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July 1976

Environmental Protection Technology Series

OIL SPILL AND OIL POLLUTION REPORTS August 1975 - October 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
3. Ecological Research
4. Environmental Monitoring
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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

August 1975 - October 1975

by

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DISCLAIMER

FOREWORD

When energy and material resources are extracted, processed, and used, these operations usually pollute our environment. The resultant air, land, solid waste and other pollutants may adversely impact our aesthetic and physical well-being. Protection of our environment requires that we recognize and understand the complex environmental impacts of these operations and that corrective approaches be applied.

The Industrial Environmental Research Laboratory - Cincinnati assesses the environmental, social and economic impacts of industrial and energy-related activities and identifies, evaluates, develops and demonstrates alternatives for the protection of the environment.

This report is a product of the above efforts. It cites current events, literature, research, patents, and other material relevant to the oil pollution abatement program and is published in an abstract format on a quarterly basis. As such, it serves as a basic reference document for all those interested in oil spill and oil pollution control. This project is part of the continuing program of the Oil & Hazardous Materials Spills Branch, IERL-Ci to assess and mitigate the environmental impact of oil pollution.

David G. Stephan
Director
Industrial Environmental Research Laboratory
Cincinnati

A B S T R A C T

The August 1975 - October 1975 Oil Spill and Oil Pollution Reports is the fifth 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 listed in previous reports;

c) Summaries of additional current research projects;

d) Patent summaries;

and,

e) Current oil-related conferences.

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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. 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), oil pollution related patents (Section IV), and current oil-related conferences (Section V).

The sources of the bibliographic citations and summaries of articles presented in Section I are scientific, technical and abstract journals. All articles entered deal with subjects relating to aquatic or terrestrial oil pollution. A list of the periodicals reviewed is provided in the appendix. The summarized entries are 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. Section II is 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) and from Environmental Research, Annual Report, sponsored by the American Petroleum Institute.

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.

A new section, Current Oil-related Conferences, contains descriptive information on recent and future conferences relating to environmental oil pollution. Conference dates are listed; and, when information is available, titles, authors and abstracts of conference papers are included. All information for this section was obtained from the periodicals reviewed (Appendix A) and from responses to personal inquiries concerning the symposia.

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, III, and IV. 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-1325-75
No title given

Anon. 1975.
Ocean Oil Weekly Report 9(47):2.

The events leading to and resulting from the August, 1975, accident in which the British tanker, "Globtik Sun," struck an offshore drilling platform in the Gulf of Mexico are given.

Citation Source: Citation Journal

C-1326-75
BURIAL AT SEA

Anon. 1975.
Environmental Action 6(6):7.

It is reported that over 11-million gallons of fuel oil were dumped or "lost" at sea during 1974. The Navy has announced that it will try to find a better way to get rid of contaminated oil.

Citation Source: Citation Journal

C-1327-75
CALIFORNIAN OILED BIRDS

Anon. 1975.
Marine Pollution Bulletin 6(7):99.

A disturbing increase in the past four years in the proportion of dead seabirds that are oiled has been reported by the Point Reyes Bird Observatory, Bolinas, California. The increase is from 1% in 1971 to 19% in 1974, and is mainly due to increased oiling of Common Murres and Sooty Shearwaters.

Biological effects of oil pollution

Citation Source: Citation Journal

C-1328-75
MORE OIL IN BANTRY BAY

Anon. 1974.
Marine Pollution Bulletin 6(2):20.

The second oil spill within a year has occurred in Bantry Bay. A tug collided with a tanker during undocking operations. Local opinion is becoming increasingly unhappy with the lack of a harbor authority and anti-pollution measures.

Citation Source: Citation Journal

C-1329-75
OIL POLLUTION AT SEA - HOW MUCH IS TOO MUCH?

Anon. 1975.
BioScience 25(5):339-340.

The article reports the findings of the Workshop on Inputs, Fates and the Effects of Petroleum in the Marine Environment (Airlie House, Virginia, 1973) concerning the amount of petroleum hydrocarbons entering the ocean. It was estimated that 6.113 metric tons a year of oil enter the ocean, with transportation sources being the largest contributor to pollution. Needs for further investigations into this topic, as emphasized in the Workshop's report, "Petroleum in the Marine Environment," are outlined.

Source identification

Citation Source: Citation Journal

C-1330-75
ON POLLUTION CONTROL

Anon. 1974.
New Civil Engineer Special Reviews 95:53.

Oil spill and prevention events during and following the Santa Barbara oil spill of 1969 are recounted. Legislation covering pollution control in the United Kingdom sector of the North Sea from 1964 to 1971 is reviewed.

Foreign legislation

Citation Source: Petroleum Abstracts 15(27):#207,608. 1975.

C-1331-75
POST-MORTEM ON MILFORD HAVEN OIL SPILL

Anon. 1975.
Marine Pollution Bulletin 6(3):35-36.

The Milford Haven Conservancy Board reacted well to a three-ton oil spillage from the VLCC "Texaco Great Britain" in October, 1974. The ship was allowed to berth despite the small leakage, but prompt action kept oil off the beaches and away from the power plant.

Citation Source: Citation Journal

C-1332-75
SUPER SPILL

Anon. 1975.
Environmental Action 7(7):14.

The article reports the massive spill of about 126,000 gallons of illegally dumped oil in the Florida Keys in July, 1975. Coast Guard officials believe that the culprit was a negligent super-tanker. Scientists report no serious environmental damage in the area.

Citation Source: Citation Journal

C-1333-75
TRANSLATIONS ON ENVIRONMENTAL QUALITY. NO. 54

Anon. 1974.
Joint Publications Research Service - 62994.

An article on oil spills in the Strait of Magellan is included in this collection of translations on water and environmental pollution.

Citation Source: Pollution Abstracts 6(3):#75-03036. 1975.

C-1334-75
BENZO(A)PYRENE POLLUTION OF THE ENVIRONMENT OF A LARGE CITY [English Summary]

Audere, A., Z. Lindbergs, and G. A. Smirnov. 1975.
Gigiena i Sanitariya (4):98-99.

Contamination of snow, soil and plants in Riga, Latvia, by benzo(a)pyrene has been reported. Deposition of the benzo(a)pyrene has increased five to six times over the last thirteen to fourteen years; the main sources of contamination are motor vehicles and some industrial plants.

Citation Source: Chemical Abstracts 83(4):#32484r. 1975.

C-1335-75
INFLUX OF PETROLEUM HYDROCARBONS INTO THE OCEAN

Bates, C. C., and E. Pearson. 1975.
Offshore Technology Conference, 7th, Houston, 1975. Preprint No. OTC-2390, Vol. 3. p. 535-544.

In the past five years, four studies have been published on the influx of petroleum hydrocarbons (PHC) into the world's oceans. The study by the National Academy of Sciences Panel (1975) concluded that approximately 6.1 million metric tons of PHC (.25% of that produced) entered the ocean in the 1971-1972 time period. Major PHC sources measured are listed.

Source identification

Citation Source: Petroleum Abstracts 15(27):#207,605. 1975.

C-1336-75
OIL POLLUTION ON ISRAELI COASTS

Dixon, T., and T. Dixon. 1975.
Marine Pollution Bulletin 6(5):70-72.

Illegal discharges of ballast waters in the Eastern Mediterranean have long polluted Israel's coast. Now the country also has an inshore oil pollution problem which originates from industrial waterways, general cargo ports, power stations and the oil ports.

Citation Source: Citation Journal

C-1337-75
HYDROCARBONS IN THE MARINE ENVIRONMENT

Farrington, J. W., and P. A. Meyer. 1975.
Environmental Chemistry 1:109-136.

"A review with 114 references is presented on hydrocarbons of the marine environment."

Bibliographies

Citation Source: Chemical Abstracts 83(8):#63452h. 1975.

C-1338-75
VLCC 'METULA' OIL SPILL

Hann, R. W., Jr. 1974.
U.S. Coast Guard Report, CG-D-54-75. 65 p.

On August 9, 1974, the Very Large Crude Carrier (VLCC) "Metula," with a load of 195,673 tons of Arabian light crude, ran aground in the Straits of Magellan, Chile. The report includes a history of the spill, oil deposition onshore, impact of oil on the shore and comments regarding containment, cleanup or stabilization possibilities.

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

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(4): #5Q4281. 1975.

C-1339-75
TAR BALL DISTRIBUTION IN THE WESTERN NORTH ATLANTIC

McGowan, W. E., W. A. Saner, and G. L. Hufford. 1974.
Final Report, CGR/DC-24/74&SCG-D-52-75. 29 p.

The surface waters of the Atlantic Ocean were quantitatively sampled for tar balls for two years (1972, 1973). A south to north decrease in tar pollution occurred for both the ocean and the Atlantic seaboard. High iron levels in the tar balls imply that man-made sources are partially responsible.

Monitoring

Citation Source: Government Reports Announcements 75(10): #AD/A-006 821/3GA. 1975.

C-1340-75
OIL TANKER DISASTER IN NORTHWEST COAST OF INDIA

Ramamurthy, V. D. 1974.
Current Science (Bangalope) 43(9):293-294.

The article describes an investigation which examines the immediate effects of the oil pollution disaster of the tanker, "M. T. Cosmos Pioneer," which broke into two pieces and released 18,000 tons of black oil on the Giyarat Coast of India. Long-term environmental degradation in the Giyarat Coast seems probable due to continuing oil pollution of the area.

General effects of oil pollution
Biological effects of oil pollution

Citation Source: Citation Journal

C-1341-75
OIL AND THE SEA [English Summary]

Sabioncelo, P., et al. 1974.
Arhiv za Higijenu Rada i Toksikologiju 25(2):241-245.

Possibilities of sea contamination by oil and methods of controlling oil spills are described. The oil spill in Kvarner on 29 December 1971 is dealt with in detail.

Citation Source: Citation Journal

C-1342-75
BACTERIA ON PETROLEUM GLOBULES IN THE PHILIPPINE SEA IN JANUARY, 1973

Seki, H., and H. Abe. 1974.
Oceanography Society of Japan, Journal 20(3):151-156.

An investigation was made to study aerobic petroleumlytic microorganisms on the surface of petroleum globules in surface water of the relatively unpolluted western North Pacific central water. About 10^6 of total bacteria or heterotrophic bacteria and about 10^4 of petroleumlytic bacteria were enumerated per square centimeter of the surface of these globules suspended in the topmost 10 m of water.

Sampling

Citation Source: Citation Journal

C-1343-75
QUANTITATIVE TAR AND PLASTIC WASTE DISTRIBUTIONS IN THE PACIFIC OCEAN

Wong, C. S., D. R. Green, and W. J. Cretney. 1974.
Nature (London) 247(5435):30-32.

The first quantitative data on tar and plastic waste distribution in Pacific Ocean surface waters are reported. Values for tar distribution in the Pacific, combined with those obtained in portions of the Atlantic and Mediterranean by other workers, indicate that these wastes are widespread on the surface of the oceans.

Citation Source: Citation Journal

2. MONITORING

C-1344-75
MARINE POLLUTION MONITORING (PETROLEUM)

Anon. 1974.
U.S. National Bureau of Standards. 56 p.

Abstracts are presented of papers on sampling and analytical methods for determining oil in water, marine organisms and sediments. Some papers also discuss standards and the biological assessment of oil pollution.

Sampling
Analysis
Biological effects of oil pollution

Citation Source: Pollution Abstracts 6(3):#75-02583. 1975.

C-1345-75
OIL-SPILL DETECTOR KEEPS CONSTANT WATCH

Anon. 1975.
Oil and Gas Journal 73(35):132-133.

A new scanning oil-spill detector has been developed which projects a beam of ultraviolet light to detect fluorescence of oil films on water. An optical fence is constructed and an alarm is sounded when the fence is crossed by oil. The system can distinguish between heavy and light oils, and has a scanning range of 300 ft at night and 30 ft in daylight.

Design and engineering

Information Source: Baird-Atomic, Inc., 125 Middlesex Turnpike, Bedford, Mass. 01730

C-1346-75
SCANNING OIL SPILL DETECTOR MODEL SOS-1

Anon.
Product Information

The Model SOS-1 utilizes a fluorescence technique for the automatic, unattended detection of oil spills. The detector automatically scans the water surface both in azimuth and elevation to provide continuous, wide area monitoring from a single location. The SOS-1 detector can also distinguish between light and heavy oils to aid in determining the source of the oil.

Source identification
Design and engineering

Information Source: D. V. Dunn, Government System's Division, Baird-Atomic, Inc., 125 Middlesex Turnpike, Bedford, Mass. 01730

C-1347-75
HANDBOOK ON ENVIRONMENTAL MONITORING

Cross, F. L., Jr. 1974.
Westport, Connecticut, Technomic. 242 p.

No summary available.

Citation Source: Chemical Abstracts 83(6):#47635q. 1975.

C-1348-75
FALSE-ALARM RISKS AT RADAR DETECTION OF OIL SPILL

Eklund, F., J. Nilsson, and A. Blomquist. 1974.
Specialist Meeting on Microwave Scattering and Emission from the Earth, Bern, Switzerland, 1974. p. 39-45.

The following topics are discussed: the generation of capillary and short gravity waves at sea, possible false oil spill alarm causes, and some results of an experimental evaluation of false alarm risks.

Citation Source: International Aerospace Abstracts 15(15): #A75-33855. 1975.

C-1349-75
FAO MANUAL OF METHODS IN AQUATIC ENVIRONMENT RESEARCH. PART 1. METHODS FOR DETECTION, MEASUREMENT AND MONITORING OF WATER POLLUTION

FAO. 1975.
FAO Fisheries Technical Paper 137. 238 p.

This manual is based on papers presented at a training course in marine pollution. The topics treated include the problems of analyzing aquatic samples, descriptions of methods of measuring physical and chemical parameters and the different classes of pollutants in the environment.

Personnel training and education

Marine Pollution Bulletin 6(8):116. 1975.

C-1350-75
STUDY OF NATURALLY OCCURRING HYDROCARBONS IN THE GULF OF MEXICO AND THE CARIBBEAN

Geyer, R. A., and W. Sweet. 1974.
IEEE International Conference on Engineering in the Ocean Environment, Halifax, Nova Scotia, 1974. Vol. 1. p. 289-300.

Results are presented of the research undertaken to study hydrocarbon seepage on the bottom, beaches and in the water column in the Gulf of Mexico, and at the surface in the Caribbean and the Gulf. Emphasis is placed on the chemical, geological and biological aspects related to seepage. Methods and techniques used are described.

General effects of oil pollution
Source identification
Analysis

Citation Source: The Engineering Index Monthly 13(5):#032528. 1975.

C-1351-75
THE MUSSEL WATCH - A FIRST STEP IN GLOBAL MARINE MONITORING

Goldberg, E. D. 1975.
Marine Pollution Bulletin 6(7):111.

A world mussel watch is proposed for the systematic monitoring of the exposure levels of major pollutants in various parts of the ocean. In this program, 100 coastal and open ocean sites would annually be analyzed for their concentrations of halogenated hydrocarbons, transuranics, heavy metals and petroleum. Both indigenous organisms and alien species transferred to open ocean sites would be employed.

Citation Source: Citation Journal

C-1352-75
FAIL-SAFE OIL-IN-WATER MONITOR DEVELOPMENT

Higginbotham, H. L. 1975.
Final Report, Contract DAAK02-73-C-0387. 94 p.

A study was undertaken to determine the best technique for detection of small quantities of oil-in-water. The theoretical basis of detection, the experimental model sensor and the evaluation of the model are described. The detection level was limited to several parts per million due to the mechanical-electronic interface.

Analysis

Citation Source: Scientific and Technical Aerospace Reports 13(14): #N75-22711. 1975.

C-1353-75
A SHIPBOARD OIL-IN-WATER CONTENT MONITOR BASED ON OIL FLUORESCENCE

Hornig, A. W., and J. T. Brownrigg. 1975.
Final Report, USCG-D-87-75, Contract DOT-CG-34169. 179 p.

The report describes the design and development of a shipboard oil monitor based on the luminescence of oils emulsified in water. Feasibility of this device has been documented; however, several areas of improvement are suggested, i.e., better emulsification, improved mask design, a transmission monitor and a high-level bypass monitor.

Design and engineering

Citation Source: Government Reports Announcements 75(15): #AD-A010 475/26A.

C-1354-75
IN-SITU DETECTION OF OIL SLICKS UTILIZING DIFFERENTIAL EVAPORATION: PHASE II. SYSTEM DESIGN

Horvath, R., E. F. Lirette, and D. M. Zuk. 1974.
U.S. Coast Guard, Office of Research and Development, CG-D--4-75. 38 p.

The basic detection design of an oil slick sensor is defined and the design parameters of the several subsystems are described. Design features have been developed to insure operability and survivability in a harbor or river marine environment.

Design and engineering

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(5): #5Q5484. 1975.

C-1355-75
MARINE POLLUTION MONITORING (PETROLEUM)

Junghans, R. C. 1974.
National Bureau of Standards Special Publication, No. 409. 293 p.

Included in these proceedings are: lectures on scientific, environmental and regulatory aspects of petroleum hydrocarbon measurements, summaries of papers dealing with developments in this area, recommendations of the topical discussion groups, and a report from an international workshop recommending the initiation of a pilot project for petroleum pollution monitoring.

International legislation

Citation Source: Petroleum Abstracts 15(24):#206,438. 1975.

C-1356-75
RADAR IMAGERY OF OIL SLICKS

Pilon, R. O., and C. G. Purves. 1973.
IEEE Transactions on Aerospace and Electronic Systems, AE-9.
p. 630-636.

A controlled oil slick experiment was sponsored by the U.S. Coast Guard in 1970, in which the Naval Research Laboratory's synthetic aperture radar was used to detect and monitor slicks at frequencies of 428, 1228, 4455 and 8910 MHz during low sea state conditions. At frequencies of 1228 MHz and higher, slicks were detected with sharp boundaries. Area growth rates for 2500-liter spills of API 26·1 crude oil and API 9·7 fuel oil in a calm sea were also obtained.

Remote sensing

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(4): #5Q4396. 1975.

C-1357-75
SURFACE SLICKS AND FILMS - A NEED FOR CONTROL

Rittall, W. F. 1974.
Proceedings of Seminar on Methodology for Monitoring the Marine Environment. S. S. Verner (ed.). EPA--600/4-74-004. p. 55-71.

The author points out that surface concentrations of films, slicks and particulates are important factors in effective pollution control. The question of whether existing water quality regulations are effective in pollution control is discussed.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(6): #5Q6791. 1975.

C-1358-75
SIGNIFICANCE OF LOW MOLECULAR WEIGHT HYDROCARBONS IN EASTERN GULF WATERS

Sackett, W. M. 1974.
Marine Environmental Implications of Offshore Drilling Eastern Gulf of Mexico, Conference/Workshop, St. Petersburg, Florida, 1974. 17 p.

The author indicates that both natural and man-derived sources of petroleum-derived hydrocarbons give rise to high concentrations of low-molecular weight components. Although it appeared that the high levels of hydrocarbons along coastal Texas and Louisiana were associated with oil drilling/production, it is not certain that they were all due to these activities. Natural gas seepage may have contributed to the existence of such high concentrations.

Source identification

Citation Source: Government Reports Announcements 75(8): #PB-238 867/6GA. 1975.

C-1359-75
USE OF LOW-MOLECULAR-WEIGHT-HYDROCARBON CONCENTRATIONS AS INDICATORS OF MARINE POLLUTION

Sackett, W. M., and J. M. Brooks. 1974.
Marine Pollution Monitoring (Petroleum) Symposium and Workshop, Gaithersburg, Maryland, 1974. NSF/IDOE-74-46. 5 p.

Coastal waters of offshore Louisiana and Texas contain up to six times the concentration of low-molecular-weight hydrocarbons found in the open ocean. The high levels of C_1 to C_3 hydrocarbons do not seem to harm marine life but serve as sensitive indicators of more toxic petroleum fractions which are usually simultaneously introduced to the ocean.

Citation Source: Government Reports Announcements 75(8): #PB-238 866/8GA. 1975.

C-1360-75
SEMINAR ON METHODOLOGY FOR MONITORING THE MARINE ENVIRONMENT. PROCEEDINGS

Verner, S. S. 1973.
Seminar, Seattle, 1973. PB-239052/4; EPA-600/4-74-004.

Topics discussed at the seminar include: surface slick sampling and analysis, a systems approach to marine pollution monitoring, and a summary of recent studies on biological effects of crude oils and oil-dispersant mixtures to the Red Sea.

Citation Source: Scientific and Technical Aerospace Reports 13(15):#N75-24178. 1975.

3. REMOTE SENSING

C-1361-75
APPLICATION OF POLARIZATION EFFECT FOR THE PURPOSES OF OIL-FILM DETECTION ON SEA SURFACE

Buznikov, A. A., G. A. Ivanyan, K. Ya. Kondratev, and D. V. Pozdnyakov. 1975.
Doklady Akademii Nauk SSSR 221(5):1082-1085.

"Based on experiments in the Caspian Sea, the given polarization method for the remote detection of oil films is justified in a designated range of azimuth angles with sea disturbance up to 3°. It is concluded that this remote detection method should be desirably conducted in short wave regions of spectrum at zenith distances of sun less than 40°, sighting angles of 40 to 45°, azimuth angles greater than 30 to 50°, with direction opposite to the sun."

Citation Source: Petroleum Abstracts 15(33):#209,504. 1975.

C-1362-75
AIRBORNE DETECTION AND MAPPING OF OIL SPILLS, GRAND BAHAMAS, FEBRUARY, 1973

de Villiers, J. N. 1973.
Data-73-7. 19 p.

The ability of various airborne sensors to detect and map Louisiana Crude and Naptha oil spills by day and by night was investigated. Photographic, infrared scanning and low light level T.V. are able to detect Louisiana Crude; only infrared scanning detects Naptha.

Citation Source: Government Reports Announcements 75(8): #PB-238 841/1GA. 1975.

C-1363-75
DEVELOPMENT OF A PROTOTYPE AIRBORNE OIL SURVEILLANCE SYSTEM

Edgerton, A. T., J. J. Bommarito, R. S. Schwantje, and D. C. Meeks. 1975.
Final Report, AESC-1812FR-1 USCG-D-90-75, Contract DOT-CG-22170-A. 327 p.

The multisensor airborne oil surveillance system, developed for the U.S. Coast Guard, permits real-time day/night, all weather detection, mapping and documentation of oil spills at sea. The system consists of a sidelooking radar, a passive microwave imager, a multispectral low light level TV, a multichannel line scanner, a position reference system and a real-time processor/display console.

Design and engineering

Citation Source: Government Reports Announcements 75(17): #AD-A011 275/5GA. 1975.

C-1364-75
DETECTION AND IDENTIFICATION OF OIL SPILLS BY REMOTE FLUOROMETRIC SYSTEMS

Eldering, H. G., A. W. Hornig, and W. A. Webb. 1974.
Final Report, USCG-D-73-75, Contract DOT-CG-31529-A. 158 p.

An Oil Spill Surveillance System has been designed and developed for oil spill detection and oil classification in a commercial harbor environment at a range greater than 100 m during hours of darkness. A method for estimating film thickness from remote fluorescence measurement and a polarization technique for distinguishing marine and oil fluorescence are presented.

Citation Source: Government Reports Announcements 75(15): #AD-A010 000/8GA. 1975.

C-1365-75
PROGRESS IN THE APPLICATION OF HIGHER SPECIFICITY LASER INDUCED LUMINESCENCE TO THE REMOTE SENSING OF THE ENVIRONMENT AND RESOURCES

Gross, H. G. 1973.
Remote Sensing Earth Resources, Technical Papers Conference Earth Resources Observation and Information Analysis. F. Shahrokhi (ed.). p. 345-361.

Laser-induced luminescence is applied to the problems of oil spill observations relative to environmental pollution, and to the remote identification of rocks and minerals relative to natural resources. Oil spill observations have indicated the need to combine several techniques, i.e., microwave, IR, and luminescence, for oil detection and characterization. The active luminescence system serves as the oil identifier.

Citation Source: Chemical Abstracts 83(4):#31231u. 1975.

C-1366-75
EMISSION PROPERTIES OF WATER SURFACES AT 3 MM WAVELENGTH

Hofer, R., and E. Schanda. 1974.
Specialist Meeting on Microwave Scattering and Emission from the Earth, Bern, Switzerland, 1974. p. 17-23.

"Antenna temperature- and forward scattering measurements at 94 GH_2 on water surfaces in a temperature range between 7 and 43 C are compared and discussed." A study of an oil-polluted water surface and surface waves is described.

Citation Source: International Aerospace Abstracts 15(15): #A75-33853. 1975.

C-1367-75
THE DETERMINATION OF OIL SLICK THICKNESS BY MEANS OF MULTI-FREQUENCY PASSIVE MICROWAVE TECHNIQUES

Hollinger, J. P. 1974.
U.S. Coast Guard, CG-D--31-75. 139 p.

An investigation was made of the technique of multifrequency microwave radiometry used for the remote determination of thickness and volume of sea surface oil spills. Aircraft-borne studies of 15 controlled marine oil spills (eight conducted under calm sea conditions and seven under rougher sea and higher marine wind conditions) revealed oil slick regions with film thicknesses of 1 mm or more, surrounded by larger and thinner slicks containing very little oil.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(5): #5Q5483. 1975.

C-1368-75
REMOTE SENSING FOR WESTERN COAL AND OIL SHALE DEVELOPMENT PLANNING AND ENVIRONMENTAL ANALYSIS

Parker, H. D.
Remote Sensing Applied to Energy-Related Problems. Proceedings of the Symposium/Course, Miami, Florida, 1974. p. S4-3 to S4-25.

This paper discusses the following two categories of remote sensing applications in the development of fossil fuel resources in the western U.S.: (1) preconstruction site evaluations, land use and usability mapping; and (2) environmental baseline data acquisition involving long-term environmental monitoring.

Citation Source: International Aerospace Reports 15(16): #A75-35458. 1975.

C-1369-75
MAPPING OF OIL SLICKS FROM THE ERTS-1 IMAGERY BY A TWO-DIMENSIONAL DENSITOMETER

Rosenberg, N. W., and J. Otterman. 1974.
In: Meteorological and Earth-Resources Satellites - Special Technologies - International Collaboration - International Symposium on Space, 14th, Rome, 1974. p. 435, 437-443.

The operation components of a computer-controlled two-dimensional densitometer and display used to prepare a map of oil slicks from ERTS-1 micron-band sea imagery are described.

Citation Source: International Aerospace Abstracts 15(14): #A75-31602. 1975.

C-1370-75
REMOTE SENSING APPLIED TO CROP DISEASE CONTROL, URBAN PLANNING, AND MONITORING AQUATIC PLANTS, OIL SPILLS, RANGELANDS, AND SOIL MOISTURE

Texas A & M University. 1975.
Progress Report, NASA-CR-142558; RSC-08, Grant NGL-44-001-001. 70 p.

The application of remote sensing techniques to oil spill monitoring is one of the subject areas discussed. Results of various projects are presented along with cost effective considerations.

Citation Source: Scientific and Technical Aerospace Reports 13(12): #N75-20799. 1975.

C-1371-75
EVALUATION OF AN INFRARED OIL FILM MONITOR

Wright, D. E., and J. A. Wright. 1974.
Final Report, April 1973 - August 1974, USCG-D-51-75, Contract DOT-CG-33672-A. 102 p.

The effectiveness of a remote oil film detection instrument was evaluated. Both laboratory and in situ experiments showed that the instrument could specifically detect hydrocarbon films on water surfaces. Test procedures, results, the theory of operation and functional descriptions of the monitor are detailed.

Citation Source: Government Reports Announcements 75(8): #AD/A-004 912/2GI. 1975.

4. SAMPLING

C-1372-75
DEVELOPMENT OF BOAT AND HELICOPTER DEPLOYABLE OIL SLICK SAMPLER

Allen, A. A., and L. E. Fausak. 1975.
Final Report, June-August 1972, USCG-D-99-75, Contract DOT-CG-24828. 54 p.

Described is an oil slick sampling device, developed by MARCONSULT, Inc., which is capable of sampling water-borne oil films ranging from 0.001 to 10 mm in thickness. The sampler, composed of a modified stainless steel testing sieve containing a sheet of sorbent material, is dipped into an oil slick. Oil adheres to the sieve screen and is absorbed by the sorbent sheet. The sampler is immediately sealed after retrieval with a clean lid and bottom pan.

Design and engineering

Citation Source: Government Reports Announcements 75(15): #AD-A010 199/8GA. 1975.

C-1373-75
STUDIES ON THE POLLUTION OF OUR COASTAL SEA BY URBAN SEWAGE AND MINERAL OILS - RETROSPECTION OF THE REGULATION IN CLASSIFICATION OF THE COASTAL SEA [English Summary]

Deskovic, I., and H. Ivekovic. 1974.
Arhiv za Higijenu Rada i Toksikologiju 25(2):233-240.

In an investigation in which 100 samples of seawater were taken at characteristic sites on the Yugoslav Adriatic Coast, parameters characterizing pure seawater and types and intensity of polluted waters were established. It was shown that the sea is not protected against any kind of pollution, i.e., "accidental pollution" through oil and oil derivatives. Several requirements of existing regulations classifying sea waters were determined to be unreasonable and insufficiently defined.

Foreign legislation

Citation Source: Citation Journal

C-1374-75
AN OIL SLICK SAMPLING SYSTEM

Fortier, S. H., and J. R. Jadamec. 1974.
Final Report, CGR/DC-38/74 USCG-D-71-75. 20 p.

The system developed can effectively sample all types of oil spills and can collect enough sample for analysis by several analytical techniques. The system is light-weight, compact and inexpensive.

Design and engineering

Citation Source: Government Reports Announcements 75(16): #AD-A010 708/6GA. 1975.

C-1375-75
ESTIMATES USING FLUORESCENCE SPECTROSCOPY OF THE PRESENT STATE OF PETROLEUM HYDROCARBON CONTAMINATION IN THE WATER COLUMN OF THE NORTHWEST ATLANTIC OCEAN

Gordon, D. C., Jr., P. D. Keizer, and J. Dale. 1974.
Marine Chemistry 2(4):251-262.

Concentrations of petroleum hydrocarbons in seawater from the region between Nova Scotia and Bermuda were measured by fluorescence spectroscopy and estimated to be 20.4 μg/l in surface water (0-3 mm) and 0.8 and 0.4 μg/l from 1 and 5 m respectively. No concentrations could be detected in deeper water. The problems with using conventional sampling equipment for hydrocarbon analysis are discussed.

Analysis

Citation Source: Citation Journal

C-1376-75
HYDROCARBONS IN THE SARGASSO SEA SURFACE MICROLAYER

Wade, T. L., and J. G. Quinn. 1975.
Marine Pollution Bulletin 6(4):54-57.

"Small particles of weathered pelagic tar are suggested as a major source of hydrocarbons found in surface microlayer and subsurface water samples collected in the Sargasso Sea."

Citation Source: Citation Journal

C-1377-75
QUANTITATIVE TAR AND PLASTIC WASTE DISTRIBUTIONS IN THE PACIFIC OCEAN

Wong, C. S., D. R. Green, and W. J. Cretney. 1974.
Nature 247(5435):30-32.

Tar was present in 30 of 33 surface tows made along 35°N during a Canadian Transpac-72 cruise. Diverse communities composed of diatoms, bryozoans, blue-green algae and goose barnacles occupied the tar lumps. The tar concentration was higher in the western Pacific; this result is discussed in terms of origin, wind transport, and surface water circulation.

Biological effects of oil pollution
Reporting

Citation Source: Pollution Abstracts 6(2):#75-01569. 1975.

5. ANALYSIS

C-1378-75
A METHOD FOR THE SEPARATION OF OIL FROM AN AQUEOUS OIL-DETERGENT SOLUTION PRIOR TO IR ANALYSIS. PART II

Adams, C. E. 1974.
Final Report, NOLTR-74-164. 13 p.

This report covers the testing and improving of a method to determine oil in water solutions in the presence of dissolved detergents. The oil is removed with a silica-gel treatment, extracted with CCl_4 and analyzed using an IR spectrophotometer.

Citation Source: Government Reports Announcements 75(10): #AD/A-006 826/2GA. 1975.

C-1379-75
ANALYSIS OF POLLUTION FROM MARINE ENGINES AND EFFECTS ON THE ENVIRONMENT

Anon. 1975.
Final Report, EPA/670/2-75-062, Grant EPA-R-801799. 333 p.

The aim of the research was to obtain sufficient laboratory and field data to be able to predict the number of outboard engines which can be operated on any particular body of water without causing adverse effects on the aquatic environment. After subjecting four natural bodies of water to outboard engine emissions three times greater than maximum "real world" boating conditions for a period of three years, results showed that there were no acute changes in the physical, chemical or biological characteristics of the water or sediments.

General effects of oil pollution

Citation Source: Government Reports Announcements 75(16): #PB-242 176/6GA. 1975.

C-1380-75
DIGITAL FILM AND PRECIPITATION METER, AND OIL POLLUTION METERING DEVICE

Anon. 1975.
Translations on Eastern Europe: Science Affairs No. 464.
JPRS-64751. p. 5-6.

An instrument suitable for measuring the oil contamination of surface waters and feedwaters, and for continuously determining the total oil concentration is described.

Citation Source: Scientific and Technical Aerospace Reports 13(15):#N75-24657. 1975.

C-1381-75
MARINE POLLUTION BY OIL: CHARACTERIZATION OF POLLUTANTS, SAMPLING, ANALYSIS AND INTERPRETATION

Anon. 1974.
Barking, United Kingdom, Applied Science Publishers. 207 p.

The book contains information on the characterization of any petroleum-derived pollutant that is likely to persist in the marine environment. The recommended analytical procedures developed by the Institute of Petroleum, and petroleum sampling techniques are dealt with in detail.

Sampling

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(6): #5Q6783. 1975.

C-1382-75
METHOD ANALYZES OILY RESIDUES IN WATER

Anon. 1975.
Chemical and Engineering News 53(35):25.

Quality control requirements of waste cleanup systems at Texaco necessitated the development of method(s) to determine accurately the nature of oily water. The solvent extraction-infrared finishing technique, using Freon-113 as the solvent, best determines the concentration of oil in the water. The method can be used routinely on the 0- to 10-ppm range.

Waste oil and waste water treatment

Citation Source: Citation Journal

C-1383-75
OIL POLLUTION OF SURFACE WATERS [English Summary]

Anon. 1974.
Erdoel und Kohle, Erdgas Petrochemie 27(9):521.

The main aspects of an analytical guide, which has been recommended for international application, for the characterization and identification of polluting oils on the water surface are outlined. The scheme is divided into sections on oil sampling and the reference specimens, sample conservation and storage, sample pretreatment, and characterization of mineral oils.

Citation Source: Environmental Health and Pollution Control 8(1):#58. 1975.

C-1384-75
ADVANCES IN THE DETECTION OF WATER POLLUTANTS

Barabas, S. 1975.
Chemistry in Canada 27(6):26-29.

The article summarizes the progress made by the Canadian Center for Inland Waters in developing analytical methods for the detection of a number of water pollutants. Two techniques for the differentiation and measurement of phenols using high-pressure liquid chromatography and spectrophotometry, and a gas chromatographic method for hydrocarbons are reported.

Citation Source: Citation Journal

C-1385-75
DETERMINATION OF MINERAL OIL IN WATER

Belcher, R. S. 1974.
Examination of Waters: Evaluation of Methods for Selected Characteristics. Australian Water Resources Council, Technical Paper No. 8. 109 p.

A review is given of current methods used for the determination of low-level mineral oil contamination of water, including limitations of their efficiency of extraction of oil, separation of natural substances, and measurement of pollution levels. A method utilizing infrared spectrophotometry and a new extraction procedure developed by the Department of Agriculture, Victoria, are described.

Citation Source: Citation Journal

C-1386-75
HYDROCARBONS

Bradley, M. P. T. 1975.
Analytical Chemistry 47(5):189R-199R, 225R-228R.

This article contains a review of the 1972 and 1973 literature pertinent to the analysis of hydrocarbons. A large number of applications or modifications of gas chromatography, a strong interest in the polycyclic compounds, and a new interest in the analysis of hydrocarbons in the environment are the major developments reported.

Bibliographies

Citation Source: Citation Journal

C-1387-75
HYDROCARBONS IN WATER AND SEDIMENT SAMPLES FROM COAL OIL POINT AREA, OFFSHORE CALIFORNIA

Brandon, E. E. 1975.
Offshore Technology Conference, 7th, Houston, 1975. Preprint No. OTC-2387, Vol. 1. p. 513-521.

Heavy and light dissolved hydrocarbons have been found in higher concentrations within one square nautical mile of the Coal Oil Point seeps than in waters 10-15 miles east-southeast of the seeps. Hydrocarbons in the sediments introduced by the seeps can be clearly distinguished from those originating in other natural processes using chromatographic analyses. These components are not moving over a wide area and are not being incorporated into the sediments or water column elsewhere, and should have little environmental impact.

Sampling
Source identification

Citation Source: Petroleum Abstracts 15(27):#207,567. 1975.

C-1388-75
INTERFERENCE OF NON-HYDROCARBONS IN OIL-IN-WATER DETERMINATION

Bridie, A. L., et al. 1973.
Journal of the Institute of Petroleum 59(50):263-267.

A wide range of solvent extraction materials was examined in an effort to obtain an oil-in-water analysis which determines mineral oil exclusively and not other organic matter in effluents. The most effective method was found to use n-pentane with the addition of 'Florisil' (a Mg-Al silicate adsorbent) which removed the relevant non-hydrocarbons from the pentane extract. Concawe's method 111B is recommended for the full determination of oil dissolved in waste water.

Citation Source: Environmental Health and Pollution Control 7(10): #2920. 1975.

C-1389-75
IDENTIFYING OIL IN THE ENVIRONMENT BY INFRARED SPECTROSCOPY

Brown, C. W. 1975.
National American Chemical Society Meeting, 169th, Philadelphia, 1975. 760 p. Abstract Paper No. ENVT 72.

Summary not available.

Citation Source: Petroleum Abstracts 15(28): Appendix A. 1975.

C-1390-75
NORMAL PARAFFIN PROFILES OF PELAGIC TAR SAMPLES FROM THE MARMAP SURVEY

Butler, J. N., and J. C. Harris. 1975.
Marine Chemistry 3(1):1-7.

Pelagic tar samples were collected from 20 stations on cruises from the Marmap Survey and were analyzed by gas chromatography to obtain normal paraffin profiles in the range from C_{10} to C_{35}, and a qualitative indication of the relative amount of other compounds having a volatility in that range. The samples were all weathered residues of waxy paraffinic crude oils and were similar to numerous samples collected in the Sargasso Sea near Bermuda.

Sampling

Citation Source: Citation Journal

C-1391-75
DISSOLVED ORGANIC MATERIALS IN THE SAINT LAWRENCE MARITIME ESTUARY: COMPARISON AND CHOICE OF METHODS [English Summary]

Cauchois, D., and M. Khalil. 1974.
Journal of the Fisheries Research Board of Canada 31(2):133-139.

A comparison was made of two methods, one based on liquid-liquid extraction and the second by adsorption on a resin, to extract dissolved organic matter in the St. Lawrence maritime estuary. The methods removed different spectrums of organics from seawater. Hydrocarbons were found to compose the major part of the extracts, varying between 3 and 5 μg/l.

Citation Source: Selected Water Resources Abstracts 8(13): #W75-06706. 1975.

C-1392-75
THE RECOGNITION OF ORGANIC POLLUTANTS IN AQUATIC SEDIMENTS

Eglinton, G., B. R. T. Simoneit, and J. A. Zoro. 1974.
A Discussion on Organic Pollutants in the Sea: Their Origin, Distribution, Degradation and Ultimate Fate,[London], 1974.

The technique of computerized gas chromatography-mass spectrometry in identifying pollutants and natural compounds in aquatic sediments is described. The use of this system for the analysis of an estuarine sediment, in which phthalate esters, polycyclic aromatic hydrocarbons, natural lipids and partially degraded crude oil were detected, is reviewed.

Citation Source: Proceedings of the Royal Society of London, B, 189(1096):415-422. 1975.

C-1393-75
SOLVENTS IN SEWAGE AND INDUSTRIAL WASTE WATERS: IDENTIFICATION AND DETERMINATION

Ellison, W. K., and T. E. Wallbank. 1974.
Water Pollution Control 73:656-671.

The use of infrared and ultraviolet spectroscopy in conjunction with gas chromatography is a powerful technique for the detection and identification of small amounts of immiscible solvent residues in waste samples. Petroleum does not mask other solvents in this method.

Citation Source: Selected Water Resources Abstracts 8(11): #W75-05840. 1975.

C-1394-75
ANALYSIS OF HYDROCARBONS IN MARINE ORGANISMS: RESULTS OF IDOE INTERCALIBRATION EXERCISES

Farrington, J. W., J. M. Teal, J. G. Quinn, P. L. Parker, and K. Winters. 1974.
Technical Report, WHOI-74-61, NSF/IDOE-74-43. 15 p.

Intercalibration exercises were conducted for the International Decade of Ocean Exploration's baseline studies of marine pollutants. The exercises provide an evaluation of the precision and accuracy of analyses of hydrocarbons in marine organisms.

Citation Source: Government Reports Announcements 75(7): #PB-238 459/2GA. 1975.

C-1395-75
SOME PROBLEMS ASSOCIATED WITH THE COLLECTION OF MARINE SAMPLES AND ANALYSIS OF HYDROCARBONS

Farrington, J. W. 1974.
In: Marine Environmental Implications of Offshore Drilling in the Eastern Gulf of Mexico; Chemical Oceanography. R. E. Smith (ed.). St. Petersburg, Florida, State University System of Florida Institute of Oceanography. p. 269-278.

The analysis of marine samples to detect petroleum hydrocarbons in recently biosynthesized hydrocarbons is discussed. The need is explained for closely spaced sampling stations and intercalibration procedures for comparing baseline data collected by different laboratories examining the distribution of hydrocarbons.

Citation Source: Marine Geology 19(1):63. 1975.

C-1396-75
DETERMINING THE CONCENTRATION OF OIL IN WATER SAMPLES BY INFRARED SPECTROPHOTOMETRY. PHASE I. SAMPLE AGING STUDY

Finger, S., H. Feingold, E. Timko, and S. Orbach. 1974.
Evaluation Report, NSRDC-4535. 110 p.

Results are given from a study in which oil-in-water samples of naval distillate fuel oil were analyzed to determine and quantify aging from various types of degradation processes during an 8-week period.

General fate of oil in the environment

Citation Source: Government Reports Announcements 75(16): #AD-A011 040-3GA. 1975.

C-1397-75
DETERMINING THE CONCENTRATION OF OIL IN WATER SAMPLES BY INFRARED SPECTROPHOTOMETRY: PHASE II. INTERLABORATORY STUDY. VOLUME I.

Finger, S., H. Feingold, E. Timko, and S. Orbach. 1975.
Evaluation Report, NSRDC-4536-Vol-1. 124 p.

An interlaboratory study to validate a method for measuring the concentration of oil-in-water was conducted by seven laboratories. This analytical procedure was evaluated as a function of oil type, water salinity and oil concentration. Data, results and conclusions are included in this volume.

Citation Source: Government Reports Announcements 75(16): #AD-A011 041/1GA. 1975.

C-1398-75
DETERMINING THE CONCENTRATION OF OIL IN WATER SAMPLES BY INFRARED SPECTROPHOTOMETRY. PHASE II. INTERLABORATORY STUDY. VOLUME II.

Finger, S., H. Feingold, E. Timko, and S. Orbach. 1975.
Evaluation Report, NSRDC-4536-Vol-2. 100 p.

"This volume contains discussions and derivations of some of the procedures in the statistical analysis used in this study, results at a greater level of detail, and results based on the inclusion of sample aging as well as calibration corrections."

Citation Source: Government Reports Announcements 75(16):
#AD-A011 042/9GA. 1975.

C-1399-75
DETERMINING THE CONCENTRATION OF OIL IN WATER SAMPLES BY INFRARED SPECTROPHOTOMETRY. PHASE II. INTERLABORATORY STUDY. VOLUME III.

Finger, S., H. Feingold, E. Timko, and S. Orbach. 1975.
Evaluation Report, NSRDC-4536-Vol-3. 176 p.

Appendices are included in this volume which present a description of samples shipped to and data provided by laboratories participating in the interlaboratory study of the IR Oil Concentration Analysis Method.

Citation Source: Government Reports Announcements 75(16):
#AD-A011 043/7GA. 1975.

C-1400-75
PETROLEUM

Fraser, J. M. 1975.
Analytical Chemistry 47(5):169R, 220R.

The format of the review which follows this introduction is explained. This is the twelfth in a series of reviews of analytical chemistry in the petroleum industry and it covers publications appearing in 1972 and 1973.

Bibliographies

Citation Source: Citation Journal

C-1401-75
ANTIOXIDANTS A NEW CLASS OF ENVIRONMENTAL CONTAMINANTS

Guesten, H., W. Koelle, K. H. Schweer, and L. Stieglitz. 1973.
Environmental Letters 5(4):209-213.

Phenols bearing tert-buty substituents in ortho-position are found in Rhine water and on filters; they were determined by gas chromatography-mass spectrometry. Although not directly toxic, these compounds are antioxidants and may inhibit photosynthesis.

Biological effects of oil pollution

Citation Source: Abstracts on Health Effects of Environmental Pollutants 4(8):#8418. 1975.

C-1402-75
EXHAUST EMISSIONS FROM 2-STROKE OUTBOARD MOTORS AND THEIR IMPACT

Hare, C. T., K. J. Springer, and T. A. Huls. 1974.
SAE (Technical Paper), 740737. 26 p.

The losses of condensible and/or soluble exhaust components of exhaust emissions into the water phase were dependent upon the water/exhaust ratios, turbulence, water temperature, bubble residence time and the pH of the water. The national impact of outboard engines was estimated to be (compared %) hydrocarbons, 1; CO, 0.9; NO_x, 0.008; and SO_x, 0.004.

Reporting

Citation Source: Chemical Abstracts 83(2):#15035c. 1975.

C-1403-75
DIRECT ANALYSIS OF WATER SAMPLES FOR ORGANIC POLLUTANTS WITH GAS CHROMATOGRAPHY-MASS SPECTROMETRY

Harris, L. E. 1974.
Analytical Chemistry 46:1912-1917.

A study was made of the applicability of direct aqueous injection gas chromatography-mass spectrometry to water pollution identification. Results indicate that direct aqueous analysis is a valuable supplementary procedure for the detection of volatile organic compounds in marine pollutants that are not found with solvent extraction.

Citation Source: Citation Journal

C-1404-75
QUALITATIVE CHARACTERIZATION OF 370-535° AROMATIC CONCENTRATES OF CRUDE OILS FROM GPC (GEL PERMEATION CHROMATOGRAPHIC) ANALYSES

Hirsch, D. E., J. E. Dooley, H. J. Coleman, and C. J. Thompson. 1974.
U.S. Bureau of Mines, Report of Investigations, No. RI7974. 26 p.

The 370-535° distillates from four crude oils were characterized by a GPC-mass spectral method. Correlations were developed to predict the retention volume, molecular volume, chain length and ring number of many petroleum components.

Citation Source: Chemical Abstracts 83(6):#45597e. 1975.

C-1405-75
MARINE POLLUTION BY OIL. CHARACTERIZATION OF POLLUTANTS, SAMPLING, ANALYSES AND INTERPRETATION

Institute of Petroleum Oil Pollution Analysis Committee. 1974.
Barking, Essex, Applied Science Publishers. ix + 198 p.

Sampling and sample preparation are described in order that coastal authorities may collect reliable samples for analyses. Two thirds of the book is concerned with analyses of petroleum oil. One chapter provides guidance on interpretation of results related to identification of oils.

Sampling
Source identification

Citation Source: Marine Pollution Bulletin 6(4):63. 1974.

C-1406-75
PROGRESS REPORT ON PELAGIC, BEACH AND BOTTOM TARS OF THE GULF OF MEXICO AND CONTROLLED WEATHERING EXPERIMENTS

Jeffrey, L. M., D. J. Frank, N. Powell, A. Bautz, A. Voz, and L. May. 1973.
Report, Texas A & M University, Department of Oceanography.

Gas chromatography analyses of sulphur and asphaltene content, V/Ni ratios and molecular size range of asphaltene fractions were parameters determined in tar samples collected from the Gulf of Mexico and the Caribbean. Differences observed in these parameters between the pelagic, beach and bottom tars, and between the environmental tars and crude or fuel oil products are discussed. Experiments examining the weathering process of tars are detailed.

Chemical changes of oil

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(3): #5Q3098. 1975.

C-1407-75
SENSITIVE MONITORING OF PHENOLS AFTER LIQUID CHROMATOGRAPHY

Katz, S., and W. W. Pitt, Jr. 1975.
Journal of Chromatography 111(2):470-471.

The authors raise several objections to the procedures used by Wolkoff and Larose (1974) in analyzing phenols. Their comments are based on four years of study of the applications of the cerate oxidative monitor and are contained in a letter to the editor.

Monitoring

Citation Source: Citation Journal

C-1408-75
ANALYSIS ON NONIONIC SURFACTANTS OF THE ALKYL PHENOL TYPE IN THE PRESENCE OF MINERAL OIL BY MEANS OF LIQUID CHROMATOGRAPHY

Krejci, M., M. Rounda, and Z. Vavrouch. 1974.
Journal of Chromatography 91:549-556.

A method has been developed for the determination of trace amounts of non-ionic surfactants of the alkyl phenol type (Arkopals) and mineral oil in waste waters. The sample is first enriched using a pre-column packed with Porapak Q; this allows concentrations of ppm to be determined. Liquid-liquid chromatography is used to discriminate the different Arkopals. UV spectra separates oils and surfactants.

Citation Source: Citation Journal

C-1409-75
ANALYTICAL AND PROCESS INSTRUMENTATION

Loveland, J. W., and C. N. White. 1975.
Analytical Chemistry 47(5):208R-220R, 231R-232R.

This review covers the 1972 and 1973 literature relevant to petroleum analytical and process instrumentation. Sub-sections cover: pollution, improved instrumental techniques and equipment with general applicability, elemental analysis, individual and type compound analysis, and physical property methods.

Bibliographies

Citation Source: Citation Journal

C-1410-75
THE DETERMINATION OF TRACE METALS IN BEACH ASPHALTS

May, L. A., and B. J. Presley. 1974.
Atomic Absorption Newsletter 13(6):144-145.

Iron, vanadium and nickel were determined in beach asphalts by flameless atomic absorption using a Perkin Elmer HGA 2000. The technique is useful in helping to identify the origin of oil and pollution samples arising from crude oil. Results of the analysis are given.

Source identification

Citation Source: Environmental Health and Pollution Control 7(10): #2749. 1975.

C-1411-75
DEVELOPMENT OF SAMPLE PREPARATION METHODS FOR ANALYSIS OF MARINE ORGANISMS

McKee, H. C., and D. S. Tarazi. 1974.
Ecological Research Series, EPA-660/3-74-026. 62 p.

Laboratory methods for processing, extracting, purifying, concentrating and measuring specific organic pollutants in marine organisms have been developed in a 2-year laboratory study. Compounds tested include saturated carbons to C_{22}, aromatics to C_9, alcohols, amines, glycols, unsaturated hydrocarbons, ketones, phenols, esters, heterocyclic compounds, acids, sulfides and chlorinated hydrocarbons.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(3): #5Q3162. 1975.

C-1412-75
DETERMINATION OF OIL IN WATER

Meijers, A. P. 1974.
H_2O (Rotterdam) 7(21):460-465.

The determination of oil extracted from water with infrared spectrometry, thin layer chromatography and gas chromatography was compared by water institute specialists. Daily oil measurements can be conducted best using infrared spectrometry; this method gives only minor qualitative information. When more qualitative information is required, gas chromatography can be applied as well.

Citation Source: Environmental Health and Pollution Control 7(9): #2464. 1975.

C-1413-75
FUNDAMENTAL STUDIES ON THE THICKNESS OF CRUDE OIL FILM ON SEA-WATER SURFACES

Miyahara, S., and Y. Nozaki. 1975.
Bulletin of Japanese Society of Scientific Fisheries 41(4): 377-382.

The thickness of the average monomolecular films of five crude oils was measured with a plate-type surface balance and the largest area that the film can cover was calculated. The resulting values were much larger than those of the oil films which had previously been studied. The average molecular weight of the five crudes was then measured by the Rast's cryoscopic method.

Physical changes of oil

Citation Source: Citation Journal

C-1414-75
AN ULTRAVIOLET SPECTROPHOTOMETRIC METHOD FOR THE DETERMINATION OF NAPHTHALENE AND ALKYLNAPHTHALENES IN THE TISSUES OF OIL-CONTAMINATED MARINE ANIMALS

Neff, J. M., and J. W. Anderson. 1975.
Bulletin of Environmental Contamination and Toxicology 14(1): 122-128.

The authors describe a direct UV spectrophotometric method for the semiquantitative determination of naphthalene, methylnaphthalenes and dimethylnaphthalenes in seawater and in marine animal tissues. In past hydrocarbon accumulation and retention studies, as little as 0.1 ppm of naphthalene and alkylnaphthalenes has been detected in marine animal tissues without difficulty. The detection limits in seawater are in the range of 0.01 to 0.05 ppm.

Citation Source: Citation Journal

C-1415-75
INDUCTION OF ARYL HYDROCARBON (BENZO[A]PYRENE) HYDROXYLASE IN FISH BY PETROLEUM

Payne, J. F., and W. R. Penrose. 1975.
Bulletin of Environmental Contamination and Toxicology 14(1): 112-116.

A study was conducted in which aryl hydrocarbon (benzo[a]pyrene) hydroxylase (AHH) activity was measured in brown trout and capelin under pollution-free and oil-contaminated conditions. Results indicate the usefulness of measuring inducible AHH in fish as a means of assessing previous exposure to petroleum or other products containing polycyclic aromatic hydrocarbons.

Biological effects of oil pollution

Citation Source: Citation Journal

C-1416-75
DETERMINATION OF TRACE AMOUNTS OF NAPHTHALENE IN SUBSTANCES OF THE ENVIRONMENT [English Summary]

Polishchuk, L. R. 1975.
Gigiena i Sanitariya 2:76-78.

The analytical procedure for determining the presence of naphthalene in waste water and agricultural products is outlined.

Citation Source: Chemical Abstracts 83(1):#2012t. 1975.

C-1417-75
INVESTIGATION OF PETROLEUM ASPHALTENES BY X-RAY DIFFRACTION

Posadov, I. A., Yu. V. Pokonova, and V. A. Proskuryakov. 1974.
Journal of Applied Chemistry of the USSR 47(11) Part II:2606-2608.

The structural characteristics of the most typical asphaltenes are given.

Citation Source: Citation Journal

C-1418-75
SPIN-LABELING TECHNIQUES FOR STUDYING MODE OF ACTION OF PETROLEUM HYDROCARBONS ON MARINE ORGANISMS

Roubal, W. T., and T. K. Collier. 1975.
Fishery Bulletin 73(2):299-305. NOAA-75051501-8, 1974. 8 p.

Basic spin-labeling theory and experimental results from spin-labeling studies of membrane-hydrocarbon contaminant interaction are discussed in this report. The purpose of these studies is to investigate the mode of action of hydrocarbon contaminants at the molecular level.

Citation Source: Government Reports Announcements 75(17):
#COM-75-50192-02-08/GA. 1975.

C-1419-75
A METHOD FOR DETERMINING OIL IN WATER

Stamulis, A. 1974.
Report No. NRL-MR-2741. 19 p.

Adding an oil-soluble dye to a well mixed oil-in-water solution produces a homogeneous colored solution. Low concentrations of oil can thus be visually determined. Many test oils gave positive results, but in some cases protective colloid action masked the color test.

Citation Source: Government Reports Announcements 75(11): #AD-A007 871/7GA. 1975.

C-1420-75
PROPERTIES OF THE NONPOLAR OIL-WATER INTERFACE. I. PROCEDURES FOR THE ACCURATE MEASUREMENT OF THE INTERFACIAL PRESSURE OF AN INSOLUBLE MONOLAYER

Taylor, J. A. G., and J. Mingins. 1975.
Journal of the Chemical Society, Faraday Transactions 71(5): 1161-1171.

A method (J. H. Brooks and B. A. Pethica, 1964) for measuring the surface pressure of an insoluble monolayer at a nonpolar oil-water interface is described.

Citation Source: Chemical Abstracts 83(4):#33352h. 1975.

C-1421-75
CRUDE OILS

Trusell, F. C. 1975.
Analytical Chemistry 47(5):169R-173R, 220R-221R.

The author reviews the literature of 1972 and 1973 pertinent to the analysis of crude oils. Subheadings include hydrocarbons, heterocompounds, shale oil, asphalts and residues, metals and salts, non-routine characterization, routine analytical data, and distillation data.

Bibliographies

Citation Source: Citation Journal

C-1422-75
COULOMETRIC DETERMINATION OF RESIDUAL CONTENT OF PHENOLS IN REFINERY WASTE WATERS

Tsayun, G. P., and E. E. Yudovich. 1975.
Chemistry and Technology of Fuels and Oils 10(5-6):489-491.

The colorimetric method used to determine phenol residuals in refinery waste waters is difficult to automate. Gas chromatography is time-consuming. A new analytical method is described in this paper which uses a coulometric titration of phenol with bromine. Details of the test and recommendations for practical uses in petroleum refineries are given.

Monitoring

Citation Source: The Engineering Index Monthly 13(7):#047164x. 1975.

C-1423-75
DETERMINATION OF MINERAL OILS IN WASTE WATER CONTAINING OIL EMULSIONS [English Abstract]

Vavrouch, Z. 1974.
Vyzkumny Ustav Vodohospodarsky Prague, Prace a Studie (136). 70 p.

A summary is given of the results of a study of the analytical methods for determining mineral oils in waste water containing oil emulsions. The possibility of using chromatographic methods and UV- and IR-spectroscopy to identify mineral oils is discussed. Attention is focused on methods of separating these oils from polar substances (emulsifying agents) using adsorption chromatography on columns packed with silica gel or aluminum oxide.

Citation Source: The Engineering Index Monthly 13(5):#035099. 1975.

C-1424-75
ANALYSIS OF EMISSIONS FROM OUTBOARD TWO-CYCLE MARINE ENGINES

Weber, W. J., Jr., D. E. Cole, and J. C. Posner. 1975.
Final Report, EPA/670/2-75-061, Grant EPA-R-801799. 266 p.

Several types of two-stroke engines were run under load conditions and both condensible and non-condensible emissions were analyzed. Exhaust products which are considered to be condensible in a water column constituted less than 10% of the fuel fed in all cases. The major portion of the water condensible aromatics evaporated fairly rapidly from the water, but a portion was nonvolatile.

Citation Source: Government Reports Announcements 75(16): #PB-242 174/1GA. 1975.

C-1425-75
CRUDE OIL SPILLS RESEARCH. AN INVESTIGATION AND EVALUATION OF ANALYTICAL TECHNIQUES

Wilson, C. A., and E. P. Ferrero. 1975.
U.S. Bureau of Mines, Report of Investigations, No. 8024. 28 p.

The article described the program of the Bureau of Mines to investigate and evaluate analytical techniques for the simple, rapid and reliable identification of crude oil spills. Gas-liquid chromatographic analysis, atomic absorption, spectrophotometric analysis and sulfur-nitrogen determinations are recommended as the most useful techniques investigated.

Citation Source: The Engineering Index Monthly 13(6):#042247. 1975.

C-1426-75
A HIGHLY SENSITIVE TECHNIQUE FOR THE LIQUID CHROMATOGRAPHIC ANALYSIS OF PHENOLS AND OTHER ENVIRONMENTAL POLLUTANTS

Wolkoff, A. W., and R. H. Larose. 1974.
Journal of Chromatography 99:731-743.

The system utilizes a reaction detector in which cerium (IV) sulfate is allowed to react with phenols in the column effluent, and the cerium (III) produced is detected by fluorescence spectroscopy. The lower limit of detection of phenols in environmental samples was shown to be about 0.4 ppb.

Citation Source: Fuel Abstracts and Current Titles 16(3):#2228. 1975.

C-1427-75
SENSITIVE MONITORING OF PHENOLS AFTER LIQUID CHROMATOGRAPHY

Wolkoff, A. W., and R. H. Larose. 1975.
Journal of Chromatography 111(2):472-473.

This 'Letter to the Editor' is a reply to criticisms on the authors' laboratory procedures made by Katz and Pitt (1975). Justification of their method of measuring phenols at a more sensitive level using high-pressure liquid chromatography is attempted.

Monitoring

Citation Source: Citation Journal

C-1428-75
HIGH-MOLECULAR-WEIGHT AROMATIC HYDROCARBON COMPOSITION OF PETROLEUM [English Translation]

Zimina, K. I., A. A. Polyakova, and A. G. Siryuk. 1975. Khimiya i Tekhnologiya Topliv i Masel 3:53-56.

The composition of this fraction of petroleum was determined by mass and UV spectra. The aromatic fraction of the high-molecular-weight aromatic hydrocarbons contained hydrocarbons with benzene rings. The light fractions included alkyl benzenes with a long chain, the heavy fractions, alkyl benzenes with several alkyl chains.

Citation Source: Chemical Abstracts 83(6):#45535h. 1975.

6. SOURCE IDENTIFICATION

C-1429-75
IDENTIFYING SPILLED OIL MAY BE DIFFICULT

Anon. 1975.
Chemical and Engineering News 53(36):22.

A recent study of the methods available for the analysis of spills indicates that although it might be possible to identify the spill source, it would be difficult due to the lack of necessary data on the world's oils. Gas liquid chromatography, V-Ni analysis by atomic absorption, and sulfur-nitrogen determinations are the most useful methods of identifying oils. But data on crude oils from all the various oil fields are necessary for comparison.

Citation Source: Citation Journal

C-1430-75
APPLICATIONS OF INFRARED SPECTROSCOPY IN PETROLEUM ANALYSIS AND OIL SPILL IDENTIFICATION

Brown, C. W., P. F. Lynch, and M. Ahmadjian. 1975.
Applied Spectroscopy Reviews 9(2):223-248.

The review covers the comparison of petroleum and component structures, and the identification of petroleum in the environment by transmission infrared and attenuated total reflection spectroscopy and remote detection.

Analysis
Bibliographies

Citation Source: Chemical Abstracts 83(6):#47712n. 1975.

C-1431-75
SOURCE IDENTIFICATION OF OIL SPILLS BY PATTERN RECOGNITION ANALYSIS OF NATURAL ELEMENTAL COMPOSITION

Duewer, D. L., B. R. Kowalski, and T. F. Schatzki. 1975.
Interim Technical Report, No. 7, Contract N00014-67-A-0103-0036.
42 p.

The use of pattern recognition analysis in determining the source of an oil spill is described. Procedures utilizing comparisons of the field sample to single known source samples and to multiple artificially weathered source samples of a given type are discussed.

Analysis

Citation Source: Government Reports Announcements 75(9):
#AD/A-006 471/7GA. 1975.

C-1432-75
IDENTIFICATION OF SOURCES OF OIL SPILLS

Green, D. M., and J. Roburn. 1973.
Proceedings of the Society of Analytical Chemistry 10(8):202-203.

The different methods of identification of the sources of oil spills are reviewed. The methods include gas chromatography, isoprenoid alkane, and V-Ni content.

Analysis

Citation Source: Chemical Abstracts 83(6):#47709s. 1975.

C-1433-75
OCCURRENCE AND ORIGIN OF SO-CALLED CARCINOGENEOUS AND OTHER POLYCYCLIC HYDROCARBONS IN WATERS

Hellmann, H. 1974.
Deutsche Gewaesserkundliche Mitteilungen 18(6):155-157.

Water and sediment samples from the Rhine River near Koblenz contain polycyclic aromatics that come from waste water and the natural contribution of the catchment during flood periods. Load increased with discharge.

Monitoring

Citation Source: Chemical Abstracts 83(8):#65224j. 1975.

C-1434-75
ORIGIN OF HYDROCARBONS IN SEDIMENTS

Hellmann, H. 1974.
Vom Wasser 43:179-192.

The problem of differentiating hydrocarbons from fossil sedimentary, biogenic and industrial sources in sediments is discussed. The method to differentiate these sources uses IR spectroscopy aided by ^{14}C dating and gas chromatography.

Analysis

Citation Source: Chemical Abstracts 83(4):#31072t. 1975.

C-1435-75
PETROCHEMICAL AND BIOGENIC HYDROCARBONS IN THE SEDIMENTS OF LAKE CONSTANCE

Koelle, W. 1974.
Vom Wasser 43:161-177.

A study was conducted which analyzed sediment samples from four locations for hydrocarbon content and ^{14}C activity. The sedimentary hydrocarbons were composed of highly branched hydrocarbons and the presence of alkylbenzenes, biphenyl, tetrachlorobenzene, hexachlorobenzene, DDE, polychlorinated biphenyls, and condensed aromatic ring compounds indicated pollution from boats on the lake.

Citation Source: Chemical Abstracts 83(4):#31071s. 1975.

C-1436-75
REVIEW OF TECHNIQUES FOR THE CHARACTERISATION AND IDENTIFICATION OF OIL SPILLAGES

McGlynn, J. A. 1974.
Examination of Waters: Evaluation of Methods for Selected Characteristics. Australia Water Resources Council, Technical Paper No. 8. 109 p.

The effectiveness of a broad spectrum of analytical techniques to identify the source of oil spill samples is reviewed. Techniques discussed include: infrared absorbance, ultraviolet fluorescence, ultraviolet absorbance, paper chromatography, trace metal ratios and specification properties, i.e., viscosity and specific gravity.

Analysis

Citation Source: Citation Journal

C-1437-75
LASER INDUCED FLUORESCENT DECAY SPECTRA. NEW FORM OF ENVIRONMENTAL SIGNATURE

Measures, R. M., W. R. Houston, and D. G. Stephenson. 1974.
Optical Engineering 13(6):494-501.

This study demonstrates that the decay time of laser-induced fluorescence is a function of emission wavelength for several crude oils and petroleum products. With this setup, oil spills can be detected and identified, and also water temperature, quality and movement measured.

Citation Source: Chemical Abstracts 83(8):#65150q. 1975.

C-1438-75
SIGNIFICANCE OF LOW MOLECULAR WEIGHT HYDROCARBONS IN EASTERN GULF WATERS

Sackett, W. M. 1974.
In: Marine Environmental Implications of Offshore Drilling in the Eastern Gulf of Mexico; Chemical Oceanography. R. E. Smith (ed.). St. Petersburg, Florida, State University System Florida Institute of Oceanography. p. 253-267.

An extensive survey of dissolved low molecular weight hydrocarbon concentrations in surface waters of the Gulf of Mexico indicates that the most important sources of these hydrocarbons are related to man's activities. These sources include shipping and petrochemical activities from ports and estuaries, offshore drilling and production platforms, and ships discharging oily wastes at sea. Low molecular weight hydrocarbons are considered to be sensitive indicators of incipient petroleum pollution in marine environments.

Chemical effects of oil prospecting and production

Citation Source: Marine Geology 19(1):66. 1975.

C-1439-75
CONTENTS OF NICKEL AND VANADIUM IN THE HEAVY OILS WHICH POLLUTE THE COASTS FROM THE UNITED STATES BORDER TO ENSENADA, BAJA CALIFORNIA [English Summary]

Salas Flores, D., K. A. Nishikawa Kinomura, H. R. Cabrera Muro, and S. Alvarez-Borrego. 1974.
Ciencias Marinas 1(1):1-15.

From a maximum of four strong suspected sources, the origin of oil pollutants can be identified by the concentrations of V, Ni and the V-Ni ratio.

Analysis

Citation Source: Chemical Abstracts 83(6):#47813w. 1975.

C-1440-75
METHODS OF IDENTIFYING AND DETERMINING SOURCE AND AGE OF PETROLEUM FOUND IN THE MARINE ENVIRONMENT

Scolnick, M. E., A. C. Scott, and M. Anbar. 1974.
Final Report, June 72 to June 74, USCG-D-61-75, Contract DOT-CG-22996-A. 121 p.

A system for the identification of oil by nonfragmenting field ionization multiscanning mass spectrometry is described in detail.

A statistical model for the analysis of spectrometer data is derived.

Analysis

Citation Source: Government Reports Announcements 75(16): #AD-A010 704/5GA. 1975.

C-1441-75
MINIMIZING OIL-SPILL HAZARDS

Zimmerman, M. D. 1975.
Machine Design 47(11):16-18.

The article describes the work being done at the Environmental Protection Agency's Edison Laboratory to determine the origins of oil and hazardous materials spilled into U.S. coastal and inland waters by the use of various analytical instruments. Oil spillers may soon be identified based on evidence supplied by absorption, infrared, gas chromatograph and fluorescence spectroscopy analysis.

Analysis

Citation Source: Petroleum Abstracts 15(30):#208,697. 1975.

B. OIL POLLUTION PREVENTION AND CONTROL

1. CONTAINMENT

C-1442-75
CIVIL ENGINEERING LABORATORY DEVELOPS UNIVERSAL CONNECTOR FOR ALL BOOMS

Anon. 1975.
Sea Technology 16(1):16.

The Civil Engineering Laboratory, Naval Construction Battalion Center, Port Hueneme, California, has developed a universal boom connector which allows sections of different size booms to be connected quickly and effectively to contain an oil spill. The design of the connector is described.

Design and engineering

Citation Source: Citation Journal

C-1443-75
EXPANDI OIL BOOM

Anon.
Product Information

The Expandi Oil Boom is a new product developed by Whittaker Corporation, La Mesa, California, which has been deployed for testing and spill control in sheltered waters and open sea. The principal advantages of the boom are light weight, compactness, high stability, rapid deployment, manageability and easy recovery.

Information Source: W. E. Bacher, Whittaker Corporation,
5159 Baltimore Dr., La Mesa, California 92041

C-1444-75
OIL SPILL FENCE

Anon. 1974.
Marine Technology Society Journal 8(7):26.

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 water surface. The fence can be stored on the sea bottom surrounding a fixed oil handling station and when needed can be inflated and floated to the surface to contain the spill.

Citation Source: Citation Journal

C-1445-75
FAST CURRENT OIL CONTROL STUDY

Graebel, W. P., and V. A. Phelps. 1974.
Interim Report, USCG-D-84-75, Contract DOT-CG-32430-A. 198 p.

Oil containment barriers and oil herders were studied using various oils and currents up to four fps. The oil herders were superior to the containment barriers. A vortex oil recovery device was tested which had small loss rates and increased its rate of recovery of a slick with current speed.

Cleanup and recovery

Citation Source: Government Reports Announcements 75(13): #AD-A009 040/7GI. 1975.

C-1446-75
CONTAINMENT OF OIL SPILLS

Herbich, J. B. 1974.
IEEE International Conference on Engineering in the Ocean Environment, Halifax, Nova Scotia, 1974. Vol. 1. p. 282-288.

The effectiveness of the pneumatic barrier concept for oil containment on the open seas is demonstrated.

Citation Source: The Engineering Index Monthly 13(5):#035101. 1975.

C-1447-75
A NATURAL LIMIT TO THE CONTAINMENT AND REMOVAL OF OIL SPILLS AT SEA

Leibovich, S. 1975.
Ocean Engineering 3(1):29-36.

A statistical model is developed to investigate the effect of turbulence on oil spill containment and cleanup operations in marine waters. The model allows a conclusion to be made concerning the probable success of such an operation based on existing wind speed and oil type conditions.

Cleanup and recovery

Citation Source: Citation Journal

C-1448-75
OIL SLICK INSTABILITY AND THE ENTRAINMENT FAILURE OF OIL CONTAINMENT BOOMS

Leibovich, S. 1975.
ASME Meeting, 1975, Paper No. 75-FE-8. 8 p.

Experimental evidence is shown to be consistent with the view that the onset of droplet formation from contained oil slicks is due to the breaking of finite interfacial waves; these waves result from the equilibration of amplifying Kelvin-Helmholtz waves. Conditions for droplet shedding from the headwave and from the entire slick are derived from this model.

Physical changes of oil in the environment

Citation Source: The Engineering Index Monthly 13(6):#039639. 1975.

C-1449-75
EVALUATION OF THE STRENGTH AND SEAKEEPING ABILITY OF POLLUTION CONTROL BARRIERS

Milgram, J. H., and J. F. O'Dea. 1974.
Final Report, USCG-D-75, Contract DOT-CG-12937-A. 204 p.

A barrier is best evaluated at present on its strength and seakeeping ability. This report provides means for evaluating arbitrary oil pollution control barriers without testing them on a full-scale level.

Citation Source: Government Reports Announcements 75(7): #AD/A-004 674/8GA. 1975.

C-1450-75
COMPRESSED AIR BREAKWATERS CHECK OIL SPILLS

Verner, B.
Energie Fluide et Lubrification 13(75):47-54.

Results are given from both model and harbor experiments in which barriers of bubbles have been generated by compressed air run through pipelines with tiny holes.

Citation Source: The Engineering Index Monthly 13(4):#027925. 1975.

2. CLEANUP AND RECOVERY

C-1451-75
(no title)

Anon. 1975.
Ocean Science News 17(24):2.

Radio frequencies for use in oil spill cleanup operations have been allocated to the licencees in the Petroleum Radio Service by the Federal Communications Commission.

Citation Source: Citation Journal

C-1452-75
CLEANING UP A MAJOR OIL SPILL

Anon. 1974.
Financial Times, 4 November.

A brief description is given of some cleanup methods being used by Gulf Oil to clear the Bantry Bay area of about 2,500 tons of crude oil which was recently spilled.

Citation Source: Fuel Abstracts and Current Titles 16(2):#803. 1975.

C-1453-75
CLEAN SWEEP OIL RECOVERY SYSTEM TO BE INSTALLED AT MIAMI AIRPORT

Anon. 1975.
Sea Technology 16(2):23.

The oil recovery system being installed at the Miami International Airport will help prevent the contamination of the nearby Miami River and Biscayne Bay from oil that has seeped into underground limestone at the airport. The design and operation of the device are described.

Design and engineering

Citation Source: Citation Journal

C-1454-75
THE CYCLONET

Anon.
Product Information

ALSTHOM-GROUPE TECHNIQUES DES FLUIDES has developed the 'Cyclonet,' a device for collecting oil straight from the sea surface. Due to the velocity of the boat, floating oil and water are forced into the apparatus via tangential slit below the water surface. The position of the slit causes a rotation inside the Cyclonet and natural separation of the oil and water occurs. The lighter oil and purified water are discharged through separate orifices.

Design and engineering

Citation Source: J. N. Butte, Alsthom Techniques des Fluides, 75, rue General-Mangin, Grenoble, France.

C-1455-75
DISPERSING OIL IN SHALLOW WATERS

Anon. 1975.
Marine Pollution Bulletin 6(4):53.

The Warren Spring Laboratory of the Department of Industry has manufactured a smaller version of its successful '5-bar gate' used for dispersing oil slicks at sea. This new version can be used in coastal waters, in rivers and near beaches.

Citation Source: Citation Journal

C-1456-75
GOODYEAR SEA SENTRY® INFLATABLE OIL BOOMS

Anon.
Product Information

Goodyear's Sea Sentry inflatable oil booms quickly surround and effectively contain polluting oil spills on water, in rough weather and offshore conditions. These booms, made of high strength nylon impregnated with a synthetic rubber, are highly resistant to oil, salt, water, contamination, weathering and gouging. Sections can be joined together and inflated to surround and contain spills from tankers, barges, offshore oil wells or pumping stations.

Design and engineering

Information Source: J. H. Evans, Engineered Fabrics Division, Goodyear Aerospace Corp., Akron, Ohio 44315

C-1457-75
HOW TO CLEAN UP THE MESS

Anon. 1975.
Marine Pollution Bulletin 6(5):65-66.

Different countries have diverged on the question of removal versus disposal of oil spills. There is now a European code for dealing with oil spills which recommends the use of dispersants at sea to keep the oil from the beaches.

International legislation

Citation Source: Citation Journal

C-1458-75
JAPANESE OIL-COLLECTING CATAMARAN

Anon. 1975.
Marine Pollution Bulletin 6(7):100.

The catamaran, "Sokai," has been built by Ishikawajima-Harima Heavy Industries to recover floating oil in Tokyo Bay. Oil is sucked with seawater into an oil-collecting device attached to the hulls, and the oil is then separated using an air bubble producing device.

Design and engineering

Citation Source: Citation Journal

C-1459-75
MARCO RECEIVES $3.1 MILLION CONTRACT FOR 24 OIL SPILL RECOVERY VESSELS

Anon. 1975.
Sea Technology 16(5):31.

Marine Construction and Design Company, Seattle, Washington, is building 24 oil spill recovery vessels for the U.S. Navy to be used in emergency oil spill cleanup on the high seas. The design and operation of the 36-foot long skimmer vessel equipped with the Marco oil recovery "Filterbelt" are described.

Design and engineering

Citation Source: Citation Journal

C-1460-75
NEW HYDROVAC OIL SWEEPER SHIP HAS MECHANICAL SEPARATION SYSTEM

Anon. 1975.
Sea Technology 16(4):20.

Two Hydrovac Sweeper Ships have been used in Rotterdam to recover oil lost due to tanker leaks, ship collisions, as well as terminal accidents and offshore drilling. The oil-water mixture is collected by the oil sweeper boom and pumped through hoses to the oil-water separator aboard ship; the resulting free oil goes into a storage tank and the purified water is discharged overboard.

Design and engineering

Citation Source: Citation Journal

C-1461-75
OFFSHORE OIL SKIMMER PASSES SURVIVAL TEST

Anon. 1974.
Petroleum Engineer 46:20.

The Lockheed Clean Sweep commercial oil/water separator is able to sweep up to 1000 gallons a minute of spilled oil from the ocean surface. The device is composed of a diesel-powered paddlewheel disc-drum mounted crosswise between four inflatable pontoons that form a catamaran. Oil in an oil-water mix adheres to the discs and is carried past wipers which direct the oil to a hollow axle. The oil is then pumped from the machine to storage containers.

Design and engineering

Citation Source: Citation Journal

C-1462-75
1974 OFFSHORE TECHNOLOGY CONFERENCE. PREPRINTS. VOLS I AND II

Anon. 1974.
Offshore Technology Conference, 6th, Dallas, 1974. 2076 p.

The papers cover a variety of topics concerned with oil pollution. Offshore oil storage tanks, oil pollution control systems, recovery systems and tar balls in the sea are subjects.

Design and engineering
Reporting

Citation Source: Pollution Abstracts 6(3):#75-02231. 1975.

C-1463-75
OIL MENACES THE MARITIME ENVIRONMENT

Anon. 1974.
Rotterdam Europoort Delta 13(2):10-13.

The following means for removing oil pollution from seawater are described: mechanical methods using apparatus such as the oil hog and oil skimmer; methods using the oil binding agent, Shell Herder; chemical methods which spray detergents on the pollution to decompose the oil and cause it to sink; and containment of the oil using oil barriers.

Containment

Citation Source: Environmental Health and Pollution Control 7(6):#1673. 1975.

C-1464-75
OIL-REMOVAL UNIT

Anon. 1975.
Oil and Gas Journal 73(35):134.

An oil removal unit operates by collecting oil on an endless belt, and then elevating above the liquid level for gravity discharge. Free oil content is reduced to trace residuals.

Information Source: Tenco Hydro/Aerosciences, Inc., 5220 East Ave., Countryside, Illinois 60525

C-1465-75
OIL SPILLS - RECOVERY AND RE-USE BY VESSEL

Anon. 1975.
Dock Harbor Authority 55(652):415.

Oil pollution is combatted and oil is salvaged for reuse in Rotterdam, Netherlands, by the collection of 10,000 t of salable oil by two Hydrovac ships. A "mother" or process ship physically takes the oil spill aboard by means of an oil sweeper boom attached to the vessel.

Citation Source: The Engineering Index Monthly 13(6):#042249. 1975.

C-1466-75
OIL-WATER SEPARATOR AIDS SPILL CLEANUP

Anon. 1975.
Oil and Gas Journal 73(34):122.

A compact oil-water separator has been developed to handle bilge, oil-spill cleanup, ballast and tank washing. The unit requires only one-fourth the volume of standard API separators and comes in capacities of 10 to 3,000 gpm.

Information Source: General Electric Re-entry and Environmental Systems Division, 3198 Chestnut St., Philadelphia, Pa. 19101

C-1467-75
RECOVERING OIL SPILLS FROM WATER

Anon. 1975.
Water and Sewage Works 122(4):73.

Hydrovac Systems of Amsterdam has developed and tested a sweeper ship that collects the oil-water mixture and pumps it into a separator. Recovery can be done in waves up to seven feet high. Ships in Rotterdam recover 500,000 gallons of salable oil per ship per year on an eight-hour daily work schedule.

Design and engineering

Citation Source: Citation Journal

C-1468-75
SKIMMER GIVES 24-HR OIL RECOVERY

Anon. 1975.
Oil and Gas Journal 73(26):159.

The diesel-powered Spill Spoiler Class III is an oil skimmer developed by Marine Construction & Design Company, Seattle, Washington, able to recover oil on a 24-hour basis under all weather conditions. The system is equipped with a Filterbelt oil reclaiming system which is formed into a continuous conveyor which traps oil while water flows through freely.

Design and engineering

Citation Source: Citation Journal

C-1469-75
VACUUM UNIT GOBBLES UP OIL SPILLS

Anon. 1974.
Electrical World 182:47.

The oil cleaning unit, developed by Vac-U-Max, Belleville, New Jersey, operates on air pressure rather than electric power or fuel and can thus be used in any environment. The units with a two-inch inlet achieve a vacuum of up to sixteen inches of mercury to effectively handle No. 4 fuel or lighter; and most entrained material is able to pass through this size line.

Design and engineering

Citation Source: Citation Journal

C-1470-75
VINYL AND POLYURETHANE SEABOOM PROVIDES PROTECTION AGAINST OFFSHORE POLLUTION

Anon. 1974.
Rubber Age 106(6):51-52.

The "Seaboom," a vinyl and polyurethane boom, was designed to promote quick and easy cleanup of accidental oil spills. The boom consists of a thick vertical vinyl sheet, a vinyl flotation unit, polyurethane ribs and connectors.

Design and engineering

Citation Source: Environmental Health and Pollution Control 7(5):#1375. 1975.

C-1471-75
A METHOD FOR DETERMINATION OF THE DISPERSIVE CAPACITY OF PREPARATIONS USED FOR REMOVING OILS FROM WATER SURFACE [English Summary]

Antonova, N. M., O. S. Mochalova, I. A. Nemirovskaya, and M. P. Nesterova. 1975.
Okeanologiya 15(2):333.

A method is described for evaluating the effectiveness of the dispersive action of chemical products used for removing oil from water surfaces. The method is simple and allows for the rapid comparison of data for different emulsifying agents and different oils.

Citation Source: Citation Journal

C-1472-75
EFFECTS OF SOME CATIONIC DETERGENTS ON AN OIL-WATER EMULSION STABILIZED BY SODIUM LAURYL SULPHATE

Bahadur, P., and S. N. Srivastava. 1975.
Colloid and Polymer Science 253(4):315.

The effects of cationic detergents of varying carbon chain lengths and head groups size on the stability of an oil-water emulsion stabilized with sodium lauryl sulfate were determined. The chain length is more important in inducing flocculation and coalescence; increasing concentration of detergents also increases instability.

Physical changes of oil in the environment

Citation Source: Citation Journal

C-1473-75
GELATION OF OIL BY AMINE CARBAMATES AS A MEANS OF REMOVAL AND RECOVERY OF OIL SLICKS

Bannister, W. W., J. R. Pennace, and H. H. Reynolds. 1974.
Southeastern Regional Meeting of the American Chemical Society, 26th, Norfolk,1974. 5 p.

Research has been initiated to devise improved additives to facilitate the recovery of oil slicks. The authors' work has centered on their observation and application of tendencies of dilute solutions of primary or secondary aliphatic or aralkey amines in hydrocarbons to produce gels upon treatment with carbon dioxide.

Citation Source: Principal author

C-1474-75
AT-SEA TESTING OF A HIGH SEAS OIL RECOVERY SYSTEM

Blockwick, T. N., R. L. Beach, F. A. March, and L. S. Brown. 1974.
Final Report, AD-A006938, USCG-D-57-75, Contract DOT-CG-32781-A. 124 p.

The design and testing of a 2000 gallon/minute oil recovery system developed by Ocean Systems, Inc., are described. Results are given of tests measuring the oil recovery system's strength, stability, operational function, ease of handling, and compatibility with the Coast Guard oil containment barrier and buoy tenders.

Design and engineering

Citation Source: Scientific and Technical Aerospace Reports
13(14):#N75-22953. 1975.

C-1475-75
REMOVAL OF OIL FROM WATER SURFACES USING WOOD DUST--THE INFLUENCE OF WOOD SIZE

Daye, R., et al. 1973.
Journal of the Institute of Petroleum 59(569):242-243.

An experiment is described to determine the retention of oil and other organic liquids on cedar wood dust of a specific particle size. It is concluded that it is deleterious to use wood particles below 0.5 inches for the removal of oil spills. The use of fine particles of wood would be particularly disadvantageous, because of its interstitial packing effect.

Citation Source: Citation Journal

C-1476-75
IGNITION AND COMBUSTION IN SITU OF OIL FROM WRECKED OIL TANKERS: SMALL SCALE BURNING TESTS CARRIED OUT AT THE RPE

Diederichsen, J., A. R. Hall, and P. T. Hinde. 1974.
Rocket Propulsion Establishment Technical Report, No. 616. 45 p.

Small scale burning tests in model tanks were conducted to determine the effect of the size and position of venting apertures on the burning rate of crude oil in tanks. Some empirical extrapolations and scaling rules have been obtained which provide an estimate of the burning rate in ship-sized tanks under various wind and venting conditions.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(4): #5Q4389. 1975.

C-1477-75
OIL BURNING RATES IN PARTLY VENTED TANKS; APPLICATION TO DISPOSAL OF WRECKED OIL TANKER CARGOES

Diederichsen, J., et al. 1973.
Journal of the Institute of Petroleum 59(567):98-105.

Small scale burning tests in model tanks were conducted to determine the effect of the size and position of venting apertures on the burning rate of crude oil in tanks. Effects of tank size, wind speed and cargo type are discussed. Results obtained indicate that 97% of the crude oil and 70% of the fuel oil in a stranded tanker could be burned if the tanker were provided with top and side vents equal to 10% of the surface area of the oil.

Design and engineering

Citation Source: Fuel Abstracts and Current Titles 16(4):#2923. 1975.

C-1478-75
POLYMERS IN THE FIGHT AGAINST POLLUTION [In French]

Donnet, J. B., and E. Papirer. 1975.
Revue Generale des Caoutchoucs et Plastiques 52(1-2):51-58.

The advantages of plastics are considered worth enduring the disadvantages of environmental pollution caused by waste plastics. Polymers are used as ion exchangers, coagulates and flocculants for the purification of polluted water. Polyurethane foam with active surfaces is used to remove oil spills.

Design and engineering
General effects of oil prospecting and production

Citation Source: Chemical Abstracts 83(8):#60848f. 1975.

C-1479-75
OPERATION OF A NEW EPA FACILITY PERMITS TESTS OF OIL-SPILL CLEANUP EQUIPMENT

Farlow, J. S., and F. J. Freestone. 1975.
Oil and Gas Journal 73(26):134.

The design and uses of the oil and hazardous materials simulated environmental test tank (OHMSETT), developed by the Environmental Protection Agency, are described. The test tank is available to private and government users to conduct tests and develop full-size devices and techniques for control of oil and hazardous material spills.

Design and engineering

Citation Source: Petroleum Abstracts 15(30):#208,706. 1975.

C-1480-75
INLAND OIL SPILL CLEANUP

Hubbard, E. H. 1974.
World Energy Conference, 9th, Detroit, 1974. Division 2, Section 2.

Summary not available.

Citation Source: Fuel Abstracts and Current Titles 16(2):#1497. 1975.

C-1481-75
CONTROL OF OIL AND OTHER HAZARDOUS MATERIALS

Hyland, J. R. 1974.
Final Report, EPA/430/1-74-005. 183 p.

A course training manual has been prepared which includes outlines of the following topics: hazardous materials; sources of the spill problem; sampling and characteristics of oil; oil prevention, control and treatment methods; and legislation and the legal response.

Sampling
Personnel training and education
Regulations, standards and planning

Citation Source: Government Reports Announcements 75(7): #PB-238 096/2GA. 1975.

C-1482-75
MECHANICAL SYSTEMS FOR THE RECOVERY OF OIL SPILLED ON WATER

Institute of Petroleum Coordinating Committee for the Prevention of Sea Pollution. 1974.
London, Applied Science Publishers. x + 139 p.

This book consists of a state-of-the-art review of mechanical oil recovery and an evaluation of available methods. Despite the vast sums of money spent on the development of mechanical removers, success is still confined to instances of small amounts of oil in calm waters.

Citation Source: Marine Pollution Bulletin 6(5):66. 1975.

C-1483-75
DISPERSANTS FOR OIL SPILL CLEAN-UP OPERATIONS AT SEA, ON COASTAL WATERS AND BEACHES

Jeffery, P. G., and J. A. Nichols. 1974.
United Kingdom Department of Trade and Industry, LR 193 (OP). 14 p.

A specification for the supply of dispersants for use in combatting oil pollution (primarily in the United Kingdom) is given. General background information and recent ideas concerning formation, composition and usage of oil dispersants are reviewed.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(4): #5Q4386. 1975.

C-1484-75
U.S. COAST GUARD FAST CURRENT OIL REMOVAL SYSTEM DEVELOPMENT PROGRAM

Jensen, D. S. 1975.
Offshore Technology Conference, 7th, Houston, 1975. Preprint, No. OTC-2197. p. 515-525.

Five concepts of methods to control and remove oil slicks in water-current velocities up to 10 kt are described and results of preliminary laboratory testing are presented. A program initiated by the U.S. Coast Guard, Office of Research and Development, concerns the development of a fast current oil removal system.

Citation Source: Petroleum Abstracts 15(25):#206,876. 1975.

C-1485-75
USE OF SORBENTS FOR OIL SPILLS

Kondo, G. 1975.
Marine Pollution Bulletin 6(5):73-76.

Collecting oil from thin slicks is difficult. This article is a review of the advantages of various methods of absorbing spilled oil.

Citation Source: Citation Journal.

C-1486-75
THE EFFECT OF DIFFERENT FLOCCULANTS ON THE ELIMINATION OF TRACE ELEMENTS AND POLYCYCLIC HYDROCARBONS IN THE WATER PURIFICATION PROCESS [English Summary]

Kunte, H., J. K. Reichert, and J. Borneff. 1974.
Zentralblatt fuer Bakteriologie, Parasitenkunde, Infektionskrankheiten und Hygiene. Erste Abteilung Originale, Reihe B: Hygiene, Praeventive Medizin 158(6):530-540.

The elimination rates for four carcinogenic hydrocarbons in water from the Rhine River using three types of flocculants are given. In all cases the concentrations after flocculation corresponded to values normally found in ground water.

Citation Source: Abstracts on Health Effects of Environmental Pollutants 4(6):#5847. 1975.

C-1487-75
HIGH SEAS OIL RECOVERY SYSTEMS DEVELOPMENT AND TESTING

Leary, J. F. 1975.
Offshore Technology Conference, 7th, Houston, 1975. Preprint No. OTC-2196. p. 503-513.

Specifications for fast response high seas oil recovery systems are outlined and a history of events leading to their development is discussed. Certain oil recovery techniques and theories of operation are mentioned and sea tests of these devices are discussed.

Design and engineering

Citation Source: Petroleum Abstracts 15(25):#206,836. 1975.

C-1488-75
HYDRODYNAMIC PROBLEMS IN OIL SPILL CONTROL AND REMOVAL

Leibovich, S. 1975.
Offshore Technology Conference, 7th, Houston, 1975. Preprint No. OTC-2198. p. 527-544.

The theoretical performance of oil-spill control equipment in calm and rough water is discussed. Increases in wave steepness within booms have been found to promote the formation of water-in-oil emulsions or increased oil dispersion. An analysis is given on the observed thickening of oil in the crests of waves.

Analysis

Citation Source: Petroleum Abstracts 15(25):#206,877. 1975.

C-1489-75
UREA FORMALDEHYDE FOAM

Leiner, W. H. M. 1974.
Australian Plastics and Rubber Journal 25(10):13-15.

One application of urea fomaldehyde foam is to control oil spills either on land or water. Under right conditions, the foam will absorb 60 times its own weight of crude or refined oil. A system has been devised to ensure that oil bound up in the foam remains floating, where it cannot cause pollution. The oil containing foam can be collected from the surface by skimming or straining.

Citation Source: Citation Journal.

C-1490-75
BEACH CLEANING EQUIPMENT: THE BEEMER BEACH CLEANER. ROCKY MOUNTAIN STEEL PRODUCTS, INC.

Nightingale, J. 1974.
Warren Spring Laboratory, Stevenage, Herts, United Kingdom, Paper No. WSL-LR-198 (OP). 13 p.

Tests were carried out to determine the suitability of the Beemer Beachcleaner for collecting tar and oil lumps washed onto sandy beaches. An evaluation of the beachcleaner is given.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(6): #5Q6785. 1975.

C-1491-75
POLLUTION OF WATER BY OIL

Smith, J. W. 1973.
In: Environmental Problems and Their International Implications. H. Odabasi and S. E. Ulug (eds.). Colorado Associated University Press. p. 111-125.

The guidelines presented in this paper help select the optimal methods for oil spill treatment and recovery from the shore and water surface. Factors influencing selection include rapidity of mixing and the quantity of polluted water. No method was superior in all situations.

Citation Source: Pollution Abstracts 6(3):#75-02227. 1975.

C-1492-75
EVALUATION OF MTF FOR TESTING HAZARDOUS MATERIAL SPILL CONTROL EQUIPMENT

Thomas, C. R., G. M. L. Robinson, and E. J. Martin. 1974.
EPA/670/2-74/073. 308 p.

The Mississippi Test Facility (MTF) is evaluated as a potential location for safely testing and demonstrating equipment designed to control hazardous materials spills (such as oil spills). The program includes environmental baseline monitoring, construction of test facilities and continual analysis of program elements.

Monitoring

Citation Source: Government Reports Announcements 75(12): #PB-240 762/5GA. 1975.

C-1493-75
EFFORTS AT ENVIRONMENTAL CONTROL BY THE MINERAL OIL MARKETING ORGANIZATION AFOR

Torok, G., A. Koltai, F. Buday, and Z. Gergely. 1974.
Schmierungstechnik 5(8):239-241.

The Hungarian Mineral Oil Marketing Organization AFOR is joining its efforts with the High Pressure Research Institute and Phylaxia, a vaccine and food processing plant, to lower soil and ground water pollution caused by crude oil production and marketing activities. The AFOR is studying the development of efficient cleanup installations and emergency measures to deal with operation mishaps and spills.

Industry standards and guidelines

Citation Source: Environmental Health and Pollution Control 7(5):#1376. 1975.

C-1494-75
CLEARANCE OF OIL FROM WATER SURFACES: THE OIL MOP RECOVERY DEVICE. OIL MOP (UK) LTD.

Wayment, E. C. 1974.
Warren Springs Laboratory, Stevenage, Herts, United Kingdom. Paper No. WSL-LR-206(OP). 8 p.

The Oil Mop recovery device, based on the continuous absorbent belt principal, was evaluated in tests using various types of oil and several oil thicknesses. Results show that the device was very efficient in recovering oil from surface waters.

Design and engineering

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(6): #5Q6786. 1975.

C-1495-75
MORE THAN SKIMMING THE SURFACE

Yoakum, C. 1974.
Ecolibrium 3(3):14-15.

The article describes developments being made by Shell Oil Company in the field of oil spill cleanup. The Shell Oil Herder® has been used to confine spilled oil by modifying the surface tension of water and keeping the oil from spreading. Shell is presently developing a new skimmer to continue the cleanup process. The device will be equipped with baffle means to slow flow of oil and water before entering the vessel.

Design and engineering

Citation Source: Citation Journal

3. RESTORATION

C-1496-75
CLEANING OILED SEA BIRDS

Tucker, W. A. H. 1975.
The Veterinary Record 97(1):20.

A large heavily oiled seabird was cleaned using Polyclens, a solvent marketed by Polycell Products Ltd. as a paint brush cleaner. The bird was able to fly strongly the next morning.

Citation Source: Citation Journal

4. OIL TRANSFER AND TRANSPORT

C-1497-75
ANTI-POLLUTION MEASURES AT FOS/MARSEILLE

Anon. 1974.
Dock and Harbour Authority 54(639):342-344.

The Marseille Port Authority has set up an anti-pollution cell which will arrange for studies of existing and future problems and coordinate actions. Measures to halt pollution include deballasting stations, breakwaters to limit oil slicks and tanks to facilitate waste recovery ashore.

Citation Source: Pollution Abstracts 6(3):#75-03049. 1975.

C-1498-75
HAVOC CAUSED BY KINKY PIPELINES

Anon. 1975.
Marine Pollution Bulletin 6(6):82-83.

If underwater pipes buckle or an anchor is dropped on one, the dent can be propagated along the entire length of the pipeline. British Petroleum is protecting their pipes with several extra sleeves of steel pipe.

Design and engineering

Citation Source: Citation Journal

C-1499-75
IMPROVED POLLUTION CONTROL AND SAFETY ACHIEVED AT NEW GULF OIL TRUCK TERMINAL

Anon. 1975.
The Journal of Canadian Petroleum Technology 14(2):69.

A new "bottom loading" technique for filling petroleum trucks is being used at the Gulf Oil marketing terminal in Clarkson, Ontario, in an effort to reduce air and water pollution during loading operations.

Design and engineering

Citation Source: Citation Journal

C-1500-75
HYGIENIC ASPECTS OF THE PROBLEM OF MARINE PROTECTION AGAINST SHIPS' POLLUTION

Elpiner, L. I., and K. S. Rozval. 1974.
Biuletyn Instytutu Medycyny Morskiej Gdansku 25(2-3-4):493-496.

Some of the major problems involved in controlling unnecessary discharges from ships and in preventing accidental oil spills are discussed. Past accidental spills have indicated the harmful consequences resulting from oil pollution, i.e., effects on aquatic organisms and ecological chains.

Biological effects of oil pollution

Citation Source: Environmental Health and Pollution Control 7(10):#2864. 1975.

C-1501-75
PORT COLLECTION AND SEPARATION FACILITIES FOR OILY WASTES. VOLUME VI. IMPACT OF OFFSHORE TERMINALS ON CONTIGUOUS PORTS

Forster, R. L., J. E. Moyer, and M. Lepeau. 1975.
Report, September 73 - 31 January 75, MA-GEN-970-75067, Contract MA-2-36202. 89 p.

The impact of the energy crisis and the environmental impact of transportation of crude oil and oil products to potential offshore terminals are assessed. The various ports on the three coasts are analyzed for tanker size accommodations, and tanker movement requirements are estimated.

General effects of oil prospecting and production

Citation Source: Government Reports Announcements 75(17): #COM-75-10765/6GA. 1975.

C-1502-75
SPHERE FINDS PIPELINE LEAK

Gagey, E. 1975.
Oil and Gas Journal 73(30):107.

The article reports the use of a sphere to help find leaks in a pipeline when no block valve is present. Tests of this procedure of leak detection are described.

Citation Source: Citation Journal

C-1503-75
AN ANALYSIS OF OIL OUTFLOWS DUE TO TANKER ACCIDENTS, 1971-1972

Henry (J. J.) Co., Inc. 1973.
Report No. CG-D-81-74. 157 p.

The analysis of estimated oil outflows was based on 1,587 worldwide tanker casualties occurring in 1971 to 1972, of which 376 incidents involved pollution. Comparisons were made between casualties in this two-year period and the 1969 to 1970 period.

Reporting

Citation Source: Petroleum Abstracts 15(27):#207,588. 1975.

C-1504-75
SPILLAGES FROM OIL INDUSTRY CROSS-COUNTRY PIPELINES IN W. EUROPE - STATISTICAL SUMMARY OF REPORTED INCIDENTS 1972

King, E. M., and Ph. Rogier. 1974.
Report, Oil Pipelines Special Task Force No. 1, CONCAWE No. 1/74. 12 p.

A statistical summary is prepared for 1972 of the oil spill incidents, causes and consequences from a pipeline system transporting crude oil and oil products in western Europe. The number of incidents reported between 1968 and 1972 amounted to 21 and the gross spillage of oil was only 0.0006% of the total quantity transported. No pollution of drinking water was observed.

Reporting

Citation Source: Reports produced by the Secretariat or Working Group Members of Stichting CONCAWE. Report No. 1/75. Abstract #102. 1975.

C-1505-75
SPILLAGES FROM OIL INDUSTRY CROSS-COUNTRY PIPELINES IN W. EUROPE - STATISTICAL SUMMARY OF REPORTED INCIDENTS 1973

King, E. M., and Ph. Rogier. 1974.
Report Oil Pipelines Special Task Force No. 1, CONCAWE No. 5/74. 13 p.

A statistical summary is given of the oil spill incidents, causes and consequences from a pipeline system transporting crude oil and oil products in western Europe. The number of incidents reported between 1969-1973 amounted to 20, and the gross spillage of oil was only 0.0002% of the total quantity transported. No pollution of potable water resources was reported.

Reporting

Citation Source: Reports Produced by the Secretariat or Working Group Members of Stichting CONCAWE. Report 1/75. Abstract #107. 1975.

C-1506-75
MARINE POLLUTION CONTROL. PART I - THE SHIP DESIGN REQUIREMENTS

Lehr, W. E. 1975.
Naval Engineers Journal 87(1):19-26.

The laws affecting ship design and operations by establishing marine environmental policy are reviewed. The laws also provide mechanisms for determining acceptable levels of contamination.

Design and engineering

Citation Source: Pollution Abstracts 6(3):#75-02460. 1975.

C-1507-75
CONOCO TECHNOLOGY CURBS PRODUCTION POLLUTION

Million, C. L. 1973.
Petroleum Engineer 45(9):42,44,46.

The pollution risks associated with major subsystems have been graded. Design practices used to reduce risks in the gathering and injection lines, and piping systems are discussed. Air and noise pollution due to the oil production and their control are discussed.

Design and engineering

Citation Source: Pollution Abstracts 6(3):#75-03050. 1975.

C-1508-75
THE MARAD POLLUTION ABATEMENT PROGRAM IN RELATION TO THE 1973 IMCO MARINE POLLUTION CONVENTION

Steinman, G. C., and W. B. Chappel. 1975.
Marine Technology 12(1):65-76.

This paper is a condensed version of the paper titled 'The MarAd Pollution Abatement Program.' It briefly summarizes the pollution abatement program and the economic and environmental impact of segregated ballast and improved load on top, two of the ship design and construction features adopted by the 1973 IMCO convention.

Citation Source: Environmental Health and Pollution Control 7(10):#2833. 1975.

C-1509-75
SYNERGISM OF THE EMULSION ACTION OF SURFACTANT MIXTURES AS A PHYSIOCHEMICAL BASIS FOR CLEANING PETROLEUM TANKERS BY THE EMULSION METHOD

Taubman, A. B., and M. P. Nesterova. 1973.
Chemie, Physikalische Chemie und Anwendungstechnik der Grenz-flaechenactiven Stoffe 3:587-592.
Berichte vom Internationalen Kongress, 6th, 1972. Munich, Germany, Carl Hanser Verlag.

A mixture of surfactants at concentrations between 0.1 and 0.2% helped form stable oil-in-water emulsions which separated spontaneously after 15-20 minutes. The detergents can be used 10-12 times. The tankers can be cleaned sufficiently to transport edible goods such as sugar without polluting the ocean.

Citation Source: Chemical Abstracts 83(6):#47768k. 1975.

5. DESIGN AND ENGINEERING

C-1510-75
CHEMICAL ADDITIVES FOR IMPROVEMENT OF OIL SPILL CONTROL

Bauer, W. H., D. N. Borton, J. J. Bulloff, and S. Ross. 1974.
USCG-D-83-75, Contract DOT-CG-33755-A. 195 p.

Sixteen oils were tested in oil flow simulation tanks to determine initial dropletting and entrainment at various current velocities. Adding non-toxic oil soluble hydrocarbon polymers, polyethylenes and ethylene-propylene copolymers raised the initial entrainment speeds to two knots, short of the objective.

Physical changes of oil in the environment

Citation Source: Government Reports Announcements 75(13): #AD-A009 019/1GA. 1975.

C-1511-75
EFFECTIVENESS OF DOUBLE BOTTOMS IN PREVENTING OIL OUTFLOW FROM TANKER BOTTOM DAMAGE INCIDENTS

Card, J. C. 1974.
Marine Technology 12(1):60-64.

This paper examines 30 pollution casualties during 1969-1973 resulting from tanker bottom damage to determine how effective double bottoms would have been in their prevention or in reducing the amount of oil outflow. It was found that a double bottom whose height is 1/15 the beam could have prevented outflow in 27 of the 30 casualties examined.

Oil transfer and transport

Citation Source: Environmental Health and Pollution Control 7(10):#2865. 1975.

C-1512-75
ICEBREAKING DRILLSHIP FOR OFFSHORE EXPLORATORY DRILLING IN THE ARCTIC

Jones, K. M., and J. C. Schaff. 1975.
Journal of Petroleum Technology 27(4):433-444.

This paper discusses design considerations for a drillship intended for extended offshore operation in the Arctic areas. Among the design considerations are environmental protection and safety features to prevent oil production accidents.

Citation Source: Citation Journal

C-1513-75
FACTORS AFFECTING BUBBLE-RISE VELOCITY OF GAS KICKS

Rader, D. W., A. T. Bourgoyne, Jr., and R. H. Ward. 1975.
Journal of Petroleum Technology 27:571-584.

Blowouts add considerable cost to the operation of an offshore rig. The factors influencing the speed of a gas kick are: inside and outside diameter of the annulus, viscous characteristics of the drilling fluid, rate of gas expansion and angle of vertical deviation.

Citation Source: The Engineering Index Monthly 13(7):#046957. 1975.

C-1514-75
A NEW APPROACH TO SUPERTANKER DESIGN

Taggart, R. 1974.
Ocean Industry 9(3):21-25.

The conflict between economic and environmental concerns on the question of tanker design is analyzed. The changes proposed for the transportation system include the dredging of existing harbors, and construction of transfer stations offshore or near deep water.

Oil transfer and transport

Citation Source: Pollution Abstracts 6(3):#75-02242. 1975.

C-1515-75
ANNULAR BLOWOUT PREVENTER FOR SUBSEA OPERATION

Vujasinovic, A. N., and D. L. O-Donnell. 1974.
ASME Petroleum Division, Petroleum Mechanical Engineering Conference, Dallas, 1974. Preprint No. 74-PET-24. 11 p.

The design, calculations and testing methods used to develop a subsea annular blowout preventer are discussed. This preventer will minimize the wearing of the sealing element when closed on reciprocating drill pipe and eliminate increased closing pressure requirements due to water depth.

Citation Source: Petroleum Abstracts 15(19):#204,590. 1975.

6. WASTE OIL AND WASTE WATER TREATMENT

C-1516-75
BIODEGRADATION OF ^{14}C-PHENOL BY ACTIVATED SLUDGE

Alexander, H. C., F. A. Blanchard, and I. T. Takahashi. 1974. American Chemical Society, Division of Fuel Chemistry Preprints 19(5):104-112.

The ultimate biodegradation of phenol by activated sludge was investigated with the use of ^{14}C-labeled phenol. The $^{14}CO_2$ released was collected and measured. After one day, 54-62% of the phenol was converted to $^{14}CO_2$, 30-43% was in the sludge solids and 3% or less remained in solution. Acclimated sludge reached a higher peak rate of degradation earlier, and with a shorter lag time.

Biological degradation

Citation Source: Citation Journal

C-1517-75
UNIT SEPARATES OIL AND SLUDGE FROM INDUSTRIAL WASTE WATER

Anon. 1975.
Water Pollution Control (Don Mills Can) 113(5):21-22.

A corrugated plate separator (CPS) removes oil from industrial waste water. When the mixture enters the CPS, its velocity slows drastically, allowing gross solids to settle out and oil to spring to the surface. The CPS system can be installed in series or with as many as six plates per basin.

Design and engineering

Citation Source: The Engineering Index Monthly 13(7):#049387. 1975.

C-1518-75
INDUSTRIAL WASTES: PETROLEUM PROCESSING WASTES

Baker, D. A. 1975.
Water Pollution Control Journal 47(6):1476-1479.

Phenol is the controlling toxicant in a significant number of oil refinery waste discharges. The effects of temperature on refinery waste toxicity to microorganisms were studied using continuous flow reaction kinetics. Microbial degradation of petroleum waste products deposited in superficial sediments of the continental shelf is discussed also.

Citation Source: Petroleum Abstracts 15(35):#210,142. 1975.

C-1519-75
TREATMENT OF INDUSTRIAL WASTE WATER FOR REUSE. CLOSING THE CYCLE

Balden, A. R., and E. L. Scholl. 1973.
Engineering Bulletin of Purdue University, Engineering Extension Series 142 (part 2):874-880.

Soluble iron anodes produce iron flocs which adsorb the oil from oily waste water. If the water is neutral or slightly alkaline, a green $Fe(OH)_2$ floc is produced which turns to red $Fe(OH)_3$ upon contact with air.

Citation Source: Chemical Abstracts 83(6):#47835e. 1975.

C-1520-75
DEFINING THE OILY WASTE CONTROL PROBLEM

Barcus, W. H. 1973.
Industrial Oily Waste Control. American Petroleum Institute Publication. p. 23-33.

Methods and equipment for defining the extent of an oily waste problem in order to establish an effective control program are described. Means to monitor the program results to assure continuously effective control are also discussed.

Monitoring

Citation Source: Environmental Health and Pollution Control 7(9):#2561. 1975.

C-1521-75
OILY WASTE WATER TREATMENT

Baum, J. S., and B. V. Prather. 1973.
Industrial Oily Waste Control. American Petroleum Institute Publication, p. 47-96.

The various types of final treatment of oily waste water are described. The routine treatment of these wastes follows a definite pattern: removal of all suspended matter (including emulsions) from water, physical and chemical examination of the clarified water to determine if reuse is possible, further treatment or discharge into a receiving stream.

Citation Source: Environmental Health and Pollution Control 7(9):#2563. 1975.

C-1522-75
FLUIDIZED BED INCINERATION OF REFINERY WASTE WATER SLUDGE

Becker, K. P., and C. J. Wall. 1975.
Industrie-Anzeiger 97(7):133.

The plans for this method of disposal of refinery sludges are described and a technique for the incineration of salt-containing sludge is given.

Citation Source: Chemical Abstracts 83(2):#15205h. 1975.

C-1523-75
EXPERIENCE IN WASTE WATER TREATMENT AT NOVOKUIBYSHEVSK PETROLEUM REFINING COMBINE

Blagodarnaya, L. F., M. G. Dyuzhakin, I. A. Makarov, and E. M. Kaliniichuk. 1974.
Chemistry and Technology of Fuels and Oils 10(1-2):124-125.

At the Kuibyshev Petroleum Refining Combine, USSR, experience has confirmed that biological treatment of oil containing waste waters that are highly contaminated with various chemical compounds is fully effective, especially when combined with preliminary treatment of the water by coagulation.

Citation Source: Environmental Health and Pollution Control 7(9):#2557. 1975.

C-1524-75
TYPICAL OILY WASTE CONTROL OPERATIONS

Bramer, H. C., and C. F. Gurnham. 1973.
Industrial Oily Waste Control. American Petroleum Institute Publication. p. 123-136.

Oily waste control programs from several industrial operations are described. These programs are practical and justifiable; a wide range of methods and equipment is available to deal with the oily waste problem.

Citation Source: Environmental Health and Pollution Control 7(5):#1357. 1975.

C-1525-75
TREATMENT OF EMULSION SYSTEMS IN INDUSTRIAL WASTE WATERS ACCORDING TO THE DIRECTIVES CONCERNING ENVIRONMENTAL POLLUTION

Burmeister, H. E. 1974.
Schmiertechnik und Tribologie 21(6):148-151.

"The aspects of a new law in West Germany are given with particular reference to the treatment of emulsions in waste water."

Foreign legislation

Citation Source: Chemical Abstracts 82(24):#159971. 1975.

C-1526-75
TREATMENT OF WASTE WATER

Citroen, B. 1974.
Quimia (Barcelona) 240:5-9.

The main types of water pollution and water purification in refineries are reviewed.

Citation Source: Chemical Abstracts 83(2):#15151n. 1975.

C-1527-75
NEW TYPE SEWAGE TREATMENT FACILITIES IN THE DEMJEN OIL FIELD [English Summary]

Dienes, N. 1975.
Banyaszati es Kohaszati Lapok, Koolaj es Foldgaz 8(3):81-82.

Wastes that have been deemulsified first pass through a series of oil separators. Then after the addition of $FeSO_4$, the wastes are aerated and settled in a conical settling basin.

Citation Source: Chemical Abstracts 83(12):#65128f. 1975.

C-1528-75
WASTE WATER TREATMENT AT THE NEW COMPONENTS PLANT OF CUMMINS ENGINE COMPANY, INC.

Escher, E. D., T. C. Synnott, and J. C. Williams. 1973.
Engineering Bulletin of Purdue University, Engineering Extension Series 142(Part 1):1063-1070.

The treatment process designed for the above plant complies with the most stringent effluent standards and has potential for zero discharge. Wastes are treated in batches; oil emulsions are broken and ions precipitated. The batch system allows adjustment of treatment with changes in the nature and volume of contaminants.

Design and engineering

Citation Source: Chemical Abstracts 83(6):#47844g. 1975.

C-1529-75
MIXED-MEDIA FILTRATION OF OILY WASTE WATERS

Evers, R. H. 1975.
Journal Petroleum Technology 27:157-163.

The design and development of mixed-media filtration as applied to oily wastes and other waters containing oil are presented. It has been shown that simple filtration through mixed media filters can remove all visible oil.

Design and engineering

Citation Source: The Engineering Index Monthly 13(4):#025400. 1975.

C-1530-75
REDUCTION IN THE VOLUME OF EFFLUENT FROM A REFINERY

Farber, A. L. 1974.
Ges. Verfahrenstechnik und Chemieingenieurwes./AIChE Joint Meeting, Proceedings, with Jahrestreffen 1974 der Verfahrens - Ing. Summary of Papers, Munich, 1974.

This paper presents a modified approach to the problem of reducing waste water flow rates.

Citation Source: The Engineering Index Monthly 13(6):#039900. 1975.

C-1531-75
INVESTIGATION OF TANKER SLOP TANK DESIGN

Fiocco, R. J., V. X. Lanotte, and G. Raffaelli. 1974.
Final Report on Task 5, EE.23TMR.74, MA-RD-900-75042, Contract C-1-35049. 64 p.

Slop tank designs to be used aboard ship as gravity separators for oily water have been investigated. Design guidelines on inlet configurations, outlets, tank structure, system design and waste water handling for oil-water separation, and reduction of oil discharges into the sea were developed.

Citation Source: Government Reports Announcements 75(9): #COM-75-10141/OGA. 1975.

C-1532-75
CONTROL OF OILY WASTE AT THE SOURCE

Freedman, A. J., and R. S. Robertson. 1973.
Industrial Oily Waste Control. American Petroleum Institute Publication. p. 35-45.

The kinds of oily waste sources and the types of oily materials in industrial waste water are described. Methods for control are suggested.

Citation Source: Environmental Health and Pollution Control 7(9):#2562. 1975.

C-1533-75
DEVELOPMENT OF A BATCHWISE IN-SITU REGENERATION TYPE SEPARATOR TO REMOVE OIL FROM OIL-WATER SUSPENSIONS

Fruman, D. H. 1974.
Final Report, TR-7080-3 MA-RD-930-75060, Contract MA-0-35467. 117 p.

The design, development and testing of a 600-gpm oil-water separator for ballast water treatment are outlined. Used in the separator is a very thick, open reticulated, oleophilic foam which separates the dispersed oil phase from the aqueous continuous phase independently of oil density and is amenable to regeneration by simple expression.

Citation Source: Government Reports Announcements 75(17): #COM-75010693/OGA. 1975.

C-1534-75
COMPOSITION OF OIL PROCESSING EFFLUENTS [English Summary]

Grunwald, A., and P. Fuchs. 1975.
Vodni Hospodarstvi, B 25(1):13-17.

A review with 12 references.

Analysis

Citation Source: Chemical Abstracts 83(8):#65075m. 1975.

C-1535-75
CRANKCASE DRAINAGE FROM IN-SERVICE OUTBOARD MOTORS

Hare, C. T., and K. J. Springer. 1974.
EPA/670/2-74-092, Contract EPA-70-108. 129 p.

Crankcase drainage from 35 outboard motors of various sizes and brand names was measured during normal operations. Four of these engines were also tested with a drainage intercepting and recirculating device. Documentation of test engines, drainage systems and test/measurement techniques was obtained.

Citation Source: Government Reports Announcements 75(12): #PB-240 691/6GA. 1975.

C-1536-75
WASTEWATER REUSE SAVES ON COOLING-TOWER MAKEUP

Harpel, W. L., and E. W. James. 1975.
Oil and Gas Journal 73(35):118-119.

Various examples of reusing wastewater streams from plants for cooling-tower makeup are provided. Considerations to be made on the suitability of a waste stream for reuse are listed.

Citation Source: Citation Journal

C-1537-75
LUBRICATING OIL BURN-OFF IN COAST GUARD POWER PLANTS

Hobbs, J. R., and R. A. Walter. 1975.
Report No. TSC-USCG-74-6, USCG-D-80-75. 97 p.

A study which investigated the feasibility of burning waste oils considered simplicity, cost, engine manufacturers' recommendations, mixing ratios and effects on engine performance. As a result, procedures for burning off waste oil at a mix ratio of 1% or less waste oil to diesel fuel oil in USCG power plants are recommended.

Citation Source: Government Reports Announcements 75(11): #AD-A007 313/0GA. 1975.

C-1538-75
EXPERIMENTAL PROTOTYPE OILY WASTEWATER TREATMENT SYSTEM

Holt (Ben) Co. 1974.
Final Report, CEL-CR-74008, Contract N62399-74-C-0004. 63 p.

The prototype wastewater treatment system is composed of three stages: a parallel corrugated plate gravity separator, a coalescer with prestrainer and filter, and two carbon columns for removing oil from mechanical emulsions in water and organic moieties for different levels of disposal options.

Citation Source: Government Reports Announcements 75(8): #AD/A-004 990/8GA. 1975.

C-1539-75
FOAM CONTROL IMPROVES WASTE WATER TREATING

Hyde, J. A. 1975.
Oil and Gas Journal 73(33):114-115.

An automatic foam control system has been developed for use in plant aeration basins which can increase effluent water treating efficiency and eliminate costly operator time.

Citation Source: Citation Journal

C-1540-75
USE OF OZONE TO PURIFY THE DISCHARGES OF PETROLEUM REFINERIES [English Translation]

Ioakimis, E. G., A. E. Kulikov, V. I. Nazarov, N. M. Podgoretskaya, and S. O. Eigenson. 1975.
Khimiya i Tekhnologiya Topliv i Masel (3):22-25.

The article describes the multistage treatment using ozone to reduce the COD and BOD in waste waters. The process has limited application for refineries due to the formation of stable intermediate oxidation products.

Citation Source: Chemical Abstracts 82(26):#174918p. 1975.

C-1541-75
NEW METHODS FOR TREATING DIRTY BALLAST

Kondo, G. K. 1973.
International Symposium on Marine Engineering, Tokyo, Japan, 1973. Technical Papers Volume, Session 3-1. p. 31-37.

The problems associated with the treatment of dirty tanker ballast are presented and use of the method of air bubbling for oil separation is discussed. Results from experiments which treated dirty ballast by air bubbling in a continuous system and in a batch system are given.

Citation Source: The Engineering Index Monthly 13(5):#033972. 1975.

C-1542-75
PRACTICAL FEASIBILITY EVALUATION OF COMBUSTING WASTE PETROLEUM OILS AND LUBRICANTS IN EXISTING HEATING PLANT BOILERS

Kroop, H., and H. Elkin. 1975.
Report No. AFWL-TR-74-171. 47 p.

Waste petroleum, oils, and lubricants were combusted in the heating plants of three Air Force bases for several months. Economic analyses indicate a significant monetary savings. The evaluation also included air pollution sampling and identification of any operational problems.

Citation Source: Government Reports Announcements 75(12): #AD-A007 889/9GA. 1975.

C-1543-75
TANKER BALLASTING - HOW LIGHT CAN YOU GO?

Lansburg, A. C., and J. M. Cruikshank. 1975.
MA-GEN-700-75061. Chesapeake Section of the Society of Naval Architects and Marine Engineers, Washington, D.C., 20 May 1975. 71 p.

Tanker ballasting practices and the possibilities for lower ballast operation are discussed. The IMCO segregated ballast level construction requirement is one of the incentives investigated.

Citation Source: Government Reports Announcements 75(16): #COM-75-10542/9GA. 1975.

C-1544-75
POTENTIALLY HAZARDOUS EMISSIONS FROM THE EXTRACTION AND PROCESSING OF COAL AND OIL

Lebowitz, H. E., S. S. Tam, G. R. Smithson, Jr., H. Nack, and J. H. Oxley. 1975.
EPA/650/2-75-038, Contract EPA-68-02-1323. 162 p.

Potentially hazardous materials associated with air, water and solid waste from a refinery, coke plant, Lurgi high-Btu process and solvent refined coal process are listed. "Fugitive loss was identified as the major emissions source in the refinery."

Citation Source: Government Reports Announcements 75(16): #PB-241 803/6GA. 1975.

C-1545-75
FIELD EXPERIENCES OF NOPOL. A METHOD OF TOTAL POLLUTION CONTROL FOR TANKERS

Lockwood, W. H., Jr., and R. O. Norris. 1973.
International Symposium on Marine Engineering, Tokyo, Japan, 1973. Technical Papers Volume, Session 3-1. p. 23-30.

The NOPOL system includes: a gravity type oil water separator, a slop oil recovery tank, specialized piping needed to get low 'flash point slop/crude oil' to the boiler front, and various safety systems.

Citation Source: The Engineering Index Monthly 13(5):#035100. 1975.

C-1546-75
CHARACTERISTICS OF BOATS AS SOURCES OF SEA POLLUTION [English Summary]

Loranskii, D. N., B. M. Raskin, and N. N. Alfimov. 1974.
Gigiena i Sanitariya 1:74-76.

Major sources of sea pollution include: discharge of oily ballast waters in ports by tankers, washing of tankers, boat accidents, and waste disposal from moored boats in harbors. Waste water treatment methods and devices to prevent pollution of seawater are presented.

Design and engineering

Citation Source: Biological Abstracts 59(12):#69456. 1975.

C-1547-75
SEPARATION AND MONITORING OF OILY BILGE WATER

Lucas, R. S. 1975.
Offshore Technology Conference, 7th, Houston, 1975. Preprint No. OTC-2200. p. 557-562.

A discussion is given of the U.S. Coast Guard's development and application of filter coalescers for oil removal from waste water, and the development of small on-line oil-in-water monitors.

Monitoring

Citation Source: Petroleum Abstracts 15(25):#206,870. 1975.

C-1548-75
INDUSTRIAL WATER PURIFICATION

Martin, L. F. 1974.
Pollution Technology Review No. 14. Park Ridge, New Jersey, Noyes Data Corporation. x + 299 p.

This book gives abstracts from 164 U.S. Patents from the period 1972-1974, and is divided into seven main sections: solid-liquid separation processes; oil-water separation processes; metals; metal finishing; pulp and paper; coal, ore and sand processing; refinery operations and other chemical processes.

Citation Source: Marine Pollution Bulletin 6(7):111-112. 1975.

C-1549-75
ELECTROFLOTATION PURIFICATION OF WASTE WATER OF BY-PRODUCT COKE MANUFACTURE [English Translation]

Mikheeva, E. P., V. M. Kagasov, and A. A. Mamakov. 1974.
Electron Obrab Mater (6):40-42.

Alloyed steel Kh 18N10T was used as electrode material for electroflotation removal of oil emulsified in waste water.

Citation Source: Chemical Abstracts 83(2):#15223n. 1975.

C-1550-75
BIOLOGICAL TREATMENT OF INDUSTRIAL WASTES WATER BY USING NITRATE AS AN OXYGEN SOURCE

Miyaji, Y., and K. Kato. 1975.
Water Research 9(1):95-101.

A pilot plant study was conducted at a petrochemical plant to examine the treatment ability and practical application of a biological treatment method for waste waters utilizing nitrate as an oxygen source. Results indicated that the COD removed had a linear relation to nitrate nitrogen removed and that there was a certain relation between COD loading and oxygen consumed per unit COD removed.

Citation Source: Citation Journal

C-1551-75
WASTE OIL - A NEGLECTED RESOURCE

Morrison, E. 1975.
Environmental Action 7(1):8-10.

A controversy existed within EPA concerning the magnitude of the waste oil problem and the dangers of burning waste oil instead of recycling it. The problem can be solved, however, by initiating local waste oil recovery programs and passing the National Oil Recycling Act.

U.S. legislation

Citation Source: Citation Journal

C-1552-75
OPERATION OF BIOCHEMICAL TREATING INSTALLATIONS OF THE NOVO-YAROSLAVL' PETROLEUM REFINERY

Pobegailo, P. I. 1974.
Chemistry and Technology of Fuels and Oils 10(5-6):376-378.

Commercial-scale experimental treating facilities were built to select the optimal procedures. Results of a series of trials and the ensuing recommendations are discussed. Biological ponds have an extremely important role; they reduce the petroleum content, the BOD and COD and also reduce or eliminate the toxicity to fish and food organisms.

Citation Source: The Engineering Index Monthly 13(7):#047163. 1975.

C-1553-75
OIL/WATER POLLUTION PROGRAM (PHASE II)

Pontello, A. P., C. J. Collick, J. J. Palmer, and A. J. Rollo. 1974.
Report No. NAPTC-PE-46. 115 p.

The research discussed in this report includes work in areas such as the surface tension of coalescer effluent water, the evaluation of detergents as bilge cleaners, and the detection of oil in water.

Citation Source: Government Reports Announcements 75(13): #AD-A009 093/6GA. 1975.

C-1554-75
EXPERIENCE WITH THE FRENCH PETROLEUM INSTITUTE PROPANE CLARIFICATION PROCESS IN RE-REFINING SPENT CRANKCASE OILS

Quang, D. V., G. Carriero, R. Schieppati, A. Comte, and J. W. Andrews. 1975.
The Journal of Environmental Sciences XVIII (3):18-20.

The clarification process for spent crankcase oils lowers the amounts of acid and clay needed, reduces sludge formation and improves product quality. The process reduces pollution by reducing overall SO_2 emissions and makes use of waste oils which might otherwise be dumped on land.

Citation Source: Citation Journal

C-1555-75
DISPOSAL OF OILY WASTES

Sargent, J. K., and R. D. Ross. 1973.
Industrial Oily Waste Control. American Petroleum Institute Publication. p. 97-121.

Acceptable disposal methods for oily materials are reviewed and recommended in the paper. The author stresses that reducing the volume of oily waste is the best way to simplify oily waste disposal.

Citation Source: Environmental Health and Pollution Control 7(9):#2564. 1975.

C-1556-75
OIL/WATER SEPARATION WITH NONCELLULOSIC ULTRAFILTRATION SYSTEMS

Schatzberg, P., L. R. Harris, C. M. Adema, D. F. Jackson, and C. M. Kelly. 1975.
Report No. NSRDC-4530. 34 p.

Recently available noncellulosic membrane systems have shown potential for overcoming the limitations of the cellulose-acetate membranes used to date in ultrafiltration of oily waste water. Experiments were designed to investigate the capability of noncellulosic membranes in different configurations to separate emulsified and suspended matter from water. The flux varied with different systems.

Citation Source: Government Reports Announcements 75(19): #AD-A008 315/4GA. 1975.

C-1557-75
CELLECO ID DISPOSAL SYSTEM FOR RECOVERY OF WASTE OIL

Skinner, E. 1974.
Australian Process Engineering 2(4):38-39.

Summary not available.

Citation Source: Australian Science Index 18(7):#2804. 1974.

C-1558-75
DISPOSAL OF USED LUBRICATING OIL IN WESTERN EUROPE

Special Task Force on "Disposal of Used Oil." 1973.
CONCAWE Report No. 9/73. 60 p.

The report contains information on the amount, origin and final disposal of used lubricating oil in western Europe. Included among the areas dealt with are: available disposal technology; collection system options; suggestions for future controls; volume of used oil; technical possibilities for final disposal; utilization; elimination; and conclusions and recommendations.

Citation Source: Reports Produced by the Secretariat or Working Group Members of Stichting CONCAWE. Report 1/75. Abstract #101. 1975.

C-1559-75
INDUSTRY'S OIL WASTE PROBLEM

Swain, J. W., Jr. 1973.
Industrial Oily Waste Control. American Petroleum Institute Publication. p. 1-11.

The dimensions of the oily waste problems are defined and practical solutions are suggested.

Citation Source: Environmental Health and Pollution Control 7(9):#2559. 1975.

C-1560-75
OILY WASTE CONTROL MANAGEMENT

Swain, J. W., Jr., and D. L. Hill. 1973.
Industrial Oily Waste Control. American Petroleum Institute Publication. p. 137-144.

The importance of management in effective oily waste control is emphasized. Problems arising from the management obligation and approaches to a solution are summarized.

Citation Source: Environmental Health and Pollution Control 7(5):#1358. 1975.

C-1561-75
CONCEPT FOR MANAGING WASTE

Teller, J. P. 1975.
Chemical Technology 5(4):222-224.

The author states that treatment of several waste streams from petroleum and petrochemical plants at a single plant offers several advantages.

Citation Source: Chemical Abstracts 83(6):#47800q. 1975.

C-1562-75
TEST METHOD FOR VOLATILE COMPONENT STRIPPING OF WASTE WATER

Thibodeaux, L. J. 1974.
Environmental Protection Technology Series, EPA 660/2-74/044.
131 p.

The desirability of using air stripping in cooling towers as a means of removing some organics from industrial waste water was assessed. Desorption experiments were performed on simulated waste water and on actual industrial samples from the paper, food, fibers, petroleum refinery and petrochemical industries.

Design and engineering

Citation Source: The Engineering Index Monthly 13(7):#049391. 1975.

C-1563-75
LUBE OILS; REREFINING SCHEMES COMPARED

Weinstein, N. J. 1974.
Hydrocarbon Processing 53:74-76.

The economics of several rerefining processes are compared to consider ways to upgrade the waste oils from auto crankcases. Rerefining is also compared with other ways of using crankcase waste oil, for instance, as a clean fuel prepared from distillation.

Citation Source: Citation Journal

C-1564-75
REMOVING OIL FROM WATERS

Wolf, F., and B. Maier. 1973.
Acta Hydrochimica et Hydrobiologica 1(1):93-100.

Chlorinated polymers (chlorinated polyisoprene, polybutadiene, and PVC) and iron exchange resins absorb oil from water.

Cleanup and recovery

Citation Source: Chemical Abstracts 83(2):#15199j. 1975.

C-1565-75
TREATMENT OF SULFUR-CONTAINING WASTE WATER FROM REFINERIES

Yao, M.-S. 1974.
Hua Hsueh Tung Pao 2:85-89.

Various amounts of S^-, phenols, and NH_3 must be removed from the condensers of petroleum refineries before entering the waste treatment plant. The S^- can be oxidized or stream extracted. The removal efficiency for NH_3 and H_2S is about 99%, and for phenols, about 45%.

Citation Source: Chemical Abstracts 83(6):#47801r. 1975.

7. PERSONNEL TRAINING AND EDUCATION

C-1566-75
INFORMING THE NEW BOSSES

Anon. 1974.
Ecolibrium 3(1):5.

The article describes Shell Oil Company's information program on oil spill prevention and contingency planning.

Contingency planning

Citation Source: Citation Journal

C-1567-75
MANUAL ON THE AVOIDANCE OF POLLUTION OF THE SEA BY OIL

Anon. 1974.
London, HMSO. 28 p.

The manual provides guidelines for use by those dealing with the following areas: prevention of spillages, leakages and accidental discharges; disposal of oil contaminated water and oil residues; records and inspection of records; and legal provisions and requirements. Guidelines for oil transferring and other oil handling activities are outlined.

Oil transfer and transport
Cleanup and recovery

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(6): #5Q6782. 1975.

C. EFFECTS OF OIL POLLUTION

1. BIOLOGICAL EFFECTS

C-1568-75
BRISBANE RIVER FISH MAY TAINT COASTAL MULLET

Anon. (undated)
Australian Fisheries 33(8):24-25.

It has been found that tainted mullet caught off southern Queensland contain hydrocarbon materials which originate from a petroleum hydrocarbon rather than an animal source. It is suggested that volatile hydrocarbons derived from sewage effluent present in the area are taken up with food or over the gills by the mullet before they run north to spawn.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(4): #5Q4343. 1975.

C-1569-75
NATURAL OIL SEEPS AT CAPE SIMPSON, ALASKA: AQUATIC EFFECTS

Barsdate, R. J. 1973.
Impact of Oil Resource Development on Northern Plant Communities, AAAS Alaska Science Conference, 23rd, Fairbanks, 1972. p. 91-95.

Results from studies of ponds near natural oil seeps of Cape Simpson indicate that phytotoxicity may limit primary productivity in waters in contact with relatively fresh oil; but at lower levels of hydrocarbon stress, productivity is high, possibly because of reduced grazing pressure.

Citation Source: The Engineering Index Monthly 13(6):#039844. 1975.

C-1570-75
BENZO(A)PYRENE EFFECTS ON MOUSE EPITHELIAL CELLS IN CULTURE

Bartholomew, J. C., A. G. Salmon, H. B. Gamper, and M. Calvin. 1975.
Cancer Research 35(3):851-856.

Mouse epithelial cells are very sensitive to the cytotoxic action of benzo(a)pyrene. The aryl hydrocarbon hydroxylase system, which metabolizes benzo(a)pyrene, is highly inducible by the carcinogen and is probably important in determining the sensitivity of the epithelial cells.

Citation Source: Abstracts on Health Effects of Environmental Pollutants 4(8):#7875. 1975.

C-1571-75
EFFECT OF AROMATIC HYDROCARBONS, ALCOHOLS, KETONES, AND ALIPHATIC ALCOHOLS ON CELL SWELLING AND POTASSIUM EFFLUX IN PSEUDOMONAS AERUGINOSA

Bernheim, F. 1974.
Cytobios 11(42):91-95.

Certain aromatic hydrocarbons and phenol increase swelling in the organism but have little effect on potassium efflux. Unsaturation increases activity. Phenol is the most active agent in this group.

Citation Source: Chemical Abstracts 83(5):#38194t. 1975.

C-1572-75
MOVEMENT AND MORTALITY RATES OF BRITISH GUILLEMOTS

Birkhead, R. R. 1974.
Bird Study 21(4):241-254.

An analysis of the ringing recoveries of British guillemots up to 1972 indicated that killing, particularly in Norwegian waters, and oiling around British coasts account for about 50% of all recoveries. The relative intensities and dispersal rates of guillemots since 1920 in different areas are calculated and analyzed.

Restoration

Citation Source: Biological Abstracts 60(3):#12764. 1975.

C-1573-75
BIRDS AND OIL

Bourne, W. R. P. 1975.
British Birds 68(5):216.

The letter is a response to previous communications written in the journal about the ability of oiled birds to clean themselves. The author points out that lightly oiled birds, although they must be capable of cleaning themselves, may damage their plumage in the process. Oiled bird vulnerability appears to vary with character of the oil and length of time taken for the oil to be reduced to inert residues, which appears to depend on the temperature.

Citation Source: Citation Journal

C-1574-75
GUILLEMOTS WITH DAMAGED PRIMARY FEATHERS

Bourne, W. R. P. 1974.
Marine Pollution Bulletin 5(6):88-90.

The most likely cause for localized damage to the plumage of auks found on the northeast coast of Britain is oil pollution. It has been reported that a number of water birds that were lightly polluted with oil in this area succeeded in cleaning themselves within a couple of weeks. The study examined two auk specimens and results indicated the presence of oil lodged on their wings after such cleaning activities. Associated intestinal problems in the birds have also been observed.

Citation Source: Environmental Health and Pollution Control 7(9):#2398. 1975.

C-1575-75
TEMPERATURE AND THE SEASONAL AND GEOGRAPHICAL OCCURRENCE OF OILED BIRDS ON WEST EUROPEAN BEACHES

Bourne, W. R. P., and C. J. Bibby. 1975.
Marine Pollution Bulletin 6(5):77-80.

In cold waters oiled birds are a more frequent aspect of oil pollution than in warm waters. At higher temperatures the liquid oil is more quickly reduced to a relatively harmless, inert, solid residue.

Physical changes of oil in the environment

Citation Source: Citation Journal

C-1576-75
RESPONSE OF ALASKAN TUNDRA MICROFLORA TO CRUDE OIL SPILL

Campbell, W. B. 1973.
Impact of Oil Resource Development on Northern Plant Communities, AAAS Alaska Science Conference, 23rd, Fairbanks, 1972. p. 53-62.

Various concentrations of Prudhoe Bay crude oil were applied on meadow tundra in Barrow, Alaska, in 1970; soil respiration rates and characteristics of the soil microflora were measured for a two-year period. Results showed that the growth of hydrocarbon decomposing flora, i.e. yeasts and Pseudomonas sp., was stimulated; whereas other microorganisms, such as diatoms and higher fungi, were inhibited.

Biological degradation

Citation Source: The Engineering Index Monthly 13(6):#039879. 1975.

C-1577-75
PETROLEUM HYDROCARBON TOXICITY STUDIES. I. METHODOLOGY

Carpenter, C. P., E. R. Kinkead, D. L. Geary, Jr., L. J. Sullivan, and J. M. King. 1975.
Toxicology and Applied Pharmacology 32(2):246-262.

This article is the first in a series on the inhalation toxicity of a series of petroleum hydrocarbons. The objectives, protocols and procedures are presented.

Citation Source: Citation Journal

C-1578-75
PETROLEUM HYDROCARBON TOXICITY STUDIES. II. ANIMAL AND HUMAN RESPONSE TO VAPORS OF VARNISH MAKERS' AND PAINTERS' NAPHTHA

Carpenter, C. P., E. R. Kinkead, D. L. Geary, Jr., L. J. Sullivan, and J. M. King. 1975.
Toxicology and Applied Pharmacology 32(2):263-281.

Humans can detect varnish makers' and painters' naphtha at concentrations of 0.004 mg/liter. A 15-minute inhalation period at 4.1 mg/liter caused upper respiratory irritation in over half the subjects. Rats and cats died when left in an atmosphere of the substantially saturated vapor.

Citation Source: Citation Journal

C-1579-75
PETROLEUM HYDROCARBON TOXICITY STUDIES. III. ANIMAL AND HUMAN RESPONSE TO VAPORS OF STODDARD SOLVENT

Carpenter, C. P., E. R. Kinkead, D. L. Geary, Jr., L. J. Sullivan, and J. M. King. 1975.
Toxicology and Applied Pharmacology 32(2):282-297.

Based on the results of inhalation studies with rats, dogs and men, the suggested hygienic standard for inhalation of Stoddard's solvent is 1.2 mg/liter. Overdosage caused central nervous system damage in dogs and cats.

Citation Source: Citation Journal

C-1580-75
ACUTE EFFECTS OF OUTBOARD MOTOR EFFLUENT ON TWO MARINE SHELLFISH. REPLY TO COMMENTS

Clark, R. C., Jr. 1975.
Environmental Science and Technology 9(4):365.

In this discussion the author agrees that problems exist in relating lab data to real conditions. However, he reiterates that small amounts of petroleum from outboard motor wastes may adversely affect shellfish.

Citation Source: Chemical Abstracts 82(25):#165537m. 1975.

C-1581-75
SPATIAL AND TEMPORAL VARIATION IN PRODUCTIVITY, SPECIES DIVERSITY, AND PIGMENT DIVERSITY OF PERIPHYTON IN A STREAM RECEIVING DOMESTIC AND OIL REFINERY EFFLUENTS

Cooper, J. M., and J. Wilhm. 1975.
Southwestern Naturalist 19(4):413-427.

Productivity decreased downstream of the pollution outfalls. The productivity/biomass ratio did not indicate spatial or temporal succession stages in the periphyton community. Species diversity increased downstream from the pollution outfalls.

Citation Source: Pollution Abstracts 6(3):#75-02576. 1975.

C-1582-75
SOME EFFECTS OF NO. 2 FUEL OIL ON THE BROWN SHRIMP PENAEUS-AZTECUS

Cox, B. A. 1973.
American Zoologist 12(4):262.

The uptake and depuration of water-soluble fractions of no. 2 fuel oil by three size groups of brown shrimp were examined. Total hydrocarbons present were determined by infrared spectrophotometry. When shrimp of two size classes were exposed to concentrations of 1.3 ppm, maximum uptake for both classes occurred within the first exposure hour and depuration began during the 20 exposure hours. Larger shrimp were found to absorb four times as much of the oil fractions as did smaller shrimp, but depuration occurred more rapidly in the larger size group.

Citation Source: Government Reports Announcements 75(7): #PB-238 519/3GA. 1975.

C-1583-75

THE EFFECT OF SEVERAL CRUDE OILS AND SOME PETROLEUM DISTILLATION FRACTIONS ON INTESTINAL ABSORPTION IN DUCKLINGS (ANAS PLATYRHYNCHOS)

Crocker, A. D., J. Cronshaw, and W. N. Holmes. 1975.
Environmental Physiology and Biochemistry 5(2):92-106.

A small dose of crude oil inhibits the adaptive response of the mucosa in ducklings fed hypertonic saline. Oils from eight locations varied in their inhibitory effects. Water-soluble extracts also had inhibitory effects on mucosal transfer rates; this effect was roughly proportional to the inhibitory power of the low boiling point fraction of each oil.

Citation Source: Citation Journal

C-1584-75

ANALYSIS OF POLLUTION FROM MARINE ENGINES AND EFFECTS ON THE ENVIRONMENT. SOUTHERN LAKES

Davis, H. L., and K. D. Wilson. 1975.
Final Report, EPA/670/2-75-063, Grant EPA-R-801799. 244 p.

The effects of two-cycle outboard engine emissions on Florida lakes using leaded fuel and drained and drainless engines were studied. Field investigations were conducted on lakes treated with drainless engines, lakes treated with engines which drained unburned fuel into the water and control lakes; results indicated no significant effects of motor emissions on benthic macroinvertebrates, phytoplankton, periphyton and fish taste.

General effects of oil pollution
Analysis

Citation Source: Government Reports Announcements 75(16): #PB-242 176/6GA. 1975.

C-1585-75

ANALYSIS OF WASTE WATERS AND INTERPRETATION OF THE RESULTS

Docherty, A. C. 1973.
Proceedings of the Society for Analytical Chemistry 10(8):201-202.

The effects of several pollutants, including phenol, on fish are reviewed. A new apparatus, which oxidizes the C over CuO to CO_2, and then with H_2 over a Ni catalyst to CH_4, is substituted for the time-consuming BOD test.

Analysis

Citation Source: Chemical Abstracts 83(6):#47708r. 1975.

C-1586-75
REDUCED GROWTH AND SURVIVAL OF CLAMS TRANSPLANTED TO AN OIL SPILL SITE

Dow, R. L. 1975.
Marine Pollution Bulletin 6(8):124-125.

The production of soft clams in an intertidal area polluted by oil fell 20%, although nearby unpolluted areas increased production by 250% due to improved environmental conditions. Clams transplanted to the contaminated area had 12.8% survival, as compared to 78.1% survival in the control transplants, and a 65% reduction in growth rate.

Citation Source: Citation Journal

C-1587-75
IMPACT OF THE OIL INDUSTRY ON SCOTLAND'S COASTS AND BIRDS

Dunnet, G. M. 1974.
Scottish Birds 8(1):3-16.

The impact on the Scottish environment of various sea installations which are needed to develop offshore oil resources is discussed. A case history of a negotiation between oil-based industries and conservationists at Loch Strathbeg, Scotland, is given.

Citation Source: Ecological Abstracts 1975/2:#75L/1188. 1975.

C-1588-75
THE EFFECT OF COLD SEAWATER EXTRACTS OF OIL FRACTIONS UPON THE BLUE MUSSEL, MYTILUS EDULIS

Dunning, A., and C. W. Major. 1974.
Pollution and Physiology of Marine Organisms. F. J. Vernberg and W. B. Vernberg (eds.). New York, Academic Press. p. 349-366.

Summary not available.

Citation Source: Current Contents, Life Sciences 18(11):21. 1975.

C-1589-75
HYDROCARBONS IN BLUE MUSSELS FROM THE KIEL BIGHT

Ehrhardt, M., and J. Heinemann. 1974.
U.S. National Bureau of Standards, Special Publication 409:221-225.

The fossil hydrocarbon content of blue mussels is above the natural background level of recent biogenic hydrocarbons. The concentrations of cycloalkanes, mono-, di-, and triaromatics tend to rise. The implications are discussed.

Monitoring

Citation Source: Chemical Abstracts 83(7):#54185w. 1975.

C-1590-75
RECENT STUDIES ON BIOLOGICAL EFFECTS OF CRUDE OILS AND OIL-DISPERSANT MIXTURES TO RED SEA MACROFAUNA

Eisler, E., G. W. Kissill, and Y. Cohen. 1974.
In: Proceedings of Seminar on Methodology for Monitoring the Marine Environment, Seattle, Washington, 1973. Environmental Monitoring Series, EPA-600/4-74/004. p. 156-179.

Studies conducted by the Hebrew University in 1972 included: reporting of acute toxicity to species of marine macrofauna of two grades of crude oils, a chemical oil dispersant, and mixtures of oil and dispersant; depth-toxicity interactions; investigating sublethal and latent effects of crudes and dispersant mixtures on physiology, metabolism and behavior; and examining short-term degradation and bioaccumulation of oil.

Biological degradation

Citation Source: Selected Water Resources Abstracts 8(12): #W75-06028. 1975.

C-1591-75
THE MEDICAL SIGNIFICANCE OF MARINE POLLUTION BY ORGANIC CHEMICALS

Elias, P. S. 1974.
A Discussion on Organic Pollutants in the Sea: Their Origin, Distribution, Degradation and Ultimate Fate, [London], 1974.

Toxicological information required for an assessment of the health hazard to man of organic pollutants in the marine environment is described. Interpretation of these biological data is explained. Examples of pollutants which pose a health hazard to man include: organomercury compounds, domestic sewage, pesticides, polychlorinated biphenyls and oils and petroleum.

Citation Source: Proceedings of the Royal Society of London, B, 189(1096):443-458. 1975.

C-1592-75
A STUDY OF THE ELIMINATION OF PHENOL FROM THE ORGANISM OF FISH [English Table of Contents]

Flerov, B. A., and Yu. V. Ershov. 1974.
Biologiya Vnutrennykh Vod (22):47-50.

Carp were injected with phenol p.o. in the first series of experiments and i.p. in the second. Water samples were drawn from the aquarium at intervals following phenol addition and were analyzed for phenol presence. Results indicate rapid elimination of unchanged toxicant, with 75% of the phenol injected p.o. and 65% injected i.p. eliminated in an hour. These results suggest the absence of a phenol-destructive enzyme system in fish.

Analysis

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(4): #5Q4345. 1975.

C-1593-75
THE EFFECTS OF THREE OILS ON MARINE PHYTOPLANKTON PHOTOSYNTHESIS

Gordon, D. C., Jr., and N. J. Prouse. 1973.
Marine Biology 22(4):329-333.

Photosynthetic rates of natural phytoplankton communities taken from the northwest Atlantic and exposed to oil were determined. The degree of inhibition depended on oil type and concentration. Present levels of oil in Bedford Basin may inhibit photosynthesis by a few percent.

Citation Source: Pollution Abstracts 6(3):#75-02319. 1975.

C-1594-75
THE ACUTE EFFECTS OF EMPIRE MIX CRUDE OIL ON ENZYMES IN OYSTERS, SHRIMP AND MULLET

Heitz, J. R., L. Lewis, J. Chambers, and J. D. Yarbrough. 1974.
Pollution and Physiology of Marine Organisms. F. J. Vernberg and W. B. Vernberg (eds.). New York, Academic Press. p. 311-328.

Summary not available.

Citation Source: Current Contents, Life Sciences 18(11):21. 1975.

C-1595-75
OIL POLLUTION OF SHELLFISH BEDS IN OOSTERSCHELDE, DECEMBER, 1973 [English Summary]

Kerkhoff, M. 1974.
Visserij 27(6):425-432.

Following an 80-ton gas oil spill in the Oosterschelde estuary in December, 1973, mussels from the estuary were analyzed for gas-oil content using gas chromatography and mass spectrometry. When mussels were transferred to clean water, 90% of the gas-oil was lost in one day, but an oily taste persisted for up to two months.

Analysis

Citation Source: Environmental Health and Pollution Control 7(6): #1472. 1975.

C-1596-75
THE EFFECTS OF CRUDE OIL ON THE PALATABILITY OF MARINE CRUSTACEANS

Knieper, L. H., and D. D. Culley, Jr. 1975.
Progressive Fish Culturist 37(1):9-14.

A panel of tasters responded differently for each marine species exposed to a single oil, indicating that species-specific and oil-specific effects exist. The exposure concentrations were sublethal, yet detectable in the shrimp after 48-hour exposures.

Citation Source: Citation Journal

C-1597-75
STRUCTURE-TOXICITY CORRELATION OF PHENOLIC COMPOUNDS TO DAPHNIA MAGNA

Kopperman, H. L., R. M. Carlson, and R. Caple. 1974.
Chemico-Biological Interactions 9(4):245-251.

"A correlation showing the dependency of the observed biological activity (LC_{50}) of a series of phenols to the free energy related terms, π, F and R (field and resonance), which are specific for each compound, has been observed for the freshwater invertebrate, D. magna."

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(4): #5Q4352. 1975.

C-1598-75
ON THE PRIMARY PRODUCTION OF EXPERIMENTAL ECOSYSTEMS ESTABLISHED IN THE RANCE ESTUARY. EFFECT OF CRUDE PETROLEUM

Lacaze, J.-C. 1974.
Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences, D, 278(20):2531-2534.

A net slowing of primary production (50%) was noted one day after crude oil was dumped into the experimental ecosystem; the slowing continued the next day (25%) and disappeared on the third day. A toxicity appeared on the fourth day and primary production was almost totally inhibited from one week to 10 days after the pollution. For the rest of the study period, production was about half of that of the control ecosystems.

Citation Source: Ecological Abstracts 1975/1:#75 L/0517. 1975.

C-1599-75
EFFECTS OF PERTURBATION, NUTRIENT ADDITION AND OIL SPILLAGE ON SOIL NITROGEN CYCLING AT THE COLLEGE HOT PIPE TEST SITE

Lindholm, G. R. 1973.
Impact of Oil Resource Development on Northern Plant Communities, AAAS Alaska Science Conference, 23rd, Fairbanks, 1972. p. 72-79.

Applications of Prudhoe Bay crude oil to disturbed soil plots caused an elevation of denitrification and an apparent decrease in nitrification rates; however, similar application of oil to undisturbed plots had no significant effect on these processes.

Citation Source: The Engineering Index Monthly 13(6):#039881. 1975.

C-1600-75
A METHOD FOR APPRAISAL OF POTENTIAL TOXICITY OF OIL DISPERSING SURFACTANTS IN SALINE WATERS

Liu, J. L. 1975.
Dissertation Abstracts International, Section B, 35(12):5874-B - 5875-B.

The sublethal toxicity potential of some typical chemical ingredients used to disperse oil spills in saline waters was measured. Toxicity effects were noted by comparing the Sigmoid curve population growth rate functions for the alga, *Platymonas subcordiformis*, in both control and chemically treated synthetic seawater.

Citation Source: Petroleum Abstracts 15(31):#208,977. 1975.

C-1601-75
TOXICITY OF SEVERAL CRUDE OILS IN RELATION TO MUSSEL LARVAE [English Summary]

Lucas, A., and S. LeRoux. 1975.
Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences, D, 280(20):2381-2384.

Five oils mixed in seawater by agitation were toxic to mussel larvae after a one-hour exposure. The toxicity depends on the nature and concentration of the oils. Tests were carried out from the age of 20 hours to 5 days and gave supporting results.

Citation Source: Citation Journal

C-1602-75
NATURAL OIL SEEPS AT CAPE SIMPSON, ALASKA: LOCALIZED INFLUENCES ON TERRESTRIAL HABITAT

McCown, B. H. 1973.
Impact of Oil Resource Development on Northern Plant Communities, AAAS Alaska Science Conference, 23rd, Fairbanks, 1972. p. 86-90.

Inactive and active oil seeps were observed and the resultant effects on the plant biota were recorded. Plant communities showed alterations in community structure, resulting from the thermal effects of the seeps on the soil. Adverse effects were limited and revegetation of both active and inactive flows was apparent.

Citation Source: The Engineering Index Monthly 13(6):#039883. 1975.

C-1603-75
PLANT GERMINATION AND SEEDLING GROWTH AS AFFECTED BY THE PRESENCE OF CRUDE PETROLEUM

McCown, D. D. 1973.
Impact of Oil Resource Development on Northern Plant Communities, AAAS Alaska Science Conference, 23rd, Fairbanks, 1972. p. 44-51.

The effects of crude oil contaminated soils on seed germination and seedling growth were investigated. All levels of contamination tested depressed germination rates, probably due to toxicity and interference of the normal seed-water relationship. Seedling growth was also adversely affected by crude contamination; species grown on contaminated soils showed a reduction in N, Ca, and Mn present in tissues as compared with controls.

Citation Source: The Engineering Index Monthly 13(6):#039877. 1975.

C-1604-75
RESPONSE OF ALASKAN TERRESTRIAL PLANT COMMUNITIES TO THE PRESENCE OF PETROLEUM

McCown, B. H. 1973.
Impact of Oil Resource Development on Northern Plant Communities, AAAS Alaska Science Conference, 23rd, Fairbanks, 1972. p. 34-43.

A research program has been developed to delineate the potential hazards of crude oil spillage on terrestrial systems in Alaska. The main objectives have been to define the most sensitive ecosystem, quantify the injury response, and determine the time interval in which injury and natural restoration can be expected.

Citation Source: The Engineering Index Monthly 13(6):#039876. 1975.

C-1605-75
DEGRADATION OF ORGANIC POLLUTANTS IN SOIL. PART 2. PETROLEUM AND HUMAN AND INDUSTRIAL WASTES

McGill, W. B. 1974.
University of Alberta Agricultural Bulletin 23:11-14.

Petroleum contamination changes many soil properties. Plant growth is usually hindered due to soil microflora competing for nutrients to decompose the oil. Soils can be reclaimed economically and fairly quickly using biological means such as nutrient additions, pH manipulations and aeration. After decomposition, soil water holding capacity actually improves.

Restoration

Citation Source: Citation Journal

C-1606-75
THE LAST SURVIVORS

Milne, L., and M. Milne. 1975.
International Wildlife 5(3):12-15.

Jackass penguins live in the cold Antarctic currents around Dassen Island. In recent years, tens of thousands have died from oil damage. Giant supertankers rounding the southern tip of Africa and attendant spills now threaten the existence of this species.

Citation Source: Citation Journal

C-1607-75
EFFECT OF OIL ON SOME COASTAL CRUSTACEANS OF THE BLACK SEA
[English Table of Contents]

Milovidova, N. Yu. 1974.
Gidrobiologicheskii Zhurnal 10(4):96-100.

From a study of the survival of Idotea baltica basteri and Gammarus (Marinogammarus olivii) in oil-polluted water, it was found that oil pollution of the order of 0.1 - 0.01 ml/l has an adverse effect. G. olivii was more quickly affected by the pollution than I. baltica basteri.

Citation Source: Biological Abstracts 60(3):#17212. 1975.

C-1608-75
HOW EFFECTIVE IS OIL POLLUTION LEGISLATION IN ARCTIC WATERS? AN EXAMPLE FROM REPULSE BAY/NAUJAA, N. W. T.

Muller-Wille, L. 1974.
Musk-Ox 14:56-57.

The killing of ringed seals in Inuit which were coated with a thick layer of oil is reported. Even though the region is scarcely a major shipping route, about 10% of the seals are being affected in this way.

Citation Source: Ecological Abstracts 1975/2:#75L/1187. 1975.

C-1609-75
THE EFFECT OF ARABIAN LIGHT CRUDE OIL AND COREXIT ON THE RESPIRATION OF THE BIVALVED MOLLUSCS BRACHIDONTES VARIABLIS AND DONAX TRUNCULUS

Nuwayhid, M. A. 1973.
Master of Science Thesis, American University, Beirut. 159 p.

Crude oil alone or a mixture of crude oil and the oil dispersant, Corexit, usually caused a decrease in respiration of the two species; Corexit had no significant effects on respiration. Crude oil, Corexit and a mixture of both caused the malformation and weakening of byssal thread structure in B. variablis. Higher mortality in the experimental animals was noticed.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(4): #5Q4356. 1975.

C-1610-75
ELSEVIER OCEANOGRAPHY SERIES, VOL. 9. THE STUDY OF BENTHIC COMMUNITIES. A MODEL AND A REVIEW

Parker, R. H. 1975.
American Elsevier Publishing Company. x + 279 p.

This study, which includes the design and results of an ecosystem survey of the benthic community of Hadley Harbor Complex, Massachusetts, is intended as a model for future community studies. The applications of this model to environmental problems, such as biological assessment of oil spill damage and disposal of pollutants in estuaries, are discussed.

Citation Source: Biological Abstracts 60(1):#1362. 1975.

C-1611-75
TOXIC EFFECTS ON THE YOUNG RAT OF A SINGLE INTUBATION OF DIFFERENT FRACTIONS PREPARED FROM HEATED OILS

Potteau, B., and A. Grandgirard. 1974.
Annales de Biologie Animale Biochimie Biophysique 14(4B):855-859.

The fractions of oil used to test the toxic effect of oil on rats were those which do not form complexes with urea. A single dose (1 ml per 100 gm body weight) either causes death or hepatic steatose in the survivors.

Citation Source: Citation Journal

C-1612-75
EFFECTS OF CRUDE OIL ON CORALS

Reimer, A. A. 1975.
Marine Pollution Bulletin 6(3):39-43.

Four species of Panamanian corals were exposed to marine diesel and bunker oil. The oils may cause delayed death, and definitely alter feeding and metabolic behavior at sublethal concentrations.

Citation Source: Citation Journal

C-1613-75
TOXICITY OF THREE OILS TO BIVALVE GAMETES AND LARVAE

Renzoni, A. 1975.
Marine Pollution Bulletin 6(8):125-128.

The eggs and sperm of two marine bivalves were exposed to water soluble extracts of crude oils from Kuwait, Nigeria and Prudhoe

Bay. Fertilization is depressed after exposure, and developmental abnormalities appear. The spermatozoa are the most sensitive. Nigerian crude is the most toxic of the three oils tested.

Citation Source: Citation Journal

C-1614-75
CONTINUOUS FLOW KINETIC MODEL TO PREDICT THE EFFECTS OF TEMPERATURE ON THE TOXICITY OF OIL REFINERY WASTE TO ALGAE

Reynolds, J. H., E. J. Middlebrooks, and D. B. Borcella. 1973.
Engineering Bulletin of Purdue University, Engineering Extension Series 142(Part 1):259-280.

Chemostat and enzyme inhibition kinetics were utilized to develop equations to describe the effects of temperature on toxicity to microorganisms. Phenol has a competitive inhibition effect on algal growth; the toxicity increases with an increase in temperature.

Citation Source: Chemical Abstracts 83(7):#54139j. 1975.

C-1615-75
LEECHES (ANNELIDA: HIRUDINEA) OIL POLLUTION

Sawyer, R. T. 1974.
Pollution Ecology of Freshwater Invertebrates. C. W. Hart, Jr., and S. L. H. Fuller (eds.). New York, Academic Press. p. 128-129.

The effect of bunker oil pollution on the leech population in the Muddy River, Massachusetts, is described from a study of oil pollution affecting the planktonic and bottom fauna of the Muddy River from autumn, 1961 to summer, 1963, by McCauly (1966). No leeches were present until summer, 1962, after which the population stabilized. The absence of leeches, in spite of the presence of potential food, probably reflected the toxic effects of substances dissolved in the oil.

Citation Source: Citation Journal

C-1616-75
ACUTE EFFECTS OF OUTBOARD MOTOR EFFLUENT ON TWO MARINE SHELLFISH. COMMENTS

Smith, D. W. 1975.
Environmental Science and Technology 9(4):365.

The author disagrees with the conclusions of Finley and Gibson concerning the effects of outboard motor effluents on oysters and mussels. Excessive concentrations are necessary to produce these effects.

Citation Source: Chemical Abstracts 83(7):#54126c. 1975.

C-1617-75
EFFECT OF NAPHTHALENE AND AQUEOUS CRUDE OIL EXTRACTS ON THE GREEN FLAGELLATE CHLAMYDOMONAS ANGULOSA. I. GROWTH

Soto, C., J. A. Hellebust, T. C. Hutchinson, and T. Sawa. 1975. Canadian Journal of Botany 53(2):109-117.

Sixty-one percent of *C. angulosa* cells were killed when saturated naphthalene was initially present in medium in an open system (allowing evaporation and volatilization of hydrocarbons); the generation time was the same as controls. A much higher percentage of the cells was killed in a closed system (hydrocarbon loss was minimized), but a shorter generation time was observed when growth resumed. The effects of extracts of different crude oils on the organisms were almost always inhibitory but less severe than those obtained with naphthalene.

Citation Source: Chemical Abstracts 83(3):#23115u. 1975.

C-1618-75
EFFECT OF NAPHTHALENE AND AQUEOUS CRUDE OIL EXTRACTS ON THE GREEN FLAGELLATE CHLAMYDOMONAS ANGULOSA. II. PHOTOSYNTHESIS AND THE UPTAKE AND RELEASE OF NAPHTHALENE

Soto, C., J. A. Hellebust, and T. C. Hutchinson. 1975. Canadian Journal of Botany 53(2):118-126.

The addition of naphthalene to *C. angulosa* cultures caused an immediate loss of photosynthetic capacity. Photosynthesis was decreased in cells incubated in closed systems with media containing aqueous crude oil extracts; however, in open systems the crude oil extracts had no significant effect on the photosynthetic capacity. Experiments indicate that cells accumulate naphthalene from the medium in closed systems for up to seven days. When the cells are transferred to uncontaminated media, an immediate loss of the aromatic hydrocarbons from the cells is observed.

Citation Source: Chemical Abstracts 83(3):#23116v. 1975.

C-1619-75
HYDROCARBONS IN SHELLFISH CHRONICALLY EXPOSED TO LOW LEVELS OF FUEL OIL

Stegeman, J. J. 1974.
In: Pollution and Physiology of Marine Organisms. F. J. Vernberg and W. B. Vernberg (eds.). New York, Academic Press. p. 329-348.

Summary not available.

Citation Source: Current Contents, Life Sciences 18(11):21. 1975.

C-1620-75
SOME EFFECTS OF POLLUTANTS ON THE BEHAVIOR OF THE BIVALVE TELLINA TENUIS

Stirling, E. A. 1975.
Marine Pollution Bulletin 6(8):122-124.

The effects of a persistent heavy metal pollutant (copper) and a nonpersistent biodegradable pollutant (phenol) on the burrowing response of a clam have been investigated. There was a measurable response at all concentrations used. The time required for 50% reburial after a standard exposure time of 96 hours would be comparable to results from 96-hour LC_{50} experiments.

Citation Source: Citation Journal

C-1621-75
EFFECTS OF BENZENE (A WATER-SOLUBLE COMPONENT OF CRUDE OIL) ON EGGS AND LARVAE OF PACIFIC HERRING AND NORTHERN ANCHOVY

Struhsaker, J. W., M. B. Eldridge, and T. Echeverria. 1974.
In: Pollution and Physiology of Marine Organisms. F. J. Vernberg and W. B. Vernberg (eds.). New York, Academic Press. p. 253-284.

Summary not available.

Citation Source: Current Contents, Life Sciences 18(11):21. 1975.

C-1622-75
MARINE POLLUTION BY CARCINOGENIC HYDROCARBONS

Sullivan, J. B. 1974.
U.S. National Bureau of Standards, Special Publication 409:261-263.

"A review with 18 references."

Social effects of oil pollution

Citation Source: Chemical Abstracts 83(7):#54010k. 1975.

C-1623-75
POWDERING OVER OIL

Sullivan, J. 1975.
Environment 17(5):38,40.

The author discusses the report submitted by a participating panel from the 1973 Workshop on Oil Pollution of the Sea (sponsored by the National Academy of Sciences) concerning the potential contamination of seafood by cancer-causing agents found in oil. It was concluded that the values of benz-a-pyrene, a cancer-inducing agent present in oil, in seafood seemed to call for more systematic efforts to test foods for such agents on a continuing basis. The attempts by the Academy to allay public concern over that contamination are discussed.

Citation Source: Citation Journal

C-1624-75
THE EFFECT OF DISSOLVED OIL PRODUCTS ON MARINE AND FRESH-WATER MONOCELLED ALGAE [English Summary]

Tkachenko, V. N., and L. E. Ajvazova. 1974.
In: Ecological Aspects of Chemical and Radioactive Pollution of Aquatic Medium. A. S. Bogdanov, et al. (eds.). Moscow, Pishchevaya Promyshlennost'. 139 p.

The photosynthetic activity of Black Sea diatoms, which were found to be sensitive organisms, was inhibited even at the allowable concentrations of dissolved oil products. The inhibitory effect was recorded in freshwater and Caspian Sea algae when the dissolved oil concentration was 10 times as high as the allowable limit level.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(5): #5Q5453. 1975.

C-1625-75
HYPERSENSITIVITY TO MINERAL OIL IN THE DOMESTIC FOWL

White, R. G., and W. J. Herbert. 1975.
Immunology 28(5):925-938.

Domestic fowl were found to be hypersensitive to a second injection of mineral oil. This hypersensitivity may have an immunological basis. The birds may be able to respond to antigenic determinants formed by long chain aliphatic hydrocarbons.

Citation Source: Citation Journal

C-1626-75
THE ABILITY OF HERRING AND PLAICE LARVAE TO AVOID CONCENTRATIONS OF OIL DISPERSANTS

Wilson, K. W. 1974.
In: The Early Life History of Fish. Proceedings of an International Symposium held at the Dunstaffnage Marine Research Laboratory of the Scottish Marine Biological Association, Oban, Scotland, May 17-23, 1974. J. H. S. Blaxter (ed.). New York, Springer-Verlag. p. 589-602.

The response of larvae of herring and plaice to horizontal gradients of oil dispersants in seawater was studied using a five-channel fluvarium. Study results indicated that larvae would not avoid areas of dispersant, but because of the effects of the dispersants would sink or swim away from lethal concentrations.

Citation Source: Citation Journal

C-1627-75
THE LABORATORY ESTIMATE OF THE BIOLOGICAL EFFECTS OF ORGANIC POLLUTANTS

Wilson, K. W. 1974.
A Discussion on Organic Pollutants in the Sea: Their Origin, Distribution, Degradation and Ultimate Fate,[London], 1974.

Acute toxicity tests are useful in providing an index of relative toxicity between compounds, but are of limited value in making ecological predictions. Factors influencing the assessment of acute toxicity and the basic requirements of sub-lethal techniques are discussed. Attention is given to the toxicity of organic pollutant compounds rather than the hazards they pose.

Citation Source: Proceedings of the Royal Society of London, B, 189(1096):459-477. 1975.

C-1628-75
OIL AFFECTED BIRDS

Yeatman, L. 1974.
Courrier de la Nature, Homme et l'Oiseau 33:240-241.

The numbers of dead birds found along the coasts of Britain, Denmark, Benelux and France in 1973 and in France in 1974, are given. The numbers per km and the percentages showing signs of oil damage are also listed. High mortality was recorded in 1973 in razorbills, guillemots and gulls, and in ducks in Denmark.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(4): #5Q4353. 1975.

2. PHYSICAL EFFECTS

C-1629-75
STUDY OF THE EFFECT OF OIL POLLUTION, SALINITY AND OTHER FACTORS ON THE OPTICAL PROPERTIES OF WATER IN THE INFRARED PART OF THE SPECTRUM

Bogorodskiy, V. V., M. A. Kropotkin, and T. Yu. Shevekva. 1975.
Meteorology and Hydrology 12:1-9 (1974).

"The effects of oil pollution, salinity, foam and other factors on the infrared spectral reflection by water and the reflection of the emission of a CO_2 laser from water are studied."

Citation Source: Scientific and Technical Aerospace Reports 13(11):#N75-19754. 1975.

C-1630-75
EVAPORATION OF MERCURY IN AN OIL CONTAMINATED CLOSED SYSTEM UNDER ISOTHERMAL CONDITIONS

Singhal, N. S. 1974.
Indian Journal of Biophysics 48(11):983.

The evaporation rate of mercury in the presence and absence of oil was determined under isothermal conditions. The evaporation rate was reduced under oil contaminated conditions due to a layer of oil on the surface of the evaporating mercury.

Citation Source: Citation Journal

C-1631-75
THE COASTAL SEDIMENT TRANSPORT SYSTEM

Tanner, W. F. 1974.
In: Marine Environmental Implications of Offshore Drilling in the Eastern Gulf of Mexico; Chemical Oceanography. R. E. Smith (ed.). St. Petersburg, Florida, State University System Florida Institute of Oceanography. p. 309-313.

The intricacy and vulnerability of the coastal sediment transport zone are discussed. The effects of an oil spill on sediment transport in the coastal zone are considered.

Citation Source: Citation Journal

3. CHEMICAL EFFECTS

C-1632-75
ECOLOGICAL STUDIES ON ALGAE ISOLATED FROM THE EFFLUENTS OF AN OIL REFINERY, A FERTILIZER FACTORY AND A BREWERY

Kumar, H. D., G. P. Bisaria, L. M. Bhandari, B. C. Rana, and V. Sharma. 1974.
Indian Journal of Environmental Health 16(3):247-255.

The algae and physicochemical characteristics of the effluents can be used to evaluate water quality. Water with a high concentration of organics and low in O_2 favors blue-greens, flagellates and euglenoids, whereas nitrogen rich waters encourage green algae.

Chemical effects of oil pollution
Biological effects of oil pollution

Citation Source: Pollution Abstracts 6(3):#75-02245. 1975.

4. ECONOMIC EFFECTS

C-1633-75
(No title given)

Anon. 1975.
Environment 17(6):23.

The Council on Economic Priorities reported in July, 1975, that oil companies will have to spend between three and four billion dollars for pollution control equipment over the next decade to comply with present federal air and water pollution controls. Capital spending will result in an increase of only 0.3% over current refinery product prices.

Social effects of oil prospecting and production

Citation Source: Citation Journal

C-1634-75
LOW-COST CLEANUP

Anon. 1975.
Chemical Week 116(25):13.

If refineries are brought into compliance with federal pollution laws, oil industry costs will increase as much as $7.5 billion through 1983, according to the Council on Economic Priorities. Such a cost increase, if totally passed on to the customer, would result in an addition of only 0.3¢/gallon and a total price increase of less than 1% on petroleum products during 1974-1983.

U.S. legislation

Citation Source: Citation Journal

C-1635-75
U.S. OIL SPENT $5-1/2 BILLION ON ENVIRONMENT SINCE '66

Anon. 1975.
Bulletin California Water Pollution Control Association 11(3):47.

The American Petroleum Institute reported in November, 1974, that environmental expenditures by the U.S. petroleum industry during 1966-1973 amounted to $5.5 billion. Of the 1973 total, $402 million were expended on water conservation, $100 million on land and other conservation programs, and $737 million on air conservation.

Citation Source: Citation Journal

C-1636-75
ADMINISTRATION: ECONOMICS

James, L. D. 1975.
Water Pollution Control Journal 47(6):1789-1796.

The annual review of pollution abatement costs by the Council on Environmental Quality predicted a $195 billion expenditure over the next decade with over 60% for operation and maintenance. The economic implications of oil tanker accidents cause researchers to argue for strict tanker liability.

Citation Source: Petroleum Abstracts 15(35):#210,150. 1975.

C-1637-75
IDENTIFICATION OF COSTS TO STATES TO PERFORM CERTAIN MARINE ENVIRONMENTAL PROTECTION FUNCTIONS

Smith, R. E. 1974.
Masters Thesis, Naval Postgraduate School. 174 p.

"The study concerns the U.S. Coast Guard's role in marine environmental protection and the costs to states of assuming two of the Coast Guard's functions, oil spill investigation and cleanup."

Citation Source: Government Reports Announcements 75(7): #AD/A-004 242/46A. 1975.

5. GENERAL EFFECTS

C-1638-75
ANALYSIS OF POLLUTION FROM MARINE ENGINES AND EFFECTS ON THE ENVIRONMENT. SUMMARY REPORT

Anon. 1975.
Final Report, EPA/670/2-75-064, Grant EPA-R-801799. 70 p.

The project's objective was to determine the environmental impacts of outboard engine usage on small lake systems. Based on results from field and laboratory investigations, it is concluded that because of high stress levels employed in the study, outboard motor emissions do not significantly affect aquatic ecosystems.

Analysis

Citation Source: Government Reports Announcements 75(16): #PB-242 177/4GA. 1975.

C-1639-75
NAS HAS RELEASED REPORT ON PETROLEUM IN MARINE ENVIRONMENT

Anon. 1975.
Sea Technology 16(22):22-23.

The major findings reported in "Petroleum in the Marine Environment," issued by the Ocean Affairs Board of the National Research Council, National Academy of Sciences, are given. The report examined the sources, fates and effects of petroleum hydrocarbons in the oceans and concluded that much more research in this area is needed.

General fate of oil in the environment
Source identification

Citation Source: Citation Journal

C-1640-75
REPORT TO THE CONGRESS ON OCEAN POLLUTION, OVERFISHING, AND OFFSHORE DEVELOPMENT; JULY 1973 THROUGH JUNE 1974

Anon. 1975.
NOAA-75040305. 84 p.

The U.S. marine research efforts which are directed at the long range effects of pollution, overfishing, etc. are described.

Marine pollution research on petroleum hydrocarbons, offshore development and regional studies on marine pollution are reviewed.

General effects of oil prospecting and production

Citation Source: Government Reports Announcements 75(13): #COM-75-10509/8GA. 1975.

C-1641-75
EFFECTS OF OUTBOARD ENGINE EXHAUST ON THE AQUATIC ENVIRONMENT

Atkins, P. 1973.
Icomia (Zurich). 26 p.

Results are given of a project financed by the Marine Exhaust Research Council and the Environmental Protection Agency to study the pollution effects of two-cycle outboard engines on water resources. The project was divided into a laboratory phase, which evaluated the two-cycle engine exhaust emissions; and a field phase, which examined the effects of drained and drainless engines operating on leaded fuel, and drainless engines operating on both leaded and non-leaded fuel.

Citation Source: Environmental Health and Pollution Control 7(5):#1371. 1975.

C-1642-75
ECOLOGIC CHANGES IN AN ARCTIC TUNDRA POND FOLLOWING EXPOSURE TO CRUDE OIL

Barsdate, R. J. 1973.
Impact of Oil Resource Development on Northern Plant Communities, AAAS Alaska Science Conference, 23rd, Fairbanks, 1972. p. 52.

The physical, chemical and biological changes after the application of crude oil were studied in a small tundra pond at Barrow, Alaska, in 1970. Physical effects were minor. The pond water temperature increased 4°C following the spill but normal temperatures were reestablished within three days. Massive zooplankton mortality occurred during the 1970 season and during the second year (1971). The production of phytoplankton, benthic algae and vascular plants was low, as were numbers of benthic animals and biomass of chironomid larvae.

Physical effects of oil pollution
Biological effects of oil pollution
Chemical effects of oil pollution

Citation Source: The Engineering Index Monthly 13(6):#039878. 1975.

C-1643-75
SUMMING UP AND CONSIDERATION OF FUTURE RESEARCH NEEDS

Cole, H. A. 1974.
A Discussion on Organic Pollutants in the Sea: Their Origin, Distribution, Degradation and Ultimate Fate, [London], 1974.

A summary of the studies included in the proceedings is given. The author discusses the role to be played by the various groups of scientists concerned with the effects and fate of organic pollutants in the sea and the need for closer coordination of their efforts.

General fate of oil in the environment

Citation Source: Proceedings of the Royal Society of London, B, 189(1096):479-483. 1975.

C-1644-75
STUDY OF POLLUTION AT SEA

Fontanel, A. 1973.
Symposium on Significant Results, Greenbelt, Maryland, 1973. Final Report, E75-10200; NASA-CR-142386.

No summary provided.

Citation Source: Scientific and Technical Aerospace Reports 13(13):#N75-21725. 1975.

C-1645-75
GESAMP. REPORT OF THE SIXTH SESSION HELD AT TWO HEADQUARTERS, GENEVA, 22-28 MARCH 1974

GESAMP. 1974.
GESAMP 6/10. Geneva, WHO. 43 p.

Topics discussed at this meeting include: harmful substances in the marine environment; the impact of oil on the marine environment; physical, chemical and biological parameters to be monitored in an evolving pollution monitoring system; interchange of pollutants between atmosphere and oceans; and information needed for site selection for the disposal of wastes into the sea.

Monitoring

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(5): #5Q424. 1975.

C-1646-75
THE BALTIC SEA AS AN EXAMPLE OF POLLUTION OF INTERNATIONAL WATERS

Kremling, K. 1973.
Environmental Problems and Their International Implications.
H. Odabas and S. E. Ulug (eds.). Colorado Associated University Press. p. 135-152.

Oil pollution is one form of pollution discussed for the Baltic Sea. The general effects, distribution, and control programs for all pollutants are reviewed. Oil pollution is increasing in the coastal areas.

Citation Source: Pollution Abstracts 6(3):#75-02228. 1975.

C-1647-75
EFFECT OF MINERAL OILS IN THE PHYSICO-CHEMICAL PROPERTIES OF WATER AND THE DEVELOPMENT OF AQUATIC ORGANISMS [English Summary]

Luczak, J., J. Stanislawska Swiatkowska, D. Zycinski, and B. Ranke Rybicka. 1974.
Roczniki Panstwowego Zakladu Higieny (Warsaw) 25(5):517-528.

In laboratory conditions the surface of water was covered with a layer of mineral oil from 0.1 mm to 2.3 mm thick. Significant inhibition of the rate of oxygen penetration into the water occurred when the oil layer thickness was 2.0 mm. Aquatic organisms from the group of Diatomea, Chlorophycae, Protozoa, Rotatoria, Copepoda and Ostracoda died when the layer was 1.0 mm thick. Studies on the mirror effect of the oil layer using Daphnia magna are given.

Chemical effects of oil pollution
Biological effects of oil pollution

Citation Source: Environmental Health and Pollution Control 8(1):#27. 1975.

C-1648-75
ENVIRONMENTAL ASPECTS OF OIL SPILLS ON LAND IN THE ARCTIC REGIONS

Mohtadi, M. F., and J. M. Raisbeck. 1974.
Ges. Verfahrenstechnik und Chemieingenieurswes./AIChE Joint Meeting, Proceedings, with Jahrestreffen 1974 der Verfahrens-Ing. Summ. of Pap., Munich, Germany, September 17-20, 1974. Vol. 1, Section B1, Paper 2. 10 p.

Important aspects of the impact of oil spills on Arctic regions have been studied. Theoretical models have been developed for the movement of oil on permeable and impermeable surfaces.

General fate of oil in the environment

Citation Source: The Engineering Index Monthly 13(6):#042250. 1975.

D. EFFECTS OF OIL PROSPECTING AND PRODUCTION

1. BIOLOGICAL EFFECTS

C-1649-75
POTENTIAL EFFECT OF OIL DRILLING/PRODUCTION ACTIVITIES ON THE PHYTOPLANKTON/ZOOPLANKTON IN THE EASTERN GULF OF MEXICO

El-Sayed, S. A., T. L. Hopkins, and K. A. Steidinger. 1974.
In: Marine Environmental Implications of Offshore Drilling in the Eastern Gulf of Mexico; Biological Oceanography. R. E. Smith (ed.). St. Petersburg, Florida, State University System of Florida Institute of Oceanography.

A summary is given of the research carried out in the past few years to determine the potential effect of oil drilling and production activities on the environmental quality in the Eastern Gulf of Mexico, and the changes in the marine ecosystem brought about by these activities. A program for studying ecosystem dynamics of the eastern and northeastern Gulf of Mexico, with special emphasis on the phytoplankton and zooplankton populations in this area,is outlined.

Citation Source: Citation Journal

C-1650-75
BENTHIC ECOLOGY OF TIMBALIER BAY, LOUISIANA, AND ADJACENT OFFSHORE AREAS IN RELATION TO OIL PRODUCTION

Farrell, D. H. 1975.
Dissertation Abstracts International, Section B, 35(12):5755-B - 5756-B.

The thesis provides an examination of species diversity, faunal similarities and biomass relations of benthic communities in Timbalier Bay and offshore Louisiana to determine possible long-term deleterious effects of oil platforms on benthic life.

Citation Source: Petroleum Abstracts 15(31):#208,978. 1975.

C-1651-75
EFFECT OF COMBINED ORGANO-MINERAL MICROFERTILIZER (MF) FOLLOWING MINERAL FERTILIZERS ON GROWTH AND YIELD OF ALFALFA HAY [In Russian]

Guseinov, D. M., and F. G. Isaeva. 1974.
Izvestya Akademii Nauk Azerbaidzhanskoi SSR Seriya Biologicheskikh Nauk 1:85-92.

The organo-microfertilizers are mixtures of wastes from sulfuric acid plants and oil refineries; they contain Cu, Zn, Mn, Fe, Al, other trace metals, and petroleum organics. If MF is used after application of $P_{90}K_{45}$ and $P_{120}K_{60}$, the maximum increase in growth and yield of alfalfa hay is achieved.

Waste oil and waste water treatment

Citation Source: Abstracts on Health Effects of Environmental Pollutants 4(8):#7811. 1975.

C-1652-75
ACUTE LETHAL TOXICITY TO TROUT OF DRILLING FLUIDS AND THEIR CONSTITUTENT CHEMICALS AS USED IN THE NORTHWEST TERRITORIES

Logan, W. J., J. B. Sprague, and B. D. Hicks. 1973.
Technical Report Series Environment Canada, CEN-T-73-1. p. 45-108.

The report describes the results from a study conducted in 1972 to determine the nature and acute toxicity of petrochemical drilling fluids, chemical components, and wastes. Drilling fluids were found to be acutely toxic to lake chub and rainbow trout; sump fluids were determined to be comparatively less toxic. Out of 27 chemicals in drilling fluids, 5 were toxic and 6 were moderately toxic. Recommendations on waste containment treatment and future studies are presented.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(3): #5Q3111. 1975.

C-1653-75
SPATIAL AND TEMPORAL VARIATIONS OF ZOOPLANKTON IN RELATION TO OFFSHORE OIL DRILLING AND ESTUARINE-MARINE FAUNAL EXCHANGE

Marum, J. P. 1975.
Dissertation Abstracts International, Section B, 35(12):6005-B.

Distribution patterns of copepod species, community indices and biomass of zooplankton were analyzed in Louisiana coastal waters to determine the impact of long-term oil drilling and production on the coastal ecosystem and on characteristics of marine faunal exchange. A quantitative method was developed for determining inshore-offshore patterns of species distribution.

Citation Source: Petroleum Abstracts 15(31):#208,979. 1975.

C-1654-75
OUTER CONTINENTAL SHELF (OCS) OIL AND GAS. AN ENVIRONMENTAL ASSESSMENT. VOLUME 5. POTENTIAL BIOLOGICAL EFFECTS OF HYPOTHETICAL OIL DISCHARGES IN THE ATLANTIC COAST AND GULF OF ALASKA

Massachusetts Institute of Technology. 1974.
PB-239,267/8GA. 606 p.

An analysis is given of the primary biological effects of potential oil discharges resulting from hypothetical oil production activity on the Atlantic and Alaskan OCS. Large-volume infrequent accidental oil spills as well as small-volume continuous discharges of oil are considered in this analysis.

Citation Source: Petroleum Abstracts 15(33):#209,487. 1975.

C-1655-75
INFLUENCE OF SOIL TEMPERATURE ON PLANT GROWTH AND SURVIVAL IN ALASKA

McCown, B. H. 1973.
Impact of Oil Resource Development on Northern Plant Communities, AAAS Alaska Science Conference, 23rd, Fairbanks, 1972. p. 12-33.

The Trans-Alaska Pipeline may be expected to produce definite changes in soil temperature. The effects of soil temperature on plant growth and survival in Alaska have been studied. Analyses indicated that low soil temperatures were a limiting factor for growth. Biomass production in the warmed soils over the pipe was found to be 500% greater the first season and 300% greater the second season than in the adjacent unheated soils.

Citation Source: The Engineering Index Monthly 13(6):#039875. 1975.

C-1656-75
ADAPTATIONS OF SPECIES AND VARIETIES OF GRASSES FOR POTENTIAL USE IN ALASKA

Mitchell, W. W. 1973.
Impact of Oil Resource Development on Northern Plant Communities, AAAS Alaska Science Conference, 23rd, Fairbanks, 1972. p. 2-6.

An overview is presented of the feasibility of revegetating diverse areas of Alaska. It was concluded that native taxa offer good potential for revegetation material and would be more durable and require less maintenance than introduced taxa.

Citation Source: The Engineering Index Monthly 13(6):#039873. 1975.

C-1657-75
OFFSHORE DRILLING: FISHERMEN AND OILMEN CLASH IN ALASKA

Panitch, M. 1975.
Science 189(4198):204-206.

The controversy concerns the Alaskan fishermen's fight to void a 1973 sale of oil and gas leases on 98,000 acres in the Cook Inlet Basin. Five thousand acres of the area in question comprise Kachemak Bay, which is acknowledged to be one of the most biologically productive bodies in the nation. Fishermen contend that the state ignored scientific evidence about the bay's biological and economical importance.

Economic effects of oil prospecting and production

Citation Source: Citation Journal

C-1658-75
COMMENTS ON THE NATURE OF THE FLORIDA MIDDLE GROUND REEF ICHTHYOFAUNA

Smith, G. B., and L. H. Ogrev. 1974.
In: Marine Environmental Implications of Offshore Drilling in the Eastern Gulf of Mexico; Chemical Oceanography. R. E. Smith (ed.). St. Petersburg, Florida, State University System Florida Institute of Oceanography. p. 229-232.

A description of the tropical reef ichthyofauna harbored in the Florida Middle Ground is presented, including comments on the complexity and productivity of the reef community. The reef ichthyofauna of the Florida Middle Ground is expected to be sensitive to environmental perturbations affiliated with oil exploration and production.

Citation Source: Citation Journal

C-1659-75
REVEGETATION OF DISTURBED TUNDRA AND TAIGA SURFACES BY INTRODUCED AND NATIVE PLANT SPECIES

Van Cleve, D. 1973.
Impact of Oil Resource Development on Northern Plant Communities, AAAS Alaska Science Conference, 23rd, Fairbanks, 1972. p. 7-11.

The report summarizes studies which involved field testing of hardy introduced plants and other techniques which might be used to stabilize disturbed ground surfaces in arctic and subarctic Alaska.

Citation Source: The Engineering Index Monthly 13(6):#039874. 1975.

2. CHEMICAL EFFECTS

C-1660-75
BENTHIC PLANTS IN THE EASTERN GULF OF MEXICO

Earle, S. A. 1974.
In: Marine Environmental Implications of Offshore Drilling in the Eastern Gulf of Mexico; Chemical Oceanography. R. E. Smith (ed.). St. Petersburg, Florida, State University System Florida Institute of Oceanography. p. 153-156.

A review is given of the biological and geological significance of benthic algae and seagrasses in the eastern Gulf of Mexico. The chemical and physical effects of petroleum drilling on the vegetation is discussed. Recommendations for work necessary to evaluate the impact of offshore drilling are given.

Physical effects of oil prospecting and production

Citation Source: Citation Journal

C-1661-75
EXPERIMENTAL DESIGN FOR AN ENVIRONMENTAL PROGRAM: HYDROCARBON ANALYSIS IN AN OIL PRODUCING AREA

Parker, P. L. 1974.
In: Marine Environmental Implications of Offshore Drilling in the Eastern Gulf of Mexico; Chemical Oceanography. R. E. Smith (ed.). St. Petersburg, Florida, State University System Florida Institute of Oceanography.

The chronic level of individual hydrocarbon types in the water column in the area of Louisiana offshore oil production was found to be in the 1-10 ppb level. In areas of oil spills, the levels may approach concentrations at which photosynthetic microorganisms and animal eggs are adversely affected. The adequacy of present-day analytical techniques to detect effects of hydrocarbons is discussed.

Biological effects of oil pollution

Citation Source: Citation Journal

3. SOCIAL EFFECTS

C-1662-75
THE SOCIAL IMPACT OF TAR SANDS DEVELOPMENT: CAN WE HAVE DEVELOPMENT AND QUALITY OF LIFE TOO?

Barr, J. J. 1975.
Petroleum Society of CIM Technical Meeting, 26th, Banff, 1975.
Preprint No. CIM 75-52. 6 p.

The potential social and ecological dangers of tar-sand development are reviewed. Actions taken to minimize damage and maximize social benefits are assessed.

General effects of oil prospecting and production

Citation Source: Petroleum Abstracts 15(31):#208,983. 1975.

4. ECONOMIC EFFECTS

C-1663-75
ECONOMIC ANALYSIS OF EFFLUENT GUIDELINES. PETROLEUM REFINING INDUSTRY

Anon. 1974.
Final Report, EPA/230/2-74/020. 86 p.

The report provides a basis for evaluating the potential economic effects of effluent limitations guidelines and standards of performance established by the EPA according to sections of the Federal Water Pollution Control Act. Areas potentially influenced are product price increases, continued viability of affected plants, employment, industry growth and foreign trade.

Citation Source: Government Reports Announcements 75(9): #PB-239 336/1GA. 1975.

5. GENERAL EFFECTS

C-1664-75
No title given

Anon. 1975.
Ocean Oil Weekly Report 9(48):3.

The Department of the Interior released its final environmental impact statement on the proposed sale of 297 tracts offshore Southern California. The statement suggests that certain tracts be withdrawn from the sale and buffer zones be established in certain areas to reduce the risk of environmental damage.

Citation Source: Citation Journal

C-1665-75
No title given

Anon. 1975.
Ocean Oil Weekly Report 9(41):1.

Offshore drilling activity off the U.S. East Coast will reach its peak by about 1980, and will continue at a peak rate until 1985, according to a recent study conducted by the University of Delaware. The threat of oil spills to the coast is predicted to be minimal because of stricter regulations on drilling procedures and the great distance the rigs will be from shore.

Citation Source: Citation Journal

C-1666-75
ALASKA OIL STUDY

Anon. 1975.
Marine Pollution Bulletin 6(7):99-100.

A $2.5 million project has been developed by the U.S. National Oceanic and Atmospheric Administration to assess the risk to Alaska of any oil developments beneath the continental shelf in the Gulf of Alaska. It is hoped that the study will identify the physical and chemical characteristics and the seabed geology of this area, complete a census and description of micro- and macro-organisms and assess the abundance of marine birds and mammals.

Citation Source: Citation Journal

C-1667-75
CPRC DEEPWATER TERMINAL STUDY RESULTS RELEASED

Anon. 1975.
The Marine Newsletter 6(1):2-3.

Discussed are the major conclusions and recommendations of the Deepwater Terminal Study supported by the Coastal Plains Regional Commission, which studied the feasibility of locating a deepwater terminal offshore and developing refinery complexes inland. The environmental impacts of such a development are considered to be small; operating procedures that safeguard against oil spill accidents, and recovery techniques that prevent a spill from spreading are recommended.

Citation Source: Citation Journal

C-1668-75
A CRITIQUE OF 'OCS OIL AND GAS - AN ENVIRONMENTAL ASSESSMENT;' A REPORT TO THE PRESIDENT PREPARED BY THE COUNCIL ON ENVIRONMENTAL QUALITY

Anon. 1974.
National Research Council Environmental Studies Board, Review Committee on the Environmental Impact of Oil and Gas Production on the Outer Continental Shelf. 55 p.

The critique assesses the environmental problems arising from U.S. outer continental shelf oil and gas development and the effectiveness with which they were treated in the 1974 Council on Environmental Quality report. The report was considered to be useful as a step toward policy development but limited,and avoided alternatives to the current energy dilemma.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(5): #5Q423. 1975.

C-1669-75
ENVIRONMENTAL STATEMENTS FOR OFFSHORE OPERATIONS

Anon. 1975.
Sea Technology 16(4):25-30.

The requirements for obtaining marine environmental data for impact statements is an exhaustive one. This report includes these data requirements and a presentation of present OCS lease statuses, recent OCS lease sales and the new OCS lease schedule.

Citation Source: Citation Journal

C-1670-75
FRENCH SCIENTIST WARNS AGAINST MARINE POLLUTION

Anon. 1975.
Sea Technology 16(2):22.

The article relates an interview with the French scientist, Dr. M. Aubert, on the topic of marine and industrial pollution. In regard to oil pollution from tankers, Dr. Aubert stated that tankers should confine their tank cleaning to ports especially designed for such activities. His feelings on the topic of oil spill risks associated with North Sea drilling are also discussed.

Oil transfer and transport

Citation Source: Citation Journal

C-1671-75
AN ISLAND IS A FRAGILE THING

Anon. 1975.
Petroleum Today 16(1):4-13.

People from Nantucket and Martha's Vineyard comment on the potential offshore development of George's Bank for oil. The concern about possible conflicts between the fishing industry and the oil industry has stimulated a study by WHOI and API. Most people believe that oil production would benefit the islands by reducing their dependence on tourism.

Citation Source: Citation Journal

C-1672-75
LOUISIANA SUPERPORT STUDIES. REPORT NO. 4. TECHNICAL APPENDICES TO RECOMMENDATIONS FOR THE ENVIRONMENTAL PROTECTION PLAN

Anon. 1974.
Louisiana State University, Baton Rouge. LSU-SG-74-04, NOAA-75020305. 231 p.

This volume includes studies on the economic impact of a Louisiana offshore oil port, the expected oil spillage from vessels and pipelines in the region of the superport and the techniques for assessing the environmental effects associated with superport development.

Economic effects of oil prospecting and production

Citation Source: Government Reports Announcements 75(10): #COM-75-10314/3GA. 1975.

C-1673-75
OFFSHORE DRILLING CONTROVERSY COUNTERPRODUCTIVE, OILMAN SAYS

Anon. 1975.
Pacific Oil World 68(7,8):10.

The article includes comments made by an American Petroleum Institute vice-president concerning the waste in time and money due to the controversy over drilling for offshore oil and natural gas. Dr. J. S. Cross believes that the U.S. can strenghen its energy position and protect the environment at the same time. Reference is made to the Santa Barbara oil spill and the conditions of the beaches and marine life after the 1969 event.

Citation Source: Citation Journal

C-1674-75
PROCEEDINGS, 10TH ANNIVERSARY STICHTING CONCAWE

Anon. 1973.
CONCAWE Document No. 6058. 53 p.

Speeches and discussions presented at the tenth anniversary meeting of Stichting CONCAWE in the Hague are included in the proceedings. Discussions concentrated on the following two questions: (1) What are the future problems involving the environment which the oil industry will have to deal with? (2) Is the trend among certain governments to propose modifications of essential environmental standards and restrictions, in order to facilitate the provisions of energy needs, likely to be seen in Europe?

Citation Source: Reports Produced by the Secretariat or Working Group Members of Stichting CONCAWE. Report No. 1/75. Abstract #89. 1975.

C-1675-75
SULLOM VOE ENVIRONMENTAL ADVISORY GROUP

Anon. 1975.
Marine Pollution Bulletin 6(5):69.

The Sullom Voe environmental advisory group will advise on all environmental aspects of all stages of the development of a major oil port east of Shetland in the North Sea. One aim is to prepare an environmental impact statement.

Citation Source: Citation Journal

C-1676-75
TRANSLATIONS ON THE LAW OF THE SEA (GUO V)

Anon. 1975.
Arlington, Virginia, Joint Publications Research Service. 11 p.

This volume includes translations of articles from various journals. Among the articles are two about the Cambodia continental shelf drilling and the Morocco-Shell oil offshore drilling agreement.

Foreign legislation

Citation Source: Government Reports Announcements 75(10): #JPRS-L/5203. 1975.

C-1677-75
TRANSLATIONS ON THE LAW OF THE SEA. XVII

Anon. 1975.
Arlington, Virginia, Joint Publications Research Service. 116 p.

This report includes articles on contracts for oil prospecting, measures taken in the aftermath of a supertanker incident, discovery of oil in the Gulf of Thailand, and the exploration for oil by Greece and Spain.

Cleanup and recovery

Citation Source: Government Reports Announcements 75(13): #JPRS-64426. 1975.

C-1678-75
AIR AND WATER POLLUTION PROBLEMS AT PETROLEUM REFINERIES

Assarsson, B. 1973.
Environmental Engineering: A Chemical Engineering Discipline. G. Lindner and K. Nyberg (eds.). Dordrecht-Holland, Netherlands, Reidel. p. 129-133.

Air pollutants resulting from increased petroleum refinery activities in Sweden are reviewed, and plans for reducing water pollutants are discussed.

Citation Source: Chemical Abstracts 83(4):#32422u. 1975.

C-1679-75
PROCESS AND ENVIRONMENTAL TECHNOLOGY FOR PRODUCING SNG AND LIQUID FUELS

Beychok, M. R. 1975.
Environmental Protection Technology Series, EPA/660/2-75-011, Contract EPA-68-03-2136. 152 p.

The process technology and environmental concerns of the emerging industries for providing new supplemental energy supplies from non-conventional sources are discussed. The production of substitute natural gas from coal, crude oil and naphtha, and the production of liquid fuels from oil shale are subjects included.

Citation Source: Government Reports Announcements 75(17): #PB-242 774/8GA. 1975.

C-1680-75
GOVERNMENTS, THE OIL INDUSTRY AND THE ENVIRONMENT

Blaikley, D. R. 1975.
Petroleum Review 29(340):233-243.

The author emphasizes the need for business, government and labor to work together in such energy related areas as offshore oil production and development. In the event of a well blowout, seepage during drilling or an oil spill during production, the interests of the oil companies in preventing these accidents are the same as those of government.

Citation Source: Petroleum Abstracts 15(27):#207,587. 1975.

C-1681-75
ENVIRONMENTAL CONSIDERATIONS FOR OIL SHALE DEVELOPMENT

Conkle, N., V. Ellzey, and K. Murthy. 1974.
Final Report, January to May 1974, EPA/650/2-74-099, Contract EPA-68-02-1323. 133 p.

The report reviews the status of development of the oil shale industry and its potential economic, resource and environmental impact upon the oil shale resource regions and the nation as a whole.

Citation Source: Government Reports Announcements 75(16): #PB-241 942/2GA. 1975.

C-1682-75
ENVIRONMENTAL SITE ASSESSMENT FOR A MASSACHUSETTS BAY DEEPWATER OIL TERMINAL

Cox, G. V. 1975.
Offshore Technology Conference, 7th, Houston, 1975. Preprint No. OTC-2382, Vol. 3. p. 471-488.

Seven offshore locations in Massachusetts Bay were selected for environmental evaluation as possible deepwater petroleum terminal sites. The sites have been ranked on the basis of available information and recommendations for supplementary actions have been made.

Citation Source: Petroleum Abstracts 15(27):#207,475. 1975.

C-1683-75
OIL SHALE AND ITS ENVIRONMENTAL CONSIDERATIONS

Decora, A. W., H. R. Johnson, and P. T. Stone. 1975.
American Chemical Society Petroleum Chemistry Division, Preprints 20(1):245-254.

A discussion of the environmental considerations which must accompany the development of the oil shale lands is given. Since most oil shale is found on federal lands and since its development affects the environment, leasing oil shale lands to private interests must be in compliance with the National Environmental Policy Act, 1969.

U.S. legislation

Citation Source: Petroleum Abstracts 15(23):#206,036. 1975.

C-1684-75
ANALYSIS OF OIL SPILL STATISTICS

Devanney, J. W., III, and R. Stewart. 1974.
In: Primary Impacts of Offshore Petroleum Developments, MITSG 74-20. p. 84-212.

Estimates are given, based on past oil spill incidents, of the likelihood of spillage by number and size of individual spill for a number of hypothetical offshore oil developments in the Atlantic and Gulf of Alaska.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(4): #5Q4305. 1975.

C-1685-75
BAYESIAN ANALYSIS OF OIL SPILL STATISTICS

Devanney, J. W., III, and R. J. Stewart. 1974.
Marine Technology 11(4):365-382.

In this paper, Bayesian reasoning plus actual spill data from various sources were used in estimating the likelihood of oil spill frequency and magnitude associated with a given amount of oil transport and production activity.

Citation Source: Environmental Health and Pollution Control 7(9):#2480. 1975.

C-1686-75
POLITICAL CONFLICT MAY DELAY FUTURE OFFSHORE PLAY

Doerner, K., III. 1975.
Offshore 35(10):91-95.

The political controversy between the state of Alaska and the federal government over the development of Alaska's offshore oil reserves is reviewed. Alaska's new governor, Jay S. Hammond, wants to delay the lease sale of 1.8 million acres of the OCS in the northern Gulf of Alaska until further studies on potential economic and environmental impacts on these areas can be made. A draft environmental impact statement on the impact of the proposed lease sale states that 43,873 bbl of oil are likely to be spilled every year during peak production; the effect of such spillage on the Gulf was not predicted.

Citation Source: Citation Journal

C-1687-75
OPPOSITION TO OCS LEASING IS SINCERE, BUT MISGUIDED

Edwards, E. 1975.
World Oil 180(5):67-70.

Governor Edwards of Louisiana feels that offshore drilling and production operations have not adversely affected the fishing industry, and that the news media misled the American public about the Santa Barbara oil spill of 1969.

Citation Source: Citation Journal

C-1688-75
ENVIRONMENTAL CAUSE-EFFECT PHENOMENA RELATING TO TECHNOLOGICAL DEVELOPMENT IN THE CANADIAN ARCTIC

Eedy, W. 1974.
Ottawa, Canada, National Research Council of Canada. 125 p.

Results from the report compiling cause/effect observations on technological development in the Canadian Arctic have indicated that undersea areas which would be affected by future offshore drilling, pipeline or subsurface transportation activities have not been studied. Studies of biological toxicity in the Arctic are lacking. Waste disposal has been predicted as a major problem arising from technological development.

Citation Source: Biological Abstracts 59(12):#65553. 1975.

C-1689-75
INVESTIGATION AND REHABILITATION OF A BRINE-CONTAMINATED AQUIFER

Fryberger, J. S. 1975.
Ground Water 13(2):155-160.

One square mile of an alluvial aquifer in Arkansas was contaminated because of faulty disposal of oil field brine through an "evaporation" pit and a faulty disposal well. The physical parameters of the contamination are defined and alternate methods of aquifer rehabilitation are explained.

Citation Source: The Engineering Index Monthly 13(6):#042246. 1975.

C-1690-75
CHARACTERIZATION OF SULFUR RECOVERY FROM REFINERY FUEL GASES

Genco, J. M., and S. S. Tam. 1974.
EPA/450/3-74-055, Contract EPA-68-02-0611. 138 p.

The processes for removing and recovering sulfur from refinery fuel gas are reviewed. Statistics on recovery systems for 1973 and 1975 are presented. The environmental impact of tail gas processes is discussed.

Citation Source: Government Reports Announcements 75(10): #PB-239 777/6GA. 1975.

C-1691-75
ENVIRONMENTAL CONSIDERATIONS IN WASTE DISPOSAL FROM DRILLING IN SHALLOW BEAUFORT SEA

Heffler, H. R. 1975.
Petroleum Society of CIM Technical Meeting, 26th, Banff, 1975. Preprint No. CIM 75-18. 13 p.

The environmental consequences of marine disposal of drilling wastes in the Canadian Arctic have been examined. Drilling wastes have been discharged to both the open and ice-covered waters of the Beaufort Sea. A study concluded that except for pH adjustment and removal of extraneous contaminants, no other treatment is necessary for the disposal systems examined.

Citation Source: Petroleum Abstracts 15(31):#208,975. 1975.

C-1692-75
SPECIAL CIRCUMSTANCES: SUPERPORTS

Hirsch, A. 1974.
Law of the Sea: The Emerging Regime of the Oceans. J. K. Gamble, Jr., and G. Pontecorvo (eds.). p. 217-222.

The impact of superports is considered. A study indicated that superports should be located as far from shore as possible to reduce the potential for estuarine and coastal damage caused by oil spills and dredging, and to aid in navigation. Proposed U.S. legislation on superports is discussed.

U.S. legislation
Oil transfer and transport

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(5): #5Q5741. 1975.

C-1693-75
ENVIRONMENTAL IMPACTS, EFFICIENCY, AND COST OF ENERGY SUPPLY AND END USE. VOLUME 1.

Hittman Associates, Inc. 1974.
Report No. HIT-593, PB-238 784/3GA. 383 p.

Thirty tables containing data quantifying the broad range of energy-related environmental impacts on land; water, air, solid waste and health are contained in this report. Twelve of these are devoted to oil supply.

Citation Source: Petroleum Abstracts 15(33):#209,483. 1975.

C-1694-75
AN ENVIRONMENTAL RESEARCH PROGRAM FOR DRILLING IN THE CANADIAN BEAUFORT SEA

Hnatiuk, J. 1975.
Petroleum Society of CIM Technical Meeting, 26th, Banff, 1975. Preprint No. CIM 75-16. 14 p.

An environmental research program has been developed to provide ecological baselines for the Beaufort Sea, a better understanding of the Beaufort Sea's physical environment, and knowledge related to the effects of possible oil spills and means of oil cleanup in ice-infested waters. The results of these studies will be used to develop operating restrictions to protect the Canadian Beaufort Sea from the adverse effects of offshore drilling. Drilling is scheduled to be undertaken during 1976.

Citation Source: Petroleum Abstracts 15(31):#208,982. 1975.

C-1695-75
THE OCEAN AS A POWER RESOURCE

Isaacs, J. D., and R. J. Seymour. 1973.
International Journal of Environmental Studies 4(3):201-206.

The possibility of developing a number of potential energy sources in the oceans to meet world needs is assessed. Means for avoiding environmental degradation are discussed.

Citation Source: Biological Abstracts 60(5):#24583. 1975.

C-1696-75
THE ENVIRONMENTAL ASPECT: THE RISKS - THE WEAPONS

Jagger, H. 1974.
Impact of Offshore Oil Operations. A. F. Peters (ed.). Essex, Applied Science Publishers, Ltd. 215 p.

The hazards of offshore exploratory drilling are considered; the overall risks are low. Problems associated with oil handling, submarine pipelines, tanker loadings, and shore facilities in the North Sea are described. The effects of oil spills and cleanup methods are outlined.

Oil transfer and transport
Cleanup and recovery

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(5): #5Q5420. 1975.

C-1697-75
ATLANTIC OUTER CONTINENTAL SHELF ENERGY RESOURCES: AN ECONOMIC ANALYSIS

Kalter, R. J., W. E. Tyner, and T. H. Stevens. 1974.
Cornell University, Department of Agricultural Economics, A. E. Res. 74-17, NOAA-75021104. 95 p.

This report focuses on the Atlantic Outer Continental Shelf (AOCS) acreage available for leasing. Current leasing policy and alternative leasing and management policy issues are examined. The impacts predicted from adoption of these alternatives are analyzed.

Citation Source: Government Reports Announcements 75(11): #COM-75-10330/9GA. 1975.

C-1698-75
ENERGY UNDER THE OCEANS, A TECHNOLOGY ASSESSMENT OF OUTER CONTINENTAL SHELF OIL AND GAS OPERATIONS

Kash, D. E., I. L. White, K. H. Bergey, M. A. Chartock, M. D. Devine, R. L. Leonard, S. N. Salomon, and H. W. Young. 1974.
Folkestone, Great Britain, Bailey Brothers and Swingen Ltd. 378 p.

This book assesses the social impact of OCS operations, contributes to the data base for OCS policy making, and helps make recommendations for changes in government as well as industry in order to optimize OCS resource development.

Citation Source: Deep Sea Research 22(7):517. 1975.

C-1699-75
SOME OIL SPILLAGE ASSURED AT PROPOSED GULF SUPERPORT

Kirkpatrick, K., and D. Kirkpatrick. 1975.
National Fisherman 56(3):9-B.

The article describes a three-year multi-phase study which determined the feasibility of building a superport off Louisiana's coast in the Gulf of Mexico. In regard to the environmental phase, the study proved the superport concept to be workable with the probability of spills from collision being low. Estimates are seven tons annual spillage offshore and in the hundreds of gallons on the pipeline per year.

Citation Source: Citation Journal

C-1700-75
THE DELAWARE ESTUARY SYSTEM, ENVIRONMENTAL IMPACTS AND SOCIO-ECONOMIC EFFECTS. IMPACTS OF A DEEPWATER TERMINAL. VOLUME I. ENVIRONMENTAL PROBLEMS ASSOCIATED WITH A DEEPWATER PORT IN THE DELAWARE BAY AREA

Maurer, D. 1974.
NSF/RA/E-74-017, Grant NSF-GI-33369. 208 p.

This report is a review of the environmental problems associated with a deepwater port in the Delaware Bay area. Included subjects are the impact on phytoplankton, zooplankton, finfish and benthos; the effect of oil spills, in particular the fate of spilled oil; and environmental effects of dry bulk commodities.

Biological effects of oil prospecting and production
General effects of oil pollution
General fate of oil in the environment

Citation Source: Government Reports Announcements 75(9): #PB-239 669/5GA. 1975.

C-1701-75
IS IMPORTING OIL THE PROBLEM

McCloskey, M. 1975.
Sierra Club Bulletin 60(7):21.

The environmental and economic arguments of the administration over importing foreign oil and developing domestic oil resources are examined in this editorial.

Citation Source: Citation Journal

C-1702-75
ACADEMIC DATA-NEEDS FOR ENVIRONMENTAL ASSESSMENTS OF OFFSHORE TECHNOLOGICAL OPERATIONS

Nuzzi, R. 1975.
Marine Technology Society, Journal 9(6):25-28.

Significant biological damage (from an oil spill, for instance) has been defined as damage which "impairs the survival of species essential to the ecosystem." Essential species have not yet been identified, however, so the task of determining the ecological impact of technological operations is difficult.

Monitoring
Biological effects of oil pollution

Citation Source: Citation Journal

C-1703-75
IMPACT OF OFFSHORE OIL OPERATIONS

Peters, A. F. (ed.). 1974.
Essex, England, Applied Science Publishers, Ltd. 205 p.

The book contains eight main papers given at a conference, organized by the Institute of Petroleum, on 'The Impact of Offshore Oil Operations' (Aviemore, Scotland, May, 1974). The papers deal with three main topics: offshore oil operations and prospects, impact of oil development on the Scottish economy, and environmental issues.

Citation Source: Journal of Petroleum Technology XXVII:737. 1975.

C-1704-75
PROGRAM PLAN FOR ENVIRONMENTAL EFFECTS OF ENERGY

Pikul, R. P., and R. Rabin. 1974.
Final Report, MTR-6726, NSF 74-SP-0827. NTIS Report PB-235 115. 314 p.

The objectives of the National Science Foundation's Five Year Program plan are to gain scientific knowledge to sustain a sound environmental policy and to find means to minimize adverse environmental effects resulting from fuel extraction and conversion processes and energy generation and utilization. Research in the areas of pollutant analysis, transport, fate and pollutant effects and systems evaluation is emphasized.

Citation Source: Selected Water Resources Abstracts 8(12): #W75-05871. 1975.

C-1705-75
THE ARCTIC OFFSHORE GAMBLE

Pimlott, D. 1974.
Living Wilderness 38(127):16.

The author assesses the arctic offshore oil-development picture from an environmental standpoint. He points out the vulnerability of this area to pollution and the potential risk of blowouts to arctic populations of birds and mammals.

Biological effects of oil prospecting and production

Citation Source: Citation Journal

C-1706-75
TANKERS AND THE U.S. ENERGY SITUATION: AN ECONOMIC AND ENVIRONMENTAL ANALYSIS

Porricelli, J. D., and V. F. Keith. 1974.
Marine Technology 11(4):340-364.

The paper is divided into four main areas: the U.S. energy situation and projected oil requirements, the economics of tankers to import oil to the U.S., the environmental impact of tanker transportation, and the cost and effectiveness of these systems.

Oil transfer and transport
Economic effects of oil prospecting and production

Citation Source: Environmental Health and Pollution Control 7(9): #2593. 1975.

C-1707-75
PIPELINE ACROSS ALASKA

Sage, B. 1974.
New Scientist, 4 April 1974:10-12.

The article discusses the trans-Alaska pipeline construction and the environmental safeguards incorporated in its design. New threats to the tundra ecosystem (i.e., a second and third pipeline, offshore oil rigs, and mineral exploitation) are mentioned.

Citation Source: Ecological Abstracts 1975/1:#75L/0518. 1975.

C-1708-75
THE OFFSHORE ECOLOGY INVESTIGATION

Sharp, J. M., and J. W. Tyson. 1975.
Offshore Technology Conference, 7th, Houston, 1975. Preprint No. OTC-2384, Vol. 3. p. 499-504.

The Offshore Ecology Investigation conducted studies during the past two years to assess the environmental/ecological impact of oil drilling and production off the Louisiana coast. Seventy-nine percent of the investigations indicated no harmful impact or a beneficial impact, and 21%, as determined by the Council, required further study but did not indicate a harmful effect.

Citation Source: Petroleum Abstracts 15(27):#207,515. 1975.

C-1709-75
EVALUATION OF LIKELIHOOD OF CARGO SPILLS AT ALTERNATE PORT SITES

Smith, W. S., K. Nair, and H. C. Shah. 1975.
Offshore Technology Conference, 7th, Houston, 1975. Preprint No. OTC-2195. p. 493-502.

In evaluating the influence of alternate supertanker port facilities on the likelihood of cargo spills, three alternative examples presented indicated that the probability of cargo spills would increase if current facilities were maintained, and decrease for supertanker facilities constructed in a port or bay or offshore.

Citation Source: Petroleum Abstracts 15(25):#206,835. 1975.

C-1710-75
MARINE ENVIRONMENTAL IMPLICATIONS OF OFFSHORE DRILLING IN THE EASTERN GULF OF MEXICO

Smith, R. E. (ed.). 1974.
St. Petersburg, Florida, State University System of Florida Institute of Oceanography

The conference/workshops were planned and held to properly define the critical research and/or information needs in the area of OCS oil exploration and production activities in the eastern Gulf of Mexico, and to discuss the development of a scientifically sound and relevant interdisciplinary program. The scientific papers presented are categorized under four main topics: physical, biological, chemical and geological oceanography.

Citation Source: Citation Journal

C-1711-75
OIL SHALE DEVELOPMENT AND COLORADO LAND USE LEGISLATION

Ulman, W. J. 1975.
AAAS Meeting, New York City, January 26-31, 1975. 17 p.

The various risks involved in oil shale development are discussed. After reviewing the advantages and flaws of developing oil shale deposits in Colorado, a growing number of concerned agencies has expressed the thought that the use of oil shale may be too expensive a proposition economically, environmentally and socially.

Citation Source: Environment Abstracts 5(7,8):#75-04690. 1975.

E. FATE OF OIL IN THE ENVIRONMENT

1. BIOLOGICAL DEGRADATION

C-1712-75
OXIDATION OF CERTAIN PRUDHOE BAY HYDROCARBONS BY MICROORGANISMS INDIGENOUS TO A NATURAL OIL SEEP AT UMITA, ALASKA

Agosti, J. M., and T. E. Agosti. 1973.
Impact of Oil Resource Development on Northern Plant Communities, AAAS Alaska Science Conference, 23rd, Fairbanks, 1972. p. 80-85.

Bacterial samples were collected from the vicinity of a natural oil seep above the Arctic circle. Visual observation of six of fourteen samples cultured on enriched medium showed complete emulsification in seven days at 20°C. Practical application of the oxidation of hydrocarbons at low temperatures is discussed.

Citation Source: The Engineering Index Monthly 13(6):#039882. 1975.

C-1713-75
INTERACTIONS OF MICROORGANISMS AND PETROLEUM POLLUTANTS IN THE ARCTIC

Atlas, R. M., E. A. Schofield, F. A. Morelli, and R. E. Cameron. 1974.
Abstracts of the Annual Meeting of the American Society for Microbiology, 74th, Chicago, 1974. Entry #G267, p. 64.

The effect of petroleum pollutants on natural microbial communities in the Arctic was determined. When Prudhoe crude oil was incubated with water from coastal ponds along Prudhoe Bay, bacterial populations increased by several orders of magnitude. The addition of 1.0 oil/100 ml water resulted in the disappearance of coccoid green algae and a change from amoeboid to flagellated protozoans. Miniature oil slicks floated on Prudhoe Bay underwent extensive biodegradation. Microbial populations underlying the slicks greatly increased.

Citation Source: Citation Journal

C-1714-75
BIODEGRADATION OF OIL ON WATER SURFACES

Bartha, R. 1975.
Patent Application. 13 p.

The microbial degradation of oil slicks on water surfaces is increased by applying the essential microbial nutrients, nitrogen and phosphorus, in a form that adheres to the oil and thus stimulates the activity of oil-degrading microorganisms.

Citation Source: Government Reports Announcements 75(16): #PAT-APPL-558 040/GA. 1975.

C-1715-75
IMPACT OF THE USE OF MICROORGANISMS ON THE AQUATIC ENVIRONMENT

Bourquin, A. W., S. P. Meyers, and D. G. Ahearn. 1974. GBERL-235, EPA/660/3-75-001. 259 p.

This symposium, sponsored by the EPA Gulf Breeze Environmental Research Laboratory, contains discussions on the possible impact of introducing microbial insect control agents or oil-degrading agents into the environment. The use of hydrocarbonoclastic microorganisms in special environments like the Arctic and the Louisiana salt marshes is considered.

Citation Source: Government Reports Announcements 75(11): #PB-240 159/4GA. 1975.

C-1716-75
MICROBIAL ECOLOGY AND THE PROBLEM OF PETROLEUM DEGRADATION IN CHESAPEAKE BAY

Colwell, R. R., J. D. Walker, and J. D. Nelson, Jr. 1974. NSF-GD-31707, Contract N00014-69-A-0220-0006. 14 p.

The seasonal incidence and species distribution of petroleum degrading microorganisms in Chesapeake Bay are being investigated. The numbers of microorganisms are related to the concentration of oil in the sample.

Citation Source: Government Reports Announcements 75(10): #AD/A-006 590/4GA. 1975.

C-1717-75
METABOLIC ACTIVITY OF MICROORGANISMS FROM ESTUARINE SLICKS

Crow, S. A., A. W. Bourquin, G. N. Smith, and W. L. Cook. 1975. American Society for Microbiology, 75th, New York, 1975. Abstract. p. 191.

Microbiological sampling studies of surface slicks indicated the presence of larger populations of microorganisms associated with the surface microlayer. Types of bacteria and fungi and comparative physiological studies of the organisms sampled are described. Only a few isolates possessed lipolytic or hydrocarbonoclastic activity.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(7): #5Q7187. 1975.

C-1718-75
MICROBIOLOGICAL ASPECTS OF PETROLEUM DEGRADATION IN THE AQUATIC ENVIRONMENT

Crow, S. A., S. P. Meyers, and D. G. Ahearn. 1974.
NOAA-04-3-158-19, Contract NOAA-75020307. 20 p.

The literature dealing with the effects of crude oil on the microbial ecosystem and the biodegradation of hydrocarbons is summarized. Other topics reviewed are the ecology of hydrocarbon utilizers and the pathways in hydrocarbon degradation.

Bibliographies

Citation Source: Government Reports Announcements 75(10):
#COM-75-10298/8GA. 1975.

C-1719-75
BIODEGRADATION OF SOME POLYNUCLEAR AROMATIC PETROLEUM COMPONENTS BY MARINE BACTERIA

Dean-Raymond, D., and R. Bartha. 1975.
Technical Report, No. TR-N-5, Contract N00014-67-A-0115-0005. 21 p.

The metabolism of polynuclear aromatic hydrocarbons by six bacterial strains isolated from oil-polluted waters was studied using various chromatographic and spectrometric techniques. All six strains grew on naphthalene, 2-methylnaphthalene and 2-ethylnaphthalene as sole sources of carbon and energy. The metabolism of other polynuclear aromatic petroleum components by the organisms is described.

Citation Source: Government Reports Announcements 75(9):
#AD/A-006 346/1GA. 1975.

C-1720-75
COMPARATIVE OXIDATION OF POLYNUCLEAR HYDROCARBONS

Fairchild, T., E. J. McKenna, and R. E. Kallio. 1974.
Abstracts of the Annual Meeting of the American Society for Microbiology, 74th, Chicago, 1974. p. 161.

Results are given of a study in which late log phase resting cell suspensions of a strain of Pseudomonas putida isolated from naphthalene enrichment culture and a Gram (-) soil bacterium isolated from phenanthrene enrichment culture were tested for their ability to oxidize polynuclear hydrocarbons (PH). Increased size of hydrocarbon ring substituents, increased number of these substituents on the ring and increased amount of ring saturation resulted in decreased oxidation of the PH.

Citation Source: Citation Journal

C-1721-75
HYDROCARBON OXIDATION AND TAXONOMY OF MYCOFORMS

Golovlev, E. L., G. K. Skyrabin, and L. A. Golovleva. 1973.
Mycobacteria Proceedings Symposium, 1971. J. G. Weiszfeiler (ed.). Budapest, Hungary, Acad. Kiado. p. 91-4.

Studies of 220 strains of mycoforms have indicated that aromatic hydrocarbons are not utilized without previous adaptation; olefin and isoalkane assimilation is characteristic of some strains and has no taxonomic value; and there is a distinct taxonomic delimitation between species which do and do not utilize n-alkanes.

Citation Source: Chemical Abstracts 83(5):#39976m. 1975.

C-1722-75
MICROBIAL DEGRADATION OF POLYCYCLIC AROMATIC HYDROCARBONS

Groenewegen, D., and H. Stolp. 1975.
Erdoel und Kohle, Erdgas, Petrochemie vereinigt mit Brennstoff-Chemie 28(4):206.

An experiment was conducted in which soil microorganisms in soil and water were mixed with various polycyclic aromatic hydrocarbons to measure microbial degradation. The microorganisms were found to significantly degrade phenanthrene, pyrene, 1,2-benzanthracene and 3,4-benzopyrene; fluorene and fluoranthene were somewhat degraded, but not chrysene.

Citation Source: Chemical Abstracts 83(3):#24990n. 1975.

C-1723-75
SEQUENTIAL GROWTH OF BACTERIA ON CRUDE OIL

Horowitz, A., D. Gutnick, and E. Rosenberg. 1975.
Applied Microbiology 30(1):10-19.

The isolation of three oil-degrading bacteria by a sequential enrichment culture technique is described. One strain, PU-2, was found to be highly specialized for growth on crude oil in seawater due to its preference for oil products as substrates for growth and its high oil conversion and oil dispersion capabilities. When these three strains and a previously isolated oil-degrading bacterium were grown together in a mixed culture or sequentially, there was over 75% oil conversion.

Citation Source: Citation Journal

C-1724-75
THE MICROBIAL DEGRADATION OF OIL IN THE SEA

Hughes, D. E., and P. McKenzie. 1974.
A Discussion on Organic Pollutants in the Sea: Their Origin, Distribution, Degradation and Ultimate Fate,[London], 1974.

From the moment oil is released into the sea, microbial degradation takes place. In laboratory experiments and field studies, about 40-90% of the oil may be degraded. Alkanes and saturated compounds will be degraded first, followed by aromatic and heterocyclic components. Sinking agents and dispersants may affect the rate and pattern of degradation.

Citation Source: Proceedings of the Royal Society of London, B, 189(1096):375-390. 1975.

C-1725-75
TERRESTRIAL OIL SPILLS IN ALASKA: ENVIRONMENTAL EFFECTS AND RECOVERY

Hunt, P. G., W. E. Rickard, F. J. Deneke, et al. 1973.
Joint Conference on Prevention and Control of Oil Spills, Washington, D.C., 1973. p. 733-740.

Investigations have been conducted on the damage and natural recovery of terrestrial ecosystems contaminated by refined oil spills along the Haines to Fairbanks pipeline in Alaska. The experiment was carried out to determine if microbial degradation of the fuel and revegetation could be enhanced by the addition of fertilizer. A positive response in microbial activity and plant growth was observed.

Biological effects of oil pollution

Citation Source: Environmental Health and Pollution Control 7(6): #1483. 1975.

C-1726-75
THE ORIGIN OF FATTY ACIDS IN THE HYDROCARBON-UTILIZING MICROORGANISM *MYCOBACTERIUM VACCAE*

King, D. H., and J. J. Perry. 1975.
Canadian Journal of Microbiology 21(1):85-89.

The fatty acid pattern in a strain of *M. vaccae* grown on n-alkanes, 1-alkenes, 2- or 3-methyl octadecane and 8-heptadecene is described in this study.

Citation Source: Biological Abstracts 59(11):#62735. 1975.

C-1727-75
NAPHTHALENE-ASSIMILATING BACTERIA OF THE PSEUDOMONAS GENUS FROM SOILS IN OIL-PRODUCING AREAS, AND THE PROPERTIES OF THESE BACTERIA

Kvasnidov, E. I., and N. Z. Tin'yanova. 1974.
Microbiology 43(4):607-610.

Some strains of *Pseudomonas* bacteria that use naphthalene as their sole source of carbon have been isolated from the soils in petroliferous forests in the Western Ukraine. They were unable to use benzene or any aliphatic hydrocarbons to grow. These strains have a high rate of oxygen consumption and form salicyclic acid during growth.

Citation Source: Citation Journal

C-1728-75
ULTRASTRUCTURE OF A HYDROCARBON OXIDIZING PSEUDOMONAD GROWN ON N-ALKANES

Patrick, M. A., P. R. Dugan, and G. D. Cagle. 1974.
Abstracts of the Annual Meeting of the American Society for Microbiology, 74th, Chicago, 1974. Entry G-222, p. 57.

Studies on a pseudomonad capable of utilizing various alkanes as a sole carbon source have resulted in altered cell fatty acid compositions which were qualitatively related to substrate chain length. Observation of the ultrastructure of cells grown on C_{16} revealed numerous inclusion bodies of unidentified composition appearing to be storage granules.

Citation Source: Citation Journal

C-1729-75
METABOLISM OF METHYLNAPHTHALENES AND OTHER RELATED AROMATIC HYDROCARBONS BY MARINE BACTERIA

Raymond, D. D. 1975.
Dissertation Abstracts International, Section B, 35(10):5014-B.

The effect of structural variation in naphthalene derivatives on their degradation by bacteria was studied. Six organisms were isolated from oil-polluted waters and grown on naphthalene, 1-methyl- or 2-methylnaphthalene as their sole source of carbon and energy. The results of the organisms' growth or degree of metabolism of naphthalene and its derivatives are described.

Citation Source: Petroleum Abstracts 15(25):#206,847. 1975.

C-1730-75
DEGRADATION OF BENZOTHIOPHENE AND RELATED COMPOUNDS BY A SOIL PSEUDOMONAS IN AN OIL-AQUEOUS ENVIRONMENT

Sagardía, F., J. J. Rigau, A. Martínez-Lahoz, F. Fuentes, C. López, and W. Flores. 1975.
Applied Microbiology 29(6):722-725.

Using benzothiophene (BT) as a model petrosulfur compound, a soil Pseudomonas has been isolated that can degrade BT and related compounds in a simple oil-aqueous environment. This system may be a practical solution to the environmental problem of the presence of high concentrations of sulfur compounds in crude and residual oils.

Citation Source: Citation Journal

C-1731-75
OBSERVATIONS ON THE EFFECTS OF MECHANICAL DISTURBANCE AND OIL ON SOIL MICROBIAL POPULATIONS

Scarborough, A. M. 1973.
Impact of Oil Resource Development on Northern Plant Communities, AAAS Alaska Science Conference, 23rd, Fairbanks, 1972. p. 63-71.

Microfungal decomposers isolated from natural, disturbed and oiled soils in Alaska were studied in 1970. In all disturbed sites there was a change from a microbial population dominated by fungi to a decomposer population dominated by bacteria.

Biological effects of oil pollution

Citation Source: The Engineering Index Monthly 13(6):#039880. 1975.

C-1732-75
DEEP-SEA BACTERIA. GROWTH AND UTILIZATION OF N-HEXADECANE AT IN SITU TEMPERATURE AND PRESSURE

Schwarz, J. R., J. D. Walker, and R. R. Colwell. 1975.
Canadian Journal of Microbiology 21(5):682-687.

A mixed culture of bacteria, obtained from the sediment-water interface off the Florida coast at a depth of 4940 m, utilized n-hexadecane as a sole carbon source for growth at the in situ temperature (4°C) and pressure (500 atm). Rate of utilization under deep-sea conditions was much slower than the rate observed at ambient pressure (1 atm) and low temperature (4°C).

Citation Source: Chemical Abstracts 83(5):#40008d. 1975.

C-1733-75
BIODEGRADATION OF OIL

Sedita, S. J. 1973.
Contract No. N00014-72-C-047. 55 p.

More than 40 microorganisms were isolated which were capable of degrading fractions of Bunker C residual fuel oil. Several "recipes" of organisms were examined under laboratory and large-scale conditions to determine their effectiveness in residual fuel oil decomposition.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(3): #5Q3097. 1975.

C-1734-75
OXIDATION AND ASSIMILATION OF AROMATIC PETROLEUM HYDROCARBONS BY MICROORGANISMS DEPENDING ON THEIR COMPOSITION AND STRUCTURE [English Summary]

Serebryakova, T. A., A. I. Zaikina, V. A. Garbalinskii, and E. L. Ruban. 1974.
Izvestiya Akademii Nauk SSSR, Seriya Biologicheskaya 3:367-380.

Yeasts and bacteria were studied on media with petroleum aromatic hydrocarbons with different numbers of aromatic rings in the molecule, different grades of condensation of the rings and different numbers and lengths of alkyl substitutes. The hydrocarbons which were assimilated by the microorganisms and the ones which were oxidized but not utilized for growth were differentiated.

Citation Source: Biological Abstracts 60(2):#9589. 1975.

C-1735-75
FORMATION OF A MODEL FLOC ABLE TO DECOMPOSE PHENOL BY THE MIXED CULTURE OF BACTERIA ISOLATED FROM ACTIVATED SLUDGE

Tago, Y., H. Kuraishi, and K. Aida. 1975.
Journal of General and Applied Microbiology 21(1):41-49.

A model floc was formed by the mixed culture of the strains No. 12 and No. 3 isolated from a phenol-adapted sludge. This mixed floc can successfully decompose as much as 700 ppm of phenol.

Citation Source: Chemical Abstracts 83(1):#4844q. 1975.

C-1736-75
PETROLEUM DEGRADATION IN LOW TEMPERATURE MARINE AND ESTUARINE ENVIRONMENTS

Traxler, R. W., and A. M. Cundell. 1975.
Annual Report No. 2, Report No. 98-01-4062-2, Contract N00014-68-A-0215-0013. 30 p.

Hydrocarbon metabolizing bacteria were still present in the winter in sediments from an oil spill site. The rate of biodegradation was 1 to 1.8 micrograms of hydrocarbon per gram of sediment per day. Fungi which metabolize petroleum hydrocarbons were also isolated.

Citation Source: Government Reports Announcements 75(11): #AD-A007 588/7GA. 1975.

C-1737-75
DEGRADATION OF PETROLEUM BY AN ALGA, PROTOTHECA ZOPFII

Walker, J. D., R. R. Colwell, and L. Petrakis. 1975.
Applied Microbiology 30(1):79-81.

Prototheca zopfii, an achlorophyllous algae which degrades oil, has been found to degrade 10 and 40% of motor oil and crude oil under appropriate conditions. This study found P. zopfii to degrade a greater percentage of the aromatic hydrocarbons in motor oil than of saturated hydrocarbons, and a greater percentage of saturated hydrocarbons in crude oil than of aromatics.

Citation Source: Citation Journal

C-1738-75
MICROBIAL DEGRADATION OF MODEL PETROLEUM AT LOW TEMPERATURES

Walker, J. D., and R. R. Colwell. 1974.
Microbial Ecology 1(2):63-95.

A correlation was found between the numbers of petroleum-degrading microorganisms isolated from two areas of Chesapeake Bay and the concentration of benzene-extractable material present in the waters. Petroleum degradation was measured when microorganisms isolated from samples were placed in a salts medium for optimal growth at 0°, 5° and 10° and in Chesapeake Bay water, which simulated natural conditions. Results indicated that utilization of model petroleum at low temperatures is a function of the types and numbers of microorganisms present in an original inoculum taken from seawater.

Citation Source: Environmental Health and Pollution Control 7(10): #2692. 1975.

C-1739-75
MICROBIAL ECOLOGY OF PETROLEUM UTILIZATION IN CHESAPEAKE BAY

Walker, J. D., and R. R. Colwell. 1974.
Technical Report, 1972-1974, Grant NSF-GD-31707. Contract N00014-67-A-0239-0027. 7 p.

Studies were conducted on petroleum degrading microorganisms collected from two stations in Chesapeake Bay; one station had 4-5 times the concentration of petroleum in water as the second station. The numbers of microorganisms were directly related to the concentration of oil in each water sample analyzed. The hydrocarbon-utilizing fungus Cladosporium resinae and actinomycetes comprised a large number of the hydrocarbon-utilizing isolates.

Citation Source: Government Reports Announcements 75(8): #AD/A-005 246/4GI. 1975.

C-1740-75
SOME EFFECTS OF PETROLEUM ON ESTUARINE AND MARINE MICROORGANISMS

Walker, J. D., and R. R. Colwell. 1975.
Canadian Journal of Microbiology 21(3):305-313.

A system composed of water from an environment free of oil, hydrocarbon substrate, and a sediment inoculum from an oil-contaminated site exhibited significantly more hydrocarbon degradation than a similar system with an inoculum from a non-oil contaminated site. Growth and cell yield of bacteria from non-contaminated sites were decreased when hydrocarbon substrate was added.

Biological effects of oil pollution

Citation Source: Citation Journal

C-1741-75
UTILIZATION OF MIXED HYDROCARBON SUBSTRATE BY PETROLEUM-DEGRADING MICROORGANISMS

Walker, J. D., H. F. Austin, and R. R. Colwell. 1975.
Journal of General and Applied Microbiology 21(1):27-39.

The ability of petroleum-degrading yeasts, fungi and bacteria to degrade a mixed hydrocarbon substrate is reported. Cumene, naphthalene, phenanthrene, pristane, 1,2-benzanthracene, perylene and pyrene were degraded by microorganisms. The patterns for hydrocarbon utilization were similar for bacteria, yeasts and fungi; however, utilization by individual isolates varied significantly.

Citation Source: Chemical Abstracts 83(1):#4843p. 1975.

C-1742-75
DYNAMICS OF THE DEGRADATION OF PHENOL IN THE SAINT LAWRENCE RIVER

Zoulalian, V., F. Bessou, A. Tessier, P. G. Campbell, S. A. Visser, and J. P. Villeneuve. 1974.
International Conference on Transportation of Persistent Chemicals in the Aquatic Ecosystem, II, Ottawa, Canada, 1974. p. 53-58.

Under favorable conditions, the concentration of phenolic substances decreases rapidly downstream of the Montreal oil refineries. Experiments demonstrated the biodegradation of PhOH and studied its kinetics. The Michaelis-Menten equation can be applied to these results.

Citation Source: Chemical Abstracts 83(8):#65111v. 1975.

2. PHYSICAL CHANGES OF OIL

C-1743-75
ADSORPTION OF POLAR ORGANIC MOLECULES AT OIL/WATER AND AIR/WATER INTERFACES

Aveyard, R., and J. Chapman. 1975.
Canadian Journal of Chemistry 53(6):916-925.

Several types of models were needed to describe the adsorption of several esters at alkane/water and air/water interfaces. Models using equations based both on two-dimensional gas and two-dimensional solution models have been tested for agreement with actual data.

Citation Source: Citation Journal

C-1744-75
EVAPORATIVE WEATHERING OF PETROLEUM RESIDUES: THE AGE OF PELAGIC TAR

Butler, J. N. 1975.
Marine Chemistry 3(1):9-21.

This paper discusses a simple semiquantitative model of evaporative weathering and its use in an attempt to determine the age of individual tar lumps. Application of the model to gas chromatograms of pelagic tar lumps collected near Bermuda indicate that most of these lumps were formed by fragmentation of much larger and older masses, some within one day of the collection time.

General fate of oil in the environment

Citation Source: Citation Journal

C-1745-75
THE INFLUENCE OF FREEZING-THAWING ON THE STABILITY OF CRUDE OIL-IN-WATER EMULSIONS

Chen, E. C. 1975.
The Journal of Canadian Petroleum Technology 14(2):38-41.

Four different crude oils at three freezing temperatures were examined. Results indicate that freezing-thawing causes an increase in the droplet size and lowers the oil-drop concentration in the emulsion.

Citation Source: Citation Journal

C-1746-75
THEORETICAL CALCULATIONS ON EXISTENCE OF COHESIVE FORCE AT OIL-WATER INTERFACE

Dastidar, S. G., B. C. Chatterjee, and K. Ghosh. 1975.
Colloid and Polymer Science 253(5):422-423.

Previously a cohesive force of the van der Waals type between the CH_2 groups of the neighboring hydrocarbon chain ions at oil/water interfaces was believed non-existent. However, a comparison of theoretical calculations with and without this force with laboratory measurements on two fatty acids indicates it does exist.

Citation Source: Citation Journal

C-1747-75
UNUSUAL FIRE HAZARD OF LNG TANKER SPILLS

Fay, J. A. 1975.
Applied Mechanics Reviews 28(5):705.

The spreading and evaporation rates of liquified natural gas spilled on water are estimated by dimensional analysis. A vapor cloud can be generated from the spill and downward drift of this cloud to land areas could result in its ignition and complete combustion.

Citation Source: Petroleum Abstracts 15(32):#209,305. 1975.

C-1748-75
THE EFFECTS OF CURRENTS AND WAVES ON AN OIL SLICK RETAINED BY A BARRIER

Hale, L. A., D. J. Norton, and C. A. Rodenberger. 1974.
U.S. Coast Guard Report, CG-D--53-75. 319 p.

Studies were made of the behavior of a thick slick, retained by a barrier, subjected to currents and waves and to the influence of various slick shield devices. Several new concepts of slick behavior resulted from the study, including a mathematical model describing the entrainment loss phenomena.

General fate of oil in the environment

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(5): #5Q5486. 1975.

C-1749-75
THE INFLUENCE OF EMULSIFIER CONCENTRATION ON THE DISPERSION STATE OF OIL-IN-WATER EMULSIONS STABILIZED WITH LECITHIN [English Abstract]

Kanatani, A., and M. Kakuta. 1975.
Journal of the Agricultural Chemical Society of Japan 49(2):75-79.

The diameter of the dispersed globules of kerosine-in-water emulsions decreased with increasing concentrations of lecithin. Salt had a minor effect on the emulsification.

Citation Source: Citation Journal

C-1750-75
THE ROLE OF MASS TRANSPORT IN OIL SLICK WEATHERING

Lassiter, J. B., III, R. J. Powers, and J. W. Devanney, III. 1974.
In: Primary, Physical Impacts of Offshore Petroleum Developments. MITSG 74-20. 45 p.

The vertical dispersion of soluble hydrocarbons beneath an oil slick was modeled mathematically. The stages of mass transfer of light aromatics from an oil slick were outlined. For a 0.1 cm thick slick, 90% of the benzene leaves in three hours; naphthalene remains in the slick for a much longer period. Diffusion studies indicate all compounds with less than C_9 will depart from the slick in an hour, mostly by evaporation. Compounds above C_9 eventually leave the slick through sedimentation and possible breaking waves.

Analysis

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(4): #5Q4307. 1975.

C-1751-75
EVAPORATION RATES OF OIL COMPONENTS

Regnier, Z. R., and B. F. Scott. 1975.
Environmental Science and Technology 9(5):469-472.

Gas chromatography was used to determine the rate constants for the evaporation of n-alkane components of Arctic Diesel 40, a No. 2 fuel oil. The evaporation was studied at several temperatures, at a constant wind speed. Such constants should aid in determining the oil remaining from spills on ice and water.

Analysis

Citation Source: Petroleum Abstracts 15(29):#208,153. 1975.

C-1752-75
DETERMINATION OF THE LEEWAY OF OIL SLICKS

Smith, C. L. 1974.
Final Report, VIMS-Contrib-644, USCG-D-60-75, CGR/DC-30/75, Contract DOT-CG-33183-A.

Aerial photography of the separation of oil slicks from a dyed patch of surface water at sea was used to calculate leeway. Wind speed and sea state were large factors in determining leeway; oil type and spill volume were not.

Citation Source: Government Reports Announcements 75(10): #AD/A-006 822/1GA. 1975.

C-1753-75
ELECTROLYTE COAGULATION AND STABILITY OF CALCIUM CAPRYLATE STABILIZED O/W EMULSIONS

Varma, R. P., P. Bahadur, and P. Bahadur. 1975.
Colloid and Polymer Science 253(2):132-138.

Studies of the coagulation of calcium caprylate coated negative xylene molecules dispersed in water in the presence of a few metal cations are described.

Cleanup and recovery

Citation Source: Petroleum Abstracts 15(27):#207,565. 1975.

C-1754-75
A NUMERICAL MODEL OF DROPLET ENTRAINMENT FROM A CONTAINED OIL SLICK

Zalosh, R. G. 1974.
Final Report, USCG-D-65-75, Contract DOT-DG-41822-A. 83 p.

"A theoretical analysis of oil droplet entrainment from a contained oil slick moving relative to water has been performed as a function of relative oil-water velocity." The completed and measured critical velocities for entrainment agree.

Citation Source: Government Reports Announcements 75(10): #AD/A-006 600/1GA. 1975.

3. GENERAL FATE OF OIL

C-1755-75
THE SOURCES, FATES AND EFFECTS OF OIL IN THE SEAS

Ahearn, D. G. 1974.
Pollution and Physiology of Marine Organisms. F. J. Vernberg and W. B. Vernberg (eds.). New York, New York, Academic Press. p. 247-252.

Summary not available.

Citation Source: Current Contents, Life Sciences 18(11):21. 1975.

C-1756-75
THE FATE OF FOSSIL FUEL HYDROCARBONS IN MARINE ANIMALS

Corner, E. D. S. 1974.
A Discussion on Organic Pollutants in the Sea: Their Origin, Distribution, Degradation and Ultimate Fate,[London], 1974.

The importance of pollution as a source of certain hydrocarbons present in crude oil and detected in marine animals, algae and sediments is considered. The question of whether these compounds, especially polycyclic aromatic hydrocarbons, are transferred through the marine food web is discussed; evidence exists that they are taken up and then released by various animals.

Citation Source: Proceedings of the Royal Society of London, B, 189(1096):391-411. 1975.

C-1757-75
OIL IN THE ARCTIC

Hoult, D. P., S. Wolfe, S. O'Dea, and J. P. Patureau. 1975.
Final Report, USCG-D-96-75, Contract DOT-CG-12438-A. 218 p.

The results of several studies on the behavior of oil spilled in the Arctic and sound theories which have developed from these studies are described. The report includes research on evaporation, spreading and maximum extent of oil spilled on ice,and the behavior of oil spilled under ice.

Physical changes of oil in the environment

Citation Source: Government Reports Announcements 75(15): #AD-A010 269/9GA.

C-1758-75
SURVIVAL IN TOXIC ENVIRONMENTS

Khan, M. A. Q., and J. P. Bederka. 1974.
New York, Academic Press. 553 p.

The general fate, disposition and bio-environmental effects of chemical pollutants including polypolychlorinated biphenyls, acaricides, insecticides, nitrilotriacetic acid, crude and refined oils and CO, were examined at the symposium.

Biological effects of oil pollution

Citation Source: Biological Abstracts 60(5):#25204. 1975.

C-1759-75
TRANSFER OF ORGANICS FROM AN OIL FILM INTO WATER

Lysyj, I., and E. C. Russell. 1975.
National American Chemical Society Meeting, 169th, Philadelphia, 1975. 760 p. Paper No. ENVT 13, Abstract.

Summary not available.

Chemical changes of oil in the environment

Citation Source: Petroleum Abstracts 15(28) : Appendix A. 1975.

C-1760-75
INVESTIGATION OF SURFACE FILMS - CHESAPEAKE BAY ENTRANCE

MacIntyre, W. G., C. L. Smith, J. C. Munday, V. M. Gibson, and J. L. Lake. 1974.
U.S. Environmental Protection Agency, Technology Series, EPA 670/2-73-099, PB-232-968/8GA. 179 p.

Oil was released experimentally in Chesapeake Bay. Results include reasonable motion prediction, an explanation of the nonbiological initial aging of oil films and fair corroboration of a theoretical oil spreading model. Films natural to the area contained hydrocarbons at 300-500 μg/l and fatty acids and esters at 700-800 μg/l.

Physical changes of oil in the environment
Remote sensing

Citation Source: Pollution Abstracts 6(3):#75-02290. 1975.

C-1761-75
THE BEHAVIOR OF CRUDE OIL SPILLED ON SNOW

MacKay, D., P. J. Leinonen, J. C. K. Overall, and B. R. Wood. 1975.
Arctic 28(1):9-20.

Studies on the behavior of isothermal and hot oil spills on snow have revealed the following results: Alberta crude oil is readily absorbed by snow (0°) and contaminates about 0.01 m^2/l, a hot spill melts a channel in the snow and flows along the ground contaminating about 0.024 m^2/l, and considerable spreading of oil may occur during thaw. Flow regimes of oil into snow and cleanup implications are given.

Physical effects of oil pollution

Citation Source: Petroleum Abstracts 15(27):#207,584. 1975.

C-1762-75
OIL SPILLS IN THE ARCTIC OCEAN: EXTENT OF SPREADING AND POSSIBILITY OF LARGE SCALE THERMAL EFFECTS

Martin, S., and W. J. Campbell. 1974.
Technical Report, TR-28, Contract N00014-67-A-0103-0007. 6 p.

Oil transport by the large-scale motion of the ice pack, mixing of oil into the underlying water column, and difficulties in the cleanup of oil trapped in pressure ridges and undeformed ice are discussed in this report.

Physical changes of oil in the environment
Cleanup and recovery

Citation Source: Government Reports Announcements 75(7):
#AD/A-004 730/8GA. 1975.

C-1763-75
DISPERSION OF LIQUIFIED NATURAL GAS SPILLS

May, W. G., et al. 1973.
Hydrocarbon Processing 52(5):105-109.

Data from this study show that the dispersion of spilled LNG vapors and plumes can be predicted with reasonable accuracy.

Physical changes of oil in the environment

Citation Source: Fuel Abstracts and Current Titles 16(4):#2937.
1975.

C-1764-75
MEASUREMENT OF OIL SPILL DRIFT CAUSED BY THE COUPLES (sic) PARALLEL EFFECTS OF WIND AND WAVES

Reisbig, R. L., D. J. Alofs, R. C. Shah, and S. K. Banerjee. 1973.
Memoires de la Societe Royale des Sciences de Liege 6(6):67-77.

An experiment was designed to evaluate the significance of coupled wind and wave effects on oil spill drift. It was found that at low wind speed, the wave drift provides an augmentation to the wind drift. At higher wind speeds, the waves cause a net decrease in the coupled drift velocity. The wave-induced diminishment increases as the wind speed increases.

Citation Source: Petroleum Abstracts 15(30):#208,685. 1975.

C-1765-75
THE FATE OF SPILLED OIL IN THE SOIL

Somers, J. A. 1974.
Hydrological Sciences Bulletin 19(4) : 501-521.

"The behavior of spilled oil in the soil and subsoil was described in terms of known models for its movement and biochemical transformation."

Physical changes of oil in the environment
Chemical changes of oil in the environment

Citation Source: Selected Water Resources Abstracts 8(12): #W75-06266. 1975.

C-1766-75
OIL SPILL TRAJECTORY STUDIES FOR ATLANTIC COAST AND GULF OF ALASKA

Stewart, R. J., J. W. Devanney, III, and W. Briggs. 1974.
In: Primary, Physical Impacts of Offshore Petroleum Developments, MITSG 74-20. p. 213-403.

The likely behavior of oil spill trajectories emanating from potential production regions of the Atlantic outer continental shelf and Gulf of Alaska and three potential nearshore terminals (Buzzards Bay, Delaware Bay, Charleston Harbor) was investigated. Emphasis was placed on the probability of a spill coming ashore, the time to shore and the wind conditions at the time the spill first reaches shore.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(4): #5Q4306. 1975.

F. OIL POLLUTION REGULATIONS

1. STATE LEGISLATION

C-1767-75
LAWS RELATING TO MINERAL AND OTHER NON-ANIMAL RESOURCES

Anon. 1973.
Mississippi University, Law Center. MASGP-74-037, NOAA-75021809.
107 p.

The Mississippi State Oil and Gas Board and its duties, responsibilities and powers are discussed. The laws affecting oil pollution, oil storage, pipelines and gas and oil exploration are cited.

Citation Source: Government Reports Announcements 75(10): #COM-75-10324/2GA. 1975.

C-1768-75
THE NORTH CAROLINA OIL POLLUTION CONTROL LAW; A MODEL FOR STATE EFFORTS TO CURB POLLUTION OF THE SEA

Maxwell, J. V. 1974.
In: Emerging Ocean Oil and Mining Law. S. W. Wurfel (ed.).
North Carolina Sea Grant Publication, UNC-SG-74-02. p. 51-59.

The North Carolina Oil Pollution Control Act of 1973 supports federal legislation on water pollution. Specific provisions of the act are described. Despite the usefulness of state and federal legislation, a true solution to the problem lies in international law.

Citation Source: Pollution Abstracts 6(3):#75-02249. 1975.

2. U.S. LEGISLATION

C-1769-75
DRILLING INDEMNITY

Anon. 1975.
Environmental Action 7(5):8.

President Ford recently submitted to Congress legislation that would create a national liability system for oil spills. The bill would establish a $200 million domestic fund, taken from a 1 to 3¢ tax on each barrel of oil produced in navigable waters, to cover damage claims.

Citation Source: Citation Journal

C-1770-75
INTERNATIONAL COMPENSATION FUND FOR OIL POLLUTION DAMAGE

Anon. 1973.
U.S. Government Printing Office, Washington, D.C., Abstract No. 75-01691. 208 p.

Full texts are provided of the hearings to consider 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 S.841, the implementing legislation for the fund convention and the 1969 Civil Liability Convention.

Citation Source: Petroleum Abstracts 15(31):#208,976. 1975.

C-1771-75
LEGISLATION ENACTED FOR LICENSING OF DEEPWATER PORTS

Anon. 1975.
The Marine Newsletter 6(2):5-6.

U.S. legislation has been passed which authorizes the planning, construction and operation of deepwater oil terminals capable of offloading crude oil from supertankers off U.S. coasts. The legislation also provides for environmental protection, liability in case of oil spills and other matters.

Citation Source: Citation Journal

C-1772-75
NON-TRANSPORTATION OIL SPILL REGULATIONS

Anon. 1973.
Pollution Control Guide 3:19795-19797.

The regulations to prevent oil discharges into navigable waters, and to contain such discharges if they occur, will establish procedures and equipment requirements for owners or operators of facilities which drill, produce, refine, store, distribute or consume oil.

Industry standards and guidelines

Citation Source: Petroleum Abstracts 15(27):#207,589. 1975.

C-1773-75
POLLUTION CRACKDOWN NEARS

Anon. 1974.
Work Boat 31(5):39,47.

EPA and USCG regulations make it illegal to discharge bilge, ballast or waste water into navigable U.S. waters if it causes a sheen. Keene Corporation has designed a system which permits the overboard discharge of bilge as it accumulates and which provides printed evidence of the non-polluting status of the vessel.

Design and engineering

Citation Source: Pollution Abstracts 6(3):#75-02503. 1975.

C-1774-75
TANKER TROUBLE

Anon. 1975.
Environmental Action 7(3):7.

This article contains a discussion of the failure of the Ford administration to set regulations to govern design, construction and repair of tankers in order to protect the marine environment from oil. Regulations which are planned to become effective in the summer, 1975, would require separation of ballast water from oil cargo and would aid in reducing the one-million tons of oil spilled annually into the oceans due to operating procedures and mishaps.

Oil transfer and transport

Citation Source: Citation Journal

C-1775-75
VIRGINIA OIL STORAGE FACILITIES MUST HAVE SPILL PREVENTION PLANS

Anon. 1975.
Sea Technology 16(4):20.

Discussed in the article are the regulations published by the Environmental Protection Agency, January, 1974, requiring any facility with underground oil storage capacity of >1,320 gallons to have oil spill prevention plans.

Contingency planning

Citation Source: Citation Journal

C-1776-75
WATER REGULATIONS--LIABILITY LIMITS FOR SMALL ONSHORE STORAGE FACILITIES

Anon. 1973.
Pollution Control Guide 2:9221-9223, paragraph 8730-8735.

Regulations are given on size classifications and associated liability limits for small onshore oil storage facilities with a fixed capacity of 1,000 barrels or less. Unless there is willful misconduct within the knowledge of the owner, liability is assessed according to the barrel capacity and the above ground or below ground location of the facility.

Citation Source: Selected Water Resources Abstracts 8(13): #W75-06614. 1975.

C-1777-75
WATER REGULATIONS--OIL POLLUTION PREVENTION

Anon. 1974.
Pollution Control Guide 2:9215-9219; paragraph 8720-8727.

These regulations provide procedures, methods and other requirements for equipment to prevent oil discharges from non-transportation-related onshore and offshore facilities. Actual or potential polluters must draw up sound spill prevention control and counter-measure plans which must include containment equipment for possible oil discharges. Civil penalties are set forth for noncompliance of regulations.

Citation Source: Selected Water Resources Abstracts 8(13): #W75-06600. 1975.

C-1778-75
USCG SETS BROADER USE OF POLLUTION CONTROL SYSTEMS

Price, R. I. 1975.
Sea Technology 16(1):30-31.

The author discusses the new regulations established in July, 1974, for the prevention of discharges into the marine environment. Developments in pollution control systems, i.e., airborne oil surveillance systems and oil barrier systems, to aid in the enforcement of these regulations are described.

Monitoring
Cleanup and recovery

Citation Source: Citation Journal

C-1779-75
OIL AND WATER STILL DON'T MIX

Winchester, E. 1975.
Sierra Club Bulletin 60(7):19-21.

The actions taken by U.S. government and international agencies to reduce the number of oil tanker disasters and oil pollution of the sea from these crude carriers are discussed. The lines of action which the Sierra Club are following to promote stricter tanker regulations are listed.

International legislation

Citation Source: Citation Journal

3. INTERNATIONAL LEGISLATION

C-1780-75
EUROPEAN MODEL CODE OF SAFE PRACTICE FOR DEALING WITH OIL SPILLS AT SEA AND ON SHORE

Anon. 1974.
London, Applied Science Publishers, 1974. viii + 97 p.

This code was prepared by a working group made up of representatives from the European technical institutes concerned with petroleum. Treatment needs to consider oil type, and location and size of the spill. The two basic rules are: minimize the amount of oil reaching the sea, and deal with the oil while it is still afloat.

Citation Source: Marine Pollution Bulletin 6(5):66. 1975.

C-1781-75
NORTH SEA ICEBURG

Anon. 1974.
The Oilman, 26 October.

"The Norwegian Fisheries Minister, Jens Evenson, called for a North Sea safety code to be agreed upon by all countries with interest in the North Sea to ensure that oil pollution, should it occur, would be effectively controlled."

Citation Source: Fuel Abstracts and Current Titles 16(2):#1488. 1975.

C-1782-75
NEW DIRECTIONS IN THE LAW OF THE SEA

British Institute of International and Comparative Law. 1973.
Oceana Publications, Inc. 4 volumes.

These 4 volumes include the relevant international treaties, parts of national legislation or policy statements on pollution and environmental problems and territorial disputes. One volume contains the proceedings of a BIICL 1973 conference, "New Directions in the Law of the Sea." For details, write to BIICL, 32 Furnival St., London EC4A1JN.

Citation Source: Marine Pollution Bulletin 6(8):115. 1975.

C-1783-75
THE BALTIC. TO BE OR NOT TO BE?

de Castro, G. 1974.
Sea Frontiers 20(5):269-273.

As a result of the increasing pollution of the Baltic Sea, the Baltic countries have agreed to regulate the discharge of oil and refuse from ships and the disposal of waste water and industrial pollutants in the sea. Measures have also been taken to eliminate the ejection of pesticides into the Baltic.

Citation Source: Aquatic Sciences & Fisheries Abstracts 5(4): #5Q4295. 1975.

C-1784-75
RECENT DEVELOPMENTS IN THE LAW OF THE SEA V: A SYNOPSIS

Greenwald, D. L., R. A. Iglow, and J. I. Mann. 1974.
San Diego Law Review 11(3):691-732.

Among the pollution control measures reviewed for 1973 are oil pollution liability,marine survey of oil contamination in the open sea and various proposed and passed laws for domestic and international regulation and prevention of oil spills.

Citation Source: Pollution Abstracts 6(3):#75-02324. 1975.

C-1785-75
INTERNATIONAL COOPERATION FOR THE CONTROL OF OIL POLLUTION

Smith, G. E. 1974.
In: Emerging Ocean Oil and Mining Law. S. W. Wurfel (ed.). South Carolina Sea Grant Publication, UNC-SG-74-02. p. 12-20.

A review of present efforts by the international community to control oil pollution of the ocean is included. Among the expert recommendations for improvement are early adoption of international shipping safeguards.

Citation Source: Pollution Abstracts 6(3):#75-02248. 1975.

C-1786-75
LEGAL MEASURES CONCERNING MARINE POLLUTION

Wurfel, S. W. 1975.
UNC-SG-75-04, Grant NOAA-04-3-158-40. 85 p.

This paper documents new concepts and developments in marine pollution control and marine resources law. The quest for oil--a decisive force in the Law of the Arctic Sea pertaining to pollution--is one of the topics discussed.

Citation Source: Government Reports Announcements 75(16): #COM-75-10702/9GA. 1975.

4. FOREIGN LEGISLATION

C-1787-75
EUROPEAN ENVIRONMENTAL REGULATIONS

Anon. 1975.
The Hague, Netherlands, Stichting CONCAWE, No. 6/75.

This report is a survey of oil regulations in Western Europe. Regulations on gasoline quality, refinery effluent standards, construction and operation of oil pipelines, etc., are included. Available free from: Stichting CONCAWE, 60 Van Hogenhoucklaan, The Hague, 2018, Netherlands.

Citation Source: Marine Pollution Bulletin 6(8):116. 1975.

C-1788-75
EXISTING ENVIRONMENTAL REGULATIONS OF CONCERN TO THE OIL INDUSTRY IN WESTERN EUROPE

Anon. 1974.
CONCAWE Report No. 2/74. 14 p.

Legislation and regulations concerning the following are compiled: standard specifications and legal limits on sulphur contents of fuel oils and gasoline composition/quality, and regulations on refinery effluents in France.

Citation Source: Reports Produced by the Secretariat or Working Group Members of Stichting CONCAWE. Report 1/75. Abstract #103. 1975.

C-1789-75
EXISTING ENVIRONMENTAL REGULATIONS OF CONCERN TO THE OIL INDUSTRY IN WESTERN EUROPE

Anon. 1974.
CONCAWE Report No. 7/74. 30 p.

Legislation and regulations concerning the following are compiled: standard specifications and legal limits on sulphur contents of fuel oils, gasoline consumption/quality, and environmental noise control; light duty gasoline engine vehicle emission regulations; reference list for design, construction and operation of oil pipelines in western Europe, and regulations on refinery effluents in France.

Citation Source: Reports Produced by the Secretariat or Working Group Members Stichting CONCAWE. Report 1/75. Abstract #109. 1975.

C-1790-75
INTERNATIONAL LAW APPLIED TO CHEMICAL SEA POLLUTION [English Summary]

Bertrand, A. R. V. 1973.
Institute Francais du Petrole, Revue, et Annales des Combustibles Liquides, Paris, 28(6):813-842.

This article attempts to relate the stages in the evolution of jurisprudence concerning chemical pollution of the seas by hydrocarbons and other sources, and to foresee future developments.

Citation Source: Marine Geology 19(1):61.

C-1791-75
OIL SPILL PROTECTION IN THE BALTIC SEA

Ladner, L., and A. Hagstrom. 1975.
Journal Water Pollution Control Federation 47(4):796-809.

Following an agreement between Baltic Sea countries and strict legislation enacted by Sweden concerning the discharge of oil into its waters, a program to combat oil spills was undertaken and is now partially complete. An oil spill research group has been formed by various Swedish governmental agencies.

International legislation

Citation Source: Petroleum Abstracts 15(27):#207,586. 1975.

5. INDUSTRY STANDARDS AND GUIDELINES

C-1792-75
INDUSTRIALIZATION AND PROTECTION OF THE ENVIRONMENT. THE EXAMPLE OF THE PORT OF LE HAVRE: A PRACTICAL ILLUSTRATION OF CARE TAKEN TO RECONCILE THESE TWO OBJECTIVES

Anon. 1974.
Navigat. Ports Industr. 16:525-530.

The completed or continuing projects and programs for the control and prevention of pollution that have been implemented by municipal and industrial organizations in Le Havre, France, are reviewed. Included are the efforts made by the petroleum industry to reduce and control gaseous, liquid and solid waste pollution.

Citation Source: Environmental Health and Pollution Control 7(7): #1899. 1975.

C-1793-75
WHERE DO WE STAND

Anon. 1974.
Ecolibrium 3(4):12.

An outline is provided listing Shell Oil Company's policies regarding environmental conservation.

Citation Source: Citation Journal

C-1794-75
ENVIRONMENTAL MANAGEMENT - AN INTEGRAL PART OF THE ECONOMIC, POLITICAL, AND TECHNICAL ASPECTS OF PETROLEUM DEVELOPMENT

Becker, H. W. 1975.
Petroleum Society of CIM Technical Meeting, 26th, Banff, 1975. Preprint No. CIM 75-15. 4 p.

The author discusses the programs and policies developed by the petroleum industry to insure the inclusion of environmental planning in all phases of industrial activity. It is emphasized that environmental management should be a part of the economic, political and technical aspects of industrial projects from the start to the final operation.

General effects of oil prospecting and production

Citation Source: Petroleum Abstracts 15(31):#208,980. 1975.

C-1795-75
EVOLUTION OF TECHNOLOGY AND TRAINING IN OFFSHORE OPERATIONS

Chace, R. N. 1975.
SPE of AIME California Regional Meeting, 45th, Ventura, 1975.
Preprint No. SPE-5351. 4 p.

The paper is an account of chronologic events and interactions of organizations to establish standards and training criteria to prevent any hazard that can result from offshore oil development. Studies conducted by the U.S. Geological Survey, the American Petroleum Institute and the Western Oil and Gas Association Offshore Operations Committee are presented.

Citation Source: Petroleum Abstracts 15(22):#205,595. 1975.

C-1796-75
WATER QUALITY REQUIREMENTS FOR THE PETROLEUM INDUSTRY

Evers, R. H. 1975.
Journal of the American Water Works Association 67(2):60-64.

The following topics are included in the review: relations between raw water used and total water requirements, current reuse practices, water qualities encountered and water-quality requirements, current treatment practices and the effect of effluent standards.

U.S. legislation

Citation Source: Chemical Abstracts 82(22):#144683r. 1975.

C-1797-75
DEVELOPMENT DOCUMENT FOR EFFLUENT LIMITATIONS GUIDELINES AND NEW SOURCE PERFORMANCE STANDARDS FOR THE PETROLEUM REFINING POINT SOURCE CATEGORY

Halper, M. 1974.
Final Report, EPA/440/1-74-014a. 207 p.

Findings are presented of an extensive study of the Petroleum Refining Industry to develop effluent limitation guidelines, standards of performance and pretreatment standards to implement sections of the Federal Water Pollution Control Act of 1972.

U.S. legislation

Citation Source: Government Reports Announcements 75(8):
#PB-238 612/6GA. 1975.

C-1798-75
STANDARDS FOR EFFECTIVE OILY WASTE CONTROL

McDoniel, S. T., Sr. 1973.
Industrial Oily Waste Control. American Petroleum Institute Publication. p. 13-22.

The following aspects of water standards are included in the paper: variation of standards governing oily waste, determining applicable standards and enforcement and responsibility.

Citation Source: Environmental Health and Pollution Control 7(9):#2560. 1975.

F. BIBLIOGRAPHIES

C-1799-75
STICHTING CONCAWE REPORTS

Anon. 1975.
Marine Pollution Bulletin 6(4):54.

Stichting Concawe is a permanent international study group which was established in 1963 by the oil companies to keep watch on conservation measures for clean air and water. An index of all their reports covering all aspects of the oil industry has been published as Report No. 1/75.

Citation Source: Citation Journal

C-1800-75
ENVIRONMENTAL LITERATURE: A BIBLIOGRAPHY

Bennett, G. F., and J. C. Bennett. 1973.
Noyes Data Corporation. 139 p.

All aspects of pollution and pollution control are covered. Abstracts, card services, "trailing microfiche" publications, etc., are listed in addition to books, pamphlets and journals. The subject categories include water, air, solid waste, environmental, film lists, and periodicals.

Citation Source: Pollution Abstracts 6(3):#75-03091. 1975.

C-1801-75
OFFSHORE DRILLING (A BIBLIOGRAPHY WITH ABSTRACTS)

Habercom, G. E., Jr. 1975.
Report for 1964-June 1975. 121 p.

This research report contains 116 abstracts covering drilling procedures, equipment, environmental aspects and legal implications involved in oceanic mineral resources recovery.

General effects of oil prospecting and production

Citation Source: Government Reports Announcements 75(17):
#NTIS/PS-75/540/5GA. 1975.

C-1802-75
SUPERTANKER AND SUPERPORTS (A BIBLIOGRAPHY WITH ABSTRACTS)

Habercom, G. E., Jr. 1975.
Report for 1964 to June 1975. 86 p.

The research report provides a review of the construction and operation of supertankers, the requirements for port facilities and the environmental aspects.

General effects of oil prospecting and production

Citation Source: Government Reports Announcements 75(16): #NTIS/PS-75/510/8GA.

C-1803-75
BIODETERIORATION OF OIL SPILLS (A BIBLIOGRAPHY WITH ABSTRACTS)

Lehmann, E. J. 1975.
Report for 1964-October 1974. 86 p.

Eighty-one abstracts are included which deal with studies on microbiology, beach cleanup, oil spill removal and the degradation products of oil.

Biological degradation

Citation Source: Government Reports Announcements 75(7): #NTIS/PS-75/152/9GA. 1975.

C-1804-75
THE BIOLOGICAL EFFECTS OF OIL SPILLS (A BIBLIOGRAPHY WITH ABSTRACTS)

Lehmann, E. J. 1975.
Report for 1964-October 1974. 112 p.

One-hundred-seven abstracts are presented on the biological and ecological effects of oil spills in salt and fresh waters. Studies include the effects of oil on microorganisms, plants and animals and also the residues and products of various oil components.

Biological effects of oil pollution

Citation Source: Government Reports Announcements 75(7): #NTIS/PS-75/118/OGA. 1975.

C-1805-75
WATER POLLUTION IN ESTUARIES AND COASTAL ZONES - A BIBLIOGRAPHY WITH ABSTRACTS

Lehmann, E. J. 1974.
NTIS/PS-74/099.

An NTIS on-line search retrieved 153 selected abstracts on research reports. Water pollution origin, prevention and control are among the topics. Pollution related to urbanization, coastal planning, etc. is included.

Citation Source: Pollution Abstracts 6(3):#75-02441. 1975.

C-1806-75
A BIBLIOGRAPHY ON MARINE AND ESTUARINE OIL POLLUTION. SUPPLEMENT

Marine Pollution Information Center. 1975.
Marine Biological Association, United Kingdom.

This volume is a supplement to the 1971 volume which covered the literature from 1866 to 1971. The supplement contains 1200+ references arranged in 30-40 subject sections with an author index. The subjects of legal and economic aspects of oil pollution, and seabirds are excluded.

Citation Source: Citation Journal

C-1807-75
WATER POLLUTION: MARINE AND ESTUARINE POLLUTION

Rush, D. J., T. J. Kauwling, and A. J. Mearns. 1975.
Water Pollution Control Journal 47(6):1617-1635.

This annotated bibliography covers nine subject headings among which are oil pollution, bioassays, microorganisms, chemical and physical oceanography. Estimates of total oil spilled or seeped are given. Methods of control of oil pollution are also covered.

Reporting
Cleanup and recovery

Citation Source: Petroleum Abstracts 15(35):#210,149. 1975.

C-1808-75
ADMINISTRATION: LAW

Smith, J. O., and R. A. Payne. 1975.
Water Pollution Control Journal 47(6):1796-1806.

This annotated bibliography covers the subject fields of federal and state water pollution control, judicial interpretation of the law, international, marine and agricultural water pollution, water resources management and sources of water pollution.

U.S. legislation
State legislation

Citation Source: Petroleum Abstracts 15(35):#210,141. 1975.

C-1809-75
OIL SPILL REMOVAL (A BIBLIOGRAPHY WITH ABSTRACTS)

Smith, M. G. 1975.
Report for 1964-June 1975. 207 p.

This bibliography contains 202 abstracts. The removal processes outlined are: oil water separators, skimmers, dispersants, adsorbents, flotation and combustion. References discussing oil spreading, droplet entrainment, prototype removal systems, equipment and costs are also included.

Cleanup and recovery

Citation Source: Government Reports Announcements 75(17):
#NTIS/PS-75/542/1GA. 1975.

C-1810-75
WASTE PROCESSING AND POLLUTION IN THE CHEMICAL AND PETROCHEMICAL INDUSTRIES (A BIBLIOGRAPHY WITH ABSTRACTS)

Werner, K. W., and E. J. Lehmann. 1975.
Report for 1964-June 1975. 217 p.

The following topics are included: control processes, pollution effects on air and water, economic factors, emissions and abatement strategies for the chemical and petrochemical industries.

Waste oil and waste water treatment
General effects of oil prospecting and production

Citation Source: Government Reports Announcements 75(17):
#NTIS/PS-75/541/3GA. 1975.

SECTION II. CURRENT STATUS OF RESEARCH PROJECTS APPEARING IN PREVIOUS REPORTS

A. OIL POLLUTION DETECTION AND EVALUATION

1. MONITORING

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, W-7405-ENG-48
Period: 7/74 to 6/75 Funds: Unknown

The Survey of Instrumentation for Environmental Monitoring is issued in four volumes; Volume 2 covers water monitoring and contains a section on oil and grease. It covers fresh, waste and saline waters (including estuaries) but excludes ocean waters. The survey centers primarily on oil and grease monitoring instruments, and includes relevant background information.

Information Source: S. L. Phillips, Lawrence Berkeley Laboratory, University of California, Berkeley, California 94720

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

This research effort is currently in the early stages of performance. The study represents a joint effort between NASA, the Virginia Institute of Marine Sciences and the Environmental Protection Agency. Prepared samples extracted from sea water and marine biota are to be furnished by VIMS and EPA for characterization by gas chromatograph-mass spectrometric methods. The instrumental systems and analysis methods necessary to perform the analyses have been developed and tested using prepared calibration standards and extracts from equilibrated oil-water mixtures. Completion of the characterization phase of the study is scheduled for September, 1975.

Information Source: J. E. Stitt, Director for Electronics, National Aeronautics and Space Administration, Langley Research Center, Hampton, Virginia 23665

R-279-74
AIRBORNE OIL SURVEILLANCE SYSTEM

Principal Investigator: Unknown
Performing Organization: U.S. Navy Research Laboratory, Washington, D.C. 20390
Supporting Agency: U.S. Department of Transportation, Coast Guard
Period: 7/74 to 6/75 Funds: Unknown

Various investigations and a series of airborne measurements were made of controlled ocean oil spills to develop a multifrequency passive microwave technique for the remote quantification of marine oil spills. This program is still continuing and plans for airborne measurements with a new passive microwave imaging system are scheduled for fall, 1975.

Reports and Publications

THE DETERMINATION OF OIL SLICK THICKNESS BY MEANS OF MULTI-FREQUENCY PASSIVE MICROWAVE TECHNIQUES

Hollinger, J. P. 1974.
Naval Research Laboratory, NRL Memorandum Report 2953.

An investigation was made of the techniques of multifrequency microwave radiometry used for the remote determination of thickness and volume of sea-surface oil spills. Aircraft-borne studies of 15 controlled marine oil spills (eight conducted under calm sea conditions and seven under rougher sea and higher wind conditions) revealed oil slick regions with thicknesses of 1 mm or more, surrounded by larger and thinner slicks containing very little oil.

THE DETERMINATION OF OIL SLICK THICKNESS BY MEANS OF MULTI-FREQUENCY PASSIVE MICROWAVE TECHNIQUES

Hollinger, J. P. 1973.
U.S. Coast Guard, Interim Report 7110-1.

The study's objective was to investigate the feasibility of remote determination of the thickness and areal extent of sea-surface oil slicks using a multifrequency passive microwave technique. The investigation was divided into three main areas: theoretical studies, the laboratory measurements program and the airborne measurements program. From these experiments, the technique was shown to be a useful tool in the confinement, control and cleanup of marine oil spills.

MEASUREMENTS OF THE DISTRIBUTION AND VOLUME OF SEA-SURFACE OIL SPILLS USING MULTIFREQUENCY MICROWAVE RADIOMETRY

Hollinger, J. P., and R. A. Mennella. 1973.
Naval Research Laboratory Report, NRL 7512.

Multifrequency passive microwave measurements from aircraft of eight controlled marine oil spills have revealed that over 90% of the oil was confined in a compact region with thickness greater than 1 mm and comprising less than 10% of the area of the visible slick. The application of microwave radiometry in measuring oil distribution thickness in sea-surface slicks is demonstrated.

OIL SPILLS: MEASUREMENTS OF THEIR DISTRIBUTIONS AND VOLUMES BY MULTIFREQUENCY MICROWAVE RADIOMETRY

Hollinger, J. P., and R. A. Mennella. 1973.
Science 181 (4094):54-56.

Using aircraft-borne multifrequency passive microwave techniques, sea-surface oil slicks can be measured for oil distribution, regions of thickness, and oil volume at any time under all weather conditions.

Information Source: J. P. Hollinger Naval Research Laboratory,
Washington, D.C. 20390

R-331-74
GENERAL WORKING AGREEMENT

Principal Investigator: Unknown
Performing Organization: Transportation Systems Center, Department of Transportation, 55 Broadway, Cambridge, Massachusetts 02142
Supporting Agency: U.S. Coast Guard, Department of Transportation
Period: 7/73 to 6/75 Funds: Unknown

The subject of the project currently active is "Development of a Remote Sensor for Oil Detection and Classification."

Reports and Publications

AN INVESTIGATION OF OIL FLUORESCENCE AS A TECHNIQUE FOR THE REMOTE SENSING OF OIL SPILLS

Fantasia, J. F., T. M. Hard, H. C. Ingrao. 1971.
U.S. Coast Guard, Final Report TSC-USCG-71-7.

Predictions of signal and background levels generated by a physical model of remote sensing of oil spills are compared to field experiments. Airborne detection, identification and quantification of oil spills at sea by laser-excited fluorescence are feasible with present equipment at all times of day.

THE REMOTE SENSING OF OIL SPILLS BY LASER EXCITED FLUORESCENCE

Fantasia, J. F., T. M. Hard, and H. C. Ingrao. 1972.
Institute of Environmental Sciences, New York, New York, 1972. 15 p.

Experiments performed on 29 crude and refined oils which are common in the marine environment demonstrate that laser excited fluorescence can detect oil films 0.2 micrometers thick, that the spectral signature of an oil is distinct, and that areal extent and thickness of a spill are also measurable with this technique.

THE DEVELOPMENT OF AN EXPERIMENTAL AIRBORNE LASER OIL SPILL REMOTE SENSING SYSTEM

Fantasia, J. F., and H. C. Ingrao. 1973.
Joint Conference on Prevention and and Control of Oil Spills, Washington, D.C., 1973. p. 101-115.

Laser stimulated oil fluorescence is used as a technique for remote detection and coarse oil classification of oil spills. Quantification is possible under certain conditions.

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, Michigan, 1974. Vol. 3:1711-1745

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.

AIRBORNE LASER REMOTE SENSOR FOR OIL DETECTION AND CLASSIFICATION, ENGINEERING REQUIREMENTS AND TECHNICAL CONSIDERATIONS RELEVANT TO A PERFORMANCE

Ingrao, H. C., M. F. Cartwright, and M. Yaffee. (In press).
Final Report. Transportation Systems Center.

THE DEVELOPMENT OF AN EXPERIMENTAL AIRBORNE LASER REMOTE SENSOR FOR OIL DETECTION AND CLASSIFICATION IN SPILLS

Ingrao, H. C., and J. F. Fantasia. (In press).
Final report. Transportation Systems Center.

Information Source: H. C. Ingrao, Transportation Systems Center, U.S. Department of Transportation, Kendall Square, Cambridge, Massachusetts 02142

3. ANALYSIS

R-179-74
OIL POLLUTION ANALYTICAL METHODS

Principal Investigator: Cram, S. P.
Performing Organization: U.S. Department of Commerce, National Bureau of Standards, Washington, D. C. 20234
Supporting Agency: U.S. Department of Commerce, Maritime Administration, No. 3109499
Period: 7/72 to 6/73 Funds: $90,000

Reports and Publications

DROP SAMPLER FOR OBTAINING FRESH AND SEA WATER SAMPLES FOR ORGANIC COMPOUND ANALYSIS

Gump, B. H., H. S. Hertz, W. E. May, S. N. Chesler, S. M. Dyszel, and D. P. Enagonio. 1974.
Analytical Chemistry 47(7):1223.

The design and operation of a water sampling device which allows the analyst to obtain shallow and deeper water samples that are free from contamination by surface compounds are described.

CHROMATOGRAPHIC ANALYSIS OF HYDROCARBONS IN MARINE SEDIMENTS AND SEAWATER

May, W. E., S. N. Chesler, S. P. Cram, B. H. Gump, H. S. Hertz, D. P. Enagonio, and S. M. Dyszel. (In Press)
Preprint: Journal of Chromatographic Science.

A method of hydrocarbon analysis has been developed which involves dynamic headspace sampling for volatile hydrocarbon components of the sample followed by coupled-column liquid chromatography for the non-volatile components.

Information Source: H. S. Hertz, Analytical Chemistry Division, U.S. Department of Commerce, National Bureau of Standards, Washington, D.C. 20234

R-021-74
MOVEMENT OF SPILLED OR LEAKING OIL IN SOIL

Principal Investigator: Dracos, T.
Performing Organization: Eidgenossische Tech, Hoch, Zurich, Switzerland
Supporting Agency: None reported
Period: 7/72-6/73 Funds: $5,263

Reports and Publications

DAS VERHALTEN UND DIE BEWEGUNG VON NICHTMISCHBAREN FLÜSSIGKEITEN IM UNTERGRUND [In German]

Dracos, Th. 1968.
Monatsbulletin 10:293-305.

No summary available.

EXPERIMENTAL INVESTIGATION ON THE MIGRATION OF OIL PRODUCTS IN UNCONFINED AQUIFERS

Dracos, Th. 1969.
Gezondheidstechniek 5:G45-G50.

The capillary forces which are active at the interface of two immiscible fluids can be utilized in planning protective measures for aquifers. Experiments have also indicated that phreatic lime strongly influences oil migration and greatly complicates the theoretical treatment of the problem. Methods of measurement which will lead to workable solutions have been started.

PROTECTION OF AQUIFERS AGAINST PETROLEUM POLLUTION IN SWITZERLAND

Dracos, Th.
No citation given.

The protective measures against contamination of aquifers are described by means of two examples: a compacted delaying layer under ballast which allows the dredging of contaminated soil materials before the oil can reach groundwater, and a system of wells which forms a depression of the groundwater table toward the interior of the refinery area and prevents contaminated groundwater from flowing out of this area.

Information Source: Th. Dracos, Eidgenössische Technische Hochschule Zürich, Institute für Hydromechanik und Wasserwirtschaft.

R-283-74
PETROLEUM CONTAMINATION - QUANTIFICATION AND PASSIVE TAGGING IN ORGANISMS AND SEDIMENTS

Principal Investigator: J. W. Farrington
Performing Organization: Woods Hole Oceanographic Institution, Main St., 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

The Environmental Protection Agency grant was planned to terminate on September 30, 1975.

Reports and Publications

ANALYTICAL TECHNIQUES FOR THE DETERMINATION OF PETROLEUM CONTAMINATION IN MARINE ORGANISMS

Farrington, J. W. 1973.
Technical Report (WHOI-73-57), Contract N00014-66-C0241; NR 083-004. 23 p.

The composition of hydrocarbons in petroleum and isolated from marine organisms was studied in an effort to select optimum analytical techniques for the detection of petroleum contamination in marine organisms.

SOME PROBLEMS ASSOCIATED WITH THE COLLECTION OF MARINE SAMPLES AND ANALYSIS OF HYDROCARBONS

Farrington, J. W. 1974.
Technical Report (WHOI-74-23), Contract N00014-66-C0241; NR 083-004.
NTIS Report AD-777 695/8WP. 24 p.

The author discusses the problems associated with collecting and analyzing hydrocarbon samples under contaminant-free conditions, and the use of accurate techniques "intercalibrated" with other laboratories.

PETROLEUM HYDROCARBONS AND FATTY ACIDS IN WASTEWATER EFFLUENTS

Farrington, J. W., and J. G. Quinn. 1973.
Journal Water Pollution Control Federation 45(5):704-712.

The concentration and types of hydrocarbons and fatty acids in the effluents of three wastewater treatment plants were analyzed. These analyses confirm that considerable quantities of petroleum hydrocarbons (28,000-140,000 metric tons) are being discharged to coastal waters by wastewater effluents. The effects of these chronic oil inputs are unknown.

PETROLEUM HYDROCARBONS IN NARRAGANSETT BAY: I. SURVEY OF HYDROCARBONS IN SEDIMENTS AND CLAMS (MERCENARIA MERCENARIA)

Farrington, J. W., and J. G. Quinn. 1973.
Estuarine and Coastal Marine Science 1(1):71-79.

Results from analyses of hydrocarbons in surface sediments from eight stations and in clams, *M. mercenaria*, from three stations in Narragansett Bay have shown that both contain a complex mixture of hydrocarbons which is not present in clams from a relatively unpolluted pond. The most probable source of the hydrocarbons is petroleum pollution from sewage effluent and small oil spills.

ANALYSIS OF HYDROCARBONS IN MARINE ORGANISMS: RESULTS OF IDOE INTERCALIBRATION EXERCISES

Farrington, J. W., J. M. Teal, J. G. Quinn, P. C. Parker, J. K. Winters, T. L. Wade, and K. Burns. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Gaithersburg, Maryland, 1974. NBS Special Publication 409.

Four participating laboratories analyzed the hydrocarbons in a tuna meal sample provided as a working intercalibration sample by the National Bureau of Standards. The methods of analysis were not specified; each laboratory used the analytical techniques employed in the respective laboratory. Comparisons are made of resulting concentrations of resolved or partially resolved peaks, unresolved complex mixture and total hydrocarbons obtained in the four laboratories.

INTERCALIBRATION OF ANALYSES OF RECENTLY BIOSYNTHESIZED HYDROCARBONS AND PETROLEUM HYDROCARBONS IN MARINE LIPIDS

Farrington, J. W., J. M. Teal, J. G. Quinn, T. Wade, and K. Burns. 1973.
Bulletin of Environmental Contamination and Toxicology 10(3):129-136.

An intercalibration study was made to determine the accuracy and precision of hydrocarbon analyses being made in different laboratories. Analyses from three laboratories showed agreement in their measurements of hydrocarbons in marine lipids.

Information Source: J. W. Farrington, Woods Hole Oceanographic Institution, Woods Hole, Massachusetts 02543

R-002-74 (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, Cincinnati, Ohio
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 15AJA04, Contract 72P18089
Period: 7/74 to 6/75 Funds: Unknown

Reports and Publications

CHARACTERIZATION AND IDENTIFICATION OF SPILLED RESIDUAL FUEL OILS BY GAS CHROMATOGRAPHY AND INFRARED SPECTROPHOTOMETRY

Kawahara, F. K. 1972.
Journal of Chromatographic Science 10:629-636.

This paper described methods developed in the last two years for the characterization and identification of heavy residual fuel oil pollutants found in surface waters. Four gas chromatographic techniques, an infrared analytical procedure and a new electron capture detector gas chromatographic procedure are discussed.

GAS CHROMATOGRAPHIC ANALYSIS OF MERCAPTANS, PHENOLS, AND ORGANIC ACIDS IN SURFACE WATERS WITH USE OF PENTAFLUOROBENZYL DERIVATIVES

Kawahara, F. K. 1974.
Environmental Science and Technology 5(3):235-239.

By use of a sensitive method which converts unidentified mercaptans, phenols and organic acids to pentafluorobenzyl thioethers, ethers and esters, respectively, traces of these compounds can be identified and quantitatively measured by electron capture gas chromatography. The applicability of this new derivative method for actual field sample analyses is demonstrated.

IDENTIFICATION AND DIFFERENTIATION OF HEAVY RESIDUAL OIL AND ASPHALT POLLUTANTS IN SURFACE WATERS BY COMPARATIVE RATIOS OF INFRARED ABSORBANCES

Kawahara, F. K. 1969.
Environmental Science and Technology 3(2):150-153.

The objective of this paper was to develop a suitable analytical procedure which would permit rapid characterization and identification of heavy residual oil, and to distinguish the residual oil from the asphalt in a mixture. By comparative ratios of infrared absorbances, the identification of unknown samples was established. Samples from seven petroleum companies were tested using this new method for rapid characterization.

RECENT DEVELOPMENTS IN THE IDENTIFICATION OF ASPHALTS AND OTHER PETROLEUM PRODUCTS

Kawahara, F. K. 1974.
Marine Pollution Monitoring (Petroleum), National Bureau of Standards, Gaithersburg, Maryland, 1974. NBS Special Publication 409. p. 145-148.

Electron capture detector gas chromatography has been successfully applied to the analysis of minor components, such as phenols and mercaptans, present in asphalts. These analyses can provide _prima facie_ legal evidence of the source of pollution.

CHARACTERIZATION OF OIL SLICKS ON SURFACE WATERS

Kawahara, F. K., and D. G. Ballinger. 1970.
I&EC Product Research and Development 9(4):553-558.

Several unidentified oil samples collected from the surface waters of the U.S. were analyzed by the method of ratios of infrared absorbance, using six wave numbers. The characterization findings were confirmed with data provided by classical methods.

OIL IDENTIFICATION: STATE OF THE ART

Kawahara, F. K., and E. C. Julian. 1973.
News of Environmental Research in Cincinnati, U.S. Environmental Protection Agency.

The measurement of major and minor components, trace elements, spectral properties and physical properties of spilled oil is the major approach to source identification. The present state of the art is promising but more sophistication will be required with the advent of multiple oil spills and overlap of old and new spills.

CHARACTERIZATION OF HEAVY RESIDUAL FUEL OILS AND ASPHALTS BY INFRARED SPECTROPHOTOMETRY USING STATISTICAL DISCRIMINANT FUNCTION ANALYSIS

Kawahara, F. K., J. F. Santner, and E. C. Julian. 1974.
Analytical Chemistry 46(2):266-273.

A statistical technique has been developed to distinguish between such heavy petroleum products as asphaltic materials and residual fuel oils. It uses IR spectrophotometry, data treatment and transformation and discriminant function analysis.

Information Source: F. K. Kawahara, U.S. Environmental Protection Agency, National Environmental Research Center, Cincinnati, Ohio

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, Cincinnati, Ohio
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 16AJA 03, Contract 72P18088
Period: 7/74 to 6/75 Funds: Unknown

See R-002-74 for Reports and Publications.

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, Cincinnati, Ohio
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development
Period: 7/74 to 6/75 Funds: Unknown

See R-002-74 for Reports and Publications.

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

The oil pollution project has been completed.

Reports and Publications

PARTICULATE OIL SPILL RECOVERY. 1, OIL SORPTION PROPERTIES OF PLASTIC FOAMS

Gumtz, G. D., and T. P. Meloy. 1975.
International Journal of Mineral Processing 2(1975):151-161.

Combining dimensional and mathematical analysis with experimental data on the absorbancy, recovery and removal of oil in water by reusable, reticulated polyurethane foams, a mathematical model of foam sorption efficiency and rate is developed. The model shows the foam sorption system to be practical. Oil viscosity, wave height, recovery ship speed and system geometry influence foam selection.

Information source: T. P. Meloy, Divison Director for Engineering, National Science Foundation, Washington, D. C. 20550

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 direct work is being conducted on oil pollution. A study was made on the feasibility of using carbon-14-tracer labelled material to measure the uptake and loss of benz-a-pyrene by fish in laboratory aquaria. No reports have been published.

Information Source: N. T. Mitchell, Ministry of Agriculture, Fisheries and Food, Fisheries Radiobiological Laboratory, Hamilton Dock, Lowestoft, Suffolk NR32 1DA, England

R-187-74 (RENEWAL)
DEVELOP METHOD FOR OIL FINGERPRINTING BY NEUTRON ACTIVATION ANALYSIS

Principal Investigator: R. V. Moore
Performing Organization: U.S. Environmental Protection Agency, Southeast Environmental Research Laboratory, Athens, Georgia 30601
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 24AAP-05
Period: 7/74 to 6/75 Funds: $17,500

The project is no longer being conducted by the Environmental Protection Agency Southeast Environmental Research Laboratory.

Information Source: R. V. Moore, U.S. Environmental Protection Agency, Southeast Environmental Research Laboratory, Athens, Georgia 30601

R-289-74
ANALYSIS OF WATER FOR POLYCYCLIC AROMATIC HYDROCARBONS (PAH)

Principal Investigator: Unknown
Performing Organization: Water Research Centre, Medmenham Laboratory, Medmenham, London, United Kingdom
Supporting Agency: United Kingdom Government
Period: 7/74 to 6/75 Funds: Unknown

Work on aspects of oil pollution has now ceased at the Medmenham Laboratory of the Water Research Centre. Two reports have been produced from the work. The study on polycyclic aromatic hydrocarbons (PAH) is not directly concerned with oil pollution. Data are being gathered on levels of PAH in drinking water using the World Health Organization recommended method based on TLC and evaluating improved techniques.

Reports and Publications

ANALYSIS OF OIL POLLUTANTS IN SURFACE WATERS

Water Research Association. 1973.
WRA Technical Paper, TP. 94.

The main part of the report reviews the techniques for identifying, measuring and monitoring oil pollutants. Areas of investigation include: evaluation of gas chromatography in conjunction with capillary columns for identifying oil, effects of weathering on analysis, and the identification of lubricating oils by thin-layer chromatography of their additives.

THE APPLICATION OF CAPILLARY COLUMNS TO THE GAS CHROMATOGRAPHIC ANALYSIS OF INLAND-WATER OIL POLLUTANTS

Report not available.

Information Source: M. Fielding, Resources (A) Division, Water Research Centre, Medmenham Laboratory, P. O. Box 16, Ferry Lane, Medmenham, Marlow, Buckinghamshire, SL7 2HD, England

4. SOURCE IDENTIFICATION

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 research project will be completed in June, 1976. There are no publications to date.

Information Source: J. G. Quinn, University of Rhode Island, Graduate School of Oceanography, Kingston, Rhode Island 02881

B. OIL POLLUTION PREVENTION AND 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. 04-5158-6
Period: 7/74 to 6/75 Funds: $33,410

The development of a scrap tire floating breakwater has been completed. The breakwater can be used in coastal waters where the significant wave height does not exceed three to five feet. A number of these breakwaters have been and are being constructed in Narragansett Bay, Boston and Newfoundland. A paper describing this breakwater will be given at the Antipollution Conference, ANERAC, Sixth Annual North Eastern Regional Antipollution Conference, 1975. Research has begun to develop a scrap tire floating breakwater effective in waves of significant heights of 10 to 30 feet. The publication "1974 Floating Breakwaters Conference Papers," T. Kowalski (editor), can be obtained from the University of Rhode Island Marine Advisory Service, Narragansett Bay Campus, Narragansett, Rhode Island 02882 ($5.00 per copy).

Information Source: T. Kowalski, Department of Ocean Engineering, University of Rhode Island, Kingston, Rhode Island 02881

R-295-74
MECHANICAL CONTROL OF OIL SPILLS UTILIZING A STREAMLINED BOOM

Principal Investigator: Wooten, D.
Performing Organization: Ultrasystems Incorporated, Newport Beach, California 92660
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, Contract No. 68-03-0403
Period: 7/74 to 6/75 Funds: $47,460

This contract was granted from the EPA, No. 68-03-0403, and deals with Phases 2 and 3 of the development of the streamlined oil retention boom. Work was started in March, 1974 and will progress for 27 months. No reports have yet been published.

Information Source: B. A. Folsom, Ultrasystems, Incorporated, 500 Newport Center Dr., Newport Beach, California 92660

2. CLEANUP AND RECOVERY

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

AiResearch currently has a contract with the Department of the Navy, Naval Sea Systems Command, Contract No. N00024-74-C-5314. Phase I of this contract is scheduled to be completed by November, 1975, and is to conduct research, develop, fabricate and test a 10-gpm experimental bilge oil removal system.

Information Source: G. T. Byer, AiResearch Manufacturing Company, Torrance, California 90509

R-299-74
FAST CURRENT OIL RESPONSE SYSTEM

Principal Investigator: Unknown
Performing Organization: Seaward Incorporated, 6269 Leesburg Pike, Falls Church, Virginia 22044
Supporting Agency: U.S. Department of Transportation, Coast Guard
Period: 7/74 to 6/75 Funds: Unknown

The final report of the project has been completed and will be available from NTIS.

Reports and Publications

DEVELOPMENT OF A STREAMING FIBER OIL SPILL CONTROL CONCEPT

Beach, R. L., and F. A. March. 1975.
Final Report, Contract DOT-CG-40, 217-A.

This oil spill control concept, developed by Seaward, Incorporated, utilizes long, continuous fibers that stream out into the current to slow down and thicken spilled oil. Conventional techniques can then be used to recover the contained oil. The method is simple and effective in currents up to 10 knots.

Information Source: R. L. Beach, Seaward International, Suite 204, 6269 Leesburg Pike, Falls Church, Virginia 22044

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: U.S. Department of Transportation, Coast Guard
Period: 9/73 to 6/74 Funds: Unknown

The oil pollution project was completed and a final report prepared in 1974. No published copies of the report are available at this time.

Information Source: N. A. Hamlin, Webb Institute of Naval Architecture, Crescent Beach Rd., Glenn Cove, New York 11542

R-301-74
OIL ENTRAINMENT LOSSES

Principal Investigator: Unknown
Performing Organization: Rensselaer Polytechnic Institute, Troy, New York 12181
Supporting Agency: U.S. Department of Transportation, Coast Guard
Period: 8/73 to 9/74 Funds: Unknown

The study is in the process of being completed. The final report is due 1 December 1975.

Reports and Publications

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.

The Pollution Incident Reporting System (PIRS) contains information as to where and when a 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.

A RISK-ANALYTIC APPROACH TO CONTROL OF LARGE-VOLUME OIL SPILLS

Paulson, A. S., A. D. Schumaker, and W. A. Wallace. 1975. Conference on Prevention and Control of Oil Pollution, San Francisco, 1975.

Large-volume oil spills happen more often than is predicted using traditional methods. Long, thick-tailed probability distributions more accurately fit the USCG data file on oil spills. Accurate predictions of oil spill volumes will enable MEP program management to more effectively allocate resources and devise operational guidelines for field units.

Information Source: W. A. Wallace, Public Management, Rensselaer Polytechnic Institute, Troy, New York 12181

3. WASTE OIL AND WASTE WATER TREATMENT

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 73069
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 12050 DKF, Contract 72P20807
Period: 7/74 to 6/75 Funds: Unknown

The project "Evaluation of Waste Waters from Petroleum and Coal Processing" is complete; however, no other papers have currently resulted from the study.

Information Source: L. Streebin, University of Oklahoma, School of Civil Engineering and Environmental Science, 202 W. Boyd St., Rm. 334, Norman, Oklahoma 73069

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: Department of the Navy, Office of Naval Research
Period: 7/72 to 6/73 Funds: Unknown

The project has been completed and a final report is available. No papers have been published.

Information Source: B. D. Church, Chemical Division, University of Denver, Denver Research Institute, University Park, Denver, Colorado 80210

4. PERSONNEL TRAINING AND EDUCATION

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: $37,000

Reports and Publications

PETROLEUM ENTERPRISES IN WESTERN WASHINGTON--WHO IS LOOKING AHEAD?

An interdisciplinary study was conducted by the Marine Technology Affairs Seminar, Program in Social Management of Technology, University of Washington, Seattle, June, 1974 (revised September, 1974).

WASHINGTON HARBORS AND REGIONAL FACILITIES: CHOICES FOR THE FUTURE

An interdisciplinary study was conducted by the Marine Technology Affairs Seminar, Program in Social Management of Technology, University of Washington, Seattle, WSG-MP 74-1, May, 1974.

Information Source: E. Wenk, Jr., University of Washington, Program in Social Management of Technology, Seattle, Washington 98195

C. EFFECTS OF OIL POLLUTION

1. BIOLOGICAL EFFECTS

R-066-74 (RENEWAL)
DEMONSTRATION OF OILY WASTE DISPOSAL BY SOIL CULTIVATION PROCESS

Principal Investigator: Baldwin, B.
Performing Organization: Shell Oil Company, Deer Park, Texas
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 12050 EZG, Contract 72P21245
Period: 7/74 to 6/75 Funds: Unknown

The demonstration project ended in 1973 when the experimental site was returned to routine soil cultivation of refinery wastes. The report "Oily Waste Disposal by Soil Cultivation Process," by C. B. Kincannon, resulted from the study. This publication is one of the Environmental Protection Technology Series and is available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402.

Information Source: R. V. Mattern, Environmental Conservation, Shell Oil Company, P. O. Box 100, Deer Park, Texas 77536

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

<u>Reports and Publications</u>

RESEARCH ON THE EFFECTS OF CRUDE OIL TRANSFER AND UPSTREAM REFINERIES ON DELAWARE BAY

College of Marine Studies, University of Delaware. 1975. Progress Report, NSF/FANN, Grant GI 41896.

Research under this grant was divided into three projects: a planning grant, development of a biological baseline, and development of a predictive model for oil spill movement. This progress statement reports on the research projects which were initiated in the planning project division of the grant. Ten reports concerning marine affairs and marine biology and geology are included.

Information Source: R. B. Biggs, College of Marine Studies, University of Delaware, Newark, Delaware 19711

R-215-74 (RENEWAL)
FAUNAL RELATIONSHIPS TO HYDROCARBONS

Principal Investigator: Farragut, R. N.
Performing Organization: U.S. Department of Commerce, Miami Fisheries Laboratory, Miami, Florida 33149
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, No. SEC-008-77-EI-A-1
Period: 7/74 to 6/75 Funds: $47,100

To date, the analysis has been completed and draft publication is in progress.

Information Source: R. Farragut, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Southeast Fisheries Center, 75 Virginia Beach Dr., Miami, Florida 33149

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 Investigator: 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. 13SYC7111-4-0030
Period: 6/74 to 5/75 Funds: $59,334

This project is ongoing. The 1974 report is on 1973 data, but similar data go through 1975.

Reports and Publications

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. C. 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 an immediate reduction in chlorophyll and a later reduction in biomass after exposure to crude oil.

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 the third summer after direct contact. Damage increased the second year after a spill due to winter killing factors. The taiga was more susceptible than the tundra.

OIL SPILL EFFECTS ON VEGETATION AND SOIL MICROFAUNA AT NORMAN WELLS AND TUKTOYAKTUK, N.W.T.

Hutchinson, T. C., J. Hellebust, and M. Telford.
Environmental-Social Committee, Northern Pipelines, Task Force on Northern Oil Development. Report No. 74-14. 111 p.

The effects of experimental crude oil spills on the vegetation and soil microfauna were studied at burned and unburned sites, summer and winter, and with and without fertilizer. The species which contact the oil and have no habitat escape are killed. The effects increased in the second year. Disturbance of the soil by construction work causes damage equal to that of an oil spill. The aquatic studies confirm that the most toxic fractions of the crude oil will disappear due to volatilization and will not go into solution to inhibit zoo- and phytoplankton growth.

EFFECT OF NAPTHALENE AND AQUEOUS CRUDE OIL EXTRACTS ON THE GREEN FLAGELLATE *CHLAMYDOMONAS ANGULOSA*. I. GROWTH

Soto, C., J. A. Hellebust, T. C. Hutchinson, and T. Sawa. 1975.
Canadian Journal of Botany 53(2):109-117.

Sixty-one percent of *C. angulosa* cells were killed when saturated naphthalene was initially present in medium in an open system (allowing evaporation and volatilization of hydrocarbons); the generation time was the same as the controls. A much higher percentage of the cells was killed in a closed system, but a shorter generation time was observed when growth resumed. The effects of extracts of different crude oils on the organisms were almost always inhibitory, but less severe than those obtained with naphthalene.

EFFECT OF NAPHTHALENE AND AQUEOUS CRUDE OIL EXTRACTS ON THE GREEN FLAGELLATE CHLAMYDOMONAS ANGULOSA. II. PHOTOSYNTHESIS AND THE UPTAKE AND RELEASE OF NAPHTHALENE

Soto, C., J. A. Hellebust, and T. C. Hutchinson. 1975. Canadian Journal of Botany 53(2):118-126.

The addition of naphthalene to C. angulosa cultures caused an immediate loss of photosynthetic capacity. Photosynthesis was decreased in cells incubated in closed systems with media containing aqueous crude oil extracts; however, in open systems the crude oil extracts had no significant effect on their photosynthetic capacity. Experiments indicate that cells accumulate naphthalene from the medium in closed systems for up to seven days. When the cells are transferred to uncontaminated media, an immediate loss of the aromatic hydrocarbons from the cells is observed.

Information Source: T. C. Hutchinson, Institute for Environmental Studies, University of Toronto, Ontario, Canada

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

See R-310-74 for Reports and Publications.

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, No. C-6007
Period: 7/74 to 6/75 Funds: Unknown

The research project is active. No papers have been presented but one related paper was presented at the plenary session of the North American Benthological Association: "Diversity and Sample Size in Stream Surveys." A paper summarizing results of the first half year's work is being written.

Information Source: R. L. Kaesler, Department of Geology, University of Kansas, Lawrence, Kansas 66045

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. E., 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

Reports and Publications

SPIN-LABELING TECHNIQUES FOR STUDYING MODE OF ACTION OF PETROLEUM HYDROCARBONS ON MARINE ORGANISMS

Roubal, W. T., and T. K. Collier. 1975.
Fishery Bulletin 73(2):299-305.

The aim of spin-labeling studies of membrane-contaminant interaction is to gain a better understanding of hydrocarbon contaminants at the molecular level. Basic spin labeling theory together with experimental results from the study are presented and discussed.

Information Source: D. C. Malins, U.S. Department of Commerce, Environmental Conservation Division, 2725 Montlake Blvd. E., Seattle, Washington 98112

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. E., 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

See R-313-74 for Reports and Publications

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. E., Seattle, Washington 98112
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service, No. FB 1500/8 818 A3
Period: 7/74 to 6/75 Funds: $155,900

See R-313 for Reports and Publications

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

The research project under this title will not begin until 1979. It is designed as the final study of a series that should help in understanding the effects of oil on arctic and subarctic estuarine environments. A current study in the series entitled, "The Sediment Environment of Port Valdez and Prince William Sound and the Effect of Oil Spilled on These Ecosystems," will be completed summer, 1975. A new three year project will be initiated summer, 1975, which is titled, "Alaskan Oil Seeps: Their Chemical and Biological Effects on the Intertidal Environment."

Information Source: R. W. Latimer, Arctic Environmental Research Laboratory, U.S. Environmental Protection Agency, College, Alaska 99701

R-101-74 (RENEWAL)
MARINE PETROLEUM POLLUTION - BIOLOGICAL EFFECTS AND CHEMICAL CHARACTERIZATION

Principal Investigators: Nicol, J. A., and C. Baalen
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, No. GX-37345
Period: 1/75 to 12/75 Funds: $111,850

Reports and Publications

THE EFFECTS OF A NO. 2 FUEL OIL AND TWO CRUDE OILS ON THE GROWTH AND PHOTOSYNTHESIS OF MICROALGAE

Pulich, W. M., Jr., K. Winters, and C. Van Baalen. 1974. Marine Biology 28:87-94.

The paper reports the effects of two crude oils and of water solubles from these oils and from a No. 2 fuel oil on the growth and photosynthesis of pure cultures of microalgae.

MARINE PETROLEUM POLLUTION: BIOLOGICAL EFFECTS AND CHEMICAL CHARACTERIZATION

University of Texas Marine Science Institute. (Date not provided). Progress Report, NSF-IDOE 37345.

The progress report is divided into five section reports: (A) The effects of a No. 2 fuel oil and two crude oils on the growth and photosynthesis of microalgae; (B) Preliminary observations on the effects of crude oils on the growth of several microalgae on the light-temperature gradient plate; (C) Chemical characterization; (D) Effects of petroleum on marine animals and larvae; and (E) A study of the effect of petroleum on sand dollar eggs.

Information Source: C. Van Baalen, University of Texas Marine Science Institute, Port Aransas, Texas

R-103-74
EFFECT OF DIESEL OIL ON STREAM LIFE

Principal Investigator: Patterson, B.
Performing Organization: State Department of Game and Fish, Santa Fe, New Mexico 87501
Supporting Agency: U.S. Department of the Interior, Bureau of Sport Fish and Wildlife, Federal Aid Division, No. F-22-R-15-B-2
Period: 4/73 to 3/74 Funds: $1,275

Reports and Publications

EFFECT OF DIESEL OIL ON STREAM LIFE

Elliot, R.
Federal Aid Project, F-22-R-15, Job No. B-2.

During the project year, the brown trout population has increased in the area affected by the oil spill. Much of the increase is in the small size classes and indicates good reproduction. The area could approach prespill numbers of brown trout with good reproduction in the fall of 1974. Data from analysis of trout populations from 1971 through fall, 1974, are presented.

Information Source: R. R. Patterson, Fisheries Research, State of New Mexico, Department of Game and Fish, Santa Fe, New Mexico 87503

R-317-74
NORTHEAST GULF OF ALASKA INTERTIDAL BIOLOGICAL BASELINES

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

The project is in its beginning stages. Survey work will be conducted to be used in the preparation of environmental impact statements and marine assessments. The project is planned to continue for three to five years. Work in later years will focus on marine monitoring and oil pollution related studies. One manuscript concerned with range extensions for six algal species has been accepted for publication.

Information Source: S. T. Zimmerman, Supervisory Oceanographer, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Auke Bay Fisheries Laboratory, P. O. Box 155, Auke Bay, Alaska 99821

2. 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

The research project was terminated. Results have not yet been published. However, a brief report is planned to be published in the future.

Information Source: A. B. Wheatland, Water Research Centre, Stevenage, Hertfordshire, SG1 1TH, England

D. 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

Ongoing research is being continued in three major areas: (1) determining effects of logging on marine ecosystems; (2) establishing baselines of intertidal organisms in Price William Sound and the Gulf of Alaska to evaluate effects of oil development; and (3) determining effects of crude oil on Alaskan organisms by means of laboratory bioassays.

Reports and Publications

EFFECTS OF OIL ON MARINE ECOSYSTEMS: A REVIEW FOR ADMINISTRATORS AND POLICY MAKERS

Evans, D. R., and S. D. Rice. 1974.
NOAA Fishery Bulletin 72(3):625-638.

A review of recent literature concerning the effects of oil on marine ecosystems is given to provide an information source for administrators and policy makers. Characteristics of crude oil and the dangers of chronic low-level pollution are among the topics included.

EFFECTS OF PRUDHOE BAY CRUDE OIL ON MOLTING TANNER CRABS, CHIONOECETES BAIRDI

Karinen, J. F., and S. D. Rice. 1974.
MFR Paper 1074 from Marine Fisheries Review 36(7):31-37.

In laboratory tests, Prudhoe Bay crude oil was found to have detrimental effects on premolt and postmolt juvenile male Tanner crabs (Chionoecetes bairdi). Estimated 48 hour TLM (median tolerance limits) were 0.56 ml oil/liter for both stages. With increasing oil exposure, molting success decreased and during oil exposure newly molted crabs autotomized limbs.

TOXICITY AND AVOIDANCE TESTS WITH PRUDHOE BAY OIL AND PINK SALMON FRY

Rice, S. D. 1973.
Joint Conference on Prevention and Control of Oil Spills, Washington, D. C., 1973. p. 667-670.

Acute toxicity concentration levels were determined for Prudhoe Bay crude oil on pink salmon fry in fresh and salt water. The observed 96-hour TLM values were lower for fry in freshwater than salt water (88 mg oil/liter vs 213 mg oil/liter in June and 110 mg oil/liter in August). Older fry were more susceptible to oil toxicity and were more sensitive in their detection and avoidance of oil than younger fry.

Information Source: T. R. Merrell, Jr., U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Auke Bay Fisheries Laboratory, P. O. Box 155, Auke Bay, Alaska 99821

E. FATE OF OIL IN THE MARINE ENVIRONMENT

1. BIOLOGICAL DEGRADATION

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: Unknown Funds: Unknown

Two oil pollution projects are presently being conducted; one is funded by the Office of Naval Research (summary included). A project to study the effects and the microbial degradation of the "Metula" oil spill has just been granted by the Environmental Protection Agency.

Reports and Publications

MICROBIAL DEGRADATION OF PETROLEUM IN THE MARINE ENVIRONMENT

Colwell, R. R. (Date not given).
Summary Report Abstract, Contract N00014-67-A0239-0027.

The fate of petroleum in the marine and estuarine environment is being determined and ecological studies of hydrocarbon-utilizing marine and estuarine microorganisms are in progress. The annual cycle of petroleum-degrading bacteria at three stations in Chesapeake Bay has been described and the main species involved in degradation of the petroleum have been characterized. A petroleum-degrading alga was discovered and has been characterized.

ECOLOGICAL ASPECTS OF PETROLEUM DEGRADATION

Colwell, R. R., and J. D. Walker. 1975.
To be published in Critical Reviews in Microbiology. CRC Press.

IMPACT OF PETROLEUM HYDROCARBONS ON MICROORGANISMS IN THE MARINE ENVIRONMENT

Colwell, R. R., and J. D. Walker. 1975.
United Nations position paper for the United States (GESAMP).

MICROBIAL ECOLOGY AND THE PROBLEM OF PETROLEUM DEGRADATION IN CHESAPEAKE BAY

Colwell, R. R., J. D. Walker, and J. D. Nelson, Jr. 1973. In: The Microbial Degradation of Oil Pollutants. D. G. Ahearn and S. P. Meyers (eds.). Center for Wetland Resources, L.S.U. Special Publication LSU-SG-73-01. p. 185-197.

To obtain information on seasonal occurrence and species distribution of oil-degrading organisms, water and sediment samples were analyzed from Chesapeake Bay. From these studies a hydrocarbon-utilizing fungus, Cladosporium resinae, and actinomycetes were the major degrading isolates.

DEEP-SEA BACTERIA: GROWTH AND UTILIZATION OF HYDROCARBONS AT AMBIENT AND IN SITU PRESSURE

Schwarz, J. R., J. D. Walker, and R. R. Colwell. 1974. Applied Microbiology 28(6):982-986.

The study was undertaken to investigate microbial degradation of hydrocarbons under simulated deep sea pressures. Microorganisms collected from Atlantic Ocean sediment samples at a depth of 4,940 meters utilized hydrocarbons at both ambient and in situ pressures; however, at ambient temperature, the rate of hydrocarbon utilization under in situ pressure (500 atm) was significantly less than utilization at ambient pressure (1 atm).

DEEP-SEA BACTERIA: GROWTH AND UTILIZATION ON N-HEXADECANE AT IN SITU TEMPERATURE AND PRESSURE

Schwarz, J. R., J. D. Walker, and R. R. Colwell. 1975. Canadian Journal of Microbiology 21(5):682-687.

A mixed culture of bacteria, obtained from a sediment-water interface sample taken off the Florida Coast at a depth of 4,940 m, was found to utilize n-hexadecane as a sole carbon source for growth at the in situ temperature (4°C) and pressure (500 atm). Rate of utilization under deep-ocean conditions was found to be much slower than the rate observed at ambient pressure (1 atm) and low temperature (4°C).

GROWTH OF DEEP-SEA BACTERIA ON HYDROCARBONS AT AMBIENT AND IN SITU PRESSURE

Schwarz, J. R., J. D. Walker, and R. R. Colwell. 1974. Developments in Industrial Microbiology 15:239-249.

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.

UTILIZATION OF MIXED HYDROCARBON SUBSTRATE BY PETROLEUM-DEGRADING MICROORGANISMS

Walker, J. D., H. F. Austin, and R. R. Colwell. 1975.
Journal of General and Applied Microbiology 21:27-39.

The ability of petroleum-degrading yeasts, fungi and bacteria to degrade a mixed hydrocarbon substrate is reported. Cumene, naphthalene, phenanthrene, pristane, 1,2-benzanthacene, perylene and pyrene were degraded by microorganisms. The patterns for hydrocarbon utilization were similar for bacteria, yeasts and fungi; however, utilization by individual isolates varied significantly.

DEGRADATION OF PETROLEUM HYDROCARBONS BY BACTERIA ISOLATED FROM THE OCEAN ENVIRONMENT

Walker, J. D., J. J. Calomiris, and R. R. Colwell. 1975.
Marine Biology. In Press.

PETROLEUM HYDROCARBONS: DEGRADATION AND GROWTH POTENTIAL FOR ATLANTIC OCEAN SEDIMENT BACTERIA

Walker, J. D., J. J. Calomiris, T. L. Herbert, and R. R. Colwell. 1975.
Marine Biology. In Press.

BIODEGRADATION OF PETROLEUM HYDROCARBONS IN BALTIMORE HARBOR OF CHESAPEAKE BAY

Walker, J. D., and R. R. Colwell. 1975.
Environmental Pollution. In Press.

DEGRADATION OF HYDROCARBONS AND MIXED HYDROCARBON SUBSTRATE BY MICROORGANISMS FROM CHESAPEAKE BAY

Walker, J. D., and R. R. Colwell. 1974.
Advanced Water Pollution Research. In Press.

DEGRADATION OF HYDROCARBONS AND MODEL PETROLEUM BY MICROORGANISMS FROM CHESAPEAKE BAY

Walker, J. D., and R. R. Colwell. 1974.
Seventh International Conference, International Association of Water Pollution Research. Pergamon Press, Ltd. In Press.

LONG-CHAIN N-ALKANES OCCURRING DURING MICROBIAL DEGRADATION OF PETROLEUM

Walker, J. D., and R. R. Colwell. 1975.
Nature. Submitted.

MEASURING THE ACTIVITY OF HYDROCARBON-DEGRADING BACTERIA

Walker, J. D., and R. R. Colwell. 1975.
Applied Microbiology. In Press.

MERCURY-RESISTANT BACTERIA AND PETROLEUM DEGRADATION

Walker, J. D., and R. R. Colwell. 1974.
Applied Microbiology 27(1):285-287.

Oil extracted from water and sediment samples from Colgate Creek, Chesapeake Bay, Maryland, contained high levels of mercury. Mercury-resistant bacteria in the samples may have degraded the oil to a significant degree.

MICROBIAL DEGRADATION OF MODEL PETROLEUM AT LOW TEMPERATURES

Walker, J. D., and R. R. Colwell. 1974.
Microbial Ecology 1(2):63-95.

A correlation was found between the numbers of petroleum-degrading microorganisms isolated from two areas of Chesapeake Bay and the concentration of benzene-extractable material present in the waters. Petroleum degradation was measured when microorganisms isolated from samples were placed in a salts medium for optimal growth at 0°, 5° and 10° and in Chesapeake Bay water, which simulated natural conditions. Results indicated that utilization of model petroleum at low temperatures is a function of the types and numbers of microorganisms present in an original inoculum taken from seawater.

MICROBIAL ECOLOGY OF PETROLEUM UTILIZATION IN CHESAPEAKE BAY

Walker, J. D., and R. R. Colwell. 1973.
Joint Conference on Prevention and Control of Oil Spills, Washington, D.C., 1973. p. 685-690.

Studies were conducted on petroleum-degrading microorganisms collected at two stations in Chesapeake Bay; one demonstrating four to five times the concentration in water of petroleum compared with the second station. The numbers of oil-degrading microorganisms were directly related to the concentration of oil in each water sample analyzed, and the hydrocarbon-utilizing fungus, Cladosporium resinae, and actinomycetes comprised a large number of the hydrocarbon-utilizing isolates.

MICROBIAL PETROLEUM DEGRADATION: ENUMERATION OF PETROLEUM-DEGRADING MICROORGANISMS

Walker, J. D., and R. R. Colwell. 1975.
Canadian Journal of Microbiology. In Press.

MORPHOLOGY OF PETROLEUM-DEGRADING BACTERIA ISOLATED FROM CHESAPEAKE BAY

Walker, J. D., and R. R. Colwell. 1973.
Electron Microscope Central Facility Newsletter 1:9.

PETROLEUM DEGRADATION BY ESTUARINE MICROORGANISMS

Walker, J. D., and R. R. Colwell. 1975.
International Biodegradation Symposium, 3d, Kingston, R. I., 1975. In Press.

ROLE OF AUTOCHTHONOUS BACTERIA IN THE REMOVAL OF SPILLED OIL FROM SEDIMENT

Walker, J. D., and R. R. Colwell. 1975.
Applied Microbiology. In Press.

SOME EFFECTS OF PETROLEUM ON ESTUARINE AND MARINE MICROORGANISMS

Walker, J. D., and R. R. Colwell. 1974.
Canadian Journal of Microbiology. In Press.

EXTRACTION OF PETROLEUM HYDROCARBONS FROM OIL-CONTAMINATED SEDIMENTS

Walker, J. D., R. R. Colwell, M. C. Hemming, and H. T. Ford. 1975.
Bulletin of Environmental Contamination & Toxicology 13(2):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.

PETROLEUM HYDROCARBONS IN BALTIMORE HARBOR OF CHESAPEAKE BAY: DISTRIBUTION IN SEDIMENT CORES

Walker, J. D., R. R. Colwell, M. C. Hemming and H. T. Ford. 1975.
Environmental Pollution. In Press.

BACTERIAL DEGRADATION OF MOTOR OIL

Walker, J. D., R. R. Colwell, and L. Petrakis. 1975.
Journal Water Pollution Control Federation. In Press.

BIODEGRADATION OF PETROLEUM BY CHESAPEAKE BAY SEDIMENT BACTERIA

Walker, J. D., R. R. Colwell, and L. Petrakis. 1975.
Canadian Journal of Microbiology. In Press.

DEGRADATION OF PETROLEUM BY AN ALGA, PROTOTHECA ZOPFII

Walker, J. D., R. R. Colwell, and L. Petrakis. 1975.
Applied Microbiology 30(1):79-81.

Prototheca zopfii, an achlorophyllous alga which degrades oil, has been found to degrade 10 to 40% of motor oil and crude oil under appropriate conditions. This study found *P. zopfii* to degrade a greater percentage of the aromatic hydrocarbons in motor oil than of saturated hydrocarbons, and a greater percentage of saturated hydrocarbons in crude oil than of aromatics.

PETROLEUM DEGRADATION BY ESTUARINE SEDIMENT BACTERIA: FATE OF AROMATIC HYDROCARBONS IN PETROLEUM INOCULATED WITH FRESH, FROZEN-STORED, AND ENRICHED CULTURES

Walker, J. D., R. R. Colwell, and L. Petrakis. 1975.
Journal of General Microbiology. In Press.

PETROLEUM DEGRADATION BY ESTUARINE SEDIMENT BACTERIA: FATE OF FRACTIONS IN PETROLEUM INOCULATED WITH FRESH, FROZEN-STORED AND ENRICHED CULTURES

Walker, J. D., R. R. Colwell, and L. Petrakis. 1975.
Journal of General Microbiology. In Press.

PETROLEUM DEGRADATION BY ESTUARINE SEDIMENT BACTERIA: FATE OF SATURATED HYDROCARBONS IN PETROLEUM INOCULATED WITH FRESH, FROZEN-STORED AND ENRICHED CULTURES

Walker, J. D., R. R. Colwell, and L. Petrakis. 1975.
Journal of General Microbiology. In Press.

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 on 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 classes of hydrocarbons.

A 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. This alga, *Prototheca zopfii*, can utilize both crude oil and a 17-component mixed hydrocarbon substrate.

EVALUATION OF PETROLEUM-DEGRADING POTENTIAL OF BACTERIA FROM WATER AND SEDIMENTS

Walker, J. D., L. Petrakis, and R. R. Colwell. 1975.
Applied Microbiology. In Press.

EFFECT OF SOUTH LOUISIANA CRUDE OIL AND NO. 2 FUEL OIL ON GROWTH OF HETEROTROPHIC MICROORGANISMS INCLUDING PROTEOLYTIC, LIPOLYTIC, CHITINOLYTIC AND CELLULOLYTIC BACTERIA

Walker, J. D., P. A. Seesman, and R. R. Colwell. 1975.
Environmental Pollution. In Press.

EFFECTS OF PETROLEUM ON ESTUARINE BACTERIA

Walker, J. D., P. A. Seesman, and R. R. Colwell. 1975.
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.

PETROLEUM HYDROCARBONS: DEGRADATION AND GROWTH POTENTIAL OF DEEP-SEA SEDIMENT BACTERIA

Walker, J. D., P. A. Seesman, T. L. Herbert, and R. R. Colwell.
1975.
Environmental Pollution. In Press.

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: U.S. Department of Transportation, Coast Guard
Period: 7/74 to 6/75 Funds: Unknown

The project sponsored by the U.S. Coast Guard has been completed.

Reports and Publications

A DISCRETE VORTEX SIMULATION OF FINITE AMPLITUDE KELVIN-HELMHOLTZ INSTABILITY

Zalosh, R. G. 1975.
AIAA Computational Fluid Dynamic Conference, 2nd, Hartford, 1975.

Calculations using Kelvin's classical theory show the evolution of an interface separating a lighter inviscid fluid (oil) from a heavier fluid. The circulation of individual vortices is calculated for stable, marginal and unstable conditions. For unstable conditions drops are generated from small irregularities along the interface.

NUMERICAL MODEL OF DROPLET ENTRAINMENT FROM A CONTAINED OIL SLICK

Zalosh, R. G. 1974.
Final Report, Contract DOT-CG-41882-A. 83 p.

"A theoretical analysis of oil entrainment from a contained oil slick moving relative to water has been performed as a function of relative oil-water velocity." The completed and measured velocities for entrainment agree.

A NUMERICAL MODEL OF DROPLET ENTRAINMENT FROM A CONTAINED OIL SLICK

Zalosh, R. G., and D. S. Jensen. 1975.
Symposium on Fluid Mechanics in the Petroleum Industry, Houston, 1975.

Shear instability across the oil/water interface causes oil droplets to form at the headwave of a contained oil slick and to be entrained into the water current. A numerical model simulates this phenomenon. Computed critical velocities for droplet entrainment agree with laboratory measurements.

Information Source: H. F. Carman, Mount Auburn Research Associates, Inc., 381 Elliot Street, Newton, Massachusetts 02164

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. 21ASA03, Contract 72P21838
Period: 7/74 to 6/75 Funds: Unknown

A small terrestrial spill of crude oil was conducted within a taiga environment in the summer of 1973. At present, findings from the oil spill are being summarized. The project will involve continued monitoring of the spill and looking at long term degradation. Future efforts are directed toward a large terrestrial spill to be conducted in August, 1975, by the U.S. Army Cold Regions Research and Engineering Laboratory.

Information Source: R. L. Jackson, U.S. Environmental Protection Agency, Arctic Environmental Research Laboratory, College, Alaska 99701

SECTION III. CURRENT RESEARCH PROJECTS

A. OIL POLLUTION DETECTION AND EVALUATION

1. MONITORING

R-269-75
PICKING AND IDENTIFICATION OF ZOOPLANKTON AND BENTHIC ORGANISMS

Principal Investigator: Dorfman, D.
Specialty: Biology
Performing Organization: Monmouth College, Graduate School, West Long Branch, New Jersey 07764
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 68-03-0422
Period: 7/73 to 6/74 Funds: $9,900

Baseline data will be collected for populations of phytoplankton and benthos in Raritan Bay and Sandy Nook Bay (New Jersey) for reference in establishing an oil spill testing facility.

SSIE No.: GMA-1924

R-270-75
OIL DETECTOR BUOY

Principal Investigator: Unknown
Performing Organization: Spectrogram Corporation, 385 State St., North Haven, Connecticut 06473
Supporting Agency: U.S. Department of Transportation, Coast Guard
Period: 7/74 to 6/75 Funds: Unknown

The aim of this project is to design and produce an oil detector buoy and land-based power source with a 500-foot interconnecting cable. The buoy shall be able to detect even a monomolecular layer of petroleum floating on a water surface, and shall detect oils ranging from heavy grades of crude through the lighter grades to gasoline.

Design and engineering

SSIE No.: GZ-55632

2. REMOTE SENSING

R-271-75
REMOTE SENSING SERVICES FOR EMERGENCY OIL AND HAZARDOUS SPILLS

Principal Investigators: Ziegler, R. C., D. B. Dahm, R. J. Pilie, and A. B. Adler
Performing Organization: Calspan Corporation, 4455 Genesee St., Buffalo, New York 14221
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, Contract 68-01-1856
Period: 7/73 to 6/74 Funds: Unknown

This program's objective is to provide remote sensing services to aid the Environmental Protection Agency in assessing any threat imposed, treatment required, and liability for damage as a result of spills of oil and hazardous substances on United States lands.

SSIE No.: GMA-2105

3. ANALYSIS

R-272-75
METHODS FOR COMPLETE ELEMENTAL ANALYSIS OF TISSUES, EFFLUENTS AND SEDIMENTS BY SSMS

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, No. 16 ADN 22, Contract 72P18264
Period: 7/74 to 6/75 Funds: Unknown

Spark source mass spectrometric analyses will be made to develop spark source mass spectrometric methods for the complete elemental analysis of tissues, effluents, sediments and oil spills. These techniques will be used to implement and extend existing gas chromatographic identification methods used at petroleum spill sites. The research report, "Multielement Analysis of Environmental Samples by Spark Source Mass Spectrometry" (EPA-660/2-74-040), was scheduled to be issued February, 1974. It discusses software improvements that provide valid analyses of some environmental samples.

SSIE No.: ZMA-708-2

R-273-75
ANALYTICAL METHODS FOR POLYNUCLEAR AROMATICS

Principal Investigator: Unknown
Performing Organization: Exxon Research and Engineering Company
Supporting Agency: American Petroleum Institute, No. 207-75
Period: Unknown Funds: Unknown

The object of this research is to examine the gas chromatographic-ultraviolet technique used in the Exxon Research and Engineering Laboratories for the determination of polynuclear aromatics at low levels in oils and in marine animal tissues.

Information Source: Environmental Research. Annual Report. API Publication No. 4243. January, 1975.

R-274-75
CHEMICAL ANALYSIS IN HOUSE

Principal Investigator: Unknown
Performing Organization: Member Company Laboratories
Supporting Agency: American Petroleum Institute, No. 204-75
Period: Unknown Funds: Unknown

"A complete characterization by mass spectrometric analysis of the four reference oils being used in the laboratory biological studies sponsored by the American Petroleum Institute was the principal effort under this project in the past year. This work was done by Exxon Research and Engineering Company."

Information Source: Environmental Research. Annual Report. API Publication No. 4243. January, 1975.

B. OIL POLLUTION PREVENTION AND CONTROL

1. CLEANUP AND RECOVERY

R-275-75
POLLUTION CONTROL EQUIPMENT

Principal Investigator: Unknown
Performing Organization: U.S. Navy, Coastal Systems Laboratory, Panama City, Florida 32401
Supporting Agency: U.S. Department of Transportation, Coast Guard, No. Z-70099-4-42734
Period: 7/74 to 6/75 Funds: Unknown

The objective of this program is to design, fabricate, test and evaluate a developmental model of a Fast Surface Delivery System for pollution control equipment.

SSIE No.: GZ-55596

R-276-75
STORAGE AND ULTIMATE DISPOSAL OF OIL RECOVERED FROM SPILLS

Principal Investigator: Unknown
Performing Organization: Battelle Memorial Institute, 505 King Ave., Columbus, Ohio 43201
Supporting Agency: U.S. Department of Transportation, Coast Guard
Period: 7/74 to 6/75 Funds: Unknown

The research proposes to investigate methods for temporary storage and ultimate disposal of oil recovered from spills in Alaska.

SSIE NO.: GZ-55585

R-277-75
HIGH CAPACITY OIL-WATER SEPARATOR SYSTEM

Principal Investigator: Markel, A. L.
Performing Organization: Reynolds Submarine Service Corporation, Richmond, Virginia 23213
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, No. 58-01-0834, Contract 72P19394
Period: 7/74 to 6/75 Funds: Unknown

The program's objective is to design, construct, and test at pilot scale a high capacity oil-water separator device for oil-water mixtures collected by mechanical oil slick harvesting devices. The device is based on a pump-separator unit which imparts a swirling action. This action causes oil from the entering oil-water mixture to concentrate at the centerline of the pipe, where it is skimmed off by one or more pilot tubes.

Design and engineering

SSIE No.: AO-19394

R-278-75
MANAGEMENT, MAINTENANCE AND OPERATION OF THE U.S. EPA OHMSETT FACILITY

Principal Investigators: Ackerman, R. A., W. E. McCracken, and G. Smith
Performing Organization: Mason & Hanger Silas Mason Company, P.O. Box 156, Leonardo, New Jersey 07737
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, Contract 68-03-049C
Period: 7/73 to 6/74 Funds: $287,913

Mason & Hanger-Silas Mason Company, Inc., maintains and operates the U.S. Environmental Protection Agency Oil and Hazardous Materials Simulated Environmental Test Tank (OHMSETT), located at the Naval Ammunition Depot, Earle, Leonardo, New Jersey. The OHMSETT facility provides a safe place to test and develop devices and methods for the control of oil and hazardous materials spilled in inland and coastal waters.

Design and engineering

SSIE No.: GMA-1891

2. RESTORATION

R-279-75
OILED WATERFOWL REHABILITATION

Principal Investigator: Stanton, P. B.
Performing Organization: Wildlife Rehabilitation Center, Framingham, Massachusetts
Supporting Agency: American Petroleum Institute, 302-75
Period: Unknown Funds: Unknown

The program will perform research, consulting and informational functions relating to the cleaning and rehabilitation of oiled birds. A manual is being prepared on the cleaning program outlined at an Oiled Bird Workshop held May, 1974.

Information Source: Environmental Research. Annual Report. API Publication No. 4243. January, 1975.

3. WASTE OIL AND WASTE WATER TREATMENT

R-280-75
INDUSTRIAL OILY WASTEWATER TREATMENT AT NAVY SHORE INSTALLATIONS

Principal Investigators: Bialecki, A., and J. S. Williams
Performing Organization: U.S. Navy, Civil Engineering Laboratory, Point Mugu, Port Hueneme, California 93041
Supporting Agency: U.S. Department of Defense, Navy
Period: 7/74 to 6/75 Funds: Unknown

The contract provides for the quantification of techniques and equipment for the treatment of industrial oily waste waters at naval installations to meet applicable regulatory discharge requirements.

SSIE No.: ZQN-244026-2

R-281-75
TREATMENT OF EMULSIFIED OIL BY COALESCENCE

Principal Investigators: Gloyna, E. F., J. Chieu, and N. Patel
Specialty: Civil Engineering
Performing Organization: University of Texas, School of Engineering, 200 W. 21st St., Austin, Texas 78712
Supporting Agency: University of Texas
Period: 7/74 to 6/75 Funds: Unknown

The feasibility of using coalescence and filtration in a combined process to separate emulsified oil from waste waters will be determined. A study will be conducted which will investigate different types of industrial wastes using several types of filtration and coalescence media.

SSIE No.: NTX-492

R-282-75
IDENTIFICATION OF MARGINAL NON-TRANSPORTATION PETROLEUM FACILITIES

Principal Investigators: Trentacoste, N., J. Cunningham, G. Bierman, and R. Isom
Performing Organization: Science Applications, Incorporated, 1651 Old Meadow Rd., Suite 620, McLean, Virginia 22101
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, Contract 68-02-2032

Period: 7/73 to 6/74 Funds: $182,000

The program will identify non-transportation related oil production, handling, processing or consuming facilities that may not be able to install systems to prevent discharged oil from reaching navigable waters. One objective of the program is to determine the financial impact of oil spill prevention regulations on these facilities.

SSIE No.: GMA-2093

4. PERSONNEL TRAINING AND EDUCATION

R-283-75
OIL SPILL CLEANUP TRAINING SCHOOL

Principal Investigator: Unknown
Performing Organization: Texas A & M University, College Station, Texas 77843
Supporting Agency: American Petroleum Institute, No. OS-24
Period: Unknown Funds: Unknown

The contract provides for a comprehensive training course for cleaning up oil spills under various conditions. The school should be in operation by April, 1975, and is being held in Galveston, Texas.

Information Source: Environmental Research. Annual Report. API Publication No. 4243. January, 1975.

R-284-75
PREVENTION OF OIL SPILLS

Principal Investigator: Unknown
Performing Organization: Educational Systems and Designs, Inc.; National Photographic Laboratories
Supporting Agency: American Petroleum Institute, No. 306-75
Period: Unknown Funds: Unknown

This project involves the development of a motivational program for oil spill prevention and a training aid for oil spill prevention in barge loading/unloading operations.

Information Source: Environmental Research. Annual Report. API Publication No. 4243. January, 1975.

5. CONTINGENCY PLANNING

R-285-75
SHORELINE PROTECTION AND RESTORATION

Principal Investigator: Unknown
Performing Organization: Exxon Research and Engineering Company
Supporting Agency: American Petroleum Institute, No. 305-75
Period: Unknown Funds: Unknown

A supplementary six-month study to determine the feasibility of using microbial products and natural plant polysaccharides to protect and/or restore salt marsh grass from oil spills and oil contamination has been completed and a report is in preparation. Laboratory and field studies have provided information concerning required dosage levels of these agents, methods of application, the effects of temperature and the duration of the protection, and the overall efficiency of the microbiological and natural product system.

Restoration

Information Source: Environmental Research. Annual Report. API Publication No. 4243. January, 1975.

R-286-75
SHORELINE PROTECTION AND RESTORATION

Principal Investigator: Unknown
Performing Organization: Shell Pipeline Research and Development Laboratory
Supporting Agency: American Petroleum Institute, No. 305-75
Period: Unknown Funds: Unknown

The contract provides for research on surfactant substances for the protection of shorelines which may become fouled by oil floating on water, and for the cleaning and restoration of shorelines that have been fouled by oil. Selection of candidate chemicals for restoration is nearing completion with two classes of compounds selected (silicates and borates). Material acquisition and design of test facilities are also being completed.

Restoration

Information Source: Environmental Research. Annual Report. API Publication No. 4243. January, 1975.

C. EFFECTS OF OIL POLLUTION

1. BIOLOGICAL EFFECTS

R-287-75
HORMONE AND ELECTROLYTE THERAPY FOR OILED WATERFOWL

Principal Investigator: Unknown
Performing Organization: Unknown
Supporting Agency: American Petroleum Institute, No. 303-75
Period: Unknown Funds: Unknown

The effects of ingested crude oil and petroleum products on marine birds are being investigated. An examination is underway of the effects of the various distillation fractions derived from crude oil on ducklings. In regard to long-term effects of ingested oil, mature saltwater adapted birds are more resistant than young birds to Kuwait and Santa Barbara crudes and to No. 2 fuel oil.

Information Source: Environmental Research. Annual Report. API Publication No. 4243. January, 1975.

R-288-75
A STUDY OF THE CHEMICAL FATE AND THE BIOLOGICAL CONSEQUENCES OF NO. 2 FUEL OIL SPILLS IN SEMI-NATURAL ECOSYSTEMS

Principal Investigators: Bieri, R. H., and R. J. Huggett
Specialty: Pollution and Ecology
Performing Organization: Virginia Institute of Marine Science, Gloucester Point, Virginia 23062
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, Contract 68-03-0423
Period: 7/73 to 6/74 Funds: $4,980

Research is underway to determine the chemical dynamics, fate and biological effects of oil spilled in an estuarine environment. Spills of No. 2 oil at different dosage levels will be applied to a confined estuarine area containing oysters (*Crassostrea virginica*) and clams. Sampling and analysis of these organisms will be conducted before and after the spills and at 24-hour intervals throughout the experiment.

General fate of oil in the environment

SSIE No.: GMA-1901

R-289-75

EFFECTS OF WATER POLLUTANTS ON ION TRANSPORT IN SINGLE CELLS

Principal Investigators: Bittar, E. E., and S. Chen
Specialty: Physiology
Performing Organization: University of Wisconsin, School of Medicine, 333 N. Randall Ave., Madison, Wisconsin 53706
Supporting Agency: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Sea Grant Office, No. 04-30158-5
Period: 7/74 to 6/75 Funds: $12,342

The objectives of this project are to study on a cellular level the pollutants in the Lake Michigan aquatic system, to test the effect of the pollutants (methyl mercury, Cd, Se, pesticides, deodorants, chlorinated biphenyls and oils) on the efflux of radiosodium in single frog eggs and single barnacle muscle fibers, to define the point of action of pollutants in the cell and to assay Na, K, Ca, Mg and Cl contents of cells before and after treatment with pollutants.

SSIE No.: GBP-1697

R-290-75

EFFECTS OF RESIDUAL TOXINS IN OIL REFINERY EFFLUENTS ON AQUATIC ORGANISMS

Principal Investigator: Dorris, T. C.
Performing Organization: Oklahoma State University, Reservoir Research Center, Life Sciences W., Stillwater, Oklahoma 74074
Supporting Agency: U.S. Department of the Interior, Office of Water Resources Research, No. B-025-OKLA
Period: 7/73 to 6/74 Funds: Unknown

The project is aimed at investigating the long-term toxicity of the nonvolatile residual fraction of oil refinery effluent, and continuing research on methods of removing the more toxic volatile components. Laboratory-raised fat head minnows will be used for long-term bioassays, and solvent extraction, followed by thin-layer or column chromatography with final characterization by infrared or ultraviolet spectrophotometry, will be used to isolate and identify the toxic organic compounds in the residual effluent.

Analysis

SSIE No.: GUW-3694-1

R-291-75
BIOLOGICAL EFFECTS OF PELAGIC OIL

Principal Investigators: Gebelein, C. D., and N. E. Manard
Performing Organization: Bermuda Biological Station
Supporting Agency: American Petroleum Institute, No. 209-75
Period: Unknown   Funds: Unknown

The effects of pelagic oil (tar balls) on the health and populations of intertidal marine organisms are being determined in this study. Parameters being examined in intertidal organisms at selected field sites include species composition, abundance and diversity, zonation, hydrocarbon analyses of animal tissues and algal biomass, and preliminary analyses of tar globules and weathering effects thereon.

Information Source: Environmental Research. Annual Report. API Publication No. 4243. January, 1975.

R-292-75
PHYSIOLOGY AND BIOASSAY STUDIES, ALASKA

Principal Investigators: Karinen, J. F., S. D. Rice, M. B. Bonnett, J. W. Short, and D. A. Moles
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. ABL-07-75, Contract FB 1700/8818-U2
Period: 7/74 to 6/75   Funds: $160,100

Objectives of this research task include: identification of deleterious effects and evaluation of the potential changes of chronic exposure of marine organisms to Alaska crude oil; identification of biochemical and physiological responses indicative of oil exposure and use of them as monitoring techniques for detecting areas of oil pollution, evaluation of the effects of oil under various temperature and salinity regimes, and determination of organisms' ability to successfully adapt to oil pollution.

SSIE No.: ZBP-969

R-293-75
DOCTORAL DISSERTATION RESEARCH IN BIOLOGICAL OCEANOGRAPHY

Principal Investigator: Mitchell, R.
Performing Organization: Harvard University, School of Engineering, Cambridge Station, Cambridge, Massachusetts 02138

Supporting Agency: U.S. National Science Foundation, Division of Environmental Sciences, No. DES75-07675
Period: 3/75 to 2/76 Funds: $2,560

This research involves the examination of some biological processes operating in the coral reef community, and the determination of the sublethal effects of pollutants such as hydrocarbons, excess nutrients and metals, upon them. Field studies will be undertaken in Israel on a Red Sea Reef which is heavily polluted with phosphates and oil at its northern end and relatively pollution-free at its southern end.

SSIE No.: GSV-5997

R-294-75
ENVIRONMENTAL IMPACTS OF PETROLEUM INDUSTRY IN THE DELAWARE ESTUARY

Principal Investigator: Whipple, W.
Performing Organization: Rutgers The State University, Water Resources Research Institute, Old Queens Bldg., New Brunswick, New Jersey 08903
Supporting Agency: U.S. National Science Foundation, Division of Advanced Environmental Research and Technology, No. AEN74-14810 AOZ
Period: 6/75 to 5/76 Funds: $450,000

Eleven individual projects will be conducted to achieve three main research goals: (1) to measure amounts and types of petroleum pollutants entering the Delaware estuary, (2) to evaluate the effects of these pollutants on estuary fauna, and (3) to evaluate the economic impact of the pollution damage in terms of cost-benefit analysis.

Economic effects of oil pollution
Monitoring

SSIE No.: GSQ-892-1

2. GENERAL EFFECTS

R-295-75
WEST FALMOUTH FOLLOW-UP STUDIES

Principal Investigator: Michael, A.
Performing Organization: Marine Biological Laboratory, Woods Hole Oceanographic Institution, Woods Hole, Massachusetts 02543
Supporting Agency: American Petroleum Institute, No. OS-20L
Period: Unknown   Funds: Unknown

A study is being conducted to determine the state of recovery of the entire West Falmouth area affected by the 1969 spill. Results have indicated that the benthic fauna of the area have substantially recovered, although the number of species in the Wild Harbor Marsh is lower than at a control marsh. The offshore area is closer to total recovery than either the marsh or boat basin.

Biological effects of oil pollution

Information Source: Environmental Research. Annual Report. API Publication No. 4243. January, 1975.

R-296-75
ENVIRONMENTAL SUPPORT TECHNOLOGY: INTERFACE CHEMISTRY IN THE MARINE ENVIRONMENT AND ITS EFFECTS ON NAVAL OPERATIONS

Principal Investigators: Garrett, W. D., and W. R. Barger
Performing Organization: U.S. Navy, Research Laboratory, Washington, D. C. 20390
Supporting Agency: U.S. Department of Defense, Navy, No. DNO-20190
Period: Unknown   Funds: Unknown

Objectives include: to enhance naval operations by chemical modification of the air-sea interface, to evaluate the role of natural, artificial and pollutant surface films on air-sea interactions, and to determine the influence of organic films on atmospheric processes. Based on laboratory, test tank and field experiments, surface active chemicals are used as sea markers to control oil pollution at naval ship installations.

SSIE No.: ZQN-20190-1

D. EFFECTS OF OIL PROSPECTING AND PRODUCTION

1. GENERAL EFFECTS

R-297-75
BASELINE ENVIRONMENTAL SURVEY OF THE MAFLA LEASE AREA (MISSISSIPPI-ALABAMA-FLORIDA CONTINENTAL SHELVES)

Principal Investigators: Blake, J., P. Betzer, S. Betzer, H. Humm, and E. Pyle
Performing Organization: University of South Florida, Graduate School, St. Petersburg, Florida
Supporting Agency: U.S. Department of the Interior, Bureau of Land Management, No. INT-08550-CT4-11
Period: 5/74 to 3/75 Funds: Unknown

The objectives of the project are to provide baseline information on biological, chemical, physical and geological parameters of the lease tracts on the MAFLA shelves before oil drilling and to investigate key problems and areas so as to make recommendations for protection of shelf habitats and resources.

SSIE No.: GUF-121

R-298-75
COOK INLET

Principal Investigator: Magoon, J. B.
Performing Organization: U.S. Department of the Interior, Geological Survey, 345 Middlefield Rd., Menlo Park, California 94025
Supporting Agency: U.S. Department of the Interior, Geological Survey, Geological Division, No. 9410-00132
Period: 7/74 to 6/75 Funds: Unknown

A geologic framework of the lower Cook Inlet (Kalgin Island) will be provided for the offshore sale scheduled in September, 1975. Integrated studies will be conducted to obtain data which demonstrate the petroleum potential and environmental hazards of the area. Results will be included in the environmental impact statement for the offshore sale.

SSIE No.: ZUA-1611-5

E. FATE OF OIL IN THE ENVIRONMENT

1. BIOLOGICAL DEGRADATION

R-299-75
GENETICALLY ENGINEERED MICROORGANISMS FOR ENHANCED PRODUCTION OF PROTEIN

Principal Investigator: Chakrabarty, A. M.
Performing Organization: General Electric Company, 1 River Rd., Schenectady, New York 12305
Supporting Agency: U.S. National Science Foundation, Division of Biological and Medical Sciences, No. BMS75-10978
Period: 6/75 to 5/76 Funds: $30,000

A large number of aromatic and polynuclear aromatic hydrocarbon metabolizing pathways will be screened and analyzed genetically in several Pseudomonas species to characterize the transmissible plasmid nature of the genes specifying these pathways. Multi-plasmid single strains will be constructed to be used for enhanced production of protein from petroleum or for rapid cleanup of oil spills on rivers and lakes.

Cleanup and recovery

SSIE No.: GSB-16385

R-300-75
BIODEGRADATION OF OIL IN SOIL

Principal Investigator: Unknown
Performing Organization: Sun Ventures, Inc.
Supporting Agency: American Petroleum Institute, No. OS-21.3
Period: Unknown Funds: Unknown

The object of the research is to develop methods to speed up the biodegradation of crude oils and crankcase oils, and to determine possible detrimental effects of oil disposal by the land spreading process. Preparation of soil plots and application of oil (100 bbls/acre) and fertilizers were completed in January, 1974, and decomposition rates of various oils after an eight-month period were determined.

Information Source: Environmental Research. Annual Report. API Publication No. 4243. January, 1975.

2. PHYSICAL CHANGES

R-301-75
SPREADING OF OIL SLICKS IN A WIND-WAVE CHANNEL

Principal Investigators: Lin, J. D., and G. S. Campbell
Performing Organization: University of Connecticut, School of Engineering, Box U-37, Storrs, Connecticut 06268
Supporting Agency: U.S. Department of the Interior, Office of Water Research and Technology, No. A-059-CONN
Period: 1/75 to 6/76 Funds: Unknown

A laboratory wind-wave channel will be used in experiments to determine the effect of wind-waves on the convection and dispersion in various regimes of oil spreading. The objective of this research is to improve the capability of predicting the size and movement of oil slicks in a sea state and in rivers.

General fate of oil in the environment

SSIE No.: GUY-131

3. GENERAL FATE OF OIL

R-302-75
ENVIRONMENTAL ORGANIC GEOCHEMISTRY OF OUTER CONTINENTAL SHELVES

Principal Investigator: Miller, R. E.
Performing Organization: U.S. Department of the Interior, Geological Survey, 12201 Sunrise Valley Dr., Herndon, Virginia 22092
Supporting Agency: U.S. Department of the Interior, Geological Survey, Geologic Division
Period: 7/74 to 6/75 Funds: Unknown

The principal objectives of this project are to determine quantitatively the low-level baseline substances in surface shelf and slope sediments; to distinguish and classify in core sediments those natural organic substances and organo-metallo complexes that are related to specific geological and geochemical processes; and, utilizing baseline information, to develop statistical models for predicting the fate and effects of synthetic chemical and petroleum products on the quality of the marine environment.

General effects of oil pollution

SSIE No.: ZUA-3570

R-303-75
FATES AND EFFECTS OF OIL AND OIL COMPOUNDS ON MARINE COASTAL ECOSYSTEMS

Principal Investigators: Templeton, W. L., C. I. Gibson, J. R. Vanderhorst, and R. M. Bean
Specialty: Ecosystems
Performing Organization: Battelle Memorial Institute, P.O. Box 999, Richland, Washington 99352
Supporting Agency: U.S. Energy Research and Development Administration, Biomedical and Environmental Research Division, Contract AT(45-1)-1830
Period: 7/74 to 6/75 Funds: Unknown

Biological and chemical studies are being integrated into a program to determine the fate of oil components in marine environments and examine the complex effects of those components on community structure. A three-month chronic exposure of an experimental intertidal community to oil is in progress.

General effects of oil pollution

SSIE No.: ZPE-11024

R-304-75
INPUTS, FATES, AND EFFECTS OF PETROLEUM IN MARINE ENVIRONMENTS

Principal Investigator: Vetter, R. C.
Performing Organization: National Academy of Sciences, 2101 Constitution Ave., N.W., Washington, D. C. 20037
Supporting Agency: U.S. Environmental Protection Agency, Office of Research and Development, 802476, Contract 72P21484
Period: 7/74 to 6/75 Funds: Unknown

The objectives of the Workshop on Inputs, Fates, and Effects of Petroleum in the Marine Environment, organized by the Ocean Affairs Board of the National Academy of Sciences, include the following: (1) quantify the inputs of petroleum in the marine environment; (2) compare analytical techniques and establish reliability criteria for these techniques; (3) investigate the fates of petroleum in the ocean caused by weathering, dispersion, biodegradation and biological uptake; (4) evaluate effects of petroleum spills on coastline and biota, marine resources and human health.

SSIE No.: AO-21484

SECTION IV. PATENTS

A. UNITED STATES PATENTS

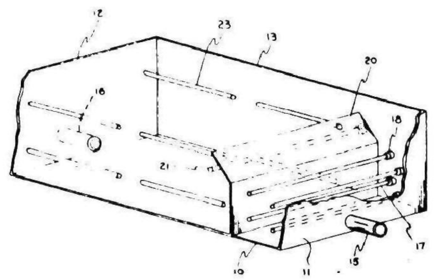
P-304-75
APPARATUS FOR REMOVAL OF DISSOLVED OR SUSPENDED SOLIDS IN WASTE WATER

Anderson, H. T. 1975.
U.S. Patent 3,865,711

A system for the de-emulsification of oil-water emulsions and clarification of dissolved or suspended solids in waste water is described. The system treats a three-dimensional anolyte stream resulting from the careful placement of anodes and impressing direct current of galvanic current through the water.

Citation Source: Chemical Abstracts 83(4):#32717u. 1975.

3,865,711
APPARATUS FOR REMOVAL OF DISSOLVED OR SUSPENDED SOLIDS IN WASTE WATER
Harry T. Anderson, Clarendon Hills, Ill., assignor to Swift & Company, Chicago, Ill.
Division of Ser. No. 191,008, Oct. 20, 1971, Pat. No. 3,816,274. This application Nov. 23, 1973, Ser. No. 418,429
Int. Cl. B03c *5/02*; B01k *3/00*
U.S. Cl. 204—275 **5 Claims**



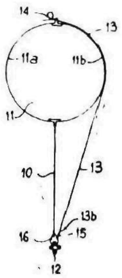
P-305-75
FLOATING ANTI-POLLUTION DEVICE

Ballu, L. 1974.
U.S. Patent 3,852,964

The barrier consists of a skirt, ballast and floats. The barrier height is adjusted using the ballast. Straps pass underneath the ballast and raise or lower the ballast corresponding to a decrease or increase in the height of the skirt.

Citation Source: Selected Water Resources Abstracts 8(11):#W75-05825. 1975.

3,852,964
FLOATING ANTI-POLLUTION DEVICE
Louis Ballu, Epernay, France, assignor to Kleber-Colombes, Paris, France
Filed July 14, 1972, Ser. No. 271,825
Claims priority, application France, July 15, 1971, 71.26043
Int. Cl. E02b *15/04, 3/06*
U.S. Cl. 61—1 F **18 Claims**



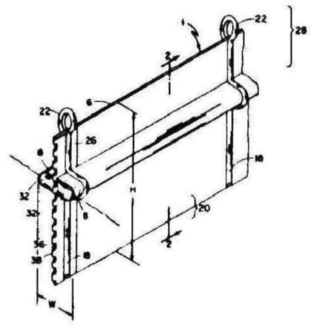
P-306-75
POLYURETHANE OIL BOOM

Benson, R. A. 1974.
U.S. Patent 3,818,708

Foam filled tubing running along the full length of sheets of hard polyurethane provides flotation. The sheets are stiffened with vertical metal pins and are hinged together.

Citation Source: Underwater Information Bulletin 7(1):#75/02/45. 1975.

3,818,708
FLOATING BARRIER
Robert A. Benson, Cohasset, Mass., assignor to Submarine Engineering Associates, Inc., Cohasset, Mass.
Filed Feb. 2, 1972, Ser. No. 222,867
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 F **12 Claims**



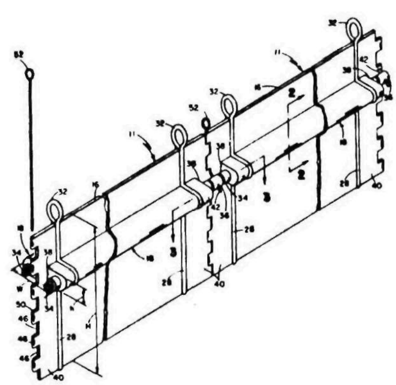
P-307-75
SUBMERSIBLE OIL BOOM

Benson, R. A. 1975.
U.S. Patent 3,859,796

The barrier is composed of solid rubber-like material which is deformable. The barrier can be floated or sunk as required by pumping either gas or water under pressure into two flotation chambers, one at each end of the barrier.

Citation Source: Underwater Information Bulletin 7(4):#75/06/49. 1975.

3,859,796
SUBMERSIBLE OIL BOOM
Robert A. Benson, Cohasset, Mass., assignor to Submarine Engineering Associates, Inc., Cohasset, Mass.
Continuation-in-part of Ser. No. 222,867, Feb. 2, 1972, Pat. No. 3,818,708. This application Mar. 27, 1974, Ser. No. 455,198
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 F 16 Claims



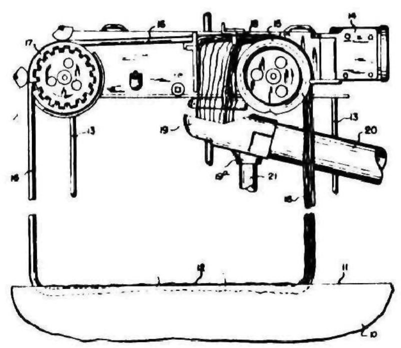
P-308-75
OIL DETECTOR

Brill, E. L. 1975.
U.S. Patent 3,887,907

A hydrophobic collector takes a continuous liquid sample from the water surface. The collection time is predetermined. The sample should be of a certain weight or volume if uncontaminated. If this weight or volume is reached before the collection time is over, a signal is given to indicate the presence of oil in the sample.

Citation Source: Petroleum Abstracts 15(35):#210,144. 1975.

3,887,907
OIL DETECTOR
Eugene L. Brill, 1803 W Royalton Rd., Cleveland, Ohio 44147
Filed Nov. 12, 1973, Ser. No. 414,996
Int. Cl. G08b *21/00*
U.S. Cl. 340—236 **9 Claims**



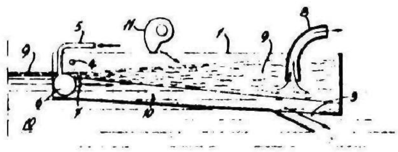
P-309-75
SCOOP FOR COLLECTING A LAYER OF POLLUTING MATERIAL ON WATER SURFACES

Chastan-Bagnis, L. 1974.
U.S. Patent 3,847,815.

A device which collects hydrocarbons, granular materials and various polluting agents floating as a layer on a water surface is composed of a scoop, having the shape of a circular sector, and a header with diffusing tubes circulating water toward the rear of the scoop where it then escapes through an opening. The thickened pollutant layer which floats on top of water is removed through a separate duct.

Citation Source: Selected Water Resources Abstracts 8(12):#W75-05903. 1975.

3,847,815
SCOOP FOR COLLECTING A LAYER OF POLLUTING MATERIAL ON WATER SURFACES
Lucien Chastan-Bagnis, 21 Avenue Isola Bella, 06400 Cannes, France
Filed Jan. 31, 1973, Ser. No. 328,310
Claims priority, application France, Feb. 4, 1972, 72.05078
Int. Cl. E02b 15/04
U.S. Cl. 210–242 3 Claims



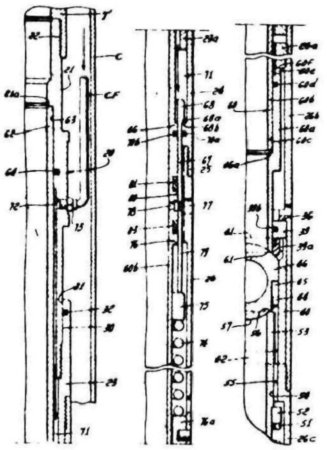
P-310-75
SUBSURFACE SAFETY VALVE

Cockrell, O. W. 1974.
U.S. Patent 3,830,297

This apparatus is used for underwater wells and includes a ball shutoff mechanism operated by fluid pressure from above. A bypass sleeve equalizes the pressure across it before the valve is opened to relieve the seating pressure.

Citation Source: Underwater Information Bulletin 7(2):#75/04/22. 1975.

3,830,297
SUB-SURFACE SAFETY VALVE WITH IMPROVED BALANCING VALVE MEANS
Darryl W. Cockrell, Houston, Tex., assignor to Baker Oil Tool, Inc., Los Angeles, Calif.
Filed Jan. 8, 1973, Ser. No. 322,075
Int. Cl. E21b 43/12
U.S. Cl. 166—224 S **20 Claims**



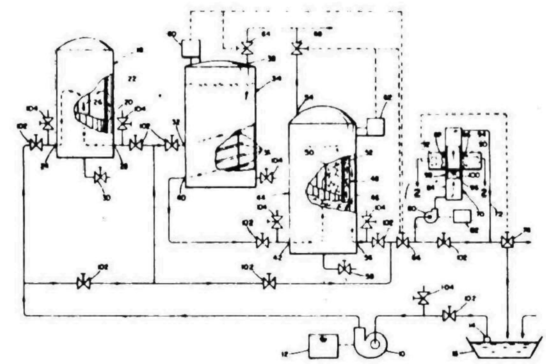
P-311-75
SYSTEM FOR SEPARATING HYDROCARBONS FROM WATER

Conley, J. D. 1975.
U.S. Patent 3,878,094

This apparatus consists of a mechanical emulsion breaker for removing emulsified hydrocarbon from the water stream, and upstream of the emulsion breaker, a separator for removing free and entrained hydrocarbon pollutants from the stream. The system can remove a wide variety of hydrocarbon contaminants and continuously monitors the effluent quality.

Citation Source: Petroleum Abstracts 15(31):#208,989. 1975.

3,878,094
SYSTEM FOR SEPARATING HYDROCARBONS FROM WATER
James D. Conley, Tulsa, Okla.; Donald E. Belden, Sand Springs, Okla., and Ralph D. Terhune, Tulsa, Okla., assignors to Fram Corporation, East Providence, R.I.
Filed Nov. 27, 1972, Ser. No. 309,660
Int. Cl. B01d 21/24
U.S. Cl. 210—96 1 Claim



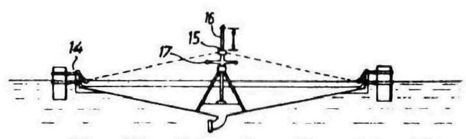
P-312-75
SKIMMING DEVICE

Falxa, H. 1975.
U.S. Patent 3,876,540

A device to skim a body of still liquid, and separate the oil and water phases is described.

Citation Source: Environmental Technology & Economics 16:6. 1975.

3,876,540
SKIMMING DEVICE
Henri Falxa, Lacq, France, assignor to Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine, Paris, France
Filed May 18, 1973, Ser. No. 361,412
Claims priority, application France, May 19, 1972, 72.18171
Int. Cl. B01d *35/14*
U.S. Cl. 210—97 **4 Claims**



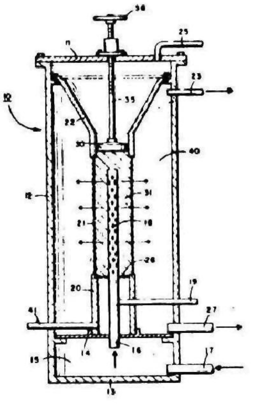
P-313-75
OIL AND WATER SEPARATION

Garcia, J. A. 1974.
U.S. Patent 3,830,381

An oil-water mixture is separated by passing it through particulate matter packed in a column. The particulate matter filters the mixture and causes oil globules to coalesce. The globules are then separated from the water by gravity.

Citation Source: Underwater Information Bulletin 7(2):#75/04/20. 1975.

3,830,371
LIQUID-LIQUID SEPARATION
Juan A. Garcia, Kingsville, Tex., assignor to Esso Production Research Company, Houston, Tex.
Filed Dec. 27, 1972, Ser. No. 319,105
Int. Cl. B01d *23/10*
U.S. Cl. 210—265 **1 Claim**



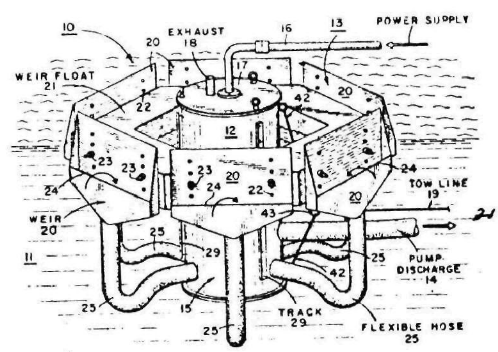
P-314-74
OIL SKIMMER

Glaeser, J. L. 1974.
U.S. Patent 3,830,370

The oil skimming device is composed of a sump, a pump and a motor located within a buoyancy unit. As the unit is towed through the water, weirs around the sump allow oil to be skimmed off and oil passing into the sump is pumped to the towing vessel.

Citation Source: Underwater Information Bulletin 7(2):#75/04/21. 1975.

3,830,370
MOTION DECOUPLED SKIMMER FOR REMOVING OIL FROM THE SURFACE OF CALM OR DISTURBED WATER
John L. Glaeser; Wilson G. Weisert, Jr., and Gerald R. Cunningham, all of Santa Monica, Calif., assignors to Esso Production Research Company, Houston, Tex.
Filed Sept. 5, 1972, Ser. No. 286,526
Int. Cl. E02b *15/04*
U.S. Cl. 210—242 **4 Claims**



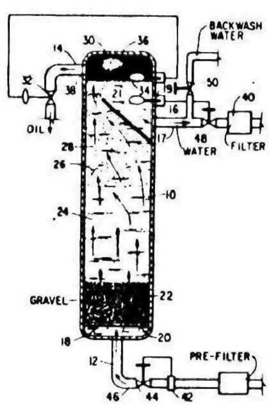
P-315-75
REMOVING OIL FROM WASTE WATER WITH SULFUR

Jones, L. W. 1974.
U.S. Patent 3,853,753

When water containing dispersed oil is forced to flow through a bed of sulfur, the oil coalesces with the sulfur. A cyclone separator then separates the oil-sulfur coagulate from the water.

Citation Source: Selected Water Resources Abstracts 8(11):#75-05820. 1975.

3,853,753
REMOVING OIL FROM WASTE WATER WITH SULFUR
Loyd W. Jones, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.
Filed Oct. 13, 1970, Ser. No. 80,424
Int. Cl. B01d *17/04*; **C02b** *9/02*
U.S. Cl. 210—23 **13 Claims**



P-316-75
OIL-WATER SEPARATION

Keller, H. F., Jr. 1975.
U.S. Patent 3,867,285

Ground up slag, shale or glass, sand or Al_2O_3 can be used as filter media through which mixtures of oil, water and particulate matter are passed and then separated into individual components. The particulates along with some oil are retained on the filter while the effluent separates into distinct oil and water layers.

Citation Source: Chemical Abstracts 83(4):#32731u. 1975.

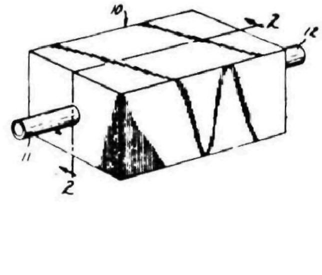
P-317-75
SEPARATOR FOR REMOVING A DISPERSED LIQUID PHASE FROM A CONTINUOUS LIQUID PHASE

Krueger, D. L. 1974.
U.S. Patent 3,847,821

The concentration of dispersed crude oil in tap water was decreased from 394 to <1.2 ppm by a stack of six webs of melt-blown polypropylene microfibers and five webs of glass fibers at 9.5 gallons/minute-ft^2. Crude, fuel, motor, soybean oils, toluene and a mixture of bunker C oil and No. 2 fuel oil dispersions were also removed by separating elements with glass fiber and reticulate polyurethane foam coalescing media and polypropylene and porous polystyrene fiber sorbing media.

Citation Source: Chemical Abstracts 82(26):#173011a. 1975.

3,847,821
SEPARATOR FOR REMOVING A DISPERSED LIQUID PHASE FROM A CONTINUOUS LIQUID PHASE
Dennis L. Krueger, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 19, 1973, Ser. No. 407,965
Int. Cl. B01d 25/16
U.S. Cl. 210—488 20 Claims



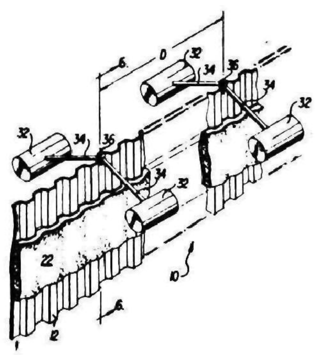
P-318-75
OIL CONTAINMENT BOOM

Markel, A. L., and J. R. R. Harter. 1973.
U.S. Patent 3,731,491

A vertical corrugated metal barrier supported by plastic flotation means comprises the oil containment boom.

Citation Source: Environmental Technology & Economics 10:8. 1975.

3,731,491
OIL CONTAINMENT BOOM
Arthur L. Markel, and J. Robert R. Harter, both of Miami, Fla., assignors to Reynolds Submarine Services Corporation, Miami, Fla.
Filed Oct. 12, 1971, Ser. No. 188,324
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 F **1 Claim**



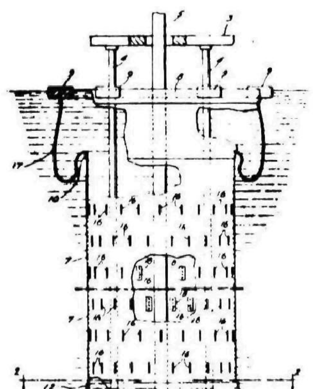
P-319-75
UNDERWATER DRILLING POLLUTION CONTROL CURTAIN

Mason, C. M. 1975.
U.S. Patent 3,879,951

A system has been developed for containing underwater hydrocarbon seepage and transporting it within a small floating collar to the surface where it can be easily collected. Seeping fluid is communicated from the sea floor upward to the predefined surface area through an enclosed curtain attached at its lower end to the ocean floor and at its upper end to the truss below the surface. A flexible barrier surrounds the truss and is attached to the collar and top of the curtain.

Citation Source: Petroleum Abstracts 15(32):#209,278. 1975.

3,879,951
UNDERWATER DRILLING POLLUTION CONTROL CURTAIN
Charley Mack Mason, Denton, Tex., assignor to Sun Oil Company, Dallas, Tex.
Filed June 25, 1973, Ser. No. 373,580
Int. Cl. E02b *17/00, 15/04*
U.S. Cl. 61—1 R **4 Claims**



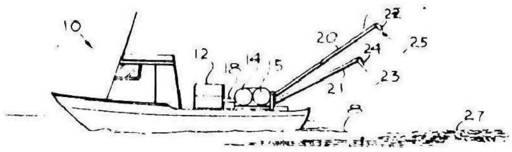
P-320-75
PROCESS FOR CONTROLLING OIL SLICKS

Miranda, S. W. 1975.
U.S. Patent 3,886,067

A process for controlling oil spills on water surfaces is described in which oleophilic foam resin is applied to the spill to bind the oil. The oil-impregnated foam is removed from the surface by skimming pumps and the remaining sponge-like clods sink to the bottom or reach beaches in an easily removable form.

Citation Source: Petroleum Abstracts 15(34):#209,785. 1975.

3,886,067
PROCESS FOR CONTROLLING OIL SLICKS
Salvatore W. Miranda, P. O. Box 5746, Carmel, Calif. 93921
Filed Feb. 3, 1970, Ser. No. 8,198
Int. Cl. C02b *9/02;* **E02b** *15/04*
U.S. Cl. 210—40 **15 Claims**



P-321-75
USE OF MICROORGANISMS TO DISPERSE AND DEGRADE OIL SPILLS

Mohan, R. R., G. H. Byrd, Jr., J. Nixon, and E. R. Bucker. 1975.
U.S. Patent 3,871,957

A method of preparing and applying certain microorganisms for the dispersal of marine oil spills is described. The spill area is treated with a water slurry of a mixture of microorganisms selected from Arthrobacter, Micrococcus, and Achromobacter.

Citation Source: Petroleum Abstracts 15(27):#207,532. 1975.

P-322-75
METHOD OF REMOVING OIL FROM WATER

Otrhalek, J. V. 1973.
U.S. Patent 3,729,411

"Spreading of a silicone-treated expanded volcanic ash to absorb oil."

Citation Source: Environmental Technology & Economics 8:8. 1975.

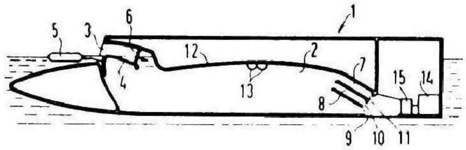
P-323-75
DEVICE FOR CLEANING WATER POLLUTED BY OIL

Rafael, J. 1975.
U.S. Patent 3,875,062

"A floating body with a collecting chamber for separation of oil and water, with discharge means for the separated layers."

Citation Source: Environmental Technology & Economics 15:7. 1975.

3,875,062
DEVICE FOR CLEANING WATER POLLUTED BY OIL
Johann Rafael, Maxstrasse 36, Salzburg, Austria
Filed Sept. 25, 1973, Ser. No. 400,633
Claims priority, application Germany, Sept. 25, 1972, 2246958
Int. Cl. E02b *15/04*
U.S. Cl. 210—242 **6 Claims**



P-324-75
DENSE SOLVENT DEMULSIFICATION METHOD FOR BITUMINOUS PETROLEUM-WATER EMULSIONS

Redford, D. A. 1975.
U.S. Patent 3,878,090

A dense solvent (CS_2 [75-15-0], CCl_4 [56-23-5], $CHCl_3$, CH_2Cl_2, and $MeCCl_3$) was added to bituminous petroleum-water emulsions to demulsify the emulsion.

Citation Source: Chemical Abstracts 83(6):#45665a. 1975.

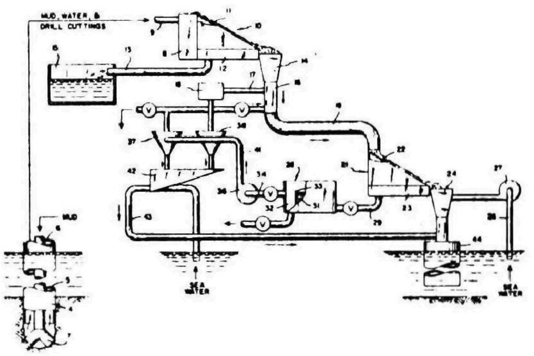
P-325-75
APPARATUS FOR AVOIDING WATER POLLUTION AT AN OFFSHORE DRILLING SITE

Teague, L. P. 1975.
U.S. Patent 3,860,019

This apparatus removes pollutants from well drilling cuttings after the cuttings have been removed from a subterranean well. Intially the majority of the mud is removed with the help of a detergent, then the detergent is eliminated.

Citation Source: Underwater Information Bulletin 7(4):#75/06/41. 1975.

3,860,019
APPARATUS FOR AVOIDING WATER POLLUTION AT AN OFFSHORE DRILLING SITE
Loy P. Teague, Morgan City, La., assignor to Texaco Inc., New York, N.Y.
Filed July 27, 1972, Ser. No. 275,677 The portion of the term of this patent subsequent to Sept. 26, 1989, has been disclaimed.
Int. Cl. B08b *3/10, 15/00*
U.S. Cl. 134—109 **8 Claims**



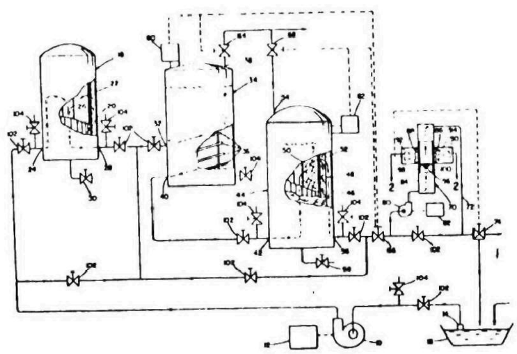
P-326-75
EMULSION BREAKER

Terhune, R. D., and J. C. Duke. 1975.
U.S. Patent 3,865,732

The mechanical emulsion breaker is composed of two stages: one stage comprises a resin impregnated fibrous medium including synthetic fibers which traps particles 25 μ in diameter, but permits passage of particles 1 μ in diameter; and a downstream stage which comprises a batt including water-resistant synthetic fibers for removing water bubbles surrounding hydrocarbon droplets passing out of the first stage.

Citation Source: Chemical Abstracts 83(4):#32716t. 1975.

3,865,732
EMULSION BREAKER
Ralph D. Terhune, and James C. Duke, both of Tulsa, Okla., assignors to Fram Corporation, East Providence, R.I.
Filed Nov. 27, 1972, Ser. No. 309,794
Int. Cl. B01d 25/06
U.S. Cl. 210—315 1 Claim



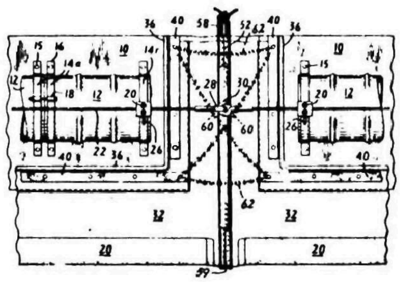
P-327-75
MODULAR OIL CONTAINMENT BOOM

Thurman, R. K. 1975.
U.S. Patent 3,868,824

The floating oil containment apparatus is composed of a number of modules which may easily be connected and disconnected while afloat. The means by which adjacent barriers are fastened are described.

Citation Source: Selected Water Resources Abstracts 8(13):#W75-06687. 1975.

3,868,824
MODULAR OIL CONTAINMENT BOOM
Robert K. Thurman, Carmel, N.Y., assignor to Merritt Division of Murphy Pacific Marine Salvage, New York, N.Y.
Continuation-in-part of Ser. No. 78,801, Oct. 7, 1970, Pat. No. 3,751,925. This application July 2, 1973, Ser. No. 375,767
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 F **4 Claims**



P-328-75
MATERIAL FOR BIOLOGICAL DEGRADATION OF PETROLEUM

Townsley, P. M. 1975.
U.S. Patent 3,883,397

Particles of nutrients, coated with a lipophilic, partially hydrophobic, biodegradable material, are used to sustain microbial activity in petroleum-containing waters. The size of the particles allows them to remain at an oil water interface or be suspended in the oil.

Citation Source: Petroleum Abstracts 15(34):#209,784. 1975.

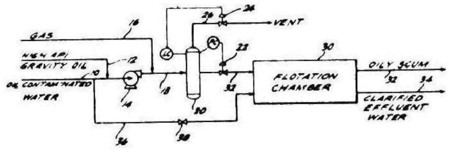
P-329-75
PROCESS FOR SEPARATING LOW API GRAVITY OIL FROM WATER

Traylor, V. L. 1975.
U.S. Patent 3,884,803

A small amount of low density oil is added to water contaminated with high-density crude oil. Fine bubbles help to float the oil and particulate matter to the surface where they can be mechanically separated. A low oil-content water remains which can be discharged.

Citation Source: Petroleum Abstracts 15(35):#210,152. 1975.

3,884,803
PROCESS FOR SEPARATING LOW API GRAVITY OIL FROM WATER
Verlon L. Traylor, Casper, Wyo., assignor to Union Oil Company of California, Brea, Calif.
Filed June 23, 1972, Ser. No. 265,649
Int. Cl. B01d *17/02*
U.S. Cl. 210—44 **11 Claims**



P-330-75
PROCESS FOR THE EXTRACTION OF PHENOL FROM WASTE WATERS IN THE FORM OF UREA-FORMALDEHYDE-PHENOL CONDENSATES

Vargiu, S., S. S. Giovanni, G. Mazzoleni, and S. Pezzoli. 1975.
U.S. Patent 3,869,387

The reactions and reaction products occurring in the extraction process to remove phenol from waste waters in the form of urea-formaldehyde-phenol condensates are described. These synthetic resin products can be used as adhesives and binding agents.

Citation Source: Selected Water Resources Abstracts 8(13):#W75-06682. 1975.

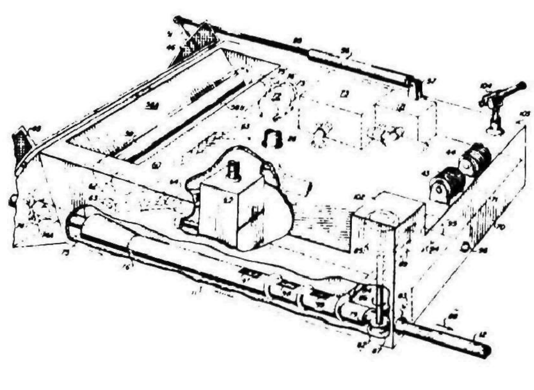
P-331-75
BOAT FOR COLLECTING OIL SLICKS AND OTHER CONTAMINANTS FROM THE SURFACE OF WATER

Weatherford, D. J. 1975.
U.S. Patent 3,862,904

This oil collection vessel is a self-propelled barge equipped with a loop-type boom that draws the oil toward the skimmer aperture. A wire basket collects rubbish which is then compressed into bales. The oil is pumped into a floating storage bag.

Citation Source: Selected Water Resources Abstracts 8(11):W75-05816. 1975.

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



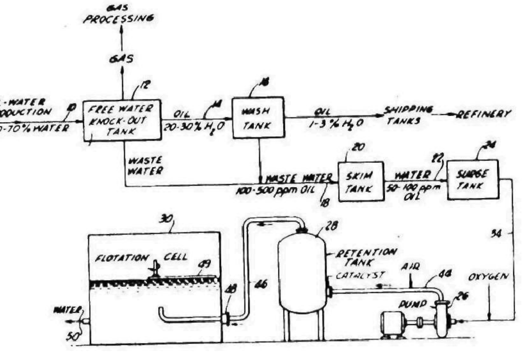
P-332-75
WASTE WATER TREATMENT PROCESS

Wheeler, D. W. 1973.
U.S. Patent 3,725,264

A method is described for removing residual oil and dissolved sulfides from oil production waste waters prior to disposal of the waste water in the ocean. Controlled amounts of oxygen, air and a catalyst to oxidize the sulfides to free sulfur in the waste water are injected.

Citation Source: Environmental Technology & Economics 1:8. 1975.

3,725,264
WASTE WATER TREATMENT PROCESS
Douglas W. Wheeler, Huntington Beach, Calif., assignor to Signal Oil and Gas Company
Filed Mar. 13, 1972, Ser. No. 234,276
Int. Cl. C02b *1/34*
U.S. Cl. 210—44 **10 Claims**



B. FOREIGN PATENTS

P-333-75
APPARATUS TO RECOVER MATTER OR MATERIAL FLOATING ON THE SURFACE OF WATER

Anon. 1974.
French Patent 2,229,260

The apparatus is composed of a flexible inclined apron installed as an endless belt which goes over two end drums, a hopper over which the lower surface of the belt moves and flexible drip flaps. Rigid projections behind the drip flaps aid in the movement of the lower belt surface from the bottom to the top.

Citation Source: Petroleum Abstracts 15(25):#206,885. 1975.

P-334-75
APPARATUS FOR REMOVING MATERIAL FLOATING ON THE SURFACE OF WATER

Anon. 1974.
French Patent 2,217,483

An apparatus for removing floating material such as oil consists of a principal floating section with at least one passage for the material and a suction and discharge pump driven by an engine on the float. Several other floats are attached around the principal body to insure the stability of the apparatus. The suction height within the passage is adjusted so that a maximum of foreign matter and a minimum of water is aspired into a collecting chamber.

Citation Source: Petroleum Abstracts 15(26):#207,244. 1975.

P-335-75
FLOATING TANK, ESPECIALLY FOR THE RECOVERY OF PETROLEUM ESCAPING FROM THE BOTTOM OF THE SEA

Anon. 1974.
French Patent 2,229,816

This floating tank consists of a vertical pipe open at its lower end and equipped with means for permitting entry into it from a large area. The column also has a large cross section structure attached so that it can move along the bottom.

Citation Source: Petroleum Abstracts 15(24):#206,441

P-336-75
ABSORPTION OF VISCOUS MATERIALS

Bentfors, W., and H. H. Gustafson. 1974.
Netherlands Application 73 08,973

Oils and other viscous hydrophobic liquids can be absorbed by a fluffy product made from finely chopped waste paper.

Citation Source: Chemical Abstracts 83(6):#47980y. 1975.

P-337-75
EMULSIFYING COMPOSITION

Blanchard, P. M. 1975.
British Patent 1,379,222

Emulsifying agents are sprayed onto oil slicks on coastline waters so as to enable an emulsion with water to be formed, resulting in the breakup of the oil slick. The composition of the emulsifying agent is given.

Citation Source: Petroleum Abstracts 15(26):#207,246. 1975.

P-338-75
DISPOSAL OF OIL WASTES

Boelsing, F. 1975.
German Offenlegungsschriften (unexamined patent application) 2,328,778

Oil-containing waste waters from refineries, garages and processing plants are mixed with an alkaline earth metal oxide pretreated and made hydrophobic with a suitable surfactant. The mixture is converted with an amount of water and the resulting carbonized and carbonated material is dumped for use as road-building material.

Citation Source: Chemical Abstracts 83(4):#32711n. 1975.

P-339-75
PROCEDURE AND INSTALLATION TO CLOSE OFF LEAKING PIPELINES

BTR Industries Ltd. 1974.
Netherlands Application 7,407,037

A casting form is placed around the pipeline leak in order to form a casting chamber. The chamber is made smaller, thereby putting the closing material under presure and at a pressure higher than the work pressure in the line.

Citation Source: Petroleum Abstracts 15(30):#208,631. 1975.

P-340-75
REMOVAL OF OIL FROM WATER SURFACES

Buettner, E., and H. Helfert. 1975.
German Offenlegungsschriften (unexamined patent application) 2,338,112

Sea sand impregnated with 1000 ppm heptadecenylimidazoline surfactant in 0.5% ethanol adsorbed oil from water surfaces. The oil film quickly sinks to the sediment using this treatment.

Citation Source: Chemical Abstracts 83(18):#65295h. 1975.

P-341-75
WATER TREATING

Cole, E. L., and H. V. Hess. 1974.
Canadian Patent 955,182

A water/oil emulsion containing algae is heated to 600°F in a 1980 ml autoclave for two hours. It is then cooled, the gases vented, and the residues filtered. The residues are coke, oil and an aqueous solution with a COD that can be reduced easily.

Citation Source: Chemical Abstracts 83(6):#47948u. 1975.

P-342-75
COMPLEX FOR FIXING HYDROCARBONS AND OTHER ORGANIC PRODUCTS, CONTAINED IN A LIQUID

Creusot-Loire. 1974.
Frenche Demande 2,223,063

Waste water is passed through a solid mixture containing a halogenating agent on a solid support material with an aliphatic, primary or protein amine. Organic solvents are then used to remove the hydrocarbons from the solid.

Citation Source: Chemical Abstracts 83(6):#47927m. 1975.

P-343-75
REMOVAL OF HYDROCARBONS FROM WASTE WATER

Creusot-Loire. 1974.
German Offenlegungsschriften (unexamined patent application) 2,414,606

Removal of hydrocarbons from waste water is achieved by repeated passage through absorption columns filled with granules containing n-tetradecylamine and crushed porcelain or bentonite. The process was demonstrated to reduce the amount of hydrocarbons in waste water from 60-70 ppm to 3.2-3.4 ppm hydrocarbons in the effluent.

Citation Source: Chemical Abstracts 82(24):#160012b. 1975.

P-344-75
PROTECTING BEACHES AND SHORES FROM CONTAMINATION BY OIL

Esso Research and Engineering Company. 1974.
Netherlands Application 74 06,257

EM-30 is a mixture of Arthrobacter nov. sp., Achromobacter nov. sp., and Micrococcus denitrificans and has the ability to degrade oil. When EM-30 is mixed with a porous carrier such as diatomaceous earth, it can be applied to surfaces of beaches, piers, etc. to break down the polluting oil. The EM-30 suspension will break down 25 times its weight in oil.

Citation Source: Chemical Abstracts 83(6):#47945r. 1975.

P-345-75
A FLOATING BOOM ASSEMBLY

Fish, J. A., and R. Wren. 1975.
British Patent 1,379,256

Floating boom elements which form a boom assembly to contain oil floating on water consist of a tubular inflatable portion, a weighted skirt, end portions with stiffening members and coupling means located at end portions.

Citation Source: Petroleum Abstracts 15(25):#206,850. 1975.

P-346-75
REMOVAL OF EMULSIFIED OIL FROM WASTE WATER

Fujii, M. 1975.
Japanese Kokai (unexamined patent application) 75 00,650

Floated oils and nonionic surfactants are removed from waste water by a process in which an anionic or cationic surfactant is added to the waste water, Na ferrocyanide, Co thiocyanate, NH_4 phosphomolybdate, and/or NH_4 phosphotungstate is added, and the mixture is electrolyzed with Al, Fe, Zn or their alloy anodes by applying an electrical current 2.5-25 mA/1000 mg oil content.

Citation Source: Chemical Abstracts 83(4):#32726w. 1975.

P-347-75
APPARATUS FOR SEPARATING A MIXTURE OF TWO IMMISCIBLE LIQUIDS HAVING DIFFERENT SPECIFIC GRAVITIES

Gillard, P. R. 1975.
British Patent 1,385,323

An apparatus consisting of a separating chamber with a device for reducing turbulence and a feed means for delivering an oil-water mixture at a superatmospheric pressure is used to separate such mixtures on board a ship or tanker.

Citation Source: Chemical Abstracts 83(2):#15333y. 1975.

P-348-75
A BOOM SECTION AND A BOOM STRUCTURE

Gillard, P. R. 1975.
British Patent 1,383,309

A boom section consists of a float portion and a keel portion arranged in a vertical position in water. The boom section is pivotally connected to an adjacent boom section. Passage of liquid between the two components is prevented by the use of flexible bellows to seal each section.

Citation Source: Petroleum Abstracts 15(26):#207,247. 1975.

P-349-75
OIL SEPARATOR

Gollan, A., and D. H. Fruman. 1974.
German Offenlegungsschriften (unexamined patent application) 2,354,939

The separation chamber is filled with a porous oil-absorbing and -coalescing material which has to be regenerated only infrequently. The supply chamber feeds into the separation chamber and the flotation chamber follows, with an upper outlet for the oil and a lower for the water.

Citation Source: Chemical Abstracts 83(6):#47918j. 1975.

P-350-75
SEPARATION OF OIL FROM WATER USING AN OLEOPHILIC POROUS MATERIAL

Gollan, A., and D. H. Fruman. 1974.
French Demande 2,224,412

An apparatus for separating oil from water is composed of polyurethane foam with 12-40 pores/cm and a gravity flotation chamber. The flow rate is controlled and the degree of oil-water separation is measured before leaving the flotation chambers and before the final exit from the apparatus.

Citation Source: Chemical Abstracts 83(4):#32738b. 1975.

P-351-75
EXTRACTION OF PETROLEUM PRODUCTS FROM WASTE WATERS BY HYDROCARBONS

Goncharenko, G. K., V. Ya. Shuteev, Ya. V. Leonenok, A. Z. Zlomnov, V. P. Mikhailichenko, and D. N. Gulyaev. 1974.
U.S.S.R. Patent 451,641

"Aliphatic hydrocarbons, e.g., gasoline from gas-condensate manufacturing, are used as extractants."

Citation Source: Chemical Abstracts 83(2):#15316v. 1975.

P-352-75
TREATMENT OF WASTE WATER CONTAINING OILS AND HYDROGEN SULFIDE

Goshi, A., Y. Natsume, and H. Tachikawa. 1974.
Japanese Kokai (unexamined patent application) 74,119,449

Industrial waste water is purified of oils and H_2S by coagulating the oils. The oil-containing waste water is contacted with solid materials having large surface areas, then the resulting coagulated oils are separated by floating, and the waste water distilled to remove H_2S.

Citation Source: Chemical Abstracts 83(2):#15271b. 1975.

P-353-75
FLOATING, FLEXIBLE MARINE ANTIPOLLUTION BARRIER WITH ADJUSTABLE DRAFT

Grihangne, A. 1975.
French Patent 2,234,781

This floating barrier, used for controlling oil spills on surface waters, is composed of a hose structure with flexible walls. Inflated with compressed air through one end and with ballast elements at its bottom, the hose forms a floating barrier with the inflated portion above water and the skirt-shaped lower part serving as an effective barrier under water.

Citation Source: Petroleum Abstracts 15(26):#207,245. 1975.

P-354-75
CHEMICAL TREATMENT OF WASTE WATER

Gubela, H. E., M. R. Blair, Jr., R. N. Boyes, M. I. Lebeaux, and H. G. Vassallo. 1975. German Offenlegungsschriften (unexamined patent application) 2,341,415.

The treatment for adsorbing oil, removing nitrate, controlling pH, and improving flocculation in a variety of waste waters is described.

Citation Source: Chemical Abstracts 83(4):#32742y. 1975.

P-355-75
POLYMER OIL ABSORBENT

Gulf Research and Development. 1974.
British Patent 1,368,669

Foam produced from ethylene-alkyl acrylate polymer is sprayed on an oil slick, and then the sodden polymer is scooped from the sea surface. The foam may be reused.

Citation Source: Underwater Information Bulletin 7(2):#75/04/57. 1975.

P-356-75
REMOVAL OF SUSPENDED SOLIDS FROM WASTE WATER BY COAGULATIVE FLOTATION

Hamada, K., and H. Uchiyama. 1974.
Japanese Kokai (unexamined patent application) 74,135,269

Suspended solids in the waste water are coagulated by adding an organic coagulant and inorganic fine hollow particles. After agitation for 10 seconds, floated flocs are removed to obtain transparent water.

Citation Source: Chemical Abstracts 83(6):#47923g. 1975.

P-357-75
PURIFICATION OF HYDROCARBON-CONTAINING WASH WATER

Hartnack, W. R. 1975.
German Offenlegungsschriften (unexamined patent application) 2,349,231

A demulsifier mixture containing an Fe (III) salt and 50-70% starch removes emulsified oil residues from oil containing industrial wash waters. The oil is removed mechanically, leaving a clear water with <10 mg/l; further treatment yielded 2.4 mg/l.

Citation Source: Chemical Abstracts 83(8):#65202a. 1975.

P-358-75
METHOD AND APPARATUS FOR BURNING COMBUSTIBLE LIQUIDS WITHIN A CONFINED BURNING AREA

Heagler, R. B. 1975.
Canadian patent 969,085

A furnace, fabricated to float partially submerged in water, is used to confine and burn oil residues and emulsions floating on a body of water. The furnace has combustion air inlet means adjacent to the upper surface of the residue and a stack with inlets for a combustible gas.

Citation Source: Petroleum Abstracts 15(30):#208,687. 1975.

P-359-75
TREATMENT OF WASTE WATER CONTAINING PHENOLS

Honda, K., Y. Aimi, T. Akatsu, and H. Sugitani. 1975.
Japanese Kokai (unexamined patent application) 74 04,855

Waste water containing phenols is mixed with 72.0 moles of a basic material per mole PhOH and its derivatives and distilled. The residue is dewatered, dried and incinerated.

Citation Source: Chemical Abstracts 83(6):#47932j. 1975.

P-360-75
COMBATTING THE CONTAMINATION OF WATER BY OIL FLOATING ON IT

International Goodrich-Europe B.V. 1975.
Netherlands Application 73 10,267

Oil spills are adsorbed on polyurethane foam particles or plates pre-moistened with water which may contain ~1% surfactant. The surfactant may also be applied directly to the foam.

Citation Source: Chemical Abstracts 83(4):#32721r. 1975.

P-361-75
SEPARATION OF OIL AND WATER

Kawachi, K., Y. Negi, and S. Nosetani. 1975.
Japanese Kokai (unexamined patent application) 75 14,576

"An oil emulsion is filtered through branched and rough-surfaced fibers of a hydrocarbon polymer to adsorb oil, the oil is then removed."

Citation Source: Chemical Abstracts 83(4):#32759j. 1975.

P-362-75
OIL ADSORBENT

Kitagaki, T., K. Taguchi, and S. Nakamura. 1974.
Japanese Kokai (unexamined patent application) 74,120,885

Oils are removed from water and seawater by the use of poly (vinyl acetal) resin sponge treated with silicone-system water repellants. When immersed in water containing fuel oil A, the adsorbent was shown to adsorb fuel oil A in an amount 10.4 times its weight.

Citation Source: Chemical Abstracts 82(24):#160026j. 1975.

P-363-75
AGENT FOR TREATING OIL ON WATER SURFACE

Kondo, G., S. Honda, and Y. Murakami. 1974.
Japanese Patent 74 45,061

An agent comprising an ester-type nonionic surfactant and ≤ 1 of methylene chloride, dichloroethylene and dichloropropane has a low toxicity to fish and shellfish and a high dispersability and emulsifying capacity for treating oil spills on water.

Citation Source: Chemical Abstracts 83(4):#32750z. 1975.

P-364-75
REMOVAL OF OILS FROM WASTE WATER

Konishi, M., and E. Chonan. 1974.
Japanese Kokai (unexamined patent application) 74,111,874

An emulsion of waste water containing mineral oils is separated by the addition of a neutral inorganic salt (10 g/l) and agitation of the mixture.

Citation Source: Chemical Abstracts 82(26):#174974d. 1975.

P-365-75
FIBROUS OIL COLLECTOR

Miyamoto, H., M. Inoue, K. Sugimura, and S. Goto. 1975.
Japanese Kokai (unexamined patent application) 75 03,089

Fiber mixtures consisting of 50-90% polyolefin-system fibers and 10-50% cellulose-system fibers and having circularity 5-30% are used to remove oils from water.

Citation Source: Chemical Abstracts 83(2):#15327z. 1975.

P-366-75
BREAKING OF OIL-WATER EMULSIONS BY ELECTROLYSIS

Mizusaki, H. 1974.
Japanese Kokai (unexamined patent application) 74 89,679

The invention treats oil-containing waste water electrolytically in a cell which employs a scrap Al powder anode, enables rapid breaking of an oil-water emulsion, and requires only electric power consumption.

Citation Source: Chemical Abstracts 83(2):#15252w. 1975.

P-367-75
SILICA AS OIL ABSORBER

Nishimura, K., and S. Otsu. 1975.
Japanese Kokai (unexamined patent application) 75 27,791

A silane-coupling agent containing an NH_2 group is used to treat siliceous material of greater than 30 m^2/g specific surface. Added to an oil emulsion of 300 or 5000 ppm, this siliceous material reduced the oil content to 3.6-10.8 ppm.

Citation Source: Chemical Abstracts 83(8):#65215g. 1975.

P-368-75
HYDROPHOBIC AND OIL-ABSORBING SILICA GEL POWDER

Noguchi, Y., and H. Wakamatsu. 1975.
Japanese Kokai (unexamined patent application) 75 08,785

An oil absorbing silica powder, prepared by adding $MeSiCl_3$ to a large amount of water, collecting the floating product and drying it, is mixed with alcohol silica gel, formed and heated till dry.

Citation Source: Chemical Abstracts 82(24):#158280u. 1975.

P-369-75
FILTER MEDIUM FOR REMOVAL OF OILS FROM WATER

Ohta, M. 1974.
Japanese Kokai (unexamined patent application) 74,132,663

Cotton fiber yarns are degreased, bleached, mercerized with an NaOH solution, washed with water, dried and woven into filter cloth having an oil permeability of <100 ppm. A waste emulsion containing 4500 ppm oil was filtered and reduced to 12 ppm.

Citation Source: Chemical Abstracts 83(8):#65194z. 1975.

P-370-75
OIL MOP

Oil Mop International, Inc. 1974.
Canadian Patent 953,674

An oil mop consists of narrow strips of polypropylene and rods of polystyrene buoyancy units threaded among strands of polypropylene rope. Oil is picked up as the mop is dragged through the slick by a barge and is squeezed out by wringer rolls on the barge.

Citation Source: Underwater Information Bulletin 7(2):#75/04/71. 1975.

P-371-75
APPARATUS AND METHOD FOR TREATING OIL-CONTAINING WASTE WATER

Oswald, E. 1975.
German Offenlegungsschriften (unexamined patent application) 2,350,544

Oil containing effluents are filtered to remove particulates, then passed through ultrafiltration pipes. The concentrate is recycled until a concentration of ~50% is reached. This can then be used for fuel or treated by conventional methods to remove oil.

Citation Source: Chemical Abstracts 83(6):#47990b. 1975.

P-372-75
LIQUID SKIMMING DEVICE

Paterson, I. W. F. 1975.
British Patent 1,380,992

This device consists of a float-supported tube with an inlet for skimming off a layer of liquid adjacent to the surface. The flow of liquid in the tube is controlled by a means responsive to variations in the dielectric constant of the skimmed liquid.

Citation Source: Petroleum Abstracts 15(27):#207,568. 1975.

P-373-75
ABSORBING MATERIAL OF FOAM PLASTIC FOR REMOVING FROM WATER ORGANIC SUBSTANCES SUCH AS OIL

Rinne, P. 1975.
Finnish Patent 49,287

"A crushed or finely powdered phenolic foam, which can be treated with fire retardants, undergoes coking on combustion of absorbed oil and can be reused as an absorbing material."

Citation Source: Chemical Abstracts 83(4):#32741x. 1975.

P-374-75
TREATING AGENT FOR OIL ON WATER

Samejima, T., and T. Imamura. 1974.
Japanese Patent 74 42,788

The oil dispersant is produced by mixing a nonionic C_{11-19} fatty ester with a nonionic surfactant of the group poly(oxyethylene) alkyliphenyl ether, poly (oxyethylene) alkyl ester, poly (oxyethylene) alkylamine, and hydroxy alkyl amide, and mixing the product with a solvent.

Citation Source: Chemical Abstracts 83(2):#15265c. 1975.

P-375-75
TREATMENT OF WASTE WATER CONTAINING ORGANIC WATER-INSOLUBLE MATERIAL IN EMULSION FORM

Schmitz, W., and H. Fratzscher. 1975.
German Offenlegungsschriften (unexamined patent application) 2,334,766

A treatment for waste water containing contaminants such as oils, fats and water-insoluble solvents in the form of emulsion is described. The various emulsion breaking agents which can be used in this treatment, i.e., certain water-soluble salts, metal halides and sulfates, organic flocculants, and two component systems are listed.

Citation Source: Chemical Abstracts 83(4):#32751z. 1975.

P-376-75
OIL DISPERSING COMPOSITIONS

Shell International Research Mij. NV. 1975.
Australian Patent 462,487

A composition used to disperse oil spilled on shores consists of an ester which comprises a mono-ester produced by reacting an aliphatic carboxylic acid with either a polyoxyalkylene glycol or an alkylene oxide, and a liquid hydrocarbon containing less than 10% by weight of aromatic compounds.

Citation Source: Petroleum Abstracts 15(32):#209,279. 1975.

P-377-75
WASTE WATER TREATMENT

Shiga, K., H. Kamata, and H. Okajima. 1974.
Japanese Kokai (unexamined patent application) 74 97,451

Waste water is purified by treating in a series of treating processes: oil removal, oxidation, filtration, and adsorption by activated carbon.

Citation Source: Chemical Abstracts 82(26):#174963z. 1975.

P-378-75
OIL ADSORBENT

Shimomai, A., I. Hamana, Y. Gomi, and K. Katayama. 1975.
Japanese Kokai (unexamined patent application) 75 03,981

An oil adsorbent is obtained by twisting and molding polyolefin or polyvinyl resin sheath-thermoplastic resin core fibers and heating at a temperature higher than the softening point of the sheath component resin but lower than the melting point of the core component resin. When the adsorbent was immersed in heavy oil-containing water for one minute, it adsorbed 1700% heavy oil, based on its weight.

Citation Source: Chemical Abstracts 83(4):#32723t. 1975.

P-379-75
TREATMENT OF WASTE OILS

Shimosaka, H. 1975.
Japanese Kokai (unexamined patent application) 75 01,969

The treatment of waste oils consists of mixing the oil with water and fossil shell powder, and then burning the oil mixture. The cohesion and decomposition of the oil is accelerated by the alkali metals, C compounds, P, and SiO_2 in the fossil shells.

Citation Source: Chemical Abstracts 83(8):#65214f. 1975.

P-380-75
OIL ADSORBENT

Simomai, A., I. Hamana, and Y. Gomi. 1974.
Japanese Kokai (unexamined patent application) 74,103,894

Twisted sheath-core bicomponent fibers were wound on a porous cylinder; water containing 1000 ppm oil was passed through the cylinder to decrease the oil content to 12 ppm.

Citation Source: Chemical Abstracts 83(2):#15301m. 1975.

P-381-75
FILTRATION APPARATUS AND REGENERATION OF FILTER ELEMENTS

Sumitomo Chemical Company. 1974.
Netherlands Application 74 00,310

A filter for the removal of oil from waste water consists of a cylindrical filtering element in which polypropylene fibers are wound on a perforated hollow shaft, protected by a perforated mantle and placed in a closed housing. Filtered oil is centrifuged out into the housing by rotating the shaft at 3000 rpm; the filter is then ready for reuse.

Citation Source: Chemical Abstracts 83(2):#12814v. 1975.

P-382-75
TREATMENT OF OIL-CONTAINING WASTE WATER

Takeda, T., and S. Sasaki. 1975.
Japanese Kokai (unexamined patent application) 75 00,649

Oil is removed from waste water by heating the water at >120° under pressure after adjusting the pH to <4.0.

Citation Source: Chemical Abstracts 83(2):#15284h. 1975.

P-383-75
REMOVAL OF OILS CONTAINING ANIONIC SURFACTANTS FROM WASTE WATER

Tanaka, K., M. Tamayama, N. Gomyo, and Y. Takahata. 1974.
Japanese Kokai 74,124,858

Waste water containing oils and anionic surfactants is treated with a multivalent metal salt and polyacrylic acid or its salt. After agitating, the flocs are removed by filtering; the oil content is reduced to several ppm.

Citation Source: Chemical Abstracts 83(8):#65191w. 1975.

P-384-75
APPARATUS FOR SEPARATING ONE LIQUID FROM ANOTHER LIQUID

Tatsuno, R. 1975.
British Patent 1,385,650

The apparatus consists of a vertical cylinder containing downwardly spaced divergent porous cone-shaped elements which repel water and adsorb oil. When an oil-water mixture is passed into the upper end of the apparatus, water is discharged at the lower end, oil masses form in the separation elements and are discharged through the tops of the elements into a separation tank containing oil and water outlets.

Citation Source: Chemical Abstracts 83(2):#15324w. 1975.

C-385-75
NITROHUMIC ACID-SYSTEM ADSORBENT

Terashima, K., S. Tomita, Y. Matsuda, and K. Abe. 1974.
Japanese Kokai (unexamined patent application) 74 98,788

The composition of an adsorbent having high adsorptive capacity and useful for removal of oils and heavy metals from waste waters is explained.

Citation Source: Chemical Abstracts 83(2):#15269g. 1975.

C-386-75
VORTEX SEPARATOR

United Aircraft Corporation. 1974.
British Patent 1,364,943

The oil-water mixture is skimmed from the sea and introduced with a swirling motion into a chamber. The oil stays in the center of the vortex and the water migrates to the outside. A part of the center is continually removed and the water returned to the sea.

Citation Source: Underwater Information Bulletin 7(1):#75/02/04. 1975.

P-387-75
FLOATING MEANS TO CONTAIN POLLUTING LAYERS

Vidilles, J. 1974.
Netherlands Application 7,411,014

A barrier for containing pollutant layers such as crude oil consists of a flexible suspended screen with an upper section having a number of floats and a lower section equipped with a ballast means. The screen is bag shaped horizontally with each end connected to a towing means.

Citation Source: Petroleum Abstracts 15(29):#208,163. 1975.

P-388-75

APPARATUS FOR THE COLLECTION OF BUOYANT FOREIGN MATTER

Waren, F. A. O. 1975.
British Patent 1,380,584

The apparatus consists of an open-bottomed tank supported so as to float in water with its upper edge above water level. The side walls, rear wall and front wall form a nonreturn valve in the form of a plate extending between the side walls and pivotally mounted at its lower end. The side walls extend forward of the valve and define an inlet tract. An impeller in the inlet tract draws water and buoyant foreign matter across the nonreturn valve and into the tank.

Citation Source: Petroleum Abstracts 15(25):#206,886. 1975.

P-389-75

SELF-PROPELLED INFLATABLE BOOM

Watson, A. D. 1974.
British Patent 1,365,870

The boom itself is made of several different fabric types and rigid pipes. A pair of hoses inflates the boom.

Citation Source: Underwater Information Bulletin 7(1):75/02/05. 1975.

P-390-75

TREATMENT OF WASTE OIL

Yamada, S., and K. Hayashi. 1974.
Japanese Kokai (unexamined patent application) 74,103,905

"Waste oil is distilled in vacuum or atmosphere to separate light components and the residual oil is oxidation-cracked at 250-500° by blowing an oxygen-containing gas into the residual oil to obtain cracked distillates and solid residue."

Citation Source: Chemical Abstracts 82(26):#174992h. 1975.

P-391-75
REMOVAL OF OILS FROM WASTE WATER

Yoshida, K., K. Kikuchi, and T. Horiuchi. 1974.
Japanese Kokai (unexamined patent application) 74,132,855

An inorganic salt is added to an oil in water emulsion at <30°, then agitated, and settled at 30-80°. The floating oil layer is easily removed. Waste water containing 8% oil can be treated to yield a solution of <30 ppm oil.

Citation Source: Chemical Abstracts 83(6):#47935u. 1975.

SECTION V. CURRENT CONFERENCES

May 11-16 World Petroleum Congress, 9th, Tokyo, 1975.

Oil Pollution Related Papers

24. Environmental Protection in the Petroleum and Petrochemical Industry

Paper 1
ELEMENTS OF AN ADEQUATE ENVIRONMENTAL IMPACT STATEMENT FOR THE PETROLEUM, PETROCHEMICAL, AND BULK ENERGY INDUSTRIES
Jimeson, R. M.

An environmental statement is required by the National Environmental Policy Act before any major Federal action can be undertaken. The elements required and the extent of technical analyses needed for adequate treatment of environmental issues are presented as they relate to the petroleum, petrochemical, and bulk energy industries.

Paper 4
STATE AND DEVELOPMENT IN REFINERY EFFLUENT PURIFICATION
Huber, L.

The state of the art and the development of pollution abatement in the petroleum industry are discussed in comparison with the international situation. Information was obtained from waste water treatment installations at six new petroleum refineries in Western Germany.

Paper 5
SYSTEMS APPROACH TO POLLUTION-FREE PETROLEUM REFINERY
Yamaguchi, T.

Control techniques for air pollutants and water pollutants, and procedures of refinery waste disposal must be developed with respect to design and operation of a big refinery so that the emission of pollutants from the refinery will be minimized.

25. Oil Spills on Land and Water

Paper 1
FATE AND EFFECTS OF OIL ON LAND AND IN FRESH WATERS
Hubbard, E. H.

Recent increases in the knowledge of the behavior of oil spilled on soil or inland waters are described. The difference between the fates of oil on still and on flowing surface waters is discussed. The gaps remaining in our knowledge are emphasized.

Paper 2
CLEAN-UP OF INLAND OIL SPILLS
Agius, P. J., D. R. Fussell, H. Jagger, and G. L. Johnes

Experience has shown that cleanup of inland oil spills is more effective if there is centralized coordination of actions and communications during an oil spill emergency. Examples of oil spill cleanup situations in the United Kingdom illustrate an approach which integrates selection of effective equipment with personnel training, actions and communications.

Paper 3
RECENT ADVANCES IN UNDERSTANDING THE EFFECTS OF OIL SPILLS ON THE MARINE ENVIRONMENT
Mertens, E. W.

Results of a four-year API program on the fate and biological effects of oil spilled in marine environments are summarized. This program involved a wide variety of marine species at all life stages and relied heavily on chemical analyses of the water column, sediments and organism tissues for petroleum fractions.

Paper 4
OIL SPILL CLEAN-UP AT SEA AND ON COASTS
Beynon, L. R.

Recent efforts and developments that have made possible the task of containing, collecting and retrieving oil spills under a wide variety of circumstances and conditions are described.

Paper 5
CONTROLLING OIL SPILLS--THE BENEFITS OF COLLABORATION BETWEEN INDUSTRY, SCIENTISTS AND PUBLIC AUTHORITIES
Bauer, M.

The analyses of research results and the guidelines established by the Federal Export Committee (a group representing industry, science, and public authorities in the Federal Republic of Germany) regarding the threat of oil pollution to water conservation are described.

May Expert Consultation on Pollution in the Mediterranean, Rome, 1975.

FFI contact M. D. Charbonnier, Food and Agricultural Organization, Department of Fisheries, Viale delle Terme di Caracalla, 00100 Rome, Italy

June 10-13 Annual Technical Meeting of the Petroleum Society of CIM, 26th, Alberta, 1975.

Oil Pollution Related Papers

ENVIRONMENTAL MANAGEMENT - AN INTEGRAL PART OF THE ECONOMIC, POLITICAL AND TECHNICAL ASPECTS OF PETROLEUM DEVELOPMENT
Becker, H. W.

AN ENVIRONMENTAL RESEARCH PROGRAM FOR DRILLING IN THE CANADIAN BEAUFORT SEA
Hnatiuk, J.

PLUME DISPERSION: ANOTHER PROBLEM IN THE DEVELOPMENT OF THE ATHABASCA OIL SANDS
Wallis, J., J. K. Donnelly, and K. Aziz

ENVIRONMENTAL CONSIDERATIONS IN WASTE DISPOSAL FROM DRILLING IN THE SHALLOW BEAUFORT SEA
Heffler, H. R., and H. J. Swanston

DEVELOPMENT OF A PIPELINE LEAK DETECTOR
Flournoy, N. E., and W. W. Schroeder

FFI Contact J. G. Wynne (Chairman); Imperial Oil Limited, Petroleum Society of CIM, Banf, Alberta, Canada.

July 9-11 Conference on Energy Conservation and Pollution Control, Kingston, Rhode Island, 1975. (no oil-related papers)

FFI contact D. Sussman, Bliss Hall, University of Rhode Island, Kingston, Rhode Island 02881

Aug. 17-23 International Biodegradation Symposium, 3rd, University of Rhode Island, 1975. Under the auspices of the Biodeterioration Society.

Oil Pollution Related Papers

Session I. Symposium. Metabolism of Hydrocarbons.

I-1
MICROBIAL DEGRADATION OF PETROLEUM
Kallio, R. E.

The complexity and variability of crude oil makes biodegradation studies difficult to standardize. Degradation of crude oil in reservoirs and components of petroleum resistant to microbial degradation are two topics discussed.

I-3
THE MICROBIAL METABOLISM OF CYCLOHEXANE AND RELATED COMPOUNDS
Booth, N. A., M. Griffin, D. B. Norris, and P. W. Trudgill

Three genera of bacteria have been isolated which are capable of growth with cyclohexanol and cyclopentanol. The steps in the breakdown of these alicyclic hydrocarbons are presented.

I-4
MICROBIAL DEGRADATION OF POLYCYCLIC AROMATIC HYDROCARBONS
Gibson, D. T.

Mammalian microsomes oxidize polycyclic aromatic hydrocarbons to arene oxides, the suggested toxic or carcinogenic agents. Results of bacterial degradation studies indicate that bacteria oxidize polycyclic hydrocarbons by a different mechanism.

Session XIII. Symposium. Biodegradation of Oil in Aquatic Environments.

XIII-1
DEGRADATION OF OIL IN CONTINUOUS CULTURE
Ventullo, R. M., and P. H. Pritchard

Oil layers approximately 1-2 mm thick were placed on samples of fresh water. Microbial growth appeared in 5-10 days; the oil layer was completely removed in 120 days. The degradation process was sensitive to environmental variables.

XIII-2
MICROBIAL DEGRADATION OF PETROLEUM IN THE ARCTIC
Atlas, R. M., and M. Busdosh

The effects of nutrient concentration, temperature, crude oil chemical composition and concentration of oil-degrading microorganisms on the biodegradation of oil in Alaskan coastal waters were investigated. Addition of N and P or seeding with petroleum-degrading bacteria increased the rate of degradation in some situations.

XIII-3
OIL BIODEGRADATION IN THE OCEAN
Floodgate, G. D.

The nutrient requirements for biodegradation are clarified. The range of microorganisms involved in biodeterioration has been extended. However, many other factors influencing the rate of biodegradation still remain to be investigated.

XIII-4
MICROBIAL POPULATIONS IN COASTAL SURFACE SLICKS
Crow, S. A., A. W. Bourquin, W. L. Cook, and D. G. Ahearn

Bacteria concentrations on the surface were 10 to 100 times those 10 cm below. The surface film bacteria had weak hydrocarbonoclastic and lipolytic activities. A greater proportion of them are capable of growth on freshwater media.

XIII-5
MODELLING OF HYDROCARBON BREAKDOWN IN UNSATURATED AND SATURATED SOIL LAYERS
Verstraete, W., R. Vanloocke, and J. P. Voets

Three different zones occur in hydrocarbon polluted soils. In each layer, monitoring of the biodegradation process is by different techniques. In the layer on a level with the aquifer, biodegradation is mainly anoxic. Models of the various processes are discussed.

XIII-6
SURFACE TENSION AND BIODEGRADATION IN MARINE ENVIRONMENTS
Gunkel, W.

Seasonal changes in the surface tension of marine waters at a monitoring station near Helgoland in the North Sea are reported. Surface tension measurements were also made during degradation of aliphatic substances and hydrocarbons and on the pore water of a heavily oiled beach. The lowering of surface tension greatly affects the uptake mechanisms of microorganisms and higher organisms.

Session XVII. Symposium. Biodegradation of Fuels.

XVII-1
HYDROCARBON USING MICROORGANISMS IN FRESH WATER ECOSYSTEMS
Cooney, J. J., and R. J. Summers

Both bacteria, and yeast and fungi are important in hydrocarbon polluted ecosystems. Only 0.1% of the total population grew with hydrocarbons as a sole carbon source. Representative colonies included 54% bacteria, 33% yeasts and 13% filamentous fungi; approximately 30% of each group was able to emulsify kerosene.

XVII-3
BACTERIAL DEGRADATION OF BUNKER 6C FUEL OIL
Liu, D., and P. T. S. Wong

A bacterium isolated from the soil of a local refinery was able to degrade Bunker 6C fuel oil, with the n-alkane fractions being the primary target for degradation. The bacteria could oxidize the Bunker 6C fuel oil over a wide range of oil concentrations.

XVII-5
BIODEGRADATION OF HIGH OCTANE GASOLINE
Jamison, V. W., R. L. Raymond, and J. O. Hudson

Groundwater contaminated with gasoline was treated with fertilizer to enhance biodegradation. Cultures isolated from the groundwater were evaluated for their ability to degrade gasoline. Several components did not appear to be utilized for growth, which raises the question of whether complete degradation of the gasoline is possible.

XVII-6
PETROLEUM: DEGRADATION BY ESTUARINE ORGANISMS
Walker, J. D., and R. R. Colwell

This paper reports on the seasonal variation in the numbers and activity of petroleum-degrading microorganisms from oil-contaminated and oil-free environments. Information on the susceptibility of petroleum to microbial degradation by indigenous microorganisms of Chesapeake Bay is presented.

XVII-7
USE OF GENETICALLY-ENGINEERED MULTI-PLASMID MICROORGANISMS FOR RAPID DEGRADATION OF FUEL HYDROCARBONS
Friello, D. A., J. R. Myerore, and A. M. Chakrabarty

Transmissible plasmids in different strains of Pseudomonas putida carry the genes specifying enzymes involved in the biodegradation of a number of hydrocarbons. Transfer of these plasmids into one strain can create a multi-plasmid strain capable of growing faster with crude oil than any of the naturally-occurring mono-plasmid parents.

Session XXV. Contributed. Microbiology of Hydrocarbon Degradation

XXV-1
DEGRADATION OF POLYCYCLIC HYDROCARBONS BY BACTERIA
Poglazova, M. N., G. E. Fedoseeva, and M. N. Meissel

Sensitive spectral and luminescent methods have been developed to measure biodegradation. Fluorescent-cytochemical methods are used to measure the penetration and localization of hydrocarbons in bacterial cells. Experiments demonstrate a decrease in carcinogenic activity with an increase in biodegradation.

XXV-3
BIODEGRADATION--MASS BALANCE RELATIONSHIPS OF AN OIL RELEASE
Kolpack, R. L., and N. B. Plutchak

The processes affecting the ultimate fate of oil in the environment and the environmental conditions that determine the effectiveness of these processes are discussed.

XXV-4
BIODEGRADATION OF PETROLEUM HYDROCARBONS BY MARINE MICROBES
Lee, R. F.

Radioactive hydrocarbons were added to water samples from three areas. In the first 24 hours, between 1 and 5% of the hydrocarbon was degraded and released as $^{14}CO_2$. The rates of degradation of alkalated aromatics, pure aromatics and paraffinics differed. No evidence existed for hydrocarbon degradation by isolated phytoplankton.

XXV-5
DISPOSAL OF WASTE OIL BY LAND SPREADING
Maunder, B. R., and J. S. Waid

A field trial in New Zealand was run to establish the effect of tillage on microbial degradation of waste lubricating oil applied to soil. Data on degradation rates, cost analyses, and hydrocarbon losses due to water runoff are presented. The state of the soil after degradation and possible toxic effects of lead residues are evaluated.

XXV-6
THE ROLE OF SOIL MICROFUNGI IN THE DECOMPOSITION OF OIL PRODUCTS
Mekhtieva, N. A., and L. I. Kondinskaja

Soil fungi isolated from oil-bearing regions of the USSR act selectively on different kinds of fuels, oils and lubricants. The microfungi change the physical and chemical content of oil products, i.e., the index of refraction increases, the specific weight and viscosity of fuel decrease.

XXV-7
METHODS AND INTERPRETATION IN MEASUREMENT OF OIL BIODEGRADATION RATE
Gibbs, C. F.

Various methods of measuring the extent and rate of oil biodegradation are discussed. Relationships between oxidation rate and the supply of nutrient N were obtained. Oxygen uptake implied a lesser amount of destruction than did recovery of oil. Changes in the physical properties of the oil are noted.

Plenary Session-1
MARINE POLLUTION AND INTERNATIONAL LAW
Ketchum, B. K.

Toxic marine pollutants are of chief concern. International conventions prevent pollution by oil and other hazardous materials. Some oil fractions decompose rapidly, others persist as tar balls.

FFI contact R. W. Traxler, Department of Plant Pathology-Entomology, University of Rhode Island, Kingston, Rhode Island 02881

Aug. 18-22 Conference on Environmental Aspects of the Petrochemical and Light Refinery Industry, Trondheim, Norway, 1975.

Oil Pollution Related Papers

WATER BORNE POLLUTION
Prengle (sic), H. W.

ASPECTS OF AIR AND WATER MONITORING SYSTEMS AND NETWORKS
Norsk A/S Philips, Norway

DISPERSION OF POLLUTANTS IN WATER
Audunson, T.

CHEMICAL REACTIONS OF POLLUTANTS IN WATER
Pregle, H. W.

ENVIRONMENTAL IMPACTS OF POLLUTANTS. NUISANCE AND TOXIC EFFECTS
Pier, S. M.

LEGAL ASPECTS, REGULATIONS AND STANDARDS
Stairmand, C. J., R. Ferm and a representative of the Ministry of Environment, Oslo, Norway

CONSEQUENCES FOR THE INDUSTRY DEMONSTRATED THROUGH CASE STUDIES
Mencher, S.

IMPACT ON THE ENVIRONMENT FROM THE ESSO SLAGEN REFINERY
Pedersen, T.

THE RAFINOR REFINERY AT MONGSTAD
Plahte, S.

THE PETROCHEMICAL COMPLEX AT RAFNES, NORWAY, ENVIRONMENTAL STANDARDS TO BE MET
Aas, P., and W. Bjerke

ANALYTICAL TECHNIQUES
Boler, J. B.

SAMPLING TECHNIQUES INSIDE THE PLANT
Stinessen, K. O., and T. Thorsen

SAMPLING TECHNIQUES OUTSIDE THE PLANT
Sivertsen, B., and a representative from Norwegian Institute for Water Research, Oslo, Norway

FFI contact SINTEF, 7034 Trondheim-NTH, Norway

Sept. 1 Scientific Workshop on Marine Pollution in East Asian Waters, Penang, Malaysia, 1975.

FFI contact Intergovernmental Oceanographic Commission, Place de Fontenoy, 74700 Paris, France

Sept. 1-3 International Environmental Law Conference, 1975.

FFI contact British Institute of International and Comparative Law, 32 Furnival St., London EC4A1JN

Sept. 7 Symposium on the Changes in the North Sea Fish Stocks and Their Causes, Aarhus, Denmark, 1975.

FFI contact G. Hempel, Convenor, Institut für Meeres-Kunde der Universität, 23 Kiel, Dusternbrooker Weg 20, GFR

Sept. 14-19 International Conference on Environmental Sensing and Assessment, Las Vegas, Nevada, 1975. Also the Joint Conference on Sensing of Environmental Pollutants: A Focus on Applications of Science and Technology to the Effective Assessment of Pressing Environmental Problems, Las Vegas, Nevada, originally scheduled for November 10-13, 1975.

Oil Pollution Related Papers

Session 17. The Evaluation and Assessment of Problems Associated with Energy Extraction and Utilization Processes

17-5
AERIAL REMOTE SENSING APPLICATIONS IN SUPPORT OF OIL SPILL CLEANUP, CONTROL AND PREVENTION
Jones, D., R. Landers, and A. Pressman

Session 21. Marine Pollution - Measurement and Problem Assessment

21-1
PROBLEMS IN ANALYSIS OF ORGANIC POLLUTANTS IN OPEN-OCEAN SAMPLES
Giam, C. S., H. S. Chan, and G. S. Neff

21-5
PETROLEUM IN THE SEA: RECOGNITION AND BIOLOGICAL EFFECTS
Parker, P. L.

Session 30. Organics - 2

30-1
ANALYSIS OF ORGANIC POLLUTANTS IN THE WATER ENVIRONMENT
Suffett, I. H. M.

30-2
FLUORESCENCE MEASUREMENTS OF CARCINOGENIC AND POLYCYCLIC AROMATIC HYDROCARBONS IN WATER
Schwarz, F. P., and S. P. Wasik

30-3
MONITORING FOR ORGANIC WATER POLLUTANTS IN GREAT BRITAIN
Verdin, A.

30-4
THE ENVIRONMENTAL CYCLE AND BALANCE OF POLYCYCLIC AROMATIC HYDROCARBONS
Suess, M. J.

FFI on the International Conference, contact J. L. Moyers, Department of Chemistry, University of Arizona, Tucson, Arizona 85721

FFI on the Joint Conference, contact D. E. Barth, NERC/EPA, P.O. Box 15027, Las Vegas, Nevada 89114

Sept. 15 Soviet-Swedish Symposium on Control of Baltic Sea Pollution, 3rd, Stockholm, 1975.

FFI contact S. Norström, Research Secretariat, Fack S-271 40, Solna 1, Sweden

Sept. 16-19 Offshore Europe 75 Conference, Aberdeen, Scotland, 1975.

FFI contact Conference Secretary, Offshore Europe, 2 Fife Rd., Kingston-upon-Thames, Surrey KT1 1TA, England

Sept. 22-25 Ocean 75 Conference and Exposition, San Diego, 1975.

Oil Pollution Related Papers

Session 1. Mineral Resources

1B
A BIOASSAY METHOD FOR DETERMINING THE ENVIRONMENTAL IMPACTS OF MINERALS RECOVERY ON THE CONTINENTAL SHELF
Stone, R. L., and R. Palmer

Session 16. Ocean Surveillance and Enforcement

16A
A METHOD FOR REMOTE DETECTION OF OIL SPILLS USING LASER-EXCITED RAMAN BACKSCATTERING AND BACKSCATTERED FLUORESCENCE
Sato, T., and K. Kashiwagi

16B
THE USE OF ELECTRONIC IMAGERY (CCTV) TO VIEW WATER SURFACE REFLECTION OF POLARIZED LIGHT TO LOCATE SMALL OIL SPILLS
Burns, W. W.

16C
THE USE OF CITIZEN-VOLUNTEER GROUPS IN TECHNOLOGY DEVELOPMENT FOR MARINE ENVIRONMENTAL MONITORING AND SURVEILLANCE
Herz, M. J.

FFI contact Ocean 75 Conference Program Chairman, Marine Physical Laboratory, Scripps Institution of Oceanography, San Diego, Ca. 92132

Sept. 22-26 Energy Conservation and Pollution, Dallas, 1975.

FFI contact American Preparedness Association Headquarters, Advisory Service, 819 Union Trust Building, 740 15th St., NW, Washington, D.C. 20051

Sept. 28 - Oct. 1 SPE-AIME Annual Fall Technical Conference and Exhibition, Dallas, 1975.

Oil Pollution Related Papers

Offshore Operations - The Environment

SPE 5613
AN ENVIRONMENTAL RESEARCH PROGRAM FOR DRILLING IN THE CANADIAN BEAUFORT SEA
Hnatiuk, J.

A comprehensive $5.3 million environmental study of the southern Beaufort Sea is reviewed. Some 29 wildlife, biological, oceanographic, meteorological, sea ice and oil cleanup studies were made.

SPE 5615
A NEW TECHNOLOGY IN POTABLE WATER DISINFECTION FOR OFFSHORE RIGS
Nathan, P. R., and J. R. Brejcha

A method of treating potable water is presented that relies on the use of a bromine-resin disposable cartridge to disinfect potable water.

FFI contact R. C. Vilnen, Society of Petroleum Engineers of AIME, 6200 N. Central Expressway, Dallas, Texas 75206

Oct. 1-3 Seminar on Marine Instrumentation and Applications in the Coastal Zone, National Oceanographic Instrumentation Center of NOAA and Charles County Community College, La Plata, Maryland, 1975.

FFI contact Thomas Poe, Charles County Community College, La Plata, Maryland

Oct. 5-10 Water Pollution Control Federation Meeting, Miami, Florida, 1975.

FFI contact R. A. Canham, Water Pollution Control Federation, 3900 Wisconsin Ave., N.W., Washington, D.C. 20016

Oct. 6-9 International Biennial Meeting, Estuarine Research Foundation, 3rd, Galveston, Texas, 1975.

FFI contact J. Williams, Environmental Science Department, U.S. Naval Academy, Stop 8C, Annapolis, Maryland 21402

For oil pollution-related papers, see p. 292.

Oct. 6-10 International Symposium on Remote Sensing of the Environment, 10th, Ann Arbor, Michigan, 1975.

FFI contact J. Cook, Environmental Institute of Michigan, University of Michigan, Box 618, Ann Arbor, Michigan 48107

Nov. 8-10 International Congress of Scientists on the Human Environment, Tokyo and Kyoto, Japan, 1975.

FFI contact A. I. Johnson, 4289 N. 38th St., Arlington, Va. 22207

Nov. 9-14 The Role of Microorganisms in the Recovery of Oil, Easton, Maryland, 1975. Engineering Foundation Conference.

Oil Pollution Related Papers

MICROBIAL METABOLISM OF ALKANES
Finnerty, W. R.

MICROBIAL METABOLISM OF CYCLICS AND POLYCYCLICS
Perry, J.

MICROBIAL METABOLISM OF AROMATICS
Gibson, D.

MICROBIAL COORDINATION OF HYDROCARBONS
Raymond, R.

ENVIRONMENTAL AND NUTRITIONAL PARAMETERS FOR MICROBIAL ACTION
Kallio, R. E.

ENVIRONMENTAL AND NUTRITIONAL CONSTRAINTS OF MICROBIAL HYDROCARBON UTILIZATION IN SOIL
Huddleston, R. L.

ENVIRONMENTAL AND NUTRITIONAL CONSTRAINTS OF MICROBIAL HYDROCARBON UTILIZATION IN WATER
Bartha, R.

STATUS OF MICROBIAL OIL RECOVERY
Coty, V. F.

FFI contact Engineering Foundation Conferences, 345 East 47th St., New York, N.Y. 10017

Nov. 10-12 The Effects of Energy-Related Activities on the Atlantic Continental Shelf, Brookhaven National Laboratory, Upton, N.Y., 1975.

FFI contact J. R. Schubel, Director, Marine Sciences Research Center, South Campus, J Bldg., SUNY at Stony Brook, Stony Brook, N.Y. 11794

Nov. 30 - Dec. 5 Energy/Environment Conference and Exhibits, Dallas, 1975.

FFI contact Energy/Environmental Conference, American Defense Preparedness Association, 819 Union Trust Building, 740 15th St., N.W., Washington, D.C. 20005.

Oct. 6-9 Oil Pollution-related Papers (continued from p. 290)

Session D-2
EFFECTS OF HEAT AND OIL ON BEHAVIOR OF MARINE INVERTEBRATES, THE LOBSTER, _HOMARUS AMERICANUS_, AND THE MUD SNAIL, _NASSARIUS OBSOLETUS_
Atema, J.

Session E-3
MICROBIOLOGICAL CYCLING OF OIL IN ESTUARINE MARSHLANDS
Ahearn, D. G., S. A. Crow, N. H. Berner, and S. P. Meyers

The indigenous microflora of Louisiana _Spartina_ marsh sediments, accidentally or experimentally inundated with crude oil, were found to contain an increased proportion of hydrocarbon-utilizing bacteria. Highest concentrations of these bacteria were obtained from sites chronically polluted with oil. Results of experiments measuring temperature effects on oil degradation and effects of seeding of oiled marshlands are described.

SUBJECT CROSS REFERENCE

Reporting
C-1377-75, C-1402-75, C-1462-75, C-1503-75, C-1504-75, C-1505-75, C-1807-75

Monitoring
C-1339-75, C-1407-75, C-1422-75, C-1427-75, C-1433-75, C-1492-75, C-1520-75, C-1547-75, C-1589-75, C-1645-75, C-1702-75, C-1778-75, R-294-75, P-309-75

Remote Sensing
C-1356-75, C-1760-75

Sampling
C-1342-75, C-1344-75, C-1381-75, C-1387-75, C-1405-75, C-1481-75

Analysis
C-1344-75, C-1350-75, C-1352-75, C-1375-75, C-1430-75, C-1431-75, C-1432-75, C-1434-75, C-1436-75, C-1439-75, C-1440-75, C-1441-75, C-1488-75, C-1534-75, C-1553-75, C-1584-75, C-1585-75, C-1592-75, C-1595-75, C-1638-75, C-1750-75, C-1751-75, R-290-75

Source Identification
C-1329-75, C-1335-75, C-1346-75, C-1350-75, C-1358-75, C-1387-75, C-1390-75, C-1405-75, C-1410-75, C-1639-75

Containment
C-1463-75, P-305-75, P-306-75, P-307-75, P-308-75, P-319-75, P-328-75, P-346-75, P-349-75, P-354-75, P-387-75, P-389-75

Cleanup and Recovery
C-1338-75, C-1445-75, C-1447-75, C-1564-75, C-1567-75, C-1677-75, C-1696-75, C-1753-75, C-1762-75, C-1778-75, C-1807-75, C-1809-75, R-299-75, P-310-75, P-313-75, P-315-75, P-316-75, P-318-75, P-320-75, P-321-75, P-322-75, P-323-75, P-324-75, P-329-75, P-330-75, P-332-75, P-334-75, P-335-75, P-336-75, P-337-75, P-338-75, P-341-75, P-350-75, P-356-75, P-359-75, P-361-75, P-363-75, P-364-75, P-365-75, P-370-75, P-372-75, P-374-75, P-376-75, P-386-75, P-388-75

Restoration
C-1572-75, C-1605-75, R-285-75, R-286-75, P-345-75

Oil Transfer and Transport
C-1511-75, C-1514-75, C-1567-75, C-1670-75, C-1692-75, C-1696-75, C-1706-75, C-1774-75, P-340-75

Design and Engineering
C-1345-75, C-1346-75, C-1353-75, C-1354-75, C-1363-75, C-1372-75, C-1374-75, C-1442-75, C-1453-75, C-1454-75, C-1456-75, C-1458-75,

Social Effects of Oil Prospecting and Production
C-1633-75

Economic Effects of Oil Prospecting and Production
C-1657-75, C-1672-75, C-1706-75

General Effects of Oil Prospecting and Production
C-1478-75, C-1501-75, C-1640-75, C-1662-75, C-1794-75, C-1801-75, C-1802-75, C-1810-75

Biological Degradation
C-1516-75, C-1576-75, C-1590-75, C-1803-75, P-322-75, P-329-75

Chemical Changes of Oil in the Environment
C-14-6-75, C-1759-75, C-1765-75

Physical Changes of Oil in the Environment
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General Fate of Oil in the Environment
C-1396-75, C-1639-75, C-1643-75, C-1648-75, C-1700-75, C-1744-75, C-1748-75, R-288-75, R-301-75

State Legislation
C-1808-75

U.S. Legislation
C-1551-75, C-1634-75, C-1692-75, C-1796-75, C-1797-75, C-1808-75

International Legislation
C-1355-75, C-1457-75, C-1779-75, C-1791-75

Foreign Legislation
C-1330-75, C-1373-75, C-1525-75, C-1676-75

Industry Standards and Guidelines
C-1492-75, C-1772-75

Bibliographies
C-1337-75, C-1386-75, C-1400-75, C-1409-75, C-1421-75, C-1430-75, C-1718-75

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
California Water Pollution Control Association Bulletin
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
Ecolibrium
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 Periodicals Bibliography
Environmental Pollution
Environmental Science & Technology
Environmental Technology and Economics
Estuarine and Coastal Marine Science
Fuel Abstracts and Current Titles

Geotimes
Government Reports Announcements
Hydrobiologia
India Journal of Environmental Health
International Aerospace Abstracts
International Journal of Environmental Analytical Chemistry
Journal of Canadian Petroleum Technology
Journal of Chromatography
Journal of Ecology
Journal of Environmental Sciences
Journal of Experimental Marine Biology and Ecology
Journal of Fish Biology
Journal of Natural History
Journal of Petroleum Technology
Journal of the Fisheries Research Board of Canada
Limnology and Oceanography
Marine Biological Association of the United Kingdom, Journal
Marine Biology
Marine Chemistry
Marine Fisheries Review
Marine Geology
Marine Newsletter
Marine Pollution Bulletin
Marine Science Contents Tables
Marine Technology Society, Journal
Maritime Research Information Service Abstracts
National Fisherman
National Petroleum News
National Research Council, News Report
National Wildlife
Natural History
Nature
Nautilus
Nippon Suisan Gakkai Shi. Bulletin of the Japanese Society of Scientific Fisheries
Ocean Engineering
Ocean Industry
Ocean Management
Ocean Oil Weekly Report
Oceanic Abstracts
Oceanology
Oceans
Oceanus
Offshore
Oil and Gas Journal
Our Sun
Outdoor California
Pacific Oil World
Petroleum Abstracts
Petroleum Today
Pollution Abstracts
Proceedings in Print

Remote Sensing of the Environment
Resources
Royal Society of London, Proceedings, Series B, Biological Sciences
Science
Science News
Scientific and Technical Aerospace Reports
Sea Frontiers
Sea Secrets
Sea Technology
Selected References on Environmental Quality
Selected Water Resources Abstracts
Sierra Club, San Francisco, Bulletin
The Ecologist
The Engineering Index
Underwater Information Bulletin
Underwater Naturalist
Water, Air, and Soil Pollution
Water Pollution Control
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 August 1975 - October 1975 Oil Spill and Oil Pollution Reports is the fifth 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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