. 15(7).
Entries #200,861; #200,862; #200,863.

C-1210-74
GROUND WATER POLLUTION FROM SUBSURFACE EXCAVATIONS. PART V. OTHER TYPES OF WELLS

Anonymous. 1974.
Water Well Journal 28(8):59-62.

A great deal of ground water pollution results from subsurface excavations. This article is the fifth in a series of 12 articles released by the Environmental Protection Agency which discusses the technical aspects and regulations of wells used in various industries, including the petroleum industry.

Citation Source: Environmental Health and Pollution Control. 1975. 7(1). Entry #4.

C-1211-74
NEW HURDLE FOR REFINERS

Anonymous. 1975.
Chemical Week 116(13):13.

The master design for development of California's coastline requires screening of all proposals for new or expanded refineries. Provisions covering areas available for construction, release of toxic substances and the responsibility for oil spills are discussed briefly.

Regulations, standards and planning

Citation Source: Citation Journal.

C-1212-74
OIL ON THE OUTER SHELF

Anonymous. 1975.
Sierra Club Bulletin 60(2):12,35.

A discussion of the proposal for a tenfold increase in the rate of leasing lands under federal jurisdiction on the outer continental shelf to energy companies for oil development, and the Draft Environmental Impact Statement on the proposed accelerated program completed by the Department of the Interior's Bureau of Land Management is provided. Actions planned by the Sierra Club in response to this program are outlined.

Citation Source: Citation Journal.

C-1213-74
SAFE OFF-CALIFORNIA DEVELOPMENT SEEN

Anonymous. 1975.
Oil and Gas Journal 73(9):50,52.

The Department of Interior states that the technology is available to safely lease and develop offshore tracts. Interior's estimates of available gas and oil reserves off California are only 1/5 those of the WOGA (Western Oil and Gas Association). Major environmental damage may include oil spills of 82,000 to 116,000 bbl in routine operations, and transportation spills of 61,000 to 288,000 bbl.

Biological effects of oil prospecting and production

Citation Source: Citation Journal.

C-1214-74
STUDY FINDS CALIFORNIA SEARCH BEST BET

Anonymous. 1975.
Offshore 35(2):231,234.

An environmental assessment study indicated that there may be six to nineteen billion barrels of recoverable oil and 12 to 38 trillion cubic feet of gas in the proposed federal lease sale area off Southern California. The study, made for Western Oil and Gas Association, concluded that there could be no sizeable environmental damage resulting from drilling.

Biological effects of oil prospecting and production

Citation Source: Petroleum Abstracts. 1975. 15(13).
Entry #202,765.

C-1215-74
OIL AND PUGET SOUND

Baldwin, M. F., and M. L. Baldwin. 1973.
The Living Wilderness Autumn. p. 14-23.

The effects of the construction of the trans-Alaska pipeline on the Puget Sound are discussed. The probability of more intensive coastal oil development, tanker traffic and resulting oil spills is explained. Methods of oil containment and cleanup and possible damage to marine life are discussed.

Biological effects of oil prospecting and production

Citation Source: Selected Water Resources Abstracts. 1975.
8(6). Entry #W75-03281.

C-1216-74
ONSHORE PLANNING FOR OFFSHORE OIL: LESSONS FROM SCOTLAND

Baldwin, P. L., and M. F. Baldwin. 1975.
Conservation Foundation (Universe). 184 p.

The onshore effects of offshore oil and gas discovery are analyzed. The development of the gas and oil fields, construction of platforms, pipelines and refineries, and the effects of the above on Scotland's environment are discussed.

Citation Source: Science News. 1975. 107(19):298.

C-1217-74
PETROLEUM AND THE NATURAL ENVIRONMENT

Bettini, V.
Ecologia 3(12):14-18.

The paper includes 11 major refiners and distributers of petroleum products in Italy and evaluates their role as potential polluters of the environment. The impact of refineries on coastal ecosystems and available measures for prevention of further pollution are discussed.

Citation Source: Environmental Health and Pollution Control.
1974. 6(9). Entry #3102.

C-1218-74
PROPOSED 1973 OUTER CONTINENTAL SHELF OIL AND GAS GENERAL LEASE SALE OFFSHORE MISSISSIPPI, ALABAMA, AND FLORIDA, VOLUME 4 (FINAL ENVIRONMENTAL STATEMENT)

Bureau of Land Management. 1973.
NTIS Report EIS-MS-73-1651-F-4. 335 p.

Five volumes comprise the Final Environmental Statement for the Outer Continental Shelf. The 4th volume includes the consultation and coordination processes involved in preparing the draft and final statement. Also presented are public hearing testimony and records and written comments from private organizations.

Citation Source: Selected Water Resources Abstracts. 1975.
8(9). Entry #W75-04589.

C-1219-74
PROPOSED 1973 OUTER CONTINENTAL SHELF OIL AND GAS GENERAL LEASE SALE, OFFSHORE MISSISSIPPI, ALABAMA, AND FLORIDA, VOLUME 5 (FINAL ENVIRONMENTAL STATEMENT)

Bureau of Land Management. 1973.
NTIS Report EIS-MS-73-1651-F-5. 262 p.

The fifth volume contains several attachments to the Statement, including outer continental shelf operating orders (numbers 1 through 12) for the Gulf of Mexico, proposed schedule for OCS leasing, report of the work group on OCS safety and pollution control, a geological survey of OCS gas and oil operations lease and management program, and equipment available for emergency oil spill control and cleanup in the Gulf of Mexico.

Citation Source: Selected Water Resources Abstracts. 1975. 8(9). Entry #W75-04590.

C-1220-74
MORE OIL ON TROUBLED WATERS?

Clapper, L. S. 1975.
National Wildlife 13(4):29-31.

The author discusses the many aspects of the offshore drilling campaign, including environmental opposition, presidential politics and U.S. foreign oil independence, and the question of just how much oil and gas exist offshore.

Citation Source: Citation Journal.

C-1221-74
OCS OIL AND GAS: AN ENVIRONMENTAL ASSESSMENT, VOLUME 1

Council on Environmental Quality. 1974.
April. 229 p.

The potential environmental impacts of Atlantic and Gulf of Alaska outer continental shelf oil and gas development are discussed. The environmental vulnerabilities of these areas are assessed and procedures for protection and alternate OCS development are recommended.

Citation Source: Scientific and Technical Aerospace Reports. 1975. 13(9). Entry #N75-17837.

C-1222-74
OCS OIL AND GAS: AN ENVIRONMENTAL ASSESSMENT, VOLUME 2

Council on Environmental Quality. 1974.
April. 269 p.

Topics in this volume include a summary of world oil and gas reserves, methods of selecting hypothetical locations of these reserves, a national energy conservation program, environmental considerations in the petroleum refining industry and environmental quality as it relates to OCS oil and gas development.

Biological effects of oil prospecting and production

Citation Source: Scientific and Technical Aerospace Reports.
1975. 13(9). Entry #N75-17838.

C-1223-74
OCS OIL AND GAS: AN ENVIRONMENTAL ASSESSMENT, VOLUME 3

Council on Environmental Quality. 1974.
April. 199 p.

The effect of natural phenomena (storms, tidal surge, currents, ice, earthquakes, tsunamis) on offshore petroleum development is discussed and the potential volumes of oil that would be released as a result of these effects are determined. Also described are the physical systems needed for OCS oil production, and collective oil spill probabilities for these systems.

Citation Source: Scientific and Technical Aerospace Reports.
1975. 13(9). Entry #N75-17836.

C-1224-74
OCS OIL AND GAS: AN ENVIRONMENTAL ASSESSMENT, VOLUME 4

Council on Environmental Quality. 1974.
April. 617 p.

Potential onshore effects of offshore oil and gas development on the Atlantic and Gulf of Alaska outer continental shelves are discussed. A description of methods used to assess onshore socio-economic and environmental impacts is presented.

Social effects of oil prospecting and production
Economic effects of oil prospecting and production

Citation Source: Scientific and Technical Aerospace Reports.
1975. 13(9). Entry #N75-17839.

C-1225-74
SOUTHERN CALIFORNIA: TEN MILLION ACRES OF OIL FOR SALE

Erickson, M. A. 1975.
Sierra Club Bulletin 60(2):19.

A discussion is given of the plans of the Department of the Interior to lease offshore areas of Southern California for oil development; the inadequacies of the draft environmental impact statement on the 10-million-acre program are also discussed.

Biological effects of oil prospecting and production

Citation Source: Citation Journal.

C-1226-74
THE DEVALUATION OF ALASKA

Gilbert, B. 1975.
Audubon 77(3):64-80.

The issues underlying the Great Alaska Pipeline Debate, an environmental controversy over the construction of a pipeline across Alaska for transportation of Prudhoe oil to southern refineries, are discussed.

Biological effects of prospecting and production

Citation Source: Citation Journal.

C-1227-74
ENVIRONMENTAL STUDIES FOR MAJOR OFFSHORE DEVELOPMENTS

Heckard, J. M., and D. L. Woodford. 1974.
Offshore Technology Conference, 6th, Houston, 1974. Preprints, Vol. 2, p. 635-640.

Mono-buoys and docking islands for large crude oil carriers are major offshore developments. Legislative requirements for environmental studies and the scope of the work needed for a comprehensive environmental evaluation are reviewed with emphasis on oil spills and movements.

General effects of oil pollution
Regulations, standards and planning

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975.
5(2). Entry #5Q2035.

C-1228-74
WAITING FOR THE PIPELINE

Hill, G. 1974.
National Wildlife 12(4):6-10.

The article reviews the development in Alaska of a 789-mile pipeline to tap the oil fields of the North Slope,and the actions of the environmentalists and oil companies to minimize the impact of the construction on Alaska's delicate ecosystem and wildlife.

Citation Source: Citation Journal.

C-1229-74
HOW GURC ESTABLISHES A CONTROL PROFILE OF OFFSHORE ENVIRONMENT

Ives, G. 1975.
Petroleum Engineer 46(13):20, 24, 27-28.

Gulf Universities Research Consortium (GURC) has generated a data base on environmental conditions to discover the effect man has on ecosystems. Seasonal variability, hydrocarbons, primary production, and community structure are among the parameters measured.

Citation Source: Petroleum Abstracts. 1975. 15(5).
Entry #200,223.

C-1230-74
PUBLIC POLICY TOWARD ENVIRONMENT 1973: A REVIEW AND APPRAISAL OF FOSSIL ENERGY

Jordan, A. R., M. W. Willrich, J. J. Schanz, et al. 1973.
Annals of the New York Academy of Sciences 216:63-78.

A review is given of the environmental impact of fossil energy production, ranging from exploration to consumption. The coal, oil and gas industries are examined. Past practices and present policies of fossil energy production are appraised in this review.

Citation Source: Environmental Health and Pollution Control.
1974. 6(10). Entry #3697.

C-1231-74
ENVIRONMENTAL PLANNING STARTS WITH PROCESS DEVELOPMENT

Kilburn, P. D., and M. W. Legatski. 1974.
Hydrocarbon Processing 53(10):95-98.

The article presents a discussion of Colony Development Operation's project to construct an oil shale complex in Colorado to process oil shale and produce synthetic crude oil. The environmental planning that was conducted during this development is reviewed.

Citation Source: Citation Journal.

C-1232-74
THE THREAT TO EUROPE'S OIL FIELDS

Loftas, T. 1974.
New Scientist 63(912):516-518.

The protection of North Sea oil platforms from sabotage or military attack, and the pollution problem of oil production in this area are two topics discussed in the article.

Biological effects of oil prospecting and production

Citation Source: Environment Abstracts. 1975. 5(3).
Entry #12-02303.

C-1233-74
OIL SPILL COUNTERMEASURES FOR THE BEAUFORT SEA

Logan, W. J. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 265-268.

The Beaufort Sea studies are designed to answer questions about the impact of the exploratory drilling phase of offshore oil operations and possible blowouts. The engineering feasibility and costs of cleanup are to be assessed. A weather and sea-ice prediction system will help reduce the hazards to both personnel and environment.

Citation Source: Citation Journal.

C-1234-74
ANOTHER VIEW OF OFFSHORE OIL AND GAS OPERATIONS

Menard, H. W. 1974.
Marine Technology Society Journal 8(9):2-12.

The National Academy of Sciences comments on the report "OCS Oil and Gas--An Environmental Assessment." The National Academy concludes that the criteria used to rate potential outer continental shelf development by environmental risk are inadequate. In particular, the ratings of the Atlantic OCS are questioned.

Citation Source: Petroleum Abstracts. 1975. 15(16).
Entry #203,789.

C-1235-74
THE SELLING OF THE SHELF

Mitchell, J. G. 1975.
Audubon 77(3):44-63.

The author discusses the questions and problems arising from the U.S. Government's plans for development of outer continental shelf (OCS) oil and gas resources: Views supporting and opposing the government's plans are presented, and an analysis of the Draft Environmental Impact Statement which assesses the impact of accelerated OCS leasing is given.

Biological effects of oil prospecting and production

Citation Source: Citation Journal.

C-1236-74
ENERGY DEMAND AND ITS EFFECT ON THE ENVIRONMENT

Morris, D. N. 1973.
Report No. P-5048. 29 p.

The topics of this report include crude oil production, environmental impacts and social impacts of energy use.

Citation Source: Government Reports Announcements. 1975.
75(3). Entry #AD/A-002 123/8GA.

C-1237-74
OFFSHORE OIL IS NOT ALL BAD, SAYS ONE WHO LIVED WITH GULF WELLS

Norville, W. 1975.
National Fisherman 56(1):18-19A.

The author presents a short history of offshore drilling in the Gulf of Mexico. The positive effects of the industry on local fishermen are given.

Citation Source: Citation Journal.

C-1238-74
LIVING ENVIRONMENT, INDUSTRY AND GOVERNMENT

Rayzacher, B. 1973.
Externerner Bericht, Kernforschungszentrum Karlsruhe 2(12):821-827.

A discussion is concerned with the environmental damages caused by petroleum production and transportation, and technological developments to limit petroleum pollution. The need for governmental action in solving these problems is emphasized.

Biological effects of oil prospecting and production

Citation Source: Environmental Health and Pollution Control. 1974. 6(6). Entry #1992.

C-1239-74
LOUISIANA SUPERPORT: PRELIMINARY ASSESSMENTS OF THE ENVIRONMENTAL IMPACT OF A SUPERPORT ON THE SOUTHEASTERN COASTAL AREA OF LOUISIANA

Stone, J. H. (undated)
Louisiana State University Center for Wetland Resources Report LSU-SG-72-05.

Evaluations are made on the environmental impacts of two proposed superport sites in southeastern Louisiana. Damage to estuaries caused by oil spill drift is predicted.

Citation Source: Environment Abstracts. 1975. 5(3). Entry #75-02309.

C-1240-74
LOUISIANA SUPERPORT STUDIES. REPORT 3. RECOMMENDATIONS FOR THE ENVIRONMENTAL PROTECTION PLAN

Stone, A. H., J. M. Robbins, D. B. Johnson, R. M. Pope, and J. G. Gosselink. 1973.
Center for Wetland Resources, Report 3. 530 p.

Data and recommendations are presented for use in the formulation of an Environmental Protection Plan which considers Louisiana superport development. Information on the environment, site selection, design guidelines, and superport construction and operation are given; and major environmental stresses that may result from such development are indicated.

Citation Source: Selected Water Resources Abstracts. 1975. 8(6). Entry #W75-03183.

C-1241-74
GEOGRAPHICAL ANALYSIS OF OIL SPILL POTENTIAL ASSOCIATED WITH ALASKAN OIL PRODUCTION AND TRANSPORTATION SYSTEMS

Surft, W. H., R. E. Brown, L. V. Kimmel, M. M. Orgul, and P. L. Petersen. 1974.
USCG-D-74, AD-784,099/4GA. 273 p.

The magnitude of oil pollution problems and environmental conditions affecting spill cleanup in Alaska are summarized. The oil reserves are large (200 billion bbl) and predominantly offshore. With increasing development, almost every mile of Alaskan coastline could be exposed to oil spills. The transportation system employed will determine the extent of these spills; a single tanker casualty could discharge 60,000 bbl of oil.

Citation Source: Scientific and Technical Aerospace Reports. 1975. 13(2). Entry #N75-11543.

C-1242-74
ENVIRONMENTAL IMPACT OF FUTURE ENERGY SOURCES

Warren, F. H., and M. I. Goldman. 1974.
Chemical Engineering 81(22):47-51.

The environmental effects of exploiting several U.S. energy sources, including coals, petroleum, nuclear, hydroelectric and oil shale resources, are discussed. The need for planning and long-term resolve in balancing energy independence and environmental stability is stated.

Biological effects of oil prospecting and production

Citation Source: Environment Abstracts. 1975. 5(3). Entry #75-02025.

F. FATE OF OIL IN THE ENVIRONMENT

1. BIOLOGICAL DEGRADATION

C-1243-74
BENTHAL DECOMPOSITION OF ADSORBED OCTADECANE

Allen, H. L., III. 1974.
Ph.D. Thesis, Rutgers University. 351 p.

A major long-term effect of oil pollution is destruction of the benthic habitat by deposited oil and from reduced oxygen concentration due to bacterial decomposition of the oil. This study evaluates the influence of octadecane, an important component of crude oil, on benthic decomposition. The author concludes that the decomposition rate of octadecane is 1/10 that of sewage, and that the oxygen uptake rate is a function of initial seed volatile solids concentration.

Physical changes of oil in the environment

Citation Source: Petroleum Abstracts. 1975. 15(12).
Entry #202,506.

C-1244-74
MICROBIAL DEGRADATION OF CYCLOPARAFFINIC HYDROCARBONS VIA CO METABOLISM AND COMMENSALISM

Beam, H. W., and J. J. Perry.
Journal of General Microbiology 82(1):163-169.

Studies have demonstrated the concerted attack of a mixed microbial population on cyclohexane; results suggest that both CO-metabolism and commensalism are associated with microbial degradation of these hydrocarbons.

Citation Source: Environmental Health and Pollution Control.
1974. 6(7). Entry #2431.

C-1245-74
GROWTH OF FUSARIA WITH ASSIMILATION OF HYDROCARBONS [English summary]

Bilai, V. I., and E. Z. Koval. 1975.
Mikrobiologiya Zhurnal 36(5):587-594.

Two hundred and five Fusarium strains tested were found to assimilate liquid paraffin, hexadecane and solid paraffin hydrocarbons. Purified diesel fuel, n-alkanes isolated from diesel fuel, paraffin oil and bright paraffin fractions were assimilated by only some strains.

Citation Source: Chemical Abstracts. 1975. 82(9).
Entry #53947p.

C-1246-74
MICROBIOLOGICAL ASPECTS OF OIL INTRUSION IN THE ESTUARINE ENVIRONMENT

Crow, S. A., Jr. 1974.
Ph.D. Thesis, Louisiana State University. 193 p.

Crude oil induces a change in the overall activity of the estuarine microbial population. The observed reduction of cellulolytic activity could seriously affect the regeneration of any oil-affected area. Sequential seeding and organic additives may speed up degradation of spilled oil.

Biological effects of oil pollution

Citation Source: Petroleum Abstracts. 1975. 15(11).
Entry #202,221.

C-1247-74
HYDROCARBON-DEGRADING BACTERIA ASSOCIATED WITH ARCTIC OIL SEEPS

Cundell, A. M., and R. W. Traxler. 1974.
Developments in Industrial Microbiology 15:250-255.

Fifteen hydrocarbon-degrading bacteria were isolated by enrichment culture from an aged asphaltic flow near a natural oil seep, Cape Simpson, Alaska; their ability to grow on various hydrocarbons at temperatures ranging from 0° to 24° was studied. The bacteria were found to grow on the hydrocarbon substrates and the optimal growth temperature of the organisms suggested that they were facultative psycrophilic bacteria.

Citation Source: Chemical Abstracts. 1975. 82(13).
Entry #82769n.

C-1248-74
BACTERIAL DEGRADATION OF CYCLOHEXANE. PARTICIPATION OF A CO-OXIDATION REACTION

Deklerk, H., and A. C. Van Der Linden. 1974.
Antonie Van Leeuwenhoek 40(1):7-15.

The steps in the complete biodegradation of cyclohexane by two strains of Pseudomonad bacteria viz an n-alkane oxidizer and a microorganism utilizing cyclohexanol are outlined.

Citation Source: Environmental Health and Pollution Control. 1974. 6(9). Entry #3331.

C-1249-74
QUANTITATIVE STUDIES ON MARINE BIODEGRADATION OF OIL. I. NUTRIENT LIMITATION AT 14°

Gibbs, C. F. 1974.
Proceedings Royal Society of London, Series B 188(1090):61-82.

Oxygen uptake from biodegradation of Kuwait oil over a 45 week period was determined in a semi-enclosed system with continuous nutrient replenishment. When measuring the rate of oil degradation in seawater at 14° and at low nutrient concentrations, the rate-controlling factor was found to be the rate of replenishment of N as nitrate or NH_3. At 14°, about 4 μm available N is required per mg oil oxidized, based on oil consumption.

Citation Source: Chemical Abstracts. 1975. 82(13). Entry #82878x.

C-1250-74
QUANTITATIVE STUDIES ON MARINE BIODEGRADATION OF OIL. II. EFFECT OF TEMPERATURE

Gibbs, C. F., K. B. Pugh, and A. R. Andrews. 1974.
Proceedings Royal Society of London, Series B 188(1090):83-94.

The rates of petroleum biodegradation in seawater, measured in terms of oxygen uptake, were determined at 4° and 14°. Results indicated that the N supply controls oxidation rates at both 4° and 14°; however, the rate of oxidation was drastically reduced on lowering the temperature from 14° to 4°. Rates of nutrient uilization were little affected.

Citation Source: Chemical Abstracts. 1975. 82(11). Entry #70229y.

C-1251-74
STUDY OF POLYPHOSPHATES, POLYSACCHARIDES, AND NUCLEIC ACIDS IN CANDIDA GUILLIERMONDII [English summary]

Grigor'eva, S. P., G. I. Vorob'eva, V. A. Bysloukh, G. N. Maksimova, and I. S. Kulaer. 1974.
Prikladnaya Biokhimiya i Mikrobiologiya 9(6):805-812.

In studies of metabolism of C. guilliermondii cultivated in medium containing different carbon sources, the total content of polyphosphates in the yeast grown in oil paraffins was 2 to 2.5 times higher than in the yeast grown in glucose. Cells grown in oil paraffin accumulated a significant amount of glycogen.

Analysis

Citation Source: Biological Abstracts. 1975. 59(9). Entry #48827.

C-1252-74
DETECTION AND PRESENCE OF POLYCYCLIC HYDROCARBONS IN YEAST GROWN ON MINERAL OIL

Grimmer, G. 1974.
Deutsche Lebensmittel Rundschau 70(11):394-397.

Study results have shown that dietary and brewer's yeast grown on petroleum or pure n-alkanes contained small amounts or no polycyclic aromatic hydrocarbons; baker's yeast was found to contain large amounts that varied with the location from which the yeasts were obtained.

Citation Source: Chemical Abstracts. 1975. 82(15). Entry #93892y.

C-1253-74
OXYGEN REQUIREMENTS OF THE THERMO-TOLERANT HYDROCARBON-OXIDIZING YEAST, CANDIDA TROPICALIS [English summary]

Isakova, D. M., E. I. Kvasnikov, and S. R. Todosiichuk. 1974.
Prikladnaya Biokhimiya i Mikrobiologiya 10(3):390-395.

The growth and hydrocarbon consumption of C. tropicalis were examined at 29 and 39° at a constant growth rate under different aeration conditions. Increasing the cultivation temperature from 29° to 39° did not influence the growth of the yeast but brought about a decline in the economic coefficient and an incomplete oxidation of intracellular hydrocarbons due to O_2 insufficiency.

Citation Source: Biological Abstracts. 1975. 59(9). Entry #48831.

C-1254-74
INITIAL REACTIONS IN THE OXIDATION OF NAPHTHALENE BY PSEUDOMONAS PUTIDA

Jeffrey, A. M., H. J. C. Yeh, D. M. Jerina, T. R. Patel, J. F. Davey, and D. T. Gibson. 1975.
Biochemistry 14(3):575-584.

A strain of P. putida which can utilize naphthalene as its sole carbon and energy source was isolated from soil. Investigations were conducted on the initial reactions and intermediates produced during the metabolism of naphthalene.

Citation Source: Chemical Abstracts. 1975. 82(19). Entry #120236w.

C-1255-74
MICROBIAL ASSIMILATION OF HYDROCARBONS. I. THE FINE STRUCTURE OF A HYDROCARBON OXIDIZING ACINETOBACTER SP.

Kennedy, R. S., W. R. Finnerty, S. Sudarsanan, and R. A. Young. 1975.
Archives of Microbiology 102(2):75-84.

This report examines the fine-structure detail of the hydrocarbon-oxidizing microorganism Acinetobacter sp. in relationship to the physiological and structural parameters that exist during hydrocarbon metabolism. A cytoplasmic modification was found to be present as a result of growth on hydrocarbon substances. Results demonstrate the microorganism's ability to accumulate these substances intracellularly, which indicates transport across the cell membrane.

Biological effects of oil pollution

Citation Source: Citation Journal.

C-1256-74
MICROBIAL ASSIMILATION OF HYDROCARBONS. II. INTRACYTOPLASMIC MEMBRANE INDUCTION IN ACINETOBACTER SP.

Kennedy, R. S., and W. R. Finnerty. 1975.
Archives of Microbiology 102(2):85-90.

The study demonstrates the induction of intracytoplasmic membranes in the hydrocarbon-oxidizing microorganism, Acinetobacter sp. when grown on hexadecane, heptadecane and hexadec-1-ene. Results suggest that the cytoplasmic pooling of hydrocarbons and the induction of intracytoplasmic membranes are required for the growth of the microorganism on hydrocarbons.

Biological effects of oil pollution

Citation Source: Citation Journal.

C-1257-74
OIL DEGRADATION BY PARAFFIN OXIDIZING MYCOBACTERIA [English summary]

Krasil'nikov, N. A. and T. V. Koronelli. 1974.
Prikladnaya Biokhimiya i Mikrobiologiya 10(4):573-576.

The degradation of oil by mycobacteria which had been isolated from oil containing natural substrates was studied. The different strains varied in their activity, but many removed oil films and were able to remove half or more of the initial 1-1.7% oil in 24-48 hours. Others changed the composition of the oil during growth.

Chemical changes of oil in the environment

Citation Source: Biological Abstracts. 1975. 59(6).
Entry #31154.

C-1258-74
EFFECT OF WATER ON THE THERMAL DEATH OF A HYDROCARBON BACTERIUM IN A NONAQUEOUS FLUID

LaRock, P. A. 1975.
Applied Microbiology 29(1):112-114.

Survival at higher temperatures of a bacterium that grows in oil was tested in menstruums of different water concentrations. The surviving fraction decreased by a factor of three as the water concentration doubled. This effect of enhanced killings only occurred above 0.02% water.

Citation Source: Petroleum Abstracts. 1975. 15(10).
Entry #201,899.

C-1259-74
ASSIMILATION OF NATURAL GAS HYDROCARBON CONSTITUENTS BY MICROBIAL ONE-SPECIES CULTURES

Malashenko, Yu. R., V. A. Romanovskaya, V. N. Bogachenko, N. V. Voloshin, and T. P. Kryshtab. 1975.
Izvestiya Akademii Nauk SSSR Seriya Biologicheskaya 1:44-51.

Studies of the assimilation of hydrocarbon constituents of natural gas by obligate methylotrophs are described. Growth of the organisms was observed only when CH_4 served as the C source. Attempts to isolate a facultative CH_4-utilizing microorganism assimilating all hydrocarbons of natural gas were unsuccessful; such assimilation was attained only through mixed bacterial cultures.

Citation Source: Chemical Abstracts. 1975. 82(21).
Entry #135406a.

C-1260-74
CRUDE OIL DEGRADATION BY FILAMENTOUS FUNGI

Perry, J. J., and C. E. Cerniglia. 1973.
Journal General and Applied Microbiology 19(2):151-153.

Three fungi isolated by enrichment culture grew easily on paraffin-base crude oil and degraded the oil in seven days at 26°. It was found that the levels of nitrogen and phosphate in the marine environment are not adequate for degrading large amounts of hydrocarbon and supplementation of these elements would be necessary.

Citation Source: Biological Abstracts. 1975. 59(5).
Entry #25113.

C-1261-74
PERSISTENCE AND BIODEGRADATION OF SPILLED RESIDUAL FUEL OIL ON AN ESTUARINE BEACH

Pierce, R. H., Jr., A. M. Cundell, and R. W. Traxler. 1975.
Applied Microbiology 29(5):646-652.

A study was conducted on the enrichment of hydrocarbon-degrading bacteria and the persistence of petroleum hydrocarbons on an estuarine beach in upper Narragansett Bay, Rhode Island, after an oil spill on April 11, 1973. An increase in bacteria enrichment occurred 4 to 16 days after the spill and was maintained in the beach sand for at least a year. The hydrocarbon levels in the area decreased during the enrichment period, remained constant during the summer and then declined after 1 year.

Monitoring
Sampling

Citation Source: Citation Journal.

C-1262-74
ACTIVATED SLUDGE STUDIES WITH PHENOL BACTERIA

Radhakrishnan, I. 1974.
Water Pollution Control Federation Journal 46(10):2392-2418.

The growth rate and yield coefficient of the phenol bacteria _Bacillus cereus_ in batch and continuous cultures are examined.

Citation Source: Environment Abstracts. 1975. 5(2).
Entry #75-01728.

C-1263-74
A MEDIUM FOR DETECTING PHENOL-DEGRADING BACTERIA

Ralston, J. R., and G. R. Vela. 1974.
Journal of Applied Bacteriology 37(3):347-351.

The medium used to identify phenol-degrading bacteria uses phenol as the only source of carbon and energy. Growth of the bacteria and changes in pH values are used to assess phenol degradation in this medium. The results agree with older methods which analyzed for phenol in the spent culture fluid.

Analysis

Citation Source: Biological Abstracts. 1975. 59(6).
Entry #31153.

C-1264-74
GROWTH OF DEEP-SEA BACTERIA ON HYDROCARBONS AT AMBIENT AND IN SITU PRESSURE

Schwarz, J. R., J. D. Walker, and R. R. Colwell. 1974.
Technical Report, Contract N00014-67-A-0239-0027, Grant NSF GA-27725. 12 p.

Bacteria collected from sediment samples at a depth of 4,940 m off the Florida coast utilized n-tetradecane at both ambient and in situ pressures; however, at ambient temperatures, the rate of hydrocarbon utilization under in situ pressure (500 atm) was significantly less than utilization at ambient pressure (1 atm). Individual isolates from the mixed culture did not utilize n-tetradecane, indicating potential synergistic relationships.

Citation Source: Government Reports Announcements. 1975.
75(6). Entry #AD/A-003 873/7GA.

C-1265-74
PETROLEUMLYTIC BACTERIA IN DIFFERENT WATERMASSES OF THE PACIFIC OCEAN IN JANUARY, 1973

Seki, H., T. Nakai, and H. Otobe. 1974.
Mer (Tokyo) 12(1):16-19.

In January, 1973, in the Pacific Ocean, water masses with different levels of pollution were sampled to determine the population densities of petroleumlytic bacteria. The densities varied from 10^2 - 10^3 per liter (Tokyo Bay) to less than 50 per liter (Western North Pacific central water).

Citation Source: Biological Abstracts. 1975. 59(6).
Entry #34283.

C-1266-74
OBTAINING HYBRIDS IN HAPLOID STRAINS OF PICHIA GUILLIERMONDII WICKERHAM WHICH ASSIMILATE PETROLEUM HYDROCARBONS [English summary]

Shcholokova, I. P., V. P. Zharova, and Y. I. Kvasnikov. 1974. Mikrobiolohichnyi Zhurnal (Kiev) 36(3):275-278.

The study demonstrates the possibility of obtaining hybrids in the haploid strains of the sporogenous yeast P. guilliermondii Wickerham isolated from natural sources and assimilating petroleum hydrocarbons.

Citation Source: Biological Abstracts. 1975. 59(11). Entry #60528.

C-1267-74
CHARACTERIZATION OF CRUDE OIL UTILIZATION BY SELECTED SOIL BACTERIA

Thompson, R. C., and H. G. Hedrick. 1974. Developments in Industrial Microbiology 15:263-272.

Results are given from analyses characterizing the utilization of crude oil by three bacterial isolates, obtained from soil used in farming or refinery wastes. The various analytical methods are described and the isolates with the greatest capacity of crude oil utilization are given.

Analysis

Citation Source: Chemical Abstracts. 1975. 82(13). Entry #82770f.

C-1268-74
MICROBIAL GROWTH ON HYDROCARBONS

Velankar, S. K., S. M. Barnett, C. W. Houston, and A. R. Thompson. 1975. Biotechnology and Bioengineering 17(2):241-251.

A model for hydrocarbon uptake by microorganisms and supporting experimental results are presented. In order for microbial cells to grow on hydrocarbon substrates, micelles of surface active agents must be present.

Citation Source: Chemical Abstracts. 1975. 82(17). Entry #110306e.

C-1269-74
HYDROCARBON METABOLISM IN CLADOSPORIUM RESINAE

Walker, J. D., Jr. 1973.
Ph.D. Thesis, Dayton University. 125 p.

The ability of this bacterium to grow on a variety of hydrocarbons was tested. The bacteria needed 12- and 16-carbon compounds to grow. Aldehydes and alkanes with two methyl branches did not support growth. Results indicate that Cladosporium resinae may have a unique ecological niche.

Citation Source: Petroleum Abstracts. 1975. 15(11).
Entry #202,017.

C-1270-74
PETROLEUM-DEGRADING ACHLOROPHYLLOUS ALGA PROTOTHECA ZOPFII

Walker, J. D., R. R. Colwell, Z. Vaituzis, and S. A. Meyer. 1975.
Nature 254(5499):423-424.

This organism was isolated from Colgate Creek in Chesapeake Bay at a time of year when significant petroleum degradation occurred. The alga can utilize both crude oil and a 17-component mixed hydrocarbon substrate.

Citation Source: Citation Journal.

C-1271-74
A STUDY OF THE BIODEGRADATION OF A SOUTH LOUISIANA CRUDE OIL EMPLOYING COMPUTERIZED MASS SPECTROMETRY

Walker, J. D., R. R. Colwell, and L. Petrakis. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 601-605.

Two inocula were grown in south Louisiana crude oil. The microorganisms in the inoculum from an oil contaminated area were able to degrade all classes of hydrocarbons and contained a wider variety of bacterial genera than the inoculum from an oil-free area. The latter was able to grow on the crude oil but was not able to degrade all hydrocarbon classes.

Citation Source: Citation Journal.

C-1272-74
TEMPERATURE AND NUTRIENT LIMITATION OF OIL BIODEGRADATION IN LAKE MENDOTA, WISCONSIN

Ward, D., and T. D. Brock. 1974.
Abstract of Annual Meeting of the American Society of Microbiology 74. p. 64.

In studies determining the rate at which microorganisms indigenous to surface waters of Lake Mendota were able to degrade oil, results indicated that the rate of oil degradation varied seasonally due to limitation by low temperature in spring and fall, and low nutrient availability during mid-summer. Maximal rates existed for about one month in late spring.

Citation Source: Abstracts on Health Effects of Environmental Pollutants. 1975. 4(3). Entry #2966.

2. PHYSICAL CHANGES

C-1273-74
VISCOUS-GRAVITY SPREADING OF AN OIL SLICK

Buckmaster, J. 1973.
Journal of Fluid Mechanics 59 Pt. 3:481-491.

The problem of a two-dimensional oil slick spreading under the influence of gravitational and viscous forces is examined, and an analytical and numerical expression for the size of a slick as a function of time is derived. Results of comparisons of theoretical results with experimental results for the time-dependent slick size are given.

General fate of oil in the environment

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #057142.

C-1274-74
CHANGES IN SURFACE TENSION DURING THE INITIAL AGING OF SOME PETROLEUM CRUDES

Chen, E. C., and C. Guarnaschelli. 1973; 1974.
The Canadian Journal of Chemical Engineering 51:134-136; 52:543.

The increase in surface tension of a petroleum crude varies linearly with $\Delta w/(1-\Delta w)$ where Δw is the loss in weight fraction due to evaporation of the volatile components. This linear relationship also applies to simulated evaporation of some simple hydrocarbon mixtures.

Chemical changes of oil in the environment

Citation Source: Citation Journal.

C-1275-74
MOVEMENT OF SPILLED OIL AS PREDICTED BY ESTUARINE NONTIDAL DRIFT

Conomos, T. J. 1975.
Limnology and Oceanography 20(2):159-173.

The movement of oil spilled in January, 1971, in San Francisco Bay, is explained by the river-induced nontidal estuarine circulation. Surface waters drift seaward as did the oil. Future predictions must include such factors as the summer decrease in the estuarine circulation and the seasonal reversal in two-layer drift in the south bay.

Citation Source: Citation Journal.

C-1276-74
THE FATE OF SPILLED NAVY DISTILLATE FUEL

Hearst, P. J. 1974.
Report No. CEL-TN-1353. 31 p.

Observations on the laboratory weathering of thick films of four Navy distillate fuels on saltwater showed little evaporation in one week nor marked physical changes. Thin films (0.1 mm) evaporated rapidly, leaving a 5% residue, whereas Navy Special Fuel Oil left residues of 65%. The weathering characteristics are related to the distillation range as shown by gas chromatographic comparisons.

Citation Source: Government Reports Announcements. 1975. 75(3). Entry #AD/A-002 256/6GA.

C-1277-74
BEHAVIOR OF OIL SPILLED UNDER FLOATING ICE

Kievil, B. E., and R. O. Ramseier. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 497-501.

The basic behavior of crude oil under ice was simulated with hot crude oil in a cold room. Accidental oil spill data confirm that crude oil does separate into particles when released in cold waters. Ice cover can act as a natural boom and can be used as a cleanup platform.

Cleanup and recovery

Citation Source: Citation Journal.

C-1278-74
FORMATION OF WATER-IN-OIL EMULSIONS SUBSEQUENT TO AN OIL SPILL

Mackay, G. D. M., A. Y. McLean, O. J. Betancourt, and B. D. Johnson. 1973.
Journal of the Institute of Petroleum 59(568):164-172.

Results from experiments, examining stable water-in-oil emulsions formed after hydrocarbon products spills at sea, indicate that the responsible agent for the stability was an asphaltic-type substance. The stabilizing effect is due to the mechanical strength of the asphaltenic layer encapsulating each water droplet.

Analysis

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #054837.

C-1279-74
SEPARATION OF MULTICOMPONENT HYDROCARBON MIXTURES SPREADING ON A WATER SURFACE

Philips, C. R., and V. M. Groseva. 1975.
Separation Science 10(2):111-118.

Differences in the spreading coefficients of individual hydrocarbons cause the separation of certain hydrocarbons from oil slicks. This phenomenon is independent of relative volatilities and solubilities.

Analysis

Citation Source: Chemical Abstracts. 1975. 82(18). Entry #115727.

C-1280-74
THE VERTICAL DIFFUSION OF WATER-SOLUBLE FRACTIONS FROM AN OIL SLICK

Powers, R. J., Jr. 1974.
Masters Thesis, Massachusetts Institute of Technology.

A model has been formulated to analyze the process of vertical diffusion of light compounds from an oil slick on calm water. Results of analyses using the model indicate that for a 0.1 cm slick, 99% of the benzene will have left the slick in six hours, mainly to the atmosphere; much less naphthalene enters the water column and remains in the slick much longer; and alkanes with greater than nine carbons will persist in the slick for long periods of time.

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #057471.

C-1281-74
OIL SPILL AT DECEPTION BAY, HUDSON STRAIT

Ramseier, R. O., G. S. Gantcheff, and L. Colby. 1973.
Canada. Inland Waters Branch. Scientific Series No. 29. 61 p.

The behavior of the oil spilled in a 427,000 gallon spill over permafrost and sea ice is reported and is found to be fundamentally different. The intertidal species most affected by the spill were harmed more by the oil burning than from the oil itself. The oil budget is reported.

Biological effects of oil pollution

Citation Source: Pollution Abstracts. 1975. 6(2). Entry #75-02003.

C-1282-74
PREDICTING THE FATE OF OIL IN THE MARINE ENVIRONMENT

Williams, G. N., R. Hann, and W. P. James. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 567-572.

The oil spill modeling described in this paper was developed to evaluate the impact of an offshore oil spill on the environment and to help SEADOCK with their oil spill contingency program. The models gave information on necessary response times and on the direction and speed of the slick.

Research
Regulations, standards and planning

Citation Source: Citation Journal.

3. CHEMICAL CHANGES

C-1283-74
CHANGES IN CHEMICAL COMPOSITION AND PHYSICAL PROPERTIES OF A HEAVY RESIDUAL OIL WEATHERING UNDER NATURAL CONDITIONS

Betancourt, O. J. 1973.
Journal of the Institute of Petroleum 59(569):223-230.

A study was conducted to examine the weathering process of residual fuel oil which had contaminated coastline areas of Chedabucto Bay, Nova Scotia, as a result of the grounding of the tanker "Arrow" in 1970. Using viscosity, density, and sulphur, nickel, vanadium and asphaltene content as indicators of weathering, the total loss of material from the residual oil was calculated to be less than 20%; and after one year, changes were negligible.

Physical changes of oil in the environment
General fate of oil in the environment

Citation Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #054814.

C-1284-74
THE EFFECT OF WEATHERING ON A CRUDE OIL RESIDUE EXPOSED AT SEA

Davis, S. J., and C. F. Gibbs. 1975.
Water Research 9(13):275-285.

Two tanks of thick water-in-oil emulsions were exposed to weathering at sea; one tank was subject to tidal flushing below the water line, the other was closed. No net loss of oil occurred, although chemical changes caused substantial changes in the physical and chemical properties.

General fate of oil in the environment

Citation Source: Citation Journal.

C-1285-74
CRUDE OIL SPILLS: DISAPPEARANCE OF AROMATIC AND ALIPHATIC COMPONENTS FROM SMALL SEA-SURFACE SLICKS

Harrison, W., J. A. Winnik, P. T. Y. Kwong, and D. Mackay. 1975.
Environmental Science and Technology 9(3):231-234.

A model of the evaporation-dissolution process was derived from data on the weathering of five small ocean spills of crude oil.

Different weathering exists in the same spill. Whitecapping also affects the weathering process.

Physical changes of oil in the environment

Citation Source: Citation Journal.

C-1286-74
PHOTODECOMPOSITION OF POLYNUCLEAR AROMATIC HYDROCARBONS IN NATURAL WATER SYSTEMS

McGinnes, P. R. 1974.
Ph.D. Thesis, University of Illinois, Urbana. Dissertation Abstracts International B. 1975. 35(7). Entry #3359.

The existence of polycyclic aromatic hydrocarbons (PAH) in natural water systems was studied and a technique for analyzing specific PAH was developed. Analysis indicated that PAH are not soluble in water but are present as particulate material or adsorbed material on solid surfaces in water. The photodecomposition of two PAH was examined and results are given.

Citation Source: Chemical Abstracts. 1975. 82(18). Entry #115970.

4. GENERAL CHANGES

C-1287-74
INVESTIGATION OF THE BEHAVIOR AND EFFECTS OF OIL UTILIZING A MANNED UNDERWATER HABITAT

Allen, A. A., R. S. Schluster, and L. E. Fausak. 1974.
Offshore Technology Conference, 6th, Houston, 1974. Preprints, Vol. 1. p. 425-434.

Sinking agent effectiveness, oil degradation, solubility and migration through bottom sediments were investigated by exposing mixtures of oils and sinking agents to the subsurface environment (50 ft.). Five days of submarine exposure produced no visible or measurable signs of aging. Once deposited on the ocean floor, the oil/sinking agent mixtures did not move.

Research

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(2). Entry #5Q2056.

C-1288-74
SPILL TRAJECTORY IS FACTOR IN OFFSHORE EXPLORATION

Anonymous. 1974.
Petroleum Engineers International 46:130.

A discussion of the studies and surveys conducted to determine possible spill movements and the environmental effects of oil spills and seeps from Atlantic Coast offshore drilling sites is given. Included are studies conducted for the Council on Environmental Quality by Massachusetts Institute of Technology Ocean Engineers Department which deal with determining where oil spills will go because of the combined action of wind, waves and currents.

Research

Citation Source: Citation Journal.

C-1289-74
PETROLEUM IN THE MARINE ENVIRONMENT

Wilson, E. B. (Chairman). 1975.
Workshop on Inputs, Fates and the Effects of Petroleum in the Marine Environment. May 21-25, 1973. 107 p.

The Workshop discussed both the physical and biological fate of oils, the uptake of oils by fish and benthic organisms, the damage or toxicity due to oil and cleanup techniques. More research is necessary to answer the basic question, "At what level of petroleum hydrocarbon input to the ocean might we find irreversible damage occurring?"

Biological effects of oil pollution

Citation Source: National Research Council. News Report. 1975. XXV(1):8.

C-1290-74
USE OF COMPUTER SIMULATION TO AID SELECTION OF OIL SPILL CONTROL EQUIPMENT

Cochran, R. A., and J. P. Fraser. 1975.
Offshore Technology Conference, 7th, Houston, 1975. Paper 2199.

A computerized oil spill simulation program is described which allows the user to assess weather effects and performance of oil spill equipment in recovering spilled oil.

Cleanup and recovery

Citation Source: Offshore. 1975. 35(5):126.

C-1291-74
CHEVRON MAIN PASS BLOCK 41 OIL SPILL: CHEMICAL AND BIOLOGICAL INVESTIGATIONS

McAuliffe, C. D., A. E. Smalley, R. D. Groover, W. M. Welsh, W. S. Pickle, and G. E. Jones. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 555-566.

In 1970, 65,000 barrels of crude oil and 2,000 barrels of chemical dispersants entered the sea near the Mississippi River Delta. The fate of the oil (evaporated, recovered, dissolved, emulsified, sank, biodegraded, photooxidized) was examined. Benthic samples showed no effects from the oil, nor did shrimp trawls, blue crabs or fish.

General effects of oil pollution
Biological effects of oil pollution
Sampling

Citation Source: Citation Journal.

C-1292-74
DETERMINATION OF THE FATE OF POLYNUCLEAR AROMATIC HYDROCARBONS IN NATURAL WATER SYSTEMS

McGinnes, P. R., and V. L. Snoeyink. 1974.
Illinois University Water Resources Center, Research Report, UILU-WRC-74-0080. 60 p.

An analytical technique for determining specific polynuclear aromatic hydrocarbons (PAH) and evaluating the presence of PAH in natural water systems is described. The photodecomposition of two PAH under UV light is discussed; decomposition occurs under solar radiation and in turbid waters.

Analysis

Citation Source: Aquatic Sciences and Fisheries Abstracts. 1975. 5(1). Entry #5Q825.

C-1293-74
CONTROL OF LARGE-SCALE OIL SLICKS BY CURRENTS AND WINDS

Murray, S. P. 1975.
Offshore Technology Conference, 7th, Houston, 1975. Paper 2389.

The effect of local winds versus near-surface currents in determining oil slick movements in coastal and shelf waters was studied during the Main Pass 41-C spill in the Mississippi Delta, 1970. Over a period of a month, it was found that the net distribution of oil was a function of the near-surface current direction rather than the wind direction.

Citation Source: Offshore. 1975. 35(5). Entry #132.

C-1294-74
DIRECTION OF DRIFT OF SURFACE OIL WITH WIND AND TIDE

Ridgway, N. M. 1972 (received 1973).
New Zealand Journal of Marine and Freshwater Research 6(1/2):178-184.

A method is described which predicts movements of surface water by vectorial addition of wind-induced surface currents and tidal currents; the utility of the method to predict surface oil movements resulting from oil spillage is indicated.

Containment
Cleanup and recovery

Citation Source: Abstracts on Health Effects of Environmental Pollutants. 1975. 4(4). Entry #3510.

C-1295-74
OIL POLLUTION STUDIES ON LAKE MARACAIBO, VENEZUELA

Templeton, W. L., E. A. Sutton, R. M. Bean, R. C. Arnett, J. W. Blaylock, R. E. Wildering, and H. J. Moore. 1975. Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 489-496.

Low concentrations of oil in the lake water, no detectable accumulation of petroleum-derived hydrocarbons in muscle tissue and the occurrence of bituminous materials in the sediment indicate that volatilization, biodegradation and sedimentation are the major oil removal mechanisms in Lake Maracaibo. The rapid loss of light hydrocarbons significantly decreases the oil's toxicity.

General effects of oil pollution

Citation Source: Citation Journal.

C-1296-74
OIL: ITS PROPERTIES AND ENVIRONMENTAL EFFECTS

Weller, E. C. 1974.
Assessing the Social Impacts of Oil Spills, Rensselaerville, New York, 1973. p. 115-120.

The types of oil and toxicology studies using these oil types are briefly reviewed. The fate of oil in the environment, including evaporation, autooxidation and biodegradation, is discussed. Research studies on the ecological effects of oil spills and cleanup measures are reviewed.

Biological effects of oil pollution
Cleanup and recovery

Citation Source: Citation Journal.

G. OIL POLLUTION LEGISLATION

1. STATE LEGISLATION

C-1297-74
OFFSHORE TERMINAL AUTHORITY

Anonymous. 1974.
Louisiana Session Laws, Vol. 3, Act No. 358. p. 662-669.

The duties of the Offshore Terminal Authority are to plan, develop, construct, license, regulate and operate offshore terminal facilities. Throughout the development program, an environmental protection plan will be in existence, which will include monitoring and operational guidelines for offshore terminal facilities.

Regulation, standards and planning

Citation Source: Selected Water Resources Abstracts. 1975. 8(7). Entry #W75-03716.

C-1298-74
POLLUTANT SPILL PREVENTION AND CONTROL ACT (AS AMENDED)

Anonymous. 1974.
Florida Session Laws, Volume 4, Ch. 74-336. p. 812-822.

The act provides regulations for the prevention and control of the discharge of pollutants in Florida. Transfer of pollutants between vessels and between onshore and offshore facilities and vessels has been found to be hazardous. Provisions are outlined which preserve public use of national waters and promote general health, safety and welfare.

Oil handling
Regulations, standards and planning

Citation Source: Selected Water Resources Abstracts. 1975. 8(7). Entry #W75-03728.

C-1299-74
THE ROLE OF THE STATE IN DAMAGE ASSESSMENT - TENNESSEE, A CASE STUDY

Stratton, B. L. 1974.
Assessing the Social Impacts of Oil Spills, Rensselaerville, New York, 1973. p. 19-20.

The attorney for the Tennessee Fish and Game Commission has used the principle of commonlaw that the state is the owner of all wildlife to convince polluters to compensate for wildlife killed by pollution. The southern branch of the American Fisheries Society has an inventory of dollar values for fish.

Economic effects of oil pollution

Citation Source: Citation Journal.

2. NATIONAL LEGISLATION

C-1300-74
INTERNATIONAL COMPENSATION FUND FOR OIL POLLUTION DAMAGE

Anonymous. 1973.
U.S. Congress. Senate Committee on Foreign Relations. Subcommittee on Oceans and International Environment. 93rd Congress, 1st session, April 17-18, 1973. Washington, D.C., GPO. 208 p.

The texts of the Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage, the 1971 amendments to the 1954 Oil Pollution Convention, and Senate bill 5,841, the implementing legislation for the fund convention and the 1969 Civil Liability Convention are included, as are the statements by various witnesses in the hearings.

International legislation

Citation Source: Pollution Abstracts. 1975. 6(2). Entry #75-01691.

C-1301-74
LEGAL AND LEGISLATIVE

Anonymous. 1974.
National Conference on Control of Hazardous Material Spills, San Francisco, 1974. p. 1-37.

Six papers are presented which review the legal and legislative aspects of controlling hazardous material spills and alternatives in the development of spill prevention regulations. Spill prevention in bulk marine cargo is discussed and a listing of hazardous materials in order of their potential danger to the aquatic environment (according to certain criteria) are given.

Regulations, standards and planning

Citation Source: Environment Abstracts. 1975. 5(4). Entry #75-02823.

C-1302-74
NOT ON OUR SHORES

Anonymous. 1975.
Environmental Action 6(19):7.15.

The bill before the Senate on offshore drilling and some coastal states' reactions are presented. The Senate Commerce Committee is investigating the delayed progress of the U.S. Coast Guard in formulating standards for domestic oil tankers.

Regulations, standards and planning
Monitoring

Citation Source: Citation Journal.

C-1303-74
OFFSHORE OIL DRILLING AT SANTA BARBARA, PART 1

Anonymous. 1973.
U.S. Congress. House. Committee on Interior and Insular Affairs. Subcommittee on Mines and Mining, 93rd Congress, 1st Session, November 17, 1973. Hearings. 162 p.

Three bills limiting oil production in the Santa Barbara Channel were considered at the hearing. The bills would establish a federal ecological preserve on a portion of the outer continental shelf of Santa Barbara, provide a moratorium on drilling operations pending the development of technology to prevent pollution by oil discharges, and to improve methods of oil production from the submerged lands.

Citation Source: Selected Water Resources Abstracts. 1975. 8(9). Entry #W75-04784.

C-1304-74
INCREMENTAL BENEFITS AND COSTS OF COMPULSORY SEGREGATED BALLASTING REDUCING OIL POLLUTION OF THE SEA

Cheng, H.-S. 1974.
Assessing the Social Impact of Oil Spills, Rensselaerville, New York, 1973. p. 89-95.

A cost-benefit analysis of a U.S. tanker-design policy that would require all new tankers to have segregated ballasting indicates that incremental benefits are very small in comparison with incremental costs. The principal features of present U.S. policy, and incremental benefits and costs of that policy are outlined.

Design and engineering
Economic effects of oil prospecting and production

Citation Source: Citation Journal.

C-1305-74
MARINE OIL POLLUTION CONTROL

Lehr, W. E. 1974.
Technology Review 75(4):13-22.

The report deals with the regulations developed by the U.S. Coast Guard to reduce oil discharges, including requirements to maintain deck spill containment systems and emergency shut-down valves in oil transfer systems on ships. Reference is also given to legislation enacted to regulate intentional oil discharges and to the development of detection systems for marine pollutants.

Regulations, standards and planning

Citation Source: Selected Water Resources Abstracts. 1975. 8(6). Entry #W75-02950.

C-1306-74
MUST THE PEOPLE SUFFER - SHOULD LEGISLATION BE ENACTED TO PROVIDE A MEANS TO COMPENSATE PERSONS DAMAGED BY THE DISCHARGE OF OIL FROM VESSELS ON THE NAVIGABLE WATERS OF THE UNITED STATES?

Post, T. R. 1974.
Assessing the Social Impacts of Oil Spills, Rensselaerville, New York, 1973. p. 21-25.

In this article the current legal status of private citizens seeking oil pollution damage compensation and the relevant legal means for receiving compensation are described. A federal fund is suggested as a solution for provision of adequate compensation and for minimization of inadequacies under current maritime standards of liability.

Economic effects of oil pollution

Citation Source: Citation Journal.

C-1307-74
FEDERAL REGULATORY CONTROL OF OIL SPILL REMOVAL METHODS

Snyder, H. J., Jr. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 33-37.

The "Torrey Canyon" spill disaster triggered the development of federal regulatory controls for oil removal methods. The evolution of annexes for chemical use control is described, starting with the 1968 plan and finishing with the 1974 plan. The chemical and biological agent data requirements and the rationale for selecting these data are explained.

Cleanup and recovery

Citation Source: Citation Journal.

C-1308-74
OIL POLLUTION OF INLAND WATERS IN ENGLAND AND WALES

Toms, R. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 23-28.

The new Control of Pollution Act, 1974, is reviewed with particular attention to the actions authorities are allowed to take if oil pollution occurs in a river. Actions can include stopping oil discharges and cleanup and recovery. A survey of significant oil spill incidents is included.

Cleanup and recovery
Reporting
Foreign legislation

Citation Source: Citation Journal.

3. INTERNATIONAL LEGISLATION

C-1309-74
TRANSLATIONS ON THE LAW OF THE SEA. XIV

Anonymous. 1974.
JPRS-63365. Joint Publications Research Service. 48 p.

One of the translations from the Law of the Sea Conference concerns Chile's proposal for oil damage aid stations.

Restoration

Citation Source: Government Reports Announcements. 1975. 75(2). Entry #JPRS-63365.

C-1310-74
IMPACT OF THE 1973 IMCO CONVENTION ON SUPERTANKER POLLUTION PREVENTION

Benkert, W. M. 1974.
Super Ocean Carrier Conference, Proceedings, New York, New York, January 16-18, 1974. p. 46-61.

The paper summarizes and evaluates the impact of the provisions of the International Convention for the Prevention of Marine Pollution, 1973, as they apply to the prevention of marine pollution by supertankers.

Citation Source: The Engineering Index Monthly. 1975. 13(2). Entry #013899.

C-1311-74
INTERNATIONAL ACTIVITY RESPONDING TO OIL POLLUTION DAMAGE FROM VESSELS AT SEA

Busha, T. S. 1974.
Assessing the Social Impacts of Oil Spills, Rensselaerville, New York, 1973. p. 101-104.

Inter-governmental activity in prevention, control and compensation of vessel-source and other oil pollution is reviewed. The questions addressed include: How far-reaching and responsive are these activities? What influences guide their formulations and how effective are they? Are the activities genuinely victim-oriented?

Standards, regulations and planning

Citation Source: Citation Journal.

C-1312-74
POLLUTION CONTROL IN THE MARINE INDUSTRIES. REPORT ON THE FOURTH ANNUAL CONFERENCE OF THE INTERNATIONAL ASSOCIATION FOR POLLUTION CONTROL

Dick, R. I. 1975.
Water Research 9(5/6):601.

The Conference was held in Washington, D.C. on May 14, 1974, and included papers which discussed the prospects for ratification of the 1973 International Convention for the Prevention of Pollution from Ships. This Conference would revise the oil pollution provisions of the 1954 IMCO Convention and extend its coverage to the discharge of noxious liquid substances, harmful substances carried in package or container form, and sewage and garbage. Technical sessions included reports on techniques for controlling bilge water, spill prevention techniques and the assessment of the environmental impact of oil spills. Work of the Smithsonian Institution concerning a worldwide survey of existing pollution monitoring programs is described.

Regulations, standards and planning

Citation Source: Citation Journal.

C-1313-74
OFFSHORE OIL POLLUTION: LAW AND ENFORCEMENT

Jackson, R. D., Jr. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 3-10.

There is no effective international legal framework to deal with offshore oil pollution; nationalization of the sea is creating chaotic inconsistency. Voluntary industry action and joint government/industry consultation, cooperation and action are the only two present approaches dealing effectively and constructively with offshore oil pollution. A review of international law, national regimes and industry actions is given.

National legislation
Regulations, standards and planning

Citation Source: Citation Journal.

C-1314-74
THE LAW OF MARITIME OIL SPILLS

Pendegrass, J. 1973.
In: Sea Grant Publication, UNC-SG-73-01. p. 108-118.

The problem of oil pollution and the need for an international solution are described. Agreements made by the United Nations' Inter-Governmental Maritime Consultative Organization concerning the entity responsible for oil pollution damage at sea are discussed.

Citation Source: Selected Water Resources Abstracts. 1975. 8(9). Entry #W75-04770.

C-1315-74
LEGAL ASPECTS OF THE 1973 MARINE POLLUTION CONVENTION: COMMENTS AND REFLECTIONS

Wallace, S. A. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 11-14.

The 1973 Marine Pollution Convention is a legal instrument with the potential to curb pollution of the oceans, but also with a large number of legal and administrative, technical and scientific problems. The author uses examples to demonstrate the uncertainties, interpretive flexibility and hidden weaknesses of the legal aspects of the 1973 convention.

Citation Source: Citation Journal.

4. FOREIGN LEGISLATION

C-1316-74
CONSTRUCTION AND PROTECTION OF TANKS

Hurlimann, G. 1974.
Gesundheitstechnik 8(2):27-28.

A summary is given of the provisions of the Swiss decree which protects the waters from pollution resulting from tank installations.

Regulations, standards and planning

Citation Source: Environmental Health and Pollution Control. 1974. 6(6). Entry #2154.

C-1317-74
LAW CONCERNING MEASURES TO ASSURE THE DISPOSAL OF WASTE OIL (WASTE OIL LAW) DATED DECEMBER 23, 1968, AND ITS IMPLEMENTATION AS WELL AS AN ASSESSMENT OF ITS SUCCESSFUL WORKING TO DATE

Kruse, F. 1974.
Wasserwirtschaft-Wassertechnik 64(7-8):206-210.

The implementation of the Waste Oil Law in the German Federal Republic, which allows for the disposal of waste oils without damage to the environment, is discussed. The economic requirements of the regulation are reviewed.

Citation Source: Environmental Health and Pollution Control. 1975. 7(2). Entry #495.

C-1318-74
NATIONAL EFFORTS IN DEALING WITH OIL POLLUTION IN NORWEGIAN COASTAL WATERS AND AT SEA (OFFSHORE) AND THE NORDIC AGREEMENT BETWEEN NORWAY, DENMARK, FINLAND AND SWEDEN ON MEASURES AGAINST POLLUTION OF THE SEA BY OIL

Reichborn-Kjennerund, E. 1974.
Offshore North Sea 1974 Safety and Environmental Protection Conference, Stavanger, Norway, September 3-6, 1974. Paper No. S-II/2b. 7 p.

The Oil Damage Protection Act, 1970, has been supplemented by municipal regulations concerning the reporting of oil spills, etc. The Act enables laws to be made to avoid, prevent and limit oil pollution damage. The four-country agreement states that if one country is fighting an oil spill threatening its coast, it may call for help from the other three, particularly those countries which may also be affected.

International legislation

Citation Source: Petroleum Abstracts. 1975. 15(12). Entry #202,511.

H. BIBLIOGRAPHIES

C-1319-74
OIL SPILLAGE: A BIBLIOGRAPHY, VOL. 1

Anonymous. 1973.
U.S. Department of Interior Bibliography Series No. WRSIC 73-207. 390 p.

The bibliography, with abstracts and indexes, was selected from Selected Water Resources Abstracts. The data base had 52,230 abstracts from SWRA through February, 1973.

Citation Source: Petroleum Abstracts. 1975. 15(2). Entry #202,507.

C-1320-74
OCEAN LAW - A BIBLIOGRAPHY WITH ABSTRACTS

Brown, R. J. 1974.
Report for 1964 - October 1974. 139 p. NTIS/PS-74/134.

The NTISearch system has retrieved 123 selected abstracts of research reports covering national and international laws on fishing, undersea mining, shipping, undersea mineral deposits, and water pollution.

International legislation

Citation Source: Government Reports Announcements. 1975. 75(2). Entry #NTIS/PS-74/134.

C-1321-74
OFFSHORE DRILLING - A BIBLIOGRAPHY WITH ABSTRACTS

Habercom, G. E., Jr. 1974.
Supercedes COM-73-11353, NTIS/PS-74/103. 111 p.

There are 96 research reports abstracted in this NTISearch. The topics abstracted include drilling procedures, environmental aspects and legal implications of offshore drilling.

General effects of oil prospecting and production

Citation Source: Government Reports Announcements. 1975. 75(1). Entry #NTIS/PS-74/103.

C-1322-74
OFFSHORE STRUCTURES - A BIBLIOGRAPHY WITH ABSTRACTS

Habercom, G. E. 1974.
Report for 1964 - October, 1974. 82 p.

An NTISearch retrieved 66 abstracts of research reports related to the feasibility, design, ocean environment and environmental impact of offshore structures.

Citation Source: Government Reports Announcements. 1975. 75(2).
Entry #NTIS/PS-74/123.

C-1323-74
WATER POLLUTION ECONOMICS. A BIBLIOGRAPHY

Lehman, E. J. 1974.
Government Reports Announcements 74(26):150.

The bibliography contains 199 selected abstracts of research reports covering all aspects of the economics of water pollution control and management.

Economic effects of oil pollution

Citation Source: Petroleum Abstracts. 1975. 15(15).
Entry #203,535.

C-1324-74
OIL POLLUTION OF BIRDS: AN ABSTRACTED BIBLIOGRAPHY

Vermeer, R., and K. Vermeer. 1974.
Pesticide Section, Canadian Wildlife Service, Department of Environment, Ottawa, Ontario. Manuscript No. 29.

This bibliography is a comprehensive collection of 232 references, 200 of which are abstracted, with literature coverage up to the end of 1973.

Citation Source: Marine Pollution Bulletin. 1975. 6(1).

SECTION II. CURRENT STATUS OF SOME OF THE RESEARCH PROJECTS LISTED IN PREVIOUS REPORTS

A. OIL POLLUTION DETECTION AND EVALUATION

1. MONITORING

R-245-74
FATE, SPATIAL AND TEMPORAL DISTRIBUTION OF PETROLEUM DERIVED ORGANIC COMPOUNDS

Principal Investigator: Anderson, J. W.
Performing Organization: Texas A & M University System Center for Marine Resources, College Station, Texas 77843
Supporting Agency: IDOE
Period: 3/73 to 2/75 Funds: $103,000

The laboratory phase of the study is completed and efforts presently focus on field work.

Reports and Publications

LABORATORY STUDIES ON THE EFFECTS OF OIL ON MARINE ORGANISMS: AN OVERVIEW

Anderson, J. W. (ed.). 1975.
API Publication No. 4249. 70 p.

The effects of oil-water dispersions (OWD) and water-soluble fractions (WSF) on phytoplankton, crustaceans, and fish were analyzed. Physiological responses were measured, as were hydrocarbon accumulation and release.

PETROLEUM HYDROCARBONS

Anderson, J. W., R. C. Clark, and J. J. Stegeman. 1974.
In: Marine Bioassays Workshop. Proceedings. MTS, Washington, D.C. p. 36-75.

The authors have described the state-of-the-art of research investigating the uptake and depuration of petroleum hydrocarbons in marine organisms usable for human consumption. An outline is presented comparing biological and petroleum sources of various hydrocarbons, extraction techniques, and species lists of "natural" tissue hydrocarbon levels.

AN EXPERIMENTAL OIL SPILL: THE DISTRIBUTION OF AROMATIC HYDROCARBONS IN THE WATER, SEDIMENT AND ANIMAL TISSUES WITHIN A SHRIMP POND

Cox, B. A., J. W. Anderson, and J. C. Parker. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 607-612.

A high aromatic No. 2 fuel was experimentally spilled on a shrimp pond. Mortalities of shrimp and other invertebrates were observed over 96 hours. Peak mortality coincided with a peak in the concentration of naphthalenes. After 10 days in the laboratory, the shrimp released naphthalenes at near background levels; oysters took 47 to 97 days to decrease release of naphthalenes to near background levels.

ACCUMULATION, RELEASE AND DISTRIBUTION OF BENZO [A] PYRENE-C^{14} IN THE CLAM RANGIA CUNEATA

Neff, J. M., and J. W. Anderson. 1975.
Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 469-471.

After a 24-hour exposure to .0305 ppm benzo [a] pyrene-C^{14}, clam tissues were 200 times above the ambient level; most of the radioactivity was detected in the viscera. Release began as soon as the clams were placed in clean seawater. After 30 days, only .07 ppm radioactivity remained and release was complete in 58 days.

ACCUMULATION AND RELEASE OF PETROLEUM-DERIVED AROMATIC HYDROCARBONS BY MARINE ANIMALS

Neff, J. M.
Preprint for Symposium on the "Chemistry, Occurrence and Measurement of Polynuclear Aromatic Hydrocarbons," presented by the ACS Petroleum Division. 27 p.

The patterns of accumulation, body distribution, and release of petroleum-derived aromatic hydrocarbons have been investigated in marine molluscs, shrimp and fish.

RESULTS OF RESEARCH INTO THE EFFECTS OF SUBLETHAL CONCENTRATIONS OF SELECTED COMPOUNDS ON THE PHYSIOLOGICAL RESPONSE OF MARINE AND ESTUARINE ORGANISMS

Petrocelli, S. R., J. W. Anderson, W. M. Sackett, B. J. Presley, and C. S. Giam. 1974.
A summary of the progress report prepared for the IDOE Pollutant Effects Meeting, Sidney, B.C., Canada, August 11-15, 1974.

Acute effects (96 hour LC-50) and sublethal effects of different substances, including metals, plasticizers, and petroleum hydrocarbons, have been determined on several species of fish, crustaceans and molluscs. Data are presented in matrix form and the physiological effects of the different substances are discussed.

Information Source: J. W. Anderson, Department of Biology, Texas A & M University, College Station, Texas 77843.

2. ANALYSIS

R-248-74
STUDY TO CONDUCT A NATIONAL ASSESSMENT OF NONPOINT POLLUTION

Principal Investigators: McElroy, A. D., J. W. Nebgen, and S. Y. Chiu
Performing Organization: Midwest Research Institute, 425 Volker Blvd., Kansas City, Missouri 64110
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development
Period: 6/74 to 7/75 Funds: $250,000

Completion of this project is scheduled for August, 1975. No reports have been issued for distribution as yet. Two papers will be presented at the ASCE Meeting in Gainesville, July, 1975. No publications are planned. The titles of the two papers are: "Review of Methodology for Estimating Nonpoint Pollution Loads," and "Discussion of Use of Functions for Estimating Nonpoint Pollution, in Water Quality Planning," by A. D. McElroy, S. Y. Chiu, J. W. Nebgen, and A. Aleti.

Information Source: A. D. McElroy, Midwest Research Institute, 425 Volker Blvd., Kansas City, Missouri 64110.

R-264-74
IDENTIFICATION OF POLLUTANTS IN PETROLEUM REFINERY WASTE WATERS AFTER ACTIVATED SLUDGE TREATMENT

Principal Investigator: Keith, L. H.
Performing Organization: U.S. Environmental Protection Agency, National Environmental Research Center, Corvallis, Oregon 97330
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 07 ABL 04 Contract 72P18094
Period: 7/74 to 6/75 Funds: Unknown

Work is being continued on this project under EPA grant No. 803019. A final report from this first year's effort should be available in the summer, 1975.

Reports

EXTRACTION AND SEPARATION TECHNIQUES FOR PETROLEUM REFINERY WASTEWATERS

Keith, L. H. 1974.
In-house Summary Report, 27 September 1974 (unpublished).

Studies to develop the best extraction and separation techniques for organics in petroleum refinery waste waters are described.

Information Source: L. H. Keith, U.S. Environmental Protection Agency, Southeast Environmental Research Laboratory, Athens, Georgia 30601.

B. OIL POLLUTION CONTROL

1. CLEANUP AND RECOVERY

R-254-74
DEMONSTRATION OF NEW OIL SPILL REMOVAL EQUIPMENT

Principal Investigator: Trentacoste, N. P.
Performing Organization: JRB Associates, Incorporated., 1701 N. Fort Myer Dr., Arlington, Virginia 22209
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 68 03 Contract 72P21699
Period: 7/74 to 6/75 Funds: Unknown

Two projects have been recently completed under this study. The final reports are forthcoming.

Reports

DEVELOPMENT OF FAST CURRENT OIL RESPONSE SYSTEM, PHASE 1 - CONCEPT FEASIBILITY STUDY

Trentacoste, N. P.
Abstract of Final Report to U.S. Coast Guard, No. DOT-CG-40216-A.

The feasibility of using a new vented hydrofoil/polyurethane foam belt oil control/recovery system has been demonstrated. It is considered to be a viable method of controlling and cleaning up spilled oil.

SURFACE EFFECTS SKIMMER DEVELOPMENT

Trentacoste, N. P.
Abstract of Final Report to Environmental Protection Agency, Program Element No. 1B12041, Contract No. 68-03-0327

This experimental program was designed to determine the utility of the Surface Effects Skimmer (SES) in removing thin film oil slicks spread over large areas by fast currents. Tests conducted in a model tank yielded collection efficiencies from 60-80%, depending on the oil viscosity, tow speeds and wave heights.

Information Source: N. P. Trentacoste, Science Applications, Incorporated, 1600 Anderson Rd., McLean, Virginia 22101.

R-254a-74
TEST AND EVALUATION PROGRAM OF A NOVEL HIGH VELOCITY OIL SLICK SKIMMER

Principal Investigator: Unknown
Performing Organization: Hydronautics, Incorporated, 7210 Pindell School Rd., Laurel, Maryland 20810
Supporting Agency: Department of Transportation, U.S. Coast Guard
Period: 7/73 to 6/74 Funds: $21,460

Two technical reports resulting from the program for the development of a high velocity current oil recovery system have been completed. A third report has been submitted to the U.S. Coast Guard for review. A proposal for continuing the project is currently being evaluated.

Reports

DEVELOPMENT OF A NOVEL HIGH VELOCITY OIL SLICK SKIMMER

Lindenmuth, W. T. 1974.
Final Report to granting agency, Grant No. DOT-CG-41 058A.
U.S. Coast Guard Catalog No. AD-785 880/5WP.

A surface velocity retarder oil skimmer (SVROS), composed of an array of closely spaced flat plates, has in experimental investigations recovered oil from oil slicks in currents up to 10 fps. Test results of a prototype scale model are presented along with conclusions and recommendations.

FAST CURRENT OIL RESPONSE SYSTEM - STAGE I, SVROS DEVELOPMENT

Lindenmuth, W. T., T. R. Sundaram, and A. M. Sinnerwalla. 1975.
Final Report to granting agency, Grant No. DOT-CG-40218-A.

Tests were performed upon a scale model surface velocity retarder oil skimmer (SVROS); test variables included velocity, oil type, slick thickness and model geometry. Complete oil recovery was accomplished in velocities up to 5 fps with light fuel oil. Performance was found to degrade with increases in velocity, viscosity, and incident wave height.

Information Source: W. T. Lindenmuth, Hydronautics, Incorporated, 7210 Pindell School Rd., Laurel, Maryland 20810.

C. EFFECTS OF OIL POLLUTION

1. BIOLOGICAL EFFECTS

R-255-74
FIELD STUDIES OF EFFECTS OF OIL ON MARINE ORGANISMS

Principal Investigator: Anderson, J. W.
Performing Organization: Texas A & M University System, Center for Marine Resources, College Station, Texas 77843
Supporting Agency: American Petroleum Institute
Period: 3/74 to 12/75 Funds: $234,000

See R-245-74. Section A(1).

R-074-74 (Renewal)
FATE AND EFFECT OF OIL IN THE ENVIRONMENT OF THE COASTAL GULF OF MEXICO

Principal Investigator: Brown, L. R.
Performing Organization: Mississippi State University, School of Arts, State College, Mississippi 39762
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development
Period: 7/74 to 6/75 Funds: Unknown

The project has been renewed.

Information Source: L. R. Brown, College of Arts and Sciences, Mississippi State University, Mississippi State, Mississippi 39762.

R-259-74
SUBLETHAL BIOCHEMICAL EFFECTS OF CONTAMINANTS

Principal Investigator: Malins, D. C.
Performing Organization: Northwest Fisheries Center, 2725 Montlake Blvd. East, Seattle, Washington 98112
Supporting Agency: Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service
Period: 7/74 to 6/75 Funds: Unknown

<u>Reports and Publications</u>

INTERAGENCY INVESTIGATIONS OF A PERSISTENT OIL SPILL ON THE WASHINGTON COAST

Clark, R. C., Jr., and J. S. Finley. 1973.
Joint Conference on Prevention and Control of Oil Spills, Washington, D.C., 1973. p. 793-808.

The report describes the preliminary findings of a 10-month investigation conducted by an interagency team of scientists and engineers on the long-term effects of oil spilled by the grounding of a troopship (General M. C. Meigs, 1972) on an ocean coast, intertidal faunal and floral community. The study revealed that n-paraffin hydrocarbons were taken up by the plants and animals. Several plant species and the urchin, *Strongylocentrotus purpuratus*, were seriously affected.

PARAFFIN HYDROCARBON PATTERNS IN PETROLEUM POLLUTED MUSSELS

Clark, R. C., Jr., and J. S. Finley. 1973.
Marine Pollution Bulletin 4(11):172-176.

The paper describes modern analytical techniques used to detect hydrocarbons at extremely low concentrations in marine organisms and to estimate the quantity of petroleum pollution uptake in the organisms.

TECHNIQUES FOR ANALYSIS OF PARAFFIN HYDROCARBONS AND FOR INTERPRETATION OF DATA TO ASSESS OIL SPILL EFFECTS IN AQUATIC ORGANISMS

Clark, R. C., Jr., and J. S. Finley. 1973.
Joint Conference on Prevention and Control of Oil Spills, Washington, D.C., 1973. p. 161-172.

The feasibility of using aquatic organisms which originally contained biogenic paraffin hydrocarbons as indicators of petroleum pollution is reported. The analytical technique used to isolate and identify n-paraffin hydrocarbons from plant, animal, and petroleum and sediment samples is described.

METHODS FOR ESTABLISHING LEVELS OF PETROLEUM CONTAMINATION IN ORGANISMS AND SEDIMENT AS RELATED TO MARINE POLLUTION MONITORING

Clark, R. C., Jr. 1974.
Presented at Marine Pollution Monitoring Symposium and Workshop, Gaithersburg, Maryland, May 13-17, 1974.

The accuracy of petroleum analyses of marine organisms is discussed with special reference to background hydrocarbon contamination in laboratory chemicals, solvents, and materials.

ACUTE EFFECTS OF OUTBOARD MOTOR EFFLUENT ON TWO MARINE SHELLFISH

Clark, R. C., Jr., and J. S. Finley. 1974.
Environmental Science and Technology 8(12):1009-1014.

Mussels (Mytilus edulis) exposed to diluted two-cycle outboard motor effluent in seawater displayed physiological stress, degeneration of gill tissue, and uptake of paraffin hydrocarbons from the effluent. Mussel response to the pollutant was immediate and mortality was delayed significantly after removal from the pollutant. Oysters (Ostrea ida) were less affected by the pollutant.

ANALYTICAL TECHNIQUES FOR ISOLATING AND QUANTIFYING PETROLEUM PARAFFIN HYDROCARBONS IN MARINE ORGANISMS

Clark, R. C., Jr., and J. S. Finley. 1974.
Presented at Marine Pollution Monitoring Symposium and Workshop, Gaithersburg, Maryland, May 13-17, 1974.

The use of normal paraffin hydrocarbons as tracers or indicator compounds for petroleum pollution is discussed.

TIDAL AQUARIUM FOR LABORATORY STUDIES OF ENVIRONMENTAL EFFECTS ON MARINE ORGANISMS

Clark, R. C., Jr., and J. S. Finley. 1974.
The Progressive Fish-Culturist 36(3):134-137.

A laboratory test chamber for studying the effects of an oil slick on intertidal organisms was constructed. The test chamber simulated tidal conditions, was free from extraneous hydrocarbon contamination, and could hold a number of small intertidal organisms for short-term (36 to 96 hours) bioassay studies.

PETROLEUM ABSORPTION AND RELEASE AND EFFECTS IN MARINE ORGANISMS

Stansby, M. E. 1974.
Presented at Marine Pollution Monitoring Symposium and Workshop, Gaithersburg, Maryland, May 13-17, 1974.

Studies have been conducted exploring the manner in which petroleum hydrocarbons are picked up, retained, and released by marine organisms, especially at the cellular level. Using carbon 14 radioisotopic and spin labeling techniques, it has been determined that aromatic hydrocarbons seek the hydrophobic, lipid-rich cell membrane interior.

Information Source: D. C. Malins, Northwest Fisheries Center, 2725 Montlake Blvd. East, Seattle, Washington 98112.

2. GENERAL EFFECTS

R-266-74
ASSESSMENT OF DAMAGE DUE TO OIL SPILLS

Principal Investigator: Enk, G. A.
Performing Organization: Institute on Man and Science, Rensselaerville, New York 12147
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 802619 Contract 72P21520
Period: 7/74 to 6/75 Funds: Unknown

The Institute's program has been completed.

Reports and Publications

ASSESSING THE SOCIAL IMPACTS OF OIL SPILLS

Enk, G. A. (Project Director). 1974.
Proceedings of an Invitational Symposium Co-sponsored by The Institute on Man and Science and the U.S. Environmental Protection Agency, Rensselaerville, New York, September 25-28, 1973. 129 p.

This report presents the results of an invitational symposium held to encourage the development of techniques and methodologies in assessing the social impacts of oil spills. The goal of the symposium was to initiate discussions between environmentalists, corporate executives, government representatives, and scientists concerning oil pollution effects.

Information Source: G. A. Enk, Director of Economic and Environmental Studies, The Institute on Man and Science, Rensselaerville, New York 12147.

D. FATE OF OIL IN THE ENVIRONMENT

1. BIOLOGICAL DEGRADATION

R-099-74 (Renewal)
THE IMPACT OF MICROORGANISMS ON OIL

Principal Investigator: Meyers, S. P.
Performing Organization: Louisiana State University, School of Agriculture, Baton Rouge, Louisiana 70803
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 800993 Contract 72P14726
Period: 7/74 to 6/75 Funds: Unknown

Reports and Publications (no summaries available)

MICROBIOLOGY OF THE CORDGRASS, SPARTINA ALTERNIFLORA

Alexander, S. K., and S. P. Meyers.
Paper to be presented at forthcoming American Society for Microbiology Meetings, New York City.

IMPACT OF THE USE OF MICROORGANISMS ON THE AQUATIC ENVIRONMENT

Bourquin, A. W., D. G. Ahearn, and S. P. Meyers (eds.). 1975.
EPA Report, 660-3-75-001.

MICROBIAL INDICATORS OF OIL-RICH SEDIMENTS

Hood, M. A., W. S. Bishop, Jr., F. W. Bishop, S. P. Meyers, and T. Whelan, III.
Paper to be presented at forthcoming American Society for Microbiology Meetings, New York City.

MICROBIAL/CHITINOLYTIC PROCESSES IN THE PHYSIOLOGY OF PENAEIDS

Meyers, S. P., and M. A. Hood. 1975.
Paper to be presented at the Workshop on the Pathology and Toxicity of Penaeid Shrimp, Galveston, Texas, April 8-10, 1975.

Information Source: S. P. Meyers, Louisiana State University Station, P.O. Box 19090-A, Baton Rouge, Louisiana 70803.

R-260-74
NAVY ENVIRONMENT: BIOLOGY OF THE MARINE ENVIRONMENT

Principal Investigators: Vedros, N. A., and A. B. Cobet
Performing Organization: University of California, School of Public Health, Berkeley, California 94720
Supporting Agency: U.S. Department of Defense, Navy DN023238, Contract N00014-69-A-0200-1001
Period: 7/74 to 6/75 Funds: $100,000

Research on the fate and effects of petroleum hydrocarbons in San Francisco Bay is being conducted.

Reports and Publications

HYDROCARBONS OF SUSPECTED POLLUTANT ORIGIN IN AQUATIC ORGANISMS OF SAN FRANCISCO BAY: METHODS AND PRELIMINARY RESULTS

DiSalvo, L. H., H. E. Guard, L. Hunter, and A. B. Cobet. 1973. Louisiana State University Sea Grant Publication, LSU-SG-73-01. p. 206-220.

Chromatographic methods have been used to analyze the hydrocarbon content of selected Bay animals in an effort to investigate the fate and effects of petroleum components in marine waters. Bay animals were shown to have a substantially higher hydrocarbon content than closely related clean-water organisms collected from other relatively unpolluted California waters.

HYDROCARBONS ASSOCIATED WITH SUSPENDED PARTICULATE MATTER IN SAN FRANCISCO BAY WATERS

DiSalvo, L. H., H. E. Guard, and B. Vince. 1975. Conference on Prevention and Control of Oil Pollution, San Francisco, 1975. p. 169-173.

Suspended sediments were collected using a double-settling tube called the "biosampler;" mussels in one of the tubes actively entrapped the particles. Thin-layer chromatography was utilized to analyze total alkane and total aromatic hydrocarbon content in the sediments. Using the minimum values, it was calculated that 13.5 metric tons of pollutant hydrocarbons were associated with the suspended particulates in the Bay.

TISSUE HYDROCARBON BURDEN OF MUSSELS AS POTENTIAL MONITOR OF ENVIRONMENTAL HYDROCARBON INSULT

DiSalvo, L. H., H. E. Guard, and L. Hunter. 1975. Environmental Science and Technology 9(3):247-251.

Data are presented on the hydrocarbon content of mussels collected from stations in San Francisco Bay and in clean water, hydrocarbon uptake by unpolluted mussels, hydrocarbon loss when polluted mussels are transferred to clean water, and the result of placing these transports back in their home waters.

QUANTITATION OF ENVIRONMENTAL HYDROCARBONS BY THIN-LAYER CHROMATOGRAPHY-GRAVIMETRY-DENSITOMETRY COMPARISON

Hunter, L. 1975.
Environmental Science and Technology 9(3):241.

Low levels of hydrocarbons can be analyzed by both gravimetric and densitometric thin-layer chromatography. Alkanes and aromatics are easily separated. The gravimetric procedure produces more quantitatively precise results. These methods are being used in chronically polluted San Francisco Bay and may be used for marine sediments as well.

Information Source: L. H. DiSalvo, Naval Biomedical Research Laboratory, Naval Supply Center, Oakland, California 94625.

E. LEGAL ASPECTS OF OIL POLLUTION

R-268-74
POLLUTION CONTROL - LEGAL INCENTIVE

Principal Investigators: Irwin, W. A., and F. H. Abel
Performing Organization: Environmental Law Institute, 1346 Connecticut Ave., N.W., Washington, D.C. 20036
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 68-01-2203
Period: 7/74 to 6/75 Funds: Unknown

Publications and Reports

ECONOMIC DISINCENTIVES FOR POLLUTION CONTROL: LEGAL, POLITICAL AND ADMINISTRATIVE DIMENSIONS

Irwin, W. A., and R. A. Liroff. 1974.
EPA Report, EPA-600/5-74-026, Contract No. 68-01-2203

"The constitutionality of federal or state imposition of disincentives is examined and the authority of the U.S. Environmental Protection Agency and the states to utilize disincentives under selected Federal environmental statutes is analyzed."

USED OIL LAW IN THE UNITED STATES AND EUROPE

Irwin, W. A., and R. A. Liroff. 1974.
EPA Report, EPA-600/5-74-025, Contract No. 68-01-2203.

Existing information on the collection and disposal of used automotive and industrial oils and the potential health risks of improperly disposed oils are reviewed. State and federal oil disposal laws and reprocessed oil laws are analyzed. A comprehensive plan to regulate used oil collection and disposal is discussed.

Information Source: W. A. Irwin, The Environmental Law Institute, Dupont Circle Bldg., 6th Floor, 1346 Connecticut Ave., N.W., Washington, D.C. 20036.

SECTION III. CURRENT RESEARCH PROJECTS

A. OIL POLLUTION DETECTION AND EVALUATION

1. MONITORING

R-167-74 (Renewal)
PASSIVE TAGGING OF OILS BY FLUORESCENCE SPECTROPHOTOMETRY

Principal Investigator: Gruenfeld, M.
Performing Organization: U.S. Environmental Protection Agency, National Environmental Research Center, 5555 Ridge Avenue, Cincinnati, Ohio 45213
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 21 AOE 06 Contract 72P17898
Period: 10/73 to 9/74 Funds: Unknown

The project will determine whether fluorescence spectrophotometry is a usable means for measuring oil parameters in the presence of weathering. A rapid method will be developed to test oils if the initial effort proves successful.

SSIE No.: ZMA-662-1.

R-168-74 (Renewal)
PASSIVE TAGGING OF WATER DISPERSED OILS

Principal Investigator: Gruenfeld, M.
Performing Organization: U.S. Environmental Protection Agency, National Environmental Research Center, 5555 Ridge Avenue, Cincinnati, Ohio 45213
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 21 AOE 07 Contract 72P17899
Period: 7/73 to 6/74 Funds: Unknown

The contract provides for the use of spectroscopic and chromatographic techniques for passive tagging of trace levels of water dispersed oils.

SSIE No.: ZMA-665-1.

R-028-74 (Renewal)
CHARACTERIZATION OF INFRARED SPECTRA OF HEAVY PETROLEUM PRODUCTS VIA STATISTICAL ANALYSIS

Principal Investigator: Kawahara, F. K.
Performing Organization: U.S. Environmental Protection Agency, National Environmental Research Center, 5555 Ridge Avenue, Cincinnati, Ohio 45213

Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 16 AJA 04 Contract 72P18089
Period: 7/73 to 6/74 Funds: Unknown

Methods are being developed to characterize petroleum products using infrared absorbance measurements and mathematical procedures. Using these techniques, the source of spills may be identified.

SSIE No.: AO-18089-1.

R-269-74
SURVEY OF INSTRUMENTATION FOR ENVIRONMENTAL MONITORING

Principal Investigator: Mack, D. A.
Performing Organization: Lawrence Berkeley Laboratory, Berkeley, California 94720
Supporting Agency: U.S. Energy Research and Development Administration, Biomedical and Environmental Research Division, No. W-7405-ENG-48
Period: 7/74 to 6/75 Funds: Unknown

"Instrumentation for Environmental Monitoring," Lawrence Berkeley Laboratory Report LBL-1, has been compiled based upon results of an in-depth survey of instrumentation for environmental monitoring. The environmental problems and methods and instrumentation to deal with oil and grease are topics covered in Volume 2, entitled "Water Monitoring."

SSIE No.: ZPE-10974.

R-270-74
SOURCE, TRANSPORT, AND FATE OF PETROLEUM HYDROCARBONS IN MARINE EFFLUENT

Principal Investigator: Quinn, J. G.
Performing Organization: University of Rhode Island, School of Oceanography, Administration Building, Kingston, Rhode Island 02881
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Sea Grant Office, No. 04-5-158-6
Period: 7/74 to 6/75 Funds: $19,739

The source and amount of petroleum hydrocarbons entering the Providence River from Field's Point sewage treatment plant will be determined and the association between petroleum hydrocarbons and humic-like substances in sewage effluent, suspended matter, and Providence River and upper Narragansett Bay sediments will be investigated.

SSIE No.: GBP-1577.

R-271-74
SHIPBOARD WASTEWATER OIL DETECTOR

Principal Investigator: Unknown
Performing Organization: Baird-Atomic, Inc., Government Systems Division, 125 Middlesex Turnpike, Bedford, Massachusetts 01730
Supporting Agency: Department of Transportation, U.S. Coast Guard
Period: 7/73 to 10/74 Funds: Unknown

The project's objective is to study oil-water mixing systems and oil fluorescence characteristics, and to design, assemble and test a monitoring system for shipboard wastewater oil detection.

Design and engineering

Information Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #038989.

R-272-74
SHIPBOARD WASTE-WATER OIL DETECTOR

Principal Investigator: Unknown
Performing Organization: Enviro Control, Inc., 960 Thompson Ave., Rockville, Maryland 20852
Supporting Agency: Department of Transportation, U.S. Coast Guard
Period: 7/73 to 7/74 (est.) Funds: Unknown

The following tasks are to be accomplished by this contract: (I) System design, (II) Electrical design, (III) Modify sensor, (IV) Order hardware and parts, (V) Determine test program, (VI) Assemble test system, (VII) Refinement of design, (VIII) Test system, (IX) Final assembly of breadboard, (X) Prepare operating manual and reports.

Design and engineering

Information Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #045014.

2. REMOTE SENSING

R-273-74
WATER QUALITY AND POLLUTION SENSING

Principal Investigator: Graves, G. B.
Performing Organization: U.S. National Aeronautic and Space Administration, Langley Research Center, Hampton, Virginia 23365
Supporting Agency: U.S. National Aeronautic and Space Administration, Aeronautics and Space Technical Office, Langley Research Center
Period: 7/74 to 6/75 Funds: Unknown

Remotely observable characteristics of water pollution and water quality indicators will be determined in order to develop remote sensing techniques for water pollution identification, quantification and mapping. Instrumentation to be used for collecting pollution data will be a multichannel ocean color sensor used in conjunction with a Hadamard transform spectrometer.

SSIE No.: ZH-41580.

R-274-74
PROTOTYPE SENSOR SYSTEM

Principal Investigator: Jakobson, K.
Performing Organization: Department of Transportation, U.S. Coast Guard, 1300 E. St., N.W., Washington, D.C. 20591
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. IAG 074 Contract 72P21162
Period: 7/74 to 6/75 Funds: Unknown

An ultraviolet-fluorescence-technique prototype sensor to be used to detect, measure, identify and classify water surface oil pollutants under all light and weather conditions is to be developed and evaluated.

SSIE No.: AO-21162.

R-275-74
HIGH RESOLUTION ENVIRONMENTAL SENSORS

Principal Investigator: Kim, H. H.
Performing Organization: U.S. National Aeronautics and Space Administration, Wallops Station, Chincoteague, Virginia 23337

Supporting Agency: U.S. National Aeronautics and Space Administration, Space Science Office, Wallops Station, No. 506-18-15 7570288
Period: 7/74 to 6/75 Funds: Unknown

The use of lasers for measurements of ocean depth fertility and oil spills will be investigated.

SSIE No.: ZH-41414.

R-276-74
REMOTE SENSING OF FLOATING ICE - OIL POLLUTION IN ICE-INFESTED WATERS

Principal Investigators: Ramseier, R., M. Vant, R. Gray, and W. Chudobiak
Performing Organization: Carleton University, Ottawa, Ontario, Canada
Supporting Agency: Canadian Government, Department of Environment
Period: 7/74 to 6/75 Funds: Unknown

"Interpretation of passive and active microwave signatures of floating ice (sea and freshwater ice). Interaction of crude oil with ice. Movement, aging, and cleanup."

SSIE No.: AW-826.

R-277-74
OCEAN-DYNAMICS--SEA STATE

Principal Investigator: Strong, A.
Performing Organization: U.S. Department of Commerce, National Environmental Satellite Service, Rockville, Maryland 20852
Supporting Agency: U.S. Department of Commerce, National Environmental Satellite Service
Period: 7/73 to 8/74 Funds: Unknown

Satellite data will be used to determine sea-surface roughness and low-level wind speeds. Oil slicks can be detected from ERTS data using this system when solar elevation exceeds 50 degrees.

SSIE No.: ZBP-848.

R-278-74
OCEAN DYNAMICS - WATER COLOR

Principal Investigator: Strong, A.
Performing Organization: U.S. Department of Commerce, National Environmental Satellite Service, Rockville, Maryland 20852
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Environmental Satellite Service
Period: 7/73 to 8/74 Funds: Unknown

ERTS and VHRR-VIS data will be analyzed for water color signatures resulting from pollutants (including oil spills), biological material, riverine effluents and geochemical suspensions.

SSIE No.: ZBP-847.

R-279-74
AIRBORNE OIL SURVEILLANCE SYSTEM

Principal Investigator: Unknown
Performing Organization: U.S. Navy Research Laboratory, Washington, D.C. 20390
Supporting Agency: Department of Transportation, U.S. Coast Guard
Period: 7/74 to 6/75 Funds: Unknown

The use of microwave radiometric sensors for determining oil slick thickness and/or slick volume will be analyzed and evaluated.

SSIE No.: GZ-48954-1.

R-280-74
DEVELOPMENT OF A LIDAR POLARIMETER SENSOR FOR REMOTE DETECTION AND MONITORING OF OIL AND OTHER HAZARDOUS MATERIAL

Principal Investigator: Unknown
Performing Organization: Texas A & M Research Foundation, Box H, College Station, Texas 77843
Supporting Agency: Department of Transportation, U.S. Coast Guard
Period: 6/73 to 12/74 (est.) Funds: Unknown

The contract provides for the design, construction, operational testing and evaluation of a Lidar Polarimeter Sensor.

Design and engineering

Information Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #045017.

3. ANALYSIS

R-281-74
RESEARCH ON CHROMATOGRAPHY

Principal Investigator: Becker, D. A.
Performing Organization: U.S. Department of Commerce, National Bureau of Standards, Washington, D.C. 20234
Supporting Agency: U.S. Department of Commerce, National Bureau of Standards, No. 310-5191
Period: 7/74 to 6/75 Funds: Multiple support, $274,000

Techniques of chromatographic separation and analysis will be developed to quantitatively determine trace levels of petroleum hydrocarbons, especially aromatic hydrocarbons, and analytical values for existing levels of crude oil pollution in the environment will be established.

SSIE No.: ZBA-6367.

R-282-74
IDENTIFICATION AND MONITORING OIL SPILLS

Principal Investigator: Brown, C. W.
Performing Organization: University of Rhode Island, School of Arts, Administration Building, Kingston, Rhode Island 02881
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Sea Grant Office
Period: 7/74 to 6/75 Funds: $13,598

Infrared identification techniques for identifying and monitoring petroleum products on surface waters will be developed and tested. Identification techniques will include changes in petroleum due to weathering.

Monitoring

SSIE No.: GBP-1573.

R-283-74
PETROLEUM CONTAMINATION-QUANTIFICATION AND PASSIVE TAGGING IN ORGANISMS AND SEDIMENTS

Principal Investigator: Farrington, J. W.
Specialty: Chemistry
Performing Organization: Woods Hole Oceanographic Institution, Woods Hole, Massachusetts 02543

Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 802724 Contract 72P21544
Period: 7/74 to 6/75 Funds: Unknown

Relatively simple, reliable analytical methods will be developed for routine use to quantify petroleum contamination at the 1 ppm level (wet weight) of marine organisms and aquatic sediments, and to correlate it with sources of contamination--"passive tagging." An evaluation of selectivity and sensitivity of column chomatography, thin-layer chromatography, gas chromatography, and U.V. fluorescence analysis will be conducted.

SSIE No.: AO-21544.

R-167-74 (Renewal)
EXTRACTION OF OIL FROM SEDIMENT FOR QUANTITATION SPECTROSCOPIC ANALYSIS

Principal Investigator: Gruenfeld, M.
Performing Organization: U.S. Environmental Protection Agency, National Environmental Research Center, 5555 Ridge Avenue, Cincinnati, Ohio 45213
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 21 AOE 03 Contract 72P17897
Period: 7/73 to 6/74 Funds: Unknown

A technique is sought which can rapidly extract small amounts of oils from sediments. Extracted oils are to be analyzed using infrared, ultraviolet or fluorescence spectrophotometry.

Sampling

SSIE No.: ZMA-663-2.

R-185-74 (Renewal)
QUANTITATIVE ANALYSIS OF OIL BY INFRARED SPECTROPHOTOMETRY

Principal Investigator: Gruenfeld, M.
Performing Organization: U.S. Environmental Protection Agency, Edison Water Quality Research Laboratory, 5555 Ridge Avenue, Cincinnati, Ohio 45268
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 21 AOE 02 Contract 72P17896
Period: 7/73 to 6/74 Funds: Unknown

Application of infrared spectrophotometry for the quantitative analysis of oil will be assessed.

SSIE No.: ZMA-664-2.

R-284-74
ESTABLISH AND IMPROVE NEUTRON ACTIVATION ANALYSIS CAPABILITY

Principal Investigator: Hoover, T. B.
Performing Organization: U.S. Environmental Protection Agency, National Environmental Research Center, Corvallis, Oregon 97330
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 16 ADN 42 Contract 72P18274
Period: 7/74 to 6/75 Funds: Unknown

Application of neutron activation analysis to environmental samples for such tasks as oil identification will be assessed.

SSIE No.: AO-18274-1.

R-027-74 (Renewal)
ANALYSES OF ASPHALTS BY ELECTRON CAPTURE DETECTOR GAS CHROMATOGRAPHY

Principal Investigator: Kawahara, F. K.
Performing Organization: U.S. Environmental Protection Agency, National Environmental Research Center, 5555 Ridge Avenue, Cincinnati, Ohio 45213
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 16 AJA 03 Contract 72P18088
Period: 7/73 to 6/74 Funds: Unknown

Minor components of asphalts are being analyzed using a gas chromatographic method. The use of gas chromatography will be analyzed with electron capture detector methods.

SSIE No.: AO-18088-1.

R-028-74 (Renewal)
EXAMINATION OF CHEMICAL AND PHYSICAL PROPERTIES OF ALL TYPES AND SOURCES OF OILS AND PRODUCTS BY VARIOUS TYPES OF INSTRUMENTATION

Principal Investigator: Kawahara, F. K.
Performing Organization: U.S. Environmental Protection Agency, National Environmental Research Center, 5555 Ridge Avenue, Cincinnati, Ohio 45213
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development
Period: 7/73 to 6/74 Funds: Unknown

All types of oils and oil products will be examined by various instrumental methods to determine chemical and physical properties which are useful in identification techniques and methods.

SSIE No.: AO-18091-1.

R-285-74
IDENTIFICATION OF POLLUTANTS IN PETROLEUM REFINERY WASTEWATERS AFTER ACTIVATED SLUDGE TREATMENT

Principal Investigator: Keith, L. H.
Performing Organization: U.S. Environmental Protection Agency, National Environmental Research Center, Corvallis, Oregon 97330
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 07 ABL 04 Contract 72P18094
Period: 7/74 to 6/75 Funds: Unknown

Qualitative and quantitative analyses will be made for specific organic pollutants in petroleum refinery waste water before, during and after all phases of biological treatment (activated sludge). Identified compounds will be listed in computer libraries and this information will be used in programs of surveillance analysis, treatment effectiveness evaluation, and in setting effluent criteria.

Waste water treatment

SSIE No.: AO-18094-1.

R-286-74
OIL TAGGING SYSTEM STUDY

Principal Investigator: Meloy, T. P.
Performing Organization: Meloy Laboratories Incorporated, 6715 Electronic Dr., Springfield, Virginia 22151
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 58-01-0500 Contract 72P19308
Period: 7/74 to 6/75 Funds: Unknown

Summary provided to SSIE appears to be in disagreement with subject of title.

SSIE No.: A-19308.

R-287-74
DEVELOPMENT AND METHODS OF ANALYSIS FOR PESTICIDES, METALS, ETC., AND THE IDENTIFICATION OF OIL POLLUTANTS

Principal Investigator: Mitchell, N. T.
Performing Organization: Ministry of Agriculture, Lowestoft, England, United Kingdom

Supporting Agency: United Kingdom Government
Period: 7/73 to 6/74 Funds: Unknown

No summary provided by SSIE.

SSIE No.: WDQ-761.

R-187-74 (Renewal)
DEVELOP METHOD FOR OIL FINGERPRINTING BY NEUTRON ACTIVATION ANALYSIS

Principal Investigator: Moore, R. V.
Performing Organization: U.S. Environmental Protection Agency, Southeast Environmental Research Laboratory, College Station Rd., Athens, Georgia 30601
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 24AAP-05
Period: 7/72 to 6/73 Funds: $17,500

A method for identifying the source of spilled oils is being developed by comparing characteristic ratios of elements as determined by neutron activation analysis.

SSIE No.: ZMA-677.

R-288-74
HYDROCARBONS IN MARINE WATERS - PORT VALDEZ, ALASKA

Principal Investigator: Shaw, D. G.
Performing Organization: University of Alaska, Institute of Marine Sciences, Fairbanks, Alaska 99701
Supporting Agency: Petroleum Industry Research Foundation
Period: 7/74 to 6/75 Funds: Unknown

"Baseline data and development of techniques."

SSIE No.: AW-668.

R-190-74 (Renewal)
METHODS FOR SSMS FINGERPRINTING OF OILS

Principal Investigator: Taylor, C. E.
Performing Organization: U.S. Environmental Protection Agency, National Environmental Research Center, Corvallis, Oregon 97330
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development
Period: 7/73 to 6/74 Funds: Unknown

The feasibility of using spark source mass spectrometry to provide stable fingerprinting of oils (unaffected by weathering) is being investigated.

SSIE No.: ZMA-709-1.

R-289-74
ANALYSIS OF WATER FOR POLYCYCLIC AROMATIC HYDROCARBONS (PAH)

Principal Investigator: Unknown
Performing Organization: Water Research Association, Medmenham, London, United Kingdom
Supporting Agency: United Kingdom Government
Period: 7/74 to 6/75 Funds: Unknown

No summary provided by SSIE.

SSIE No.: WDQ-1205.

R-290-74
DETERMINATION OF POLYCYCLIC AROMATIC HYDROCARBONS

Principal Investigator: Unknown
Performing Organization: Water Research Association, Medmenham, London, United Kingdom
Supporting Agency: United Kingdom Government
Period: 7/74 to 6/75 Funds: Unknown

No summary provided by SSIE.

SSIE No.: WDQ-1182.

B. OIL POLLUTION CONTROL

1. CONTAINMENT

R-291-74
FLOATING BREAKWATERS

Principal Investigator: Kowalski, T.
Performing Organization: University of Rhode Island, School of Engineering, Administration Building, Kingston, Rhode Island 02881
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Sea Grant Office, No. 04-5-158-6
Period: 7/74 to 6/75 Funds: $33,410

Floating breakwater research will be conducted for the protection of oil booms which contain oil spills and for the prevention of beach erosion.

Research

SSIE No.: GBP-1579.

R-292-74
DETERMINE PHYSICAL PARAMETERS WHICH EFFECT OIL SPILL CONTAINMENT

Principal Investigator: Unknown
Performing Organization: U.S. Environmental Protection Agency, National Environmental Research Center, 5555 Ridge Avenue, Cincinnati, Ohio 45213
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 21 AOH 03 Contract 72P17903
Period: 7/74 to 6/75 Funds: Unknown

No summary provided by SSIE.

SSIE No.: AO-17903.

R-293-74
HYDRODYNAMIC STUDY OF POROUS BARRIERS AND THE DISC-DRUM OIL RECOVERY MECHANISM

Principal Investigator: Unknown
Performing Organization: Texas A & M University System, Graduate School, College Station, Texas 77843

Supporting Agency: Department of Transportation, U.S. Coast Guard
Period: 7/74 to 6/75 Funds: Unknown

"A computer simulation of the governing equations for the one-dimensional theory will be performed. Both single and multiple barrier configurations will be studied. The effect of oil thickness, water and oil velocity, and oil type will be considered with the purpose of determining values of k, the pressure drop coefficient, which will be required. Concurrent with the computer analysis, a closed loop pressure drop rig will be designed and fabricated."

SSIE No.: GZ-55593.

R-294-74
SEQUENTIAL AIRDROP PROGRAM

Principal Investigator: Unknown
Performing Organization: U.S. Air Force Flight Test Center, Edwards Air Force Base, Edwards, California 93523
Supporting Agency: Department of Transportation, U.S. Coast Guard
Period: 7/74 to 6/75 Funds: Unknown

The sequential airdrop capability of the U.S. Coast Guard oil containment barrier aerial delivery system will be developed and demonstrated.

SSIE No.: GZ-55594.

R-295-74
DEVELOPMENT OF A STREAMLINED OIL RETENTION BOOM

Principal Investigators: Wooten, D. C., B. A. Folsom, and G. Carver
Performing Organization: Ultrasystems, Incorporated, 500 Newport Center Dr., Suite 800, Newport Beach, California 92660
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 68-03-0403
Period: 7/74 to 6/75 Funds: Unknown

An oil retention boom capable of operating in high currents (up to 8 knots) will be designed.

SSIE No.: GMA-1858.

2. CLEANUP AND RECOVERY

R-066-74 (Renewal)
DEMONSTRATION OF OILY WASTE DISPOSAL BY SOIL CULTIVATION PROCESS

Principal Investigator: Baldwin, B.
Performing Organization: Shell Oil Co., Deer Park, Texas
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 12050 EZG Contract 72P21245
Period: 7/73 to 6/74 Funds: Unknown

In a series of experiments oily sludges (crude tank bottoms, Bunker C, intermediate wax oils) will be spread and cultivated into the ground. The condition of the oil and microbiological activity will then be monitored.

SSIE No.: 40-21245-1.

R-296-74
DESIGN A MOBILE WASHING SYSTEM

Principal Investigator: Dean, R. C.
Performing Organization: Ecological Research Corporation, P.O. Box 71, Hanover, New Hampshire 03755
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 58-01-0830 Contract 72P19390
Period: 7/74 to 6/75 Funds: Unknown

A pilot scale system for cleaning oil-contaminated beach sand will be designed and tested. Oil-water-sand separation will be accomplished with a jet washer and cyclone. Future efforts will be directed toward developing a 100 ton/hour sand cleaner.

SSIE No.: AO-19390.

R-297-74
REMOVAL OF OIL WASTES FROM VARIOUS WATER SURFACES

Principal Investigator: Mason, J. L.
Performing Organization: Garrett Corporation, 9851 S. Sepulveda Blvd., Los Angeles, California 90009
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 58-01-0524 Contract 72P19321
Period: 7/74 to 6/75 Funds: Unknown

The effectiveness of a high capacity, high efficiency centrifuge for separating oil-water mixtures will be demonstrated under simulated sea conditions.

SSIE No.: AO-19321.

R-102-74 (Renewal)
MICROBIOLOGICAL SEEDING TO ACCELERATE DEGRADATION OF HYDROCARBONS

Principal Investigator: Oppenheimer, C.
Performing Organization: University of Texas, Marine Science Institute, Port Aransas, Texas
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 15080EHF Contract 72P21565
Period: 7/73 to 6/74 Funds: Unknown

The project involves the development of techniques to accelerate the natural degradation process of oil in marine waters.

Biological degradation

SSIE No.: GMA-1643-1.

R-298-74
OIL RECOVERY SYSTEM USING SORBENT MATERIALS

Principal Investigator: Sartor, J. D.
Performing Organization: URS Systems Corporation, 155 Bovet Rd., San Mateo, California 94402
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 68-01-0069 Contract 72P20863
Period: 7/73 to 6/74 Funds: Unknown

An oil removal system using sorbent materials and capable of being field assembled for installation on a variety of vessels will be designed.

SSIE No.: AO-20863.

R-299-74
FAST CURRENT OIL RESPONSE SYSTEM

Principal Investigator: Unknown
Performing Organization: Seaward, Incorporated, 6269 Leesburg Pike, Falls Church, Virginia 22044
Supporting Agency: Department of Transportation, U.S. Coast Guard
Period: 7/74 to 6/75 Funds: Unknown

A fast current oil response system that will operate in 4-10 knot currents over a variety of oil spill conditions will be developed.

SSIE No.: GZ-55588.

R-300-74
HIGH SEAS, EPA POOL AND SPILL OF OPPORTUNITY TESTING OF PROTOTYPE OIL RECOVERY SYSTEM

Principal Investigator: Unknown
Performing Organization: Ocean Systems, Inc., 11440 Isaac Newton Industrial Square North, Reston, Virginia 22070
Supporting Agency: Department of Transportation, U.S. Coast Guard
Period: 6/73 to 12/73 (est.) Funds: Unknown

The study's objective is to evaluate the oil recovery system's strength, stability, operational function, handling, compatibility with the high seas barrier, and efficiency in recovering oil under various sea conditions.

Information Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #045131.

R-301-74
OIL ENTRAINMENT LOSSES

Principal Investigator: Unknown
Performing Organization: Rensselaer Polytechnic Institute, Troy, New York 12181
Supporting Agency: Department of Transportation, U.S. Coast Guard
Period: 8/73 to 9/74 Funds: Unknown

The study's objective is to determine the "feasibility of using chemical additives to minimize loss of entrained oil droplets under a barrier retaining an oil slick at water current velocities of up to 10 knots."

Information Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #045873.

R-302-74
PROGRAM TO EVALUATE A MEMBRANE OIL POLLUTION PREVENTION SYSTEM

Principal Investigator: Unknown
Performing Organization: Naval Ship Systems Command, Department of the Navy, Washington, D.C. 20360

Supporting Agency: Department of Transportation, U.S. Coast Guard
Period: 4/74 to 1/75 Funds: Unknown

An evaluation program is being jointly conducted by the Coast Guard and U.S. Navy to determine the effectiveness of using impermeable membrane barriers in cargo/fuel oil tanks of ships to eliminate contamination of seawater ballast. Plans are to conduct the eventual evaluation of a Navy fleet oiler.

Information Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #048820.

R-303-74
TEST AND EVALUATION PROGRAM OF A NOVEL HIGH VELOCITY OIL SLICK SKIMMER

Principal Investigator: Unknown
Performing Organization: Hydronautics, Inc., 7210 Pindell School Rd., Laurel, Maryland 20810
Supporting Agency: Department of Transportation, U.S. Coast Guard
Period: 1/74 to 6/74 Funds: Unknown

The contract provides for the testing and evaluation of a novel high velocity oil slick skimmer, in accordance with the Hydronautics, Inc. proposal of 30 July 1973.

Information Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #048617.

R-304-74
RESEARCH ON TREATMENT OF OIL WASTES

Principal Investigator: Walkup, P. C.
Performing Organization: Battelle Memorial Institute, P.O. Box 999, Richland, Washington 99352
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 58-01-0513 Contract 72P19316
Period: 7/74 to 6/75 Funds: Unknown

"Delineate an optimum system which utilizes a vortex generator and a high capacity air lift system with an adjustable suction nozzle for pickup of spilled oil from the water surface. Performance of the system will be evaluated by prototype tests under simulated at-sea conditions."

SSIE No.: AO-19316.

C. EFFECTS OF OIL POLLUTION

1. BIOLOGICAL EFFECTS

R-305-74
CLINICAL STUDY OF TOXICITY TO BIOTA OF OIL IN WATER

Principal Investigator: Anderson, J. W.
Performing Organization: Texas A & M University, Center for Marine Resources, College Station, Texas 77843
Supporting Agency: American Petroleum Institute
Period: 7/73 to 6/74 Funds: $210,000

Oysters, clams, marine worms, shrimp and fish will be exposed to oil containing radioactive tagged compounds. Areas of study will include the effects of oil on physiological parameters, contamination mechanisms and sites of contamination, and retention and passage of pollutants through the food chain.

SSIE No.: PAP-94.

R-306-74
FIELD STUDIES OF EFFECTS OF OIL ON MARINE ORGANISMS

Principal Investigator: Anderson, J. W.
Performing Organization: Texas A & M University, Center for Marine Resources, College Station, Texas 77843
Supporting Agency: American Petroleum Institute
Period: 3/74 to 12/75 Funds: $234,000

Samples of sediment and organisms will be collected at various distances from a Galveston Bay contamination source in order to study changes in organism populations and the effects of contamination on growth and reproduction of various species of marine organisms. Laboratory analyses of water, sediment and animal tissue for detailed hydrocarbon characteristics will be conducted.

SSIE No.: PAP-93.

R-307-74
RESEARCH AND DEVELOPMENT PROJECTS

Principal Investigator: Ayyad, M. A.
Specialty: Botany
Performing Organization: Alexandria University, Alexandria, Arab Republic of Egypt

Supporting Agency: Ford Foundation
Period: 7/74 to 6/75 Funds: $230,000

"This grant will help Middle Eastern scientists and policy makers establish sound environmental problems." Among the problems to be studied will be the effects of oil pollution on fish populations.

SSIE No.: QY-2594.

R-308-74
RESEARCH ON THE EFFECTS OF CRUDE OIL TRANSFER AND UPSTREAM REFINERIES ON DELAWARE BAY

Principal Investigator: Biggs, R. B.
Performing Organization: University of Delaware, School of Marine Science, Newark, Delaware 18711
Supporting Agency: U.S. National Science Foundation, Division of Environmental Systems and Resources
Period: 3/74 to 5/75 Funds: $300,800

The impact of refinery residuals and oil transfer operations on Delaware Bay are to be studied. Included will be efforts to develop operational management criteria to follow the study, to generate biological baseline data, and to provide a user-oriented predictive model for oil slick movement in Delaware Bay.

SSIE No.: GSQ-898.

R-215-74 (Renewal)
FAUNAL RELATIONSHIPS TO HYDROCARBONS

Principal Investigator: Farragut, R. N.
Performing Organization: U.S. Department of Commerce, Miami Fisheries Laboratory, 75 Virginia Beach Dr., Miami, Florida 33149
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, No. SEC-008-76-IE-A
Period: 7/73 to 6/74 Funds: $97,300

Hydrocarbon components of marine fauna and their relationship to environmental parameters are being determined.

SSIE No.: ZBP-680.

R-309-74
AN ASSESSMENT OF THE CLAM RESOURCES IN PRINCE WILLIAM SOUND

Principal Investigators: Feder, H. M., R. Neve, F. Orth, and D. Shaw

Performing Organization: University of Alaska, Institute of Marine Sciences, Fairbanks, Alaska 99701
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Sea Grant Office
Period: 6/74 to 5/75 Funds: $48,000

Among the factors to be studied in an assessment of the clam resources of Prince William Sound will be studies of petroleum residues in clams. These studies will assist in the assessment of damage to the resource in the event of a major petroleum spill.

Economic effects of oil pollution

SSIE No.: GBP-1775.

R-089-74 (Renewal)
ASSESSMENT OF INTERTIDAL ANIMALS AND PLANTS FOLLOWING CONTAMINATION BY OIL

Principal Investigator: Hand, C.
Performing Organization: University of California, Bodega Marine Laboratory, Bodega Bay, California
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 15080 HFS
Period: 7/73 to 6/74 Funds: Unknown

Repopulation studies are being conducted on several intertidal sites in which the marine biota suffered loss through death and retardation as a result of the San Francisco Bay Standard Oil incident.

SSIE No.: GMA-1645-1.

R-217-74 (Renewal)
EFFECTS OF PETROLEUM OILS, OIL DISPERSANTS, PETROCHEMICAL WASTES, AND ASSOCIATED POLLUTANTS ON MARINE LIFE

Principal Investigator: Hegre, C. S.
Performing Organization: U.S. Environmental Protection Agency, National Environmental Research Center, Corvallis, Oregon 97330
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 16 AAV 12 Contract 72P17877
Period: 7/73 to 6/74 Funds: Unknown

Variability of toxic levels to aquatic organisms and water qualities which influence response are being investigated. Interim safe level standards are to be provided based upon field studies.

Analysis

SSIE No.: ZMA-644-1.

R-310-74
A STUDY TO COVER THE EFFECT OF CRUDE OIL SPILLS ON NORTHERN TERRAIN, AQUATIC AND TERRESTRIAL VEGETATION AND ON SOIL FAUNA

Principal Investigators: Hellebust, J., and T. Hutchinson
Specialty: Botany
Performing Organization: University of Toronto, Toronto, Ontario, Canada
Supporting Agency: Canadian Government, Department of Indian and Northern Affairs, No. 135YC7111-4-0030
Period: 6/74 to 5/75 Funds: $59,334

No summary provided by SSIE.

SSIE No.: AY-130.

R-311-74
EFFECT OF CRUDE OIL SPILLS ON NORTHERN TERRAIN ON AQUATIC AND TERRESTRIAL VEGETATION AND SOIL FAUNA

Principal Investigator: Hutchinson, T. C.
Specialty: Botany
Performing Organization: University of Toronto, Toronto, Ontario, Canada
Supporting Agency: Canadian Government, Department of Indian and Northern Affairs, No. IAND 0020
Period: 7/74 to 6/75 Funds: $85,306

No summary provided by SSIE.

SSIE No.: AY-436.

R-312-74
DIVERSITY OF STREAM COMMUNITIES UNDER CONDITIONS OF POLLUTIONAL STRESS

Principal Investigator: Kaesler, R. L.
Specialty: Geology
Performing Organization: University of Kansas, School of Liberal Arts, 249 Snow Hall, Lawrence, Kansas 66044
Supporting Agency: U.S. Department of the Interior, Office of Water Research and Technology
Period: 7/74 to 6/75 Funds: Unknown

Usefulness of diversity indexes based upon information theory will be tested as they apply to stream organisms exposed to different kinds of pollutional stress. Means to reduce limnological survey costs by applying methods of partitioning diversity among various taxonomic levels will be investigated.

SSIE No.: GUY-100.

R-313-74
EFFECTS OF ALTERATIONS IN THE NATURAL ENVIRONMENT, LOWER COLUMBIA RIVER AND ESTUARY

Principal Investigator: Malins, D. C.
Performing Organization: U.S. Department of Commerce, Environmental Conservation Division, 2725 Montlake Blvd. East, Seattle, Washington 98112
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, No. FB 1600/8 818 A4
Period: 7/74 to 6/75 Funds: Multiple support $176,000

One of the sub-objectives in a study to determine the effects of natural and man-induced environmental effects on the lower Columbia River and estuary is to study the effects of Prudhoe Bay crude oil on finfish and shellfish, and aquatic organisms' responses to water-soluble fractions of petroleum hydrocarbons.

SSIE No.: ZBP-966.

R-314-74
SUBLETHAL BIOCHEMICAL EFFECT OF CONTAMINANTS

Principal Investigator: Malins, D. C.
Performing Organization: U.S. Department of Commerce, Environmental Conservation Division, 2725 Montlake Blvd. East, Seattle, Washington 98112
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, No. FB 1600/8 818 A2
Period: 7/74 to 6/75 Funds: $286,700

Routes of penetration of contaminants and the effects of contaminants on marine organisms are to be investigated. Areas of study will include the determination of aromatic hydrocarbon storage sites, aromatic hydrocarbon solubility capabilities within organisms, biochemical transport mechanisms of toxic metals, and the assessment of impact of petroleum hydrocarbons and heavy metals on fish epidermal and gill mucus.

SSIE No.: ZBP-916.

R-315-74
CHRONIC AND ACUTE EFFECTS OF CRUDE OIL ON SELECTED MARINE ORGANISMS IN THE ARCTIC AND SUBARCTIC ECOSYSTEMS

Principal Investigator: Mueller, E. W.

Performing Organization: U.S. Environmental Protection Agency, National Environmental Research Center, Corvallis, Oregon 97330
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 21 ARZ 04 Contract 72P21837
Period: 7/74 to 6/75 Funds: Unknown

A literature survey will be conducted to determine the state-of-the art on the fate and effects and treatment of oil in the marine environment. In addition, the ability to analyze oil pollutants in the marine environment, research on the effects of oil and oil cleanup techniques on marine organisms, and bioassay studies of the effects of these pollutants on marine organisms are objectives of this project.

SSIE No.: AO-21837.

R-225-74 (Renewal)
MARINE TUNICATE RESPONSE TO LOW LEVEL CONCENTRATIONS OF OILS

Principal Investigator: Nadeau, R. J.
Performing Organization: U.S. Environmental Protection Agency, National Environmental Research Center, 5555 Ridge Avenue, Cincinnati, Ohio 45213
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 21 APU 02 Contract 72P17906
Period: 7/73 to 6/74 Funds: Unknown

A continuous-flow system was developed to screen macroinvertebrate marine animals for possible indicator species that could be used to determine the impact of an oil spill on marine populations. Sublethal responses of the tunicate *Molgula manhattensis* to low concentrations of oil were observed.

SSIE No.: ZMA-650-1.

R-101-74 (Renewal)
MARINE PETROLEUM POLLUTION - BIOLOGICAL EFFECTS AND CHEMICAL CHARACTERIZATION

Principal Investigators: Nicol, J. A., and C. VanBaalen
Performing Organization: University of Texas, Marine Science Institute, Port Aransas, Texas
Supporting Agency: U.S. National Science Foundation, Division of National and International Progress, No. GX-37345
Period: 2/73 to 1/74 Funds: $142,150

Lab and field studies will investigate the impact of the aromatic fraction of petroleum on bacteria, microalgae, and marine invertebrates.

SSIE No.: GSN-1146.

R-316-74
A STUDY ON THE EFFECT OF OIL SPILLAGE ON MICROORGANISMS IN THE TUNDRA REGION

Principal Investigator: Parkinson, D.
Performing Organization: University of Calgary, Calgary, Alberta, Canada
Supporting Agency: Canadian Government, Department of Indian and Northern Affairs, No. 135YC7111-4-00038
Period: 5/74 to 4/75 Funds: $9,056

No summary provided by SSIE.

SSIE No.: AY-129.

R-113-74 (Renewal)
TEMPERATURE EFFECTS OF SANTA BARBARA CRUDE OIL IN THE UPPER INTERTIDAL ZONE

Principal Investigator: Straughan, D.
Performing Organization: University of Southern California, Allan Hancock Foundation, Los Angeles, California
Supporting Agency: U.S. Environmental Protection Agency, Office of Water Programs, No. 15080 HGX
Period: 7/72 to 6/73 Funds: $14,590

The temperature effects of oil on larvae and their survival in the intertidal zone are being studied. Resulting information will assist in assessing the biological damage caused by oil spills.

SSIE No.: GMA-192-1.

R-317-74
NORTHEAST GULF OF ALASKA INTERTIDAL BIOLOGICAL BASELINE

Principal Investigator: Zimmerman, S. T.
Performing Organization: U.S. Department of Commerce, Auke Bay Fisheries Laboratory, P.O. Box 155, Auke Bay, Alaska 99821
Supporting Agency: U.S. Department of the Interior, Bureau of Land Management, No. 871214
Period: 7/74 to 6/75 Funds: $125,000

Transect lines and visual orientation methods will be used to enumerate the populations of intertidal algae and invertebrates in areas likely to be affected by oil pollution between Yakutak and Seward. Life histories and oil-related susceptability information on the principal organisms will be obtained from the scientific literature.

SSIE No.: GUK-59.

2. PHYSICAL EFFECTS

R-126-74 (Renewal)
A STUDY TO COVER THE PHYSICAL ASPECTS OF CRUDE OIL SPILLS ON NORTHERN SITES

Principal Investigator: Mackay, D.
Performing Organization: University of Toronto, Toronto, Ontario, Canada
Supporting Agency: Canadian Government, Department of Indian and Northern Affairs, No. IAND 0027
Period: 7/74 to 6/75 Funds: $60,715

A study to predict the physical effects of crude oil spills on Mackenzie Valley terrain is being conducted.

SSIE No.: AR-826-2.

3. CHEMICAL EFFECTS

R-077-74 (Renewal)
INVESTIGATIONS OF THE BREAKDOWN AND SUBLETHAL BIOLOGICAL EFFECTS OF TRACE PETROLEUM CONSTITUENTS IN THE MARINE ENVIRONMENT

Principal Investigator: Calder, J. A.
Specialty: Oceanography
Performing Organization: Florida State University, School of Arts, Tallahassee, Florida
Supporting Agency: U.S. National Science Foundation, Division of National and International Progress, No. GX-37351
Period: 2/73 to 1/74 Funds: $42,100

An investigation into the impact and fate of petroleum at the bacterial and molecular level in the ocean is being conducted.

SSIE No.: GSN-1151.

R-318-74
CONTAMINANT EFFECTS ON LIFE PROCESSES

Principal Investigator: Malins, D. C.
Performing Organization: U.S. Department of Commerce, Environmental Conservation Division, 2725 Montlake Blvd. East, Seattle, Washington 98112
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, No. FB 1600/8 818 A3
Period: 7/74 to 6/75 Funds: $155,900

Among the studies related to pen-rearing salmon in salt water is an examination of the effects of petroleum and primary treated chlorinated effluents on chemosensory systems and behavior of salmon, crabs and shrimp.

Biological effects of oil pollution

SSIE No.: SBP-944.

4. GENERAL EFFECTS

R-319-74
EFFECT OF OIL AND TREATMENT OF OILY WASTES (CBI SCHEME)

Principal Investigator: Unknown
Performing Organization: Water Pollution Research Laboratory, Stevenage, England, United Kingdom
Supporting Agency: United Kingdom Government
Period: 7/73 to 6/74 Funds: Unknown

No summary provided by SSIE.

Waste water treatment

SSIE No.: WDQ-1147.

D. OIL POLLUTION PREVENTION

1. DESIGN AND ENGINEERING

R-320-74
LINE VORTEX MODEL OF DROPLET FORMATION AND ENTRAINMENT AT AN OIL/WATER INTERFACE

Principal Investigator: Unknown
Performing Organization: Mount Auburn Research Associates, Inc., 385 Elliot St., Newton, Massachusetts 02164
Supporting Agency: Department of Transportation, U.S. Coast Guard
Period: 1/74 to 9/74 Funds: Unknown

The work to be accomplished is as follows: Task I, Program line vortex model equations; Task II, Assess validity of model assumptions; Task III, Define oil droplet formation in model; Task IV, Determine the number of vortices required; Task V, Comparison of computed and experimental results; Task VI, Calculate oil loss rates and compare with laboratory or field data; Task VII, Final Report.

Cleanup and recovery

Information Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #045975.

R-321-74
NON-STRUCTURAL BULKHEADS TO CONTROL TANKER OIL SPILLS

Principal Investigator: Unknown
Performing Organization: Webb Institute of Naval Architects, Crescent Beach Rd., Glenn Cove, New York 11542
Supporting Agency: Department of Transportation, U.S. Coast Guard
Period: 9/73 to 6/74 Funds: Unknown

The contract provides for the study of the use of non-structural bulkheads to control tanker oil spills and for a report of the findings.

Information Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #045872.

2. WASTE WATER TREATMENT

R-322-74
BIOCHEMICAL STUDIES ON ALGAL-BACTERIAL SYMBIOSIS IN HIGH-RATE OXIDATION PONDS WITH VARYING RETENTION

Principal Investigators: Ganapati, S. V., and H. J. Eby
Performing Organization: University of Baroda, Baroda, Gujarat, India
Supporting Agency: U.S. Department of Agriculture, Agricultural Research Service, Beltsville Agricultural Research Center, No. 0021968 A7-AE-11
Period: 7/74 to 6/75 Funds: Unknown

Various wastes (including oil refinery wastes) containing phenolic compounds will be innoculated with selective types of algae. Minimal-time purification rates of the waste water will be determined and the harvested algae will be analyzed for nutrient level and may be fed to rats.

SSIE No.: GY-21968-3.

R-323-74
DEVELOPMENT OF TREATMENT AND CONTROL TECHNOLOGY FOR PETROCHEMICAL WASTES

Principal Investigator: Klein, E.
Performing Organization: Louisiana State University Systems, School of Arts, University Station, Baton Rouge, Louisiana 70803
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 800773 Contract 72P00717
Period: 7/74 to 6/75 Funds: Unknown

Biological oxidation, solvent extraction, absorption, and ozonization will be the processes investigated in a study to develop and demonstrate waste treatment processes for the reduction of refractory petrochemical waste.

SSIE No.: AO-717.

R-324-74
HYDROCYCLONIC OIL & SEA WATER SEPARATION SYSTEM

Principal Investigator: Rod, R.
Performing Organization: American Process Equipment Corporation, Hawthorne, California 90250

Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 58-01-0825 Contract 72P19386
Period: 7/74 to 6/75 Funds: Unknown

An oil-water separator which employs a cyclone concept to separate un-emulsified oil-water mixtures will be designed, constructed and tested.

SSIE No.: AO-19386.

R-325-74
PARTICULATE REMOVAL IN OIL/WATER SEPARATION PROCESSES

Principal Investigators: Schmitt, R. F., and W. K. Upton
Performing Organization: U.S. Navy, Ship Research and Development Center, Annapolis, Maryland 21402
Supporting Agency: Department of Defense, U.S. Navy, No. DN578168
Period: 7/74 to 6/75 Funds: Unknown

"To develop new techniques for removal of solid fines and colloidal flocs to replace cartridge or in-depth prefillers in bilge oil/water separators. Develop the technology to reduce the presence and/or effect of solids in bilge fluids."

SSIE No.: ZQN-578168.

R-326-74
EVALUATE APPLICABILITY OF AVAILABLE CARBON ADSORPTION TECHNOLOGY TO OILY WATER SEPARATION REQUIREMENTS OF THIS ROAP

Principal Investigator: Unknown
Performing Organization: U.S. Environmental Protection Agency, National Environmental Research Center, 5555 Ridge Avenue, Cincinnati, Ohio 45213
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 21 AOF 04 Contract 72P17900
Period: 7/74 to 6/75 Funds: Unknown

No summary provided by SSIE.

SSIE No.: AO-17900.

R-327-74
NAVY ENVIRONMENT: SHIPBOARD SEWAGE AND WASTE TREATMENT SYSTEM

Principal Investigator: Updegraff, D. M.
Performing Organization: Denver University, Denver Research Institute, Denver, Colorado 80210

Supporting Agency: Office of Naval Research, Department of the Navy

Period: 7/72 to 6/73 Funds: Unknown

Research plans are to examine a process for the microbial decomposition and disposal of wastes, including oily wastes, on U.S. Navy ships. This effort is in accordance with the guidelines set forth by Executive Order 11507 'Prevention, Control and Abatement of Air and Water Pollution at Federal Facilities' (1970).

Information Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #051244.

3. PERSONNEL TRAINING AND EDUCATION

R-328-74
ENVIRONMENTAL QUALITY ADVISORY SERVICE

Principal Investigators: Hughes, J. M., and C. E. Woods
Specialty: Civil Engineering
Performing Organization: Texas A & M University System, School of Engineering, P.O. Box FE 44, College Station, Texas 77843
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Sea Grant Office, No. 04-3-158-18
Period: 6/74 to 5/75 Funds: $15,297

Engineers and scientists with interdisciplinary technological expertise in marine and estuarine environmental quality fields will be called upon to provide technical advice to those groups which have environmental quality problems in the Texas coastal zone.

SSIE No.: GBP-1675.

4. RESEARCH

R-329-74
CHARACTERISTICS OF PETROCHEMICAL WASTE POLLUTION PROBLEMS

Principal Investigator: Gloyna, E. F.
Performing Organization: Engineering Science, Incorporated, 150 E. Foothill Blvd., Arcadia, California 91006
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 58-01-0461 Contract 72P19279
Period: 7/74 to 6/75 Funds: Unknown

The project will include a history and projection of the petrochemical industry, a study of pollutants associated with waste treatment problems, and an evaluation of treatment and disposal practices. Economic aspects of present and future waste treatment will be studied as well as an assessment of research needs.

Waste water treatment

SSIE No.: AO-19279.

R-330-74
SHIP OPERATIONS SUPPORT

Principal Investigator: Parker, P. L.
Performing Organization: University of Texas, Marine Science Institute, Port Aransas, Texas 78373
Supporting Agency: U.S. National Science Foundation, Division of National and International Progress
Period: 1/75 to 12/75 Funds: $50,000

Partial support will be provided for the operation of the "R/V Longhorn" to conduct coastal water research.

SSIE No.: GSN-1787.

R-162-74 (Renewal)
STATE-OF-THE-ART EVALUATION ON PETROLEUM AND COAL WASTES

Principal Investigator: Streebin, L.
Performing Organization: University of Oklahoma, Research Institute, Norman, Oklahoma
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 12050 DKF

Period: 7/72 to 6/73 Funds: $14,297

Pollution problems, abatement procedures and control techniques of the petroleum and coal industries were studied. Results of field studies of three refineries are included.

SSIE No.: GMA-1584.

R-331-74
GENERAL WORKING AGREEMENT

Principal Investigator: Unknown
Performing Organization: Transportation Systems Center, Department of Transportation, 55 Broadway, Cambridge, Massachusetts 02142
Supporting Agency: Department of Transportation, U.S. Coast Guard
Period: 7/73 to 6/75 Funds: Unknown

The purpose of the project is to provide support to the Coast Guard's research and development programs by assisting in generating new concepts and solving problems in areas such as navigation control, communications, and pollution. Examples of the duties of the Transportation Systems Center are oil spill detection and classification, and quantitative measurement technique development.

Information Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #045389.

R-332-74
A PROGRAM IN MARINE AFFAIRS

Principal Investigator: Wenk, E.
Performing Organization: University of Washington, School of Public Affairs, C301 Health Sciences Bldg., Seattle, Washington 98105
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Sea Grant Office, No. 04-3-158-42
Period: 7/74 to 6/75 Funds: $36,000

Seminars and graduate studies in various fields of marine affairs will be supported. "The oil spill hazards to Puget Sound" was a marine policy research project sponsored by this program.

SSIE No.: GBP-1784.

5. REGULATIONS, STANDARDS AND PLANNING

R-333-74
COASTAL WETLANDS MANAGEMENT

Principal Investigator: McIntire, W. G.
Performing Organization: Louisiana State University System, School of Arts, University Station, Baton Rouge, Louisiana 70803
Supporting Agency: Ford Foundation
Period: 7/74 to 6/75 Funds: $50,000

A study of coastal wetlands management will be conducted comparing control policies and programs of the Rhone River in France, the Rhine in the Netherlands, the Mississippi in the U.S., and the Thames in England.

SSIE No.: QY-2559.

R-334-74
SUPPORT PROGRAM FOR ENVIRONMENTAL IMPACT CAPABILITIES

Principal Investigator: Mitchell, G. E.
Performing Organization: National Maritime Research Center, Galveston, Todd Shipyards, P.O. Box 1600, Galveston, Texas 77550
Supporting Agency: Maritime Administration, Department of Commerce
Period: 7/74 to 6/75 Funds: Unknown

The Pollution Section is reviewing the requirements and the federal role of government agencies in preparing and reviewing Environmental Impact Statements so as to determine if an EIS is required for the Mar Ad Oil/Water Separation Test Installation and other Mar Ad Projects.

Information Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #072500.

R-335-74
PETROLEUM SYSTEMS RELIABILITY ANALYSIS

Principal Investigator: Ritchie, J. E.
Performing Organization: Computer Sciences Corporation, 6565 Arlington Blvd., Falls Church, Virginia 22046
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 68-01-012 Contract 72P20869

Period: 7/73 to 6/74 Funds: Unknown

Present petroleum operation procedures, equipment, control devices and other system and sub-system components will be evaluated for reliability. Strong federal and state level oil prevention programs and new oil construction reliability tests will be developed based upon the resultant evaluation.

SSIE No.: AO-20869.

R-336-74
OIL SPILL CONTINGENCY PLANS, ALYESKA PIPELINE SYSTEM

Principal Investigator: Sartor, J.
Performing Organization: Woodward Envicon, Incorporated, 699 Battery St., San Francisco, California 94111
Supporting Agency: Alyeska Pipeline Service Company, Incorporated
Period: 7/74 to 6/75 Funds: Unknown

"Develop oil spill contingency plans for Alyeska Pipeline System."

SSIE No.: AW-669.

E. EFFECTS OF OIL PROSPECTING AND PRODUCTION

1. BIOLOGICAL EFFECTS

R-337-74
EFFECTS OF ALASKA PIPELINE AT PORT VALDEZ, ECOSYSTEMS

Principal Investigator: Myren, R. T.
Performing Organization: U.S. Department of Commerce, Auke Bay Fisheries Laboratory, P.O. Box 155, Auke Bay, Alaska 99821
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, No. R81856
Period: 7/74 to 6/75 Funds: $71,800

Seasonal samples will be taken of common intertidal organisms in order to investigate numbers, growth, survival rates and population dynamics of key indicator organisms. This baseline information will be used to evaluate the polluting effects of petroleum operations.

SSIE No.: ZBP-949.

F. FATE OF O'   HE ENVIRONMENT

1. BIOLOGICAL DEGRADATION

R-338-74
HYDROCARBON MICROBIOLOGY

Principal Investigator: Bourguin, A. W.
Performing Organization: U.S. Environmental Protection Agency, National Environmental Research Center, Corvallis, Oregon 97330
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 25 AJN 04 Contract 72P21853
Period: 7/74 to 6/75 Funds: Unknown

Oil breakdown by microbial communities, either by itself or with malathion, mirex and heptachlor, will be investigated. The resultant data is expected to be useful in determining the effects of combinations of pollutants on an estuarine environment and estuarine microflora. Pesticide degradation will be studied as it occurs in artificial and natural oil slicks.

Biological effects of oil pollution

SSIE No.: AO-21853.

R-339-74
BIOLOGY OF MARINE AND ESTUARINE MICROORGANISMS

Principal Investigators: Colwell, R. R., and J. D. Walker
Performing Organization: Maryland University, Department of Microbiology, College Park, Maryland 20742
Supporting Agency: Office of Naval Research, Department of the Navy
Period: 8/72 - unknown time Funds: Unknown

The project is the study of the biology of marine bacteria and the feasibility of isolating and characterizing deep sea forms capable of utilizing biologically refractive material. Cultures obtained from the continental slope and trenches have been identified and are being examined for their ability to degrade hydrocarbons under environmental conditions prevailing in the natural habitat.

Information Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #044218.

2. PHYSICAL CHANGES OF OIL IN THE ENVIRONMENT

R-340-74
INVESTIGATION INTO THE EFFECTS OF ENTRAINMENT AND E... .CATION OF CRUDE OIL IN ARCTIC SEA ICE

Principal Investigator: Unknown
Performing Organization: Norcor Engineering and Research Limited, Don Mills, Ontario, Canada
Supporting Agency: Canadian Government Department of Environment, No. 5V02KF832-3-7062
Period: 6/74 to 5/75 Funds: $472,000

No summary provided by SSIE.

SSIE No.: WDB-12.

3. GENERAL FATE OF OIL IN THE ENVIRONMENT

R-341-74
THE FATE OF OIL SPILLS ON ALASKAN TERRESTRIAL AND FRESHWATER ENVIRONMENTS

Principal Investigator: Jackson, R.
Performing Organization: U.S. Environmental Protection Agency, National Environmental Research Center, Corvallis, Oregon 97330
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 21 ASA 03 Contract 72P21838
Period: 7/74 to 6/75 Funds: Unknown

Experimental oil spills will be used to evaluate the fate of oil on Alaskan terrain by investigating its movement and changes over permafrost and in terrain underlain by permafrost, and the behavior of oil in freshwater and under extreme cold.

SSIE No.: AO-21838.

R-342-74
SPILLS OF HAZARDOUS CHEMICALS ON WATERWAYS

Principal Investigator: Unknown
Performing Organization: Lowell Technological Institute, Lowell, Massachusetts 01854
Supporting Agency: Office of Systems Development and Technology, Department of Transportation
Period: 3/73 to 5/74 (est.) Funds: Unknown

Major objectives include: the study of the spreading of immiscible nonvolatile hazardous chemicals (other than oil) on water in the presence of waves as a function of spill release rate and wave characteristics; the establishment of a relationship between the behavior of oil and immiscible hazardous chemicals in the presence of waves.

Physical changes of oil in the environment

Information Source: National Academy of Sciences Maritime Research Information Service Abstracts. 1974. Vol. 10. Entry #036997.

SECTION IV. PATENTS

A. UNITED STATES PATENTS

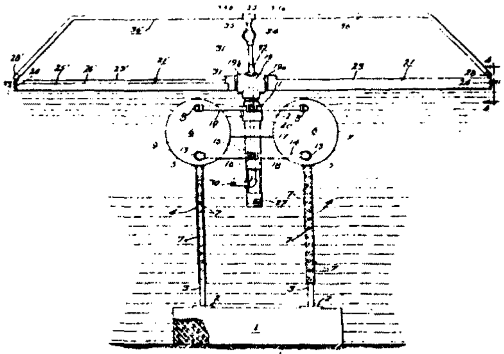
P-189-74
ROTARY SKIMMER

Aulisa, G. D.
U.S. Patent 3,844,950

A skimming blade, maintained in an adjustable position by a float, rotates through the liquid. A collection trough on the blades accumulates the skimmed material. The float is anchored to the bottom of the body of water being skimmed.

Citation Source: Petroleum Abstracts. 1975. 15(7).
Entry #200,888.

3,844,950
ROTARY SKIMMER
Gerard D. Aulisa, Claymont, Del., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.
Filed Feb. 20, 1973, Ser. No. 333,831
Int. Cl. E02b *15/04*
U.S. Cl. 210—170 **3 Claims**



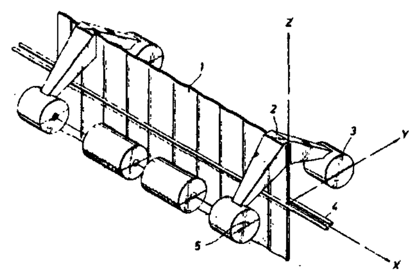
P-190-74
OIL BOOM

Ayers, R. R.
U.S. Patent 3,859,797

Outriggers equipped with floats support a vertical skirt of corrugated material. This corrugated material is unrolled, attached to the floats which are connected by the outrigger, and the entire apparatus is deployed in the water around the oil spill.

Citation Source: Petroleum Abstracts. 1975. 15(19).
Entry #204,794.

3,859,797
OIL BOOM
Ray R. Ayers, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.
Continuation of Ser. No. 95,649, Dec. 7, 1970, abandoned.
This application Sept. 26, 1972, Ser. No. 292,388
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 F **2 Claims**



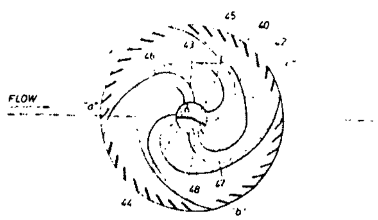
P-191-74
OIL SPILL CLEANUP

Ayers, R. R., and D. P. Hemphill
U.S. Patent 3,865,730

This skimmer has baffled entry ports inclined to the direction of current flow or mounted on a drum. The oil enters through the baffles into a chamber underneath an inverted funnel or within the axle of the drum. The skimmer is returned to a horizontal position to remove the oil through the funnel.

Citation Source: Petroleum Abstracts. 1975. 19(19). Entry #204,797.

3,865,730
OIL SPILL CLEANUP
Ray R. Ayers, and Dean P. Hemphill, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.
Division of Ser. No. 289,043, Sept. 14, 1972,. This application Dec. 17, 1973, Ser. No. 425,579
Int. Cl. E02b 15/04
U.S. Cl. 210—242 3 Claims



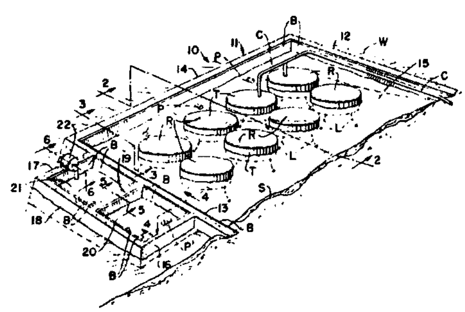
P-192-74
PROTECTED OFFSHORE STORAGE FACILITY

Bliss, W. E., Jr.
U.S. Patent 3,844,122

A protected area in a body of water is described in which tanks for storing crude oil are moored. The floating tanks are equipped with fixed roofs, a design feature which aids in the prevention of evaporation of the light ends of the stored oil.

Citation Source: Selected Water Resources Abstracts. 1975. 8(7). Entry #W75-03744.

3,844,122
PROTECTED OFFSHORE STORAGE FACILITY
Woodrow E. Bliss, Jr., Pittsburgh, Pa., assignor to Pittsburgh-Des Moines Steel Company, Pittsburgh, Pa.
Filed Apr. 26, 1973, Ser. No. 354,639
Int. Cl. E02b *3/00, 3/04*
U.S. Cl. 61—1 **10 Claims**



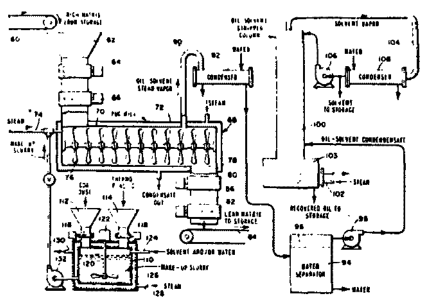
P-193-74
COMPOSITION FOR RECOVERING OIL FROM WATER

Bunn, C. O.
U.S. Patent 3,846,335

A matrix composed of finely divided coal,bonded in spaced relation by polyethylene,has a high oil sorption capacity. The matrix material can be a fixed or a moveable sorption bed, or can be dispersed on a water surface and collected following oil sorption.

Citation Source: Chemical Abstracts. 1975. 82(10).
Entry #64113q.

3,846,335
COMPOSITION FOR RECOVERING OIL FROM WATER
Clinton O. Bunn, Denver, Colo., assignor to Cal-Ment Corporation, Butte, Mont.
Division of Ser. No. 121,000, March 4, 1971, Pat. No. 3,783,129. This application June 6, 1973, Ser. No. 367,481
Int. Cl. B01d *39/14*
U.S. Cl. 252—428 1 Claim



P-194-74
DEVICE FOR RECEIVING WATER SURFACE FLOATING IMPURITIES

Derzhavets, A. Y., P. G. Kogan, and S. M. Nunuparov
U.S. Patent 3,862,902

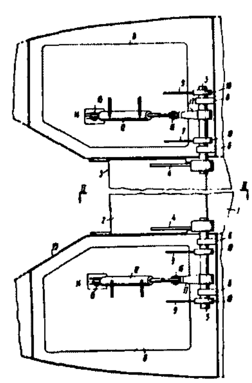
The upper horizontal edge of the gate to the collecting tank of a skimmer craft forms a weir which is a constant depth below the water surface. The side of the gate facing the polluted water is shaped like a cylinder whose axis coincides with the horizontal axis about which the gate is rocking.

Citation Source: Petroleum Abstracts. 1975. 15(19).
Entry #204,795.

3,862,902
DEVICE FOR RECEIVING WATER SURFACE FLOATING IMPURITIES

Abram Yakovlevich Derzhavets, prospekt Gagarina, 4, kv. 5; Petr Grigorievich Kogan, ulitsa Perekopskoi divizii, 2, kv. 14, and Sergei Martynovich Nunuparov, ulitsa Lastochkina 5, kv. 34, all of Odessa, U.S.S.R.

Filed June 6, 1973, Ser. No. 367,396
Int. Cl. B01d *33/00*
U.S. Cl. 210–122 4 Claims



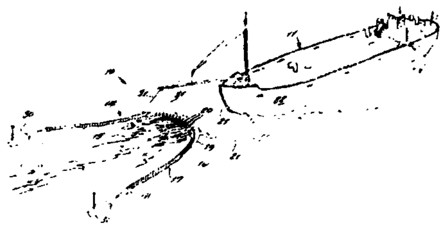
P-195-74
POLLUTION SUCTION WATER SWEEPER

Di Perna, J.
U.S. Patent 3,847,816

Electronically controlled director tugs pull an oil harvesting ring in front of a tanker with a series of oil collection tanks within its hold. The skimmer section of the ring sucks up the floating oil and transports it to the collection tanks.

Citation Source: Petroleum Abstracts. 1975. 15(9).
Entry #201,642.

3,847,816
POLLUTION SUCTION WATER SWEEPER
James DiPerna, 85 Foxhill Ter., Staten Island, N.Y. 10305
Filed Mar. 7, 1973, Ser. No. 339,381
Int. Cl. E02b *15/04*
U.S. Cl. 210—242 **1 Claim**



P-196-74
METHOD AND APPARATUS FOR PROCESSING WASTE WATER SLIMES OF STEEL MILL WATER TREATMENT SYSTEMS

Duval, L. A.
U.S. Patent 3,844,943

A method is given for the processing of a stream of water from a steel mill water treatment system containing iron oxides, liquid oils, heavy oil particles, a waste material slime and water.

Citation Source: Selected Water Resources Abstracts. 1975. 8(7).
Entry #W75-03740.

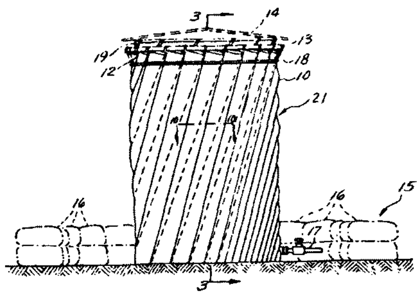
P-197-74
DEPLOYABLE SYSTEM FOR CONTAINING OIL SPILLS

Fisher, E. N.
U.S. Patent 3,863,694

A polyvinyl chloride diaphragm is placed under a small oil storage tank and then pleated and fastened to the upper part of the tank. The diaphragm is able to hold the entire contents of the tank in case of any tank failure.

Citation Source: Petroleum Abstracts. 1975. 15(16). Entry #203,799.

3,863,694
DEPLOYABLE SYSTEM FOR CONTAINING OIL SPILLS
Edwin N. Fisher, 7632 Wandering Dr., Anchorage, Alaska 99502
Filed Sept. 22, 1972, Ser. No. 291,255
Int. Cl. B65d *65/02*
U.S. Cl. 150—1 **9 Claims**



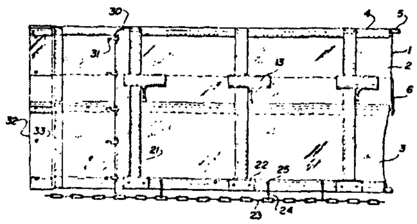
P-198-74
FLEXIBLE OIL BOOM

Fossberg, R. A.
U.S. Patent 3,852,978

This oil boom has strength, light weight and stability in choppy waters. The barrier wall of the boom is constructed of sheet material; the upper and lower parts of the wall are sewn together. Vertical stiffeners and straps near the overlap which can be connected to individual floats complete the boom.

Citation Source: Petroleum Abstracts. 1975. 15(9).
Entry #201,645.

3,852,978
FLEXIBLE OIL BOOM
Robert A. Fossberg, 1594 De la Broquerie, Bruno, Quebec, Canada
Continuation-in-part of Ser. No. 70,333, Sept. 8, 1970, abandoned. This application May 23, 1973, Ser. No. 363,040
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 F **6 Claims**



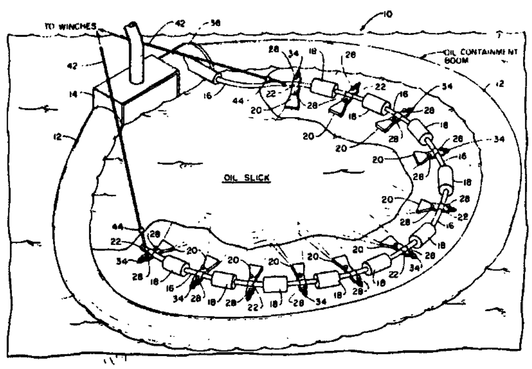
P-199-74
FLOATING WATER JET FOR OIL SLICK CONTROL

Graham, D. A.
U.S. Patent 3,762,169

Water jets force a hose against an oil slick, pushing the floating oil into a recovery mechanism. The hose is supported by floats and the water jets are connected to the hose between the floats.

Citation Source: Government Reports Announcements. 1975. 75(5). Entry # PATENT 3,762,169.

3,762,169
FLOATING WATER JET FOR OIL SLICK CONTROL
Douglas J. Graham, Port Hueneme, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Aug. 23, 1972, Ser. No. 283,021
Int. Cl. E02b *15/04*; B05b *1/04*
U.S. Cl. 61—1 F **6 Claims**



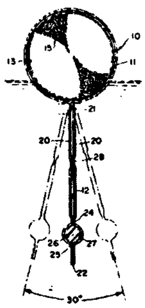
P-200-74
BOOM AS A BARRIER FOR OIL SLICKS AND THE LIKE ON THE SURFACE OF WATER

Green, L. G.
U.S. Patent 3,839,869

A number of nonpneumatic floats are wrapped with webbing for the boom. The web joint is on the underside of the float. The web is weighted and hangs down to form a ballasting fin.

Citation Source: Petroleum Abstracts. 1975. 15(2). Entry #199,198.

3,839,869
BOOM AS A BARRIER FOR OIL SLICKS AND THE LIKE ON THE SURFACE OF WATER
Leon G. Green, North Caldwell, N.J., assignor to Metropolitan Petroleum Petrochemicals Co., Inc., New York, N.Y.
Filed May 15, 1969, Ser. No. 824,930
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 F 14 Claims



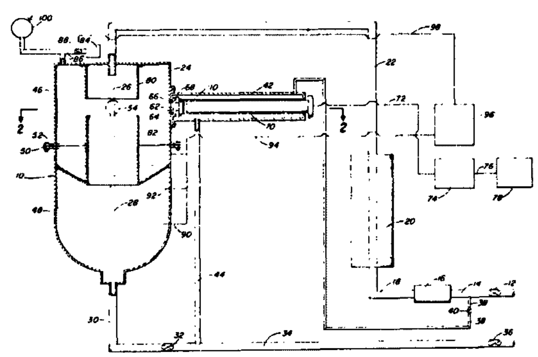
P-201-74
PRESSURIZED OIL-IN-WATER MONITOR

Gregory, M. D., J. E. Stolhand, and M. E. Yost
U.S. Patent 3,842,270

The water stream containing oil falls through a tubular housing. The upper part of the housing has windows through which UV is shown and the fluorescence of the oil is detected.

Citation Source: Chemical Abstracts. 1975. 18(20).
Entry #127,334k.

3,842,270
PRESSURIZED OIL-IN-WATER MONITOR
M. Duane Gregory; James E. Stolhand, and Marvin E. Yost, all of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.
Filed Oct. 29, 1973, Ser. No. 410,850
Int. Cl. G01n *21/34*
U.S. Cl. 250—301 **13 Claims**



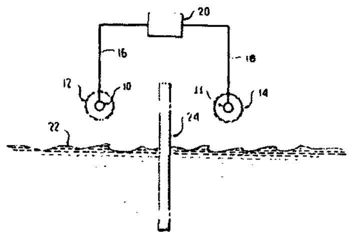
P-202-74
METHOD AND APPARATUS FOR MONITORING POLLUTION OF NATURAL WATERS

Horvath, R.
U.S. Patent 3,852,997

Two wet bulb thermometers are used in this system. One is wetted by water which may become polluted, whereas water from the same source which cannot be polluted wets the other. Any differences in these two temperature readings indicate the presence of pollutants with significantly different evaporative rates.

Citation Source: Petroleum Abstracts. 1975. 15(12).
Entry #202,524.

3,852,997
METHOD AND APPARATUS FOR MONITORING POLLUTION OF NATURAL WATERS
Robert Horvath, Plymouth, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.
Filed Feb. 9, 1973, Ser. No. 331,300
Int. Cl. G01n *25/00*
U.S. Cl. 73—61.1 R **14 Claims**



P-203-74

CLEANING OF OIL-LADEN METAL WASTE TO RECOVER THE METAL AND TO RECLAIM THE OIL

Ihrig, J. K.
U.S. Patent 3,846,173

A continuous countercurrent process for cleaning oil-laden metal waste is described. Wet sludge is removed from the detergent in a rehabilitation circuit, mixed with the cleaned waste and dried. The heavier solids, usually metal, are discharged with the waste and the detergent solution is recovered for recycling.

Citation Source: Chemical Abstracts. 1975. 82(16).
Entry #102880x.

3,846,173

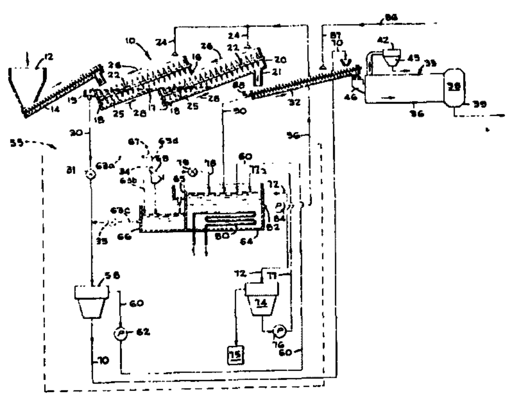
PROCESS FOR CLEANING OF OIL-LADEN METAL WASTE TO RECOVER THE METAL AND TO RECLAIM THE OIL

John Kenneth Ihrig, Glenwood, Ill., assignor to FMC Corporation, San Jose, Calif.

Filed Mar. 16, 1973, Ser. No. 342,014

Int. Cl. B08b *3/08, 3/10;* **C23g** *1/36*

U.S. Cl. 134—10 **22 Claims**



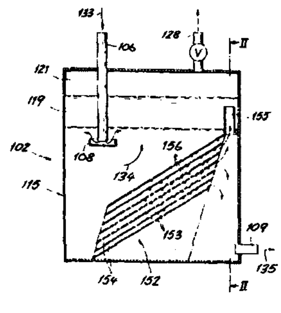
P-204-74
DEVICE FOR REMOVING OIL AND THE LIKE FROM WATER CONTAMINATED BY OIL OR THE LIKE

Jakubek, P.
U.S. Patent 3,849,311

This apparatus is of use in ship bilges. Oil contaminated water is pumped first through an air separator, then through an oil separator. Both a coarse and a fine separator are used; the coarse separator connects with the collecting tank.

Citation Source: Petroleum Abstracts. 1975. 15(16).
Entry #203,819.

3,849,311
DEVICE FOR REMOVING OIL AND THE LIKE FROM WATER CONTAMINATED BY OIL OR THE LIKE
Peter Jakubek, Brunn am Gebirge, Austria, assignor to Fa. International Pollution Control Systems, Inc., Washington, D.C.
Filed Dec. 1, 1972, Ser. No. 311,264
Claims priority, application Austria, Dec. 1, 1971, 10355/71
Int. Cl. B01d *19/00*
U.S. Cl. 210—188 **8 Claims**



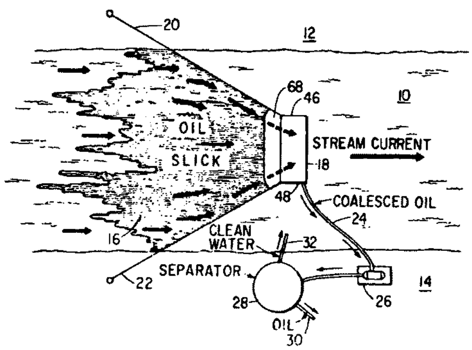
P-205-74
REMOVING FLOATING OIL FROM WATER

Jones, L. W.
U.S. Patent 3,850,806

A stream of water with a thin film of oil on the surface is directed through a bed of granular sulfur which is in a container. The oil is coalesced and removed, leaving the effluent water clean.

Citation Source: Chemical Abstracts. 1975. 82(18). Entry #115824.

3,850,807
SYSTEM FOR REMOVING FLOATING OIL FROM WATER
Loyd W. Jones, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.
Filed Oct. 15, 1971, Ser. No. 189,663
Int. Cl. E02b *15/04*
U.S. Cl. 210—170 **6 Claims**



P-206-74
FATTY OIL-WATER SEPARATION PROCESS

Keller, H. F., Jr.
U.S. Patent 3,803,031

Fatty constituents and particulate solids are retained from aqueous systems by passage through a finely divided, acid and alkali resistant filter media (particle mesh size range from 12 to 60) at a rate from 1 to 50 gallons/minute/square foot of filter media surface area. Methods of regeneration of the filter media are described.

Citation Source: Selected Water Resources Abstracts. 1975. 8(4). Entry #W75-01768.

P-207-74
POLYURETHANE COMPOSITIONS EXTENDED WITH LOW AROMATIC HYDROCARBON OILS

Mayer, S. E.
U.S. Patent 3,846,355

"Solid urethane polymers were extended with normally incompatible hydrocarbon oils by adding a thixotropic colloidal agent and an emulsifying agent to the polyisocyanate-polyol reaction containing the oil."

Citation Source: Chemical Abstracts. 1975. 82(10). Entry #59149b.

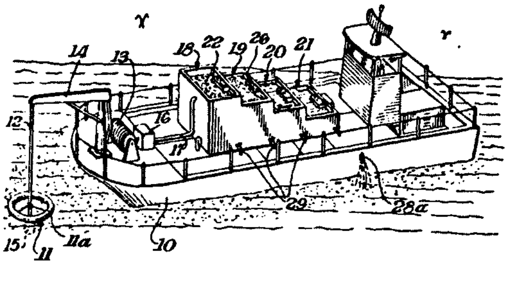
P-208-74
APPARATUS AND METHOD FOR EFFECTING SEPARATORS

Mercuri, L.
U.S. Patent 3,844,944

The mixture passes through a number of separators, each of which receives the processed fluid by gravity flow from the container immediately preceding it. The lighter material is allowed to go to the top after each successive separation and is skimmed off or sent to storage. Oil from oil spills can be recovered in this manner.

Citation Source: Petroleum Abstracts. 1975. 15(7).
Entry #200,920.

3,844,944
APPARATUS AND METHOD FOR EFFECTING SEPARATIONS
Louis Mercuri, 11 Linda St., Newark, Del. 19711
Filed June 27, 1972, Ser. No. 266,596
Int. Cl. E02b *15/04*
U.S. Cl. 210—73 **3 Claims**



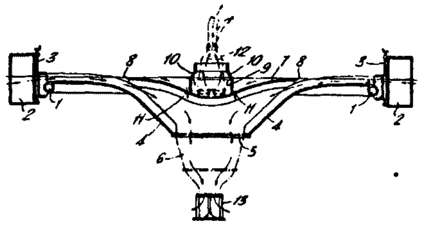
P-209-74
PUMPING APPARATUS FOR SKIMMING AND RECOVERING AN OIL LAYER FROM A BODY OF WATER

Mohn, F.
U.S. Patent 3,853,767

An apparatus for recovering floating oil consists of a bowl which has a central downwardly and inwardly inclined upper surface, a pump for pumping recovered oil from the central lower portion of the bowl, and a plate surrounding the bowl for directing water and oil toward the bowl's edge where oil is separated from water.

Citation Source: Petroleum Abstracts. 1975. 15(3).
Entry #202,777.

3,853,767
PUMPING APPARATUS FOR SKIMMING AND RECOVERING AN OIL LAYER FROM A BODY OF WATER
Frank Mohn, Fana, Norway, assignor to Patents and Developments A/S, Nesttun, Norway
Filed Apr. 14, 1972, Ser. No. 244,010
Claims priority, application Norway, Apr. 23, 1971, 1522/71
Int. Cl. E02b *15/04*
U.S. Cl. 210—242 **5 Claims**



P-210-74
OIL POLLUTION TOTALIZER

Moreau, J. O., and R. A. Halko
U.S. Patent B369,563

The totalizer measures both the rate and total amount of oil discharged in a flow. The oil is accumulated at a rate directly proportional to the discharge rate. This device would be useful in tanker deballasting operations and refinery effluent streams.

Citation Source: Petroleum Abstracts. 1975. 15(17).
Entry #204,083.

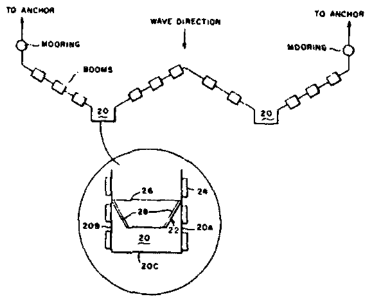
P-211-74
OIL ACCUMULATOR

Nugent, J. B.
U.S. Patent 3,768,656

A floating skimmer is described which has three sides. The skimmer itself is in a line of booms. A wave with oil on its surface enters the skimmer and surges up over the ramp, leaving the oil in the unit for later processing.

Citation Source: Petroleum Abstracts. 1975. 15(16).
Entry #203,817.

3,768,656
OIL ACCUMULATOR
John B. Nugent, Winthrop, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Filed May 28, 1971, Ser. No. 148,107
Int. Cl. E02b *15/04*
U.S. Cl. 210—242 **4 Claims**



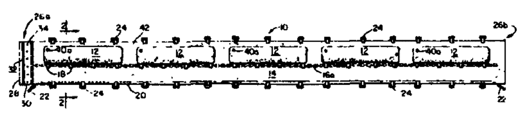
P-212-74
INFLATABLE BARRIER FOR SUBSTANCES FLOATING ON WATER

Preus, P.
U.S. Patent 3,849,989

A series of inflatable chambers, held together by tension members, are connected end to end. A flexible skirt hangs down into the water from the chambers.

Citation Source: Petroleum Abstracts. 1975. 15(9).
Entry #201,643.

3,849,989
INFLATABLE BARRIER FOR SUBSTANCES FLOATING ON WATER
Paul Preus, Box 1002, Toms River, N.J. 08753
Filed May 25, 1973, Ser. No. 363,954
Int. Cl. E02b *3/04, 15/04*
U.S. Cl. 61—1 F **4 Claims**



P-213-74
PREPARATION OF PERLITE-ASPHALT-FIBER COMPOSITIONS FOR SEPARATING HYDROCARBONS FROM WATER

Preus, P.
U.S. Patent 3,855,152

The material is formed from a loose mass of expanded perlite mixed with clays and fibrous filler. This mixture absorbs the hydrocarbon selectively from a hydrocarbon-water system; the mixture-hydrocarbon is then removed.

Citation Source: Petroleum Abstracts. 1975. 15(12).
Entry #202,525.

P-214-74
RECLAMATION OF HYDROCARBON CONTAMINATED GROUND WATERS.

Raymond, R. L.
U.S. Patent 3,846,290

An underground water supply contaminated by hydrocarbons is purified by the addition of nutrients and oxygen for hydrocarbon-degrading microorganisms normally present in the water supply.

Citation Source: Chemical Abstracts. 1975. 82(10).
Entry #64114r.

3,846,290

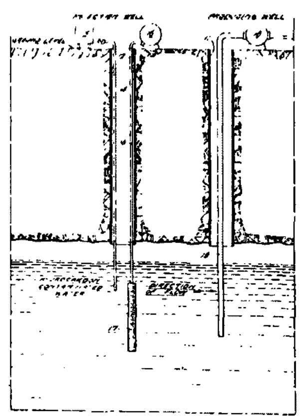
RECLAMATION OF HYDROCARBON CONTAMINATED GROUND WATERS

Richard L. Raymond, Wilmington, Del., assignor to Sun Research and Development Co., Philadelphia, Pa.

Filed Sept. 29, 1972, Ser. No. 293,621

Int. Cl. C02c *5/10*

U.S. Cl. 210—11 **7 Claims**



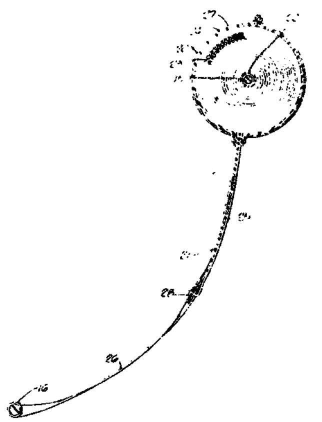
P-215-74
FLOTATION TYPE WATER SWEEP BOOM AND METHODS

Rudd, C. H.
U.S. Patent 3,852,965

A floating boom with a hanging curtain is towed through the water. The upper part of the curtain is impervious, and the lower part is open for free water passage. A lower line, connected to the bottom of the curtain, is pulled in advance of an upper line, which is attached to the floating surface barrier.

Citation Source: Petroleum Abstracts. 1975. 15(9).
Entry #201,644.

3,852,965
FLOTATION TYPE WATER SWEEP BOOM AND METHODS
Chris H. Rudd, 824 Luton Dr., Glendale, Calif. 91206
Continuation of Ser. No. 207,187, Dec. 13, 1971, abandoned.
This application Oct. 31, 1973, Ser. No. 411,277
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 F **20 Claims**



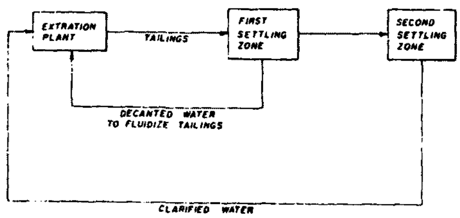
P-216-74
TAILINGS DISPOSAL SYSTEM FOR TAR SANDS PLANT

Schutte, R.
U.S. Patent 3,869,384

A waste disposal process is described for the tailings stream from a hot water extraction plant for recovering bitumen from tar sand. The stream undergoes settling and clarification and the remainder of the decanted water is added to the tailings stream to fluidize it and render it pumpable.

Citation Source: Petroleum Abstracts. 1975. 15(20).
Entry #205,054.

3,869,384
TAILINGS DISPOSAL SYSTEM FOR TAR SANDS PLANT
Robert Schutte, Sherwood Park, Alberta, Calif., assignor to Canada-Cities Service Ltd.; Imperial Oil Limited; Atlantic Richfield Canada Ltd. and Gulf Oil Canada Limited
Filed Jan. 21, 1974, Ser. No. 435,226
Int. Cl. B01d *21/00*
U.S. Cl. 210—44 **2 Claims**



P-217-74
PROCESS FOR CONTAINING OIL SPILLS

Stanley, W. L., and A. G. Pittman
U.S. Patent 3,869,385

Means are provided for containing an oil spill on a body of water. In the process, quantities of a polyisocyanate and a polyamine are applied to the spill. These substances have a density less than that of water and are at least partially miscible with oil, but are immiscible with water.

Citation Source: Petroleum Abstracts. 1975. 15(20).
Entry #205,051.

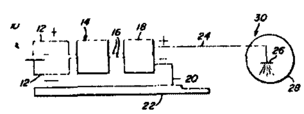
P-218-74
CORONA DISCHARGE TREATMENT OF AN OIL SLICK

Stoddard, P. C.
U.S. Patent 3,865,722

When a free floating oil slick is treated with a corona discharge, the oil tends to conglomerate and become cohesive. Removal of the oil is made easier. The corona also decreased the tendency of the oil to become emulsified in the water.

Citation Source: Petroleum Abstracts. 1975. 15(19). Entry #204,796.

3,865,722
CORONA DISCHARGE TREATMENT OF AN OIL SLICK
Patrick C. Stoddard, 7734 Leonard Dr., Falls Church, Va. 22043
Filed Oct. 25, 1972, Ser. No. 300,520
Int. Cl. C02b *9/02*
U.S. Cl. 210—42 **7 Claims**



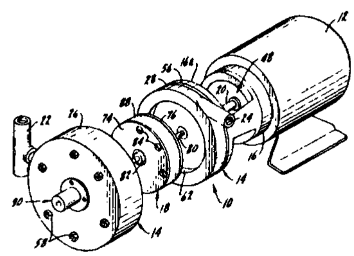
P-219-74
APPARATUS FOR SEPARATING OIL FROM WATER AND MEASURING THE AMOUNT OF OIL SO SEPARATED

Tulumello, A. C.
U.S. Patent 3,847,810

A rotor, enclosed in a housing with an inlet for oily water and an outlet for pure water, has two spaced metal plates with absorber material between them. As the rotor turns, oil is collected in the absorber material. The capacitance between the two plates changes as the oil is absorbed and measures the amount of oil collected from a water stream.

Citation Source: Petroleum Abstracts. 1975. 15(9).
Entry #201,641.

3,847,810
APPARATUS FOR SEPARATING OIL FROM WATER AND MEASURING THE AMOUNT OF OIL SO SEPARATED
Angelo C. Tulumello, 18508 Lorrence Ave., Apt. 2E, Lansing, Ill. 60438
Filed May 4, 1973, Ser. No. 357,506
Int. Cl. E02b *15/04*
U.S. Cl. 210—96 **12 Claims**



P-220-74
OIL WATER SEPARATION

Vennett, R. M.
U.S. Patent 3,869, 388

The process for separating oil and water in storage vessels involves the addition of a liquid inert to and insoluble in both oil and water, and having a specific gravity higher than that of oil and lower than that of water, so an intermediate layer forms between the oil and water.

Citation Source: Petroleum Abstracts. 1975. 15(20).
Entry #205,022.

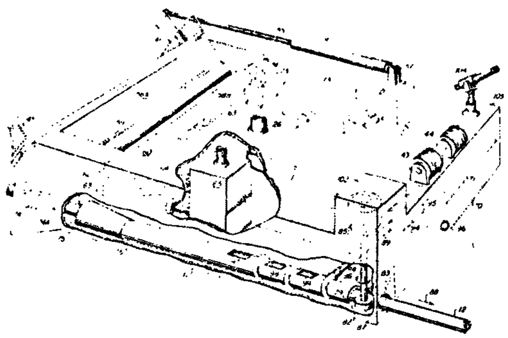
P-221-74
BOAT FOR COLLECTING OIL SLICKS AND OTHER CONTAMINANTS FROM THE SURFACE OF WATER

Weatherford, D. J.
U.S. Patent 3,862,904

This oil collection boat has a noose-type boom which draws surface films to a front-end surface skimmer. As the oil is drawn in and the area decreases, the layer thickens. A mesh basket in front of the skimmer collects debris.

Citation Source: Petroleum Abstracts. 1975. 15(17).
Entry #204,071.

3,862,904
BOAT FOR COLLECTING OIL SLICKS AND OTHER CONTAMINANTS FROM THE SURFACE OF WATER
Danny J. Weatherford, 7250 North 41st. Ave., Phoenix, Ariz. 85021
Filed Jan. 21, 1974, Ser. No. 435,103
Int. Cl. E02b *15/04*
U.S. Cl. 210—242 13 Claims



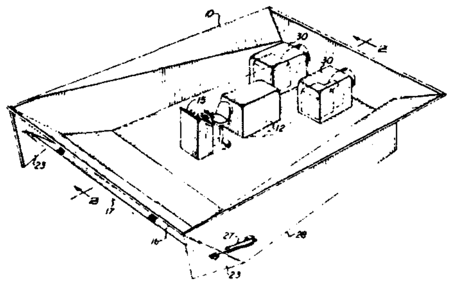
P-222-74
OIL SLICK SKIMMER

Weatherford, D. J.
U.S. Patent 3,860,519

In this process, oil slicks are skimmed from the surface by a boat with an appended hull. The slick is pumped to a compartment where the oil immediately rises to the top and is bled off and pumped into an accumulation compartment. The water is filtered and returned to the sea.

Citation Source: Petroleum Abstracts, 1975. 15(16). Entry #203,820.

3,860,519
OIL SLICK SKIMMER
Danny J. Weatherford, 7250 N. 41st Ave., Phoenix, Ariz. 85021
Filed Jan. 5, 1973, Ser. No. 321,281
Int. Cl. E02b 15/04
U.S. Cl. 210—242 3 Claims



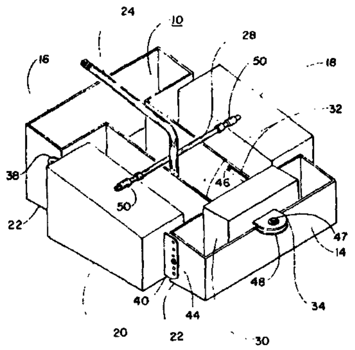
P-223-74
APPARATUS FOR SKIMMING FLOATING POLLUTION FROM A LIQUID SURFACE

Westerman, H.
U.S. Patent 3,849,308

A container with one open shallow end and one deep end is supported on the water's surface. These two ends are raised and lowered automatically, causing a flow that dissolves soluble solids and carries insoluble solids past the suction end of the center pipeline. The frequency of the rocking motion self-adjusts and is in part a function of the discharge rate from the container.

Citation Source: Petroleum Abstracts. 1975. 15(16).
Entry #203,818.

3,849,308
APPARATUS FOR SKIMMING FLOATING POLLUTION FROM A LIQUID SURFACE
Hulan Westerman, P.O. Box 118, Boothville, La. 70038
Filed Oct. 25, 1972, Ser. No. 300,601
Int. Cl. B01d *33/38*; E02b *15/04*
U.S. Cl. 210—98 **2 Claims**



P-224-74
OIL-ABSORBENT FOAMED SILICATE FOR OIL POLLUTION CONTROL

Whittington, J. M. C., J. E. Meyer, and G. D. Tingle
U.S. Patent 3,843,306

A process is described in which an alkaline metal silicate foam having oleophilic-hydrophobic properties is used to control and remove oil spills. When the foam is spread over an oil slick, the oil is immediately absorbed by the foam and can be ignited. Burning continues until oil is completely consumed.

Citation Source: Chemical Abstracts. 1975. 82(10).
Entry #64112p.

B. FOREIGN PATENTS

P-225-74
TREATMENT OF OIL SPILLS BY USING OIL-BALL FORMING AGENTS BASED ON WATER SOLUBLE PROTEINS

Abe, K., S. Tomita, Y. Matsuda, and K. Terajima
Japanese Kokai (unexamined patent application) 74 86,276

Oil spills are effectively removed by spraying an oil-ball-forming agent, made of water-soluble protein 0.1-2.0 weight % of the oil to be treated, on a spill and collecting the resulting oil balls. An equal amount of a polymeric oil-ball-formation promoting agent may be added to the agent.

Citation Source: Chemical Abstracts. 1975. 82(16). Entry #102888f.

P-226-74
TREATMENT OF OIL SPILLS USING BASIC POLYMER OIL-BALL FORMING AGENTS

Abe, K., S. Tomita, Y. Matsuda, K. Terajima, and T. Kanayama
Japanese Kokai (unexamined patent application) 74 89,687

Oil-ball-forming agents, composed of a water-soluble basic polymer 0.3 to 2.0 weight % of the amount of oil spilled, is sprayed over a spill and the resulting oil balls are collected. The oil-ball-forming agent coagulates the oils spilled on the water surface as well as the oils dissolved in the seawater, thus facilitating the recovery of the oil spill.

Citation Source: Chemical Abstracts. 1975. 82(16). Entry #102894e.

P-227-74
FLOATING VESSELS

Anonymous
Netherlands Patent 7,406,443

An oil-recovering floating vessel consists of a buoyant vertical column supplied with a ballast section having a large diameter at its end. The column and ballast section determine the limits of a shaft which is open at its lower end and allows fluid to enter the shaft over a relatively large area.

Citation Source: Petroleum Abstracts. 1975. 15(3). Entry #202,779.

P-228-74
IMPROVED APPARATUS FOR THE SEPARATION AND PUMPING OF STRATIFIED LIQUIDS

Anonymous
British Patent 1,371,993

Adjustable floats are used to support a bowl in two stratified liquids. A disk is superimposed on the bowl to separate the liquids and two pumps are used to pump them. The floats place the disk edge at the plane of separation of the liquids.

Citation Source: Petroleum Abstracts. 1975. 15(16). Entry #203,822.

P-229-74
METHOD OF COLLECTING OIL ON WATER SURFACE

Anonymous
British Patent 1,384,217

Waste tires cut into 5 mm chips and then ground into a powder are scattered on a water surface. The powdered tires absorb the oil, forming blobs or balls of oil that can be easily collected.

Citation Source: Petroleum Abstracts. 1975. 15(16). Entry #203,823.

P-230-74
MIXTURES FOR TRANSFORMING FATS AND HYDROCARBONS INTO BIODEGRADABLE EMULSIONS

Anonymous
German Offenlegungsschriften (unexamined patent application) 2,422,449

Mixtures of alkanamides (20-34%), ammonium alkano (2.5-6%), and solvent (55-75%) are used to emulsify a hydrocarbon layer on water.

Citation Source: Chemical Abstracts. 1975. 82(18). Entry #115862.

P-231-74
PROCEDURE AND INSTALLATION TO REMOVE POLLUTANTS FROM WATER

Anonymous
Netherlands Patent 1,404,099

A system consisting of a gutter divided into a number of mixing chambers is used to remove and accumulate the upper layer containing oil and water. The mixture is then placed in accumulation and settling tanks.

Citation Source: Petroleum Abstracts. 1975. 15(12).
Entry #202,526.

P-232-74
SWAB

Anonymous
Netherlands Patent 7,306,564

A swab, consisting of a number of thin strips of polypropylene, can be used to clean up oil spills on coastlines.

Citation Source: Petroleum Abstracts. 1975. 15(13).
Entry #202,780.

P-233-74
APPARATUS FOR RECOVERING OIL FROM WASTE SOLUBLE OIL EMULSIONS

Atherton, D. G., and B. A. Silvester
British Patent 1,368,991

The main tank consists of a reaction chamber and storage for the recovered oil. Three reservoirs above the reaction chamber release an emulsion breaking agent, an acid, and an alkali into the agitated contents of the chamber. The oil is then skimmed off into storage.

Citation Source: Chemical Abstracts. 1975. 82(18).
Entry #113988a.

P-234-74
OIL SPILL CAPTURING SHEET

Ausawa, S., K. Tsuchiya, S. Kubota, T. Horie, and N. Fukuoka
Japanese Kokai (unexamined patent application) 74 90,687

An oil spill removing sheet having good mechanical strength and a high oil-absorption capacity is formed by treating paper pulp with a sizing and pouring it into a sheet with an average porosity of 50-95%.

Citation Source: Chemical Abstracts. 1975. 82(22).
Entry #144681p.

P-235-74
MATERIAL FOR TREATING OCEAN OIL SPILLAGE

Azuma, K.
Japanese Kokai (unexamined patent application) 74 53,177

The method of preparation of a material used to remove oil floating on the surface of water is given. The material is considered to be useful in treating oil spills from oil tankers and other ocean-going vessels and is especially useful for oil removal from vicinities of shell-fish beds and seaweed harvesting areas.

Citation Source: Chemical Abstracts. 1975. 82(12).
Entry #76952a.

P-236-74
PIPELINE FOR CRUDE OIL PRODUCT

Ballast Nedam Groep NV, and Mining Equipment Manufacturing Corporation
Netherlands Patent 7,305,013

A pipeline for crude oil or petroleum products is partly buried in the sea bottom, unlike floating pipelines, so as to eliminate the danger of breaking.

Citation Source: Petroleum Abstracts. 1975. 15(11).
Entry #202,192.

P-237-74
ANTIPOLLUTION FLOATING BARRIER

Ballu, L.
French Patent 2,215,073

This patent describes flotation pockets and a procedure for installing and maintaining the pockets in floating barriers. The pockets open downward and are shaped by inserts lighter than water, such as cellulen material impervious to water and with little compressibility, or small inflated balloons, or just air.

Citation Source: Petroleum Abstracts. 1975. 15(9).
Entry #201,647.

P-238-74
OIL-ABSORBING POLYURETHANE FOAM

Bommer, H.
German Offenlegungsschriften (unexamined patent application)
2,306,916

The oil-absorbing material is prepared from granular polyurethane foam, binders and additives (powders, granules, cuttings and fibers).

Citation Source: Chemical Abstracts. 1975. 82(10). Entry #64147d.

P-239-74
OIL SKIMMER APPARATUS

Craggs, D. E., and R. S. Gillen
British Patent 1,381,197

An oil skimming apparatus consists of the following: a rectangular structure with an imperforate bottom member which defines a partially enclosed open-fronted compartment, a cutting lip pivotly attached to the front edge of the bottom member, a vertical weir transversely positioned across the compartment near the rear, and a transverse outlet in the bottom of the compartment for discharge of oil-free water.

Citation Source: Petroleum Abstracts. 1975. 15(13).
Entry #202,778.

P-240-74
DEVICE FOR CONTROLLING DROP COAGULATION

Davies, G. A., G. V. Jeffreys, and D. P. Bayley
German Offenlegungsschriften (unexamined patent application)
2,303,990

Petroleum-water dispersions are separated in a column containing a packing composed of a mixture of stainless steel and polypropylene filaments. The dispersed liquid forms continuous films on the packing and flows out the column bottom in discrete streams to a separator.

Citation Source: Chemical Abstracts. 1975. 82(10). Entry #61117h.

P-241-74
APPARATUS FOR ENCOURAGING EMULSIFICATION

Desty, D. H.
British Patent 1,376,166

A rotating drum agitates the surface layer of water sufficiently to mix it with the contaminating oil. The drum surface is of perforated or expanded metal. The apparatus can be supported by a conventional ship or be self floating with independent motors.

Citation Source: Petroleum Abstracts. 1976. 15(9). Entry #201,649.

P-242-74
PRECIPITATION OF OIL FROM SURFACE OF WATER BY SPRAYING WITH FINE KAOLIN

DeVilliers, W. R.
Canadian Patent 940,457

When finely divided kaolin is applied to oil slicks on water, it removes the oil by forming a kaolin-oil complex which precipitates. The amount of kaolin required to precipitate an oil slick is a function of the following: type of oil, slick depth, viscosity, and wave or other motion of the water.

Citation Source: Chemical Abstracts. 1975. 82(12). Entry #76871y.

P-243-74
OIL ABSORBENT

Fischer, K. O. P.
Canadian Patent 956,921

Specially dried and processed peat is used to collect and absorb oil spilled on the water's surface. Peat fibers and peat fines spread on water readily and float, exhibit excellent oil absorbent qualities, and do not sink when oil laden.

Citation Source: Chemical Abstracts. 1975. 82(12). Entry #76874b.

P-244-74
OIL ABSORBING NONWOVEN TEXTILES

Fujimura, I.
Japanese Kokai (unexamined patent application) 74,122,891

A textile made from a polybutene-polyolefin side-by-side composite fiber is useful for removing oils from waste water. Water containing 70 ppm oil was filtered through a 20 cm layer of the textile, and emerged containing 8 ppm oil. This textile has a longer life than other oil absorbing textiles.

Citation Source: Chemical Abstracts. 1975. 82(18). Entry #113159v.

P-245-74
FLOATING FLEXIBLE SEA BARRIER HAVING ADJUSTABLE DRAFT

Grihangne, A.
Netherlands Patent 7,408,400

A floating, flexible expandable sea barrier is used to contain oil slicks. The barrier is a tube shaped line that can be inflated or deflected.

Citation Source: Petroleum Abstracts. 1975. 15(21).
Entry #205,281.

P-246-74
ABSORBENTS FOR REMOVAL OF OIL DISPERSED IN WATER

Harris, A., W. Margotte, and B. M. Thomas
German Offenlegungsschriften (unexamined patent application) 2,431,610

Removal of oil dispersed in waste water is achieved by mixing with an adsorption agent (vinyl polymer, urea formaldehyde resin, or melamine formaldehyde polymer) 40-90 wt. %; an emulsion-breaking agent ($Al_2(SO_4)_3 \cdot 16\ H_2O$ or $CaCl_2$) 9-50 wt.%; and a hydrophobic agent (paraffin wax, lanolin, liquid paraffin, castor oil, capryl wax, or a silicone oil) 1-10 wt. %.

Citation Source: Chemical Abstracts. 1975. 82(22). Entry #144655h.

P-247-74
OIL BARRIER

In't Veld, C.
French Patent 2,210,193

Vertical bars made of floating material are tied together. The bars are slightly parted. Two of these partial barriers parallel to each other can localize any oil spill and serve as a container to remove oil from the water surface.

Citation Source: Petroleum Abstracts. 1975. 15(7).
Entry #200,922.

P-248-74
REMOVAL OF OIL FROM THE SURFACE OF WATER

Kawachi, J., Y. Negi, and T. Toiyama
Japanese Kokai (unexamined patent application) 74 96,980

Water slurry, composed of short polyolefin fibers, is sprayed over oil on the surface of water to gel the oils. The gel-like oils with the polyolefin fibers are then removed from the water.

Citation Source: Chemical Abstracts. 1975. 82(16).
Entry #102865w.

P-249-74
SEPARATING OF OIL FROM WATER

Kita, S., T. Kono, and S. Fujita
Japanese Kokai (unexamined patent application) 74 86,267

Oil floating on the surface of water or present in solution as an emulsion in water is treated by adding an alum-type material and contacting the oil-containing water with a sorbent material for oil separation.

Citation Source: Chemical Abstracts. 1975. 82(16).
Entry #102989q.

P-250-74
REINFORCED OIL ABSORBING MATTS FOR RECOVERY OF OIL SPILLS AND TREATMENT OF WASTE SOLUTIONS

Kita, S., and T. Kono
Japanese Kokai (unexamined patent application) 74 86,277

Oil from oil spills or industrial waste solutions is recovered by the use of oil-absorbing matts, prepared from polyolefin fibers. Tapes or threads are incorporated in the matts to give reinforced oil-absorbing capabilities. The matt can absorb 4.1 and 11 times its weight of A- and C-type heavy oils, respectively.

Citation Source: Chemical Abstracts. 1975. 82(16).
Entry #102889q.

P-251-74
OIL ABSORBING FIBERS AND SHEETS

Kita, S., and T. Kono
Japanese Kokai (unexamined patent application) 74 87,866

Fibers and sheets, prepared from a mixture of boiling heptane-insoluble crystalline polypropylene and boiling heptane-insoluble ethylene-propylene copolymer, are used to absorb oil on seawater.

Citation Source: Chemical Abstracts. 1975. 82(10). Entry #59717k.

P-252-74
OIL ADSORBENT

Kitagaki, T., K. Taguchi, and S. Nakamura
Japanese Kokai (unexamined patent application) 74 119,882

An oil adsorbent used to remove oils from waste water is obtained from chaff or sawdust treated with a silicone system water repellent and packed in fibrous material bags treated with a water repellent.

Citation Source: Chemical Abstracts. 1975. 82(22). Entry #144662h.

P-253-74
TREATMENT OF WASTE OIL

Koizumi, T.
Japanese Kokai 74,102,568

A hydroxycarboxylic acid (0.2-20 wt. parts) is mixed with 100 wt. parts waste oil. Sludge forms and is removed by centrifugation.

Citation Source: Chemical Abstracts. 1975. 82(20). Entry #129035n.

P-254-74
EXTRACTION OF TARRY MATTERS AND HYDROCARBONS FROM WASTE WATERS

Kupryakhina, K. Z., E. I. Shuleshov, and I. V. Rozhnyatovskii
U.S.S.R. Patent 444,732

The extraction is simplified and the consumption of the extracting agent is decreased when a mixture of the agent and waste water is passed through a granular material, and the extracting agent is recovered by distillation.

Citation Source: Chemical Abstracts. 1975. 82(20). Entry #129037q.

P-255-74
HYDROCARBON DETERMINATION IN WATER

Laier, G.
German Offenlegungsschriften (unexamined patent application)
2,322,986

"Hydrocarbons are determined in water and wastewater by cracking in the vapor phase at 100° with the formation of H and CO and determining the $H-H_2O$ equilibrium by the oxygen potential using ZrO_2 solid electrolyte cells."

Citation Source: Chemical Abstracts. 1975. 82(22).
Entry #144782x.

P-256-74
APPARATUS AND METHOD FOR TREATING EMULSIONS

Lefeurre, A. A. J.
German Offenlegungsschriften (unexamined patent application)
2,412,715

$CaCl_2$ and a water-in-oil type emulsifier are added to a 0.5 to 5% oil-containing emulsion. After agitation, droplets of water-in-oil emulsion are removed by filtration. The resulting water phase contains <15 ppm oil.

Citation Source: Chemical Abstracts. 1975. 82(12). Entry #77508x.

P-257-74
APPARATUS FOR PROTECTING THE WATER ALONG THE SHORE OF THE SEA OR OF RIVERS AGAINST POLLUTION WHICH MIGHT ENDANGER HUMAN BEINGS DURING BATHING

Leonard, S.
French Patent 2,216,821

The apparatus consists of a vertical sheet of plastic which isolates a volume of water near shore. The sheet is attached at the surface to polystyrene floats and anchored to ballast on the bottom. The isolated volume can be purified and continuously renewed with clean water. One use is to protect the seawater in areas of offshore drilling for oil.

Citation Source: Petroleum Abstracts. 1975. 15(9).
Entry #201,648.

P-258-74
SEPARATING HYDROCARBONS

Luke, L. A., and N. G. McTaggart
British Patent 1,380,581

The method analyzes hydrocarbon mixtures containing paraffin, naphthenes and olefins and aromatics. The mixture is first hydrogenated to convert olefins to paraffins and naphthenes, and then run in the gas phase through a molecular sieve column. The olefins are removed and the remaining mixture, in gas phase, is passed through a molecular sieve and the effluents are identified.

Citation Source: Petroleum Abstracts. 1975. 15(10). Entry #201,898.

P-259-74
SORBENTS FOR THE REMOVAL OF PETROLEUM PRODUCTS FROM WASTE WATERS

Lyubman, H. Y., O. N. Chistyakova, Y. N. Svyadoshch, G. K. Imangazieva, and L. S. Dukhankina
U.S.S.R. Patent 448,191

"The title sorbents are produced by treating a chloromethylated styrene-divinylbenzene copolymer with aliphatic alcohols ($C \geq 5$) at 80-100° in the presence of an alkali catalyst."

Citation Source: Chemical Abstracts. 1975. 82(20). Entry #129043p.

P-260-74
REMOVAL OF OIL FILMS FROM SEA WATER SURFACES BY BIODEGRADATION

Marconi, W.
German Offenlegungsschriften (unexamined patent application) 2,417,431

A number of nutritive salts are listed which are added to oil spills to aid oil biodegrading microorganisms. The salts are treated with paraffins to make them lipophilic and floatable.

Citation Source: Chemical Abstracts. 1975. 82(16). Entry #102996q.

P-261-74
PRODUCTS USEFUL IN COMBATTING POLLUTION BY OILY MATERIALS

Martineau, J., and F. J. Biechler
French Demande 2,214,662

The preparation of a complex powder useful in adsorbing oily contaminants of waste water and capable of being removed from the surface for later extraction is described.

Citation Source: Chemical Abstracts. 1975. 82(16). Entry #102872w.

P-262-74
PROCESS FOR REMOVAL FROM THE SURFACE OF A BODY OF WATER A POLLUTING LIQUID OF LOWER DENSITY, AND APPARATUS USED FOR THIS PURPOSE

Massei, O.
French Patent 2,223,516

Polluted surface waters are driven into a submerged channel whose roof is below the surface. Baffles create zones of pollutant accumulation near the roof of the channel. The pollutant is removed by aspiration and sent to decantation tanks. The apparatus is operable on the high seas.

Citation Source: Petroleum Abstracts. 1975. 15(19). Entry #204,798.

P-263-74
EMULSIFYING AGENT

Mo Och Domsjo A/B
British Patent 1,368,671

Compounds of the general formula RCOO $(C_nH_{2n}O)pR_1$ form excellent emulsifying agents for hydrophobic fluids. R is a linear aliphatic hydrocarbon radical with 15 to 23 carbons; R_1 is an alkyl, cycloalkyl or aryl group with 1 to 6 carbons; $(C_nH_{2n}O)$ does not have the number of propyleneoxy units greater than 40% of the ethyleneoxy units, and p is usually 20 to 30.

Citation Source: Petroleum Abstracts. 1975. 15(19). Entry #204,738.

P-264-74
BARRIER FOR PROTECTION OF THE SURFACE OF WATER AGAINST POLLUTION

Mondiet, R. P.
French Patent 2,226,852

The upper edge of this antipollution barrier is attached to a line supported by buoys. The lower edge of the net is attached to the buoys and also has lead weights to keep the net vertical.

Citation Source: Petroleum Abstracts. 1975. 15(19).
Entry #204,799.

P-265-74
TREATMENT OF OIL EMULSION IN WATER

Mori, H.
Japanese Kokai (unexamined patent application) 74 80,858

Water containing an oil emulsion and iron is treated by the addition of HClO or its salt to separate oil and iron from the water.

Citation Source: Chemical Abstracts. 1975. 82(16).
Entry #102846r.

P-266-74
SEPARATING OIL FROM WASTE WATERS

Miyazawa, T.
German Offenlegungsschriften (unexamined patent application) 2,412,559

Oil- and fat-containing waste water is treated with an amount of paraffin hydrocarbon and a flocculating agent, stirred, and the supernatant oil-containing foam is removed for oil recovery by distillation.

Citation Source: Chemical Abstracts. 1975. 82(10).
Entry #64075d.

P-267-74
OIL-EMULSIFYING COMPOSITION

Nagao, F., and K. Hagiwara
Japanese Kokai (unexamined patent application) 74 67,885

An oil emulsifying composition useful for diffusion of oil on the surface of seawater consists of a polyoxyethylene sorbitan fatty acid ester and N-paraffin or paraffin-containing solvent.

Citation Source: Chemical Abstracts. 1975. 82(10).
Entry #64148e.

P-268-74
TREATMENT OF THE SLUDGE OBTAINED BY TREATING OIL-CONTAMINATED SEWAGES WITH ALUMINUM AND IRON SALTS

Nagy, G., J. Sdravich, G. Szebeni, and S. Bodas
Hung. Teljes 8,881

The sludge of oil-contaminated sewage is decomposed to aqueous, oily and solid phases by a process of concentration by sedimentation, and acidification with H_2SO_4 to pH 3.0-5 and 2.0-5, respectively.

Citation Source: Chemical Abstracts. 1975. 82(10). Entry #64139c.

P-269-74
REMOVAL OF OIL FROM WASTE WATER

Nakaguro, F., and T. Nishimura
Japanese Kokai (unexamined patent application) 74 90,285

Oil-containing waste water is passed through an oil collector-packed tower made from polymers which are soluble in oils. Oils in the waste water come into contact with the oil collector and the collector is dissolved in the oils, thus separating them from the waste water.

Citation Source: Chemical Abstracts. 1975. 82(16).
Entry #102861s.

P-270-74
REMOVAL OF OIL FROM SEAWATER

Nakajima, T., K. Arai, S. Sugawara, A. Higuehi, and A. Ichikawa
Japanese Kokai (unexamined patent application) 74 105,782

Oil-containing seawater is mixed with a lipophilic polymer emulsion which is broken by seawater. After agitation, the coagulated polymers are separated from the seawater with a 95% efficiency.

Citation Source: Chemical Abstracts. 1975. 82(20).
Entry #129033k.

P-271-74
ADSORBENT FOR REMOVING OILS FROM WASTE WATER

Ohkita, J., H. Segawa, K. Saito, and M. Nakamura
Japanese Kokai (unexamined patent application) 74 84,979

An oil adsorbent is prepared by mixing synthetic fibrils made from hydrophobic resins with hydrophilic, natural cellulosic cut staple fibers. Waste water containing 100 ppm fuel oil A, when passed through a column packed with the adsorbent, has a reduced oil content of 0.1 ppm fuel oil A.

Citation Source: Chemical Abstracts. 1975. 82(12). Entry #76868c.

P-272-74
ADSORBENT FOR REMOVING OILS FROM WASTE WATER

Ohkita, J., H. Segawa, S. Kurosaki, and T. Mochizuki
Japanese Kokai (unexamined patent application) 74 84,980

An adsorbent with a high capacity to adsorb oils from waste water is prepared by mixing synthetic fibrils, made from hydrophobic resins, with natural cellulosic materials. When waste water containing 100 ppm fuel oil A is passed through a column packed with the mixture, the fuel oil A is completely removed.

Citation Source: Chemical Abstracts. 1975. 82(10). Entry #64090e.

P-273-74
ADSORBENT FOR REMOVING OILS FROM WASTE WATER

Ohkita, J., S. Kurosaki, K. Kagitami, and S. Morihiro
Japanese Kokai (unexamined patent application) 74 84,981

An adsorbent with a high capacity to adsorb oils from waste water consists of nonwoven fabrics made from hydrophobic fibers and hydrophilic fibers. When waste water containing 100 ppm fuel oil A is passed through a column packed with the adsorbent, fuel oil A is completely removed.

Citation Source: Chemical Abstracts. 1975. 82(10). Entry #64091f.

P-274-74
OIL ADSORBENT

Ohkita, J., and H. Segawa
Japanese Kokai (unexamined patent application) 74 115,087

Polystyrene fiber cloth, made from polystyrene resin fibers containing 30% stearic acid and polyethylene glycol dilaurate, was cut and packed in a reactor. Water containing 100 ppm heavy oil was passed through the reactor at 120 ml/min. The oil content was reduced to 2 ppm.

Citation Source: Chemical Abstracts. 1975. 82(22). Entry #144671k.

P-275-74
FILTER MATERIAL FOR OIL AND WATER EMULSIONS

Ohta, M.
Japanese Kokai (unexamined patent application) 74 27,622

A material made of an at least partially marcellized or acetylated cellulose fiber is used to rapidly separate oil-in-water and water-in-oil emulsions. When an aqueous emulsion containing 5000 ppm oil is filtered through the material, the amount of oil in the solution is reduced to 0.7 ppm oil.

Citation Source: Chemical Abstracts. 1975. 82(10).
Entry #64138b.

P-276-74
OIL-ABSORBING STRUCTURAL SUBSTANCE

Ohyabu, M., T. Ishimaru, and K. Murakami
Japanese Patent 74 33,741

A barrier tube for absorbing oil floating on sea or water surfaces is described. The tube consists of wide mesh cloth packed with polypropylene at a space rate of 55-85%.

Citation Source: Chemical Abstracts. 1975. 82(14).
Entry #89723b.

P-277-74
SEPARATION OF OIL FROM WATER USING A FLOCCULATION LAYER

Oshitari, Y.
Japanese Kokai (unexamined patent application) 74 83,670

An oil-water mixture containing surfactants and oil additives is treated by blowing in reducing or oxidizing gases and other chemicals, and then passing the mixture through a layer for coalescing the oil droplets. The gases serve to destroy the surfactants, which lower the surface tension of water and reduce the efficiency of oil droplet coalescence.

Citation Source: Chemical Abstracts. 1975. 82(16).
Entry #102990h.

P-278-74
COMPOUND AND PROCESS FOR DISPERSING OIL FILMS FLOATING ON THE SURFACE OF WATER

Perlaky, C.
French Patent 2,213,093

A compound, consisting of a nonionic dispersing agent (3 to 50% by weight) and an oxygenated organic compound soluble in water (50 to 97% by weight), added in small amounts, disperses an oil film. The organic compound can be mixed alcohols or esters of alcohols with 4 to 13 carbon atoms, oxo products obtained when preparing C_6 to C_{13} alcohols, or a mixture.

Citation Source: Petroleum Abstracts. 1975. 15(9).
Entry #201,646.

P-279-74
APPARATUS FOR THE SEPARATION OF LIGHT LIQUIDS FROM WASTE WATERS

Purator Klaeranlagen Grosshandel Ing. Oestreicher and Company
Austrian Patent 318,505

A filtration apparatus is described which is used for the separation of light liquids, such as mineral oils, from waste water.

Citation Source: Chemical Abstracts. 1975. 82(10).
Entry #64109t.

P-280-74
APPARATUS AND METHOD FOR PURIFYING WATER

PLM Glasindustrie Dongen B.V.
Netherlands Patent 73 05,509

"Oil is separated from water in a bell jar touching a basin into which the polluted water continuously flows."

Citation Source: Chemical Abstracts. 1975. 82(12).
Entry #76879g.

P-281-74
APPARATUS FOR THE PURIFICATION OF WATER POLLUTED WITH OIL

Rafael, J.
German Patent 2,246,958

A floating tank with an inlet for the pollution layer collects the polluted water. The convex roof of the tank has a hole where the roof is highest and the oil collects. The oil can be withdrawn.

Citation Source: Petroleum Abstracts. 1975. 15(7).
Entry #200,923.

P-282-74
PURIFICATION OF WASTE WATER CONTAINING PHENOLS AND AROMATIC HYDROCARBONS

Sanada, H.
Japanese Kokai (unexamined patent application) 74 105,358

Aeration of waste water containing phenols and aromatic hydrocarbons removes all or part of the aromatic hydrocarbons. The waste water is then passed through a fixed bed adsorber packed with activated C to remove the phenol.

Citation Source: Chemical Abstracts. 1975. 82(18).
Entry #115851p.

P-283-74
IMPROVEMENTS IN OR RELATING TO MARINE BOOMS FOR CONTROLLING FLOATING POLLUTION

Sandford, W. H.
British Patent 1,387,123

This invention is useful both for booms intended to control oil pollution and to enclose bathing areas. A length of flexible material is folded longitudinally and an inflatable member is inserted to support the screen partly above the water. A chain on the lower edge of the screen serves as ballast and secures the boom between moorings.

Citation Source: Petroleum Abstracts. 1975. 15(19).
Entry #204,800.

P-284-74
IMPROVEMENTS IN AND RELATING TO INFLATABLE BOOMS

Sayles, J. A.
British Patent 1,371,143

A floating boom with a weighted skirt forms a barrier to help collect and segregate floating substances.

Citation Source: Petroleum Abstracts. 1975. 15(16).
Entry #203,821.

P-285-74
SEPARATION OF OIL EMULSIONS INTO CLEAN, OIL-FREE WATER AND OIL

Schaefers, H.
German Offenlegungsschriften (unexamined patent application)
2,311,625

The aqueous phase of an oil emulsion is vaporized and cooled in a multichambered evaporator. The partially separated oil then goes from chamber to chamber, each increasing in temperature. The oil becomes more water-free at each step. The water from the separator is oil-free, sterile and of low hardness.

Citation Source: Chemical Abstracts. 1975. 82(20).
Entry #127378c.

P-286-74
REMOVAL OF HYDROCARBONS FROM WASTE WATER EMULSIONS

Schulze, G.
German Offenlegungsschriften (unexamined patent application)
2,313,217

A method of separating hydrocarbon oil-water emulsions by neutralization of the emulsion to a value between acid consumption $\leq$ 0.5 mequiv/l and base consumption $\leq$ 3.0 mequiv/l is outlined.

Citation Source: Chemical Abstracts. 1975. 82(10).
Entry #64065a.

P-287-74
COMPOSITIONS FOR COLLECTING PETROLEUM AND METHOD FOR REMOVING PETROLEUM FROM WATER

Shell Internationale Research Maatschappij B.V.
French Patent 2,203,402

A mixture of primary aliphatic long chain alcohols (RO $(C_2H_4O)_mH$, where m is 1-3 and R is C_{10-15} alkylradical) and a diluting material, with polar groups and derived from esters, is used to collect petroleum from water and silicon-containing materials. The proportions of the mixture are varied.

Citation Source: Chemical Abstracts. 1975. 82(18).
Entry #115827k.

P-288-74
ADSORPTIVE PURIFICATION OF WASTE WATER

Shiga, K., and C. Shimodaira
German Offenlegungsschriften (unexamined patent application) 2,410,007

A method for the treatment of petroleum refinery effluent by active carbon in a fluidized bed is described.

Citation Source: Chemical Abstracts. 1975. 82(10). Entry #64066b.

P-289-74
REMOVAL OF OILS FROM WASTE WATER

Shinoda, K., T. Nakagawa, H. Takahashi, and M. Koike
Japanese Kokai (unexamined patent application) 74 91,075

Graphite oxide and a coagulant will precipitate oil from oil-containing waters. The precipitate can then be removed. An oil emulsion of 5700 ppm was reduced after precipitation and filtering to 110 ppm.

Citation Source: Chemical Abstracts. 1975. 82(18). Entry #115845q.

P-290-74
TREATMENT OF WASTE WATER CONTAINING ACRYL RESINS

Takagi, M., and M. Shiraishi
Japanese Kokai (unexamined patent application) 74 55,152

Oils or antifoaming agents were removed from a waste water containing acryl resins by treating with poly (vinyl alcohol) or starch and inorganic salts, and then adjusting the pH to >7.

Citation Source: Chemical Abstracts. 1975. 82(12). Entry #76858z.

P-291-74
REMOVAL OF OILS FROM WASTE WATER CONTAINING OILS

Tamaki, K., M. Fujii, M. Tanaka, and Y. Kubo
Japanese Kokai (unexamined patent application) 74 79,051

Oils can be removed from waste water by adding oil-absorbing materials, aerating the solution, and removing the resultant foams which contain the oils incorporated in the absorbent.

Citation Source: Chemical Abstracts. 1975. 82(10). Entry #64085q.

P-292-74
OIL COLLECTOR

Tanaka, K.
Japanese Kokai (unexamined patent application) 74 87,586

An oil collector which absorbs oil from the water surface consists of filaments coated with a thin film of oleophilic substances, sprayed with an emulsion of Silicone YSW 6606, Adecatol 45-10 and water, and wrapped in a polyethylene net.

Citation Source: Chemical Abstracts. 1975. 82(10). Entry #64143z.

P-293-74
OIL-REMOVING AGENT

Tanaka, K., N. Gomyo, M. Tamayama, and Y. Takahata
Japanese Kokai (unexamined patent application) 74 93,289

This oil-removing agent is prepared by dissolving high molecular weight compounds in a water-soluble solvent, adding the resulting solution to water to precipitate the high molecular weight compounds, and washing with water.

Citation Source: Chemical Abstracts. 1975. 82(16).
Entry #102857v.

P-294-74
DISPOSAL OF OIL SUSPENSION IN WATER

Tanaka, K., Y. Takahata, M. Tamayama, and N. Gomyo
Japanese Kokai (unexamined patent application) 74 74,196

A high molecular compound used to remove oil from water is prepared by dissolving a water-insoluble high molecular compound in a solvent and reprecipitating with water. Oil concentration in an oil-water mixture can be reduced to <0.5 ppm.

Citation Source: Chemical Abstracts. 1975. 82(12). Entry #76859a.

P-295-74
REMOVAL OF OILS FROM WASTE WATER

Tanaka, K., T. Takahata, M. Tomoyama, and N. Gomyo
Japanese Kokai (unexamined patent application) 74 103,464

Addition and agitation of a cationic high molecular weight coagulant to oil containing waste water creates removable flocs. Further clarification is achieved by adding water-insoluble combustible powder and removing the resulting flocs. Fuel oil concentrations decreased from 10,000 ppm to 120 ppm.

Citation Source: Chemical Abstracts. 1975. 82(18).
Entry #115848t.

P-296-74
FIXED UNDERSEA TANK FOR THE STORAGE OF LARGE AMOUNTS OF CRUDE OIL

Technomare SpA
French Patent 2,225,356

The storage tank consists of a concave base and a metal dome. A rubberized fabric membrane separates the oil from the water and stretches to fill the tank. The assembly can be flooded regularly under control. No pollution of the surrounding water occurs.

Citation Source: Petroleum Abstracts. 1975. 15(19).
Entry #204,709.

P-297-74
UNDERWATER SITUATED STORAGE TANK FOR CRUDE OIL

Technomare SpA
Netherlands Patent 7,404,848

This anchored deepwater tank will store a large volume of crude oil without polluting nearby waters. Filled with crude oil, the tank weighs enough to rest stable on the sea bottom. The tank consists of a metal cap, an elastic membrane and a foundation plate.

Citation Source: Petroleum Abstracts. 1975. 15(11).
Entry #202,195.

P-298-74
APPARATUS FOR SEPARATING OIL-WATER MIXTURES FROM OIL PRODUCTION

Texaco Development Corporation
British Patent 1,362,313

An apparatus for the separation of oil from waste water from oil production consists of an elongated caisson, whose lower end is submerged in water, with panels spaced longitudinally and forming a vertically aligned passage. Oil separates from waste water flowing down the passage and accumulates under the panels, from where it is removed.

Citation Source: Chemical Abstracts. 1975. 82(22).
Entry #142033e.

P-299-74
SEPARATION OF OIL AND WATER

Ueda, K.
Japanese Kokai (unexamined patent application) 74 87,577

The treatment of oily waste water with an oil absorbent, and the method of separating the oil from the absorbent by the addition of a hydrocarbon containing fluorine are described.

Citation Source: Chemical Abstracts. 1975. 82(10).
Entry #64144a.

P-300-74
DEVICE FOR COLLECTING OIL FROM THE SURFACE OF WATER

Van Dieden, A. F.
Canadian Patent 959,423

An absorbent roller is positioned at the rear end of an upward sloping channel which has its front end below the oil/water interface and the rear end above. The roller is driven to absorb oil with which it comes in contact. The device is equipped with an abutment which engages the roller to squeeze out absorbed liquid and an oil catchment area to catch the discharged oil. The device floats or can be supported.

Citation Source: Petroleum Abstracts. 1975. 15(7).
Entry #200,921.

P-301-74
OIL REMOVAL FROM AQUEOUS EMULSION WASTES

Von Preen, W.
German Offenlegungsschriften (unexamined patent application) 2,321,749

Waste oil-in-water emulsions are separated by heating under pressure to a temperature high enough to decompose the emulsifier. The mixture is then cooled and separated.

Citation Source: Chemical Abstracts. 1975. 82(14).
Entry #89848w.

P-302-74
BREAKING OF LUBRICATING OIL EMULSIONS

Wochner, W.
German Offenlegungsschriften 2,318,657

The speed of breaking waste lubricating oil-in-water emulsions was greatly increased by reducing the pH to 2-3, then immediately neutralizing the mixture.

Citation Source: Chemical Abstracts. 1975. 82(18). Entry #114005d.

P-303-74
PURIFICATION OF ORGANIC SUBSTANCE-CONTAINING WASTE WATER BY ELECTROLYSIS

Yamazaki, H., S. Yoshida, and Y. Tsuda
Japanese Kokai (unexamined patent application) 74 122,146

Purification of waste water containing organic substances, i.e. oil, and water-soluble electrolytes, is accompanied by electrolysis. The electrolyzer has a 0.9% C-containing steel or cast iron anode and a graphite cathode applying direct current.

Citation Source: Chemical Abstracts. 1975. 82(22). Entry #144679u.

TOPIC CROSS REFERENCE

Reporting: C-864-74, C-1011-74, C-1065-74, C-1168-74, C-1179-74, C-1308-74

Monitoring: C-829-74, C-842-74, C-849-74, C-859-74, C-863-74, C-984-74, C-985-74, C-1053-74, C-1101-74, C-1261-74, C-1302-74

Remote Sensing: C-819-74, C-821-74, C-897-74

Sampling: C-803-74, C-805-74, C-806-74, C-873-74, C-877-74, C-1029-74, C-1035-74, C-1044-74, C-1261-74, C-1291-74

Analysis: C-805-74, C-807-74, C-808-74, C-811-74, C-812-74, C-813-74, C-814-74, C-833-74, C-834-74, C-835-74, C-987-74, C-993-74, C-1035-74, C-1251-74, C-1263-74; C-1267-74, C-1278-74, C-1279-74, C-1292-74, R-217-74, P-255-74, P-258-74

Containment: C-963-74, C-1171-74, C-1294-74, P-190-74, P-197-74, P-198-74, P-200-74, P-212-74, P-215-74, P-217-74, P-237-74, P-245-74, P-247-74, P-264-74, P-284-74, P-285-74

Cleanup and Recovery: C-793-74, C-797-74, C-837-74, C-861-74, C-872-74, C-902-74, C-903-74, C-906-74, C-909-74, C-910-74, C-914-74, C-967-74, C-974-74, C-976-74, C-977-74, C-979-74, C-1004-74, C-1017-74, C-1026-74, C-1027-74, C-1037-74, C-1058-74, C-1062-74, C-1111-74, C-1128-74, C-1153-74, C-1158-74, C-1159-74, C-1160-74, C-1161-74, C-1164-74, C-1171-74, C-1277-74, C-1290-74, C-1294-74, C-1296-74, C-1307-74, C-1308-74, P-189-74, P-191-74, P-193-74, P-194-74, P-195-74, P-199-74, P-205-74, P-207-74, P-208-74, P-209-74, P-210-74, P-211-74, P-213-74, P-214-74, P-218-74, P-220-74, P-221-74, P-222-74, P-223-74, P-224-74, P-225-74, P-226-74, P-227-74, P-228-74, P-229-74, P-230-74, P-231-74, P-232-74, P-233-74, P-234-74, P-235-74, P-238-74, P-239-74, P-240-74, P-241-74, P-242-74, P-243-74, P-246-74, P-247-74, P-248-74, P-249-74, P-250-74, P-251-74, P-252-74, P-256-74, P-257-74, P-260-74, P-262-74, P-267-74, P-270-74, P-274-74, P-275-74, P-276-77, P-277-74, P-279-74, P-281-74, P-282-74, P-288-74, P-293-74, P-294-74, P-295-74, P-299-74, P-301-74, P-303-74

Restoration: C-936-74, C-942-74, C-956-74, C-964-74, C-1005-74, C-1309-74, P-263-74

1) Biological effects of oil pollution: C-793-74, C-794-74, C-798-74, C-801-74, C-836-74, C-839-74, C-876-74, C-879-74, C-880-74, C-881-74, C-967-74, C-973-74, C-1074-74, C-1076-74, C-1098-74, C-1175-74, C-1246-74, C-1255-74, C-1256-74, C-1281-74, C-1281-74, C-1289-74, C-1291-74, C-1296-74

2) Physical effects of oil pollution: C-797-74, C-834-74

3) Social effects of oil pollution: C-1073-74, C-1078-74, C-1079-74

4) Economic effects of oil pollution: C-797-74, C-801-74, C-818-74, C-967-74, C-972-74, C-1033-74, C-1067-74, C-1069-74, C-1070-74, C-1299-74, C-1304-74, C-1306-74, C-1323-74, R-309-74

5) Chemical effects of oil pollution: C-889-74, C-997-74, C-1010-74, C-1012-74, C-1013-74, C-1048-74

6) General effects of oil pollution: C-793-74, C-798-74, C-896-74, C-1034-74, C-1106-74, C-1227-74, C-1291-74, C-1295-74

Design and engineering: C-802-74, C-809-74, C-810-74, C-837-74, C-904-74, C-905-74, C-907-74, C-923-74, C-925-74, C-926-74, C-927-74, C-928-74, C-934-74, C-937-74, C-949-74, C-950-74, C-951-74, C-952-74, C-953-74, C-955-74, C-962-74, C-1109-74, C-1121-74, C-1143-74, C-1176-74, C-1184-74, C-1190-74, C-1304-74, P-189-74, P-197-74, P-201-74, P-286-74, P-297-74

Oil handling: C-791-74, C-795-74, C-1102-74, C-1127-74, C-1142-74, C-1162-74, C-1165-74, C-1168-74, C-1181-74, C-1189-74, C-1191-74, C-1298-74, P-189-74, P-192-74, P-208-74, P-220-74, P-236-74, P-253-74, P-298-74

Waste water treatment: C-809-74, C-812-74, C-951-74, C-1042-74, C-1100-74, C-1101-74, C-1123-74, C-1189-74, P-196-74, P-203-74, P-204-74, P-206-74, P-216-74, P-219-74, P-244-74, P-246-74, P-249-74, P-250-74, P-252-74, P-254-74, P-259-74, P-261-74, P-265-74, P-266-74, P-268-74, P-269-74, P-271-74, P-272-74, P-273-74, P-278-74, P-280-74, P-283-74, P-286-74, P-287-74, P-289-74, P-290-74, P-291-74, P-292-74, P-294-74, P-296-74, P-299-74, P-300-74, P-302-74, P-304-74

Personnel training and education: C-954-74, P-960-74, P-1069-74, P-1108-74, P-1176-74

1) Biological effects of oil prospecting and production: C-1046-74, C-1057-74, C-1204-74, C-1211-74, C-1214-74, C-1215-74, C-1222-74, C-1225-74, C-1226-74, C-1232-74, C-1235-74, C-1238-74, C-1242-74

2) Physical effects: C-1193-74

3) Social effects: C-1083-74, C-1224-74

4) Economic effects: C-1200-74, C-1201-74, C-1202-74, C-1224-74

5) General effects: C-1087-74, C-1096-74, C-1108-74, C-1170-74, C-1180-74, C-1192-74, C-1321-74

Regulations, standards and planning: C-794-74, C-804-74, C-918-74, C-932-74, C-956-74, C-959-74, C-961-74, C-965-74, C-1006-74, C-1069-74, C-1082-74, C-1187-74, C-1211-74, C-1227-74, C-1282-74, C-1297-74, C-1298-74, C-1301-74, C-1302-74, C-1305-74, C-1311-74, C-1312-74, C-1313-74, C-1316-74

Research: C-791-74, C-796-74, C-821-74, C-911-74, C-912-74, C-913-74, C-939-74, C-1110-74, C-1115-74, C-1143-74, C-1190-74, C-1233-74, C-1282-74, C-1287-74, C-1288-74, R-291-74

Biological degradation of oil in the environment: C-800-74, C-836-74, C-1123-74, C-1140-74, C-1183-74, R-102-74, P-214-74, P-260-74

Chemical changes of oil in the environment: C-1257-74, C-1274-74

Physical changes of oil in the environment: C-848-74, C-1008-74, C-1195-74, C-1196-74, C-1243-74, C-1283-74, C-1285-74

General fate of oil in the environment: C-800-74, C-807-74, C-867-74, C-869-74, C-882-74, C-893-74, C-896-74, C-970-74, C-1025-74, C-1033-74, C-1036-74, C-1051-74, C-1066-74, C-1273-74, C-1283-74, C-1284-74

State legislation: C-865-74, C-1119-74, C-1172-74, C-1178-74

National legislation: C-1075-74, C-1078-74, C-1082-74, C-1119-74, C-1143-74, C-1198-74, C-1313-74

International legislation: C-980-74, C-1075-74, C-1093-74, C-1163-74, C-1169-74, C-1300-74, C-1318-74, C-1320-74

Foreign legislation: C-1119-74

Bibliographies: C-1047-74

APPENDIX

Journals Scanned

Abstracts on Health Effects of Environmental Pollutants
Ambio
American Fisheries Society Newsletter
American Fisheries Society Transactions
American Naturalist
Applied Microbiology
Applied Science & Technology Index
Aquatic Sciences & Fisheries Abstracts
Atlantic Naturalist
Audubon
Auk: A Quarterly Journal of Ornithology
Australian Journal of Marine and Freshwater Research
Australian Science Index
Biological Abstracts
Bioscience
Bird Study
British Birds
Bulletin of Environmental Contamination and Toxicology
Bulletin of Marine Science
California Fish and Game
Chemical Abstracts
Chemical and Engineering News
Chemical Engineering
Chemical Engineering Progress
Chemical Week
Chemistry in Canada
Critical Reviews in Environmental Control
Crustaceana
Current Contents: Life Sciences
Current Contents: Physical and Chemical Sciences
Deep-Sea Research
Ecological Abstracts
Ecological Monographs
Ecological Society of America Bulletin
Ecology Law Quarterly
Environment
Environment Abstracts
Environmental Action
Environmental Health and Pollution Control
Environmental Letters
Environmental Pollution
Environmental Science & Technology
Estuarine and Coastal Marine Science
Geotimes
Government Reports Announcements
Hydrobiologia
International Aerospace Abstracts
Journal of Canadian Petroleum Technology

Journal of Chromatography
Journal of Ecology
Journal of Environmental Sciences
Journal of Experimental Marine Biology and Ecology
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Marine Technology Society, Journal
Maritime Research Information Service Abstracts
National Fisherman
National Petroleum News
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National Wildlife
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Nautilus
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Scientific Fisheries
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Offshore
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Pacific Oil World
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Petroleum Today
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Resources
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Sea Frontiers
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Science News
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Selected References on Environmental Quality
Selected Water Resources Abstracts
Sierra Club, San Francisco, Bulletin
The Ecologist

The Engineering Index
The Geological Society of America Bibliography and Index of Geology
Toxicity Bibliography
Underwater Naturalist
Water, Air, and Soil Pollution
Water Pollution Control Federation, Journal
Water Research
Water Resources Research: A Journal of the Sciences of Water
Western Fisheries

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16. ABSTRACT

The May 1975 - July 1975 Oil Spill and Oil Pollution Reports is the fourth quarterly compilation of oil spill events and oil pollution report summaries. Presented in the report are: (a) summaries of oil spill events; (b) summaries and bibliographic literature citations; (c) summaries of current research projects; and (d) patent summaries. This report is submitted in partial fulfillment of EPA Grant No. R-803063 by the Marine Science Institute, University of California, Santa Barbara, under the sponsorship of the Environmental Protection Agency.

17. KEY WORDS AND DOCUMENT ANALYSIS

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*Bibliographies *Summaries *Patents *Documents *Research	Oil pollution Oil spill events Oil spill research Oil pollution control Oil pollution patents	13B

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