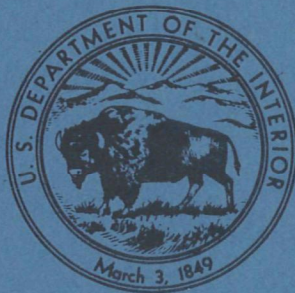


# LAKE ERIE

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# United States Department of the Interior

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Sincerely yours,

H. Garland Hershey  
Director

ENVIRONMENTAL PROTECTION AGENCY  
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LAKE ERIE

A Bibliography

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## INTRODUCTION

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FLOOD PLAIN INFORMATION, CATTARAUGUS CREEK AND THATCHER BROOK, IRVING, SUNSET BAY AND GOWANDA, NEW YORK.

US ARMY CORPS OF ENGINEERS, BUFFALO DISTRICT.

US ARMY CORPS OF ENG, BUFFALO DIST, NY, 68 P, FEB 1968. 17 FIG, 20 PLATE, 14 TAB.

DESCRIPTORS:

\*FLOODS, DISCHARGE(WATER), \*STAGE-DISCHARGE RELATIONS, \*STREAMFLOW, DISCHARGE MEASUREMENT, SMALL WATERSHEDS, STREAM GAGES, GAGING STATIONS, FLOW MEASUREMENT, NEW YORK, LAKE ERIE, \*FLOOD DAMAGE, FLOODWAYS, \*FLOOD PROTECTION.

IDENTIFIERS:

FLOOD PEAK, \*ANNUAL FLOOD, \*FLOOD DATA, PEAK STAGES, FLOOD FREQUENCIES, FLOOD MEASUREMENTS, GOWANDA, NY.

ABSTRACT:

A STUDY WAS MADE OF FLOODING AND FLOOD DAMAGE BETWEEN 1834 AND 1967 ON CATTARAUGUS CREEK AND ITS TRIBUTARY, THATCHER BROOK, FROM THE MOUTH AT LAKE ERIE TO MI 19.5. THE GREATEST KNOWN FLOOD ON CATTARAUGUS CREEK, MARCH 17, 1942, WOULD HAVE CAUSED \$140,000 WORTH OF DAMAGE IN 1967. THE GREATEST KNOWN FLOOD ON THATCHER BROOK, SEPT 1939, WOULD HAVE COST \$131,000 IN 1967. AVERAGE ANNUAL DAMAGE FROM FLOODING IS \$26,300 ON CATTARAUGUS CREEK AND \$4,450 ON THATCHER BROOK AT MAY 1967 PRICE LEVELS AND DEVELOPMENT. RECORDS OF STAGE AND DISCHARGE ARE AVAILABLE ON CATTARAUGUS CREEK FROM 1939 TO THE PRESENT. THERE ARE NO RECORDS FOR THATCHER BROOK. MOST OF THE SERIOUS FLOODING UPSTREAM WAS CAUSED BY HEAVY RAINS, USUALLY IN SPRING WHEN SNOW IS MELTING AND THE GROUND IS SATURATED. SERIOUS DOWNSTREAM FLOODS WERE ALL CAUSED BY ICE JAMS ON A BAR ACROSS THE MOUTH OF CATTARAUGUS CREEK. POTENTIAL FLOOD DAMAGE IS BEING REDUCED BY VARIOUS CHANNEL IMPROVEMENTS INCLUDING REMOVAL OF A DAM AND PERIODIC DREDGING OF THE BAR. TWENTY-ONE PLATES INCLUDE FLOOD HYDROGRAPHS, PROFILES, TOPOGRAPHIC MAPS, ECONOMIC DEVELOPMENT, FLOOD AREA MAPS, AND A MAP OF THE DRAINAGE BASIN OF CATTARAUGUS CREEK. INFORMATION WAS EXTRACTED FROM THE REPORT AND PRESENTED IN TWO PAMPHLETS COVERING THE GOWANDA AREA AND THE AREA NEAR THE MOUTH.

FIELD 04A

ACCESSION NO. W68-00023

EUTROPHICATION OF THE ST. LAWRENCE GREAT LAKES,

US BUREAU OF COMMERCIAL FISHERIES, ANN ARBOR, MICH.

ALFRED M. BEETON.

LIMNOL OCEANOGR, VOL 10, PP 240-254, JUL 1968. 15 P.

DESCRIPTORS:

\*GREAT LAKES, \*FISH POPULATIONS, \*EUTROPHICATION, \*CHEMICAL PROPERTIES, NUTRIENTS, LAKES, DISSOLVED SOLIDS, OLIGOTROPHY, SUMMER, CLASSIFICATION, LAKE HURON, LAKE MICHIGAN, LAKE SUPERIOR, LAKE ONTARIO, LAKE ERIE, DISSOLVED OXYGEN, HYPOLIMNION, PLANKTON.

IDENTIFIERS:

\*ACCELERATED EUTROPHICATION, MAN'S EFFECTS, MESOTROPHY.

ABSTRACT:

LAKES HURON, MICHIGAN, AND SUPERIOR ARE CLASSIFIED AS OLIGOTROPHIC LAKES ON THE BASIS OF THEIR BIOLOGICAL, CHEMICAL, AND PHYSICAL CHARACTERISTICS. LAKE MICHIGAN TRENDS TOWARD MESOTROPHY AS SHOWN BY THE HIGH CONTENT OF DISSOLVED SOLIDS IN ITS WATERS. LAKE ONTARIO IS MESOTROPHIC IN THAT IT RETAINS THE BIOTA OF AN OLIGOTROPHIC LAKE BECAUSE OF ITS LARGE DEEP-WATER AREA BUT HAS THE NUTRIENT RICHNESS OF A EUTROIC LAKE. LAKE ERIE, THE MOST PRODUCTIVE OF THE LAKES AND THE SHALLOWEST, IS EUTROPHIC. SEVERAL CHANGES COMMONLY ASSOCIATED WITH EUTROPHICATION IN SMALL LAKES HAVE BEEN OBSERVED IN THE GREAT LAKES, CHANGES THAT APPARENTLY REFLECT ACCELERATED EUTROPHICATION IN THE GREAT LAKES BECAUSE OF MAN'S ACTIVITY. CHEMICAL DATA COMPILED FROM NUMEROUS SOURCES, DATING BACK TO 1854, INDICATE A PROGRESSIVE INCREASE IN THE CONCENTRATIONS OF MAJOR IONS AND TOTAL DISSOLVED SOLIDS, PARTICULARLY CHLORIDES AND SULFATES, IN ALL OF THE LAKES EXCEPT LAKE SUPERIOR. THE PLANKTON HAS CHANGED SOMEWHAT IN LAKE MICHIGAN, AND THE PLANKTON, BENTHOS, AND FISH POPULATIONS OF LAKE ERIE NOW DIFFER GREATLY FROM THOSE OF THE PAST. RECENTLY AN EXTENSIVE AREA OF HYPOLIMNETIC WATER OF LAKE ERIE HAS DEVELOPED LOW DISSOLVED-OXYGEN CONCENTRATIONS IN LATE SUMMER.

FIELD 05C

ACCESSION NO. W68-00247

INDICES OF GREAT LAKES EUTROPHICATION,

A. M. BEETON.

PUBL GREAT LAKES RES DIV, (IN PRESS), VOL 14, 1966.

DESCRIPTORS:

\*EUTROPHICATION, NUTRIENTS, NITROGEN, PHOSPHORUS, PLANKTON, DISSOLVED OXYGEN, HYPOLIMNION, GREAT LAKES, LAKE ERIE, STATISTICS, GROWTH RATES, ALGAE, FRESH WATER FISH.

ABSTRACT:

INDICES OF EUTROPHICATION WERE CITED: (1) INCREASES IN NITROGEN AND PHOSPHORUS; (2) CHANGES IN SPECIES COMPOSITION AND AN INCREASE IN THE ABUNDANCE OF PLANKTON; (3) DECREASES IN THE DISSOLVED OXYGEN CONTENT OF BOTTOM WATERS; (4) CHANGES IN THE FISH POPULATION; (5) THE REPLACEMENT OF BOSMINA COREGONI BY B. LONGIROSTRIS; AND (6) EXTENSIVE GROWTHS OF CLADOPHORA. OTHER CHANGES SUCH AS INCREASES IN TDS AND MAJOR IONS ARE REGARDED AS REPRESENTATIVE OF ENVIRONMENTAL CHANGES AND NOT NECESSARILY INDICES OF EUTROPHICATION. THERE ARE FEW OFFSHORE DATA ON NUTRIENTS (NITROGEN AND PHOSPHORUS) FROM THE GREAT LAKES OTHER THAN LAKE ERIE, AND EVEN THESE DATA ARE QUESTIONABLE. CHANGES IN THE RATES OF GROWTH OF FISH SHOULD BE VIEWED WITH CAUTION WHEN RELATING THEM TO EUTROPHICATION INASMUCH AS MANY ENVIRONMENTAL VARIABLES MAY BE OF INFLUENCE AS WELL AS AN INCREASE IN NUTRIENTS.

FIELD 05C

ACCESSION NO. W68-00253



LIMNOLOGICAL SURVEY OF LAKE ERIE 1959 AND 1960,

WISCONSIN UNIV., MILWAUKEE, GREAT LAKES RES. CTR.

A. M. BEETON.

GREAT LAKES FISH COMM, TECH REPT NO 6, 32 P, 1963.

DESCRIPTORS:

\*EUTROPHICATION, GREAT LAKES, \*LAKE ERIE, \*DISSOLVED OXYGEN, HISTORY, ANALYSES, EFFLUENTS, RIVERS, CHEMICAL PROPERTIES, WATER POLLUTION, PHYSICAL PROPERTIES, \*HYPOLIMNION, LIMNOLOGY, SURVEYS, \*HYDROLOGIC DATA.

ABSTRACT:

THIS REPORT VERIFIES CERTAIN EARLIER CONCLUSIONS (1960 AND 1961) OF THE AUTHOR THAT A LARGE AREA OF LAKE ERIE, PARTICULARLY WITHIN THE CENTRAL BASIN, HAS LOW OXYGEN VALUES. SEVERAL AGENCIES, FEDERAL, STATE, AND UNIVERSITY, EMPLOYING VARIOUS KINDS OF VESSELS MADE TRANSECTS ACROSS LAKE ERIE, OVER THE CENTRAL BASIN IN 1959, AND THROUGHOUT THE ENTIRE AREA OF THE LAKE IN 1960. ABOUT 70% OF THE BOTTOM WATERS OF THE CENTRAL BASIN HAD A SERIOUS DEFICIENCY IN OXYGEN IN 1959 AND 1960. OTHER ANALYSES WERE MADE TO DETERMINE ALKALINITY, CONDUCTIVITY, TEMPERATURE, TRANSPARENCY, PH, AND PHENOLPHTHALEIN ALKALINITY. THESE LATTER WERE RELATED TO DISTRIBUTIONS WITHIN THE LAKE OF RIVER EFFLUENTS, SUCH AS THOSE OF THE MAUMEE AND DETROIT RIVERS.

FIELD 05C

ACCESSION NO. W68-00462

DISSOLVED OXYGEN IN LAKE ERIE, PAST AND PRESENT,

U OF MICHIGAN, ANN ARBOR.

J. F. CARR.

GREAT LAKES RES DIV, PUBL 9, PP 1-14, 1962.

DESCRIPTORS:

\*EUTROPHICATION, \*LAKE ERIE, GREAT LAKES, LAKES, LIMNOLOGY, \*DISSOLVED OXYGEN, THERMOCLINE, HYPOLIMNION, HISTORY, -OXYGEN REQUIREMENT, SEASONAL, STATISTICS.

ABSTRACT:

THE DISSOLVED OXYGEN CONTENT OF THE WATERS OF LAKE ERIE VARIES AREALLY AND BATHYMETRICALLY. ANALYTICAL DATA ASSEMBLED FOR THE YEARS 1927 THROUGH 1961 SHOW THAT OXYGEN DEPLETION IN THE CENTRAL BASIN OF THE LAKE HAS BECOME MORE EXTENSIVE OVER THE LAST 3 DECADES. THERE MAY HAVE BEEN CRITICALLY LOW CONCENTRATIONS OF DISSOLVED OXYGEN PRIOR TO THE PERIOD REPORTED; HOWEVER, THEY MAY NOT HAVE BEEN DETECTED BECAUSE OF DEFICIENCIES IN SAMPLING PROCEDURES AND TECHNIQUES. SIGNS OF EUTROPHICATION IN THE WATERS OF LAKE ERIE BEGAN TO APPEAR AS EARLY AS 1929. AT THE PRESENT TIME THERE ARE HUNDREDS OF SQUARE MILES OF BOTTOM WATERS IN WHICH THERE IS NO DETECTABLE DISSOLVED OXYGEN DURING A PART OF THE YEAR. THE VERTICAL DISTRIBUTION OF DISSOLVED OXYGEN IS AFFECTED STRONGLY BY THE TEMPERATURE GRADIENT, AND WHERE THE THERMOCLINE IS ABSENT, THE OXYGEN SATURATION OF BOTTOM WATERS IS USUALLY 60% OR MORE.

FIELD 02H

ACCESSION NO. W68-00465

EVIDENCE FOR THE EUTROPHICATION OF LAKE ERIE FROM PHYTOPLANKTON RECORDS,

DEPT. OF BIOLOGY, WESTERN RESERVE UNIV., CLEVELAND, OHIO.

C. C. DAVIS.

LIMNOL AND OCEANOGR, VOL 9, PP 275-283, 1964. 9 P, 6 FIG, 1 TAB, 29 REF.

DESCRIPTORS:

\*EUTROPHICATION, LAKES, \*PHYTOPLANKTON, HISTORY, SEASONAL, ASTERIONELLA, MOLOSIRA, CYCLOTELLA, FRAGILARIA, PLANKTON, TABELLARIA, SYNEDRA, \*LAKE ERIE, LAKE MICHIGAN, GREAT LAKES, BIBLIOGRAPHIES, AQUATIC ALGAE, AQUATIC POPULATIONS, LIMNOLOGY.

IDENTIFIERS:

\*SEASONAL CHANGES, PLANT POPULATIONS, NUMERICAL ANALYSIS.

ABSTRACT:

LONG-TERM RECORDS INDICATE THAT THERE HAS BEEN INCREASINGLY RAPID EUTROPHICATION OF THE WATER IN LAKE ERIE. COMPLETE RECORDS OF CELL COUNTS OF PHYTOPLANKTON IN WATER SAMPLES TAKEN FROM THE DIVISION AVE FILTRATION PLANT OF THE CLEVELAND DIV OF WATER AND HEAT WERE RECORDED FOR 25 FULL YEARS SINCE 1919 AND FOR 7 ADDITIONAL PARTIAL YEARS IN THAT SAME INTERVAL. THE INCREASE IN THE AVERAGE QUANTITY OF PHYTOPLANKTON HAS BEEN CONSISTENT, AND RANGES FROM COUNTS OF LESS THAN 500 CELLS/ML IN THE EARLY YEARS OF RECORD TO MORE RECENT COUNTS OF 1500 OR MORE CELLS/ML. SPRING AND FALL PHYTOPLANKTON PEAKS WERE NOT HIGH AND DID NOT EXTEND OVER MANY DAYS IN 1927, BUT THE PEAKS IN 1962 ROSE TO MUCH GREATER HEIGHTS IN TERMS OF CELLS/ML AND EACH ONE EXTENDED OVER SEVERAL MONTHS. GRAPHS SHOW THE WINTER MINIMA TO BE SHORT-LIVED IN THE LATER YEARS OF RECORD AND THAT FAILED TO DEVELOP IN SOME OF THEM. PHYTOPLANKTON GENERA REPRESENTED IN LAKE ERIE WATERS HAVE ALSO ALTERED IN THIS INTERVAL: THE SPRING PULSES HAVE CHANGED FROM A PREDOMINANCE ASTERIONELLA TO ONE OF MELOSIRA WITH SOME CYCLOTELLA, FRAGILARIA, AND TABELLARIA; THE FALL PULSES HAVE SHIFTED FROM SYNEDRA TO MELOSIRA, AND FINALLY, TO FRAGILARIA.

FIELD 02H

ACCESSION NO. W68-00476

GREAT LAKES LIMNOLOGICAL INVESTIGATIONS,

A. M. BEETON.

UNIV OF MICH, GREAT LAKES RES DIV PUB, VOL 4, PP 123-128, 1960. 6 P.

DESCRIPTORS:

\*EUTROPHICATION, GREAT LAKES, \*LAKE ERIE, LAKE HURON, LAKE MICHIGAN, LAKE SUPERIOR, \*FISH POPULATIONS, LAKES, DISSOLVED OXYGEN, WATER TEMPERATURE, BENTHIC FAUNA, MAYFLIES, \*OXYGEN SAG, THERMAL STRATIFICATION, TUBIFICIDS, MIDGES, CADDISFLIES, LAKE TROUT, LAMPREYS, CHEMICAL ANALYSIS, DISSOLVED SOLIDS, SEASONAL, BAYS, REVIEWS.

IDENTIFIERS:

UNITED STATES BUREAU OF COMMERCIAL FISHERIES.

ABSTRACT:

STUDIES OF LAKE ERIE FOR THE PAST 30 YR INDICATE THAT EUTROPHICATION IS ACCELERATING. THE LAKE HAS CHANGED FROM ONE THAT SUPPORTED A LARGE COLD WATER FISH POPULATION, DEMANDING A HIGH OXYGEN CONTENT, INTO ONE DOMINATED BY WARM WATER SPECIES ADAPTED TO HIGHER TEMPERATURES AND LOWER OXYGEN CONCENTRATIONS. MAJOR CHANGES HAVE ALSO TAKEN PLACE IN ITS BOTTOM FAUNA. PRIOR TO SUMMER 1953, THE MAYFLY LARVAE AVERAGED ABOUT 400/SQ M OF LAKE BOTTOM; A LONG CALM IN SUMMER 1953 PRODUCED A THERMAL STRATIFICATION THAT SEVERELY DEPLETED OXYGEN IN THE BOTTOM WATERS, FOLLOWING WHICH THERE WERE ONLY 44 LIVE MAYFLY LARVAE/SQ M. CADDISFLY LARVAE, ONCE ABUNDANT, AVERAGED LESS THAN 1/SQ M IN 1957. TUBIFICIDS INCREASED FROM 12/SQ M IN 1929 TO 551/SQ M IN 1957, AND MIDGE LARVAE FROM 56/SQ M IN 1929 TO 299/SQ M. LAKE ERIE IS THE MOST CHANGED OF THE GREAT LAKES. THE TROUT POPULATION OF LAKE MICHIGAN WAS RAPIDLY DEPLETED RECENTLY; BUT THE LOSS LARGELY RESULTED FROM LAMPREY PREDATION. LAKE SUPERIOR SHOWS SURPRISING UNIFORMITY OF CHEMICAL CONDITIONS BOTH AREALLY AND BATHYMETRICALLY. OXYGEN SATURATION OCCURS EVEN IN THE DEEPEST WATERS OF LAKES HURON, MICHIGAN, AND SUPERIOR, ALTHOUGH CONCENTRATIONS ARE REDUCED IN GREEN BAY AND SAGINAW BAY; CERTAIN AREAS OF LAKE ERIE ARE CHARACTERIZED BY LOW CONCENTRATIONS. (BYRNE-WISC)

FIELD 05C, 02H

ACCESSION NO. W68-00683

ENVIRONMENTAL CHANGES IN LAKE ERIE,

A. M. BEETON.

TRANS AMER FISH SOC, VOL 90, PP 153-159, 1961. 7 P.

DESCRIPTORS:

\*EUTROPHICATION, HISTORY, BENTHIC FAUNAS, \*BIOLOGICAL COMMUNITIES, PHOSPHORUS, FISH POPULATIONS, \*LAKE ERIE, GREAT LAKES, BIOINDICATORS, PIKES, CISCO, COMMERCIAL FISH, WATER TEMPERATURE, DISSOLVED OXYGEN, PROFUNDAL ZONE, COLIFORMS, PLANKTON, NITROGEN, CHEMICAL PROPERTIES, \*ENVIRONMENTAL EFFECTS, \*INFLUENT STREAMS, FLOW RATES.

ABSTRACT:

DATA COMPILED DURING THE PAST SIXTY YEARS INDICATE THAT MAJOR CHANGES HAVE OCCURRED IN THE BOTTOM AND FISH FAUNAS OF LAKE ERIE. THE BOTTOM FAUNA WAS EARLY DOMINATED BY HEXAGENIA NYMPHS, BUT MIDGE LARVAE AND OLIGOCHAETES ARE NOW THE MOST ABUNDANT FORMS; THESE CHANGES SEEM TO BE CONFINED TO THE WESTERN AND CENTRAL BASINS OF THE LAKE. BLUE PIKE AND CISCO ONCE DOMINATED THE COMMERCIAL CATCH BUT ARE NOW SCARCE AND HAVE BEEN REPLACED BY OTHER SPECIES. THE MAJOR IONS HAVE INCREASED AS MUCH AS 10 MG/L, BUT INCREASES IN THE CONCENTRATIONS OF NITROGEN AND PHOSPHORUS COMPOUNDS COULD HAVE THE MOST IMPORTANT BIOLOGICAL EFFECTS. MEAN ANNUAL WATER TEMPERATURES ARE ABOUT 2 DEG F WARMER NOW THAN IN THE 1918-28 PERIOD. THE NUMBER OF COLIFORMS WAS INCREASED. LOW DISSOLVED OXYGEN LEVELS HAVE BEEN RECORDED SEVERAL TIMES SINCE 1930, AND VERY LOW CONCENTRATIONS HAVE RECENTLY BEEN FOUND IN BOTTOM WATERS COVERING MANY SQ MI OF THE CENTRAL BASIN. ANY GREAT CHANGES IN THE CHEMISTRY OR IN THE PLANKTON OF THE LAKE MUST ORIGINATE IN CHANGES IN THE CHARACTERISTICS OF THE WATERS FLOWING INTO THE LAKE, ESPECIALLY IN THE WESTERN BASIN WHERE THE DETROIT RIVER INFLOW RESULTS IN A FLUSHING RATE OF ABOUT TWO MO. MORE DATA ARE NEEDED ON THE PAST AND PRESENT CHEMICAL CHARACTERISTICS OF THIS AND OTHER INFLUENT STREAMS. (BYRNE-WISC)

FIELD 05C, 02H

ACCESSION NO. W68-00687



WATER RESOURCE DEVELOPMENT PLAN.

TRI-COUNTY REGIONAL PLANNING COMMISSION, AKRON, OHIO.

TRI-COUNTY REGIONAL PLANNING STUDY NO. 27, APRIL, 1963. 205 P, 18 MAPS, 8 ILLUS, 20 TABLES, 3 CHARTS, 3 APPEND.

DESCRIPTORS:

\*WATER RESOURCE DEVELOPMENT, \*WATERSHEDS, RIPARIAN RIGHTS, LATERALS,  
\*INTERGOVERNMENTAL COOPERATION, GROUNDWATER, SUBSURFACE WATERS,  
\*METROPOLITAN AREA PLANNING, WATER DISTRIBUTION, WATER SUPPLY,  
\*MULTI-PURPOSE PROJECTS.

IDENTIFIERS:

AKRON, OHIO, MEDINA COUNTY, SUMMIT COUNTY, OHIO, PORTAGE COUNTY, OHIO,  
LAKE ERIE.

ABSTRACT:

IN THE TRI-COUNTY REGION, THERE IS A NATURAL LIMITATION ON AVAILABLE WATER SUPPLY. PLANNING FOR DEVELOPMENT OF WATER RESOURCES AS TO YIELD THE NEEDED QUANTITIES MUST CONSIDER THE LATERAL TRANSFER OF WATER ACROSS THE WATERSHED BOUNDARIES AND THE USE OF LAKE ERIE AS A SOURCE OF WATER. THE STUDY RELATES THE LEGAL BACKGROUND OF THE WATER STATUS IN OHIO AND RECOMMENDS CERTAIN REVISIONS IN THE WATERSHED DISTRICT ACT; NAMELY: (1) AMENDING THE REQUIREMENT THAT THE BOUNDARIES OF A WATERSHED DISTRICT FOLLOW TOWNSHIP LINES TO MORE CLOSELY FOLLOW THE HYDROLOGIC DIVIDE; (2) COMBINING THE MAJOR RIVER WATERSHEDS WITH COMMON ECONOMIC AFFILIATIONS. THE STUDY ALSO RECOMMENDS A WATER POLICY BE INSTITUTED THAT DEVELOPS THE WATER RESOURCES ON A WATERSHED BASIS. TO IMPLEMENT THE WATER POLICY THE STUDY CALLS FOR THE FORMATION OF WATERSHED DISTRICTS AS POLITICAL ENTITIES WITH MAJOR RESPONSIBILITY FOR FORMULATING PLANS FOR WATER IMPROVEMENT PROJECTS, COORDINATING THE ACTIVITIES OF BOTH PUBLIC AND PRIVATE INTERESTS IN THE DISTRICTS, CONSTRUCTION OF WATER IMPROVEMENT PROJECTS WHICH ARE BEYOND THE CAPABILITIES OF OTHERS, AND, ULTIMATELY, THE CONTROL OF THE USE OF WATER RESOURCES BY REQUIRING ALL PROJECTS BE APPROVED BY THE DISTRICTS. (STARR-CHICAGO)

FIELD 06E

ACCESSION NO. W68-00844

NEW YORK POLLUTION CONTROL POLICY AND LAKE ERIE,

ANSELMO F. DAPPERT.

INDUSTRIAL WATER AND WASTES, VOL 9, NO 1, PP 29-31, JAN-FEB 1964. 3 P.

DESCRIPTORS:

NEW YORK, \*WATER POLLUTION CONTROL, NEUTRALIZATION, SEWAGE TREATMENT, WASTE WATER TREATMENT, \*LAKE ERIE, TASTE, WATER POLLUTION EFFECTS, ACIDITY, ODOR, DOMESTIC WASTES, INDUSTRIAL WASTES, SEWAGE EFFLUENTS, SILTS, SEWAGE DISPOSAL, LEGISLATION, WATER LAW, STATE GOVERNMENTS.

ABSTRACT:

THE NEW YORK STATE WATER POLLUTION CONTROL PROGRAM IS BASED ON THE CONCEPT THAT ALL WATERS WHICH RECEIVE OR ARE TO RECEIVE WASTE DISCHARGES OF ANY KIND SHALL BE PROTECTED TO THE EXTENT NECESSARY FOR THE VARIOUS USAGES WHICH ARE OFFICIALLY RECOGNIZED FOR SUCH WATERS. THE OFFICIAL RECOGNITION OF THESE USAGES IS PRECEDED BY A SERIES OF STEPS LEADING TO CLASSIFICATION AND ASSIGNMENT OF QUALITY STANDARDS TO ALL WATERS IN THE STATE-FRESH SURFACE WATERS, TIDAL SALT WATERS AND GROUND WATERS. BASICALLY, FOR DISCHARGES INTO LAKE ERIE WATERS THE POLICY IS TO CONSIDER EACH PROBLEM IN RELATION TO THE PARTICULAR CIRCUMSTANCES AND THE ACTUAL OR ANTICIPATED LAKE CLASSIFICATIONS. (R. SMITH-FLA)

FIELD 05G

ACCESSION NO. W69-00495

UNITED STATES V 461.42 ACRES OF LAND (AVULSION AS IT RELATES TO TITLE).

222 F SUPP 55-59 (N D OHIO 1963).

DESCRIPTORS:

OHIO, JUDICIAL DECISIONS, LAKE ERIE, DIKES, RIPARIAN WATERS, RIPARIAN LAND, \*OWNERSHIP OF BEDS, UNITED STATES, CONDEMNATION, EMINENT DOMAIN, \*AVULSION, BEDS, STORMS, \*BEACH EROSION, WAVES(WATER), EROSION.

ABSTRACT:

THIS WAS A PROCEEDING TO DETERMINE TITLE TO LAND APPROPRIATED BY THE UNITED STATES. THE STATE OF OHIO AND DEFENDANT CLAIMED TITLE AND THE UNITED STATES SOUGHT A JUDICIAL CLARIFICATION OF TITLE SO THAT PAYMENT FOR THE APPROPRIATED LAND MIGHT BE MADE. THE LAND IN QUESTION HAD BEEN SUBMERGED IN LAKE ERIE SINCE 1929, AND OHIO CLAIMED TITLE BASED ON A STATUTE WHICH PROVIDED THAT TITLE TO LAND UNDER LAKE ERIE WOULD BE IN THE STATE. DEFENDANT CLAIMED TITLE BASED ON THE FACT THAT PRIOR TO 1929 THE LAND WAS ABOVE WATER AND BECAME SUBMERGED BY AVULSION AFTER A VIOLENT STORM. THERE IS AN OHIO STATUTE WHICH PROVIDES THAT TITLE SHALL NOT BE LOST BY AVULSION. OHIO CLAIMED THAT THE STORM IN 1929 WAS SIMPLY A FACTOR AIDING IN THE EROSION OF THE LAND, AND THAT LAND LOST BY EROSION WILL EXTINGUISH TITLE. THE LAND WAS HELD TO HAVE BEEN LOST BY AVULSION AND TITLE REMAINED IN THE DEFENDANT. (CRABTREE-FLA)

FIELD 06E

ACCESSION NO. W69-00515

MAJOR SOURCES OF NUTRIENTS FOR ALGAL GROWTH IN WESTERN LAKE ERIE,

FEDERAL WATER POLLUTION CONTROL ADMIN., GROSSE ILE, MICH.

GEORGE L. HARLOW.

PUBLICATION NUMBER 15, GREAT LAKES RES DIV, UNIV MICH, PP 389-394, 1966. 6 P,  
2 FIG, 5 TAB, 9 REF.

DESCRIPTORS:

\*EUTROPHICATION, \*LAKE ERIE, \*NUTRIENTS, ALGAE, WATER POLLUTION  
SOURCES, NITROGEN COMPOUNDS, PHOSPHATES, GREAT LAKES, MICHIGAN.

IDENTIFIERS:

LAKE ST CLAIR, ROUGE RIVER, HURON RIVER, RAISIN RIVER, DETROIT RIVER,  
MAUMEE RIVER.

ABSTRACT:

DUE TO AN EXCESS OF NUTRIENTS, WESTERN LAKE ERIE HAS DEVELOPED PROLIFIC BLOOMS OF ALGAE CONTRIBUTING TO AND INDICATING THE ACCELERATED ENRICHMENT OF THIS VALUABLE NATURAL RESOURCE. NUTRIENT CONCENTRATIONS AND QUANTITIES INCREASE AS THE WATERS FROM LAKE ST CLAIR PASS BY THE METROPOLITAN COMPLEX OF DETROIT TO WESTERN LAKE ERIE. THE SOURCES OF WASTE WHICH CONTRIBUTE TO THESE INCREASES ARE PRESENTED, AS WELL AS THE RELATIVE QUANTITIES FROM EACH WASTE SOURCE. MUNICIPAL WASTES CONTRIBUTE 89% OF TOTAL PHOSPHATES AND 86% OF TOTAL NITROGEN RECEIVED INTO LAKE ERIE FROM SOUTHEAST MICHIGAN, WHEREAS THE CONTRIBUTION OF PHOSPHATE FROM LAND DRAINAGE IS A MINOR FACTOR. NITROGEN RUNOFF FROM LANDS CONTRIBUTES MORE SIGNIFICANTLY TO NUTRIENT LOADING THAN DOES PHOSPHATE FROM THE SAME SOURCE. IN LAKE ERIE, CONCENTRATIONS OF NUTRIENT COMPOUNDS CLOSER TO THE MOUTH OF THE DETROIT RIVER ARE HIGHER THAN AT STATIONS FURTHER OFFSHORE, EXCEPT IN THE CASE OF TWO OFFSHORE STATIONS THOUGHT TO BE INFLUENCED BY THE MAUMEE RIVER. RESULTS OF NUTRIENT DETERMINATIONS FROM ALL STATIONS REPORTED FOR LAKE ERIE SHOW CONCENTRATIONS GREATER THAN THOSE THOUGHT TO BE CRITICAL FOR TRIGGERING BLOOMS OF ALGAE.

FIELD 05B

ACCESSION NO. W69-01445

TO RESTORE LAKE ERIE BEACHES.

ASCE - SAN ENG DIV, NEWSLETTER, P 6, MAY, 1968.

DESCRIPTORS:

\*RECREATION FACILITIES, \*WATER POLLUTION CONTROL, \*OVERFLOW FLOW CONTROL, \*CHLORINATION, DISCHARGE(WATER).

IDENTIFIERS:

\*COMBINED SEWERS, \*CLEVELAND(OHIO), \*LAKE ERIE, \*INTERCEPTOR SEWERS, CAPACITY, \*POLYMERS, \*SEWER FLUSHING.

ABSTRACT:

CLEVELAND, OHIO IS ATTEMPTING TO RESTORE SOME OF ITS LAKE ERIE BEACHES POLLUTED BY OVERFLOWS OF COMBINED STORM AND SANITARY SEWERS. METHODS UNDER INVESTIGATION ARE: (1) THE USE OF POLYMERS TO REDUCE OVERFLOWS FROM THE EDGEWATER SEWER BY INCREASING THE FLOW-CARRYING CAPACITY OF THE WESTERLY INTERCEPTOR SEWER; (2) HYPOCHLORINATION OF THE MAJOR OVERFLOWS AND CREEK WATERS ENTERING LAKE ERIE; (3) FLUSHING SEWERS DURING DRY WEATHER TO REDUCE THE DISCHARGE OF SOLIDS WHEN IT RAINS; (4) SCREENING OF OVERFLOWS AND STREAMS.

FIELD 09

ACCESSION NO. W69-01536



A PLAN TO HELP LAKE ERIE.

ASCE - SAN ENG DIV, NEWSLETTER, P 5, JAN 1967.

DESCRIPTORS:

\*OVERFLOW, \*CONSTRUCTION, \*SEWAGE LAGOON, SEWAGE TREATMENT.

IDENTIFIERS:

\*CLEVELAND(OHIO), \*STORAGE TANKS, \*COMBINED SEWERS, \*LAKE ERIE.

ABSTRACT:

THE FEASIBILITY OF BUILDING A LARGE WASTE-WATER HOLDING AND TREATMENT RESERVOIR IN LAKE ERIE FOR COMBINED-SEWER OVERFLOWS IN CLEVELAND IS BEING STUDIED. THE POSSIBILITY OF BUILDING A DEEP DETENTION FACILITY OFF THE SHORE OF LAKE ERIE IS BEING INVESTIGATED BECAUSE OF THE HIGH COST OF ACQUIRING VALUABLE LAKEFRONT LAND THERE. CONSTRUCTION TECHNIQUES WILL BE ANALYZED AND THE BEST METHODS OF OPERATION TO ASSURE FLEXIBILITY OF USE AND EFFICIENCY OF TREATMENT WILL BE RECOMMENDED. IF THIS PROVES TO BE FEASIBLE, THE LAGOON MAY PROVIDE FURTHER TREATMENT OF THE WASTES FROM CLEVELAND'S EASTERLY SECONDARY-TREATMENT PLANT AND FLOWS FROM STORM SEWERS IN THIS SECTION OF THE CITY.

FIELD 09

ACCESSION NO. W69-01537

FEDERAL GRANT TO HELP RESTORE CLEVELAND BEACHES.

CIV ENG, VOL 38, NO 6, P 85, JUNE 1968.

DESCRIPTORS:

\*RECREATION FACILITIES, \*OVERFLOW, FLOW CONTROL, \*CHLORINATION, STORM RUNOFF, \*WATER POLLUTION CONTROL, DISCHARGE(WATER).

IDENTIFIERS:

\*COMBINED SEWERS, \*CLEVELAND(OHIO), \*POLYMERS, \*LAKE ERIE, \*SEWER FLUSHING, \*INTERCEPTOR SEWERS, CAPACITY.

ABSTRACT:

CLEVELAND, OHIO HAS RECEIVED A GRANT TO RESTORE BEACHES POLLUTED LARGELY BY OVERFLOWS OF COMBINED SEWERS AND TO EXPAND RECREATIONAL OPPORTUNITIES FOR THE AREA. CONTROL AND TREATMENT METHODS TO BE USED IN THIS PROJECT INCLUDE: EXPERIMENTAL USE OF POLYMERS TO REDUCE OVERFLOWS FROM THE COMBINED SEWERS BY INCREASING THE FLOW-CARRYING CAPACITY OF INTERCEPTOR SEWERS; HYPOCHLORINATION OF THE MAJOR OVERFLOWS AND CREEK WATER ENTERING LAKE ERIE; IMPLEMENTATION OF A SEWER-FLUSHING PROGRAM DURING DRY WEATHER TO REDUCE THE DISCHARGE OF SOLIDS WHEN IT RAINS; AND SCREENING OF OVERFLOWS AND STREAMS.

FIELD 09

ACCESSION NO. W69-01538

COMPARISON OF THE DISTRIBUTION OF ORGANIC MATTER IN THE FIVE GREAT LAKES,

MICHIGAN UNIV., ANN ARBOR, GREAT LAKES RESEARCH DIV., INST. OF SCIENCE AND  
TECH.

ANDREW ROBERTSON, AND CHARLES F. POWERS.

PART OF FINAL REPT. OF USPHS GRANT WP-00311. MICHIGAN UNIV SPEC NO 30 OF THE  
GREAT LAKES RES DIV PP 1-18, 1967. 18 P, 7 TAB, 3 FIG, 22 REF. ONR-104-818.

DESCRIPTORS:

\*EUTROPHICATION, \*GREAT LAKES, NUTRIENTS, PLANKTON, ZOOPLANKTON,  
PRODUCTIVITY, SURFACE WATERS, WATER QUALITY, DISSOLVED SOLIDS, ORGANIC  
MATTER, BIOLOGICAL PROPERTIES.

IDENTIFIERS:

\*PARTICULATE ORGANIC MATTER, MACROBENTHOS.

ABSTRACT:

PARTICULATE AND DISSOLVED ORGANIC MATTER WERE MEASURED IN ALL 5 OF THE  
GREAT LAKES AND THE BIOMASS OF ZOOPLANKTON AND MACROBENTHOS WERE  
MEASURED IN THE UPPER 3 LAKES. IN GENERAL, TOTAL ORGANIC MATTER  
INCREASES IN THE ORDER, SUPERIOR, HURON, MICHIGAN, ERIE, ONTARIO, THE  
SAME ORDER AS SHOWN BY TOTAL DISSOLVED SOLIDS AND TOTAL DISSOLVED  
ORGANIC MATTER. THIS MAY ALSO REPRESENT THEIR RELATIVE STATES OF  
EUTROPHICATION. DISSOLVED ORGANIC MATTER CONTENT IN THE SURFACE WATERS  
IS 2.22-2.98 MG/L IN LAKE SUPERIOR, 2.52-2.91 MG/L IN LAKE HURON,  
3.24-5.81 MG/L IN LAKE MICHIGAN, 5.82-6.01 MG/L IN LAKE ERIE, AND  
5.85-6.53 MG/L IN LAKE ONTARIO. THE PARTICULATE ORGANIC MATTER IS MUCH  
GREATER THAN THE AMOUNTS OF ZOOPLANKTON AND MACROBENTHOS. (KNAPP-USGS)

FIELD 05C

ACCESSION NO. W69-01620

PRIMARY PRODUCTION IN LAKES,

BOWLING GREEN STATE UNIV., OHIO. DEPT. OF BIOLOGY.

JACOB VERDUIN.

LIMNOL OCEANGR, VOL 1, PP 85-91, 1956. 7 P, 2 FIG, 2 TAB, 17 REF, DISC.

DESCRIPTORS:

\*LAKES, \*CARBON CYCLE, \*PRIMARY PRODUCTIVITY, \*PHYTOPLANKTON, \*PHOTOSYNTHESIS, LIMNOLOGY, LIGHT PENETRATION, LAKE ERIE, INSTRUMENTATION, EUTROPHICATION, OLIGOTROPHY, WISCONSIN, COLORADO, KANSAS, PENNSYLVANIA, COMPARATIVE PRODUCTIVITY, DIATOMS, SESTON, CHLOROPHYLL, ESTIMATING EQUATIONS.

IDENTIFIERS:

HELMET LAKE(WIS), TROUT LAKE(WIS), CRYSTAL LAKE(WIS), MUSKELLUNGE LAKE(WIS), WEBER LAKE(WIS), NEBISH LAKE(WIS), SCAFFOLD LAKE(WIS), PYMATUNING RESERVOIR, GEORGES BANK, SANDUSKY BAY, ALLENS LAKE(COLO), BASE LINE LAKE(COLO), HAYDENS LAKE(COLO), BEASLY LAKE(COLO), GAYNOR LAKE(COLO), BOULDER LAKE(COLO), KOSSLER LAKE(COLO), SECCHI DISK, AUTOTROPHY, EUPHOTIC ZONE.

ABSTRACT:

LIMNOLOGICAL DATA FROM THE LITERATURE AND AUTHOR'S RESEARCH YIELD MEAN PHOTOSYNTHETIC RATES FOR LACUSTRINE PHYTOPLANKTON UNDER OPTIMAL LIGHT (NATURAL CONDITIONS) OF ABOUT 0.5 MICROMOLES (OXYGEN EVOLVED OR CARBON DIOXIDE CONSUMED)/MICROLITER OF ORGANISMS/HOUR; 1-2 MICROMOLES/MILLIGRAM ASH-FREE DRY WEIGHT/HOUR; AND 0.2 MICROMOLES/MICROGRAM CHLOROPHYLL/HOUR. FOR LAKES WITH EPILIMNETIC EUPHOTIC ZONE, EQUATION FOR ESTIMATING DAILY PHOTOSYNTHESIS/SQUARE METER OF WATER (Y SUB A) IS:  $(Y \text{ SUB } A) = (P \text{ SUB } V)(Y \text{ SUB } P) (D \text{ SUB } 1)(0.65)$ , WHERE  $(P \text{ SUB } V)$  = MEAN PHYTOPLANKTONIC CROP/CUBIC METER IN EUPHOTIC ZONE;  $(Y \text{ SUB } P)$  = DAILY PHOTOSYNTHESIS/UNIT STANDING CROP UNDER OPTIMAL LIGHT;  $(D \text{ SUB } 1)$  = DEPTH OF EUPHOTIC ZONE. FOR LAKES WITH HYPOLIMNETIC EUPHOTIC ZONE OR WHERE BOTTOM RECEIVES MORE THAN 1% OF SURFACE LIGHT, EQUATION IS:  $(Y \text{ SUB } A) = (P \text{ PRIME SUB } V) (Y \text{ SUB } P)(D \text{ SUB } 2)$ ; WHERE  $(P \text{ PRIME SUB } V)$  = MEAN PHYTOPLANKTONIC CROP IN EPILIMNION;  $(D \text{ SUB } 2)$  = DEPTH TO MIDTHERMOCLINE OR TO BOTTOM IN UNSTRATIFIED LAKES. FOR SEVEN WISCONSIN LAKES, YIELDS (MILLIMOLES/SQ. METER/DAY) CALCULATED FROM THESE EQUATIONS RANGE FROM 56 (TROUT L) TO 325 (SCAFFOLD L), COMPARED WITH RANGE OF 47 (HELMET L) TO 146 (SCAFFOLD L) ESTIMATED BY MORE TEDIOUS METHOD DESCRIBED ELSEWHERE IN LITERATURE. TEN SIMILAR COMPUTATIONS FOR WATERS OF KANSAS, COLORADO, AND L ERIE YIELDED MEAN VALUE OF 196.0, WITH RANGE 122 (KOSSLER L, COLO) TO 450 (GAYNOR L, COLO).

FIELD 02H

ACCESSION NO. W69-02523

SYSTEMS ANALYSIS: AN ECONOMIST'S VIEW,

OHIO STATE UNIV., COLUMBUS.

RICHARD A. TYBOUT.

SYSTEMS APPROACH TO WATER QUALITY IN THE GREAT LAKES, PROC 3RD ANNU SYMP  
WATER RESOURCES RES, PP 117-126, OHIO STATE UNIV, SEPT 1967. 10 P.

DESCRIPTORS:

\*SYSTEMS ANALYSIS, \*ECONOMICS, \*WATER POLLUTION CONTROL, \*STANDARDS,  
PUBLIC BENEFITS, PUBLIC RIGHTS, MARGINAL UTILITY, MARGINAL COSTS,  
PRICING, CONSTRAINTS, LAKE BASINS, MATHEMATICAL MODELS, LAKE ONTARIO,  
LAKE ERIE, RECREATION DEMAND, COST-BENEFIT ANALYSIS, AESTHETICS, WATER  
POLICY, TAXES, OPTIMIZATION.

ABSTRACT:

THREE APPROACHES TO THE PROBLEM OF OPTIMALLY ATTAINING WATER QUALITY  
STANDARDS IN A HYPOTHETICAL LAKE ILLUSTRATED THE INTERDEPENDENCY OF  
ECONOMICS AND SYSTEMS ANALYSIS AND THE PROBLEM OF PHILOSOPHICAL  
APPROACH IN SETTING AND ADMINISTERING OF THOSE STANDARDS. SYSTEM 1  
CALLED FOR THE SOLUTION OF A SIMPLE LINEAR MODEL, WHERE THE COSTS OF  
POLLUTION REMOVAL FOR ALL USERS OF A LAKE WERE EQUATED TO THE COSTS OF  
ALL POLLUTION IMPOSED ON THE LAKE BY POLLUTERS. THE QUALITY STANDARD  
FOR THE LAKE WAS ASSUMED GIVEN. SYSTEM 2 MAXIMIZED THE UTILITIES TO ALL  
INDIVIDUALS FROM POLLUTANT AND NON-POLLUTANT GENERATING PRODUCTS,  
SUBJECT TO THEIR BUDGET CONSTRAINTS. SYSTEM 3 MAXIMIZED THE  
BENEFIT-COST RATIOS OF VARIOUS PRODUCTS, SUBJECT TO BUDGET CONSTRAINTS,  
ASSUMING BENEFITS AND COSTS WERE QUANTIFIABLE. THE PROBLEMS AND MERITS  
OF EACH APPROACH AND THEIR COMBINATION WERE DISCUSSED. (GYSI-CORNELL)

FIELD 05G, 06A

ACCESSION NO. W69-02612



EVALUATION OF CHANNEL CHANGES IN ST. CLAIR AND DETROIT RIVERS,

WEATHER BUREAU, CHICAGO, ILL.

IVAN W. BRUNK.

WATER RESOURCES RES, VOL 4, NO 6, PP 1335-1346, DECEMBER 1968. 12 P, 6 FIG, 3 TAB, 9 REF.

DESCRIPTORS:

\*RIVER FLOW, \*CHANNEL IMPROVEMENT, \*GREAT LAKES, LAKE ERIE, LAKE MICHIGAN, LAKE HURON, STAGE-DISCHARGE RELATIONS, STREAM GAGES, HYDROGRAPHS.

IDENTIFIERS:

ST. CLAIR RIVER, DETROIT RIVER, STREAMFLOW ESTIMATES.

ABSTRACT:

EXTENSIVE IMPROVEMENTS FOR NAVIGATION HAVE BEEN MADE IN THE ST. CLAIR-DETROIT RIVER (SCDR). CHANNEL CHANGES HAVE LOWERED THE LEVEL OF LAKE MICHIGAN-HURON BY ABOUT 2 FEET, BRINGING ABOUT THE LOWEST LEVELS OF RECORD IN 1964 AND 1965. THE UNRECOGNIZED CHANGES IN THE REGIMEN OF THE SCDR BEFORE 1900 HAVE ALSO RESULTED IN THE COMPUTATION OF FLOWS THAT ARE MUCH TOO LARGE. THE DISCHARGE OF LAKE ERIE AND THE PRECIPITATION IN THE ERIE BASIN ARE USED TO DERIVE MORE REASONABLE ESTIMATES OF THE FLOW OF THE SCDR BEFORE 1900. THE AMOUNT OF MATERIAL EXCAVATED FROM CHANNELS AND THE ANNUAL DIFFERENCES IN REPORTED AND COMPUTED FLOW OF THE SCDR FROM 1869-1908 ARE TABULATED. HYDROGRAPHS SHOW COMPUTED FLOW AND LAKE ERIE FLOW FROM 1860-1967.

FIELD 02E

ACCESSION NO. W69-02693

LAKE ERIE REPORT: A PLAN FOR WATER POLLUTION CONTROL,

FEDERAL WATER POLLUTION CONTROL ADMINISTRATION, WASHINGTON, D. C.

FED WATER POLLUT CONTR ADMIN, GREAT LAKES REG, 107 P, AUG 1968. 52 FIG, 16  
TAB, 1 APPEND.

DESCRIPTORS:

\*LAKE ERIE, \*WATER POLLUTION EFFECTS, \*EUTROPHICATION, \*WATER POLLUTION  
CONTROL, WATER QUALITY CONTROL, HYDROGEOLOGY, LIMNOLOGY, MUNICIPAL  
WASTES, DREDGING, INDUSTRIAL WASTES, GREAT LAKES.

ABSTRACT:

DETAILED DESCRIPTIONS OF WATER POLLUTION OF LAKE ERIE, STRONG  
RECOMMENDATIONS FOR CORRECTION, AND DESCRIPTIONS AT THE LAKE, LAKE  
BASIN, AND THE URBAN AREAS OF THE LAKE ERIE AREA ARE PRESENTED. LAKE  
ERIE AND ITS DRAINAGE BASIN SUPPORT OVER 13 MILLION PEOPLE.  
MANUFACTURING ADDS 17 BILLION DOLLARS A YEAR TO THE ECONOMY OF THE U.  
S. AND CANADA. THE LAKE WATER ITSELF IS USED FOR WATER SUPPLY,  
RECREATION, COMMERCIAL FISHING, AND SHIPPING. THE LAKE HAS TOO MANY  
NUTRIENTS FROM POLLUTION. BOTTOM OXYGEN IS DEPLETED IN SUMMER. FISH  
QUALITY IS DECLINING. ALGAE CAUSE BAD TASTES AND ODOR AND LITTER  
SHORELINES WITH DECOMPOSING ORGANIC MATTER. BACTERIAL CONTAMINATION  
CLOSES SWIMMING BEACHES. SILT FROM CHANNEL DREDGING CARRIES OXYGEN  
DEMAND TO DUMPING AREAS WHERE IT WOULD OTHERWISE BE LOWER. THE MAIN  
POLLUTION SOURCE AREAS ARE DETROIT, CLEVELAND, AND THE MAUMEE RIVER  
BASIN. PHOSPHORUS, THE PRINCIPAL CAUSE OF ALGAE PROBLEMS, IS 72% FROM  
MUNICIPAL WASTES, 17% RURAL, 7% INDUSTRIAL, AND 7% URBAN RUNOFF. THE  
COST OF WASTE TREATMENT TO STOP THE POLLUTION IS ESTIMATED AT \$1.1  
BILLION FOR MUNICIPALITIES AND \$285 MILLION FOR INDUSTRY. STANDARDS FOR  
STREAMS ENTERING LAKE ERIE HAVE BEEN SET. (KNAPP-USGS)

FIELD 05C, 02H, 05A

ACCESSION NO. W69-02695

BURKE V FREY (SURFACE WATER DRAINAGE).

358 MICH 606, 101 N W 2D 385-387 (1960).

DESCRIPTORS:

\*MICHIGAN, JUDICIAL DECISIONS, \*SURFACE RUNOFF, \*SURFACE DRAINAGE, DRAINAGE SYSTEMS, REPULSION(LEGAL ASPECTS), LAKE ERIE, STORM RUNOFF, FLOODING.

ABSTRACT:

PROPERTY OWNERS BLAMED SURFACE FLOODING OF THEIR LOTS ON THE REFUSAL OF NEIGHBORING OWNERS TO REOPEN AND MAINTAIN A DRAINAGE DITCH. PLAINTIFFS ALLEGED THAT DEFENDANTS HAD LESSENED THE EFFICIENCY OF THE METHOD OF DRAINAGE OF THEIR OWN PROPERTY AND THAT, IN CONSEQUENCE, SURFACE WATERS ON OCCASION FLOWED ONTO PLAINTIFFS' LOTS. THE COURT STATED THAT A LANDOWNER HAS A DUTY NOT TO INCREASE THE NATURAL FLOW OF WATER UPON A NEIGHBOR'S LAND EITHER BY ERECTING BARRIERS TO NATURAL DRAINAGE OR BY TAKING STEPS TO FACILITATE DRAINAGE OF HIS OWN PROPERTY. IT WAS HELD THAT DEFENDANTS HAD NOT VIOLATED THEIR DUTY TO PROTECT PLAINTIFFS' PROPERTY FROM SURFACE WATER AND THAT FLOODING HAD RESULTED FROM PROXIMITY TO LAKE ERIE AND THE OCCURRENCE OF UNUSUALLY HEAVY STORMS. (MACMILLAN-FLA)

FIELD 04A

ACCESSION NO. W69-03019

SYSTEMS APPROACH TO WATER QUALITY IN THE GREAT LAKES.

PROC OF 3RD ANNUAL SYMP ON WATER RESOURCES RES, OHIO STATE UNIV WATER  
RESOURCES CENTER, 130 P, SEPT 1967. OWRR A-999-OHIO.

DESCRIPTORS:

\*SYSTEMS ANALYSIS, \*GREAT LAKES, \*LAKE ERIE, \*WATER QUALITY,  
EUTROPHICATION, WATER POLLUTION, WATER POLLUTION CONTROL, MANAGEMENT,  
MODEL STUDIES.

ABSTRACT:

A SYMPOSIUM ON THE SUBJECT OF USING THE SYSTEMS APPROACH TO WATER  
QUALITY IN THE GREAT LAKES, PARTICULARLY LAKE ERIE, WAS HELD AT OHIO  
STATE UNIVERSITY, SEPTEMBER 1967. IT WAS AGREED THAT LAKE ERIE WATER  
QUALITY CHANGED MARKEDLY IN THE PAST 70-100 YEARS IN TEMPERATURE,  
ECOLOGY, AND SUSPENDED AND DISSOLVED SOLIDS, BUT THE CAUSE HAS NOT BEEN  
FIRMLY ESTABLISHED. POLLUTION, INVASION BY MARINE ORGANISMS, NATURAL  
EUTROPHICATION, AND OTHER CAUSES ARE ALL INVOLVED. A SYSTEMS APPROACH  
HELPS SOLVE THE PROBLEM BY POINTING OUT INADEQUACIES IN KNOWLEDGE AND  
IN CONCEPTUAL, MATHEMATICAL, AND COMPUTER MODELS USED AS TOOLS, AND  
WHEN SUFFICIENT GOOD EVIDENCE HAS BEEN COLLECTED, SYSTEMS METHODS ARE  
POWERFUL TOOLS FOR PROBLEM SOLVING AND MANAGEMENT. THE GENERAL  
CONCLUSION IS THAT A SYSTEMS-MODELING APPROACH TO QUALITY PROBLEMS IN  
THE GREAT LAKES IS FEASIBLE AND SHOULD BE INSTIGATED AS SOON AS  
POSSIBLE ON AS LARGE A GEOGRAPHICAL SCALE AS POSSIBLE. (KNAPP-USGS)

FIELD 02H, 06A

ACCESSION NO. W69-03059

POWER GENERATION UNDER IJC REGULATION,

NEW YORK STATE POWER AUTHORITY, NIAGARA FALLS.

GEORGE T. BERRY.

PROC AMER SOC CIV ENG, J POWER DIV, VOL 94, NO P02, PP 217-231, NOV 1968. 15 P, 9 FIG, 1 TAB, 2 REF, APPEND.

DESCRIPTORS:

\*RIVER REGULATION, FLOOD CONTROL, PUMPED STORAGE, LAKES, \*NAVIGATION, WATER RESOURCES, \*HYDROELECTRIC POWER, STREAMFLOW RECORDS, \*ELECTRIC POWER PRODUCTION, STREAMFLOW, REGULATED FLOW, ST. LAWRENCE RIVER, ECONOMICS, INFLOW, OUTFLOWS, FEASIBILITY, GREAT LAKES, LAKE ERIE, \*LAKE ONTARIO.

IDENTIFIERS:

\*OPERATING CRITERIA, NIAGARA RIVER, NIAGARA FALLS, GREAT LAKES POWER DVLPMT., ST. LAWRENCE POWER PROJECT(CANADA).

ABSTRACT:

THE INTERNATIONAL JOINT COMMISSION AND ITS BOARDS OF CONTROL COMPRISE THE PRINCIPAL AUTHORITY PRESCRIBING THE LIMITS WITHIN WHICH THE HYDROELECTRIC RESOURCES OF THE ST. LAWRENCE AND NIAGARA RIVERS ARE PUT TO USE. TO FACILITATE DEVELOPING REGULATION PLANS APPROPRIATE FOR PRESENTLY EXISTING GREAT LAKES BASIN CONDITIONS, A HOMOGENEOUS SET OF UNREGULATED LAKE ONTARIO LEVELS AND FLOWS CONSISTENT WITH EXISTING DIVERSION TO AND FROM THE GREAT LAKES, EXISTING LAKE SUPERIOR REGULATION, AND EXISTING STAGE-DISCHARGE RELATIONSHIPS FOR THE CONNECTING CHANNELS WERE DERIVED BY ADJUSTING THE NATURAL RECORD FOR CHANGES TO THESE FACTORS. CRITERIA USED FOR DEVELOPING LAKE ONTARIO REGULATION PLANS ARE GIVEN. REGULATION PLANS HAVE EVOLVED AS EXPERIENCE HAS BEEN GAINED, RESULTING IN BETTER USE OF WATER RESOURCES. FLEXIBILITY IN THE ST. LAWRENCE RELEASES AND PUMPED STORAGE FACILITIES AT THE NIAGARA PROJECT CAN BE USED TO IMPROVE EFFICIENCY AND REDUCE THE COST OF POWER REQUIRED FROM THERMAL SOURCES TO MEET NEW YORK POWER NEEDS. STUDIES ARE UNDERWAY TO DETERMINE HOW MUCH ADDITIONAL VALUE NIAGARA POWER OUTPUT WOULD HAVE IF LAKE ERIE OUTFLOWS WERE CONTROLLED. (USBR)

FIELD 04A

ACCESSION NO. W69-03781

DISPOSITION OF STATE UNDERWATER LANDS.

N Y PUB LANDS LAW SEC 3 (4) (5) (MCKINNEY SUPP 1968).

DESCRIPTORS:

\*NEW YORK, \*BEDS, \*PERMITS, LEGISLATION, \*ADMINISTRATIVE AGENCIES,  
ADMINISTRATIVE REGULATION, JURISDICTION, LAKE ERIE, NAVIGATION,  
AVULSION, EROSION, SANDS, GRAVELS, REGULATION, LEGAL ASPECTS.

IDENTIFIERS:

CANAL LANDS, SALT SPRING CONSERVATION LAND.

ABSTRACT:

THE COMMISSIONER OF GENERAL SERVICES IS AUTHORIZED TO TRANSFER TO ANY  
STATE DEPARTMENT OR AGENCY THE JURISDICTION OVER ANY LANDS, INCLUDING  
SUBMERGED LANDS, ABANDONED CANAL LANDS AND SALT SPRINGS RESERVATION  
LAND. THE COMMISSIONER MAY LICENSE AND REGULATE THE TAKING OF SAND,  
GRAVEL OR OTHER MATERIALS FOUND IN DEPOSIT IN OR UPON THE UNDER WATER  
LANDS OF THE STATE. THE COMMISSIONER MAY AUTHORIZE THE TAKING OF SOIL  
FROM STATE UNDER WATER LAND WHEN TAKEN BY AN UPLAND OWNER FOR THE  
IMPROVEMENT OR THE PROTECTION OF HIS UPLAND FROM THE ACTION OF THE  
WATER OR FOR THE RESTORATION OF HIS UPLAND. (CHILDS-FLA)

FIELD 06E, 04C

ACCESSION NO. W69-03919

WATER POLLUTION IN THE GREAT LAKES BASIN,

FEDERAL WATER POLLUTION CONTROL ADMINISTRATION, GREAT LAKES REGION, CHICAGO, ILL.

H. W. POSTON.

LIMNOS, VOL 1, NO 1, PP 6-11, SPRING 1968. 6 P, 6 PHOTO.

DESCRIPTORS:

\*GREAT LAKES, \*WATER POLLUTION, \*WATER POLLUTION CONTROL, WATER POLLUTION EFFECTS, EUTROPHICATION, FISHKILL, ALGAE, OXYGEN SAG, WATER QUALITY, CHLORIDES, PHOSPHORUS, SULFATES, HARDNESS(WATER).

IDENTIFIERS:

GREAT LAKES BASIN, BACTERIAL POLLUTION.

ABSTRACT:

THE CAUSES OF WATER POLLUTION OF THE GREAT LAKES BASIN, PRESENTLY AVAILABLE REMEDIES, AND RECOMMENDATIONS FOR ACTION IN POLLUTION CONTROL ARE DISCUSSED. THE LAKES, PARTICULARLY LAKE ERIE, ARE BECOMING EUTROPHIC BECAUSE OF WASTE DISCHARGES. TERTIARY TREATMENT WITH PHOSPHORUS REMOVAL WILL ALLEVIATE THE PROBLEM AND ALSO REDUCE BIOCHEMICAL OXYGEN DEMAND. CHLORIDES, SULFATES, AND HARDNESS ARE INCREASING. BACTERIAL POLLUTION IS A SERIOUS PROBLEM IN TRIBUTARIES, AND IN LOCAL ZONES IN THE GREAT LAKES NEAR POPULATION CENTERS WHERE RECREATIONAL DEMAND IS ALSO HIGHEST. ELIMINATION OF COMBINED SEWERS AS WELL AS BETTER SEWAGE TREATMENT WILL HELP. CHEMICAL CONTAMINATION CAUSED BY INDUSTRIAL WASTE DISPOSAL IS WIDESPREAD. OXYGEN LEVELS ARE LOW IN STREAMS, SMALL LAKES, AND THE CENTRAL BASIN OF LAKE ERIE. AN UNUSUAL FORM OF POLLUTION IS THE OVER-POPULATION OF ALEWIVES IN LAKE MICHIGAN. PERIODIC FISHKILLS LITTER THE SHORE. ONE OF THE MAIN DIFFICULTIES IN SOLVING GREAT LAKES PROBLEMS IS DIVERSITY AND NEED FOR COORDINATION OF GOVERNMENT AGENCIES IN THE BASIN. CREATION OF THE WATER QUALITY STANDARDS AND THE GREAT LAKES BASIN COMMISSION SHOULD HELP. (KNAPP-USGS)

FIELD 05B, 05C

ACCESSION NO. W69-03948

THE ROLE OF LAW IN A SYSTEM FOR LAKES ERIE AND ONTARIO,

OHIO STATE UNIV., COLUMBUS. WATER RESOURCES CENTER.

EARL FINBAR MURPHY.

OHIO STATE UNIVERSITY WATER RESOURCES CENTER, THIRD ANNUAL SYMPOSIUM ON WATER RESOURCES RESEARCH, SYSTEMS APPROACH TO WATER QUALITY IN THE GREAT LAKES, SEPTEMBER, 1967, PP 105-115.

DESCRIPTORS:

METHODOLOGY, LAKE ERIE, LAKE ONTARIO, DYNAMIC PROGRAMMING, NON-STRUCTURAL ALTERNATIVES, WATER POLLUTION CONTROL, ADMINISTRATIVE AGENCIES, LEGAL ASPECTS, JURISDICTION.

ABSTRACT:

THE ESSAY EXAMINES THE ROLE OF LAW IN A SYSTEM TO IMPROVE WATER QUALITY OF LAKES ERIE AND ONTARIO, THE MOST POLLUTED OF THE GREAT LAKES. EXISTING LEGAL BODIES PASS LAWS THAT CANNOT BE ENFORCED. THE ESSAY SUGGESTS THAT THE PROPOSED GREAT LAKES BASIN COMMISSION BE GIVEN JURISDICTION IN ALL THE AREAS WHERE DRAINAGE BREAKS TOWARD THE LAKES. IT SHOULD WORK CLOSELY WITH NATIONAL, STATE, LOCAL, AND OTHER GOVERNMENTS IN THE AREA, BUT SHOULD BE ALLOWED TO FORM AND GOVERN ITSELF. MODELS FOR SUCH AN APPROACH ARE THE RUHRVERBAND IN GERMANY, THE DELAWARE RIVER BASIN COMMISSION IN THE UNITED STATES, AND THE STREAM CONTROL ASSOCIATIONS IN ENGLAND. MEANS OF FINANCING ARE DISCUSSED. SYSTEMS ANALYSIS AS A METHOD IS DISCUSSED AS A DYNAMIC MODE OF ANALYSIS THAT VIEWS NATURE AS A WHOLE, MAN AS A SINGLE PART. ITS FUNCTION IS TO CREATE VIABLE BALANCES OF NATURE BASED ON PATTERNS OF HUMAN ACTIVITY; AND, IF THIS IS IMPOSSIBLE, TO PROVIDE THE EVIDENCE FOR LEGISLATING CHANGE IN HUMAN ACTIVITY. (GOSSEN-CHICAGO)

FIELD 06E

ACCESSION NO. W69-04212



ANNUAL REPORT, FISCAL YEAR 1968,

OHIO STATE UNIV., COLUMBUS. WATER RESOURCES CENTER.

G. P. HANNA, JR.

ANNUAL REPORT TO OFFICE OF WATER RESOURCES RESEARCH, SEPTEMBER 1, 1968. 118 P.

DESCRIPTORS:

\*OHIO, \*PROGRAMS, ACID MINE WATER, GREAT LAKES, \*LAKE ERIE, EUTROPHICATION, GROUND WATER, HYDROLOGY, SMALL WATERSHEDS, WATER QUALITY, ALGAE, PHOSPHATES, ECONOMICS, RECREATION DEMAND, TAXES, APPALACHIA.

ABSTRACT:

EIGHT CURRENT ALLOTMENT PROJECTS AND SEVEN MATCHING GRANTS PROJECTS ARE DESCRIBED. A STRONG ORIENTATION OF THE CENTER'S ACTIVITIES TOWARD THE PROBLEMS OF WATER QUALITY IN LAKE ERIE IS EVIDENCED BY THESE PROJECTS. FOUR BIOLOGICAL PROJECTS WERE DESIGNED TO FILL CRITICAL GAPS IN THE AVAILABLE KNOWLEDGE PERTAINING TO CHEMICAL, PHYSICAL AND BIOLOGICAL PHENOMENA IN WESTERN LAKE ERIE AND ITS TRIBUTARY STREAMS. TWO PROJECTS INVOLVING THE ECONOMICS OF THE AREA ALSO PROVIDES THE BROADENING OF OUR INVOLVEMENT IN THE LAKE ERIE BASIN. TWO PROJECTS, ASSOCIATED WITH THE CENTER'S EARLIER EMPHASIS ON ACID MINE DRAINAGE, REMAIN. THREE HYDROLOGICAL PROJECTS ARE ALSO INCLUDED; ONE DEALING WITH CHARACTERISTICS OF SMALL WATERSHEDS, THE OTHER TWO RELATING TO GROUND-WATER FLOWS. COMPLETION OF A STUDY ON STRONTIUM ISOTOPE AND TRACE-ELEMENT CONCENTRATIONS IN LAKE HURON IS ALSO REPORTED. A SOCIOLOGICAL STUDY IS ALSO UNDERWAY TO EXAMINE COMMUNITY REACTIONS TO WATER PROBLEMS IN RELATION TO PLANNING.

FIELD 090

ACCESSION NO. W69-05160

RESERVOIR MANAGEMENT PROBLEMS CREATED BY INCREASED PHOSPHORUS LEVELS OF SURFACE WATERS,

SOUTHERN ILLINOIS UNIV., CARBONDALE. DEPT. OF BOTANY.

JACOB VERDUIN.

RESERVOIR FISH RESOURCES SYMP, GEORGIA UNIV, APR 5-7, 1967, PP 200-206, 1967.  
7 P, 1 FIG, 3 TAB, 15 REF.

DESCRIPTORS:

\*RESERVOIR OPERATION, \*EUTROPHICATION, \*PHOSPHORUS, LAKE ERIE, ALGAE, SEWAGE TREATMENT, TERTIARY TREATMENT, NUTRIENTS, NITROGEN, LAGOONS.

IDENTIFIERS:

RESERVOIR MANAGEMENT, PHOSPHORUS REMOVAL.

ABSTRACT:

PHOSPHORUS LEVELS HAVE INCREASED IN FRESH WATERS OF THE U.S.A. ABOUT FOUR-FOLD DURING THE PAST 20 YEARS. PRESENT LEVELS ARE IN THE VICINITY OF 100-200 MICROGRAMS/LITER, AND ARE ABOUT 10 TIMES HIGHER THAN THE LEVELS CONSIDERED SUFFICIENT TO PRODUCE NUISANCE CONCENTRATIONS OF ALGAE. NITROGEN TO PHOSPHORUS RATIOS HAVE DROPPED FROM VALUES OF 35 TO ABOUT 9, IN LAKE ERIE, INDICATING A MORE NEARLY BALANCED N:P SUPPLY. HIGH NUTRIENT LEVELS ARE LIKELY TO CREATE SUCH INCREASED PROBLEMS FOR RESERVOIR MANAGEMENT AS FOUL ODORS AND TASTES IN DRINKING WATER, LARGE DEPOSITS OF ALGAE ON BEACHES, AND FISH AND BENTHOS MORTALITY. IT IS SUGGESTED THAT LAGOONS BE CONSTRUCTED AS AN ADJUNCT TO SEWAGE TREATMENT PLANTS TO REDUCE NUTRIENT LEVELS BY NATURAL CROPPING BEFORE RELEASING SEWAGE EFFLUENTS TO OUR STREAMS AND LAKES. (KNAPP-USGS)

FIELD 02H.

ACCESSION NO. W69-05470

STATE SQUIRE V CITY OF CLEVELAND (FILL LAND AND HIGHWAY USE AS TO LITTORAL RIGHTS).

74 NE 2D 438-459 (OHIO CT APP 1947).

DESCRIPTORS:

\*OHIO, \*ACCESS ROUTES, \*RIPARIAN RIGHTS, \*RIPARIAN LANDS, LEGISLATION, CITIES, HIGHWAYS, LANDFILLS, BEDS, LAKES, LAKE ERIE, GREAT LAKES, REASONABLE USE, CONDEMNATION, EMINENT DOMAIN, PUBLIC BENEFITS, PUBLIC RIGHTS, PUBLIC LANDS, LEGAL ASPECTS, JUDICIAL DECISIONS, LITTORAL, NAVIGATION, PIERS.

IDENTIFIERS:

STATE STATUTES.

ABSTRACT:

PLAINTIFF SOUGHT A DECLARATORY JUDGMENT CONCERNING THE RIGHTS OF THE PARTIES IN CERTAIN LANDFILLS ADJACENT TO PLAINTIFF'S LITTORAL LANDS. THE PLAINTIFF ALSO SOUGHT TO ENJOIN DEFENDANT FROM MAINTAINING A THOROUGHFARE OVER THE LANDFILL. THE DEFENDANT CONTENTED THAT ITS ACTIVITIES WERE SANCTIONED BY STATE STATUTE AUTHORIZING CITIES TO CONSTRUCT MARGINAL THOROUGHFARES ALONG THE SHORELINE AND ACROSS LANDFILLS ALONG LAKE ERIE. THE PLAINTIFF ARGUED THAT PART OF THE ENABLING STATUTE RELIED ON BY THE DEFENDANT WAS UNCONSTITUTIONAL IN REGARD TO CERTAIN ISSUES NOT AT BAR. THE PLAINTIFF CONTENTED THAT THE ENTIRE STATUTE WAS VOID DUE TO THE INVALIDITY OF THAT SECTION. THE COURT UPHELD THE STATUTE DESPITE PARTIAL INVALIDITY. PLAINTIFF CONTENTED THAT DEFENDANT WAS NOT CONFORMING TO THE STATUTORY REQUIREMENT THAT THE THOROUGHFARE BE UTILIZED FOR PURPOSES OF COMMERCE AND NAVIGATION. THE COURT HELD THAT THE HIGHWAY REGULATION FORBIDDING TRUCK TRAVEL WAS THEREFORE ILLEGAL, BUT DENIED PLAINTIFFS FURTHER CONTENTION THAT THEIR LITTORAL RIGHTS TO WHARF OUT INTO NAVIGABLE WATER HAD BEEN VIOLATED, RECOGNIZING THAT PLAINTIFFS COULD RETAIN ACCESS TO SUCH WATER BY CONSTRUCTION OF OVERPASSES AND UNDERPASSES. (KATZ-FLA)

FIELD 04C, 06E

ACCESSION NO. W69-05555

WASTES, WATER, AND WISHFUL THINKING: THE BATTLE OF LAKE ERIE,  
CASE WESTERN RESERVE UNIV., CLEVELAND.

ARNOLD W. REITZE, JR.

CASE W RES L REV, VOL 20, NO 1, PP 5-86, NOV 1968. 82 P, 448 REF.

DESCRIPTORS:

\*OHIO, \*LAKE ERIE, \*WATER POLLUTION CONTROL, \*POLLUTION ABATEMENT, POLLUTANTS, WASTES, THERMAL POLLUTION, TOXINS, PESTICIDE RESIDUES, PHOSPHATES, ALGAE, SEWAGE, WATER POLLUTION, WATER LAW, WATER POLLUTION EFFECTS, WATER POLLUTION SOURCES, WATER POLLUTION TREATMENT, FINANCING, GRANTS, FEDERAL GOVERNMENT, STATE GOVERNMENTS, WATER QUALITY STANDARDS.

ABSTRACT:

LAKE ERIE IS SERIOUSLY POLLUTED, AND ITS CONTINUED USE AS A PUBLIC WATER SUPPLY IS IN JEOPARDY. THE POLLUTANTS INCLUDE SEWAGE, PHOSPHATES, ORGANIC CHEMICALS, AND PETROLEUM PRODUCTS. THE FEDERAL GOVERNMENT HAS PASSED POLLUTION STATUTES WHICH DATE BACK TO THE 19TH CENTURY, BUT THE FIRST-SERIOUS ATTEMPT TO CLEAN UP LAKE ERIE BEGAN IN 1965, UNDER THE FEDERAL WATER POLLUTION CONTROL ACT. UNDER THIS ACT, THE STATES ARE REQUIRED TO SET WATER QUALITY STANDARDS FOR THEIR NAVIGABLE WATERWAYS. EACH JURISDICTION MUST MAINTAIN THE EXISTING QUALITY OF THE WATER AND MAY NOT ALLOW TREATABLE WASTES TO BE DISCHARGED INTO THE WATER IN AN UNTREATED STATE. OHIO HAS ESTABLISHED POLLUTION STANDARDS, BUT THESE STANDARDS ARE CRITICIZED BECAUSE THEY ASSUME THE WATER DOES NOT HAVE TO BE PURE AND BECAUSE THEY ARE TOO VAGUE AND INCONSISTENT. THE POLLUTION ABATEMENT OF LAKE ERIE REQUIRES THE EFFORTS OF FEDERAL AND STATE ADMINISTRATIVE AGENCIES AND OF THE COURTS. THE ATTEMPT AT POLLUTION ABATEMENT OVER THE LAST THREE YEARS HAS ENDED IN FAILURE. OHIO EXPENDS ONLY \$239,000 YEARLY ON ITS RIVER SANITATION PROGRAM; APPROXIMATELY TEN BILLION DOLLARS ARE NEEDED TO CLEAN LAKE ERIE. (HOFFMAN-FLA)

FIELD 05G, 05B, 06E

ACCESSION NO. W69-06305

LAKE FRONT EAST 55TH STREET CO V CITY OF CLEVELAND (ESTABLISHMENT OF BOUNDARY LINES).

66 NE 2D 328-329 (OHIO CT APP 1941).

DESCRIPTORS:

\*OHIO, \*BOUNDARIES (PROPERTY), \*BOUNDARY DISPUTES, \*ACCRETION (LEGAL ASPECTS), LEGAL ASPECTS, JUDICIAL DECISIONS, NAVIGABLE WATERS, GREAT LAKES, DAMAGES, RIPARIAN RIGHTS, CITIES, LOCAL GOVERNMENTS, SHORES, RELATIVE RIGHTS, LAND TENURE, COMPENSATION, COMPETING USES.

ABSTRACT:

PLAINTIFF BROUGHT THIS ACTION TO ESTABLISH THE BOUNDARY LINES OF LAND FORMED BY ACCRETION ON THE SHORE OF LAKE ERIE. AN EARLIER DECISION BY THE STATE SUPREME COURT HAD ESTABLISHED THAT PLAINTIFF OWNED THE LAND BUT HAD FAILED TO SET OUT THE BOUNDARIES. IN THE PRESENT CASE, THE COURT HELD THAT A DECREE SHOULD BE ENTERED QUIETING TITLE IN THE PLAINTIFF. THE COURT ESTABLISHED THE EASTERLY AND WESTERLY BOUNDARIES OF THE PROPERTY IN THE SAME LOCATIONS AS WERE FIXED IN AN EARLIER ACTION. THE BOUNDARY LINE, AS ESTABLISHED, INCLUDED GRADUAL ACCRETIONS WITHIN THE TRACT, AND PLAINTIFF WAS HELD TO POSSESS RIPARIAN RIGHTS IN RESPECT OF THIS LAND. THE COURT REMANDED FOR A DECISION ON THE ISSUE OF COMPENSATION TO THE PLAINTIFF FOR LAND TAKEN AND FOR ANY DAMAGES TO THE RESIDUE. (SHEVIN-FLA)

FIELD 06E

ACCESSION NO. W69-06388

COLEMAN V SCHAEFFER (OBSTRUCTION TO NAVIGABLE STREAM).

163 OHIO ST 202, 126 NE 2D 444-449 (1955).

DESCRIPTORS:

\*OHIO, \*NAVIGABLE WATERS, \*LAKE ERIE, \*STREAMS, BRIDGES, MARINAS, LEGISLATION, RIVERS AND HARBORS ACT, JUDICIAL DECISIONS, STREAM FISHERIES, FLOTATION, VEGETATION EFFECTS, STREAMFLOW, BOATS, ACCESS ROUTES, LEGAL ASPECTS, LAKES, REMEDIES.

IDENTIFIERS:

\*INJUNCTIONS(MANDATORY), INGRESS, EGRESS.

ABSTRACT:

PLAINTIFFS BROUGHT SUIT FOR MANDATORY INJUNCTIONS TO REQUIRE DEFENDANTS TO REMOVE STEEL CABLES AND A WIRE FENCE FROM A STREAM USED BY PLAINTIFFS IN ITS BOAT RENTAL BUSINESS. DEFENDANTS OWNED LAND ON OPPOSITE SIDES OF THE STREAM EXTENDING UP STREAM FROM LAKE ERIE, AND PLAINTIFFS' LAND WAS IMMEDIATELY ABOVE THESE PROPERTIES. DEFENDANTS' CONSTRUCTION OF THE FENCE AND CABLE DESTROYED PLAINTIFFS' RIGHT TO TRAVEL TO AND FROM THE NAVIGABLE LAKE. THE LOWER COURTS HAD DENIED INJUNCTIVE RELIEF. ON APPEAL, THE SUPREME COURT NOTED THAT THE ULTIMATE QUESTION TO BE DECIDED WAS WHETHER THIS STREAM WAS A NAVIGABLE STREAM. THE COURT INDICATED THAT THE LACK OF COMMERCIAL TRAFFIC DOES NOT NECESSARILY INDICATE THE STREAM IS NON-NAVIGABLE. A STREAM IS 'NAVIGABLE' AS LONG AS IT IS CAPABLE OF BEING PUT TO ANY BENEFICIAL PUBLIC USE. ALTHOUGH THIS STREAM WAS CROSSED BY A BRIDGE WHICH HAD A CLEARANCE OF BUT 5 1/2 FEET, AND ALTHOUGH IT WAS OFTEN CLOGGED WITH VEGETATION, PLAINTIFFS OPERATED THEIR BOAT RENTAL BUSINESS FOR 14 YEARS UNTIL STOPPED BY THE FENCE AND CABLES. THE COURT WAS OF THE OPINION THAT THE STREAM WAS NAVIGABLE AND THAT PLAINTIFFS WERE ENTITLED TO THE INJUNCTIONS PRAYED FOR. (REED-FLA)

FIELD 06E

ACCESSION NO. W69-06584

STATE V CITY OF CLEVELAND (RIGHT OF ACCESS TO NAVIGABLE WATERS).

150 OHIO ST 303, 82 NE 2D 709-730 (1948).

**DESCRIPTORS:**

\*LANDFILLS, \*OWNERSHIP OF BEDS, \*APPROPRIATION, \*OHIO, LITTORAL, RIPARIAN RIGHTS, SHALLOW WATER, LAKE ERIE, CONDEMNATION, COMPENSATION, RIGHT OF WAY, STATE GOVERNMENTS, LOCAL GOVERNMENTS, DOCKS, NAVIGABLE WATERS, NAVIGATION, WATER LAW, SHORES, CITIES, GREAT LAKES, DAMAGES, REMEDIES, JUDICIAL DECISIONS, EMINENT DOMAIN, LEGAL ASPECTS, NONNAVIGABLE WATERS, HIGHWAYS.

**IDENTIFIERS:**

FACT QUESTIONS.

**ABSTRACT:**

PLAINTIFF OWNED LAND ON LAKE ERIE AND HAD COMMENCED TO FILL IN THE SHALLOW NONNAVIGABLE WATERS OF THE LAKE FOR THE DUAL PURPOSE OF ADDING UPLAND AND WHARFING OUT TO NAVIGABLE WATERS. DEFENDANT ENTERED THIS FILL AND CONSTRUCTED A HIGHWAY ACROSS IT, CUTTING OFF PLAINTIFF'S ACCESS TO THE SEA. PLAINTIFF SUED FOR COMPENSATION, AND THE TRIAL COURT ORDERED THE JURY TO ASSESS DAMAGES. DEFENDANT APPEALED; THE COURT OF APPEALS REVERSED, BASING ITS DECISION ON A STATUTE WHICH PROVIDED THAT A MUNICIPAL CORPORATION COULD BUILD ANY WORK IN AID OF NAVIGATION AND WATER COMMERCE UPON FILL ON SUBMERGED LAND WITHOUT COMPENSATION. PLAINTIFF APPEALED THIS DECISION. THE SUPREME COURT FOUND THAT THE STATE HOLDS TITLE TO SUBAQUEOUS LAND IN TRUST FOR THE PROTECTION OF THE PUBLIC RIGHTS OF NAVIGATION AND COMMERCE. THE LITTORAL OWNER HAS THE RIGHT TO WHARF OUT TO NAVIGABLE WATERS PROVIDED HE DOES NOT INTERFERE WITH THOSE PUBLIC RIGHTS. THE CASE TURNED ON WHETHER THE HIGHWAY WAS BUILT IN AID OF NAVIGATION AND WATER COMMERCE. DETERMINATION OF SUCH A QUESTION IS PROVINCE OF THE JURY, AND THUS, THE COURT REVERSED AND REMANDED FOR A NEW TRIAL. (GABRIELSON-FLA)

FIELD 06E

ACCESSION NO. W69-06619

LEGAL ASPECTS FOR CONTROL OF INTRASTATE, INTERSTATE AND INTERNATIONAL WATERS,

MICHIGAN STATE ASSISTANT ATTORNEY GENERAL.

NICHOLAS V. OLDS.

THE FRESH WATER OF NEW YORK STATE: ITS CONSERVATION AND USE, PP 116-123, WM C BROWN BOOK CO, DUBUQUE, IOWA, 1967. 8 P, 15 REF. EDITED BY LAUREN B. HITCHCOCK.

DESCRIPTORS:

\*LEGAL ASPECTS, \*WATER CONTROL, \*GREAT LAKES, ADMINISTRATION, HARBORS, ST. LAWRENCE SEAWAY, WATER MANAGEMENT, FEDERAL GOVERNMENT, BOUNDARY DISPUTES, MICHIGAN, OHIO, LAKE ERIE, MINNESOTA, WISCONSIN, NAVIGATION, RECREATION, WATER POLLUTION.

IDENTIFIERS:

INTERSTATE PROBLEMS, INTRASTATE PROBLEMS, INTERNATIONAL PROBLEMS, LAKE LEVELS, OWNERSHIP, DEEP DRAFT OCEAN NAVIGATION, INTERNATIONAL GOVERNMENT, PILOTAGE, TOLLS.

ABSTRACT:

THE GREAT LAKES CONSTITUTES THE GREATEST BODY OF FRESH WATER IN THE WORLD AND IS CONSIDERED ONE OF THE GREATEST WATERWAYS. THE BASIN ENCOMPASSES EIGHT STATES, TWO PROVINCES AND TWO NATIONS. MANY INTRASTATE, INTERSTATE AND INTERNATIONAL PROBLEMS OF A HIGHLY COMPLEX NATURE NEED TO BE RESOLVED. IN THE PAST THERE HAVE BEEN BOUNDARY DISPUTES SETTLED BOTH BY SUPREME COURT DECISIONS AND INTERSTATE COMPACTS. THE INTERNATIONAL BOUNDARY HAS BEEN SUBJECT TO MANY TREATIES AND IS FIXED BY AN INTERNATIONAL BOUNDARY COMMISSION. OTHER PROBLEMS OF THE GREAT LAKES, MANY HAVING ECONOMIC ASPECTS, CONCERN LAKE LEVELS, THE OWNERSHIP OF NATURAL RESOURCES, THE CONSTRUCTION OF PORTS AND HARBORS, THE DEEPENING OF CHANNELS AND THE CONSTRUCTION OF THE ST. LAWRENCE SEAWAY WHICH OPENED THE GREAT LAKES TO DEEP DRAFT OCEAN NAVIGATION. IT IS ARGUED THAT THE EIGHT GREAT LAKES STATES AS WELL AS THE TWO CANADIAN PROVINCES SHOULD PLAY THEIR RIGHTFUL ROLE IN THE MANAGEMENT AND REGULATION OF THESE WATER RESOURCES IN COOPERATION WITH FEDERAL AND INTERNATIONAL GOVERNMENTS AND ENTITIES. (SEE W69-08076). (LOEB-RUTGERS)

FIELD 06E

ACCESSION NO. W69-08080



CLEVELAND BOAT SERVICE V CITY OF CLEVELAND (CONDEMNATION VALUE OF ACCRETED LAND).

130 NE 2D 421-430 (OHIO CT APP 1955).

DESCRIPTORS:

\*OHIO, \*CONDEMNATION, \*RIPARIAN LAND, \*LAKE ERIE, NAVIGABLE WATERS, LAKE SHORES, JUDICIAL DECISIONS, BOUNDARIES(PROPERTY), LANDFILLS, LAND TENURE, CONDEMNATION VALUE, DAMAGES, COMPETING USES, ACCRETION(LEGAL ASPECTS), BOUNDARIES(PROPERTY), LEGAL ASPECTS, WATER LAW.

IDENTIFIERS:

\*LITTORAL PROPRIETORSHIP, \*PUBLIC TRUST DOCTRINE.

ABSTRACT:

IN A LOWER COURT LESSEE RECOVERED A \$50,000 JUDGEMENT FOR DAMAGES AGAINST THE CITY OF CLEVELAND, THE CONDEMNOR. THE BASIS OF THE SUIT WAS INTERFERENCE BY THE CITY WITH LEASED REALTY ALONG THE SHORELINE OF LAKE ERIE BY CONSTRUCTING A FREEWAY ON PART OF PLAINTIFF-LESSEE'S LEASEHOLD ADJACENT TO THE LAKE ERIE SHORELINE. ON APPEAL BY THE CONDEMNOR ON QUESTIONS OF LAW, THE OHIO COURT OF APPEALS REVERSED AND REMANDED. IN THE LOWER COURT, CONDEMNOR WAS NOT ALLOWED TO INTRODUCE EVIDENCE THAT THE LEASE PURPORTED TO COVER LAND FORMED BY FILLING IN THE WATERS OF LAKE ERIE BEYOND THE NATURAL SHORELINE. THE UPPER COURT HELD THAT THIS EVIDENTIARY EXCLUSION CONSTITUTED PREJUDICIAL ERROR SINCE, IF CONDEMNOR'S ALLEGATION WERE TRUE, THE TITLE TO THE SHORELINE OVER WHICH THIS DISPUTE AROSE WOULD REPOSE IN THE STATE OF OHIO AS TRUSTEE FOR THE PEOPLE AND ANY LEASE EXECUTED PERTAINING TO SUCH LAND WOULD BE VOID AB INITIO. THE LITTORAL RIGHTS OF PLAINTIFF UNDER SUCH CIRCUMSTANCES WOULD BE SUBJECT TO REGULATION AND CONTROL BY THE STATE AND FEDERAL GOVERNMENTS. (CARRUTHERS-FLA)

FIELD 06E

ACCESSION NO. W69-08140

NATURAL AND POLLUTION SOURCES OF IODINE, BROMINE, AND CHLORINE IN THE GREAT LAKES,

MICHIGAN UNIV., ANN ARBOR. DEPT. OF METEOROLOGY AND OCEANOGRAPHY.

MARY A. TIFFANY, JOHN W. WINCHESTER, AND RONALD H. LOUCKS.

J WATER POLLUT CONTR FEDERATION, VOL 41, NO 7, P 1319-1329, JULY 1969. 11 P, 10 FIG, 5 TAB, 13 REF. CONTRACT NO AT(11-1)-1705AEC).

DESCRIPTORS:

\*WATER QUALITY, \*GREAT LAKES, \*TRACE ELEMENTS, \*WATER POLLUTION EFFECTS, CHLORIDES, HALOGENS, ALGAE, WATER POLLUTION SOURCES, WATER CHEMISTRY, WATER ANALYSIS.

IDENTIFIERS:

\*BROMINE, \*IODINE.

ABSTRACT:

THIS STUDY INVOLVES THE DETERMINATION OF TRACE ELEMENTS I, BR, AND CL IN THE GREAT LAKES, USING NEUTRON ACTIVATION ANALYSIS OF 90 WATER SAMPLES FROM LAKE SUPERIOR AND ITS TRIBUTARY STREAMS, LAKE MICHIGAN, SOUTHERN LAKE HURON, LAKE ST. CLAIR, WESTERN LAKE ERIE, AND NORTHERN LAKE ONTARIO. POSSIBLE POLLUTION BY BROMINE THROUGH AN ATMOSPHERIC ROUTE IS OF INTEREST BECAUSE OF THE COMBUSTION OF LEADED GASOLINE. IODINE DEFICIENCY IN LAKE WATER MAY BE RELATED TO THYROID DISORDERS AMONG MARINE FISH WHICH HAVE BECOME ADAPTED TO FRESH WATER, AND ALGAE MAY OFFER COMPETITION FOR THE AVAILABLE IODINE. CHLORINE IS A NOTICEABLE CONTAMINANT EXCEPT IN LAKE SUPERIOR. THE LAKE SUPERIOR STREAMS APPEAR TO REPRESENT A GOOD AVERAGE OF THE ATMOSPHERIC INPUTS OF I, BR, AND CL. (KNAPP-USGS)

FIELD 05A, 02K

ACCESSION NO. W69-08562

A NOTE ON THE RELATIONSHIP OF GRAIN SIZE, CLAY CONTENT, QUARTZ AND ORGANIC CARBON IN SOME LAKE ERIE AND LAKE ONTARIO SEDIMENTS,

DEPARTMENT OF ENERGY, MINES AND RESOURCES, BURLINGTON (ONTARIO). CANADA  
CENTRE FOR INLAND WATERS.

R. L. THOMAS.

J SEDIMENT PETROL, VOL 39, NO 2, PP 803-809, JUNE 1969. 7 P, 5 FIG, 2 TAB, 14 REF.

DESCRIPTORS:

\*SEDIMENTS, \*LAKE ERIE, \*LAKE ONTARIO, \*ORGANIC MATTER, CLAYS, SANDS, SILTS, CARBON, ORGANIC COMPOUNDS, GREAT LAKES, DEPOSITION(SEDIMENTS), QUARTZ, SEDIMENTATION, PARTICLE SHAPE, PARTICLE SIZE.

IDENTIFIERS:

GREAT LAKES SEDIMENTS.

ABSTRACT:

AN EXAMINATION OF THE GEOCHEMISTRY OF FINE-GRAINED SEDIMENTS IN RELATION TO SIZE FREQUENCY DISTRIBUTION WAS CARRIED OUT ON SEDIMENT SAMPLES FROM LAKES ERIE AND ONTARIO. THIS STUDY DEMONSTRATED A DIRECT RELATIONSHIP BETWEEN THE UNDER 2 MICRON GRAIN SIZE AND THE THEORETICAL CLAY CONTENT COMPUTED FROM THE ORGANIC CARBON, QUARTZ AND CARBONATE CONTENT. A SYMPATHETIC RELATIONSHIP WAS OBSERVED BETWEEN CLAY CONTENT AND ORGANIC CARBON, AND ALSO BETWEEN MEDIAN GRAIN SIZE AND QUARTZ CONTENT. THE FORMER RELATIONSHIP IS BELIEVED TO BE THE RESULT OF ABSORPTION FROM SOLUTION AND THE LATTER IS BROUGHT ABOUT BY NATURAL SEDIMENTATION FROM SUSPENSION. (KNAPP-USGS)

FIELD 02J, 02K

ACCESSION NO. W69-08586

IN RE SCIOTO-SANDUSKY CONSERVANCY DISTRICT (FLOOD CONTROL DISTRICTS).

109 NE 2D 51-54 (CT APP OHIO 1952).

DESCRIPTORS:

\*OHIO, \*FLOOD CONTROL, \*LEVEES, \*DAMS, RESERVOIRS, MULTI-PURPOSE PROJECTS, LEGISLATION, JUDICIAL DECISIONS, LEGAL ASPECTS, RIVERS, OHIO RIVER, WATERSHEDS, ENGINEERS, PUBLIC BENEFITS, PUBLIC HEALTH, DRAINAGE, LAKE ERIE, FINANCING, FEDERAL GOVERNMENT.

IDENTIFIERS:

\*FLOOD DISTRICT, SCIOTO RIVER, SANDUSKY RIVER.

ABSTRACT:

THE SCIOTO-SANDUSKY CONSERVANCY DISTRICT WAS ESTABLISHED BY A GENERAL LEGISLATIVE ACT. THE DISTRICT ADOPTED ITS OFFICIAL PLAN, CERTAIN PERSONS OBJECTED, AND A SPECIAL HEARING WAS HELD. THE COURT CONDUCTING THE HEARING APPROVED THE PLAN AFTER CERTAIN AMENDMENTS WERE MADE. THIS RULING WAS APPEALED BY THE OBJECTORS. MOST OF THE OBJECTIONS CONCERNED A CERTAIN DAM AND RESERVOIR IN TWO SPECIFIC COUNTIES. IN RESPECT TO THESE PROJECTS, THE OFFICIAL PLAN CALLED FOR THEM TO BE FINANCED BY FEDERAL FUNDS. THE OBJECTORS CLAIMED THAT DURING THE INTERIM BETWEEN THE PLAN'S ADOPTION AND THE FEDERAL GOVERNMENT'S ACTION, THERE WILL BE A LONG PERIOD OF UNCERTAINTY THAT WOULD BE DETRIMENTAL TO THE PERSONS AFFECTED. THE COURT HELD THAT SINCE THE PURPOSE OF THE PLAN WAS TO PROVIDE FOR THE HEALTH AND WELFARE OF THE PUBLIC, IT MUST BE LIBERALLY CONSTRUED AND REJECTED THIS CONTENTION AS MERE CONJECTURE. THE COURT SAID THAT A FEW MUST NECESSARILY BE INCONVENIENCED SO THAT A BENEFIT MAY ACCRUE TO MANY. THE COURT APPROVED THE OFFICIAL PLAN AS AMENDED. (SHEVIN-FLA)

FIELD 06E, 04A

ACCESSION NO. W69-08777

VIAN V SHEFFIELD BLDG. AND DEV. CO. (SUIT TO ENJOIN DISCHARGE OF SEWAGE).

88 NE 2D 410-415 (CT APP OHIO 1948).

DESCRIPTORS:

\*OHIO, \*SEWAGE, \*SURFACE DRAINAGE, \*PRESCRIPTIVE RIGHTS, PUMPING PLANTS, SEWAGE EFFLUENTS, SEWAGE DISPOSAL, SURFACE WATERS, DRAINAGE, SEWERS, DITCHES, LAKE ERIE, BEACHES, DISCHARGE(WATER), LEGAL ASPECTS, JUDICIAL DECISIONS, RELATIVE RIGHTS, INDUSTRIAL WASTES, ALTERATION OF FLOW.

ABSTRACT:

PLAINTIFF HEREIN WAS SEEKING TO ENJOIN DEFENDANT BUILDING AND DEVELOPMENT COMPANY FROM: (1) DISCHARGING SURFACE WATERS UPON PLAINTIFF'S PROPERTY; AND (2) CASTING SEWAGE AND/OR DISPOSAL PLANT EFFLUENT THEREUPON THROUGH THE USE OF DITCHES AND SEWERS. THE COURT FOUND THAT PLAINTIFF HAD FAILED TO SUSTAIN THE BURDEN OF PROOF OF SHOWING THAT DEFENDANT HAD IN FACT DIVERTED AND CAST SURFACE WATERS UPON PLAINTIFF'S PROPERTY. THE COURT FURTHER HELD THAT IN ACCORDANCE WITH OHIO LAW ONE MAY NOT OBTAIN BY PRESCRIPTION OR OTHERWISE THAN BY PURCHASE A RIGHT TO CAST SEWAGE UPON THE LANDS OF ANOTHER WITHOUT HIS CONSENT. PLAINTIFF MET HIS BURDEN OF PROOF IN SHOWING THAT DEFENDANT HAD CAUSED SEWAGE TO FLOW UPON PLAINTIFF'S PROPERTY, AND THE REQUEST FOR AN INJUNCTION WAS GRANTED. (LOGAN-FLA)

FIELD. 05G, 06E

ACCESSION NO. W69-09064

**FIGHTING WATER POLLUTION.**

**PERFORMED LINE PRODUCTS CO. OF CLEVELAND, OHIO.**

**UNDER SEA TECHNOL, VOL 10, NO 5, P 46-47, MAY 1969.**

**DESCRIPTORS:**

**\*WATER POLLUTION, \*BUOYS, \*LAKE ERIE, TEMPERATURE, WAVES(WATER), WIND VELOCITY, TURBIDITY, TURBIDITY CURRENTS, BOTTOM SEDIMENTS, CONDUCTIVITY, LIGHT INTENSITY.**

**IDENTIFIERS:**

**LAKE ERIE BUOY SYSTEM, WATER POLLUTION MONITORING.**

**ABSTRACT:**

**A BUOY SYSTEM DEVELOPED BY THE PREFORMED LINE PRODUCTS CO. OF CLEVELAND, OHIO WAS TESTED BY MOORING THIS SYTEM IN LAKE ERIE FIVE MILES NORTH OF CLEVELAND. THE SYSTEM IS BEING DESIGNED TO MEASURE ACIDITY OF THE WATER, TEMPERATURE VARIATION AND GRADIENT, WAVE HEIGHT AND FREQUENCY, WIND SPEED, WIND DIRECTION, TURBIDITY, CONDUCTIVITY, BOTTOM SEDIMENTS, AND PENETRATION OF LIGHT AT VARIOUS DEPTHS AND TIMES. (GABRIEL-USGS)**

**FIELD 05A**

**ACCESSION NO. W69-09147**

**DISTRIBUTION OF OLIGOCHAETES IN WESTERN LAKE ERIE, 1961,**

**BUREAU OF COMMERCIAL FISHERIES, ANN ARBOR, MICH. BIOLOGICAL LAB.**

**JARL K. HILTUNEN.**

**LIMNOL AND OCEANOGR, VOL 14, NO 2, MAR 1969. P 260-264, 5 P, 9 FIG, 15 REF.**

**DESCRIPTORS:**

**\*OLIGOCHAETES, \*LAKES, \*LAKE ERIE, SAMPLING, TUBIFICIDS, ESTUARIES, RIVERS, POLLUTANT IDENTIFICATION, MAPPING, RUNOFF, ECOLOGY, ECOLOGICAL DISTRIBUTION.**

**IDENTIFIERS:**

**LAKE ERIE OLIGOCHAETES.**

**ABSTRACT:**

**A TOTAL OF 52,390 OLIGOCHAETES WERE COLLECTED FROM 40 STATIONS IN WESTERN LAKE ERIE IN SPRING 1961. THE POPULATION WAS COMPOSED OF 2 FAMILIES, NAIDIDAE AND TUBIFICIDAE. ONLY 6 SPECIES OF NAIDIDS WERE FOUND. ONE, PARANAIS FRICI, IS APPARENTLY NEW TO THE LIST OF NORTH AMERICAN FRESHWATER NAIDIDAE. AMONG THE 14 TUBIFICIDS FOUND, 5 SPECIES OF LIMNODRILUS WERE MOST ABUNDANT; THEY CONTRIBUTED 90% OR MORE OF ALL OLIGOCHAETES AT 33 OF THE 40 STATIONS. NUMBERS OF LIMNODRILUS WERE GENERALLY LARGE NEAR THE MOUTHS OF THE DETROIT, RAISIN, AND MAUMEE RIVERS AND DECREASED PROGRESSIVELY LAKEWARD. STYLODRILUS HERINGIANUS, A POLLUTION-INTOLERANT SPECIES COMMON IN EASTERN LAKE ERIE, WAS NOT FOUND IN THE WESTERN END OF THE LAKE. (GABRIEL-USGS)**

**FIELD 02H**

**ACCESSION NO. W69-09256**

EUTROPHICATION OF THE ST. LAWRENCE GREAT LAKES,

BUREAU OF COMMERCIAL FISHERIES, ANN ARBOR, MICH.

ALFRED M. BEETON.

LIMNOLOGY AND OCEANOGRAPHY, VOL 10, NO 2, P 240-254, 1965. 4 FIG, 3 TAB, 52 REF.

DESCRIPTORS:

\*GREAT LAKES, \*EUTROPHICATION, \*HYPOLIMNION, \*LAKE MORPHOMETRY, \*LAKE MORPHOLOGY, \*DISSOLVED OXYGEN, \*DISSOLVED SOLIDS, \*NUTRIENTS, OLIGOTROPHY, PHOSPHORUS, NITROGEN, BIOTA, SEWAGE DISPOSAL, DOMESTIC WASTES.

IDENTIFIERS:

\*MESOTROPHY, TRANSPARENCY, SPECIFIC CONDUCTION.

ABSTRACT:

LAKES HURON, MICHIGAN, AND SUPERIOR ARE CLASSIFIED AS OLIGOTROPHIC LAKES ON THE BASIS OF THEIR BIOLOGICAL, CHEMICAL, AND PHYSICAL CHARACTERISTICS. LAKE ONTARIO, ALTHOUGH RICH IN NUTRIENTS, IS MORPHOMETRICALLY OLIGOTROPHIC OR MESOTROPHIC BECAUSE OF ITS LARGE AREA OF DEEP WATER. LAKE ERIE, THE MOST PRODUCTIVE OF THE LAKES AND THE SHALLOWEST, IS EUTROPHIC. SEVERAL CHANGES COMMONLY ASSOCIATED WITH EUTROPHICATION IN SMALL LAKES HAVE BEEN OBSERVED IN THE GREAT LAKES. THESE CHANGES APPARENTLY REFLECT ACCELERATED EUTROPHICATION IN THE GREAT LAKES DUE TO MAN'S ACTIVITY. CHEMICAL DATA COMPILED FROM A NUMBER OF SOURCES, DATING AS EARLY AS 1854, INDICATE A PROGRESSIVE INCREASE IN THE CONCENTRATIONS OF VARIOUS MAJOR IONS AND TOTAL DISSOLVED SOLIDS IN ALL OF THE LAKES EXCEPT LAKE SUPERIOR. THE PLANKTON HAS CHANGED SOMEWHAT IN LAKE MICHIGAN AND THE PLANKTON, BENTHOS, AND FISH POPULATIONS OF LAKE ERIE ARE GREATLY DIFFERENT TODAY FROM THOSE OF THE PAST. AN EXTENSIVE AREA OF HYPOLIMNETIC WATER OF LAKE ERIE HAS DEVELOPED LOW DISSOLVED OXYGEN CONCENTRATIONS IN LATE SUMMER WITHIN RECENT YEARS. THE INFORMATION IS DETAILED IN TABLES AND GRAPHS. (SHERMAN-VANDERBILT)

FIELD 05C, 02H

ACCESSION NO. W69-09315



CHANGES IN WESTERN LAKE ERIE DURING THE PERIOD 1948-1962,

BOWLING GREEN STATE UNIV., OHIO.

JACOB VERDUIN.

PROC OF INTERNATIONAL ASSOC OF THEORETICAL AND APPLIED LIMNOLOGY, VOL 15, P 639-644, FEB 1961. 1 FIG, 2 TAB, 5 REF.

DESCRIPTORS:

\*EUTROPHICATION, \*LAKE ERIE, SEICHES, SAMPLING, SILTS, NUTRIENTS, LIGHT PENETRATION, PHYSICAL PROPERTIES, PHYTOPLANKTON, BENTHIC FAUNA, FISH, AGRICULTURAL WATERSHEDS, DETERGENTS, LAKES, HYDROGEN ION CONCENTRATION, NITRATES, PHOSPHATES.

IDENTIFIERS:

\*LAKE CHANGES, LAKE STUDIES, CHEMICAL CHANGES, BIOTA CHANGES, OXYGEN DEPLETION, CARBON DIOXIDE(DAILY CHANGES), CHEMICAL FERTILIZERS, PUT-IN-BAY(OHIO), DETROIT RIVER, MAUMEE RIVER(OHIO), MAUMEE BAY(OHIO), ASTERIONELLA FORMOSA, TABELLARIA FENESTRATA, MELOSIRA AMBIGUA, FRAGILLARIA CAPUCINA, COSCINODISCUS RADIATUS, MELOSIRA BINDERANA, HEXAGENIA LIMBATA, TENDIPES PLUMOSUS, STIZOSTEDION VITREUM VITREUM, PERCA FLAVESCENS, OSMERUS MORDAX.

ABSTRACT:

EXTENSIVE STUDIES OF WESTERN LAKE ERIE HAVE BEEN MADE SINCE 1948. THE AREA OF APPROXIMATELY 3100 SQUARE KILOMETERS IS STIRRED CONTINUALLY BY THE SEICHES RESULTING IN RELATIVELY HOMOGENEOUS TEMPERATURES, CHEMICAL CHARACTERISTICS, AND BIOLOGICAL POPULATIONS VERTICALLY. THE DETROIT RIVER ENTERS THE BASIN'S NORTHWEST CORNER CONTRIBUTING MOST OF THE WATER FLOWING THROUGH THE LAKE. THE MAUMEE RIVER ENTERS AT THE SOUTHWEST CORNER, ADDING MOST OF THE SILT LOAD AND NUTRIENTS TO THE LAKE. ABOUT 100 YEARS AGO THE LAND OF THE MAUMEE WATERSHED WAS DRAINED AND CONVERTED FROM SWAMP TO AGRICULTURAL LAND. IN THE YEARS FROM 1948-1962, MAJOR CHANGES WERE OBSERVED IN THE PHYTOPLANKTON, BENTHIC FAUNA, AND FISH COMMUNITIES. CHEMICAL CHANGES ALSO NOTED INCLUDE DECREASING OXYGEN SATURATION NEAR THE BOTTOM, INCREASING PH MAXIMA, INCREASING CARBON DIOXIDE CHANGE RATES PER DAY, AND INCREASING NITRATE AND PHOSPHATE LEVELS. ALL THESE CHANGES SUGGEST AN ENRICHMENT OF WESTERN LAKE ERIE OCCURRING RATHER SHARPLY BETWEEN 1949 AND 1953. RECORDS OF NITRATE AND PHOSPHATE CONCENTRATIONS FOR THE MAUMEE RIVER SHOW THAT IT CONTRIBUTES SIGNIFICANTLY GREATER NUTRIENT SUPPLIES TO WESTERN LAKE ERIE THAN IT DID FIFTEEN YEARS AGO. THIS CAN BE ATTRIBUTED PRIMARILY TO INCREASED FERTILIZATION ON FARMS IN THE RIVER'S WATERSHED. (KETELLE-WIS)

FIELD 02H, 05G

ACCESSION NO. W69-10156

SOME ASPECTS OF THE EUTROPHICATION OF WATER,

WATER POLLUTION RESEARCH LAB., STEVENAGE (ENGLAND).

MORLAIS OWENS, AND GAVIN WOOD.

WATER RESEARCH, VOL 2, P 151-159, 1968. 3 FIG, 2 TAB, 17 REF.

DESCRIPTORS:

\*EUTROPHICATION, \*NUTRIENTS, CYANOPHYTA, FISHKILL, RESERVOIRS, SURFACE DRAINAGE, FERTILIZERS, DETERGENTS, SEWAGE EFFLUENTS, INDUSTRIAL WASTES, LAKE ERIE, WATER POLLUTION SOURCES, WATER POLLUTION EFFECTS, PHOSPHORUS COMPOUNDS, NITROGEN COMPOUNDS, SUBSURFACE DRAINAGE.

IDENTIFIERS:

\*GREAT BRITAIN, NUTRIENT REMOVAL, NUTRIENT CONCENTRATIONS, NUTRIENT SOURCES, ALGAL BLOOMS, OXYGEN DEPLETION, FLOWING WATER, EUTROPHICATION EVALUATION, ALGAL NUTRIENT REQUIREMENTS, SURFACE-ACTIVE MATERIALS, LAKE WASHINGTON(WASH), ZURICHSEE(SWITZ), POTOMAC RIVER(D C), GREAT OUSE(ENGLAND), LEE RIVER(ENGLAND), THAMES RIVER(ENGLAND), OSCILLATORIA RUBESCENS, ANABAENA FLOS-AQUAE, WATER POLLUTION RESEARCH LABORATORY(ENGLAND).

ABSTRACT:

AUTHORS DESCRIBE SYMPTOMS OF EUTROPHICATION AND EVALUATE THE EXTENT OF ENRICHMENT AND ASSOCIATED TECHNICAL AND ECONOMIC PROBLEMS. INCREASING APPLICATIONS OF FERTILIZERS TO LAND AND GREATER USE OF DETERGENTS ARE PARTIALLY RESPONSIBLE FOR HIGHER CONCENTRATIONS OF NITROGEN AND PHOSPHORUS IN RIVERS OF GREAT BRITAIN. IN THE LAST TEN YEARS, AMOUNTS OF NITROGENOUS FERTILIZERS APPLIED TO AGRICULTURAL LAND IN BRITAIN HAVE DOUBLED WITH CONSEQUENT GREATER CONTRIBUTIONS OF INORGANIC NITROGEN TO RIVERS FROM LAND DRAINAGE. AUTHORS SUGGEST, FROM INDIRECT EVIDENCE, THAT APPROXIMATELY 50% OF PHOSPHORUS IN SEWAGE EFFLUENTS IS DERIVED FROM DETERGENTS. A NUTRIENT BALANCE SHEET FOR A PORTION OF THE GREAT OUSE WAS CONSTRUCTED TO DETERMINE THE CONTRIBUTION OF SEWAGE EFFLUENTS TO THE SUPPLY OF MAJOR NUTRIENTS IN THE RIVER. IT INDICATED THAT WHILE SEWAGE EFFLUENTS ADD ONLY A SMALL PROPORTION OF THE TOTAL NITROGEN, SILICON, CHLORIDE, AND SULPHATE, THEY ARE RESPONSIBLE FOR MOST OF THE PHOSPHORUS. BECAUSE OF INCREASED DEMANDS ON WATER SUPPLIES, INFORMATION ON PROPORTIONS OF NUTRIENTS DERIVED FROM VARIOUS SOURCES IS IMPORTANT TO BASE DECISIONS ON ECONOMICALLY SOUND REMEDIAL ACTION, E. G. ESTABLISHMENT OF TREATMENT WORKS FOR NUTRIENT REMOVAL.  
(KETELLE-WISCONSIN)

FIELD 05C

ACCESSION NO. W70-00266

THE ROLE OF MARINE SCIENCES IN THE MULTIPLE USES OF THE COASTAL ZONE OF LAKE ERIE AND LAKE SUPERIOR,

NATIONAL PLANNING ASSOCIATION, WASHINGTON, D.C. CENTER FOR TECHNO-ECONOMIC STUDIES.

MILLER B. SPANGLER.

AVAILABLE FROM CLEARINGHOUSE AS PB 185 163 FOR \$3 IN PAPER COPY, 65 CENTS IN MICROFICHE. REP OF TECHNO-ECON STUDIES CENTER, NAT PLANNING ASS, JUNE 1969. 391 P, 7 FIG, 10 TAB, 8 APPEND.

DESCRIPTORS:

\*MULTIPLE-PURPOSE PROJECTS, \*PLANNING, \*GREAT LAKES, \*WATER RESOURCES DEVELOPMENT, \*WATER POLLUTION CONTROL, LAKE ERIE, LAKE SUPERIOR, WATER POLLUTION TREATMENT, RECREATION, INDUSTRIAL WATER, MUNICIPAL WATER, NAVIGATION, GOVERNMENTS, LEGISLATION, WATER MANAGEMENT(APPLIED).

IDENTIFIERS:

MULTIPLE SHORELINE USES(GREAT LAKES).

ABSTRACT:

A STUDY WAS MADE TO IDENTIFY MEASURES IN MARINE SCIENCES WHICH CAN BE APPLIED TO THE PROMOTING OF OPTIMUM USE OF THE COASTAL ZONE OF THE GREAT LAKES. LAKE SUPERIOR AND LAKE ERIE WERE SELECTED FOR STUDY TO ILLUSTRATE THE CONTRAST OF PROBLEMS AND OPPORTUNITIES IN UTILIZING THE WATERS AND SHORELINE RESOURCES OF THE GREAT LAKES SYSTEM. LAKE SUPERIOR IS THE LARGEST AND DEEPEST OF THE GREAT LAKES AND WITH A FEW LOCAL EXCEPTIONS IS STILL BASICALLY OF PRISTINE CHARACTER. LAKE ERIE BY CONTRAST, IS THE SMALLEST AND SHALLOWEST LAKE IN THE SYSTEM, AND WITH ITS INTENSIVELY DEVELOPED SHORELINE AND HINTERLAND HAS SUFFERED PROBABLY THE MOST EXTREME DEGRADATION OF ENVIRONMENTAL QUALITY. THE ANALYSIS OF THESE CONDITIONS HAS LEAD TO THE CONCLUSION THAT THE PRIORITY EMPHASIS FOR ACTION SHOULD BE DIRECTED TOWARD PRESERVATION OF THE ESSENTIALLY UNDETERIORATED RESOURCES OF LAKE SUPERIOR, AND TO COMBATING THE FURTHER DETERIORATION AND RESTORATION OF THE QUALITY OF RESOURCES OF LAKE ERIE. A MAJOR CONCLUSION OF THIS STUDY IS THAT LAKE ERIE, FAR FROM BEING A 'DEAD LAKE,' IS CAPABLE OF A SIGNIFICANT DEGREE OF RESTORATION OF ENVIRONMENTAL QUALITY IF THE SOURCES OF POLLUTION ENTERING LAKE ERIE ARE BROUGHT UNDER EFFECTIVE CONTROL. BECAUSE OF THE RELATIVE SHALLOWNESS OF LAKE ERIE, THE PRESENT RATE OF OUTFLOW INTO LAKE ONTARIO DISCHARGES A TOTAL VOLUME OF WATER IN ONLY 2 1/2 YR EQUAL TO THE VOLUME OF WATER CONTAINED IN LAKE ERIE, WHICH SUGGESTS THAT IMPROVEMENTS IN WATER QUALITY COULD BE ACHIEVED IN A RELATIVELY FEW YEARS. RECOMMENDATIONS ARE MADE TO REINFORCE OR TO ENCOURAGE RECONSIDERATION OF ESSENTIAL ACTIONS LEADING TO POTENTIALLY NEW OR EXPANDED DEVELOPMENTS OF COASTAL ZONE RESOURCES, PARTICULARLY IN THOSE AREAS WHERE REGIONAL, NATIONAL, AND INTERNATIONAL BENEFITS MAY BE FORTHCOMING FROM A STRENGTHENED MARINE SCIENCES PROGRAM. (KNAPP-USGS)

FIELD 02L, 06B

ACCESSION NO. W70-00457

A RECONNAISSANCE OF STREAM SEDIMENT IN THE ERIE-NIAGARA BASIN, NEW YORK,  
GEOLOGICAL SURVEY, ALBANY, N.Y.

R. J. ARCHER, AND A. M. LA SALA, JR.

N Y STATE WATER RESOURCES COMM BASIN PLANNING REP ENB-5, 1968. 34 P, 7 FIG, 4  
TAB, 9 REF.

DESCRIPTORS:

\*SEDIMENT LOAD, \*NEW YORK, SUSPENDED LOAD, BED LOAD, SEDIMENT YIELD,  
STREAMFLOW, EROSION, DEPOSITION (SEDIMENTS), SEDIMENTATION, LAKE ERIE,  
SURVEYS, SAMPLING.

IDENTIFIERS:

\*ERIE-NIAGARA BASIN (NY).

ABSTRACT:

A RECONNAISSANCE STUDY OF EROSION AND DEPOSITION OF SEDIMENT IN THE  
ERIE-NIAGARA BASIN INDICATES THAT THE HIGHEST SEDIMENT YIELDS, ON THE  
ORDER OF 1,000 TONS/SQ MI/YR, OCCUR IN STREAMS THAT DRAIN UPLAND AREAS.  
IN CONTRAST, FOR EXAMPLE, FROM THE LOWLAND PART OF THE TONAWANDA CREEK  
BASIN, THE ANNUAL SEDIMENT YIELDS ARE ON THE ORDER OF 100 TONS/SQ  
MI/YR. THE ESTIMATED AVERAGE ANNUAL SEDIMENT YIELDS OF STREAMS IN THE  
BASIN RANGE FROM 50 TONS/SQ MI FOR LITTLE TONAWANDA CREEK AT LINDEN, TO  
1,500 TONS/SQ MI FOR CAZENOVIA CREEK AT EBENEZER. THESE ESTIMATES ARE  
BASED ON MEASURED INSTANTANEOUS SEDIMENT DISCHARGE AT SELECTED STREAM  
STATIONS, THE SEDIMENT LOADS OF WHICH RANGED FROM 1,100 TONS/YR FOR  
LITTLE TONAWANDA CREEK AT LINDEN TO 610,000 TONS/YR FOR CATTARAUGUS  
CREEK AT GOWANDA. PEAK SUSPENDED-SEDIMENT CONCENTRATIONS IN THE RANGE  
OF 2,600 TO 5,300 PPM WERE OBSERVED AT 3 STATIONS IN THE CATTARAUGUS  
CREEK BASIN, AS WELL AS AT BUFFALO CREEK AT GARDENVILLE, CAZENOVIA  
CREEK AT EBENEZER, AND CAYUGA CREEK NEAR LANCASTER. (KNAPP-USGS)

FIELD 02J.

ACCESSION NO. W70-00466

ECOLOGICAL FACTORS AND THE DISTRIBUTION OF CLADOPHORA GLOMERATA IN THE GREAT LAKES,

WISCONSIN UNIV., MILWAUKEE. DEPT. OF BOTANY.

RICHARD P. HERBST.

THE AMER MIDLAND NATUR, VOL 82, NO 1, P 90-98, JULY 1969. 9 P, 3 FIG, 1 TAB, 15 REF.

DESCRIPTORS:

\*ECOLOGY, \*EUTROPHICATION, \*GREAT LAKES, \*ALGAE, NUTRIENTS, PHOSPHORUS, POPULATION, POLLUTANTS, MAPPING, HYDROGEN SULFIDE, CITIES, LAKE HURON, LAKE ERIE, LAKE ONTARIO, LAKE MICHIGAN, WATER TEMPERATURE, PHOSPHATES, TURBIDITY.

IDENTIFIERS:

CLADOPHORA GLOMERATA.

ABSTRACT:

NUTRIENT ENRICHMENT IN THE GREAT LAKES HAS PROVIDED FERTILE AREAS FOR GROWTH OF ALGAL NUISANCES. ONE OF THESE SPECIES, CLADOPHORA GLOMERATA, HAS BECOME A MAJOR PROBLEM FOR MANY CITIES BORDERING THE GREAT LAKES. ECOLOGICAL FACTORS CONCERNING ITS GROWTH IN MILWAUKEE'S HARBOR WERE STUDIED, AND ITS DISTRIBUTION IN THE GREAT LAKES DETERMINED. PHOSPHORUS LEVELS APPEAR TO BE CLOSELY LINKED WITH CLADOPHORA INCREASES. (GABRIEL-USGS)

FIELD 05C, 02H

ACCESSION NO. W70-00667

COMPARATIVE ECOLOGY OF SANDSPIT PONDS,

OBERLIN COLL., OHIO. DEPT. OF BIOLOGY.

EDWARD J. KORMONDY.

THE AMER MIDLAND NATUR, VOL 82, NO 1, P 28-61, JULY 1969. 34 P, 9 FIG, 10  
TAB, 53 REF.

DESCRIPTORS:

\*LAKES, \*ECOLOGY, \*PONDS, \*SAND SPITS, LAGOONS, LAKE ERIE, ORGANIC  
MATTER, VEGETATION, PLANT POPULATION, ALKALINE WATER, CARBONATES, WATER  
CHEMISTRY, PHYTOPLANKTON, SEASONAL, CARBON RADIOISOTOPES, PRODUCTIVITY,  
INVERTEBRATES, OXYGEN, PHOTOSYNTHESIS, MAPPING.

IDENTIFIERS:

SAND SPIT POND ECOLOGY, PRESQUE ISLAND(PA).

ABSTRACT:

LIMNOLOGY, PRODUCTIVITY AND COMMUNITY METABOLISM OF A SERIES OF BEACH  
AND LAGOON PONDS, LOCATED ON A SANDSPIT IN LAKE ERIE, PENNSYLVANIA,  
WERE INVESTIGATED BY USING CHEMICAL, BIOLOGICAL AND GEOLOGICAL  
TECHNIQUES. ORGANIC MATTER WHICH HAS ACCUMULATED TO A MAXI-M-M OF 0.8 M  
IN ONE POND, RESULTS IN REDUCTION OF SIZE APPROXIMATELY 60% AND 95% IN  
50 AND 75 YR, RESPECTIVELY. SIGNIFICANT MACROVEGETATIONAL  
CHARACTERISTICS INCLUDE THE REPLACEMENT OF INITIAL COLONIZERS AND THE  
APPEARANCE OF FLOATING-LEAVED SPECIES IN 30 OR 40 YR. THE PONDS ARE ALL  
MODERATELY TO WELL BUFFERED ALKALINE SYSTEMS WITH MEDIUM TO HIGH LEVELS  
OF CARBONATES. PHYTOPLANKTON DENSITY IS GREATEST IN LATE JULY TO EARLY  
AUGUST WITH THE SPECIES DIVERSITY GREATEST IN MIDSUMMER. ANNUAL NET  
PRODUCTIVITY IS LOWER IN OLDER BEACH PONDS, AND STANDING CROP OF  
CHLOROPHYLL 'A' SHOWED CONSIDERABLE VARIATION ANNUALLY AND BY STAGE OF  
SUCCESSION. COLONIZATION BY INVERTEBRATES IS VIA SECONDARY INVASION  
SUBSEQUENT TO THE ESTABLISHMENT OF THE PONDS. COMMUNITY METABOLISM  
SHOWED A CHANGE IN THE RATIO OF PHOTOSYNTHESIS TO RESPIRATION FROM 1.0  
IN THE YOUNGEST POND TO 0.33 IN THE OLDEST POND. (GABRIEL-USGS)

FIELD 02L, 02H

ACCESSION NO. W70-00671

GROUNDWATER RESOURCES OF THE ERIE-NIAGARA BASIN, NEW YORK,

GEOLOGICAL SURVEY, ALBANY, N.Y.

A. M. LASALA, JR.

NY STATE WATER RESOURCES COMM BASIN PLANNING REP ENB-3, 1968. 114 P, 20 FIG,  
5 PLATE, 9 TAB, 29 REF.

DESCRIPTORS:

\*WATER RESOURCES, \*GROUNDWATER, \*SURVEYS, \*NEW YORK, LAKE ERIE,  
HYDROLOGIC DATA, DATA COLLECTIONS, WATER WELLS, AQUIFERS, WATER LEVELS,  
WATER QUALITY, WATER POLLUTION, GROUNDWATER MOVEMENT, INDUCED  
INFILTRATION, WATER SUPPLY, DURATION CURVES, HYDROGRAPHS.

IDENTIFIERS:

ERIE-NIAGARA BASIN(NY).

ABSTRACT:

THE ERIE-NIAGARA BASIN, NEW YORK, BORDERS LAKE ERIE AND THE NIAGARA RIVER AND INCLUDES THE PRINCIPAL PART OF THEIR DRAINAGE BASIN IN NEW YORK. THE PRINCIPAL WATER-BEARING FORMATIONS IN THE AREA ARE GLACIAL SAND AND GRAVEL DEPOSITS; THE CAMILLUS SHALE, WHICH CONTAINS INTERBEDDED GYPSUM; A LIMESTONE AQUIFER UNIT CONSISTING OF THE ONONDAGA LIMESTONE, AKRON DOLOMITE, AND BERTIE LIMESTONE; AND THE LOCKPORT DOLOMITE. A NUMBER OF THICK AND PERMEABLE SAND AND GRAVEL DEPOSITS LIE IN THE VALLEYS OF THE UPLAND REGION AND WILL YIELD SUPPLIES OF 500 TO 1,400 GPM TO INDIVIDUAL WELLS THAT ARE PROPERLY CONSTRUCTED. AVERAGE ANNUAL RECHARGE TO THE SAND AND GRAVEL DEPOSITS IN THE UPLAND REGION RANGES FROM ABOUT HALF A MILLION TO 4 MGD/SQ MI. AS THE LARGER DEPOSITS ARE EACH SEVERAL SQUARE MILES IN EXTENT, THE POTENTIAL FOR DEVELOPMENT IS LARGE. TO THIS POTENTIAL SHOULD BE ADDED INFILTRATION FROM STREAMS THAT COULD BE INDUCED BY PUMPING LARGE QUANTITIES OF GROUNDWATER. THE QUALITY OF GROUNDWATER IN THE APPALACHIAN UPLANDS IS MARKED BY A HIGH HARDNESS BUT GENERALLY NOT BY OTHER UNFAVORABLE CHARACTERISTICS. SHALLOW GROUNDWATER IN CARBONATE ROCKS AND SAND AND GRAVEL DEPOSITS LOCALLY HAS BEEN POLLUTED BY SEPTIC TANK EFFLUENT. (KNAPP-USGS)

FIELD 02F

ACCESSION NO. W70-00687

RECORD LOW DISSOLVED OXYGEN IN THE ISLAND AREA OF LAKE ERIE,

OHIO STATE UNIV., COLUMBUS. COLL. OF BIOLOGICAL SCIENCES; AND OHIO STATE  
UNIV., DEPT. OF ZOOLOGY AND ENTOMOLOGY.

N. WILSON BRITT, EDWIN J. SKOCH, AND KENNETH R. SMITH.

THE OHIO J SCI, VOL 68, NO 3, P 175-179, MAY 1968. 5 P, 1 FIG, 12 REF.

DESCRIPTORS:

\*LAKE ERIE, \*LAKES, \*DISSOLVED OXYGEN, SAMPLING, SEASONAL, WINTER,  
SUMMER, AIR TEMPERATURE, STATISTICAL METHODS, WIND VELOCITY, DISSOLVED  
SOLIDS, PLANT GROWTH, NUTRIENTS, NITROGEN, PHOSPHORUS, PHYSICOCHEMICAL  
PROPERTIES, WEATHER PATTERNS, CLIMATES.

IDENTIFIERS:

\*OXYGEN DEPLETION(LAKE ERIE), LAKE-WATER DISSOLVED OXYGEN.

ABSTRACT:

THE DISSOLVED OXYGEN CONTENT OF LAKE ERIE WAS INVESTIGATED BY  
COLLECTING DAILY SAMPLES FROM JUNE 22 TO AUGUST 31, 1966 AT A SINGLE  
STATION SOUTH OF RATTLESNAKE ISLAND. DISSOLVED OXYGEN NEAR THE BOTTOM  
FLUCTUATES CONSIDERABLY FROM 0.1 PPM RECORDED ON JULY 1 TO 9.2 PPM ON  
JULY 19. TWO MORE LOW PERIODS WERE RECORDED ON AUGUST 7 (3.7 PPM) AND  
AUGUST 30 (3.0 PPM). IN EACH OF THESE 2 CASES, THE LOW-OXYGEN CONDITION  
WAS ASSOCIATED WITH AN AVERAGE WIND SPEED OF ABOUT 6 KNOTS AND AIR  
TEMPERATURE OF ABOUT 26 DEG C. STATISTICAL ANALYSIS INDICATES A  
SIGNIFICANT RELATIONSHIP BETWEEN WIND SPEED AND DISSOLVED OXYGEN.  
(GABRIEL-USGS)

FIELD 05C, 02H

ACCESSION NO. W70-01425



PHYSICAL PROPERTIES OF MARINE SEDIMENTS AS RELATED TO SEISMIC VELOCITIES,  
TEXAS INSTRUMENTS, INC., DALLAS.

NABIL MORGAN.

GEOPHYSICS, VOL 34, NO 4, P 529-545, AUG 1969. 17 P, 13 FIG, 3 TAB, 18 REF.

DESCRIPTORS:

\*SEISMIC STUDIES, \*SEDIMENTS, \*LAKE ERIE, \*SEISMIC PROPERTIES, DENSITY,  
POROSITY, PARTICLE SIZE, STRATIGRAPHY, DATA COLLECTIONS, STATISTICAL  
METHODS, SEISMOLOGY.

IDENTIFIERS:

SEISMIC VELOCITY (SEDIMENTS).

ABSTRACT:

AN INVESTIGATION OF THE DEPENDENCE OF SEISMIC VELOCITIES ON DIFFERENT  
PHYSICAL PROPERTIES OF NATURALLY OCCURRING FRESH-WATER SEDIMENTS IN  
LAKE ERIE HAS BEEN CONDUCTED. CORES FROM ONE LAKE BOTTOM WERE COLLECTED  
AND THE LONGITUDINAL SEISMIC WAVE VELOCITIES AS WELL AS THE PHYSICAL  
PROPERTIES (GRAIN DENSITY, BULK DENSITY, POROSITY, MEDIAN DIAMETER, AND  
PHI DEVIATION) WERE MEASURED. THE DATA WERE FITTED WITH A SECOND-ORDER  
POLYNOMIAL IN ALL THE PHYSICAL PROPERTIES TO THE SEISMIC VELOCITY.  
INDEPENDENT VARIABLES WERE RANKED ACCORDING TO THEIR INDIVIDUAL EFFECT  
UPON THE SUM OF THE SQUARES OF THE REGRESSION RESIDUALS. A  
VARIANCE-ANALYSIS TABLE WAS SET UP, AND THE COEFFICIENTS WERE TESTED BY  
A SERIES OF F RATIOS AT CERTAIN PROBABILITIES. AS POROSITY AND BULK  
DENSITY ARE LINEARLY RELATED, THESE WERE NOT INCLUDED TOGETHER IN THE  
SAME MODEL. THERE ARE STRONG INDICATIONS THAT THE POROSITY AND ITS  
SQUARE TOGETHER WITH THE MEDIAN DIAMETER PLAY A SIGNIFICANT ROLE IN  
DETERMINING THE SEISMIC VELOCITY AT THE PROBABILITY OF 0.90. AT THE  
HIGHER PROBABILITY OF 0.99, THE MEDIAN DIAMETER PROVED INSIGNIFICANT.  
THE CUBIC TERM OF POROSITY IS INSIGNIFICANT AT THE 0.50 LEVEL.  
(KNAPP-USGS)

FIELD 02L, 07B

ACCESSION NO. W70-01433

**MICROPARTICULATES: ISOLATION FROM WATER AND IDENTIFICATION OF ASSOCIATED  
CHLORINATED PESTICIDES,**

OHIO STATE UNIV., COLUMBUS. DEPT. OF MICROBIAL AND CELLULAR BIOLOGY.

R. M. PFISTER, P. R. DUGAN, AND JAMES I. FREA.

SCIENCE, VOL 166, NO 3907, P 878-879, NOV 1969. 2 P, 1 TAB, 7 REF. OWRR  
GRANTS A-006-OHIO AND A-013-OHIO.

**DESCRIPTORS:**

\*PESTICIDE KINETICS, \*LAKES, \*ADSORPTION, \*SUSPENDED LOAD, GAS  
CHROMATOGRAPHY, PATH OF POLLUTANTS, PESTICIDE RESIDUES, LABORATORY  
TESTS, SAMPLING, ANALYTICAL TECHNIQUES, CHLORINATED HYDROCARBON  
PESTICIDES.

**IDENTIFIERS:**

MICROPARTICULATES, GAS-LIQUID CHROMATOGRAPHY, THIN-LAYER CHROMATOGRAPHY.

**ABSTRACT:**

MICROPARTICULATES SUSPENDED IN LAKE WATER WERE COLLECTED BY CONTINUOUS  
CENTRIFUGATION AND EITHER EXAMINED DIRECTLY OR PLACED ON A LINEAR  
SUCROSE GRADIENT. TOTAL RESIDUE AS WELL AS FRACTIONS OF THE CENTRIFUGED  
GRADIENT WERE EXTRACTED WITH HEXANE AND EXAMINED BY GAS CHROMATOGRAPHY  
FOR THE PRESENCE OF CHLORINATED HYDROCARBON PESTICIDES. HEXANE EXTRACTS  
OF TOTAL RESIDUES WERE ALSO EXAMINED BY THIN-LAYER CHROMATOGRAPHY.  
LINDANE AND ENDRIN WERE SHOWN, BY GAS-LIQUID CHROMATOGRAPHY AND  
THIN-LAYER CHROMATOGRAPHY, TO BE ASSOCIATED WITH MICROPARTICLES. THESE  
AND OTHER PESTICIDES APPEARED TO BE SELECTIVELY ASSOCIATED WITH  
MICROPARTICLES OF DIFFERENT DENSITIES, WHEN GAS-LIQUID CHROMATOGRAPHY  
WAS USED, ALTHOUGH CONCENTRATIONS WERE BELOW THE DETECTION LIMITS  
REQUIRED FOR CONFIRMATION BY THIN-LAYER CHROMATOGRAPHY. SAMPLES TAKEN  
AT DIFFERENT TIMES FROM DIFFERENT LOCATIONS IN LAKE ERIE REVEALED  
DIFFERENT ASSOCIATIONS WITH HEXANE-SOLUBLE ELECTRON-CAPTURING  
COMPOUNDS. (KNAPP-USGS)

FIELD 05A, 02H

ACCESSION NO. W70-01669

PROCEEDINGS OF THE CONFERENCE ON CHANGES IN THE BIOTA OF LAKES ERIE AND ONTARIO.

BUFFALO SOCIETY OF NATURAL SCIENCES, N.Y.; AND STATE UNIV. OF NEW YORK,  
BUFFALO. RESEARCH FOUNDATION.

BULLETIN OF THE BUFFALO SOCIETY OF NATURAL SCIENCES, VOL 25, NO 1, 1969. 84  
P, 19 FIG, 2 TAB, 141 REF. SWEENEY, ROBERT A (EDITOR).

DESCRIPTORS:

\*CONFERENCES, \*BIOTA, \*LAKE ERIE, \*LAKE ONTARIO, ANALYTICAL TECHNIQUES,  
NEW YORK, ECOLOGY, GREAT LAKES, PLANNING, EUTROPHICATION, PLANKTON,  
WATER POLLUTION EFFECTS, COMMERCIAL FISH, FISH, LAKES, PLANTS, BENTHOS.

IDENTIFIERS:

BUFFALO SOCIETY OF NATURAL SCIENCES, STATE UNIVERSITY COLLEGE AT  
BUFFALO, BUFFALO(NY), LOWER GREAT LAKES, GAME FISH, ECOLOGICAL  
TECHNIQUES.

ABSTRACT:

GROWING PUBLIC CONCERN EXISTS REGARDING CHANGES EFFECTED BY POLLUTION  
AND CULTURAL EUTROPHICATION ON THE BIOTA OF LAKES ERIE AND ONTARIO,  
PARTICULARLY REGARDING THE DECLINE OF COMMERCIAL AND GAME FISHES, THE  
MARKED INCREASE OF LESS DESIRABLE SPECIES, AND THE ALTERATION IN  
QUALITY AND QUANTITY OF THE FLORA. THIS PUBLICATION REPORTS THE  
PROCEEDINGS OF A CONFERENCE, HELD ON APRIL 16-17, 1968, OF A SMALL  
GROUP OF INVESTIGATORS INTERESTED IN CURRENT OR PLANNED STUDIES OF  
THESE LAKES. THE CONFERENCE WAS ORGANIZED BY THE BIOLOGY DEPARTMENT,  
STATE UNIVERSITY COLLEGE AT BUFFALO AND THE BUFFALO SOCIETY OF NATURAL  
SCIENCES AND SUPPORTED BY THE RESEARCH FOUNDATION OF THE STATE  
UNIVERSITY OF NEW YORK. INDIVIDUAL CONTRIBUTIONS, WITH NAMES OF AUTHOR  
INDICATED IN PARENTHESES, ARE: CHANGES IN THE BIOLOGY OF THE LOWER  
GREAT LAKES (CHARLES A DAMBACH); PLANTS IN LAKES ERIE AND ONTARIO, AND  
CHANGES OF THEIR NUMBERS AND KINDS (CHARLES C DAVIS); AND CHANGES IN  
THE BENTHOS OF LAKES ERIE AND ONTARIO (RALPH O BRINKHURST). REPORT  
INCLUDES AN INTRODUCTION, TRANSCRIPTION OF DISCUSSIONS FOLLOWING  
INDIVIDUAL PAPERS, AND A TRANSCRIPTION OF A DISCUSSION BY ALL  
PARTICIPANTS OF PROBLEMS AND TECHNIQUES. (SEE ALSO W70-01943 THRU  
W70-01945). (EICHHORN-WISCONSIN)

FIELD 05C, 02H

ACCESSION NO. W70-01942

CHANGES IN THE BIOLOGY OF THE LOWER GREAT LAKES,

OHIO STATE UNIV., COLUMBUS. NATURAL RESOURCES INST.

CHARLES A. DAMBACH.

BULLETIN OF THE BUFFALO SOCIETY OF NATURAL SCIENCES, VOL 25, NO 1, P 1-17,  
1969. 19 REF.

DESCRIPTORS:

\*BIOLOGY, \*GREAT LAKES, \*LAKE ERIE, \*LAKE MICHIGAN, \*LAKE ONTARIO, LAKE HURON, AESTHETICS, ECOLOGY, ECONOMICS, OHIO, COMMERCIAL FISHING, PUBLIC HEALTH, WALLEYE, VEGETATION, WILD RICE, SILTS, PLANKTON, MAYFLIES, FAUNA, FISH, OLIGOCHAETES, MIDGES, SNAILS, PHOSPHORUS, NUTRIENTS, ALGAE, DIATOMS, CHLOROPHYTA, DISSOLVED OXYGEN, PIKE, CARP, DRUM(FRESHWATER), CISCO, LAKE TROUT, EUTROPHICATION, STRIPED BASS, CYANOPHYTA, WATER POLLUTION EFFECTS, ELECTRIC POWERPLANTS.

IDENTIFIERS:

HEXAGENIA, CHIRONOMIDAE, PROCLADIUS, CHIRONOMUS PROMOSUS, TRICHOPTERA, LEECHES, FINGERNAIL CLAMS, WHITE FISH, ALEWIFE, GIZZARD SHAD, SEA LAMPHREY, COHO SALMON.

ABSTRACT:

DRAMATIC BIOLOGICAL CHANGES HAVE APPEARED IN BOTTOM FAUNA AND AMONG CERTAIN FISHES OF THE LOWER GREAT LAKES. OF SPECIAL SIGNIFICANCE IS ABUNDANT INCREASE, SINCE 1959, OF THE MIDGE PROCLADIUS, A SUPPOSEDLY MORE POLLUTION-TOLERANT FORM, WHILE CHIRONOMUS PROMOSUS HAS DECREASED, SUGGESTING THAT POLLUTION ZONES HAVE EXTENDED FURTHER INTO THE LAKES. THE MAYFLY IS NOW RARE. BENTHIC FAUNA IS NOW DOMINATED BY OLIGOCHAETES AND MIDGES, WITH SOME FINGERNAIL CLAMS, SNAILS, AND LEECHES ON THE INCREASE. CHEMICAL CONDITIONS PROBABLY PROVIDE A MORE RELIABLE INDEX TO CHANGES THAN PLANKTON DATA, BUT ARE DIFFICULT TO RELATE. SPECIES COMPOSITION, ONCE DOMINATED BY DIATOMS, ARE NOW DOMINATED BY BLUE-GREEN ALGAE. DECLINE OF CERTAIN HIGH QUALITY FISHES, NOTABLY THE BLUE PIKE AND WALLEYE PIKE, IS LARGELY RESPONSIBLE FOR THE ACCELERATED PUBLIC INTEREST IN CORRECTIVE MEASURES. RELATIVE SIGNIFICANCE OF ENVIRONMENT VERSUS OVERFISHING IS DEBATABLE. INCREASE IN EUTROPHICATION RATE OF THE GREAT LAKES, ESPECIALLY LAKE ERIE, IS SIGNIFICANT. HUMAN TECHNOLOGY CAN SO MODIFY THE ENVIRONMENT THAT BIOLOGICAL POPULATIONS ARE SIGNIFICANTLY AFFECTED. BIOLOGISTS WITH REQUISITE KNOWLEDGE, SHOULD DEVELOP BETTER GUIDELINES FOR WEIGHING COSTS OF EACH INCREMENT OF DEGRADATION AND EACH INCREMENT OF IMPROVEMENT. (SEE W70-01942). (JONES-WISCONSIN)

FIELD 05C, 02H

ACCESSION NO. W70-01943

PLANTS IN LAKES ERIE AND ONTARIO, AND CHANGES OF THEIR NUMBERS AND KINDS,

MEMORIAL UNIV. OF NEWFOUNDLAND, ST. JOHNS. DEPT. OF BIOLOGY.

CHARLES C. DAVIS.

BULLETIN OF THE BUFFALO SOCIETY OF NATURAL SCIENCES, VOL 25, NO 1, P 18-44,  
1969. 8 FIG, 2 TAB, 100 REF.

DESCRIPTORS:

\*LAKE ERIE, \*LAKE ONTARIO, \*PLANTS, PHYTOPLANKTON, BENTHIC FAUNA, BENTHIC FLORA, DIATOMS, NANNOPLANKTON, ECOLOGY, CLIMATES, WEATHER MODIFICATION, DEPTH, EUTROPHICATION, GLACIATION, WATER LEVELS, STORMS, SEICHES, SOLAR RADIATION, RAINFALL, RUNOFF, WINDS, CARP, MUSKRATS, TURBIDITY, CYANOPHYTA, CHLOROPHYTA, ECOSYSTEMS, MOLDS, MANAGEMENT, PERIPHYTON, YEASTS, FISH, WATER POLLUTION EFFECTS.

IDENTIFIERS:

UPWARPING, CLADOPHORA FRACTA, ASTERIONELLA, SYNEDRA, MELOSIRA, CYCLOTELLA, FRAGILARIA, STEPHANODISCUS, PEDIASTRUM, ANABAENA, OSCILLATORIA, SEASONAL PULSES, TECTONIC CHANGES, PHYCOMYCETES, PHYTOGEOGRAPHY.

ABSTRACT:

THE LITERATURE REGARDING VEGETATIONAL CHANGES IN LAKES ERIE AND ONTARIO IS REVIEWED. MOST STUDIES DEALING WITH PERIPHYTON HAVE BEEN TAXONOMIC; STUDIES OF MACROPHYTOBENTHOS, MORE EXTENSIVE, THOUGH USUALLY LACKING IN CONTINUITY, MAKE EFFECTIVE COMPARISONS WITH PAST CONDITIONS DIFFICULT. WITH GLACIAL RECESSION AND LAND REBOUNDOING, CHANGES IN WATER DEPTH ARE PROBABLY TOO GRADUAL TO CAUSE THE OBSERVED GROSS VEGETATIONAL CHANGES; LONG-RANGE CLIMATIC CHANGES ARE ALSO LIKELY TO HAVE BEEN TOO SLOW FOR GREAT EFFECTS IN THE PERIOD OBSERVED. OCCURRENCE OF HEAVY STORMS, SEICHES, FLUCTUATIONS OF SUNSHINE AND PRECIPITATION, AND OTHER SHORT-RANGE WEATHER VARIABLES AFFECT AQUATIC VEGETATION. DIRECT OR INDIRECT EFFECTS UPON BENTHIC PLANTS THROUGH HUMAN ACTIVITIES (INTRODUCING FOREIGN FISH SPECIES AND OTHER ORGANISMS) HAVE BEEN OBSERVED. SUMMARIES OF PHYTOPLANKTON STUDIES INDICATE THAT VERY FEW OFFER DETAILED, RELIABLE CONCLUSIONS CONCERNING PLANT COMMUNITY CHANGES OVER THE YEARS. LONG-RANGE CHANGES IN DOMINANT PHYTOPLANKTERS WERE DEMONSTRATED. THERE IS EVIDENCE OF RAPID ARTIFICIAL EUTROPHICATION OF LAKE ERIE. IN BOTH LAKES, FURTHER QUANTITATIVE SEASONAL STUDIES OF PHYTOPLANKTON ARE NEEDED. PHYTOGEOGRAPHIC PROBLEMS ARE IMPORTANT. MORE IS LEARNED REGARDING WATER MASSES BY EXAMINING PLANKTONIC BIOTA THAN BY SENSITIVE CHEMICAL AND PHYSICAL MEASUREMENTS. ECOSYSTEMS MUST BE CLEARLY UNDERSTOOD IF THEY ARE TO BE INTELLIGENTLY MANAGED FOR LONG-RANGE BENEFITS OF MANKIND. (SEE W70-01942). (JONES-WISCONSIN)

FIELD 05C, 02H, 02I

ACCESSION NO. W70-01944

CHANGES IN THE BENTHOS OF LAKES ERIE AND ONTARIO,

TORONTO UNIV. (ONTARIO). DEPT. OF ZOOLOGY.

RALPH O. BRINKHURST.

BULLETIN OF THE BUFFALO SOCIETY OF NATURAL SCIENCES, VOL 25, NO 1, P 45-71,  
1969. 11 FIG, 21 REF.

DESCRIPTORS:

\*LAKE ERIE, \*LAKE ONTARIO, \*BENTHOS, OXYGEN, EUTROPHICATION,  
OLIGOTROPHY, FISH, TEMPERATURE, POLLUTION ABATEMENT, MAYFLIES,  
OLIGOCHAETES, TUBIFICIDS, CURRENTS(WATER), DEPTH, SODIUM, SAMPLING,  
GREAT LAKES REGION, WATER POLLUTION EFFECTS, BIOINDICATORS.

IDENTIFIERS:

\*BIOTIC CHANGES, PONTOPOREIA, HYALELLA, SPHAERIID MOLLUSKS,  
CHIRONOMIDS, LUMBRICULIDAE, PISIDIUM FORMS.

ABSTRACT:

SPECIES COMPOSITION OF CHIRONOMID AND OLIGOCHAETE FAUNA IN DEEPEST PARTS OF LAKES ERIE AND ONTARIO AND GEORGIAN BAY IS FAIRLY CONSISTENT WITH BEETON'S TROPHIC CLASSIFICATION OF THESE THREE LAKES. THE BOTTOM FAUNA OF LAKE ERIE SUGGESTS A WEST TO EAST GRADIENT FROM EXTREMELY EUTROPHIC TO MODERATELY OLIGOTROPHIC CONDITIONS. A SIMILAR SOUTH TO NORTH GRADIENT IS, AT LEAST PARTLY, A REFLECTION OF TEMPERATURE. LAKE ONTARIO FAUNA SUGGESTS OLIGOTROPHY WITH POSSIBLY AN EUTROPHIC SHORE ZONE. OXYGEN DETERMINATIONS OF 10 YEARS AGO WOULD BE VALUABLE. IN GROSSLY POLLUTED SITUATIONS, NUMBERS OF OLIGOCHAETES STAY HIGH; REPRESENTATIVES OF OTHER GROUPS MAY BE SCARCE. COMMONEST OLIGOCHAETE UNDER SUCH CONDITIONS IS LIMNODRILUS HOFFMEISTERI. PROPORTION OF OLIGOCHAETES TO OTHER FORMS OF LIFE, AND THE PERCENTAGE OF LIMNODRILUS HOFFMEISTERI IN RELATION TO ALL OLIGOCHAETES MAY BE GUIDES TO DEGREE OF ORGANIC POLLUTION. DIFFICULTIES IN DISCUSSING THE CHIRONOMID FAUNA INCLUDE PROBLEMS OF NOMENCLATURE AND SYSTEMATICS. THE BOTTOM FAUNA, POTENTIALLY A GOOD INDICATOR OF QUALITATIVE CHANGE, HAS BEEN STUDIED ONLY SUPERFICIALLY IN THE PAST. SINCE HARD PARTS OF CHIRONOMID LARVAE PRESERVE WELL IN LAKE SEDIMENTS, CORE ANALYSES MIGHT PROVIDE INFORMATION ON WHETHER THE DISTRIBUTIONS REPRESENT RECENT DEVELOPMENTS. (SEE W70-01942). (JONES-WISCONSIN)

FIELD 05C, 02H

ACCESSION NO. W70-01945

A PHYTOPLANKTON BLOOM IN WESTERN LAKE ERIE,

PUBLIC HEALTH SERVICE, CLEVELAND, OHIO.

VICTOR L. CASPER.

MICHIGAN UNIV, ANN ARBOR, GREAT LAKES RESEARCH DIVISION, PUBLICATION NO 13, P 29-35, 1965. 2 FIG, 3 TAB, 11 REF.

DESCRIPTORS:

\*PHYTOPLANKTON, \*EUTROPHICATION, \*LAKE ERIE, CYANOPHYTA, SAMPLING, DISSOLVED OXYGEN, NITROGEN, NITRATES, LAKES, DIATOMS, CHLOROPHYTA, SEASONAL, CHEMICAL STRATIFICATION, PHOSPHORUS, CLIMATIC DATA, HYDROGEN ION CONCENTRATION, ALKALINITY, CONDUCTIVITY, CHEMICAL OXYGEN DEMAND, PHYSICAL PROPERTIES, TEMPERATURE, SURFACE WATERS, PHOTOSYNTHESIS, RESPIRATION, LIGHT PENETRATION, PRODUCTIVITY, BIOCHEMICAL OXYGEN DEMAND, ORGANIC MATTER, NITROGEN FIXATION, WATER POLLUTION EFFECTS.

IDENTIFIERS:

ANACYSTIS CYANEA, OSCILLATORIA, CARTERIA, APHANIZOMENON HOLSATICUM, ANABAENA CIRCINALIS, DETROIT RIVER, MAUMEE RIVER, CLADOPHORA, STEPHANODISCUS, BOTTOM, GLENODINIUM, CYCLOTELLA, CHLAMYDOMONAS, DEPTH EFFECTS.

ABSTRACT:

LAKE ERIE EXHIBITS SYMPTOMS OF ORGANIC ENRICHMENT; TEMPORAL SHIFTS IN DOMINANT ALGAL GENERA, FROM DIATOMS TO GREENS AND BLUE-GREENS (CYANOPHYTES) ARE OCCURRING. ON 9 AND 10 SEPTEMBER 1964, BIOLOGISTS AT GREAT LAKES-ILLINOIS RIVER BASINS PROJECT'S LAKE ERIE PROGRAM OFFICE INVESTIGATED A BLOOM OF CYANOPHYTES IN WESTERN LAKE ERIE. THE BLOOM, CONSISTING PRIMARILY OF ANACYSTIS CYANEA, OSCILLATORIA SP, CARTERIA SP, APHANIZOMENON HOLSATICUM, AND ANABAENA CIRCINALIS, COVERED APPROXIMATELY 800 SQUARE MILES. PLANKTON AND CHEMICAL SAMPLES WERE COLLECTED FROM TOP, MIDDLE AND BOTTOM DEPTHS, AND COLOR PHOTOGRAPHED. EXTREME VERTICAL VARIATIONS IN BIOLOGICAL AND CHEMICAL PARAMETERS OFTEN OCCUR. DURING THE BLOOM, TOTAL NITROGEN (N) WAS HIGH, AND NITRATE-N VERY LOW. INORGANIC N HAS PROBABLY BECOME LIMITING FOR PHYTOPLANKTON PRODUCTION; HIGH CONCENTRATIONS OF SOLUBLE PHOSPHORUS SUGGEST THAT IT WAS NOT LIMITING. DURING THE DAY DISSOLVED OXYGEN WAS AT SATURATION OR ABOVE. PLANKTON COUNTS WERE QUITE VARIABLE. IN EARLY MORNING, ALGAE WERE WELL DISPERSED TOP TO BOTTOM DUE TO LIGHT WIND, BUT BY AFTERNOON THEY WERE CONCENTRATED IN UPPER TWO FEET, FORMING A DENSE SCUM. ON 11 SEPTEMBER, HIGH WINDS, TOGETHER WITH A COLD FRONT AND RAIN, WERE FOLLOWED BY SEVERAL CLOUDY DAYS, AND THE BLOOM WAS NOT OBSERVED AGAIN. (JONES-WIS)

FIELD 02H, 05C

ACCESSION NO. W70-02254

SEASONAL DISTRIBUTION, CONSTITUTION, AND ABUNDANCE OF ZOOPLANKTON IN LAKE ERIE,  
MEMORIAL UNIV. OF NEWFOUNDLAND, ST. JOHNS. MARINE SCIENCES RESEARCH LAB.; AND  
MEMORIAL UNIV. OF NEWFOUNDLAND, ST. JOHNS. DEPT. OF BIOLOGY.

CHARLES C. DAVIS.

JOURNAL FISHERIES RESEARCH BOARD OF CANADA, VOL 26, NO 9, P 2459-2476, 1969.  
5 TAB, 14 REF.

DESCRIPTORS:

\*DISTRIBUTION PATTERNS, \*LAKE ERIE, \*ZOOPLANKTON, DAPHNIA, CYCLOPS,  
ROTIFERS, PROTOZOA.

IDENTIFIERS:

ASPLANCHNA, BOSMINA, CERIODAPHNIA, CHYDORUS, CLADOCERA, CYCLOPS,  
DIAPTOMUS, HOLOPEDIUM, KERATELLA, MESOCYCLOPS, POLYARTHRA,  
TROPOCYCLOPS, LAKE ERIE BASINS.

ABSTRACT:

DISTRIBUTION, CONSTITUTION, AND ABUNDANCE OF ZOOPLANKTON IN LAKE ERIE  
ARE GIVEN ON THE BASIS OF VERTICAL ZOOPLANKTON HAULS FROM 28 STATIONS.  
AMONG PROTOZOA, VORTICELLA, EPISTYLIS, AND CODONELLA WERE DOMINANT IN  
WEST BASIN IN OCTOBER 1967; CODONELLA BEING ALSO ABUNDANT IN CENTRAL  
AND EAST BASINS WITH EPISTYLIS OCCURRING MINIMALLY. IN JANUARY 1968,  
VORTICELLA WAS ABUNDANT IN WEST AND CENTRAL BASINS, CODONELLA OCCURRING  
IN SMALLER NUMBERS. AMONG LARGER ZOOPLANKTON AT LEAST 15 SPECIES (9  
GENERA) OF ROTIFERS, 9 SPECIES (7 GENERA) OF CLADOCERANS AND 13 SPECIES  
(7 GENERA) OF COPEPODS WERE ENCOUNTERED. DISTINCT DIFFERENCES IN  
ZOOPLANKTON POPULATIONS OCCUR IN THE THREE BASINS OF THE LAKE. OCTOBER  
BIOMASS OF CLADOCERANS AND COPEPODS WAS GREATLY REDUCED AS COMPARED  
WITH JULY. AMONG CLADOCERANS BOSMINA COREGONI OCCURRED MAINLY IN EAST  
AND CENTRAL BASINS; B LONGIROSTRIS WAS MORE ABUNDANT IN WESTERN BASIN.  
COPEPOD POPULATIONS OF WESTERN BASIN WERE GREATLY IMPOVERISHED AS  
COMPARED WITH OTHER BASINS. RATIOS OF SESTON, CHLOROPHYLL A AND  
PHYTOPLANKTON AMONG THREE BASINS EXHIBITED A PROGRESSIVE DECREASE FROM  
WEST TO EAST. A POSSIBLE INSTANCE OF WINTERKILL OF MICROCRUSTACEA WAS  
NOTED IN JANUARY 1968. (VOIGTLANDER-WISCONSIN)

FIELD 05C

ACCESSION NO. W70-02971



WATER QUALITY STUDIES ON THE GREAT LAKES BASED ON CARBON FOURTEEN MEASUREMENTS  
ON PRIMARY PRODUCTIVITY,

MINNESOTA UNIV., MINNEAPOLIS.

WILLIAM G. PARKOS, THEODORE A. OLSON, AND THERON O. ODLAUG.

WATER RESOURCES RESEARCH CENTER, MINNESOTA UNIV GRADUATE SCHOOL, MINNEAPOLIS,  
WRRR BULLETIN 17, 1969. 121 P, 23 FIG, 25 TAB, 70 REF, 10 PLATES, APPENDIX  
A, B, C, D, E, F. OWRR PROJECT A 011-MINN.

DESCRIPTORS:

\*PRIMARY PRODUCTIVITY, SURFACE WATERS, PRODUCTIVITY, PHYTOPLANKTON,  
GREAT LAKES, LAKE SUPERIOR, LAKE MICHIGAN, LAKE HURON, LAKE ERIE, WATER  
QUALITY.

IDENTIFIERS:

CARBON-14 MEASUREMENT, SHIPBOARD INCUBATION.

ABSTRACT:

CARBON-14 MEASUREMENTS OF SURFACE WATER PRIMARY PRODUCTION OF LAKES  
SUPERIOR, MICHIGAN, HURON, AND ERIE ARE REPORTED. ESTIMATES ARE BASED  
ON SHIPBOARD INCUBATION OF SAMPLES COLLECTED AT IRREGULAR INTERVALS  
DURING THE 1967 AND 1968 SHIPPING SEASONS. LAKE SUPERIOR PROVED TO BE  
THE LEAST PRODUCTIVE OF THE LAKES STUDIED, MEAN SURFACE PRODUCTIVITY OF  
16.72 MILLIGRAMS OF CARBON/CUBIC METER PER DAY. THE OTHER LAKES SHOWED  
INCREASING LEVELS OF PRODUCTIVITY: LAKE HURON, 23.04 MILLIGRAMS OF  
CARBON/CUBIC METER PER DAY, LAKE MICHIGAN, 37.62 MILLIGRAMS OF  
CARBON/CUBIC METER PER DAY, AND LAKE ERIE, 175.20 MILLIGRAMS OF  
CARBON/CUBIC METER PER DAY. HIGHEST PRODUCTIVITY LEVELS IN EACH LAKE  
TENDED TO OCCUR NEAR LARGE POPULATION CENTERS. (KOONCE-WISCONSIN)

FIELD 02H

ACCESSION NO. W70-02983

A STUDY OF THE OPEN WATER DISTRIBUTION AND ABUNDANCE OF NET PLANKTON AS AN INDEX OF EUTROPHICATION IN LAKE SUPERIOR,

MINNESOTA UNIV., MINNEAPOLIS. SCHOOL OF PUBLIC HEALTH.

T. A. OLSON.

TECHNICAL COMPLETION REPORT, JUNE 1969. 2 P. OWRR PROJECT NO A-011-MINN.

DESCRIPTORS:

\*LAKES, \*GREAT LAKES, \*LAKE SUPERIOR, \*EUTROPHICATION, \*ZOOPLANKTON, \*PRIMARY PRODUCTIVITY, LAKE HURON, LAKE MICHIGAN, LAKE ERIE, WATER POLLUTION EFFECTS, BIOINDICATORS, CARBON RADIOISOTOPES, PHYTOPLANKTON, WATER POLLUTION SOURCES, ENVIRONMENTAL EFFECTS, SECONDARY PRODUCTIVITY, WATER QUALITY, OLIGOTROPHY, ANALYTICAL TECHNIQUES.

IDENTIFIERS:

\*NET PLANKTON, HARDY CONTINUOUS PLANKTON RECORDER, RADIOCARBON UPTAKE TECHNIQUE, PLANKTON ABUNDANCE, PLANKTON DISTRIBUTION, SEASONAL VARIATIONS, DAILY VARIATIONS, WATER MASSES, WATER POLLUTION ASSESSMENT.

ABSTRACT:

BASED UPON CRITERIA OF NET PLANKTON ABUNDANCE, DETERMINED WITH THE HARDY CONTINUOUS PLANKTON RECORDER (CPR), AND PRIMARY PLANKTON PRODUCTIVITY (PPP), DETERMINED FROM MEASUREMENTS OF CARBON-14 UPTAKE, THE STATUS OF FOUR GREAT LAKES SAMPLED, IN INCREASING ORDER OF EUTROPHICATION, IS: SUPERIOR, HURON, MICHIGAN, ERIE. LAKE ERIE IS MORE THAN FOURFOLD PRODUCTIVE THAN ANY OTHER LAKE SAMPLED. EUTROPHICATION INCREASES PROGRESSIVELY FROM NORTH TO SOUTH. MEAN SEASONAL PRODUCTIVITY GENERALLY INCREASED WITH ASCENDING TEMPERATURE OF SURFACE WATERS. SHARPLY DELINEATED REGIONS OF HIGH ZOOPLANKTONIC DENSITY WAS OBSERVED, AS EXPECTED. SPECIES COMPOSITION AND ABUNDANCE OF ZOOPLANKTON DIFFER AMONG WATER MASSES WITHIN LAKES, SHOWING SEASONAL AND DAILY VARIATIONS. ZOOPLANKTERS ARE MORE ABUNDANT LOCALLY IN CHEMICALLY POLLUTED AREAS WITHIN LAKES. LOWEST PPP WAS OBSERVED IN CENTRAL LAKE SUPERIOR. LOWER LAKES ARE MOST PRODUCTIVE, AND ESPECIALLY MARKED INCREASES IN PPP OCCUR IN REGIONS WHERE MASSES POPULATION AND INDUSTRY HAVE ENRICHED THE LAKES. RADIOCARBON UPTAKE AND CPR ARE EFFECTIVE TOOLS FOR STUDY OF TROPHIC STATUS OF WATERS OF GREAT LAKES BASIN, AND CPR CAN PROVIDE ASSESSMENT OF POLLUTION AND EUTROPHICATION ON A SCALE HITHERTO UNAVAILABLE FOR THE GREAT LAKES. (EICHORN-WISCONSIN)

FIELD 02H, 05C

ACCESSION NO. W70-03311

COMPONENTS OF THE BOTTOM FAUNA OF THE ST LAWRENCE, GREAT LAKES,

TORONTO UNIV (ONTARIO). DEPT. OF ZOOLOGY; AND FISHERIES RESEARCH BOARD OF CANADA, WINNIPEG (MANITOBA).

R. O. BRINKHURST, A. L. HAMILTON, AND H. B. HERRINGTON.

GREAT LAKES INSTITUTE, UNIV OF TORONTO, NO PR 33, MAR 1968. 50 P, 7 TAB, 23 REF, APPENDIX WITH 11 FIG.

DESCRIPTORS:

\*BENTHIC FAUNA, \*GREAT LAKES, \*ST LAWRENCE RIVER, OLIGOCHAETES, SAMPLING, SEASONAL, DEPTH, LAKE ERIE, LAKE ONTARIO, TUBIFICIDS, DISTRIBUTION, WATER POLLUTION, EUTROPHICATION, OLIGOTROPHY, LITTORAL, LIMNOLOGY, BATHYMETRY, TEMPERATURE, ECOLOGY, TROPHIC, LAKE HURON, OXYGEN.

IDENTIFIERS:

SPHAERIIDAE, CHIRONOMIDAE, GEORGIAN BAY(ONTARIO), MESOTROPHIC, LAKE NIPIGON(ONTARIO), LAKE ATHABASKA(ONTARIO), GREAT SLAVE LAKE(ONTARIO), CREE LAKE(ONTARIO), PATRICIA DISTRICT LAKES, STRAITS OF MACKINAC, SPECIES COMPOSITION, DETROIT RIVER, MAUMEE RIVER, TAXONOMY, CORE ANALYSES, CHEMICAL CONDITIONS, TAXONOMIC KEYS.

ABSTRACT:

BOTTOM FAUNA WERE SAMPLED DURING SYNOPTIC CRUISES THROUGH GEORGIAN BAY, LAKE ONTARIO, AND LAKE ERIE AND DISTRIBUTIONS OF THEIR MAJOR COMPONENTS DETERMINED. OLIGOCHAETA, SPHAERIIDAE, AND CHIRONOMIDAE WERE SEPARATED. IDENTITY OF SPECIES AND THEIR DISTRIBUTION IS DISCUSSED. REFERENCE IS MADE TO OTHER GREAT LAKES STUDIES ON BENTHOS. SAMPLES REPRESENTING ALL SEASONS WERE INCLUDED WHERE POSSIBLE. RESULTS ARE PRESENTED IN TAXONOMIC GROUPS AND DISTRIBUTION MAPS. MAPS OF DEPTH PROFILES, INDICATING DEGREE OF OXYGEN DEPLETION IN LAKE ERIE IN SUMMER, AND BATHYMETRICAL MAPS ARE INCLUDED. 31 SPECIES OF TUBIFICIDAE FROM THE GREAT LAKES AND SOME IN CANADIAN LAKES ARE RECORDED. IN GROSSLY POLLUTED SITUATIONS, THE NUMBER OF OLIGOCHAETES IS VERY HIGH. SPECIES OF THE SPHAERIIDAE IDENTIFIED IN THE GREAT LAKES INSTITUTE COLLECTION ARE LISTED. THE TAXA OF CHIRONOMIDAE, REASONABLY COMPLETE IN ASSESSMENT OF THE PROFUNDAL AND SUBLITTORAL FAUNA, FROM THESE THREE LAKES ARE LISTED. TO FACILITATE COMPARISON BETWEEN THESE LAKES A MEASURE OF THE 'TROPHIC CONDITIONS' OF EACH AREA WAS CALCULATED ACCORDING TO ABILITY TO WITHSTAND EUTROPHIC CONDITIONS, PROVIDING NUMERICAL VALUES WHICH AID IN THE COMPARISONS OF VARIOUS BODIES OF WATER. KEY TO TUBIFICIDAE IS GIVEN. (JONES-WISCONSIN)

FIELD 02H, 05C

ACCESSION NO. W70-03315

CONSERVATION OF NATURAL RESOURCES (SHORE EROSION).

OHIO REV CODE ANN SECS 1507.01 THRU 1507.13 (PAGE 1964), AS AMENDED, (SUPP 1970).

DESCRIPTORS:

\*OHIO, \*BEACH EROSION, \*SHORE PROTECTION, \*EROSION CONTROL, LEGISLATION, LEGAL ASPECTS, SHORES, EROSION, CONSTRUCTION, STRUCTURES, PERMITS, RIPARIAN LAND, FINANCING, RIVERS AND HARBORS ACT, ADMINISTRATIVE AGENCIES, NATURAL RESOURCES, WATER RESOURCES, FEDERAL GOVERNMENT, LAKE ERIE, INVESTIGATIONS, NAVIGABLE WATERS, TAXES, MINERALOGY, WATERCOURSES(LEGAL), COST ALLOCATION, CONTRACTS, PLANNING, RECREATION.

IDENTIFIERS:

GROINS.

ABSTRACT:

THE OFFICE OF THE CHIEF ENGINEER OF THE DEPARTMENT OF NATURAL RESOURCES WILL ACT AS THE EROSION AGENCY OF THE STATE FOR PURPOSES OF COMPLYING WITH THE RIVERS AND HARBORS ACT. THE OFFICE WILL COOPERATE WITH THE FEDERAL BEACH EROSION BOARD IN CONDUCTING INVESTIGATIONS AND STUDIES ALONG THE SHORES OF LAKE ERIE WITH A VIEW TO EROSION PREVENTION AND CORRECTION. NAVIGABLE WATERS, FOR THE PURPOSE OF THIS SECTION, MEANS WATERS WITHIN THE JURISDICTION OF THE BOARD AND ANY WATERWAYS WITHIN OR ADJACENT TO THE STATE. NO PERSON WILL CONSTRUCT A BEACH OR ANY OTHER EROSION ARRESTING STRUCTURE ON THE SHORES OF LAKE ERIE WITHOUT A PERMIT FROM THE OFFICE. FUNDS FOR EROSION PROJECTS WILL BE OBTAINED FROM PERMIT SALES AND LAKE ERIE MINERAL LEASES. THE OFFICE MAY ENTER INTO AGREEMENTS WITH ANY POLITICAL SUBDIVISION FOR THE PURPOSE OF CONSTRUCTING AND MAINTAINING PROJECTS TO PREVENT, CORRECT, AND ARREST EROSION ON SPECIFIED BEACHES. COST ALLOCATION FORMULAS ARE PROVIDED FOR THE DIFFERENT GOVERNMENTAL SUBDIVISIONS. THE CHIEF ENGINEER IN COOPERATION WITH THE DIVISION OF GEOLOGICAL SURVEY, WILL PREPARE A PLAN FOR THE PREVENTION OF SHORE EROSION IN THE STATE. (KEITH-FLORIDA)

FIELD 04D, 02L

ACCESSION NO. W70-03405

STATE'S POWER OVER WATERS OF LAKE ERIE AND OVER LEASING OF LAKEFRONT LAND FOR PRIVATE IMPROVEMENT.

OHIO REV CODE ANN SECS 123.03, 123.031 (PAGE 1969), AS AMENDED, (SUPP 1970).

DESCRIPTORS:

\*OHIO, \*LAKE ERIE, \*RIPARIAN LAND, \*LEASES, WATER RIGHTS, NAVIGATION, LAND TENURE, SHORES, SOIL MANAGEMENT, LITTORAL, RIPARIAN RIGHTS, CHANNELS, REASONABLE USE, PIERS, LANDFILLS, LEGISLATION, PUBLIC RIGHTS, ADMINISTRATIVE AGENCIES, ADMINISTRATIVE DECISIONS, AQUATIC SOILS, LOCAL GOVERNMENTS, PORT AUTHORITIES, PLANNING, PROGRAMS, MINERALOGY, FISHERIES.

ABSTRACT:

THE WATER AND UNDERLYING BED OF LAKE ERIE WITHIN THE JURISDICTION OF THE STATE ARE OWNED AND HELD BY THE STATE FOR PUBLIC USE, SUBJECT TO THE POWERS OF THE UNITED STATES, RIGHTS OF PUBLIC NAVIGATION, COMMERCE, AND FISHERY AND PROPERTY RIGHTS OF LITTORAL OWNERS. THE DEPARTMENT OF PUBLIC WORKS IS RESPONSIBLE FOR CARE, PROTECTION, AND ENFORCEMENT OF THE STATE'S INTERESTS IN THIS TERRITORY. ANY OWNER OF UPLANDS FRONTING ON LAKE ERIE MAY APPLY TO THE STATE FOR A LEASE OF THE WATERS AND UNDERLYING BEDS OR ARTIFICIALLY FILLED LANDS BETWEEN THE NATURAL SHORE LINE AND THE HARBOR LINE, FOR SPECIFIED PURPOSES. THE DIRECTOR OF PUBLIC WORKS SHALL DETERMINE WHETHER THE SUGGESTED IMPROVEMENTS AND DEVELOPMENTS WILL IMPAIR PUBLIC RIGHTS. THE APPROPRIATE MUNICIPAL CORPORATION, COUNTY COMMISSION, OR PORT AUTHORITY SHALL DETERMINE WHETHER THE TERRITORY IS NEEDED BY THAT LOCAL AUTHORITY, AND WHETHER THE PROPOSED USE COMPLIES WITH THE AUTHORITY'S WATERFRONT PLANS. THE DIRECTOR SHALL ESTABLISH THE CONSIDERATION FOR AND PERIOD OF SUCH LEASE. THE GOVERNOR SHALL ISSUE THE LEASE CERTIFICATE, SPECIFICALLY RESERVING TO THE STATE ALL MINERAL RIGHTS IN THE LEASED TERRITORY. (DEARING-FLORIDA)

FIELD 06E, 04A

ACCESSION NO. W70-03410

PARTICULATE FRACTIONS IN WATER AND THE RELATIONSHIP TO AQUATIC MICROFLORA,  
OHIO STATE UNIV., COLUMBUS. DEPT. OF MICROBIOLOGY; AND OHIO STATE UNIV.,  
COLUMBUS. AQUATIC BIOLOGY LAB.

ROBERT M. PFISTER, PATRICK R. DUGAN, AND JAMES I. FREA.

INTERNATIONAL ASSOCIATION OF GREAT LAKES RESEARCH, PROCEEDINGS 11TH  
CONFERENCE GREAT LAKES RESEARCH, P 111-116, 1968. 6 FIG, 2 TAB, 11 REF.

DESCRIPTORS:

AQUATIC ENVIRONMENT, WATER QUALITY CONTROL, ECOSYSTEMS, BIOLOGICAL  
COMMUNITIES, DETRITUS, CHEMICAL PROPERTIES, INTERFACES, ADSORPTION,  
ELECTRON MICROSCOPY, BIOCONTROL.

IDENTIFIERS:

\*LAKE ERIE, \*PARTICULATE FRACTIONS, \*MICROFLORA, LINEAR SUCROSE  
GRADIENT, BECKMAN TUBE CUTTING DEVICE, MEMBRANOUS ORGANELLES,  
STREPTOMYCES, MICROMONOSPORA, PSEUDOMONADS, ENVIRONMENTAL CONTAMINANTS,  
BIOLOGICAL REACTIONS.

ABSTRACT:

WATER SAMPLES FROM A 15-FOOT DEPTH OF LAKE ERIE AND FROM THE SURFACE OF  
SANDUSKY RIVER, OHIO, WERE SUBJECTED TO GRADIENT CENTRIFUGING.  
DIFFERENT SUBMICROSCOPIC FRACTIONS OF SUSPENDED PARTICULATES (MINERAL  
AND DETRITUS) WERE INVESTIGATED BY ELECTRON MICROSCOPY AND EXAMINED FOR  
THEIR ABILITY TO INFLUENCE BIOLOGICAL REACTIONS. ADDITION OF THE  
PARTICULATE FRACTION 0.3 MICRON AND LARGER TO A CARBON-FREE SALTS  
MEDIUM CAUSED A SIGNIFICANT INCREASE IN THE BIOMASS OF MICROMONOSPORA  
AND STREPTOMYCES. AN AGGREGATION OF SUBMICROSCOPIC PARTICLES OF  
MAGNESIUM SILICATE WITH AN EXOCYLLULAR POLYMER, PRODUCED BY A  
FLOC-FORMING PSEUDOMONAD, WAS DEMONSTRATED. A SYSTEM OF ECOLOGICAL  
CONTROL OF POLLUTION INVOLVING A BUILDUP OF LARGER AGGREGATES BY  
ASSOCIATION OF INORGANIC PARTICLES AND ORGANISMS IS POSTULATED.  
(WILDE-WISCONSIN)

FIELD 05B, 05C

ACCESSION NO. W70-03505

PRESIDENT'S LECTURE: LIMNOLOGY, SOCIAL WELFARE, AND LAKE KINNERET,

UPPSALA UNIV. (SWEDEN). INST. OF LIMNOLOGY.

WILHELM RODHE.

VERH INTERNAT VEREIN LIMNOL, VOL 17, P 40-48 NOV 1969. 12 REF.

DESCRIPTORS:

\*LIMNOLOGY, \*SOCIAL NEEDS, ECOSYSTEMS, SAMPLING, SEICHES, DEPTH, STRATIFICATION, WINDS, TEMPERATURE, EPILIMNION, THERMOCLINE, HYPOLIMNION, PHYTOPLANKTON, CHEMICAL ANALYSIS, ZOOPLANKTON, LIGHT PENETRATION, PRIMARY PRODUCTIVITY, CARBON RADIOISOTOPES, COMPUTER PROGRAMS, RESERVOIRS, POLITICAL ASPECTS, EUTROPHICATION, SEWAGE, EFFLUENTS, BOTTOM SEDIMENTS, BIOCHEMICAL OXYGEN DEMAND, INORGANIC COMPOUNDS, NUTRIENTS, LAKE ERIE, LAKE ONTARIO, LAKE MICHIGAN, NITROGEN, PRODUCTIVITY, WATER QUALITY, INDUSTRIES, UNITED NATIONS.

IDENTIFIERS:

\*LAKE KINNERET (ISRAEL), BEIT NETUFA (ISRAEL), WINNIPEG (CANADA), LAKE ZURICH (SWITZERLAND), LAKE BAIKAL, LAKE WASHINGTON (WASH), SEATTLE (WASH), SWEDEN, LAKE MALAREN (SWEDEN), WORLD HEALTH ORGANIZATION.

ABSTRACT:

IN LIMNOLOGY EACH COMPONENT IS REGARDED A LINK IN THE ECOSYSTEM AND THE ENTIRE ECOSYSTEM A PRODUCT OF SOURCES AND SURROUNDINGS. SOUND WATER POLICY MUST BE INCLUDED IN THE SOCIAL PLANNING OF EVERY COMMUNITY AND INDUSTRY AND THE COST OF CLEAN WATERS MUST BE MET. THE DIFFICULTY LIES IN THE FAILURE OF POLITICIANS TO RECOGNIZE LIMNOLOGICAL ADVANCES AND ACT ON THEM ON A GLOBAL CONCEPT. ISRAEL'S LAKE KINNERET RESEARCH PROJECT REQUIRES REGULAR SAMPLING OF BASIC DATA: THREE 'ISOTHERMAL SAMPLES' AT EACH STATION ARE NECESSARY TO REPRESENT LOWER EPILIMNION, STEEPEST THERMOCLINE, AND UPPER HYPOLIMNION, AND, WITH SAMPLES CLOSE TO THE SURFACE AND BOTTOM, MAKE A WEEKLY LOAD OF 35 SAMPLES FROM SEVEN STATIONS FOR CHEMICAL ANALYSES AND QUANTITATIVE DETERMINATIONS OF PHYTOPLANKTON AND ZOOPLANKTON. AT ONE STATION, A SERIES OF SAMPLES FROM 5 OR 3 DEPTHS WILL BE PRESERVED FOR INFORMATION CONCERNING VERTICAL DISTRIBUTION OF PLANKTON. MEASUREMENTS OF LIGHT PENETRATION AND CARBON-14 EXPOSURES ARE MADE TO DETERMINE PRIMARY PRODUCTION. CONTINUOUS METEOROLOGICAL AND HYDROLOGICAL RECORDS ARE INDISPENSABLE FOR INTERPRETATION OF SEICHES AND OTHER DYNAMIC PHENOMENA. AUGMENTATION OF THE STUDY OF LAKE KINNERET AND ITS TRIBUTARIES WITH THE WORK AT MEKOROT LABORATORY AT BEIT NETUFA RESERVOIR IS INTENDED. (JONES-WISCONSIN)

FIELD 02H, 05C, 06G

ACCESSION NO. W70-03509

WATER SUPPLY - SANITATION - DITCHES (ORGANIZATION AND PURPOSES OF CONSERVANCY DISTRICTS).

OHIO REV CODE ANN SEC 6101.04 (PAGE 1953).

DESCRIPTORS:

\*OHIO, \*CONSERVATION, \*REGULATION, \*ADMINISTRATIVE AGENCIES, EROSION, STREAMS, LAKE ERIE, ENVIRONMENTAL SANITATION, WATER SUPPLY, IRRIGATION, FLOOD CONTROL, LEGISLATION, STATE GOVERNMENTS, WATER CONSERVATION, EROSION CONTROL, RESERVOIRS, LAND RECLAMATION, MULTIPLE-PURPOSE PROJECTS, SEWAGE, SEWAGE SYSTEMS, SEWAGE DISTRICTS, DITCHES, IRRIGATION DITCHES, DRAINAGE ENGINEERING.

ABSTRACT:

ANY AREA OR AREAS SITUATED IN ONE OR MORE COUNTIES MAY BE ORGANIZED AS A CONSERVANCY DISTRICT. THESE DISTRICTS SHALL BE SUBJECT TO CONDITIONS STIPULATED IN OTHER SECTIONS OF THIS ACT. THE FOLLOWING SHALL BE THE PURPOSES OF THESE DISTRICTS: PREVENTING FLOODS; REGULATING STREAM CHANNELS BY CHANGING THEIR DIMENSIONS; PROVIDING FOR IRRIGATION WHERE NEEDED; RECLAIMING OR FILLING WET AND OVERFLOWED LANDS; REGULATING THE FLOW OF STREAMS AND DIVERTING OR WHOLLY ELIMINATING WATERCOURSES; PROVIDING A WATER SUPPLY FOR DOMESTIC USE; COLLECTING AND DISPOSING OF SEWAGE; AND ARRESTING EROSION ALONG THE OHIO SHORELINE OF LAKE ERIE.  
(BARNETT-FLORIDA)

FIELD 04A

ACCESSION NO. W70-03643



RX FOR AILING LAKES--A LOW PHOSPHATE DIET,

INTERNATIONAL JOINT COMMISSION-UNITED STATES AND CANADA.

ENVIRONMENTAL SCIENCE AND TECHNOLOGY, VOL 3, NO 12, P 1243-1245, 1969. 2 FIG.

DESCRIPTORS:

\*PHOSPHATES, \*LAKES, \*DETERGENTS, \*TERTIARY TREATMENT, \*GREAT LAKES, CONTROL, COSTS, EUTROPHICATION, NITRATES, LAKE ERIE, LAKE ONTARIO, POLLUTION ABATEMENT, OLIGOTROPHY, DEPTH, PHYTOPLANKTON, ZOOPLANKTON, PHYSICOCHEMICAL PROPERTIES, DOMESTIC WASTES, SEWAGE, INDUSTRIAL WASTES, AGRICULTURE, ST LAWRENCE RIVER, ALGAE, COLIFORMS, DISSOLVED OXYGEN, DISSOLVED SOLIDS, TEMPERATURE, COLOR, TASTE, HYDROGEN ION CONCENTRATION, IRON, RADIOACTIVITY.

IDENTIFIERS:

CANADA, MESOTROPHY, LAKE NORRVIKEN, LAKE MENDOTA, LAKE FURES, LAKE SEBASTICOOK, LAKE WASHINGTON, LAKE MALAREN, LAKE ANNECY, LAKE VANERN, LAKE CONSTANCE, PFAFFIKERSEE, TURLERSEE, BALDEGGERSEE, GREIFENSEE, ZURICHSEE, MOSES LAKE, HALLWILLERSEE.

ABSTRACT:

STUDY WAS INITIATED IN 1964 WHEN THE INTERNATIONAL JOINT COMMISSION OF THE U S AND CANADA ESTABLISHED ADVISORY GROUPS ON STATUS OF POLLUTION IN LAKES ERIE AND ONTARIO AND SEGMENTS OF THE ST LAWRENCE RIVER. REPORT RECOMMENDS TECHNICAL AND LEGISLATIVE MACHINERY FOR CONTROL MEASURES. DETERGENTS' PHOSPHATE CONTENT SHOULD BE REDUCED IMMEDIATELY TO MINIMUM PRACTICAL LEVELS, WITH COMPLETE REPLACEMENT OF PHOSPHORUS WITH LESS INNOCUOUS SUBSTANCES NO LATER THAN 1972. 80% REMOVAL OF PHOSPHATES FROM ALL EFFLUENTS SHOULD BE EFFECTED BY 1972 IN THE LAKE ERIE BASIN AND BY 1975 IN LAKE ONTARIO. TREATMENT OF WASTE EFFLUENTS FOR PHOSPHATE REMOVAL MUST BE IN ADDITION TO, NOT A SUBSTITUTE FOR DETERGENT REFORMULATION. PHOSPHORUS AND NITROGEN ARE RECOGNIZED AS THE MAJOR NUTRIENTS RESPONSIBLE FOR EUTROPHICATION; IT IS APPARENT THAT PHOSPHATE IS THE CONTROLLING FACTOR IN ENRICHMENT OF LOWER GREAT LAKES. EFFICIENT AND RELATIVELY INEXPENSIVE METHODS ARE AVAILABLE FOR 80-95% REMOVAL OF PHOSPHORUS DURING SEWAGE TREATMENT, WHEREAS COMPARABLE ELIMINATION OF NITROGEN COMPOUNDS IS NOT YET FEASIBLE. COSTS FOR PHOSPHATE REMOVAL AT TREATMENT PLANTS WOULD BE REDUCED BY ONE-HALF TO TWO-THIRDS WITH REPLACEMENT OF PHOSPHATE DETERGENT BUILDERS. (JONES-WISCONSIN)

FIELD 02H, 05C

ACCESSION NO. W70-03964

PRINCIPLES OF PRIMARY PRODUCTIVITY: PHOTOSYNTHESIS UNDER COMPLETELY NATURAL CONDITIONS,

BOWLING GREEN STATE UNIV., OHIO. DEPT. OF BIOLOGY.

JACOB VERDUIN.

ALGAE AND MAN (JACKSON, D F, EDITOR) PLENUM PRESS, N Y, P 221-238, 1964. 3 FIG, 3 TAB, 6 REF.

DESCRIPTORS:

\*PRIMARY PRODUCTIVITY, \*PHOTOSYNTHESIS, \*ENVIRONMENTAL EFFECTS, RESPIRATION, PONDS, PHYTOPLANKTON, LIMITING FACTORS, PHYSIOLOGICAL ECOLOGY, CARBON DIOXIDE, PHOSPHORUS, NITROGEN, IRON, NUTRIENTS, AQUATIC HABITATS, LIGHT, HYDROGEN ION CONCENTRATION, PENNSYLVANIA, EUGLENA, LAKES, LAKE ERIE, MICHIGAN, ANALYTICAL TECHNIQUES, OXYGEN.

IDENTIFIERS:

\*PHOTOBIOLOGY, \*CHEMICAL PROCESSES, GLENODINIUM, TRACHELOMONAS, PREDICTIVE EQUATIONS, CERATIUM, BAULE-MITSCHERLICH EQUATION, THIEL COLLEGE(PA), ULVA LACTUCA, ALGAL POPULATIONS, DIFFERENTIAL TITRATION, LAMBERT-BEER LAW, SUSPENSOID CONCENTRATIONS, WINKLER TECHNIQUE, COMMUNITY METABOLISM, YOUNG'S POND(PA), BROWN'S POND(PA), WEST LOST LAKE(MICH), MAUMEE RIVER, OHIO RIVER, PYMATUNING RESERVOIR(PA).

ABSTRACT:

INDIVIDUAL DETERMINATIONS OF PRIMARY PRODUCTIVITY VARY WIDELY, BOTH SPATIALLY AND TEMPORALLY. SIMPER METHODS FOR DETERMINING SUCH RATES, PERMITTING ACQUISITION OF MANY DATA, ARE PREFERABLE TO MORE PRECISE, BUT TIME-CONSUMING TECHNIQUES. STUDIES UNDER COMPLETELY NATURAL CONDITIONS ARE DESIRABLE BECAUSE IN BOTTLED SAMPLES, SURFACE EFFECTS YIELD ERRONEOUS VALUES FOR BOTH PHOTOSYNTHESIS AND RESPIRATION. COMMUNITY METABOLISM CAN BE ASSESSED BY MEASURING, OVER SHORT INTERVALS, CHANGES IN DISSOLVED OXYGEN BY WINKLER'S TECHNIQUES, AND CHANGES IN CONCENTRATION OF CARBON DIOXIDE BY DIFFERENTIAL TITRATION. ESTIMATES OF HOURLY PHOTOSYNTHETIC RATES PER MICROLITER OF PHYTOPLANKTON, DETERMINED THUS FOR TWO SMALL PONDS, ARE IN GOOD AGREEMENT WITH DATA REPORTED IN THE LITERATURE. ANALYSIS OF PHOTOSYNTHETIC YIELDS, BASED ON THEORETICAL CONSIDERATIONS AND ON THE BAULE-MITSCHERLICH EQUATION FOR LIMITING FACTORS, SUGGESTS THAT, AMONG PHYSICAL, CHEMICAL, AND BIOTIC FACTORS, SEVERAL FACTORS CAN SIMULTANEOUSLY LIMIT PHOTOSYNTHETIC YIELD. SUBSTANTIAL REDUCTION OF OPTIMAL YIELD IS PROBABLY THE RULE IN AQUATIC ENVIRONMENTS. THE LAMBERT-BEER'S LAW, DESCRIBING ATTENUATION OF LIGHT IN WATER, CAN BE MODIFIED BY ADDING AN EXPONENTIAL TERM FOR CONCENTRATION OF LIGHT-ABSORBING PARTICULATES. SEVERAL APPLICATIONS OF THE RESULTANT EQUATION TO AQUATIC ENVIRONMENTS ARE RECOMMENDED FOR FURTHER STUDY. (SEE VOL 2, NO 19, FIELD 5C, ENTRY W69-07832). (EICHHORN-WISCONSIN)

FIELD 02K

ACCESSION NO. W70-03965

A STUDY OF THE PROFUNDAL BOTTOM FAUNA OF LAKE WASHINGTON,

WASHINGTON UNIV., SEATTLE. DEPT. OF ZOOLOGY.

RUDOLPH N. THUT.

ECOLOGICAL MONOGRAPHS, VOL 39, NO 1, P 79-110, 1969. 27 FIG, 5 TAB, 34 REF.

DESCRIPTORS:

\*BENTHIC FAUNA, NITROGEN, PHOSPHORUS, PHYTOPLANKTON, DIATOMS, ZOOPLANKTON, DINOFLAGELLATES, ALGAE, DISSOLVED OXYGEN, HYPOLIMNION, EPILIMNION, LAKE ERIE, INSECTS, DIPTERA, CRUSTACEA, MOLLUSCS, OLIGOCHAETES, GASTROPODS.

IDENTIFIERS:

\*LAKE WASHINGTON(WASH), MACROFAUNA, GYTJA, OSCILLATORIA RUBESCENS, ZURICHSEE, FILAMENTOUS ALGAE, FILAMENTOUS BLUE-GREEN ALGAE, OCULAR MICROMETER, SUCROSE-FLOTATION TECHNIQUE, METALIMNION, BATHYTHERMOGRAPH, ARTHROPODA, CHIRONOMIDAE, AQUATIC OLIGOCHAETES.

ABSTRACT:

A REVIEW OF THE MACROFAUNA IN THE PROFUNDAL ZONE OF LAKE WASHINGTON BETWEEN SEPTEMBER 1963 AND SEPTEMBER 1964 AND DISCUSSION. ALTHOUGH SEWAGE DIVERSION BEGAN IN 1963, PHOSPHATE AND OXYGEN VALUES INDICATED THE LAKE WAS STILL IN THE EUTROPHIC PHASE. TEN STATIONS WERE CHOSEN AT 5-METER DEPTH INTERVALS FROM 10 TO 55 METERS AND SAMPLED APPROXIMATELY MONTHLY WITH AN EKMAN DREDGE. 24 SPECIES WERE RECOGNIZED FROM THE PROFUNDAL ZONE, EACH PRESENTED SEPARATELY, WITH THE EXCEPTION OF OLIGOCHAETA SPECIES, ALONG WITH THEIR DEPTH AND POPULATION DYNAMICS THROUGHOUT THE YEAR. THE CHIRONOMIDAE WERE MOST NUMEROUS OF BOTTOM FAUNA CONSTITUENTS (ABOUT 45% OF THE TOTAL). 13 SPECIES WERE FOUND DURING THE STUDY, INCLUDING PREDATORS, DEPOSIT-FEEDERS, AND FILTER-FEEDERS. LARVAE WERE MOST COMMON AT THE SHALLOW-WATER STATIONS AND BECAME PROGRESSIVELY DIMINISHED WITH INCREASE IN DEPTH. THE OLIGOCHAETA COMPRISED ABOUT 1/2 OF THE TOTAL NUMBER AND 1/3 OF THE TOTAL BIOMASS OF THE PROFUNDAL FAUNA. FOUR SPECIES WERE IDENTIFIED. THE OLIGOCHAETA WERE FOUND IN THE GREATEST NUMBERS AND BIOMASS AT THE GREATEST DEPTH SAMPLED; THEIR ABUNDANCE PROGRESSIVELY DECLINED WITH DECREASE IN DEPTH. AMPHIPODA AND SPHAERIDAE WERE PRESENT BUT IN SMALLER NUMBERS. (HASKINS-WISCONSIN)

FIELD 02H, 05C

ACCESSION NO. W70-04253

LIFE ON A DYING LAKE,

PETER SCHRAG.

SATURDAY REVIEW, P 19-21, 55-56, SEPTEMBER 20, 1969. 3 PHOTOS.

DESCRIPTORS:

\*LAKE ERIE, \*GREAT LAKES, \*EUTROPHICATION, \*WATER POLLUTION, \*WATER POLLUTION EFFECTS, WATER POLLUTION CONTROL, WATER POLLUTION SOURCES, WATER LAW, RECREATION, CHLORINATION, BEACHES.

IDENTIFIERS:

\*LAKE ERIE BASIN, CUYAHOGA RIVER(OHIO), IRON III, FERRIC IRON, MAUMEE RIVER, CLEVELAND(OHIO).

ABSTRACT:

A LOOK AT LAKE ERIE'S POLLUTION PROBLEMS SHOWS THE CONFLICTS BETWEEN THE SOCIAL, ECONOMIC, AND POLITICAL VIEWPOINTS. ERIE HAS AGED 15,000 YEARS IN THE PAST 50 YEARS, BUT THE QUESTIONS SURROUNDING THE CLEANUP CONCERN RESOURCES, PRIORITIES, AND THE URGENCY, THUS LEAVING THE THIRTEEN MILLION PEOPLE DEPENDENT ON THE LAKE IN LIMBO. CITY SEWERS, INDUSTRIAL WASTES, AND RUNOFF PROVIDE THE INPUT, WHILE ALGAE, LOW OXYGEN LEVELS, SMELL, TRASH FISH, RIVER FIRE, AND THE NECESSITY TO CHLORINATE BEACHES ARE SOME RESULTS. THERE IS FEAR THAT THE IRON III COMPOUND KEEPING ALGAE NUTRIENTS TRAPPED ON THE LAKE BOTTOM IS BEING DISSOLVED, WHICH WOULD RESULT IN SHARPLY INCREASED EUTROPHICATION IF THE NUTRIENTS ARE RELEASED. THE CITIES HAVE NOT CORRECTED THEIR SEWAGE POLLUTION BEFORE DEMANDING THAT THE STATES ENFORCE ANTI-POLLUTION STANDARDS, LEAVING FEDERALLY CONDUCTED ENFORCEMENT CONFERENCES TO ENCOURAGE THE FIVE LAKE-REGION STATES TO COMMIT THEMSELVES TO REMOVE 80% OF THE PRIMARILY DETERGENT-ORIENTED PHOSPHATES BY WASTE TREATMENT. POLLUTION LAW SHOWS IT'S HARD TO DEMONSTRATE A CONNECTION BETWEEN DISCHARGES AND DAMAGES. 'WHOSE RIGHTS ARE AFFECTED', 'WHOSE ENVIRONMENT IS IT', AND 'WHO CONTROLS THE ENVIRONMENT' ARE SOME OF THE BASIC QUESTIONS APPROACHED. (POWERS-WISCONSIN)

FIELD 05C

ACCESSION NO. W70-04375

BRIEF TO THE INTERNATIONAL JOINT COMMISSION CONCERNING THE POLLUTION OF LAKES  
ERIE, ONTARIO AND THE INTERNATIONAL WATERS OF THE ST LAWRENCE RIVER,

TORONTO UNIV. (ONTARIO). GREAT LAKES INST.

P. H. JONES.

UNIVERSITY OF TORONTO, FEBRUARY 6, 1970. 12 P, 3 FIG.

DESCRIPTORS:

\*LAKE ONTARIO, \*LAKE ERIE, \*GREAT LAKES, DETERGENTS, PHOSPHATE, TESTING.

IDENTIFIERS:

ST LAWRENCE RIVER, HEAVY DUTY DETERGENT, DETERGENT BIODEGRADABILITY  
TESTS, FISH TOXICITY STUDIES, ALGAE STUDIES, BIODEGRADABLE DETERGENT.

ABSTRACT:

PHOSPHATE IS THE CRITICAL NUTRIENT IN THE FERTILIZATION OF THE GREAT  
LAKES, AND DETERGENTS CONTRIBUTE 1/2 TO 2/3 OF THE PHOSPHATES REACHING  
WASTE TREATMENT PLANTS. A NON-PHOSPHATE HEAVY DUTY LAUNDRY DETERGENT  
HAS BEEN DEVELOPED WHICH IS COMPARABLE IN CLEANING EFFECTIVENESS WITH  
CURRENT PRODUCTS, AND WOULD COST NO MORE TO PRODUCE WHEN ECONOMIES OF  
SCALE ARE ACHIEVED. IT CONTAINS NOTHING WHICH WOULD UPSET THE NATURAL  
CYCLE OR CREATE POLLUTION CONDITIONS. BIODEGRADABILITY STUDIES RESULTED  
FAVORABLY. OTHER TESTS ARE UNDER WAY. (POWERS-WISCONSIN)

FIELD 05G, 05B

ACCESSION NO. W70-04378

THE GREAT AND DIRTY LAKES,

GLADWIN HILL.

IN: CONTROLLING POLLUTION: THE ECONOMICS OF A CLEANER AMERICA, ED. MARSHALL I. GOLDMAN, ENGLEWOOD CLIFFS, N.J.: PRENTICE-HALL, INC., 1967, P. 43-48, AND SATURDAY REIVEW, OCT. 23, 1965.

DESCRIPTORS:

\*ALGAE, \*INDUSTRIAL WASTES, \*MUNICIPAL WASTES, \*GREAT LAKES, \*WATER POLLUTION, SEWAGE, AESTHETICS, AEROBIC CONDITIONS, ANAEROBIC CONDITIONS, WATER SUPPLY.

IDENTIFIERS:

\*DEVOLUTION, \*INTERSTATE POLLUTION, \*METROPOLITAN AREAS, BLONDIN.

ABSTRACT:

THE POLLUTION OF THE GREAT LAKES IS DISCUSSED. FOCUSING ON NIAGRA FALLS, THE SOURCES OF POLLUTION FROM DULUTH TO BUFFALO ARE TRACED. SPECIAL ATTENTION IS GIVEN TO THE CHICAGO AND DETROIT METROPOLITAN AREAS. THE GREAT LAKES ARE TREATED AS ONE CONTINUOUS SYSTEM AND SUGGESTS INTERSTATE POLLUTION ABATEMENT AS THE ONLY POSSIBLE RECOURSE, REJECTING INTERNATIONAL EFFORTS AS CUMBERSOME AND INTRASTATE EFFORTS AS INEFFECTUAL. WHILE RECOGNIZING THE MUNICIPAL WASTE AS A MAJOR POLLUTION SOURCE, THE AUTHOR CONCENTRATES ON INDUSTRIAL WASTES FROM THE OIL, STEEL, PAPER, SOAP, CHEMICAL AND AUTOMOTIVE INDUSTRIES. HE CITES THE CHICAGO AND DETROIT METROPOLITAN AREAS AS THE MAIN DISCHARGERS OF AMMONIA NITROGEN, PHENOLS, CYANIDE, OIL, PHOSPHATES, CHLORIDES, SUSPENDED AND SETTLEABLE SOLIDS AND NITROGEN COMPOUND WASTES INTO THE LAKES. CHICAGO'S EFFORTS TO MAINTAIN A USABLE WATER SUPPLY AND DETROIT'S OUTDATED SEWAGE TREATMENT FACILITIES ARE ALSO REVIEWED. THE DEATH OF LAKE ERIE IS TREATED ALONG WITH A DISCUSSION OF THE DEVOLUTION OF AQUATIC LIFE WHICH ACCOMPANIED IT. THE EFFORTS OF PRIVATE INDIVIDUALS AND CONSERVATION GROUPS AND THOSE OF VARIOUS STATE AND FEDERAL GOVERNMENTS ARE TREATED. (RICHMOND-CHICAGO)

FIELD 05G, 05B

ACCESSION NO. W70-04430

OUTWITTING THE PATIENT ASSASSIN: THE HUMAN USE OF LAKE POLLUTION,

NORTHWESTERN UNIV., EVANSTON, ILL. TECHNOLOGICAL INST.

HAROLD B. GOTAAS.

BULLETIN OF THE ATOMIC SCIENTISTS, P 8-10, MAY 1969.

DESCRIPTORS:

\*NUTRIENTS, \*BENEFIT-COST ANALYSIS, \*LAKE ERIE, PHOSPHORUS, FISH STOCKING, COMMERCIAL FISH, SALMON, ALGAE, FISH.

IDENTIFIERS:

ANTIPOLLUTION PROGRAMS, BIOLOGICAL BALANCE, OVERFISHING, COHO SALMON, ALEWIFE, NUTRIENT REMOVAL.

ABSTRACT:

SOME ASPECTS OF THE OCTOBER 1968 DEPARTMENT OF INTERIOR REPORT ON LAKE ERIE ARE CHALLENGED. THE EMPHASIS ON NUTRIENT REMOVAL WHICH WOULD RESULT IN IMMEDIATE EXPENDITURE OF \$1.1 BILLION TO CONTROL MUNICIPAL POLLUTION AND \$285 MILLION FOR CURBING INDUSTRIAL CONTAMINATION IS QUESTIONED IN LIGHT OF THE EXPECTED BENEFITS. SEVERAL EFFICACIOUS ALTERNATIVES FOR REVIVING THE GREAT LAKES ARE SUGGESTED: (1) FURTHER NUTRIENT RELATIONSHIPS AND COST VERSUS BENEFITS STUDIES SHOULD BE UNDERTAKEN BEFORE MONEY IS SPENT TO BUILD EXPENSIVE TREATMENT FACILITIES; (2) HARVEST ALGAE AS A POTENTIAL SOURCE OF FOOD THUS PREVENTING IT FROM CONTRIBUTING TO THE ORGANIC WASTE LOAD; (3) PREVENT THE INTRODUCTION OF ALL TOXIC MATERIALS ENABLING DESIRABLE BIOLOGICAL BALANCES TO BE ESTABLISHED; (4) SEED THE LAKES WITH DESIRABLE FISH TO ESTABLISH A FOOD CHAIN WHICH WOULD PERMIT THE GROWTH AND REMOVAL OF NUTRIENTS AS WELL AS FISH FOR FOOD NEEDS AND SPORT; AND (5) ADOPT WATER QUALITY STANDARDS THAT ARE REALISTIC AS TO THEIR COSTS, BENEFITS, AND TIME PRIORITIES. (HASKINS-WISCONSIN)

FIELD 05C, 02H

ACCESSION NO. W70-04465

ALGAE FROM WESTERN LAKE ERIE,

OHIO STATE UNIV., COLUMBUS. DEPT. OF BOTANY AND PLANT PATHOLOGY.

CLARENCE E. TAFT, AND W. JACK KISHLER.

OHIO JOURNAL OF SCIENCE, VOL 68, NO 2, P 80-83, 1968. 9 FIG, 7 REF.

DESCRIPTORS:

\*ALGAE, \*LAKE ERIE, CHLOROPHYTA, CYANOPHYTA, UNITED STATES, HABITATS.

IDENTIFIERS:

\*NEW SPECIES, \*WESTERN LAKE ERIE(OHIO), GONGROSIRA STAGNALIS, NEPHROCYTIUM OBESUM W AND G S WEST, RADIOCOCCUS NIMBATUS, URONEMA ELONGATUM HODGETTS, CHROOCOCCUS PRESCOTTII, CALOTHRIX FUSCA, MICROCOLEUS LACUSTRIS (RAB) FARLOW, CLADOPHORA, TAXONOMIC DESCRIPTIONS, GONGROSIRA LACUSTRIS BRAND, GONGROSIRA DEBARYANA RAB, OOCYSTIS, OSCILLATORIA, ULOTHRIX, EUCAPSIS ALPINA CLEMENTS AND SCHANTZ, SCYTONEMA ALATUM (CARM) BORZI, SCYTONEMA MYOCHROUS.

ABSTRACT:

FOUR SPECIES OF ALGAE IN THE CHLOROPHYTA (GONGROSIRA STAGNALIS, NEPHROCYTIUM OBESUM, RADIOCOCCUS NIMBATUS, AND URONEMA ELONGATUM) AND FIVE IN THE CYANOPHYTA (CHROOCOCCUS PRESCOTTII, CALOTHRIX FUSCA, MICROCOLEUS LACUSTRIS, SCYTONEMA ALATUM, AND SCYTONEMA MYOCHROUS) ARE NEWLY REPORTED FOR WESTERN LAKE ERIE. GONGROSIRA STAGNALIS (G S WEST) SCHMIDLE, COLLECTED FROM THE BASAL FRAGMENTS OF OLD CLADOPHORA, APPEARS TO BE A NEW RECORD FOR THE UNITED STATES. NEPHROCYTIUM OBESUM W AND G S WEST, WHICH IS REPORTED AS OFTEN HAVING A SHALLOWLY SCROBICULATE WALL, IS UNIQUE AND MERITS FURTHER INTENSIVE STUDY. THESE NEW ALGAE OCCASIONALLY APPEAR IN TEACHING AND RESEARCH COLLECTIONS AT STONE LABORATORY, PUT-IN-BAY, OHIO. THE HABITAT OF G STAGNALIS ON CALCIUM-ENCRUSTED CLADOPHORA FILAMENTS IS UNIQUE. (JONES-WISCONSIN)

FIELD 05C

ACCESSION NO. W70-04468



THE ECOLOGICAL DECLINE OF LAKE ERIE,

NEW YORK STATE COLL. OF AGRICULTURE, ITHACA.

DEAN F. ARNOLD.

NEW YORK FISH AND GAME JOURNAL, VOL 16, NO 1, P 27-45, 1969. 5 FIG, 69 REF.

DESCRIPTORS:

\*LAKE ERIE, \*EUTROPHICATION, \*WATER POLLUTION EFFECTS, \*WATER POLLUTION SOURCES, DOMESTIC WASTES, DISSOLVED OXYGEN, ZOOPLANKTON, BENTHIC FAUNA, FISHERIES, WALLEYE.

IDENTIFIERS:

\*CULTURAL EUTROPHICATION, MAUMEE RIVER(MICH), DETROIT RIVER(MICH), BLUE PIKE, COREGONIDS, STURGEON.

ABSTRACT:

LAKE ERIE IS PERHAPS THE BEST-DOCUMENTED EXAMPLE OF A LARGE LAKE WHICH IS DETERIORATING RAPIDLY IN SEVERAL ASPECTS, INCLUDING EUTROPHY. THE SHALLOW WESTERN BASIN IS EXPOSED TO HIGH SEDIMENT LOADS, CONTRIBUTED LARGELY BY FARMLAND EROSION TRANSPORTED BY THE MAUMEE RIVER. HUMAN ACTIVITIES, INCLUDING CONSTRUCTION OF JETTIES AND EROSION-CONTROL STRUCTURES HAVE INCREASED TOTAL SHORE EROSION AND SILT LOAD. EFFECTS OF DOMESTIC AND INDUSTRIAL POLLUTION ARE MOST NOTICEABLE IN THE WESTERN BASIN. ALL CHEMICAL CONSTITUENTS EXCEPT SILICATE AND IRON HAVE INCREASED FROM ABOUT 16 TO 300% SINCE 1906. OXYGEN DEPLETION IS MOST NOTABLE IN THE DEEPER CENTRAL BASIN. AVERAGE QUANTITY OF PHYTOPLANKTON HAS INCREASED THREEFOLD; SHIFTS IN SPECIES COMPOSITION HAVE BEEN NOTED. BLUE-GREEN ALGAE HAVE BECOME A DOMINANT FORM; ATTACHED AND FLOATING ALGAE HAVE INCREASED. CLADOCERAN ZOOPLANKTON HAVE INCREASED AS HAVE CHARACTERISTICALLY EUTROPHIC SPECIES OF COPEPODS. MAYFLY NAIADS (HEXAGENIA) HAVE DECREASED MARKEDLY WHILE OLIGOCHAETES, CHIRONOMID LARVAE AND SEWAGE FUNGUS HAVE INCREASED. POPULATIONS OF COREGONIDS, STURGEON, PIKE (STIZOSTEDION) HAVE COLLAPSED; SHAD, ALEWIFE, SMELT, AND CARP HAVE INCREASED. SEVERAL FEASIBLE REMEDIAL ACTIONS HAVE BEEN PROPOSED; THEIR PRACTICABILITY AND EFFICACY IS DIFFICULT TO PREDICT. (VOIGTLANDER-WISCONSIN)

FIELD 02H, 05C

ACCESSION NO. W70-04496

DISTRIBUTION OF C-14 IN PRODUCTS OF PHOTOSYNTHESIS AND ITS RELATIONSHIP TO  
PHYTOPLANKTON COMPOSITION AND RATE OF PHOTOSYNTHESIS,

ASHLAND COLL., OHIO. DEPT. OF BIOLOGICAL SCIENCES.

JOHN H. OLIVE, DUANE M. BENTON, AND JACK KISHLER.

ECOLOGY, VOL 50, NO 3, P 380-386, 1969. 6 FIG, 2 TAB, 31 REF.

DESCRIPTORS:

\*LAKES, \*PHOTOSYNTHESIS, \*PHYTOPLANKTON, METHODOLOGY, STANDING CROP,  
PROTEINS, CARBOHYDRATES, LIPIDS, GROWTH RATES, LAKE ERIE.

IDENTIFIERS:

\*CARBON-14, \*PHOTOSYNTHETIC RATE, CASCINODISCUS, APHANIZAMENON,  
MICROCYSTIS, CERATIUM.

ABSTRACT:

DISTRIBUTION OF CARBON-14 IN FOUR DOMINANT SPECIES OF PHYTOPLANKTON WAS  
DETERMINED FROM IN SITU CULTURES. ETHANOL-SOLUBLE FRACTIONS OF  
PHYTOPLANKTON ACCOUNTED FOR 25-60% OF ASSIMILATED CARBON-14; INSOLUBLE  
FRACTIONS ACCOUNTED FOR 20-48%. ION-EXCHANGE FRACTIONATION OF  
ETHANOL-SOLUBLE FRACTION REVEALED 68-83% OF CARBON-14 IN  
CARBOHYDRATE-LIPID FRACTION; 8-23% IN NON-AMINO ORGANIC ACID FRACTION  
AND 3-20% IN FREE AMINO ACID FRACTION. DISTRIBUTION OF CARBON-14 IN  
DIFFERENT FRACTIONS VARIED WITH SPECIES OF ALGA, RATE OF POPULATION  
INCREASE AND LEVEL OF ILLUMINATION. RAPIDLY-GROWING POPULATIONS SHOWED  
HIGHER PROPORTIONS OF CARBON-14 IN PROTEIN FRACTIONS; HIGH PROPORTIONS  
OF CARBON-14 IN CARBOHYDRATE-LIPID FRACTIONS WERE ASSOCIATED WITH HIGH  
PHOTOSYNTHETIC RATES. GRAPHICAL DATA INCLUDE TEMPORAL VARIATION IN  
DISTRIBUTION OF CARBON-14 AND IN TOTAL AND RELATIVE RATES OF  
PHOTOSYNTHESIS. (VOIGTLANDER-WISCONSIN)

FIELD 02H

ACCESSION NO. W70-04497

PLANKTON DIATOM ASSEMBLAGES IN LAKE MICHIGAN,

MICHIGAN UNIV., ANN ARBOR.

EUGENE F. STOERMER, AND J. J. YANG.

UNIVERSITY OF MICHIGAN, ANN ARBOR, GREAT LAKES RESEARCH DIVISION, SPECIAL  
REPORT NO. 47, 1969. 268 P, 65 REF.

DESCRIPTORS:

PHYTOPLANKTON, \*DIATOMS, LAKE MICHIGAN, EUTROPHICATION.

IDENTIFIERS:

DIVERSITY INDEX, \*THERMAL BAR.

ABSTRACT:

DETAILED ANALYSES ARE PRESENTED OF PLANKTON DIATOM POPULATIONS OCCURRING IN MODERN COLLECTIONS FROM ALL PARTS OF THE LAKE AS WELL AS COLLECTIONS FROM THE CHICAGO AREA DATING BACK TO 1876. RECORDS OF OCCURRENCE AND POPULATION FREQUENCY ARE GIVEN FOR 714 TAXONOMIC ENTITIES. DIVERSITY AND REDUNDANCY INDICES WERE CALCULATED FOR THE ASSEMBLAGES EXAMINED. STUDY SHOWED INCREASING INCURSION OF POLLUTION TOLERANT FORMS INTO THE LAKE MICHIGAN FLORA. SPECIES WHICH HAVE CAUSED OBJECTIONAL BLOOMS IN RECENT YEARS IN SOUTHERN LAKE MICHIGAN FIRST OCCURRED IN COLLECTIONS TAKEN IN THE 1930'S AND NOW ARE FOUND IN ALL PARTS OF THE LAKE. SPECIES ASSOCIATED WITH EXTREME WATER QUALITY DEGRADATION IN LAKE ERIE HAVE RECENTLY BEEN INTRODUCED INTO LAKE MICHIGAN. AT THE PRESENT TIME EXTREME DIFFERENCES ARE NOTED BETWEEN THE NEARSHORE FLORA AND THAT OF THE OPEN LAKE, PARTICULARLY DURING THERMAL BAR CONDITIONS IN THE SPRING. ON THE BASIS OF FLORISTIC ANALYSIS THE AUTHOR'S GENERAL CONCLUSION IS THAT LAKE MICHIGAN AT THE PRESENT TIME IS APPROACHING THE BREAK-POINT BETWEEN TRANSIENT ALGAL NUSIANCES CONFINED TO THE INSHORE AREA AND MORE DRASTIC CHANGES AFFECTING THE ENTIRE ECOSYSTEM.

FIELD 05C, 021

ACCESSION NO. W70-04902

WATER MASSES AND THEIR MOVEMENTS IN WESTERN LAKE ERIE,

OHIO STATE GEOLOGICAL SURVEY, COLUMBUS.

CHARLES E. HERDENDORF.

OHIO GEOLOGICAL SURVEY REPORT OF INVESTIGATIONS NO 74, 1969. 7  
REF.

DESCRIPTORS:

\*LAKE ERIE, \*LIMNOLOGY, \*FLOW, CHEMICAL PROPERTIES, CURRENTS(WATER),  
WATER CHEMISTRY, HYDROLOGY, WATER LEVELS, TRACKING TECHNIQUES.

IDENTIFIERS:

WATER MASS MOVEMENT.

ABSTRACT:

A SYNOPTIC SURVEY OF SEVERAL OF THE PHYSICAL AND CHEMICAL CHARACTERISTICS OF THE WATER IN WESTERN LAKE ERIE WAS CONDUCTED ON JUNE 23, 1963. THE MAIN OBJECTIVE OF THE STUDY WAS TO DETERMINE THE FEASIBILITY AND VALUE OF A SYNOPTIC SURVEY OF WATER PROPERTIES AS A METHOD OF MAPPING WATER MASSES AND OF DETERMINING THEIR ORIGINS AND PATHS OF MOVEMENT. THIS BASIN IS THE RECIPIENT OF LARGE INFLUXES OF WATER, EACH WITH ITS DISTINCTIVE PROPERTIES, FROM THE DETROIT AND MAUMEE RIVERS AND FROM THE CENTRAL BASIN OF LAKE ERIE. SAMPLING STATIONS WERE ESTABLISHED ON A TWO-MILE GRID, RESULTING IN A TOTAL OF 300 STATIONS. AT EACH STATION WATER SAMPLES WERE TAKEN WITH KEMMERER WATER SAMPLERS AT TWO DEPTHS: 5 FEET BELOW THE SURFACE AND 2 FEET ABOVE THE BOTTOM. AT THE TIME OF SAMPLING, WATER TEMPERATURES WERE MEASURED TO THE NEAREST DEGREE FAHRENHEIT. THE COMPUTED VELOCITIES ARE GENERALLY SUBSTANTIATED BY DIRECT MEASUREMENTS. TEMPERATURE AND CONDUCTIVITY VALUES INDICATE A DOMINATING SOUTHWARD MOVEMENT OF THE DETROIT RIVER WATER. A NORTHWESTWARD FLOW OF CENTRAL LAKE ERIE WATER INTO THE SOUTHERN ISLANDS AREA AND SOUTH OF PEELE POINT IS ALSO RECOGNIZED. MOST OF THE FLOW FROM WESTERN LAKE ERIE INTO THE CENTRAL BASIN APPEARS TO BE THROUGH PEELE PASSAGE. VARIATIONS IN WATER LEVELS, WHEN CORRELATED WITH PODLIKE MASSES OF WATER WHICH HAVE ENTERED THE LAKE FROM THE DETROIT RIVER, PROVIDE DATA FOR DETERMINING THE VELOCITY OF THEIR MOVEMENTS. THE AVERAGE VELOCITY OF DETROIT RIVER WATER FLOW IN WESTERN LAKE ERIE IS APPROXIMATELY 0.5 FT/SEC. (KNAPP-USGS)

FIELD 02H

ACCESSION NO. W70-05076

THE INFLUENCE OF NITROGEN ON HETEROCYST PRODUCTION IN BLUE-GREEN ALGAE,

BUREAU OF COMMERCIAL FISHERIES, ANN ARBOR, MICH. BIOLOGICAL LAB.

ROANN E. OGAWA, AND JOHN F. CARR.

LIMNOLOGY AND OCEANOGRAPHY, VOL 14, NO 3, P 342-351, 1969. 7 FIG, 4 TAB, 26 REF.

DESCRIPTORS:

\*ALGAE, \*CYANOPHYTA, \*NITROGEN FIXATION, NUTRIENTS, LAKE ERIE.

IDENTIFIERS:

\*HETEROCYSTS, ANABAENA VARIABILIS, MICROCYSTIS AERUGINOSA, APHANIZOMENON FLOS-AQUAE, OSCILLATORIA, ANABAENA CYLINDRICA B629, ANABAENA INAEQUALIS 381, ANABAENA FLOS AQUAE, TOLYPOTHRIX DISTORTA, GLOEOTRICHIA ECHINULATA LB 1303.

ABSTRACT:

INDIRECT EVIDENCE IS PRESENTED SUGGESTING INVOLVEMENT OF HETEROCYSTS IN UTILIZATION OF ATMOSPHERIC NITROGEN AS SOLE NITROGEN SOURCE FOR ALGAE. SEVEN HETEROCYSTOUS (KNOWN ATMOSPHERIC NITROGEN-FIXING) BLUE-GREEN ALGAE WERE GROWN IN A MODIFIED CHU NO 10 MEDIUM DEVOID OF COMBINED NITROGEN; TWO NON-HETEROCYSTOUS (NON-ATMOSPHERIC-FIXING) BLUE-GREENS DID NOT GROW IN THIS MEDIUM. HETEROCYSTS WERE PRODUCED SHORTLY AFTER INOCULA DEVOID OF HETEROCYSTS WERE PLACED IN NITROGEN-FREE MEDIUM. PRODUCTION WAS GREATEST WHEN ATMOSPHERIC NITROGEN SERVED AS SOLE NITROGEN SOURCE, AND LEAST WHEN AMMONIA-NITROGEN SERVED AS SOLE NITROGEN-SOURCE. NITRATE-NITROGEN PRODUCED AN INTERMEDIATE NUMBER OF HETEROCYSTS. WHEN MEDIUM NITRATE-NITROGEN CONTENT WAS VARIED AS SOLE NITROGEN SOURCE, NUMBERS OF HETEROCYSTS PRODUCED WERE INVERSELY PROPORTIONAL TO THE NITROGEN CONCENTRATION. THEY DID NOT DEVELOP IN THE ABSENCE OF PHOSPHORUS, BUT NO EFFORT WAS MADE TO DETERMINE THE CRITICAL PHOSPHORUS CONCENTRATION FOR THEIR PRODUCTION. PRODUCTION OF HETEROCYSTS IN CIRCUMSTANCES OF LOW COMBINED NITROGEN MAY PROVIDE AN ECOLOGICAL ADVANTAGE. THE RELATIVE NUMBERS OF HETEROCYSTS IN FIELD-COLLECTED SAMPLES INDICATE THE RELATIVE AMOUNT OF AVAILABLE NITROGEN AND A CONTINUING SUPPLY OF AVAILABLE PHOSPHORUS. (GERHOLD-WISCONSIN)

FIELD 05C

ACCESSION NO. W70-05091

**NUTRIENT REMOVAL A UNIVERSAL REQUIREMENT,**

**ROGER DAVIES.**

**WATER AND POLLUTION CONTROL, P 28-30, JANUARY 1970. 1 FIG.**

**DESCRIPTORS:**

**\*NUTRIENTS, INTERNATIONAL JOINT COMMISSION, LAKE ERIE, LAKE ONTARIO, WATER POLLUTION, EUTROPHICATION, ST LAWRENCE RIVER, OLIGOTROPHY, TURBIDITY, PRODUCTIVITY, PHYTOPLANKTON, PHOSPHORUS, NITROGEN, DETERGENTS, INDUSTRIAL WASTES, MUNICIPAL WASTES, RETENTION, SEDIMENTATION, CYANOPHYTA, NITROGEN FIXATION, SEWAGE TREATMENT, EFFLUENTS, DRAINAGE, AGRICULTURAL WATERSHEDS, COLIFORMS, MICHIGAN, OHIO, NEW YORK, STORM DRAINS, VIRUSES, HERBICIDES, PESTICIDES, OIL WASTES, GASOLINE, DRILLING, COST ANALYSIS.**

**IDENTIFIERS:**

**\*REMOVAL, \*REQUIREMENT, MESOTROPHIC, CANADA, DETROIT(MICH), TOLEDO(OHIO), CLEVELAND(OHIO), BUFFALO(N Y), NIAGARA RIVER(N Y), OSHAWA(CANADA), STANDBY EQUIPMENT, PUBLIC.**

**ABSTRACT:**

**THIS REVIEW OF THE INTERNATIONAL JOINT COMMISSION FINDINGS ON POLLUTION OF LAKES ERIE AND ONTARIO AND THE ST LAWRENCE RIVER INTERNATIONAL SECTION RECOMMENDS COMPLETE REPLACEMENT OF PHOSPHORUS COMPOUNDS IN DETERGENTS AND PHOSPHORUS REDUCTION IN MUNICIPAL AND INDUSTRIAL WASTES WITH NITROGEN REDUCTION TO FOLLOW. PARTIAL REPLACEMENT OF PHOSPHATES IN DETERGENTS IS POSSIBLE WITH NO REDUCTION IN CLEANSING EFFICIENCY. AN ENVIRONMENTALLY HARMLESS SUBSTITUTE FOR FULL REPLACEMENT OF PHOSPHATES MIGHT BE FOUND. IF PHOSPHATES WERE REPLACED IN DETERGENTS, REMOVAL OF 80% OF REMAINING PHOSPHORUS AT SEWAGE TREATMENT PLANTS WOULD REDUCE THE CONCENTRATION TO 0.6 MILLIGRAMS/LITER. FURTHER REDUCTIONS IN LAKES ARE POSSIBLE BY PREVENTING LAND DRAINAGE. ANTI-POLLUTION RECOMMENDATIONS INCLUDE: STANDBY EQUIPMENT TO TAKE OVER DURING BREAKDOWNS, INADEQUATE PERFORMANCE, OR OVERFLOWS; SEPARATION OF STORM AND SANITARY SEWAGE COLLECTION SYSTEMS; AVOIDANCE OF BYPASSING UNTREATED WASTES; INTENSIFICATION OF VIRAL RESEARCH; REQUIREMENT THAT ORGANIZATIONS, PLANNING THERMAL POWERPLANTS, SUBMIT PLANS TO POLLUTION CONTROL AGENCIES; BANNING UNCONFINED OPEN LAKE DUMPING; IMPLEMENTATION OF HERBICIDES AND PESTICIDES CONTROLS; RECOGNITION THAT OIL AND GAS DRILLING ARE POTENTIAL POLLUTION SOURCES; MAINTENANCE OF ADEQUATE WATER QUALITY MONITORING. SUCCESS OF THE PROPOSALS DEPENDS UPON WILLINGNESS OF THE PUBLIC TO PAY INCREASED CONTROL COSTS. (JONES-WISCONSIN)**

**FIELD 02H, 05C**

**ACCESSION NO. W70-05412**

THE AGING GREAT LAKES.

CHARLES F. POWERS, AND ANDREW ROBERTSON.

SCIENTIFIC AMERICAN, VOL 215, NO 5, P 94-100, 102, 104, 1966. 8 FIG.

DESCRIPTORS:

\*EUTROPHICATION, \*GREAT LAKES, \*LAKE ERIE, LAKE HURON, FISH, FISH POPULATIONS, BASS, HERRING, WALLEYE, PIKES, LAMPREYS, CARP, TROUT, COMMERCIAL FISHING, PERCHES, INDUSTRIAL WASTES, WASTES.

IDENTIFIERS:

DETROIT RIVER, CATTARAUGUS CREEK(N Y), ALEWIFE, SUCKERS.

ABSTRACT:

A GENERAL PHYSICAL AND GEOGRAPHICAL LOOK AT THE GREAT LAKES TOGETHER WITH SOME ECOLOGICAL CHANGES THAT HAVE OCCURRED BECAUSE OF MAN'S ACTIVITIES ARE PRESENTED. NATURAL AGING ASPECTS OF THE LAKES VERSUS ACCELERATED AGING (EUTROPHICATION) ARE COMPARED. ONE OF THE FIRST INSTANCES OF MAN'S CATASTROPHIC EFFECTS ON THE NATURAL RESOURCES FOLLOWED THE BUILDING OF THE WELAND CANAL, WHICH ALLOWED THE SEA LAMPREY AND ALEWIFE TO PENETRATE AROUND NIAGARA FALLS INTO THE INNER LAKES. BY THE 1950'S THE ALEWIFE HAD KILLED OFF NEARLY ALL THE LAKE TROUT AND BURBOT IN LAKES HURON, MICHIGAN AND SUPERIOR. THE ALEWIFE HAS BECOME PROMINENT AND THREATENS TO CHANGE THE ECOLOGICAL BALANCE BY FEEDING ON THE EGGS OF MORE DESIRABLE SPECIES. THE COHO SALMON EXPERIMENT IN LAKES MICHIGAN AND SUPERIOR, TO REDUCE THE ALEWIFE POPULATION IS BRIEFLY DISCUSSED. ECOLOGICAL ALTERATIONS THAT WILL OCCUR AS THE RESULT OF POLLUTION WILL BE MORE PROFOUND. INDUSTRIAL AND MUNICIPAL POLLUTANTS THAT ARE DISCHARGED INTO LAKE ERIE AND THEIR EFFECT ON COMMERCIAL FISHING ARE DRASTIC. BETWEEN 1956 AND 1965 CATCHES OF BLUE PIKE, WALLEYE, LAKE HERRING, WHITEFISH, AND SAUGER DECLINED WHILE CATCHES OF UNDESIRABLE SPECIES ROSE. (HASKINS-WISCONSIN)

FIELD 02H, 05C

ACCESSION NO. W70-05415

PORT AUTHORITIES (ESTABLISHMENT, AUTHORITY, AND REGULATION OF PORT AUTHORITIES).

OHIO REV CODE ANN SECS 4582.01 THRU 4582.20 (PAGE, 1965), AS AMENDED, (SUPP .1970).

DESCRIPTORS:

\*OHIO, \*PORT AUTHORITIES, \*HARBORS, \*LAKE ERIE, LEGAL ASPECTS, LEGISLATION, CITIES, FEDERAL GOVERNMENT, STATE GOVERNMENTS, INTER-AGENCY COOPERATION, WATER RESOURCES DEVELOPMENT, ADMINISTRATION, LAKES, CHANNELS, CHANNEL IMPROVEMENT, DRAINAGE SYSTEMS, RECREATION FACILITIES, RIPARIAN LAND, RIPARIAN RIGHTS, DOCKS, PIERS, COSTS, TAXES, NAVIGATION, EMINENT DOMAIN, RIGHT-OF-WAY, EASEMENTS, WATERCOURSES(LEGAL).

ABSTRACT:

ANY MUNICIPAL CORPORATION OR COUNTY MAY CREATE A PORT AUTHORITY OR MAY JOIN AN EXISTING PORT AUTHORITY. A COUNTY CREATING A PORT AUTHORITY MUST FULLY COMPENSATE THE MUNICIPALITIES WITHIN THE COUNTY FOR THEIR PRIOR WATERFRONT INVESTMENTS. A BOARD OF DIRECTORS GOVERNS EACH PORT AUTHORITY. A PORT AUTHORITY MAY: (1) PURCHASE, CONSTRUCT, AND OPERATE COMMERCIAL AND RECREATIONAL FACILITIES; (2) IMPROVE ANY WATERCOURSE NECESSARY TO DEVELOPMENT OF PORT FACILITIES; (3) ISSUE BONDS TO FINANCE AUTHORIZED ACTIVITIES; (4) EXERCISE THE POWER OF EMINENT DOMAIN WHEN NECESSARY FOR THE CONSTRUCTION OR EFFICIENT OPERATION OF ANY OF ITS FACILITIES; (5) ENTER INTO CONTRACTS OR AGREEMENTS WITH OTHER GOVERNMENTAL AGENCIES; AND (6) CONTRACT FOR CONSTRUCTION OR IMPROVEMENT OF FACILITIES IN ACCORDANCE WITH CERTAIN ENUMERATED RESTRICTIONS. PROCEDURES ARE ESTABLISHED WHICH ENABLE THE OWNERS OF LAND ABUTTING LAKE ERIE AND WITHIN THE JURISDICTION OF A PORT AUTHORITY TO ENTER INTO LEASES OF ADJACENT SUBMERGED LAND FROM THE STATE FOR PURPOSES OF CONSTRUCTING IMPROVEMENTS. THE DIRECTOR OF PUBLIC WORKS MUST APPROVE LEASES OF THIS TYPE. (CASEY-FLORIDA)

FIELD 06E

ACCESSION NO. W70-05661



**MUNICIPAL CORPORATIONS- SALE OR LEASE OF PROPERTY (USE, LEASE AND CONTROL OF LAKE ERIE WATERS AND SOIL).**

OHIO REV CODE ANN SECS 721.04, 721.05, 721.09, 721.11 (PAGE, 1953), AS AMENDED, (SUPP, 1970).

**DESCRIPTORS:**

\*OHIO, \*LAKE ERIE, \*CITIES, \*LAND DEVELOPMENT, LEGISLATION, MUNICIPAL WATER, LANDFILLS, LAND FORMING, LAND MANAGEMENT, DOCKS, BULKHEAD LINES, BULKHEADS, COASTAL STRUCTURES, PIERS, HIGHWAYS, ROAD CONSTRUCTION, ASSESSMENTS, COST REPAYMENT, COST ALLOCATION, COST SHARING, SHORES, LITTORAL, LEGAL ASPECTS, LAND TENURE, REAL PROPERTY, LAND USE.

**ABSTRACT:**

MUNICIPAL CORPORATIONS BORDERING LAKE ERIE MAY OPERATE DOCKING AND TERMINAL FACILITIES ON MUNICIPAL PROPERTY OR ON ARTIFICIALLY FILLED STATE PROPERTY BEYOND THE SHORELINE. THEY MAY ALSO REGULATE THE ESTABLISHMENT OF HARBOR LINES AND OTHER ENCROACHMENTS ON THE TERRITORY. MUNICIPAL AUTHORITY OVER EXISTING LAND, OR LAND CREATED BY FILLING, EXTENDS TWO MILES BEYOND THE NATURAL SHORELINE AND IS SUBJECT TO ANY RIGHTS OF THE FEDERAL GOVERNMENT. LAND FILLED OR IMPROVED BY THE UPLAND OWNER MAY NOT BE TAKEN BY THE MUNICIPALITY WITHOUT FOLLOWING THE PROCEDURES PROVIDED. RENTALS COLLECTED FOR THE USE OF SUCH LAND OR FACILITIES MAY BE USED ONLY FOR THE IMPROVEMENT OF NAVIGATION AND WATER COMMERCE. ANY MUNICIPALITY HAVING JURISDICTION OVER WATERFRONT PROPERTY MAY DEVELOP THE WATERFRONT BY CONSTRUCTING BULKHEADS AND FILLING PROPERTY OUT TO THE BULKHEADS. LAND BENEFITED BY SUCH DEVELOPMENT MAY BE ASSESSED FOR THE COST OF SAME, AND BONDS MAY BE ISSUED IN ANTICIPATION OF THE ASSESSMENTS. (DOUBERLEY-FLORIDA)

**FIELD 06E**

**ACCESSION NO. W70-05771**

AGRICULTURAL POLLUTION OF WATER BODIES,

AGRICULTURAL RESEARCH SERVICE, WASHINGTON, D.C.

WILLIAM M. EDWARDS, AND LLOYD L. HARROLD.

THE OHIO JOURNAL OF SCIENCE VOL 70, NO 1, P 50-56, JAN 1970.

DESCRIPTORS:

\*WATER POLLUTION, \*FARMS, \*LIVESTOCK, \*PHOSPHORUS, \*NITRATES,  
\*PESTICIDES, \*SOIL CONSERVATION, RUNOFF, EROSION, PERCOLATION,  
SEDIMENT, WASTE.

IDENTIFIERS:

LAKE ERIE, BARNYARD, SOLIDS, LIQUIDS.

ABSTRACT:

POLLUTION OF OHIO'S WATER BODIES IS OF GROWING PUBLIC CONCERN; INDUSTRIAL, URBAN, AND RURAL SOURCES ARE BECOMING THE SUBJECT OF CRITICAL EXAMINATION. RURAL SOURCES ARE SOIL SEDIMENT, PLANT NUTRIENTS, ANIMAL WASTE, AND PESTICIDES. PESTICIDES AND PHOSPHORUS ARE ABSORBED RAPIDLY AND STRONGLY TO SOIL PARTICLES. THEREFORE REDUCTIONS IN SEDIMENT, PHOSPHORUS, AND PESTICIDE POLLUTION ARE ACHIEVED BY SOIL-EROSION-CONTROL FARMING PRACTICES. MORE ACRES NEED TO BE BROUGHT UNDER EROSION-CONTROL PRACTICES. NITRATES DISSOLVE IN WATER AND ARE CARRIED BY SURFACE FLOW TO STREAMS AND LAKES, AND BY PERCOLATING WATER TO UNDERGROUND AQUIFERS. INCREASES IN THE USE OF NITROGEN FERTILIZER, IN EVIDENCE ALMOST EVERYWHERE, COULD RESULT IN SERIOUS CONTAMINATION OF WATER BODIES, IF SOIL ENRICHMENT GREATLY EXCEEDS THE CROP DEMAND. AREAS WHERE LARGE-SCALE LIVESTOCK AND POULTRY PRODUCTION IS CONCENTRATED ARE ALSO POTENTIAL SOURCES OF SERIOUS POLLUTION. IN OHIO, ANIMAL-WASTE POLLUTION PROBLEMS ARE BEING STUDIED AT THE OHIO STATE UNIVERSITY, AND MOVEMENT OF POLLUTANTS IN SURFACE AND SUBSURFACE WATERS ON DRAINAGE PLOTS NEAR CASTALIA ARE BEING STUDIED BY THE OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER AND ON AGRICULTURAL WATERSHEDS BY USDA AGRICULTURAL RESEARCH SERVICE AT COSHOCTON, OHIO. (HARROLD-USDA, ARS)

FIELD 05B

ACCESSION NO. W70-06041

FRESH WATER WHITECAPS,

HOBART AND WILLIAM SMITH COLLEGES, GENEVA, N.Y.

EDWARD C. MONAHAN.

AVAILABLE FROM THE CLEARINGHOUSE AS AD-698 977, \$3.00 IN PAPER COPY, \$0.65 IN MICROFICHE. JNL OF ATMOSPHERIC SCIENCES, V. 26, NO. 5, PT. 2, P. 1026-1029, SEPT. 69. ONR CONTRACT N00014-68-C-0409, NR 083-212.

DESCRIPTORS:

\*WAVES, LAKE MORPHOMETRY, LAKES, GREAT LAKES, WINDS, VELOCITY, AIR TEMPERATURE, THERMAL PROPERTIES, HYGROMETRY, ANEMOMETERS, BUBBLES,

IDENTIFIERS:

\*WHITECAPS, LAKE SUPERIOR, LAKE HURON, LAKE ERIE, DETROIT EDISON VESSEL, NAUGATUCK VESSEL, AIR WATER INTERACTIONS, WIND VELOCITY.

ABSTRACT:

PHOTOGRAPHIC OBSERVATIONS OF THE WHITECAP COVERAGE OF LARGE FRESH WATER LAKES WERE MADE IN CONJUNCTION WITH MEASUREMENTS OF WIND VELOCITY, AND AIR AND SURFACE WATER TEMPERATURES. THE FRACTION OF THE WATER SURFACE COVERED BY WHITECAPS SHOWS AN ABRUPT INCREASE AS THE WIND VELOCITY INCREASES FROM APPROXIMATELY 7 TO APPROXIMATELY 8 M/SEC. THIS ABRUPT CHANGE IS QUALITATIVELY IN ACCORD WITH THE PUBLISHED OBSERVATIONS OF 'CRITICAL' WIND VELOCITIES ASSOCIATED WITH NUMEROUS OTHER WATER-SURFACE AND SURFACE-RELATED PHENOMENA. THE WHITECAP COVERAGE OF FRESH WATER BODIES, PARTICULARLY AT THE HIGHER WIND VELOCITIES, IS MUCH LESS THAN THE PUBLISHED VALUES OF WHITECAP COVERAGE OF OCEANS UNDER THE SAME WIND CONDITIONS.

FIELD 02L, 07B

ACCESSION NO. W70-06459

THE GREAT LAKES WATER RESOURCE,

FEDERAL WATER POLLUTION CONTROL ADMINISTRATION, CHICAGO, ILL. GREAT LAKES REGION.

H. W. POSTON, AND C. R. DOWNBEY.

JOURNAL AMERICAN WATER WORKS ASSOCIATION, VOL 60, NO 1, P 15-20, 1968. 4 REF.

DESCRIPTORS:

\*GREAT LAKES, \*WATER RESOURCES, WATER QUALITY, EUTROPHICATION, LAKE ERIE, LAKE ONTARIO, LAKE MICHIGAN, PHOSPHATES, PRODUCTIVITY, FERTILIZATION, CHEMICALS, DISSOLVED OXYGEN, STRATIFICATION, BACTERIA, SEWAGE EFFLUENTS, STORM RUNOFF, SEWERS, ST. LAWRENCE RIVER, LAKE HURON, NEW YORK, MICHIGAN, ILLINOIS, WISCONSIN, OHIO, INDIANA, PENNSYLVANIA.

IDENTIFIERS:

CANADIAN GOVERNMENT, ONTARIO, DETROIT(MICH), CALUMET RIVER(ILL), FOX RIVER(WIS), SAGINAW RIVER(MICH), CUYAHOGA RIVER(OHIO), MAUMEE RIVER(OHIO), MENOMINEE RIVER(WIS).

ABSTRACT:

LAKE ERIE HAS THE LARGEST CONTRIBUTING POPULATION TO DEGRADATION ON ITS WATERSHED AND THE LARGEST DISCHARGER OF MUNICIPAL EFFLUENTS UNDERGOING ONLY TOKEN NUTRIENT REDUCTION. MODIFICATION OF TREATMENT PLANT DESIGN AND OPERATING PRACTICES CAN REDUCE PHOSPHATE CONCENTRATION IN WASTE WATER TO A HIGH DEGREE. ACCURATE MEASUREMENT OF PRODUCTIVITY AND EFFICIENT TECHNIQUES FOR CONTROL OF AQUATIC ORGANISMS ARE NEEDED. CHEMICAL CONSTITUENTS ARE INCREASING; FOR EXAMPLE, CHLORIDES TRIPLED FROM 1910 TO 1960; OXYGEN DEPLETION RESULTS FROM OVERSTIMULATION OF BIOLOGICAL ACTIVITY; HEALTH HAZARDS ALONG THE SHORES PREVAIL FROM INADEQUATELY DISINFECTED SEWAGE EFFLUENTS. THE LARGEST SINGLE PLANNING EFFORT UNDER WAY AT PRESENT IS THE GREAT LAKES-ILLINOIS RIVER BASINS STUDY UNDER THE FEDERAL WATER POLLUTION CONTROL ACT. THE INTERNATIONAL JOINT COMMISSION IS ALSO COORDINATING A STUDY. PLANS FOR LOCAL ACTIONS ARE FORMULATED. THE ADMINISTRATORS' AND POLICY MAKERS' TASK WILL BE TO ASSURE PROPER BALANCE IN THE EFFORTS DIRECTED TO RESEARCH, PLANS FOR ACTION AND APPLICATION. SOME ACCEPTABLE INSTITUTIONAL ARRANGEMENT MUST BE EVOLVED TO SETTLE DISPUTES BETWEEN CONFLICTING INTERESTS. AN ORGANIZATION HAVING AUTHORITY TO COMMAND EFFECTIVE ACTION MUST BE ESTABLISHED, CORRELATING EFFORTS OF PHYSICAL SCIENTISTS, ENGINEERS, ECONOMISTS, LAWYERS, AND POLITICAL SCIENTISTS. A TVA OF THE GREAT LAKES IS SUGGESTED. (JONES-WISCONSIN)

FIELD 06B

ACCESSION NO. W70-06658

NEARSHORE TWO-DIMENSIONAL DISPERSION,

GREAT LAKES WATER RESOURCES COMMISSION, TORONTO. GREAT LAKES WATER SURVEYS  
SPECIAL STUDIES PROGRAM.

W. A. PALMER, AND J. B. HAYY.

GREAT LAKES WATER RESOURCES COMMISSION, CANADA GREAT LAKES SURVEYS PROGRAM  
1970. 29 P, 11 FIG, 5 TAB, 9 REF.

DESCRIPTORS:

LAKEES, \*CURRENTS (WATER), \*DISPERSION, MARKOV PROCESSES, STOKASTIC  
PROCESSES, INSTRUMENTATION, CURRENT METERS, GREAT LAKES, CANADA  
RELEASES, TRACKING TECHNIQUES, STATISTICAL METHODS.

IDENTIFIERS:

LAKESHORE DISPERSION.

ABSTRACT:

NEARLY TWO-DIMENSIONAL DISPERSION CHARACTERISTICS ARE DETERMINED BY  
RECORDING CURRENT METER HISTORIES FOR THE NEARSHORE AREAS ON LAKE  
AND LAKE ONTARIO. THE CURRENT HISTORIES WERE OBTAINED IN AREAS  
1 KM OF SHORE AND AT WATER DEPTHS OF 10 TO 14 METERS DURING MAY 1960.  
A MARKOV CHAIN PROCESS WAS APPLIED TO HOURLY  
READINGS. THREE DIFFERENT FORMULATIONS OF THE STOCHASTIC PROCESS  
WERE TESTED PRIOR TO THE SELECTION OF THE MOST RELIABLE ONE. THE RESULTS  
OBTAINED IN APPLYING THE DEVELOPED TECHNIQUE COMPARE FAVORABLE WITH  
RESULTS OBTAINED FROM CONVENTIONAL DYE INJECTION AND DRUGUE STUDIES.  
(MAPP-USGS)

FIELD 02H

ACCESSION NO. M70-06762

CHEMICAL CHARACTERISTICS OF LAKE ONTARIO,

BUREAU OF COMMERCIAL FISHERIES, ANN ARBOR, MICH. BIOLOGICAL LAB.

HERBERT E. ALLEN.

GREAT LAKES FISHERY COMMISSION TECHNICAL REPORT NO 14, P 1-18, 1969. 1 FIG, 5  
TAB, 14 REF.

DESCRIPTORS:

\*SAMPLING, \*LAKE ONTARIO, \*CHEMICAL PROPERTIES, DISSOLVED OXYGEN,  
HYDROGEN ION CONCENTRATION, ALKALINITY, CONDUCTIVITY, POTASSIUM,  
SODIUM, CALCIUM, SILICA, NANSEN BOTTLES.

IDENTIFIERS:

OPEN WATER, CHEMICAL VARIATIONS.

ABSTRACT:

SAMPLES OF OPEN WATER WERE COLLECTED AT 106 STATIONS IN LAKE ONTARIO  
WITH THE INTENTION OF ESTABLISHING EAST-WEST AND SURFACE-SUBSURFACE  
VARIATIONS IN WATER QUALITY. DETERMINATIONS OF PH VALUES, ALKALINITY,  
SPECIFIC CONDUCTANCE, AND DISSOLVED OXYGEN WERE PERFORMED ON THE  
RESEARCH BOAT USING SAMPLES COLLECTED WITH NANSEN BOTTLES.  
DETERMINATION OF CALCIUM, POTASSIUM, SODIUM, AND SILICA WAS MADE IN THE  
LABORATORY. WITH THE EXCEPTION OF DISSOLVED OXYGEN, LAKE ONTARIO WAS  
FOUND TO BE CHEMICALLY SIMILAR TO LAKE ERIE, WHICH SUPPLIES LAKE  
ONTARIO WITH 85% OF ITS WATER. THE AVERAGE CONCENTRATION OF DISSOLVED  
OXYGEN IN SURFACE WATER WAS ASTONISHINGLY HIGH, VARYING FROM 8.85 TO  
9.76 PPM. (WILDE-WISCONSIN)

FIELD 02K, 02H

ACCESSION NO. W70-06966

PESTICIDE CONCENTRATIONS IN GREAT LAKES FISH,

BUREAU OF COMMERCIAL FISHERIES, ANN ARBOR, MICH. GREAT LAKES FISHERY LAB.

ROBERT E. REINERT.

CONTRIB. NO. 371 OF GREAT LAKES FISHERY LABORATORY. PESTICIDES MONITORING JOURNAL, VOL. 3, NO. 4, P 233-240, MARCH 1970. 8 TAB, 1 FIG, 8 REFS.

DESCRIPTORS:

\*GREAT LAKES, \*DIELDRIN, \*DDT, CHLORINATED-HYDROCARBON PESTICIDES, \*PESTICIDE RESIDUES, LAKE MICHIGAN, GAS CHROMATOGRAPHY, LAKE ERIE, LAKE TROUT, LAKE HURON, LAKE ONTARIO, LAKE SUPERIOR, PESTICIDE REMOVAL.

IDENTIFIERS:

DDD, DDE, ALEWIFE.

ABSTRACT:

REPORTS ON A 4 YEAR STUDY BY ANN ARBOR GREAT LAKES FISHERY LABORATORY OF THE BUREAU OF COMMERCIAL FISHERIES ON INSECTICIDE LEVELS IN FISH FROM THE GREAT LAKES. THE TWO INSECTICIDES FOUND IN ALL GREAT LAKES FISH HAVE BEEN DDT (DDT, DDD, DDE) AND DIELDRIN. FISH FROM LAKE MICHIGAN CONTAIN FROM 2 TO 7 TIMES AS MUCH OF THESE INSECTICIDES AS THOSE FROM THE OTHER GREAT LAKES. INSECTICIDE LEVELS CALCULATED ON A WHOLE-FISH BASIS SHOW A MARKED DIFFERENCE FROM SPECIES TO SPECIES. WITHIN A SPECIES THERE IS ALSO AN INCREASE IN DDT AND DIELDRIN LEVELS WITH AN INCREASE IN SIZE. IF THESE INSECTICIDE LEVELS ARE, HOWEVER, CALCULATED AS PPM OF INSECTICIDE IN THE EXTRACTABLE FISH OIL, THE DIFFERENCES IN CONCENTRATION BETWEEN SPECIES AND THE DIFFERENCES BETWEEN SIZE GROUPS BECOMES CONSIDERABLY LESS. LABORATORY EXPERIMENTS INDICATE THAT FISH CAN BUILD UP CONCENTRATIONS OF DDT AND DIELDRIN AT THE PARTS-PER-MILLION LEVEL FROM PARTS-PER-TRILLION CONCENTRATIONS IN THE WATER. (SJOLSETH-WASHINGTON)

FIELD 05C

ACCESSION NO. W70-07138

CHANGES IN THE ENVIRONMENT AND BIOTA OF THE GREAT LAKES,

WISCONSIN UNIV., MADISON.

A. M. BEETON.

EUTROPHICATION: CAUSES, CONSEQUENCES, CORRECTIVES, P 150-187. PRINTING AND PUBLISHING OFFICE, NATIONAL ACADEMY OF SCIENCES, WASHINGTON, D C, 1969. 15 FIG, 1 TAB, 76 REF.

DESCRIPTORS:

\*SEDIMENTS, \*EUTROPHICATION, \*GREAT LAKES, LAKE MICHIGAN, LAKE SUPERIOR, LAKE HURON, LAKE ERIE, LAKE ONTARIO, NITRATES, WATER POLLUTION SOURCES, WATER POLLUTION EFFECTS, PHYSICOCHEMICAL PROPERTIES, BENTHOS, FISH POPULATIONS, DISSOLVED SOLIDS, DISSOLVED OXYGEN, SULFATES.

IDENTIFIERS:

CHLORIDES, LITERATURE REVIEW, GREEN BAY, SAGINAW BAY.

ABSTRACT:

ALTHOUGH CONCERN OVER CHANGES IN THE GREAT LAKES HAS EXISTED FOR MANY YEARS, THE IDEA THAT THE LAKES ARE UNDERGOING ACCELERATED EUTROPHICATION IS RECENT. ENVIRONMENTAL CHANGES CAN BE CONSIDERED IN THREE CATEGORIES: POLLUTION OF INSHORE AREAS, LONG-TERM CHANGES IN OPEN WATERS, AND CHANGES IN SEDIMENTS. ON THE BASIS OF ACCEPTED PHYSIOCHEMICAL CHARACTERISTICS, LAKES SUPERIOR, MICHIGAN, AND HURON ARE OLIGOTROPHIC, LAKE ERIE IS EUTROPHIC AND LAKE ONTARIO IS IN AN INTERMEDIATE CONDITION. SUPERIOR REMAINS OLIGOTROPHIC, EXCEPT FOR LOCALIZED POLLUTION; CHANGES IN FISH STOCKS ARE TRACEABLE TO COMMERCIAL FISHING AND PREDATION BY LAMPREY. LAKES MICHIGAN AND HURON HAVE UNDERGONE CHANGES INVOLVING DISSOLVED OXYGEN, TOTAL DISSOLVED SOLIDS AND BIOTA WHICH INDICATE INCREASING EUTROPHY, ESPECIALLY IN GREEN AND SAGINAW BAYS. LAKE ERIE HAS SHOWN MAJOR CHANGES IN LIMNOLOGICAL FACTORS AND BIOTA; EFFECTS OF INCREASED POLLUTION AND EUTROPHICATION OF ERIE HAVE SPREAD TO LAKE ONTARIO. THE MOST IMPORTANT CHANGES APPARENTLY ARE THOSE OCCURRING IN SEDIMENTS OWING TO THE CONTRIBUTION OF LARGE QUANTITIES OF ALLOCHTHONOUS MATERIALS RESULTING FROM URBANIZATION AND INDUSTRIALIZATION. CHANGES IN SEDIMENTS ARE IMPORTANT FACTORS IN THE OBSERVED CHANGES IN LIMNOLOGICAL FACTORS AND FISH POPULATIONS. ABATEMENT OF PRESENT CONDITIONS IN LAKE ERIE IS THEORETICALLY POSSIBLE. (SEE ALSO W70-03975). (VOIGTLANDER-WISCONSIN)

FIELD 05C

ACCESSION NO. W70-07269



THE LANGE-KUENTZEL-KERR THESIS.

CANADIAN RESEARCH AND DEVELOPMENT, MARCH 1970. 8 P, 1 FIG, 1 TAB, 14 REF.

DESCRIPTORS:

\*EUTROPHICATION, \*PHOSPHORUS, \*CARBON, BACTERIA, ALGAE, SYMBIOSIS, CARBON DIOXIDE, NITROGEN, LAKES, ESTUARIES, NUTRIENTS, DETERGENTS, WISCONSIN, LAKE ERIE, LAKE ONTARIO, ST LAWRENCE RIVER, INTERNATIONAL JOINT COMMISSION.

IDENTIFIERS:

\*CARBONACEOUS MATERIAL, \*CANADIAN PHOSPHATE DETERGENT BAN, WYANDOTTE CHEMICAL CORPORATION, FMC CORPORATION, SOAP AND DETERGENT ASSOCIATION, CARBOY TRIALS, CANADA, NITROGEN: PHOSPHORUS RATIO.

ABSTRACT:

REPORTS BY W LANGE (NATURE VOL. 215, NO. 5107: 1277-1278, SEP 17, 1967), L E KUENTZEL (JOURNAL WATER POLLUTION CONTROL FEDERATION: 1737-1747, OCT 1969), AND P C KERR (UNPUBLISHED) ARE CITED DEFENDING THE THESIS THAT CARBONACEOUS MATERIAL, NOT PHOSPHORUS, IS THE FACTOR CONTROLLING THE PROCESS OF EUTROPHICATION. AS ADDITIONAL PROOF OF THE MINOR ROLE OF PHOSPHORUS AND NITROGEN IN THE GROWTH OF ALGAE, THE REPORT INCLUDES THE RESULT OF AN EXPERIMENT CONDUCTED IN TWO SMALL OLIGOTROPHIC LAKES IN FLORIDA. ADDITION OF PHOSPHATE AND NITROGEN FERTILIZERS TO ONE OF THESE ORGANIC MATTER-FREE LAKES FAILED TO ALTER SIGNIFICANTLY THE TROPHIC STATE OF THE LAKE AND THE DENSITY OF PLANKTONIC ORGANISMS. THE ISSUE IN QUESTION IS OF A FAR-REACHING IMPORTANCE AS IT IS RELEVANT TO THE USA AND CANADIAN GOVERNMENT ACTION RESTRICTING PHOSPHATE ENRICHED EFFLUENTS OF SOAP AND DETERGENTS INTO ERIE AND ONTARIO LAKES AND THE INTERNATIONAL SECTION OF THE ST LAWRENCE RIVER. (WILDE-WISCONSIN)

FIELD 05B, 05C

ACCESSION NO. W70-07283

METEOROLOGICAL RECORDS FOR LAKESIDE, 1968 AND 1969.

STATE UNIV. COLL., FREDONIA, N.Y.

RICHARD CARROLL, AND JOHN A. JONES.

NEW YORK STATE UNIVERSITY, FREDONIA, TECHNICAL DATA REPORT NO 6, LAKE ERIE ENVIRONMENTAL STUDIES, MAY 1970. 28 P, 3 FIG, 2 REF, APPEND.

DESCRIPTORS:

\*CLIMATIC DATA, \*LAKE ERIE, \*NEW YORK, \*DATA COLLECTIONS, CLIMATOLOGY, WEATHER DATA, TEMPERATURE, HUMIDITY, WINDS, SOLAR RADIATION.

IDENTIFIERS:

LAKESIDE LABORATORY(NY).

ABSTRACT:

REDUCED METEOROLOGICAL DATA ARE SUMMARIZED FOR THE LATTER HALF OF 1968 AND ALL OF 1969 AT THE LAKESIDE LABORATORY OF LAKE ERIE ENVIRONMENTAL STUDIES. THE LAKESIDE LABORATORY IS LOCATED ON THE SOUTHEASTERN SHORE OF LAKE ERIE. THE LABORATORY IS ON A BLUFF 9 METERS ABOVE LAKE LEVEL AND ABOUT 100 METERS FROM THE SHORELINE BEHIND A LINE OF TREES AVERAGING ABOUT 15 METERS HIGH. THE RECORDING INSTRUMENTS INCLUDE A THERMOGRAPH, A HYGROMETER, AN ANEMOMETER, A PYRHELIOGRAPH, A RAIN AND SNOW GAGE, AND MICROBAROGRAPH. THE PERIOD WAS SELECTED FOR THE AVAILABILITY OF CONTINUOUS RECORDS ON THE WIDEST VARIETY OF INSTRUMENTS AND THE COMPLETENESS OF THESE RECORDS. GAPS IN THE RECORDS REFLECTING PERIODS OF INSTRUMENT FAILURE, ARE FEW. ON THE WHOLE, THE REPORTING PERIOD MAY BE DESCRIBED AS RELATIVELY TYPICAL FOR THE REGION. TOTAL PRECIPITATION FOR BOTH YEARS WAS QUITE CLOSE TO NORMAL. WINTER TEMPERATURES WERE ATYPICALLY MILD. WIND AND PRESSURE REGIMES ARE PROBABLY TYPICAL. (KNAPP-USGS)

FIELD 02B, 02H

ACCESSION NO. W70-07345

TYPICAL FISH MORTALITY RATES IN EASTERN LAKE ERIE,

STATE UNIV. COLL., FREDONIA, N.Y.

LINDA A. TOMKIEWICZ.

LAKE ERIE ENVIRONMENTAL STUDIES, TECHNICAL DATA REPORT, NUMBER 4, APRIL 1970,  
15 P, 5 FIG, 9 REF.

DESCRIPTORS:

\*LAKE ERIE, \*FISHKILL, MORTALITY, SMELTS, BASS, BULLHEADS, GREAT LAKES,  
ON-SITE DATA COLLECTIONS, \*WATER POLLUTION EFFECTS, WATER POLLUTION  
SOURCES, FISH DIETS, CARP, COMMERCIAL FISHING, SPORT FISHING, FISH  
POPULATIONS, YELLOW PERCH.

IDENTIFIERS:

\*SEASONAL MORTALITY VARIATIONS, ALEWIFE.

ABSTRACT:

THIS STUDY WAS CONDUCTED TO ESTABLISH A BASE LINE OF NATURAL FISH  
MORTALITIES IN EASTERN LAKE ERIE THROUGHOUT A YEARLY CYCLE. SEASONAL  
VARIATIONS IN MORTALITY RATE INDICES ARE SHOWN GRAPHICALLY FOR THE  
EIGHT MOST COMMON SPECIES (SMELT, BLACK BULLHEADS, WHITE SUCKERS,  
SHEEPSHEAD, YELLOW PERCH, WHITE BASS, SMALLMOUTH BASS, AND ROCK BASS).  
NO DIRECT CAUSE FOR THE MORTALITY COULD BE GIVEN ALTHOUGH THE AUTHOR  
STATED POSSIBLE CAUSES AS PREDATION, DISEASES AND PARASITISM,  
POLLUTION, AND PHYSICAL DAMAGE CAUSED BY MAN. MOST CAUSES OF HIGH FISH  
MORTALITY RATES WERE RELATED TO COMMERCIAL AND SPORTS FISHING ACTIVITY.  
THE NEED FOR FURTHER RESEARCH IS STATED. (SJOLSETH-WASHINGTON)

FIELD 05C

ACCESSION NO. W70-08385

NEARSHORE UNDER ICE WATER MOVEMENT AT NANTICOKE, LAKE ERIE - 1970,

ONTARIO WATER RESOURCES COMMISSION, TORONTO. GREAT LAKES WATER QUALITY SURVEYS PROGRAM.

M. D. PALMER, AND J. B. IZATT.

ONTARIO WATER RESOURCES COMMISSION REPORT, GREAT LAKES WATER QUALITY SURVEYS PROGRAM, MAY 1970. 22 P, 5 FIG, 6 TAB, 2 REF, 3 APPEND.

DESCRIPTORS:

\*CURRENTS(WATER), \*LAKE ERIE, \*ICED LAKES, LAKE ICE, MEASUREMENT, CURRENT METERS, DISPERSION, PATH OF POLLUTANTS, WATER QUALITY CONTROL.

IDENTIFIERS:

NANTICOKE(ONTARIO).

ABSTRACT:

CURRENTS WERE MEASURED AT NANTICOKE, LAKE ERIE, WITH A RECORDING CURRENT METER FROM DECEMBER 1969 TO MARCH 1970, WHEN AN ICE COVER EXISTED IN THE AREA. THE CURRENTS WERE MEASURED AT A FIXED POINT 700 M FROM THE SHORE AT A POINT 3 M FROM THE BOTTOM IN 11 M OF WATER. THE WATER MOVEMENTS WERE GENERALLY IN THE SAME DIRECTION AS THOSE WITHOUT AN ICE COVER; HOWEVER, LONGER PERIODS OF LITTLE OR NO WATER MOVEMENT EXISTED. PERIODS OF VELOCITY JETTING OCCURRED AFTER THE ICE COVER FORMED. THE MEAN MONTHLY AND HOURLY DISPERSION CHARACTERISTICS WITH AN ICE COVER WERE SIGNIFICANTLY LESS THAN WITHOUT AN ICE COVER, PARTICULARLY IN FEBRUARY, INDICATING THE NEED TO AVOID WASTE DISCHARGES IN THE ADJACENT NEARSHORE AREAS. (KNAPP-USGS)

FIELD 02H, 02C

ACCESSION NO. W70-08479

NEAR-SHORE WATER CHEMISTRY OF EASTERN LAKE ERIE,

STATE UNIV. COLL., FREDONIA, N.Y.

GEORGE W. SCHMIDT.

LAKE ERIE ENVIRONMENTAL STUDIES, TECHNICAL DATA REPORT NO 2. 34 P, 13 FIG, 2 TAB, 8 REF.

DESCRIPTORS:

\*LAKE ERIE, \*WATER CHEMISTRY, PHYSICAL PROPERTIES, TEMPERATURE, SEASONAL, DISSOLVED OXYGEN, BIOCHEMICAL OXYGEN DEMAND, HYDROGEN ION CONCENTRATION, CARBON DIOXIDE, RUNOFF, HARDNESS(WATER), ALKALINITY, DETERGENTS, LIGNINS, WINDS, TRIBUTARIES, WAVES(WATER), OXIDATION-REDUCTION POTENTIAL, IRON, AMMONIA, SILICA, SUSPENDED LOAD, PHOSPHATES, COLIFORMS, BICARBONATES, CHLORIDES, SULFATES, NITRATES, COPPER, TRACE ELEMENTS, PRECIPITATION(ATMOSPHERIC), MAGNESIUM, TURBIDITY.

IDENTIFIERS:

\*NEAR-SHORE, \*EASTERN LAKE ERIE, TANNINS, CHROMATES, CONDUCTANCE.

ABSTRACT:

A BASE LINE OF PHYSICAL AND CHEMICAL PARAMETERS FOR NEAR-SHORE WATERS OF THE EASTERN BASIN OF LAKE ERIE HAS BEEN ESTABLISHED FOR AN 18 MONTH PERIOD FROM MID-JULY 1968 THROUGH MID-DECEMBER 1969. VARIATIONS DUE TO WATER TEMPERATURE CHANGES WERE DETECTABLE IN DISSOLVED OXYGEN CONCENTRATION, BIOCHEMICAL OXYGEN DEMAND, AND HYDROGEN ION CONCENTRATION. DISSOLVED CARBON DIOXIDE CONCENTRATION WAS NOT SHOWN TO BE WATER TEMPERATURE DEPENDENT BY THE METHOD EMPLOYED. HYDROGEN ION CONCENTRATION DATA DO INDICATE THAT SOLUBILITY OF CARBON DIOXIDE WAS PROBABLY DEPENDENT ON WATER TEMPERATURE. EFFLUENTS OF INDIVIDUAL STREAMS WERE DETECTABLE IN THE WATER CHEMISTRY OF THE LAKE, WHICH VARIED WIDELY IN CHEMICAL CONSTITUENTS ON BOTH SEASONAL AND RANDOM BASIS. MIXING OF NEAR-SHORE WATERS WAS GENERALLY DEPENDENT UPON WIND VELOCITY AND WAVE CONDITIONS. CALM PERIODS, IN WHICH LITTLE MIXING OCCURRED, APPEARED TO HAVE CAUSED A STANDING WATER MASS ALONG THE NEAR-SHORE AREA. THIS MIGHT HAVE INFLUENCED DECOMPOSING ORGANIC MATTER TO DECREASE THE OXIDATION-REDUCTION POTENTIAL LOCALLY. CONTINUOUS RECORDING DEVICES TO MONITOR WATER TEMPERATURE, DISSOLVED OXYGEN CONCENTRATION, HYDROGEN ION CONCENTRATION, SPECIFIC CONDUCTANCE, OXIDATION-REDUCTION POTENTIAL, WATER LEVEL, AND LOCAL STREAM DISCHARGE WOULD BE OF TREMENDOUS VALUE IN INTERPRETING SHORT TERM CHANGES IN ALL PARAMETERS. (JONES-WISCONSIN)

FIELD 02H

ACCESSION NO. W70-08658

THERMAL LOADING IN DUNKIRK HARBOR,

STATE UNIV. COLL., FREDONIA, N.Y.

RUTH E. BRAUN, AND JOHN A. JONES.

LAKE ERIE ENVIRONMENTAL STUDIES, TECHNICAL REPORT NO. 5, APRIL 1970. 12 P, 6 FIG.

DESCRIPTORS:

\*THERMAL POLLUTION, \*WATER TEMPERATURE, \*HEAT, WATER CIRCULATION, POWERPLANTS, WARM-WATER FISHING, SEASONAL, SURFACES, VOLUME, HARBORS, LAKE ERIE, WINDS, EDDIES, ISOTHERMS, CONDUCTIVITY, RESERVOIR EVAPORATION.

IDENTIFIERS:

\*TEMPERATURE ANOMALIES, THERMISTOR, RELATIVE HUMIDITY.

ABSTRACT:

THERMAL LOADING DUE TO WARMED EFFLUENTS FROM A POWER PLANT LOCATED ON DUNKIRK HARBOR HAS BEEN INVESTIGATED OVER A 14-MONTH PERIOD. TEMPERATURE ANOMALIES OF MORE THAN 3C WERE FOUND TO EXIST IN THE HARBOR YEAR-ROUND. GREATEST ANOMALIES OCCURRED IN MARCH, SMALLEST ANOMALIES IN APRIL. THE HARBOR BASIN WAS NOTED TO BE CAPABLE OF DISSIPATING THE HEAT ADDED BY THE POWER PLANT. LITTLE EFFECT COULD BE FOUND OUTSIDE THE CONFINES OF THE HARBOR. NO SERIOUS DETRIMENTAL EFFECTS DUE TO THERMAL LOADING HAVE BEEN DEMONSTRATED. AS FAR AS THE RESIDENTS OF DUNKIRK ARE CONCERNED, THE HEAT WHICH THE POWER PLANT RELEASES IS MORE BENEFICIAL THAN HARMFUL. FISHING IS GOOD YEAR-ROUND AND BOATS CAN REMAIN IN THE WATER OVER THE WINTER. SINCE THE HARBOR BASIN IS CAPABLE OF DISSIPATING THE ADDED HEAT UNDER PRESENT CONDITIONS, THE RATIO OF HEAT ADDED TO THE SURFACE AREA OR VOLUME OF THE HARBOR IS CONSIDERED FAVORABLE. ANY PROJECT WHICH MIGHT CHANGE THE SIZE OF CIRCULATION PATTERN IN THE BASIN SHOULD BE CAREFULLY CONSIDERED IN LIGHT OF THE EFFECTS IT MIGHT HAVE ON THE CHARACTERISTICS OF THERMAL DISSIPATION OF THE HARBOR. (OSBORNE-VANDERBILT)

FIELD 05B, 02D

ACCESSION NO. W70-08838

WAVE ACTION AND BREAKWATER LOCATION, VERMILION HARBOR, OHIO; HYDRAULIC MODEL INVESTIGATION,

ARMY ENGINEER WATERWAYS EXPERIMENT STATION, VICKSBURG, MISS.

C. W. BRASFIELD.

SPONSORED BY U.S. ARMY ENGINEER DISTRICT, BUFFALO. U.S. ARMY ENGINEER WATERWAYS EXPERIMENT STATION, VICKSBURG, MISSISSIPPI, TECHNICAL REPORT H-70-5, MAY 1970. 18 P, 6 TAB, 4 PHOTO, 6 PL, 7 REF.

DESCRIPTORS:

\*BREAKWATERS, \*HYDRAULIC MODELS, \*WAVES(WATER), SHORE PROTECTION.

IDENTIFIERS:

\*VERMILION HARBOR, OHIO; LAKE ERIE.

ABSTRACT:

MODEL INVESTIGATION WAS MADE TO TEST AND DEVELOP PLANS FOR IMPROVEMENT PROPOSED FOR REDUCING WAVE HEIGHTS AT THE HARBOR ENTRANCE AND IN THE OUTER REACHES OF VERMILION RIVER CHANNEL. THE 1:75-SCALE MODEL, MOLDED IN CEMENT MORTAR, REPRODUCED APPROXIMATELY ONE-HALF MILE OF THE LAKE ERIE SHORELINE ON EACH SIDE OF HARBOR ENTRANCE, ABOUT 3600 FT OF THE RIVER CHANNEL, SEVERAL BOAT MOORING LAGOONS OFF THE MAIN CHANNEL, AND SUFFICIENT UNDERWATER CONTOURED AREA TO PERMIT ACCURATE SIMULATION OF STORM-WAVE ACTION. A 52-FT-LONG WAVE MACHINE AND ELECTRICAL WAVE HEIGHT MEASURING AND RECORDING APPARATUS WERE USED. IT WAS CONCLUDED THAT AN OFFSHORE BREAKWATER, APPROXIMATELY 700 FT LONG, INSTALLED PERPENDICULAR TO ENTRANCE CHANNEL CENTER LINE AND 200 FT FROM OUTER END OF THE EXISTING EAST CHANNEL PIER WOULD PROVIDE ADEQUATE PROTECTION FROM WAVE ACTION. (SPIVEY-WATERWAYS EXPERIMENT STATION)

FIELD 08B

ACCESSION NO. W70-09178

DISPERSION PREDICTION FROM CURRENT METERS,

ONTARIO WATER RESOURCES COMMISSION, TORONTO. WATER QUALITY SURVEYS BRANCH.

MERVYN D. PALMER, AND J. BRYAN IZATT.

ASCE PROCEEDINGS, JOURNAL OF THE HYDRAULICS DIVISION, VOL 96, NO HY8, PAPER 7464, P 1667-1680, AUGUST 1970. 14 P, 8 FIG, 6 TAB, 9 REF, APPEND.

DESCRIPTORS:

\*DISPERSION, \*DIFFUSION, \*CURRENT METERS, \*LAKE ERIE, FORECASTING, HYDRAULICS, TURBULENCE, TURBULENT FLOW, CORRELATION ANALYSIS, PROBABILITY, PATH OF POLLUTANTS.

IDENTIFIERS:

TURBULENCE METERS.

ABSTRACT:

TWO-DIMENSIONAL DISPERSION PLUMES FOR THE NEAR SHORE AREA OF NANTICOKE ON LAKE ERIE ARE PREDICTED BY APPLYING TURBULENT DIFFUSION CONCEPTS TO RECORDING CURRENT METER DATA. EULERIAN INTEGRAL TIME SCALES ARE FOUND FROM AUTOCORRELATION COEFFICIENTS, BASED ON MONTHLY DATA. LAGRANGIAN INTEGRAL SPACE SCALES AND ONE-DIMENSIONAL DIFFUSION COEFFICIENTS MAY BE PREDICTED. AVERAGE MONTHLY PROBABILITY DISTRIBUTIONS ARE BASED ON NORTH-SOUTH AND EAST-WEST DIFFUSION COEFFICIENTS. THE PREDICTION EQUATION IS AN AVERAGE OF LONG AND SHORT TIME DIFFUSION EQUATIONS. BETTER DILUTION IS FOUND NEAR THE SHORE AND PARALLEL TO IT. IT IS ASSUMED THAT VERTICAL DIFFUSION IS NEGLIGIBLE, THAT THE REYNOLD'S NUMBER IS LARGE, AND THAT THE EFFECTIVE DIFFUSION COEFFICIENTS ARE CONSTANT OVER LONG PERIODS. (KNAPP-USGS)

FIELD 02E, 07B

ACCESSION NO. W70-09219



A TEST OF FEDERAL WATER PROJECT EVALUATION PROCEDURES WITH EMPHASIS ON REGIONAL INCOME AND ENVIRONMENTAL QUALITY: DETROIT RIVER, TRENTON NAVIGATION CHANNEL,

MICHIGAN STATE UNIV., EAST LANSING. DEPT. OF AGRICULTURAL ECONOMICS.

A. ALLAN SCHMID, AND WILLIAM WARD.

AGRICULTURAL ECONOMICS REPORT NO. 158, APRIL 1970. 73 P, 10 TAB, 3 PLATES, 1 APPEND. WATER RESOURCES COUNCIL AGREEMENT WRC69-6.

**DESCRIPTORS:**

\*NAVIGATION, INDUSTRIAL WATER, LEONTIEF MODELS, COST-BENEFIT ANALYSIS, INCOME ANALYSIS, CONSTRUCTION COSTS, COST SHARING DECISION MAKING, FEDERAL PROJECT POLICY, FEDERAL BUDGETS, ENVIRONMENTAL EFFECTS.

**IDENTIFIERS:**

\*WATER RESOURCES COUNCIL TASK FORCE REPORT, MCLOUTH STEEL COMPANY, DETROIT REGION, LAKE ERIE, MICHIGAN DEPARTMENT OF CONSERVATION, US ARMY CORPS OF ENGINEERS.

**ABSTRACT:**

THIS REPORT IS AN EFFORT TO APPLY THE PRINCIPLES SET FORTH BY A SPECIAL TASK FORCE OF THE U.S. WATER RESOURCES COUNCIL IN THEIR JUNE 1969 REPORT, PROCEDURES FOR EVALUATION OF WATER AND RELATED LAND RESOURCE PROJECTS. THE TASK FORCE ENCOURAGED POTENTIAL EFFECTS TO LOCAL INCOMES AND TO THE ENVIRONMENT FROM PROPOSED WATER PROJECTS. IN THIS STUDY THE PROPOSED EXTENSION BY THE ARMY CORPS OF ENGINEERS OF THE TRENTON CHANNEL WHICH LEADS INTO THE DETROIT RIVER IN MICHIGAN WAS EXAMINED. THIS PROJECT WOULD ENLARGE THE COMMERCIAL NAVIGATIONAL USE OF THE CHANNEL AND WOULD THEREBY ALLOW THE MCLOUTH STEEL COMPANY TO DEVELOP A PRIMARY STEEL MILL AT GIBRALTAR, MICHIGAN. THE AUTHORS SOUGHT TO DETERMINE HOW THE ACTUAL COSTS AND BENEFITS OF THIS PROJECT COULD BE BEST PREDICTED. ALTHOUGH THEIR RESULTS WERE NOT CONCLUSIVE, THEY STRESSED THE NEED TO STUDY ALTERNATIVE LOCATIONS AND TO VIEW THE PROPOSED PROJECT IN RELATION TO THE NEEDS OF OTHER REGIONS IN THE UNITED STATES FOR NAVIGATIONAL AND INDUSTRIAL DEVELOPMENT. (HOLMES-RUGGERS)

FIELD 03E, 06B

ACCESSION NO. W70-09497

MAN'S INFLUENCE ON LAKE ERIE,

SOUTHERN ILLINOIS UNIV., CARBONDALE. DEPT. OF BOTANY.

JACOB VERDUIN.

THE OHIO JOURNAL OF SCIENCE, VOL 69, NO 2, P 65-69, 1969. 1 FIG, 2 TAB, 12 REF.

DESCRIPTORS:

\*LAKE ERIE, \*OHIO, SWAMPS, FARMS, SILTS, LIGHT PENETRATION, BIOTA, NUTRIENTS, PHOSPHORUS, OXYGEN, SEWAGE EFFLUENTS, CISCO, WALLEYE, SEICHES, MAYFLIES, HYDROGEN ION CONCENTRATION, PHOTOSYNTHESIS, NITROGEN, DETERGENTS, PHYTOPLANKTON, BENTHIC FAUNA, CARBON DIOXIDE, BLOODWORMS, YELLOW PERCH, MIDGES.

IDENTIFIERS:

\*MAN'S INFLUENCE, MAUMEE RIVER, TOLEDO(OHIO), LEUCICHTHYS ARTEDI, ESOX MOSQUINONGY, STIZOSTEDION VITREUM, HEXAGENIA LIMBATA, ASTERIONELLA FORMOSA, TABELLARIA FENESTRATA, MELOSIRA AMBIGUA, MELOSIRA BINDERANA, FRAGILARIA CAPUCINA, COSCINODISCUS RADIATUS, CHIRONOMUS PLUMOSUS, PERCA FLAVESCENS, CLADOPHORA GLOMERATA, GREAT BLACK SWAMP(OHIO).

ABSTRACT:

CONVERSION OF NORTHWESTERN OHIO'S GREAT BLACK SWAMP TO FARM LAND DURING THE LAST HALF OF THE 19TH CENTURY HAD A PROFOUND, BUT SCANTILY DOCUMENTED INFLUENCE ON LAKE ERIE. SILTS, ONCE LARGELY FILTERED BY SWAMPLAND VEGETATION, WERE, WITH THE DESTRUCTION OF THAT VEGETATION, CARRIED INTO LAKE ERIE, REDUCING LIGHT PENETRATION AND SIGNIFICANTLY ALTERING THE LAKE'S BIOTA. MORE RECENTLY ENHANCEMENT OF PLANT NUTRIENTS, ESPECIALLY PHOSPHORUS, WHICH HAS INCREASED 5-FOLD SINCE 1948, HAS SUPPORTED NUISANCE LEVELS OF PLANT GROWTH CREATING SEVERE OXYGEN DEPLETION NEAR THE LAKE BOTTOM AND RESPONSIBLE FOR ADDITIONAL MAJOR AND UNDESIRABLE CHANGES IN SPECIES COMPOSITION OF PLANT AND ANIMAL COMMUNITIES. THE SOLUTION TO THIS PROBLEM IS REMOVAL OF PLANT NUTRIENTS FROM THE WATERS BEFORE THEY ENTER LAKE ERIE. THE 'LIVING FILTER' TREATMENT, IN WHICH SEWAGE PLANT EFFLUENTS ARE FILTERED THROUGH ROOT ZONES OF PLANT COMMUNITIES, SEEMS MOST PROMISING. THIS TREATMENT EFFECTIVELY REMOVES NUTRIENTS, CONVERTING THEM TO PLANT PRODUCTS. ANOTHER MODEL, WHERE EFFLUENT FROM SEWAGE TREATMENT PLANTS IS PASSED THROUGH A SERIES OF ARTIFICIAL LAKES, PROCESSES THE EFFLUENTS EFFECTIVELY SO THAT FINAL-STAGE LAKES ARE EXCELLENT RECREATIONAL FACILITIES, AND THE RELEASED WATERS DO NOT BURDEN AQUATIC ENVIRONMENTS. (JONES-WISCONSIN)

FIELD 02H, 05C

ACCESSION NO. W70-09900

# THE NATURE OF AQUATIC POLLUTION,

STATE UNIV. COLL., FREDONIA, N.Y. LAKE ERIE ENVIRONMENTAL STUDIES.

JOHN A. JONES.

STATE UNIVERSITY COLLEGE, FREDONIA, NEW YORK, LAKE ERIE ENVIRONMENTAL STUDIES, PUBLIC INFORMATION REPORT NO 2, 1970. 36 P, 23 FIG.

## DESCRIPTORS:

\*WATER POLLUTION SOURCES, \*WATER POLLUTION, \*WATER POLLUTION EFFECTS, POLLUTANTS, COLIFORMS, TOXICITY, NUTRIENTS, SUSPENDED LOAD, NUCLEAR WASTES, EUTROPHICATION, SEWAGE, AGRICULTURE, INDUSTRIAL WASTES, PESTICIDES, THERMAL POLLUTION, TERTIARY TREATMENT, DETERGENTS, LAKE ERIE, BACTERIA, VIRUSES, PROTOZOA, FUNGI, WORMS, RADIOISOTOPES, SALMONELLA, SHIGELLA, CLOSTRIDIUM, RED TIDE, MOLLUSKS, TREMATODES, CHEMICALS, COPEPODS, NEMATODES, BIOCHEMICAL OXYGEN DEMAND, DDT, HEAVY METALS, NITROGEN, PHOSPHORUS, POWERPLANTS, CYANOPHYTA, WASTES, DREDGING.

## IDENTIFIERS:

FLOATING DEBRIS, SYNERGISTIC EFFECTS, PARASITIC DISEASES, CLASSIFICATION OF POLLUTANTS, BIOLOGICAL CONCENTRATION, PETROLEUM INDUSTRIES, PARASITIC WORMS, BIOLOGICAL POLLUTANTS, CHEMICAL POLLUTANTS, PHYSICAL POLLUTANTS, FLOW BARRIERS, SHIPPING WASTES, BOATING WASTES, SUBLETHAL EFFECTS.

## ABSTRACT:

WATER POLLUTANTS HAVE BEEN CATEGORIZED AS BIOLOGICAL, CHEMICAL, AND PHYSICAL. THE POTENTIAL PRESENCE OF MOST DISEASE ORGANISMS MAY BE DETECTED BY TESTS WHICH DETERMINE THE NUMBERS OF COLIFORM BACTERIA. CHEMICAL POLLUTANTS INCLUDE SUBSTANCES EXERTING AN OXYGEN DEMAND, LETHAL AND SUBLETHAL TOXIC SUBSTANCES, UNPLEASANT NON-TOXIC MATERIALS, AND FERTILIZING NUTRIENTS. PRESENCE AND QUANTITY OF THESE POLLUTANTS ARE DETERMINED BY CHEMICAL ANALYSES, AND THEIR EFFECTS ARE GENERALLY READILY EVIDENT IN THE ENVIRONMENT. PHYSICAL POLLUTANTS INCLUDE SUSPENDED SEDIMENTS, FLOATING DEBRIS, NUCLEAR WASTE MATERIALS, AND HEAT ENERGY; THESE AFFECT BASIC BIOLOGICAL PROCESSES OF ORGANISMS INHABITING NATURAL WATERS OR DESTROY THE VALUES OF AQUATIC RESOURCES. POLLUTANTS EXERT SYNERGISTIC EFFECTS ON AQUATIC ORGANISMS; THUS, THE PRESENCE OF ONE POLLUTANT INCREASES THE SUSCEPTIBILITY OF ORGANISMS TO THE OTHER POLLUTANTS AND ENVIRONMENTAL STRESSES. CHEMICAL AND PHYSICAL POLLUTANTS APPEAR TO BE THE MOST PROBLEMATIC TO THE GENERAL ENVIRONMENT; THESE INCLUDE ESPECIALLY OXYGEN DEMAND, EUTROPHICATION, TOXIC SUBSTANCES, AND WASTE HEAT. THE MOST HAZARDOUS POLLUTION DIRECTLY AFFECTING THE HEALTH OF MAN ARE BIOLOGICAL AND CHEMICAL, INCLUDING PARASITIC DISEASES AND BIOLOGICALLY ACCUMULATED TOXIC SUBSTANCES. RECOVERY AND REUSE OF 'WASTES' APPEARS TO BE THE ONLY FEASIBLE SOLUTION TO WASTE DISPOSAL IN THE LONG-TERM VIEW. (JONES-WISCONSIN)

FIELD 05A

ACCESSION NO. W70-09906

CONCENTRATIONS OF TRACE ELEMENTS IN GREAT LAKES FISHES,

ARGONNE NATIONAL LAB., ILL.; AND BUREAU OF COMMERCIAL FISHERIES, ANN ARBOR, MICH.

HENRY F. LUCAS, JR., DAVID N. EDGINGTON, AND PETER J. COLBY.

JOURNAL FISHERIES RESEARCH BOARD OF CANADA, VOL. 27: 677-684, 1970. 2 TAB, 12 REF.

DESCRIPTORS:

\*TRACE ELEMENTS, HEAVY METALS, \*GREAT LAKES, LAKE MICHIGAN, LAKE SUPERIOR, LAKE ERIE, TOXICITY, FISH TOXINS, PERCHES, ALEWIFE, COBALT, CHROMIUM, COPPER, GOLD, WATER POLLUTION SOURCES, NEUTRON ACTIVITIES ANALYSIS, SHINERS.

IDENTIFIERS:

URANIUM, THORIUM, CADMIUM, ARSENIC, ANTIMONY, LANTHANUM, RHENIUM, RUBIDIUM, SELENIUM, \*TISSUE ANALYSES, BROMINE, FISH LIVERS.

ABSTRACT:

THE CONCENTRATION OF 15 TRACE ELEMENTS WAS DETERMINED BY ACTIVATION ANALYSIS OF SAMPLES OF WHOLE FISH AND FISH LIVERS FROM THREE OF THE GREAT LAKES; MICHIGAN, SUPERIOR, AND ERIE. THE AVERAGE CONCENTRATIONS OF 7 ELEMENTS IN 19 WHOLE FISH FROM 3 SPECIES WERE AS FOLLOWS: URANIUM, 3 PPB (PARTS PER BILLION); THORIUM, 6 PPB; COBALT, 28 PPB; CADMIUM, 94 PPB; ARSENIC, 16 PPB; CHROMIUM, 1 PPM; AND COPPER, 1.3 PPM. THE AVERAGE CONCENTRATIONS OF 8 ELEMENTS IN 40 LIVER SAMPLES FROM 10 SPECIES OF FISH WERE AS FOLLOWS: URANIUM, APPROXIMATELY 2 PPB; THORIUM, LESS THAN OR EQUAL TO 2 PPB; COBALT, 40 PPB; COPPER, 9 PPM; ZINC, 30 PPM, BROMINE, 0.4 PPM; ARSENIC, 30 PPB; AND CADMIUM, 0.4 PPM. OTHER ELEMENTS OBSERVED IN MOST OF THE SAMPLES WERE: ANTIMONY, 5-100 PPB; GOLD, 2-5 PPB; LANTHANUM, 1-20 PPB; RHENIUM, 0.5-5 PPB; RUBIDIUM, 0.06-4 PPM; AND SELENIUM, 0.1-2 PPB. TRACE ELEMENT CONCENTRATIONS VARIED WITH SPECIES AND LAKE. URANIUM AND THORIUM VARIED WITH SPECIES, BUT NOT FOR THE SAME SPECIES FROM DIFFERENT LAKES. THE LEVELS OF COPPER, COBALT, ZINC, AND BROMINE VARIED LITTLE BETWEEN SPECIES AND LAKES. THE CONCENTRATION OF CADMIUM, ARSENIC, AND CHROMIUM VARIED BETWEEN SPECIES AND WITH SPECIES BETWEEN LAKES. (SJOLSETH-WASHINGTON)

FIELD 05C

ACCESSION NO. W70-09972

WATER QUALITY BEGINS AT THE LOCAL LEVEL.,

AMERICAN CHEMICAL SOCIETY, WASHINGTON, D.C.

ENVIRONMENTAL SCIENCE AND TECHNOLOGY, P 281-282, VOL 4, NO 4, APRIL 1970. 2  
FIG.

DESCRIPTORS:

\*TREATMENT FACILITIES, INDUSTRIAL WASTES, HYDROLOGIC BUDGET, SEWAGE  
TREATMENT, LAKE ERIE, WASTE WATER TREATMENT.

IDENTIFIERS:

\*CLEVELAND, CUYAHOGA RIVER.

ABSTRACT:

SINCE THE ADOPTION OF A \$100 MILLION WATER BOND ISSUE IN NOVEMBER 1968,  
CLEVELAND, OHIO HAS BEEN MODERNIZING EXISTING SEWAGE TREATMENT PLANTS  
AND MAKING PLANS FOR THE EXPANSION AND RENOVATION OF ITS ENTIRE WASTE  
WATER TREATMENT PROGRAM. CLEVELAND'S CLEAN WATER TASK FORCE, SET UP IN  
JANUARY 1969, HAS DIRECTED ITS ATTENTION TOWARD THREE CRUCIAL AREAS:  
UPDATING THE CITY'S THREE TREATMENT PLANTS AND DESIGNING A NEW  
TREATMENT UNIT FOR ONE OF THE PLANTS WHICH WILL SUBSTITUTE  
PHYSICAL-CHEMICAL TREATMENT FOR BIOLOGICAL TREATMENT, DESIGNING A NEW  
SEWAGE COLLECTION AND TRANSPORTATION NETWORK, AND ENCOURAGING JOINT  
INDUSTRIAL-MUNICIPAL TREATMENT SCHEMES. (HOLMES-RUTGERS)

FIELD 05D

ACCESSION NO. W70-10177

EUTROPHICATION SPEEDED BY MAN,

RICHARD H. GILLULY.

SCIENCE NEWS, VOL 98, NO 1, P 17-19, JULY 4, 1970. 4 FIG.

DESCRIPTORS:

\*EUTROPHICATION, \*PHOSPHORUS, \*NITROGEN, SEWAGE DISPOSAL, \*DETERGENTS.

IDENTIFIERS:

\*LAKE WASHINGTON, LAKE TAHOE, LAKE ERIE, LAKE MONONA, LAKE SEBASTICOOK,  
SECCHI DISK.

ABSTRACT:

DISPOSAL OF INTOLERABLE AMOUNTS OF PHOSPHORUS AND NITROGEN ARE SPEEDING UP THE EUTROPHICATION PROCESS OF LAKES IN NORTH AMERICA AND THROUGHOUT THE WORLD. THESE NUTRIENTS STIMULATE PLANT GROWTH AND TURN THE LAKE INTO A MARSHY FOUL-SMELLING, FISH KILLING, OXYGEN LACKING BODY OF WATER. A GREAT DEAL OF THIS ACCELERATED EUTROPHICATION IS THE DIRECT RESULT OF SEWAGE DISPOSAL INTO THE LAKES. DETERGENT PHOSPHATES AND NITRATES ARE ALSO POTENT ACCELERATING FORCES. ALTHOUGH THE CAUSES HAVE BEEN IDENTIFIED, THE CURE IS OFTEN VERY DIFFICULT TO ADMINISTER BECAUSE OF POLITICAL AND ECONOMIC OBSTACLES. THE 'MOST OBVIOUS' SOLUTION IS TO DIVERT SEWAGE TO ANOTHER OUTLET OR TO SUBJECT IT TO TERTIARY TREATMENT. (HOLMES-RUTGERS)

FIELD 05C

ACCESSION NO. W70-10181

MERCURY IN GREAT LAKES FISH,

BUREAU OF COMMERCIAL FISHERIES, ANN ARBOR, MICH.

HARRY L. SEAGRAN.

LINNOS, VOL 3, NO 2, P 3-10, 1970. 2 FIG.

DESCRIPTORS:

HEAVY METALS, \*GREAT LAKES, \*PUBLIC HEALTH, WATER POLLUTION EFFECTS, WATER POLLUTION SOURCES, FISH HARVEST, INSPECTION, LEGAL ASPECTS, \*MONITORING, ON-SITE INVESTIGATIONS, INDUSTRIAL WASTES, PULP AND PAPER INDUSTRY, PULP WASTES, ECONOMIC IMPACT, LAKE HURON, LAKE ERIE.

IDENTIFIERS:

\*RECOMMENDATIONS, \*MERCURY, FISHING CLOSURES, CHLOR-ALKALI PLANTS, MINAMATA DISEASE, ST. CLAIR RIVER.

ABSTRACT:

THIS ARTICLE SUMMARIZES STATEMENTS BY PUBLIC AGENCIES AND THE PRIVATE SECTOR DEALING WITH MERCURY CONTAMINATION INTRODUCED BEFORE THE SUBCOMMITTEE ON ENERGY, NATURAL RESOURCES AND THE ENVIRONMENT OF THE SENATE COMMITTEE ON COMMERCE. THE DEVELOPMENT OF THE CURRENT SITUATION, SOURCES OF CONTAMINATION, BACKGROUND ON MERCURY CONTAMINATION, ECONOMIC ASSESSMENT OF LOSSES DUE TO MERCURY CONTAMINATION, A DESCRIPTION OF CURRENT BCF RESEARCH, AND A LIST OF RECOMMENDATIONS ARE DISCUSSED. THE RECOMMENDATIONS STRESS THE NEED TO IDENTIFY ALL SOURCES OF MERCURY POLLUTION AND DETERMINE THE FATE AND TOXIC EFFECTS OF MERCURY IN THE ENVIRONMENT. (SEE ALSO W70-10322) (KATZ-WASHINGTON)

FIELD 05C

ACCESSION NO. W70-10321

THE MERCURY THREAT: QUESTIONS TO CONSIDER,

MICHIGAN UNIV., ANN ARBOR. GREAT LAKES RESEARCH DIV.

RICHARD COPELAND.

LIMNOS, VOL 3, NO 2, P 11-13, 1970. 2 FIG.

DESCRIPTORS:

HEAVY METALS, \*GREAT LAKES, LAKE ERIE (GEOCHEMISTRY), TRACE ELEMENTS, WATER POLLUTION SOURCES, WATER POLLUTION EFFECTS, FUNGICIDES, REGULATIONS, LETHAL LIMIT, INDUSTRIAL WASTES, PULP AND PAPER INDUSTRY, \*PULP WASTES, \*FOOD CHAINS, \*PATH OF POLLUTANTS, \*PUBLIC HEALTH PERSISTENCE.

IDENTIFIERS:

\*MERCURY POLLUTION, LAKE ST. CLAIR, CHLOR-ALKALI PLANTS, MINAMATA DISEASE, \*CONCENTRATION MECHANISMS.

ABSTRACT:

THIS PAPER DISCUSSES THE BASICS OF THE MERCURY POLLUTION PROBLEM. MERCURY IS USED IN INDUSTRY IN TWO FORMS, METALLIC MERCURY AS AN ELECTRODE IN THE PRODUCTION OF CHLORINE AND ALKALIS, AND ORGANIC MERCURY COMPOUNDS. THE LATTER ARE AS SLIMICIDES USED IN THE PULPING INDUSTRY. MERCURY IS INCORPORATED AND ACCUMULATED IN FISH IN TWO WAYS. VIA THE GILLS AS AN EQUILIBRIUM IS SET UP BETWEEN MERCURY IN FISH AND WATER. THE SECOND METHOD IS INGESTION OF MERCURY CONTAMINATED FOOD. THE AUTHOR GIVES A CALCULATED GUESS AS TO HOW LONG A MERCURY POLLUTED ENVIRONMENT WILL STAY POLLUTED AFTER STOPPING MERCURY INPUT. IN THE CASE OF THE LAKE ERIE - ST. CLAIR SYSTEM AN ESTIMATE OF 10-100 YEARS IS GIVEN. (SEE ALSO W70-10321) (KATZ-WASHINGTON)

FIELD 05C

ACCESSION NO. W70-10322



POLLUTION OF LAKE ERIE, LAKE ONTARIO AND THE INTERNATIONAL SECTION OF THE ST. LAWRENCE RIVER.

INTERNATIONAL LAKE ERIE WATER POLLUTION BOARD AND INTERNATIONAL LAKE ONTARIO-ST. LAWRENCE RIVER WATER POLLUTION BOARD REPORT TO INTERNATIONAL JOINT COMMISSION, 3 VOL, 1969. 796 P.

DESCRIPTORS:

\*LAKE ERIE, \*LAKE ONTARIO, \*ST. LAWRENCE RIVER, \*WATER POLLUTION, \*WATER POLLUTION CONTROL, SURVEYS, SAMPLING, LEGISLATION, GOVERNMENTS, INTERNATIONAL COMMISSIONS, GREAT LAKES, EUTROPHICATION, INTERNATIONAL WATERS.

IDENTIFIERS:

INTERNATIONAL WATER POLLUTION CONTROL BOARDS.

ABSTRACT:

INVESTIGATIONS WERE MADE TO DETERMINE THE EXTENT AND NATURE OF POLLUTION IN THE WATERS OF LAKE ERIE, LAKE ONTARIO AND THE INTERNATIONAL SECTION OF THE ST. LAWRENCE RIVER. DATA ON WHICH THE REPORT IS BASED COVER THE PERIOD FROM 1963 THROUGH 1967, BUT FURTHER SOURCE INFORMATION HAS BEEN ADDED IN ORDER TO INCLUDE SIGNIFICANT OBSERVATIONS. LAKE ERIE, LAKE ONTARIO AND THE INTERNATIONAL SECTION OF THE ST. LAWRENCE RIVER ARE BEING POLLUTED ON BOTH SIDES OF THE BOUNDARY TO AN EXTENT THAT IS CAUSING AND IS LIKELY TO CAUSE INJURY TO HEALTH AND PROPERTY ON THE OTHER SIDE OF THE BOUNDARY. THERE IS SUBSTANTIAL MIXING OF WATERS IN THE LAKES TO THE EXTENT THAT CONCENTRATION LEVELS OF POLLUTING MATERIALS ARE REMARKABLY UNIFORM THROUGHOUT EXTENSIVE AREAS OF EACH LAKE. THUS, THERE APPEARS TO BE NO DOUBT THAT ALL MAJOR SOURCES OF POLLUTION TO THE LAKES HAVE CONTRIBUTED DIRECTLY, OR INDIRECTLY, TO THEIR GENERALLY DEGRADED CONDITION. THE MAJOR SOURCES OF POLLUTION TO THE REFERENCED WATERS ARE MUNICIPALITIES AND INDUSTRIES. MUNICIPAL WASTES COMPRISE THE PRINCIPAL SOURCE OF PHOSPHORUS TO THE LOWER LAKES. MUNICIPAL AND INDUSTRIAL WASTES ALSO CONTRIBUTE DISSOLVED AND SUSPENDED SOLIDS, OXYGEN-CONSUMING MATERIALS, TOXIC SUBSTANCES AND PATHOGENS. REMEDIAL PROGRAMS ARE SUGGESTED TO BE CARRIED OUT PROMPTLY AND ON A CONTINUING BASIS, TO REVERSE THE DETERIORATING CONDITIONS OF THE LAKES. (KNAPP-USGS)

FIELD 05B, 05A, 02H

ACCESSION NO. W71-00397

FEASIBILITY OF A STABILIZATION-RETENTION BASIN IN LAKE ERIE AT CLEVELAND, OHIO.

HAVENS AND EMERSON, CLEVELAND, OHIO.

AVAILABLE FROM NTIS AS PB-195 083, \$3.00 IN PAPER COPY, \$0.95 IN MICROFICHE.  
REPORT, MAY, 1968. 145 P, 22 TAB, 34 FIG, 38 REF, 3 APPEND. FWQA PROJECT  
11020---05/68, CONTRACT NO 14-12-27.

DESCRIPTORS:

LAKE ERIE, WASTE WATER TREATMENT, \*OXIDATION LAGOONS, OHIO, RETENTION,  
WATER STORAGE, \*SETTLING BASINS, COSTS, EVALUATION, POLLUTION  
ABATEMENT.

IDENTIFIERS:

CLEVELAND(OHIO), \*STABILIZATION-RETENTION BASINS, \*COLLECTION SYSTEMS.

ABSTRACT:

A FEASIBILITY STUDY WAS CONDUCTED OF A LARGE STABILIZATION-RETENTION BASIN TO CONSTRUCTED IN LAKE ERIE AT CLEVELAND, OHIO. THE STABILIZATION IS VIEWED AS A POSSIBLE ALTERNATIVE TO SEPARATION OF A COMBINED SEWER SYSTEM. THE PROPOSED BASIN WOULD TREAT FLOWS FROM A NUMBER OF LARGE COMBINED SEWER OVERFLOWS, FROM SEVERAL POLLUTED STREAMS, AND EFFLUENT FROM A LARGE SECONDARY WASTEWATER TREATMENT PLANT. TREATMENT WOULD CONSIST OF BIO-OXIDATION, SEDIMENTATION, STABILIZATION AND DISINFECTION. A SHORELINE COLLECTION SYSTEM IS INCLUDED TO CONVEY FLOWS TO THE BASIN. THE CHEMICAL, BIOLOGICAL, PHYSICAL AND STRUCTURAL ASPECTS OF THE PROPOSED BASIN WERE STUDIED, AND THE PROBABLE BENEFITS TO WATER QUALITY AND THE EFFECTIVENESS OF THE BASIN AS A TREATMENT DEVICE WERE EVALUATED. ESTIMATES OF COST OF THE BASIN AND COLLECTION SYSTEM WERE PREPARED, AND IT WAS CONCLUDED THAT THE STABILIZATION BASIN WOULD PROVIDE A HIGHER DEGREE OF POLLUTION ABATEMENT THAN WOULD SEPARATION OF SANITARY AND STORM SEWERS, AT ABOUT ONE-THIRD THE COST.

FIELD 05D

ACCESSION NO. W71-00411

STATE EX REL DUFFY V LAKEFRONT EAST FIFTY-FIFTH ST CORP (TITLE DISPUTE IN LITTORAL RELICTION).

137 OHIO ST 8, 27 NE2D 485-487 (1940).

DESCRIPTORS:

\*OHIO, \*LAKE ERIE, \*ACCRETIONS(LEGAL ASPECTS), \*BOUNDARY DISPUTES, BOUNDARIES(PROPERTY), LANDFILLS, LAND FORMING, LAKES, LAKE BEDS, BULKHEADS, STATE GOVERNMENTS, LAKE SHORES, NAVIGATION, STATE JURISDICTION, RESERVATION DOCTRINE, JUDICIAL DECISIONS, LEGAL ASPECTS, LITTORAL, LEASES, REAL PROPERTY.

IDENTIFIERS:

\*TITLE DISPUTES.

ABSTRACT:

PLAINTIFF STATE BROUGHT ACTION TO EVICT DEFENDANT LITTORAL LEASEHOLDER FROM A RELICTION ON LAKE ERIE. THE RELICTION WAS FORMED WHEN THE CONTIGUOUS OWNERS ARTIFICIALLY FILLED THEIR LANDFRONTS, FORMING A POCKET IN FRONT OF DEFENDANT'S LEASEHOLD WHICH FACILITATED NATURAL ACCRETION. DEFENDANT CONTENDED OWNERSHIP OF THE RELICTION BY COMMON LAW, WHILE PLAINTIFF ASSERTED THAT SINCE THE RELICTION WAS FORMED ARTIFICIALLY, DEFENDANT HAD NO RIGHTS IN IT. THE COURT FIRST FOUND THAT VARIOUS STATUTES DID NOT AFFECT THE COMMON LAW, AND STATED THAT IF THE ACCRETION WAS FORMED NATURALLY, DEFENDANT HAD AN ESTATE THEREIN. ARTIFICIAL FILLING BY CONTIGUOUS LITTORAL OWNERS WAS FOUND NOT TO ALTER DEFENDANT'S RIPARIAN RIGHTS. FINDING THAT ANY ARTIFICIAL FILLING WHICH MAY HAVE OCCURRED IN THE DISPUTED RELICTION WAS TRIVIAL, THE COURT HELD THAT THE RELICTION WAS FORMED NATURALLY, AND THAT DEFENDANT HELD TITLE THERETO. (HART-FLORIDA)

FIELD 06E.

ACCESSION NO. W71-00509

DYNAMIC MODEL STUDY OF LAKE ERIE, PART I. SIMILITUDE CRITERIA AND EXPERIMENTAL SET-UP,

STATE UNIV. OF NEW YORK, BUFFALO. FACULTY OF ENGINEERING AND APPLIED SCIENCES.

RALPH R. RUMER, JR.

AVAILABLE FROM NTIS AS PB-195 544, \$3.00 IN PAPER COPY, \$0.95 IN MICROFICHE. CIVIL ENGINEERING REPORT NO. 18.1, AUGUST, 1970. 43 P, 9 FIG, 21 REF. FWQA PROGRAM GRANT WP-00837.

DESCRIPTORS:

\*LAKE ERIE, \*MODEL STUDIES, \*HYDRAULIC MODELS, \*SIMULATION ANALYSIS, CURRENTS(WATER), \*HYDRAULIC SIMILITUDE, SYNTHETIC HYDROLOGY, WATER CIRCULATION, MOVEMENT, WATER QUALITY, WATER POLLUTION CONTROL, DILUTION.

IDENTIFIERS:

ROTATING MODEL.

ABSTRACT:

BOTH ANALYTICAL AND EXPERIMENTAL INVESTIGATIONS EMPLOYED TO PROVIDE BASIC INFORMATION CONCERNING WATER MOVEMENT IN THE LAKE. THE KNOWLEDGE AND EXPERIENCE ACQUIRED IN THE COURSE OF THIS STUDY SHOULD IMPROVE OUR CAPABILITY TO CONSTRUCT AND OPERATE ROTATING HYDRAULIC MODELS. THIS INFORMATION SHOULD ALSO ASSIST IN THE OVERALL WATER QUALITY MANAGEMENT OF THE LAKE. THE STUDIES REPORTED HERE DEAL WITH THE IDEALIZED CONDITIONS OF ZERO WIND STRESS (INCLUDING THE INFLOW OF THE DETROIT RIVER AND THE OUTFLOW OF THE NIAGARA RIVER) AND, UNDER THIS SAME FLOW CONDITION, WITH THE SUPERPOSITION OF A UNIFORM WESTERLY WIND OVER THE SURFACE OF THE LAKE. THE WATER MASS IS ISOTHERMAL AND VARIATIONS IN DENSITY ARE ASSUMED ABSENT. UNDER THESE CONDITIONS, INVESTIGATIONS OF THE CIRCULATION PATTERNS WERE CONDUCTED. ALSO STUDIED WAS THE OSCILLATION OF THE ENTIRE WATER MASS IN THE MODEL LAKE. IN PARTICULAR, ATTENTION WAS GIVEN TO THE TRANSIENT EFFECT THAT THIS MASS OSCILLATION HAD ON THE OTHERWISE STEADY-STATE CIRCULATION PATTERN AND ITS EFFECT ON THE MIXING AND DILUTION OF WASTE DISCHARGES INTO THE LAKE. THE MIXING AND DILUTION OF TRACERS INTRODUCED AT VARIOUS POSITIONS IN THE MODEL LAKE WERE ALSO STUDIED UNDER THESE SAME CONDITIONS OF ZERO WIND STRESS AND CONSTANT THROUGHFLOW AND WITH THE SUPERPOSITION OF THE WESTERLY WIND. A HIGHLY IDEALIZED MODEL OF LAKE ERIE WAS ALSO CONSTRUCTED AND OPERATED. THIS MODEL WAS RECTANGULAR IN SHAPE, OF CONSTANT DEPTH, AND HAD THE SAME LENGTH TO WIDTH RATIO AS LAKE ERIE. CIRCULATION PATTERNS, THE DECAY OF SCICHES, AND MIXING OF TRACERS WERE ALSO STUDIED IN THIS IDEALIZED MODEL. THE RESULTS OBTAINED FROM THE IDEALIZED RECTANGULAR BASIN HELPED TO DELINEATE THE MAJOR EFFECTS OF GEOMETRICAL VARIATIONS THAT WERE PRESENT IN THE SCALED LAKE ERIE MODEL. THIS REPORT RECOUNTS THE DEVELOPMENT OF THE LABORATORY AND THE MODEL LAKE AND SUMMARIZES THE ANALYTICAL AND EXPERIMENTAL WORK ACCOMPLISHED THUS FAR. (SEE ALSO W71-00622).

FIELD 02H, 05G, 05B

ACCESSION NO. W71-00621

DYNAMIC MODEL STUDY OF LAKE ERIE, PART II, ANALYTICAL AND EXPERIMENTAL RESULTS,  
STATE UNIV. OF NEW YORK, BUFFALO. FACULTY OF ENGINEERING AND APPLIED SCIENCES.  
RALPH R. RUMER, JR.

AVAILABLE FROM NTIS AS PB-195 545, \$3.00 IN PAPER COPY, \$0.95 IN MICROFICHE.  
CIVIL ENGINEERING REPORT NO 18.2, AUGUST, 1970. 39 P, 2 TAB, 22 FIG, 33  
REF. FWQA PROGRAM GRANT WP-00837.

DESCRIPTORS:

\*LAKE ERIE, \*MODEL STUDIES, HYDRAULIC MODELS, \*SIMULATION ANALYSIS,  
CURRENTS(WATER), \*HYDRAULIC SIMILITUDE, SYNTHETIC HYDROLOGY, WATER  
CIRCULATION, MOVEMENT, WATER QUALITY, WATER POLLUTION CONTROL,  
DILUTION.

IDENTIFIERS:

ROTATING MODEL.

ABSTRACT:

THIS SECOND REPORT CONSIDERS THE EXPERIMENTAL RESULTS OBTAINED AND THE  
RELATIONSHIP OF THESE RESULTS TO VARIOUS MATHEMATICAL MODEL APPROACHES  
TO THE HYDRAULIC STUDY OF LAKE ERIE. BASED ON THE EXPERIMENTAL AND  
ANALYTICAL RESULTS OF THIS STUDY, THE FOLLOWING SUMMARIZING STATEMENTS  
ARE MADE REGARDING THE DYNAMIC BEHAVIOR OF LAKE ERIE. IN THE ABSENCE OF  
WIND, THE THROUGHFLOW CAUSED BY THE INFLOW OF THE DETROIT RIVER AND THE  
OUTFLOW OF THE NIAGARA RIVER GENERATES SIGNIFICANT CURRENTS AND EASILY  
OBSERVABLE PATTERNS OF CIRCULATION. THE PRESENCE OF WESTERLY WIND  
SIGNIFICANTLY ALTERS THE CIRCULATION PATTERNS OF LAKE ERIE AS OBSERVED  
IN THE ABSENCE OF WIND. A PROCEDURE FOR RELATING MODEL WIND SPEEDS TO  
PROTOTYPE WIND SPEEDS BASED ON SIMILARITY BETWEEN WIND SET-UP IN MODEL  
AND PROTOTYPE HAS BEEN PRESENTED. THE PERIOD FOR THE FIRST MODE MASS  
OSCILLATION IN THE MODEL LAKE IS IN GOOD AGREEMENT WITH CALCULATED AND  
OBSERVED PERIODS. OBSERVED DETENTION PERIODS SHOW SIGNIFICANT SHORT  
CIRCUITING FOR THE HOMOGENEOUS LAKE WITH NO WIND STRESS. ONLY LIMITED  
CORRESPONDENCE CAN BE ACHIEVED IN MODELING DISPERSION IN VERTICALLY  
DISTORTED FROUDE MODELS OF VERY LARGE BODIES OF WATER. (SEE ALSO  
W71-0062).

FIELD 02H, 05G, 05B

ACCESSION NO. W71-00622

NUMERICAL CALCULATIONS OF THE STEADY-STATE, WIND-DRIVEN CURRENTS IN LAKE ERIE,  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, CLEVELAND, OHIO. LEWIS  
RESEARCH CENTER.

RICHARD GEDNEY, AND WILBERT LICK.

AVAILABLE FROM NTIS AS N70-26980, \$3.00 IN PAPER COPY, \$0.95 IN MICROFICHE.  
THIRTEENTH CONFERENCE ON GREAT LAKES RESEARCH, BUFFALO, N.Y., MARCH  
31-APRIL 3, 1970. TYPESCRIPT, 12 P, FIG. NASA TMX-52786.

IDENTIFIERS:

\*CONFERENCES, FLUID FLOW, \*LAKES, \*MATHEMATICAL MODELS, \*WIND EFFECTS,  
CURRENTS.

ABSTRACT:

SOLUTIONS FOR THE STEADY-STATE, WIND-DRIVEN CURRENTS IN LAKE ERIE HAVE  
BEEN OBTAINED BY NUMERICAL METHODS. A SHALLOW LAKE MODEL, WHICH DOES  
NOT REQUIRE THE FRICTION LAYERS TO BE SMALL BY COMPARISON WITH THE  
DEPTH OF THE LAKE, HAS BEEN USED. IN ORDER TO OBTAIN SOME OF THE  
OBSERVED FEATURES OF THE CURRENTS, IT WAS NECESSARY TO USE A RELATIVELY  
SMALL GRID (3.22 KILOMETERS). THIS GRID WAS VARIABLE IN SIZE FOR THE  
MESH POINTS ADJACENT TO THE BOUNDARIES, THUS PERMITTING AN ACCURATE  
APPROXIMATION OF THE BOUNDARY. THE VELOCITY AS A FUNCTION OF DEPTH AND  
HORIZONTAL POSITION HAS BEEN DETERMINED. RESULTS ARE PRESENTED FOR  
SOUTHWESTERLY AND NORTHEASTERLY WINDS. IN BOTH CASES, NARROW BANDS OF  
STRONG CURRENTS WERE FOUND NEAR THE SHORE. IN OTHER AREAS, LARGE  
SUBSURFACE GYRES WERE EVIDENT. THE CALCULATED RESULTS COMPARE QUITE  
WELL WITH SEABED DRIFTER MEASUREMENTS AND OTHER OBSERVATIONS.

FIELD 02H

ACCESSION NO. W71-01517

SQUAW ISLAND FREIGHT TERMINAL CO V CITY OF BUFFALO (RECOVERY OF DAMAGES FOR CITY'S POLLUTION OF RIVER).

165 MISC 722, 1 NYS2D 589-595 (1938).

DESCRIPTORS:

\*NEW YORK, \*WATER POLLUTION, \*RIPARIAN RIGHTS, \*SEWAGE, SEWAGE DISPOSAL, SEWERS, LEGAL ASPECTS, JUDICIAL DECISIONS, SANDS, GRAVELS, CITIES, RIPARIAN WATERS, RIVERS, NAVIGABLE WATERS, LAKE ERIE, PERMITS, DREDGING, LAND, LAND TENURE, LOCAL GOVERNMENTS, MUNICIPAL WASTES.

IDENTIFIERS:

\*UPLANDS.

ABSTRACT:

PLAINTIFF RIPARIAN OWNER SOUGHT DAMAGES AND INJUNCTIVE RELIEF AGAINST DEFENDANT MUNICIPALITY FOR POLLUTION OF THE NIAGARA RIVER ADJACENT TO PLAINTIFF'S PROPERTY. PLAINTIFF ALLEGED DESTRUCTION OF SAND AND GRAVEL DEPOSITS ON ITS LAND UNDER WATER, WHICH IT DREDGED FOR COMMERCIAL PURPOSES, AND PERMANENT DAMAGE TO ITS UPLANDS. DEFENDANT ARGUED THAT PLAINTIFF COULD NOT RECOVER BECAUSE IT HELD NO FEDERAL LICENSE TO DREDGE. THE TRIAL COURT GAVE JUDGMENT FOR DEFENDANT. THE APPELLATE DIVISION REVERSED AND ENTERED AN INTERLOCUTORY JUDGMENT FOR PLAINTIFF. THE SUPREME COURT AFFIRMED THE APPELLATE DIVISION AND ASSESSED DAMAGES. THE COURT STATED THAT THE RIGHT OF PLAINTIFF AS A RIPARIAN OWNER TO DREDGE ITS LAND IS ABSOLUTE, AND THAT A FEDERAL LICENSE TO DREDGE WAS NOT NECESSARY. THE COURT ACCEPTED THE TRIAL COURT'S DETERMINATION OF PLAINTIFF'S OWNERSHIP OF LANDS UNDER WATER AND ASSESSED THE DAMAGES FOR DESTRUCTION OF THE SAND AND GRAVEL. IT ALSO DETERMINED DAMAGES TO PLAINTIFF'S UPLANDS, BUT FOUND THAT THE EVIDENCE DID NOT SHOW PERMANENT DAMAGE. SINCE THE CONSTRUCTION OF A NEW POWER PROJECT WAS IN PROGRESS WHICH WOULD OBVIATE POLLUTION IN THE FUTURE, THERE WAS NO REASON TO GRANT PLAINTIFF INJUNCTIVE RELIEF. (DUSS-FLORIDA)

FIELD 06E, 05B

ACCESSION NO. W71-01580

TREATMENT PLANT DESIGNED FOR FROZEN MEAT WASTES,

BISSELL, MERRILL AND ASSOCIATES, WILLIAMSVILLE, N.Y.

WILLIAM H. MERRILL, JR.

WATER AND WASTES ENGINEERING VOL 7, NO 5, P C5, MAY 1970. 1 FIG.

DESCRIPTORS:

\*DESIGN, \*INDUSTRIAL WASTES, LAKE ERIE, BIOCHEMICAL OXYGEN DEMAND, WASTE WATER TREATMENT, AEROBIC CONDITIONS, AEROBIC TREATMENT, FLOCCULATION, NEW YORK.

IDENTIFIERS:

\*FOOD PROCESSING WASTES, PACKAGING PLANTS, BUFFALO(NEW YORK).

ABSTRACT:

A PACKAGED FROZEN MEAT PRODUCTS PLANT WAS ESTABLISHED OUTSIDE BUFFALO, NEW YORK, WHERE THERE WERE NO SEWERS AND NONE PLANNED. DESIGN FLOWS OF THE PLANT WERE 100,000 GPD. IN SETTING UP A WASTE WATER TREATMENT FACILITY, DATA FROM ANOTHER PLANT WAS CONSIDERED. THE PH INTENSITY LEVEL OF THE WASTES INDICATED A BIOLOGICAL TREATMENT WOULD BE FAVORABLE AND A NUTRITIONALLY BALANCED SYSTEM WOULD RESULT. HOWEVER, THE HIGH ETHER SOLUBLE CONTENT WOULD SERIOUSLY AFFECT A BIOLOGICAL SYSTEM BY IMPAIRING THE OXYGEN TRANSFER EFFICIENCY OF APPLIED AIR. THEREFORE A SYSTEM FOR REMOVING THE ETHER SOLUBLES WOULD HAVE TO PRECEDE THE BIOLOGICAL SYSTEM. THIS WOULD ALSO AFFECT SOME BOD REMOVAL. INITIAL TREATMENT OF THE WASTES IS IN AN AIR FLOTATION CELL, WHERE GREASE AND FATS ALONG WITH MOST OF THE SUSPENDED SOLIDS ARE REMOVED. AFTER COMPLETION OF THE FLOTATION PROCESS AND BEFORE ENTERING THE AERATION UNIT, THE SUBSTRATE IS MIXED WITH THE DOMESTIC WASTE FROM THE INPLANT POPULATION. THE COMBINED WASTE ENTERING THE AERATION TANK IS AERATED AND DETAINED FOR ABOUT 24 HOURS. DURING THIS TIME, AIR IS CONTINUOUSLY MIXED WITH THE WASTE WATER BY MEANS OF A SURFACE AERATOR. FROM THE AERATION TANK THE WATER IS CLARIFIED FOR 4.5 HOURS. WATER LEAVING THE CLARIFIER IS CHLORINATED AND DISCHARGED THROUGH A MEASUREMENT FLUME INTO LAKE ERIE. THE LENGTHY OUTFALL LINE ACTS AS A CHLORINE CONTACT TANK. THE OVERALL BOD REMOVAL EFFICIENCY AVERAGES 85 TO 90% AT PRESENT AND IS EXPECTED TO INCREASE AS THE PLANT'S EXPERIENCE GROWS. (SELBY-TEXAS)

FIELD 05D

ACCESSION NO. W71-01973



ERICKSON V COUNTY OF STEARNS (LIABILITY OF COUNTY FOR DAMAGES FROM DAM OPERATION).

252 NW 219-221 (MINN 1934).

DESCRIPTORS:

\*MINNESOTA, \*DAM CONSTRUCTION, \*WATER LEVELS, \*FLOOD DAMAGE, DAMSITES, DAMS, OPERATION AND MAINTENANCE, HEIGHT, LAKES, LOCAL GOVERNMENTS, LEGISLATION, ADMINISTRATIVE AGENCIES, ELEVATION, JURISDICTION, STATE JURISDICTION, LAND, RIPARIAN LAND, FLOODS, FLOODING, REMEDIES, JUDICIAL DECISIONS, LEGAL ASPECTS.

ABSTRACT:

PLAINTIFF RIPARIAN LANDOWNER BROUGHT AN ACTION FOR DAMAGES CAUSED BY DEFENDANT COUNTY'S ALLEGED IMPROPER MAINTENANCE OF A DAM ON A CERTAIN LAKE. THE MAJOR PORTION OF THE LAKE LAY WITHIN ANOTHER COUNTY, BUT A SMALL PART WAS WITHIN DEFENDANT'S BOUNDARIES. UNDER MINNESOTA LAW, THE STATE DELEGATED ITS POWER OVER CONTROL OF WATER LEVELS IN NAVIGABLE WATERS TO THE SEVERAL COUNTIES, AND PETITION WAS MADE TO DEFENDANT COUNTY TO ESTABLISH A DAM TO CONTROL THE LEVEL IN THE PORTION OF THE LAKE WITHIN ITS BOUNDARIES. THE DAM WAS CONSTRUCTED BY THE STATE GAME AND FISH DEPARTMENT, WITH DEFENDANT AGREEING TO PAY HALF THE COSTS. PLAINTIFF'S PROPERTY WAS FLOODED AS A RESULT OF THE DAM, AND THE DAM WAS REMOVED WHEN DEFENDANT REQUIRED THE GAME AND FISH DEPARTMENT TO DO SO. DEFENDANT DENIED LIABILITY FOR PLAINTIFF'S DAMAGE UNDER THE DOCTRINE OF ULTRA VIRES. THE TRIAL COURT ACCEPTED THE DEFENSE THAT DEFENDANT COULD NOT BE LIABLE SINCE IT HAD NO AUTHORITY OVER THE DAM'S MAINTENANCE, AND THE CASE WAS DISMISSED. AFFIRMING, THE SUPREME COURT OF MINNESOTA RULED THAT THE LEGISLATURE COULD NOT HAVE ATTEMPTED TO GIVE A COUNTY CONTROL OVER A LAKE, THE MAJOR PORTION OF WHICH LAY IN ANOTHER COUNTY. THEREFORE, DEFENDANT HAD NO INTEREST IN THE LAKE, AND ANY ATTEMPT TO EXERCISE AN INTEREST WAS ULTRA VIRES. (BARKER-FLORIDA)

FIELD 06E

ACCESSION NO. W71-02176

EAST BAY SPORTING CLUB V MILLER (OWNERSHIP OF NON-NAVIGABLE WATERS).

118 OHIO ST 360, 161 NE 12-16 (1928).

DESCRIPTORS:

\*OHIO, \*PUBLIC RIGHTS, \*NON-NAVIGABLE WATERS, \*FISHING, OWNERSHIP OF BEDS, RIPARIAN RIGHTS, RIPARIAN WATERS, NAVIGABLE WATERS, STREAMS, LAKES, LAKE ERIE, WATERCOURSES(LEGAL), TIDES, TIDAL MARSHES, FISH MANAGEMENT, RECREATION, FISH CONSERVATION, WILDLIFE, LEGAL ASPECTS, JUDICIAL DECISIONS, REMEDIES, RELATIVE RIGHTS.

ABSTRACT:

PLAINTIFF SPORTING CLUB AND GAME PRESERVE ASKED THAT DEFENDANT FISHERMEN BE ENJOINED FROM TRESPASSING ON ITS PROPERTY, CLAIMING THEY DISTURBED BREEDING GROUNDS AND SCARED WILDFOWL. DEFENDANTS ANSWERED THAT THEY HAD THE RIGHT TO FISH IN NAVIGABLE WATERS. PLAINTIFF'S LAND BORDERED ON LAKE ERIE, AND THE WATERS IN QUESTION, A LAKE AND TWO STREAMS, WERE ACCESSIBLE FROM SUCH LAKE. THE LOWER COURT RULED FOR DEFENDANTS, AND DENIED THE INJUNCTION. THE SUPREME COURT OF OHIO AGREED THE OPEN BODY OF WATER WAS PART OF THE BAY AND THUS PUBLIC, BUT IT ENJOINED DEFENDANTS FROM USE OF THE TWO STREAMS. THE COURT STATED THE STREAMS WERE DEFINED WATERCOURSES AND DID NOT LOSE THAT DEFINITION BECAUSE THE WATER LEVEL ROSE WITH THE TIDE. NOR COULD SUCH STREAMS BE CONSIDERED NAVIGABLE UNDER THE DEFINITION OF WATER CAPABLE OF USE AS A COMMERCIAL HIGHWAY. FLAT-BOTTOMED FISHING BOATS ARE NOT COMMERCE, AND, SINCE THE STREAMS FLOWED ONLY FROM PLAINTIFF'S PRIVATE LAND, THEY WERE OWNED BY PLAINTIFF. (MORRIS-FLORIDA)

FIELD 06E

ACCESSION NO. W71-02422

THE MERCURY POLLUTION PROBLEM IN MICHIGAN AND THE LOWER GREAT LAKES AREA (A SUMMARY OF INFORMATION AND ACTION PROGRAMS),

MICHIGAN WATER RESOURCES COMMISSION, LANSING.

W. G. TURNEY.

MAY 1970. 12 P, 10 REF.

DESCRIPTORS:

\*MICHIGAN, \*WATER POLLUTION, \*POLLUTION ABATEMENT, \*CHEMICAL WASTES, POLLUTANTS, POLLUTANT IDENTIFICATION, INVESTIGATIONS, WATER POLLUTION SOURCES, GOVERNMENTS, WATER POLLUTION EFFECTS, WATER POLLUTION CONTROL, LEGAL ASPECTS, LAKE ERIE, GREAT LAKES, ECOLOGY, LABORATORIES, LABORATORY TESTS, FISH, FISHKILL, FISH CONSERVATION, METALS.

IDENTIFIERS:

\*MERCURY POLLUTION.

ABSTRACT:

THE MERCURY POLLUTION PROBLEM IN THE ST. CLAIR RIVER, LAKE ST. CLAIR, THE DETROIT RIVER, AND LAKE ERIE IS SURVEYED. DATA GATHERED BY NUMEROUS AGENCIES WITHIN VARIOUS GOVERNMENTS IS COMPILED AND THERE IS A PRELIMINARY ASSESSMENT OF THE PROBLEM. THE REPORT ATTEMPTS TO SHOW HOW MICHIGAN LEARNED OF THE PROBLEM, WHAT ACTION HAS BEEN TAKEN, WHAT ACTION IS PLANNED, AND WHAT FURTHER NEEDS TO BE DONE. AN HISTORICAL REVIEW OF MERCURY CONTAMINATION AND INVESTIGATIVE WORK IN JAPAN, SWEDEN AND CANADA IS PRESENTED. THE CLINICAL SYMPTOMS OF MERCURY POISONING IN MAN ARE ENUMERATED AND MERCURY UPTAKE BY FISH DISCUSSED. THE RESULTS OF LABORATORY TESTING FOR MERCURY CONCENTRATIONS IN FISH BY VARIOUS GOVERNMENTAL LABORATORIES ARE REVEALED. THE REPORT DISCLOSES ACTION PROGRAMS BY THE MICHIGAN WATER RESOURCES COMMISSION RELATING TO THE CONTROL OF MERCURY DISCHARGES. ACTION HAS BEEN TAKEN AGAINST WYANDOTTE CHEMICAL COMPANY, AND GENERAL ELECTRIC COMPANY, THE MAJOR MICHIGAN MERCURY POLLUTION SOURCES. (POWELL-FLORIDA)

FIELD 05G, 05B, 06E

ACCESSION NO. W71-03294

GREAT LAKES SHORELAND MANAGEMENT AND EROSION DAMAGE CONTROL FOR MICHIGAN.

MICHIGAN WATER RESOURCES COMMISSION, LANSING. DEPT. OF NATURAL RESOURCES.

DEPARTMENT OF NATURAL RESOURCES, WDS-4, JANUARY 1970. 18 P, 21 FIG. SUPPORTED BY A WATER RESOURCES COUNCIL GRANT.

DESCRIPTORS:

\*SHORE PROTECTION, \*EROSION CONTROL, \*GREAT LAKES, \*LITTORAL DRIFT, \*SOIL EROSION, \*FLOOD DAMAGE, BANK STABILITY, MICHIGAN, LAKE SHORES, LAKE ERIE, LAKE MICHIGAN, LAKE HURON, SEICHES, WIND TIDES, LAND MANAGEMENT, SEDIMENT CONTROL.

IDENTIFIERS:

\*SHORELAND MANAGEMENT.

ABSTRACT:

A PROGRAM HAS BEEN DEVELOPED AND INTRODUCED TO THE MICHIGAN LEGISLATURE TO PROVIDE FOR THE PROTECTION, EFFECTIVE MANAGEMENT, AND MAINTENANCE OF THE QUALITY OF THE GREAT LAKES SHORELANDS OF MICHIGAN. INCLUDED ARE PROVISIONS TO: REQUIRE ZONING OF SHORELANDS; ESTABLISH THE RESPONSIBILITIES OF THE DEPARTMENT OF NATURAL RESOURCES AND THE WATER RESOURCES COMMISSION; AUTHORIZE ENGINEERING AND SPECIAL STUDIES OF THE SHORELANDS; AND DEVELOP A COMPREHENSIVE PLAN FOR THE USE OF THE SHORELANDS. THE SHORELANDS OF SOME OF MICHIGAN'S SOUTHERN COUNTIES ARE OVER 80 PERCENT DEVELOPED. EROSION IS A NATURAL PROCESS; HOWEVER, WHEN WATER LEVELS ARE HIGH AND WHEN HIGH WINDS OCCUR, DAMAGE CAN BE SEVERE. IN ADDITION TO DAMAGES CAUSED BY NORMAL WEATHER DURING HIGH WATER, THERE IS A THREAT OF SHORT BUT VIOLENT FLUCTUATIONS FROM SEICHES THAT CAN INUNDATE LARGE AREAS WITHIN MINUTES. PRIMARY DAMAGE RESULTS FROM EROSION OF THE SHORELINE, CAUSING PHYSICAL LOSS OF LAND AREAS, TREES, STRUCTURES, DOCKS, HOMES, COTTAGES AND ROADS. ACCELERATED SEDIMENTATION IMPAIRS WATER QUALITY, INCREASES DOMESTIC WATER TREATMENT COSTS, DESTROYS AQUATIC LIFE AND HABITAT, AND FILLS RIVER MOUTHS. A SHORELAND MANAGEMENT PROGRAM SHOULD GIVE FIRST PRIORITY TO ASSURING THAT NEW DEVELOPMENTS ALONG THE GREAT LAKES WILL NOT BE SUBJECT TO EROSION EFFECTS. A PARTNERSHIP MANAGEMENT PROGRAM BETWEEN THE MICHIGAN STATE GOVERNMENT AND LOCAL GOVERNMENTS IS SUGGESTED. (POERTNER)

FIELD 02H, 02J

ACCESSION NO. W71-03908

PESTICIDES IN SURFACE WATERS OF THE UNITED STATES: A FIVE-YEAR SUMMARY  
1964-1968,

FEDERAL WATER POLLUTION CONTROL ADMINISTRATION, CINCINNATI, OHIO. ANALYTICAL  
QUALITY CONTROL LAB.

JAMES J. LICHTENBERG, JAMES W. EICHELBERGER, RONALD C. DRESSMAN, AND JAMES E.  
LONGBOTTOM.

AVAILABLE FROM: EPA WQO, ANALYTICAL QUALITY CONTROL LABORATORY, 1014  
BROADWAY, CINCINNATI, OHIO 45202. SEPTEMBER 1969. 34 P, 2 FIG, 8 TAB, 10  
REF.

DESCRIPTORS:

\*WASTE WATER(POLLUTION), \*DIELDRIN, \*ORGANOPHOSPHORUS PESTICIDES,  
HUDSON RIVER, \*PESTICIDE RESIDUES, ENDRIN, DDT, ALDRIN, HEPTACHLOR,  
WATER QUALITY, FISHKILL, DELAWARE RIVER, TENNESSEE RIVER, OHIO RIVER,  
ST. LAWRENCE RIVER, LAKE ERIE, LAKE MICHIGAN, LAKE SUPERIOR,  
MISSISSIPPI RIVER, MISSOURI RIVER, RIO GRANDE RIVER, COLORADO RIVER,  
COLUMBIA RIVER, WATER POLLUTION SOURCES.

IDENTIFIERS:

\*CHEMICAL RECOVERY, \*PARATHION, LINDANE, BHC, CHLORDANE, METHYL,  
PARATHION, FENTHION, ETHION, MALATHION, TRITHION, DDE, DDD, HEPTACHLOR  
EPOXIDE, CONNECTICUT RIVER, SCHUYLKILL RIVER, MERRIMACK RIVER, RARITAN  
RIVER, POTOMAC RIVER, SHENANDOAH RIVER, SUSQUEHANNA RIVER, ROANOKE  
RIVER, NEUSE RIVER, APALACHICOLA RIVER, BEAUCLAIR RIVER, ESCAMBIA  
RIVER, OKLAHOMA RIVER, WEST PALM BEACH CANAL, CHATTAHOOCHEE RIVER,  
SAVANNAH RIVER, CLINCH RIVER, TOMBIGBEE RIVER, ALLEGHENY RIVER, KANAWHA  
RIVER, MONONGAHELA RIVER, WABASH RIVER, DETROIT RIVER, ST. CLAIR RIVER,  
ST. MARY'S RIVER, SAGINAW RIVER, MAUMEE RIVER, ILLINOIS RIVER, FOX  
RIVER, NORTH PLATTE RIVER, PLATTE RIVER, SOUTH PLATTE RIVER,  
YELLOWSTONE RIVER, RAINY RIVER, RED RIVER, KANSAS RIVER, BIG HORN  
RIVER, ATCHAFALAYA RIVER, ARKANSAS RIVER, BRAZOS RIVER, VERDIGRIS  
RIVER, TRINITY RIVER, BEAR RIVER, GREEN RIVER, KLAMATH RIVER,  
SACRAMENTO RIVER, SAN JOAQUIN RIVER, SAN JUAN RIVER, TRUCKEE RIVER,  
CLEARWATER RIVER, PEND OREILLE RIVER, SNAKE RIVER, SPOKANE RIVER,  
WILLAMETTE RIVER, YAKIMA RIVER, CARBAMATE COMPOUNDS.

ABSTRACT:

THIS REPORT SUMMARIZES THE RESULTS OF FIVE ANNUAL SYNOPTIC SURVEYS  
(1964-1968) FOR CHLORINATED HYDROCARBON PESTICIDES IN SURFACE WATER OF  
THE UNITED STATES. THE ANALYTICAL METHODS EMPLOYED WERE BASED UPON  
STANDARD METHODS ESTABLISHED BY FWQA WHICH ARE SPECIFIC FOR DIELDRIN,  
ENDRIN, DDT, DDE, DDD, ALDRIN, HEPTACHLOR, HEPTACHLOR EXPOXIDE,  
LINDANE, BHC, GAMMA-CHLORDANE AND TECHNICAL CHLORDANE. IN THE 1967 AND  
1968 SURVEYS, SAMPLES WERE ALSO ANALYZED FOR MEHYL PARATHION,  
PARATHION, FENTHION, ETHION, MALATHION, AND TRITHION. THE RESULTS  
SHOWED WIDE-SPREAD OCCURRENCE OF THE PESTICIDES THROUGHOUT THE UNITED  
STATES. THE NUMBER OF OCCURRENCES REACHED A PEAK IN 1966 AND THEN  
DECLINED SHARPLY IN 1967 AND 1968. THE MAXIMUM CONCENTRATIONS HAVE NOT  
EXCEEDED PERMISSIBLE LIMITS AS THEY RELATE TO HUMAN INTAKE DIRECTLY  
FROM A DOMESTIC WATER SUPPLY. HOWEVER, THEY HAVE OFTEN EXCEEDED THE

ENVIRONMENTAL LIMIT RECOMMENDED BY THE FEDERAL COMMITTEE ON WATER  
QUALITY CRITERIA. MAPS AND TABLES ARE INCLUDED TO SHOW THE DISTRIBUTION  
OF THE VARIOUS PESTICIDES THROUGHOUT THE UNITED STATES.  
(LITTLE-BATTELLE)

FIELD 05A, 05B

ACCESSION NO. W71-04201

AN ECOLOGICAL CRITERION FOR EVALUATING AN ENVIRONMENT,

NEW YORK STATE COLL. OF AGRICULTURE, ITHACA. DEPT. OF CONSERVATION.

BRUCE T. WILKINS.

IN: ASPECTS OF PLANNING, EVALUATION AND DECISION-MAKING IN SPORT FISHERY  
MANAGEMENT DEPARTMENT OF CONSERVATION EXTENSION SERIES NO 1, CORNELL  
UNIVERSITY, MAY 28, 1968, P 18-23. 2 REF.

DESCRIPTORS:

\*DECISION-MAKING, \*ENVIRONMENTAL EFFECTS, RESOURCE ALLOCATION, NEW  
YORK, LAKE ERIE, \*NATURAL RESOURCES, EVALUATION.

IDENTIFIERS:

ADIRONDACKS, FOREST PRESERVE, PRESERVATION OF AGRICULTURAL LAND.

ABSTRACT:

DIVERSITY IS ONE OF THE MAJOR CRITERIA IN THE DEVELOPMENT OF NATURAL  
RESOURCES. A MONOCULTURE IS LESS STABLE THAN A COMPLEX OF  
ORGANISMS--CATASTROPHIC RESULTS ASSOCIATED WITH SUCH THINGS AS DISEASE,  
PREDATORS, WEATHER INFLUENCES, OR ABSENCE OF BUFFER SPECIES ARE MORE  
LIKELY TO OCCUR AS DIVERSITY SHRINKS. IT IS CONCLUDED THAT SOCIETY  
MINIMIZED RISK BY MAINTAINING DIVERSITY WHICH MAY HAVE THE EFFECT OF  
SACRIFICING MAXIMUM PRODUCTIVITY. (SEE ALSO W71-04271) (HOLMES-RUTGERS)

FIELD 06B

ACCESSION NO. W71-04274

BAUMHART V MCCLURE (OWNERSHIP OF RIPARIAN LAND AFTER SUSTAINED SUBMERGENCE).

153 NE 211-212 (OHIO APP 1926).

DESCRIPTORS:

\*OHIO, \*LAND TENURE, \*ACCRETION(LEGAL ASPECTS), \*BOUNDARIES(PROPERTY), BOUNDARY DISPUTES, REAL PROPERTY, EROSION, SUBMERGENCE, ADJUDICATION PROCEDURE, RIPARIAN LAND, LAKE ERIE, LAKES, JUDICIAL DECISIONS, LEGAL ASPECTS, AVULSION.

ABSTRACT:

PLAINTIFF RIPARIAN LOT OWNER SOUGHT TO QUIET TITLE TO RIPARIAN LAND CLAIMED BY DEFENDANT RIPARIAN OWNER. DEFENDANT'S LOT WAS ABOVE LAKE ERIE WHEN IT WAS ORIGINALLY PLATTED. IT WAS LATER SUBMERGED FOR 40 YEARS, BUT HAD RECENTLY REAPPEARED. PLAINTIFF CLAIMED TITLE TO THE LOT BY ACCRETION OR RELICTION. THE OHIO COURT OF APPEALS DEFINED ACCRETION AS AN INCREASE IN REALTY BY GRADUAL DEPOSIT OF SOLID MATERIAL BY WATER TO CREATE DRY LAND. RELICTION WAS DEFINED AS AN INCREASE IN REALTY BY RECESSION OF WATER. NOTING THAT THE BURDEN OF PROOF WAS UPON THE CLAIMANT BY ACCRETION AS AGAINST ONE HAVING CHAIN OF TITLE, THE COURT STATED THAT AN OWNER'S TITLE IS DESTROYED BY A DISAPPEARANCE OF LAND ONLY WHEN THE LAND IS TRANSPORTED BEYOND THE OWNER'S BOUNDARY, OR IS SUBMERGED FOR A PERIOD PRECLUDING ESTABLISHMENT OF THE PROPERTY'S IDENTITY. FURTHERMORE, IT WAS OBSERVED THAT TITLE WOULD NOT BE DESTROYED BY SUDDEN AVULSION FROM STORM. STATING THAT LAND LOST BY SUBMERGENCE MIGHT BE REGAINED BY RELICTION, AND ITS DISAPPEARANCE BY EROSION COULD BE RETURNED BY ACCRETION, THE COURT HELD THAT PLAINTIFF HAD NOT SUSTAINED THE BURDEN OF PROVING THAT DEFENDANT'S TITLE IN THE PROPERTY HAD BEEN PERMANENTLY DESTROYED BY ITS SUBMERGENCE. DEFENDANT'S TITLE WAS HELD UNIMPAIRED. (HART-FLORIDA)

FIELD 06E.

ACCESSION NO. W71-04330



EAST BAY SPORTING CLUB V MILLER (RIGHT OF PUBLIC TO USE PRIVATE  
WILDLIFE-MANAGEMENT LANDS ON LAKE ERIE).

118 OHIO ST 360, 161 NE 12-16 (1928).

DESCRIPTORS:

\*OHIO, \*LAKE ERIE, \*FISHING, \*NAVIGABLE WATERS, FISH MANAGEMENT,  
RECREATION, FISH CONSERVATION, LAKES, BAYS, WATERCOURSES(LEGAL),  
INTERMITTENT STREAMS, JUDICIAL DECISIONS, MARSHES, WILDLIFE  
CONSERVATION, WILDLIFE, WILDLIFE HABITATS, WILDLIFE MANAGEMENT, LEGAL  
ASPECTS.

ABSTRACT:

PLAINTIFF SPORTING CLUB BROUGHT ACTION TO ENJOIN DEFENDANT CITIZEN FROM  
HUNTING AND FISHING UPON ITS LANDS. THE DISPUTED LANDS WERE PRIMARILY  
MARSHES. DEFENDANT ASSERTED THE RIGHT TO HUNT AND FISH THE LANDS AS A  
MEMBER OF THE PUBLIC AND ASSERTED THAT DEPRIVATION OF SUCH RIGHT WAS  
UNCONSTITUTIONAL. THE SUPREME COURT OF OHIO NOTED THAT: (1) THE PUBLIC  
IS ENTITLED TO FISH IN LAKE ERIE AND ITS OPEN BAY REGARDLESS OF WHETHER  
SUCH WATERS ARE NAVIGABLE, (2) WATERS CAPABLE OF USE AS HIGHWAYS FOR  
COMMERCE ARE NAVIGABLE, AND (3) A 'WATERCOURSE' IS A STREAM IN A  
NATURAL CHANNEL DISCHARGING INTO A LARGER BODY OF WATER. SINCE PART OF  
THE DISPUTED LAND WAS PART OF A BAY OF LAKE ERIE, THE COURT HELD THAT  
DEFENDANT WAS ENTITLED TO FISH THAT PORTION. HOWEVER, SINCE PLAINTIFF  
ESTABLISHED OWNERSHIP OF THE REMAINING LAND, WHICH WAS NOT PART OF LAKE  
ERIE, THE COURT ENJOINED DEFENDANT FROM TRESPASSING UPON THE REMAINDER.  
(HART-FLORIDA)

FIELD 06E

ACCESSION NO. W71-04529

LAKE HOURLY DISPERSION ESTIMATES FROM A RECORDING CURRENT METER,

ONTARIO WATER RESOURCES COMMISSION, TORONTO.

MERV D. PALMER, AND J. BRYAN IZATT.

JOURNAL OF GEOPHYSICAL RESEARCH, VOL 76, NO 3, P 688-693, JANUARY 20, 1971. 6  
P, 3 FIG, 4 TAB, 18 REF. ONR CONTRACT N00014-67-A-0103-0007, NR 307-252.

DESCRIPTORS:

\*DISPERSION, \*WATER CIRCULATION, \*GREAT LAKES, \*LAKE ERIE,  
CURRENTS(WATER), LAKES, MIXING, CURRENT METERS, PATH OF POLLUTANTS,  
TRACKING TECHNIQUES, CORRELATION ANALYSIS, PROBABILITY, MARKOV  
PROCESSES, STOCHASTIC PROCESSES, REYNOLDS NUMBER, DATA COLLECTIONS,  
STATISTICAL METHODS, COMPUTER PROGRAMS.

IDENTIFIERS:

\*DISPERSION(LAKES).

ABSTRACT:

FOR THE GREAT LAKES, MEAN HOURLY DISPERSION COEFFICIENTS ARE PREDICTED  
BY USING A FIRST-ORDER MARKOV CHAIN MODEL DEVELOPED FROM CONTINUOUS  
HOURLY CURRENT METER RECORDS AT A FIXED POINT. DISPERSION COEFFICIENTS  
COMPARE FAVORABLY WITH OTHER STUDIES. THE EULERIAN DATA ARE ASSUMED  
EQUIVALENT TO LAGRANGIAN BECAUSE THE REYNOLDS NUMBERS WERE LARGE, AND  
BECAUSE THE VELOCITY FIELD WAS HOMOGENEOUS OVER THE DISTANCES  
CONSIDERED. A CONVENTIONAL DYE INJECTION STUDY AT PORT MAITLAND ON LAKE  
ERIE VERIFIED THE CONVERSION OF DATA FROM EULERIAN TO LAGRANGIAN FORM.  
CONCENTRATIONS WERE COMPUTED AS A FUNCTION OF DISTANCE FOR A CONSTANT  
CONTINUOUS POINT SOURCE OF A PASSIVE CONTAMINANT. A METHOD WAS  
DEVELOPED FOR DETERMINING THE MAXIMUM, MEAN, AND MINIMUM PROBABLE  
DISTANCES TRAVELED BY A PARTICLE IN A PERIOD OF HOURS. (KNAPP-USGS)

FIELD 02H

ACCESSION NO. W71-04565

SYSTEMS ANALYSIS FOR GREAT LAKES WATER RESOURCES.

OHIO STATE UNIV., COLUMBUS. WATER RESOURCES CENTER.

AVAILABLE FROM NTIS AS PB-197 678, \$3.00 IN PAPER COPY, \$0.95 IN MICROFICHE. PROCEEDINGS OF THE FOURTH SYMPOSIUM ON WATER RESOURCES RESEARCH OF THE OHIO STATE UNIVERSITY, WATER RESOURCES CENTER, OCTOBER 1969. 135 P, 10 FIG, 18 TAB, 52 REF, 2 APPEND. OWRR PROJECT A-999-OHIO(3).

DESCRIPTORS:

\*SYSTEMS ANALYSIS, \*WATER RESOURCES DEVELOPMENT, \*OPTIMIZATION, \*GREAT LAKES, POLLUTION ABATEMENT, ECONOMICS, OHIO, WATER POLLUTION CONTROL.

ABSTRACT:

THE SYMPOSIUM WAS AN OUTGROWTH OF INTEREST IN POLLUTION ABATEMENT MEASURES FOR THE GREAT LAKES. IT REPRESENTED AN EFFORT TO RESOLVE THE OPTIMUM APPROACH TO BE TAKEN IN THE SOLUTION OF WATER PROBLEMS. SECTION I DEALT WITH THE BIOLOGICAL-CHEMICAL-PHYSICAL SUBSYSTEM AND INCLUDED DEVELOPMENT OF A COMPREHENSIVE SIMULATION MODEL OF THE FISH RESOURCES OF THE GREAT LAKES, MICROBIAL-CHEMICAL INTERACTIONS AS SYSTEMS PARAMETERS FOR LAKE ERIE, AN OXYGEN-BASED PERFORMANCE MODEL FOR WESTERN LAKE ERIE, AND PRELIMINARY POLICY MODELS FOR GREAT LAKES REGULATION. THE ECONOMIC SUBSYSTEM WAS DEALT WITH IN SECTION II WHICH DESCRIBED AN INTERINDUSTRY FORECASTING MODEL WITH WATER QUALITY AND QUALITY CONSTRAINTS, SOME DETERMINANTS OF DETROIT'S REGIONAL SHARE OF ECONOMIC ACTIVITY IN SELECTED INDUSTRIES, A REGIONAL TRADE AND STRUCTURE MODEL FOR POLLUTION ABATEMENT IN THE WESTERN BASIN OF LAKE ERIE. SECTION III ENTITLED 'INTEGRATION OF THE MODEL' INCLUDED THE TOPICS OF THE UTILITY OF SYSTEMS ANALYSIS IN ESTUARINE WATER QUALITY MANAGEMENT, AND SYSTEMS ANALYSIS, WATER QUALITY AND GOVERNMENT DECISION MAKING. (SEE ALSO W71-04757 THRU W71-04766) (KRISS-CORNELL)

FIELD 06A, 05G

ACCESSION NO. W71-04756

SOME MICROBIAL-CHEMICAL INTERACTIONS AS SYSTEMS PARAMETERS IN LAKE ERIE,  
OHIO STATE UNIV., COLUMBUS. MICROBIAL AND CELLULAR BIOLOGY.

P. R. DUGAN, J. I. FREA, AND R. M. PFISTER.

IN: SYSTEMS ANALYSIS FOR GREAT LAKES WATER RESOURCES, P 21-28, OCTOBER 1969.  
8 P, 2 FIG, 16 REF. OWRR PROJECT A-999-OHIO(3).

DESCRIPTORS:

\*SYSTEMS ANALYSIS, DATA COLLECTIONS, \*ALGAE CONTROL, \*LAKE ERIE,  
BIOCHEMICAL OXYGEN DEMAND, BACTERIA, ECOLOGY, WATER POLLUTION EFFECTS,  
LAKES, \*CYANOPHYTA, \*EUTROPHICATION, WATER QUALITY.

ABSTRACT:

SOME MICROBIAL-CHEMICAL INTERACTIONS AS SYSTEMS PARAMETERS IN LAKE ERIE WERE PRESENTED. ONE OF THE MAJOR PROBLEMS CITED WAS THE INCREASED GROWTH RATE OF BLUE GREEN ALGAE AND OTHER MICROORGANISMS IN THE LAKE WHICH HAVE LED TO OBJECTIONS BECAUSE OF DECREASED RECREATIONAL VALUE, MORTALITY OF FISH AND DOMESTIC ANIMALS, CLOGGING OF WATER SUPPLY INTAKE FILTERS, AND DEPLETION OF OXYGEN IN THE WATER. FOUR GENERAL PARAMETERS WERE CONSIDERED IN RELATIONSHIP TO ACCELERATED GROWTH OF BLUE GREEN ALGAE: (1) AMOUNT OF LIGHT (ENERGY); (2) NITROGEN SUPPLY; (3) CO<sub>2</sub> OR CO<sub>3</sub>; AND (4) MINERALS. SEVERAL OBSERVATIONS WERE MADE FROM DATA COLLECTED IN THE WESTERN BASIN OF LAKE ERIE DURING THE SPRING AND SUMMER OF 1969. USING BOD AS AN EXAMPLE OF RECYCLING, ROLE OF BACTERIA IN MAKING NUTRIENTS AVAILABLE FOR ALGAE GROWTH WAS SHOWN SIGNIFICANT; AND ALGAE, ONCE ABOVE A CRITICAL CONCENTRATION SIGNIFICANTLY ENRICH THEIR OWN ENVIRONMENTS WITH ORGANICS, WHICH INDICATED A SPIRALING INCREASE IN RATE OF EUTROPHICATION. SUGGESTIONS FOR DECREASING ALGAE AND BACTERIA POPULATION IN THE LAKE WERE: PREVENTING ORGANIC AND MINERAL NUTRIENTS FROM ENTERING THE WATER COLUMN AND REMOVING SEDIMENTS OF RELATIVELY HIGH ORGANIC CONTENT PHYSICALLY OR ALLOWING THEM TO DECREASE NATURALLY. (SEE ALSO W71-04756) (KRIS-CORNELL)

FIELD 06A, 05C, 02H

ACCESSION NO. W71-04758

DEVELOPMENT OF AN OXYGEN-BASED PERFORMANCE MODEL FOR THE WESTERN LAKE ERIE  
PHYSICO-BIOLOGICAL SYSTEM,

OHIO STATE UNIV., COLUMBUS. DEPT. OF MICROBIOLOGY.

C. I. RANGLES, T. Y. LI, K. S. SHUMATE, AND S. STOLLMACK.

IN: SYSTEMS ANALYSIS FOR GREAT LAKES WATER RESOURCES, P 29-35, OCTOBER 1969.  
7 P, 1 FIG. OWRR PROJECT A-999-OHIO(3).

DESCRIPTORS:

\*SYSTEMS ANALYSIS, \*MATHEMATICAL MODELS, \*OXYGEN, DATA COLLECTIONS,  
\*LAKE ERIE, ORGANIC LOADING, SOCIAL ASPECTS, ECONOMICS, LAKES,  
\*INPUT-OUTPUT ANALYSIS, WATER QUALITY.

ABSTRACT:

A PERFORMANCE MODEL FOR THE WESTERN LAKE ERIE PHYSICO-BIOLOGICAL SYSTEM THAT WILL PROVIDE A SOUND BASE FOR DETERMINING THE 'BEST' USES OF THE SYSTEM IN A SOCIO-ECONOMIC SENSE USING A SYSTEMS ANALYSIS APPROACH WAS PROPOSED. MATHEMATICAL MODELING OF PROCESSES IN THE BASIS, OR SUBMODELS OF THE SYSTEM, PROVIDED THE BASIS FOR SELECTING SIGNIFICANT PARAMETERS, VIA QUANTITIZED ANALYSES, INCLUDED IN THE OVERALL SYSTEM MODEL. OXYGEN PROVIDED THE BEST COMBINATION OF CHARACTERISTICS NEEDED FOR THE COMMON MEASURE OF PERFORMANCE OF THE SYSTEM BECAUSE OF ITS USABILITY, INCLUSIVENESS, AND SCIENTIFIC SOUNDNESS. MAJOR INPUTS, OUTPUTS, PROCESSES AND INFLUENCING FACTORS FOR MEASURING THE STATE AND CHANGES IN STATE OF THE PHYSICO-BIOLOGICAL WERE ILLUSTRATED AND GENERAL COMMENTS WERE MADE ABOUT THE SYSTEM. TWO SPECIAL CASES, ONE WHERE THERE WERE NO INPUTS OR OUTPUTS OF EITHER ORGANIC MATERIALS OR OXYGEN (A CLOSED SYSTEM), AND ONE WHERE THE SYSTEM IS IN A STEADY STATE (INPUTS AND OUTPUTS OF OXYGEN AND ORGANIC MATERIALS WERE BALANCED) WERE MENTIONED ALTHOUGH COULD NOT BE USED FOR WESTERN LAKE ERIE. SPECIFIC DATA NEEDED FOR THE CONCEPTUAL MODEL WERE: ORGANIC AND OXYGEN INPUTS IN INFLUENT RIVERS; ORGANIC AND OXYGEN OUTPUTS TO CENTRAL BASIN; ORGANIC INPUTS OR OUTPUTS TO SEDIMENTS; ORGANIC OUTPUTS IN THE FORM OF FISH, INSECTS, ALGAE, ETC., OXYGEN INPUTS FROM OR OUTPUTS TO THE ATMOSPHERE; AND PHOTOSYNTHESIS AND RESPIRATION. (SEE ALSO W71-04756) (KRISS-CORNELL)

FIELD 06A, 02H

ACCESSION NO. W71-04759

REGIONAL TRADE AND STRUCTURE MODEL FOR POLLUTION ABATEMENT STUDY,

OHIO STATE UNIV., COLUMBUS. DEPT. OF ECONOMICS.

RICHARD T. STILLSON.

IN: SYSTEMS ANALYSIS FOR GREAT LAKES WATER RESOURCES, P 75-89, OCTOBER 1969.  
15 P, 2 FIG, 1 APPEND. OWRR PROJECT A-999-OHIO(3).

DESCRIPTORS:

\*OPTIMIZATION, \*SIMULATION ANALYSIS, \*MODEL STUDIES, REGIONAL ANALYSIS,  
\*POLLUTION ABATEMENT, ECONOMICS, LAKE ERIE, COSTS, CONSTRAINTS, LAKES,  
WATER POLLUTION CONTROL, WATER QUALITY.

ABSTRACT:

OUTLINES OF A REGIONAL TRADE MODEL USEFUL IN DETERMINING THE LIKELY ECONOMIC IMPACT OF VARIOUS PROPOSED POLLUTION ABATEMENT PROGRAMS FOR THE WESTERN BASIN OF LAKE ERIE WERE PRESENTED. THE MODEL WAS DESIGNED TO ANALYZE THE LIKELY ECONOMIC IMPACT OF IMPLEMENTATION OF 'THE LAKE ERIE REPORT: A PLAN FOR WATER POLLUTION CONTROL' WHICH PROPOSED SEVERAL ABATEMENT PROGRAMS INCLUDING CONSTRUCTION FOR SEWERS, SECONDARY AND TERTIARY TREATMENT FACILITIES OF MUNICIPAL WASTE AND ENFORCEMENT OF A HIGH STANDARD OF INDUSTRIAL TREATMENT FACILITIES. INTERREGIONAL ACTIVITY ANALYSIS WAS BROKEN DOWN FOR EACH REGION INTO: (1) PRODUCTION OF FINAL PRODUCTS, (2) PRODUCTION OF INTERMEDIATE PRODUCTS AND (3) SHIPMENT OF EVERY COMMODITY FROM EACH REGION. A SAMPLE INPUT-OUTPUT MATRIX OF SUCH ACTIVITIES WAS SHOWN. THIS ACTIVITY ANALYSIS WAS USED TO FORMULATE A PROGRAMMING MODEL TO ALLOCATE GIVEN RESOURCES AMONG ACTIVITIES. THE VARIABLE MAXIMIZED WAS THE GROSS RETURN TO REGIONAL RESOURCES AND TO SHIPPING. THE FOUR CONSTRAINTS ON THE ACTIVITY LEVELS WERE: (1) MATERIAL BALANCES, (2) FINAL RESOURCE CONSTRAINTS, (3) CAPACITY CONSTRAINTS, AND (4) NON-NEGATIVITY CONSTRAINTS. THE MODEL WAS USED TO SIMULATE SHORT RUN IMPACT OF ABATEMENT PROGRAMS WITH FOUR MAJOR EFFECTS ON A REGIONAL ECONOMY: (1) TAXATION EFFECT, (2) WATER INPUT EFFECT, (3) INDUSTRIAL CONTROL EFFECT, AND (4) ABATEMENT AS A USER OF RESOURCES. THE MODEL WAS TO BE SIMULATED FOR THE DETROIT-TOLEDO AREA USING INPUT-OUTPUT COEFFICIENTS FOR 1963. (SEE ALSO W71-04756)  
(KRISS-CORNELL)

FIELD 06A, 06C, 05G

ACCESSION NO. W71-04763

TRADE STUDY RELEVANT TO POLLUTION ABATEMENT IN THE WESTERN BASIN OF LAKE ERIE,  
OHIO STATE UNIV., COLUMBUS. DEPT. OF ECONOMICS.

THOMAS C. WEBSTER.

IN: SYSTEMS ANALYSIS FOR GREAT LAKES WATER RESOURCES, P 91-110, OCTOBER 1969.  
10 P, 7 TAB. OWRR PROJECT A-999-OHIO(3).

DESCRIPTORS:

\*REGIONAL ANALYSIS, \*POLLUTION ABATEMENT, \*LAKE ERIE, INDUSTRIAL  
PRODUCTION, DATA COLLECTIONS, STATISTICS, LAKES, WATER POLLUTION  
CONTROL, COSTS, WATER QUALITY.

IDENTIFIERS:

\*TRADE STUDY.

ABSTRACT:

DATA, WHICH WILL PROVIDE A DESCRIPTION OF THOSE INDUSTRIES IMPORTANT TO  
THE ECONOMY OF THE WESTERN BASIN AND ENGAGED IN REGIONAL TRADE FOR USE  
IN THE REGIONAL TRADE STUDY OF THE WESTERN BASIN OF LAKE ERIE, WAS  
GIVEN. THE GEOGRAPHIC AREA CONSTITUTING THE INDUSTRIAL SECTOR OF THE  
WESTERN BASIN WAS DEFINED AS THE METROPOLITAN AREAS OF DETROIT AND  
TOLEDO. INDUSTRIES INCLUDED IN THE MODEL WERE ASSUMED TO HAVE SIMILAR  
TECHNOLOGIES AND THEREFORE BE AFFECTED BY POLLUTION ABATEMENT PROGRAMS  
IN SIMILAR WAYS. IN TABLE 1, THESE INDUSTRIES WERE CLASSIFIED ACCORDING  
TO THE STANDARD INDUSTRIAL CLASSIFICATION (SIC) SYSTEM AND A  
DESCRIPTION OF EACH PROVIDED A BREAKDOWN OF THE VARIOUS PRODUCTS THEY  
PRODUCE. TABLE 2 LISTED DATA FOR THE ADJUSTED VALUE ADDED BY  
MANUFACTURING FOR EACH SELECTED OR MAJOR INDUSTRY GROUP IN THE  
DETROIT-TOLEDO SMSA AND THE PERCENTAGE OF THE TOTAL VALUE ADDED BY  
MANUFACTURING FOR EACH SELECTED INDUSTRY. THE DISTANCE WHICH THE  
COMMODITIES PRODUCED BY THE VARIOUS INDUSTRIES ARE TRANSPORTED, AS  
GIVEN BY THE '1962 CENSUS OF TRANSPORTATION' WAS GIVEN IN TABLE 3.  
TABLE 4 SHOWED THE DEGREE OF CONCENTRATION OF THE VARIOUS INDUSTRIES  
WITHIN THE FIFTEEN LARGEST PRODUCING REGIONS FOR EACH INDUSTRY.  
AGGREGATES THAT WILL BE USED IN THE REGIONAL TRADE MODEL WERE SHOWN IN  
TABLE 5. ADJUSTED VALUES ADDED BY EACH INDUSTRY AND PERCENTAGE OF THE  
TOTAL VALUE ADDED TO EACH INDUSTRY AGGREGATION WERE GIVEN IN TABLES 6  
AND 7 RESPECTIVELY. (SEE ALSO W71-04756) (KRIS-CORNELL)

FIELD 06A, 06C, 05G

ACCESSION NO. W71-04764

THE EXPERIMENTAL MODIFICATION OF LAKE-EFFECT WEATHER,

CORNELL AERONAUTICAL LAB., INC. BUFFALO, N.Y.

WILLIAM J. EADIE.

AVAILABLE FROM NTIS AS COM-71-00009, \$3.00 IN PAPER COPY, \$0.95 IN MICROFICHE. FINAL REPORT, CAL REPORT NO VC-2898-P-1, AUG 1970. 88 P, 8 FIG, 6 TAB, 16 REF. ESSA CONTRACT NO E 22-6-69(N).

IDENTIFIERS:

\*WEATHER MODIFICATION, \*GREAT LAKES, \*SNOW FALL, REDUCTION, CLOUD SEEDING, SNOWSTORMS, INTENSITY, SILVER IODIDE, ICE, METEOROLOGICAL RADAR, RADAR ECHO AREAS, DRY ICE, MATHEMATICAL MODELS, LAKE ERIE, \*LAKE EFFECT SNOWSTORMS.

ABSTRACT:

DURING NOVEMBER AND DECEMBER OF 1968, FIELD EXPERIMENTS WERE CARRIED OUT ON THE SOUTHEASTERN SHORE OF LAKE ERIE TO DETERMINE THE FEASIBILITY OF MODIFYING LAKE-EFFECT WEATHER. THE PRIMARY OBJECTIVE OF THE EXPERIMENTS WAS TO TEST THE HYPOTHESIS THAT THE SNOWFALL FROM INTENSE LAKE-EFFECT STORMS COULD BE REDISTRIBUTED OVER A LARGER AREA BY OVERSEEDING WITH ICE NUCLEI, THEREBY REDUCING THE HEAVY NATURAL SNOWFALL NEAR THE LEE SHORE. THE EXPERIMENTS DEMONSTRATED THAT OVERSEEDING CAN BE ACCOMPLISHED FOR SHORT PERIODS IN LAKE-EFFECT SNOW BANDS OF MODERATE INTENSITY.

FIELD 02B, 03B

ACCESSION NO. W71-04951



SUBMERSIBLE RECORDING CURRENT AND WATER QUALITY METERS,

ONTARIO WATER RESOURCES COMMISSION, TORONTO.

M. D. PALMER.

WATER AND SEWAGE WORKS, 1970 REFERENCE NUMBER, VOL 117, P R64-R70, NOVEMBER 28, 1970. 7 P, 5 FIG, 1 TAB, 8 REF.

DESCRIPTORS:

\*WATER QUALITY, \*CURRENTS(WATER), \*LAKE ERIE, \*DATA COLLECTIONS, \*INSTRUMENTATION, HYDROLOGIC DATA, MODEL STUDIES, COMPUTER MODELS, CHEMICAL ANALYSIS, CURRENT METERS, ELECTRONIC EQUIPMENT, ON-SITE TESTS, TELEMETRY, FLOW RATES, WATER YIELD, WATER RESOURCES, WATER MEASUREMENT.

IDENTIFIERS:

WATER INTAKES, WASTE OUTFALLS.

ABSTRACT:

SOME APPLICATIONS FOR WATER MANAGEMENT BASED UPON INFORMATION GATHERED FROM A SMALL COMPLETELY SELF-CONTAINED SUBMERSIBLE WATER QUALITY METER AND A RECORDING CURRENT METER OPERATED ON LAKE ERIE AT NANTICOKE ARE DISCUSSED. STATISTICAL METHODS OF INTERPRETING THE DATA ARE DESCRIBED AND IT WAS CONCLUDED THAT THE UTILIZATION OF RECORDING METERS IN THE NEARSHORE AREAS OF LAKES PROVIDES THE NECESSARY DATA FOR A COMPUTER MODEL WHICH WILL INDICATE: (1) THE BEST LOCATION FOR WATER INTAKES AND WASTE OUTFALLS FROM THE DILUTION POINT-OF-VIEW; AND (2) THE ACCEPTABLE DISCHARGE CONCENTRATIONS AND FLOWS ON THE BASIS OF NOT EXCEEDING DESIRABLE VALUES AT LOCATIONS IN THE PROXIMITY OF THE DISCHARGE POINT ON A PROBABILITY BASIS. (WOODARD-USGS)

FIELD 05A, 02H

ACCESSION NO. W71-05084

PLATING AND INDUSTRIAL WASTE TREATMENT AT THE FISHER BODY PLANT,

GENERAL MOTORS CORP., WARREN, MICH. FISHER BODY DIV.

RAYMOND FISCO.

WATER AND SEWAGE WORKS, 1970 REFERENCE NUMBER, VOL 117, P R236-239, NOVEMBER 28, 1970. 4 P, 4 FIG.

DESCRIPTORS:

\*WASTE WATER TREATMENT, \*INDUSTRIAL WASTES, \*INDUSTRIAL WATER, \*WATER MANAGEMENT(APPLIED), \*LAKE ERIE, METHODOLOGY, PLANNING, CHROMIUM, WATER POLLUTION, STREAMS, SLUDGE TREATMENT, ACIDS, ALKALINITY, NEUTRALIZATION, TREATMENT FACILITIES, WATER QUALITY, WATER UTILIZATION, CHEMICALS, RECLAIMED WATER, EFFLUENTS.

IDENTIFIERS:

\*FISHER BODY(ELYRIA, OHIO PLANT).

ABSTRACT:

THE FISHER BODY, ELYRIA, OHIO PLANT IS A MAJOR MANUFACTURER OF HARDWARE AND ELECTROPLATED PARTS FOR THE AUTOMOBILE INDUSTRY. THE TREATMENT PLANT EFFLUENT NOW AVERAGES 1.5 MGD. THIS DISCHARGES INTO A LARGE STORM SEWER WHICH IN TURN JOINS THE BLACK RIVER ONE MILE EAST OF THE PLANT AND IS APPROXIMATELY ONE-FOURTH MILE UPSTREAM FROM CASCADE PARK.

INASMUCH AS THE FISHER BODY EFFLUENT FLOWS TO A SURFACE STREAM, THE PLANT IS REQUIRED TO OPERATE UNDER THE PROVISIONS OF A PERMIT FROM THE OHIO WATER POLLUTION CONTROL BOARD AT COLUMBUS. THE RAW WASTE FLOW MAY BE DESCRIBED AS RATHER WEAK SOLUTIONS OF ACID OR ALKALI AND VARIOUS SUSPENSIONS INCIDENTAL TO THIS TYPE OF MANUFACTURING. THE FLOW-THROUGH VERSUS BATCH-TYPE WASTE TREATMENT IS COMPARED. THE IMPORTANCE OF SEGREGATION OF THE VARIOUS TYPES OF WASTES IS EMPHASIZED. THE FLUE GAS METHOD OF CHROME WASTE SCRUBBING HAS PROVEN HIGHLY EFFECTIVE AT THIS PLANT. SURVEILLANCE AND CONTINUOUS MONITORING ARE LIKEWISE EXTREMELY IMPORTANT. A VALUABLE ADJUNCT TO THE SYSTEM IS AN AQUARIUM RECEIVING FLOW FROM THE FINAL EFFLUENT STREAM. (WOODARD-USGS)

FIELD 05D

ACCESSION NO. W71-05085

GREAT LAKES SNOWSTORMS. PART 1. CLOUD PHYSICS ASPECTS,

STATE UNIV. OF NEW YORK, ALBANY. ATMOSPHERIC SCIENCES RESEARCH CENTER.

JAMES E. JIUSTO, AND EDMOND W. HOLROYD, III.

AVAILABLE FROM NTIS AS COM-71-00012, \$3.00 IN PAPER COPY, \$0.95 IN MICROFICHE. JUN 70. 153 P, 42 FIG, 13 TAB, 71 REF. ESSA GRANT NO E22-49-70(G).

IDENTIFIERS:

\*CLOUD SEEDING, \*GREAT LAKES, \*SNOWSTORMS, REDUCTION, CLOUD PHYSICS, SILVER IODIDE, AEROSOLS, FREEZING, CONDENSATION NUCLEI, ATMOSPHERIC PHYSICS, TEMPERATURE, METEOROLOGICAL RADAR, DRY ICE, SNOW FALL, RADAR CROSS SECTIONS, NETWORKS, MATHEMATICAL MODELS, COMPUTER PROGRAMS, LAKE ERIE, LAKE ONTARIO, \*LAKE EFFECT SNOWSTORMS.

ABSTRACT:

STUDIES OF THE SYNOPTIC, MESOSCALE, AND MICROPHYSICAL CHARACTERISTICS OF SNOWSTORMS OCCURRING TO THE LEE OF LAKES ERIE AND ONTARIO WERE DONE, WITH EMPHASIS ON DEFINING PRECIPITATION MECHANISMS, LAND STRUCTURE, AEROSOL CHARACTERISTICS AND SNOWFALL PATTERNS. CLOUD SEEDING WAS PERFORMED WITH SILVER IODIDE AND WITH DRY ICE. THE PRACTICAL IMPLICATIONS OF EACH MODIFICATION CONCEPT CANNOT BE DEFINITELY ASSESSED, BUT SEEDING WITH ADDITIONAL FREEZING NUCLEI TO INCREASE GROUND OR LAKE PRECIPITATION CAN BE ACCOMPLISHED, AND SEEDING FROM THE GROUND OFFERS EXPERIMENTAL AND OPERATIONAL ADVANTAGES. SNOW CRYSTAL CONCENTRATION AT GROUND LEVEL IS AN EFFECTIVE MEASURE OF MODIFICATION EFFICACY. IT IS RECOMMENDED THAT THE GROUND OBSERVER NETWORK BE INCREASED BY A FACTOR OF 3, AND THAT THE DURATION AND AREA OF SEEDING BE INCREASED BY AT LEAST A FACTOR OF 2 TO 3.

FIELD 02C, 02H

ACCESSION NO. W71-05153

GREAT LAKES SNOWSTORMS, PART 2. SYNOPTIC AND CLIMATOLOGICAL ASPECTS,

STATE UNIV. OF NEW YORK, ALBANY. ATMOSPHERIC SCIENCES RESEARCH CENTER.

JAMES E. JIUSTO, DOUGLAS A. PAINE, AND MICHAEL L. KAPLAN.

AVAILABLE FROM NTIS AS COM-71-00011, \$3.00 IN PAPER COPY, \$0.95 IN MICROFICHE. MAY 1970. 58 P, 24 FIG, 7 TAB, 16 REF. ESS GRANT E22-13-69(G).

IDENTIFIERS:

\*SNOWSTORMS, \*GREAT LAKES, \*CLIMATOLOGY, ANALYSIS, AIR WATER INTERACTIONS, CLOUD PHYSICS, VORTICES, CONVECTION, ATMOSPHERIC MOTION, SNOW FALL, REDUCTION, CRYSTALS, SUPERCOOLING, METEOROLOGICAL RADAR, STATISTICAL ANALYSIS, PRECIPITATION, METEOROLOGY, LAKE ERIE, LAKE ONTARIO, LAKE EFFECT SNOWSTORMS.

ABSTRACT:

A SECONDARY PERTURBATION OF TROUGH HAS BEEN FOUND IN SOME DEEP CYCLONIC SYSTEMS WHICH APPEARS TO PLAY AN IMPORTANT ROLE IN MESOSCALE LAKE EFFECT STORMS. IN TWO CASES SUCH A TROUGH'S ASSOCIATED POSITIVE VORTICITY FIELD PROVIDED ORGANIZED ASCENT IN THE REGION BETWEEN 850 MB AND 600 MB. IN THE NOVEMBER 1967 STORM, AIR PARCELS TRAVELING BETWEEN THE 850 MB AND 700 MB LEVELS UNDERWENT ONE TO SIX THOUSAND FOOT ASCENTS. THIS ASCENT, IN TURN, PROVIDED A MOIST ENVIRONMENT WHICH ENHANCED CLOUD GROWTH, NEARLY DOUBLING CLOUD DEPTHS IN THE 1968 CASE. WHILE EXAMINING SYNOPTIC-MESOSCALE INTERACTIONS, IT IS EQUALLY IMPORTANT TO RECOGNIZE THE ROLE PLAYED BY ORGANIZED DESCENT OVER A PARTICULAR LAKE. SUBSIDENCE COMMONLY OCCURS IN THE NEGATIVE VORTICITY AREA LOCATED AHEAD OF THE SECONDARY TROUGH AND BEHIND THE COLD FRONT. THIS DESCENT IS ENVISIONED AS EFFECTIVELY CAPPING CONVECTIVE MOTIONS AT THE RESULTING INVERSION WHILE DRYING OUT THE ENVIRONMENT BENEATH THE STABLE LAYER. A NUMERICAL MODEL NOW BEING DEVELOPED WILL PROVIDE AN IMPORTANT INPUT OF INITIAL AND CHANGING BOUNDARY CONDITIONS FOR COMPLEMENTING MESO- AND MICROSCALE STUDIES. THE MODEL'S PREDICTED VORTICITY FIELD AT THREE HOUR INTERVALS WILL YIELD A MEASURE OF THE CHANGING VALUES OF A SYNOPTICALLY IMPOSED VERTICAL MOTION PATTERN, PLUS ITS SUBSEQUENTLY CREATED MOISTURE ENVIRONMENT.

FIELD 02H

ACCESSION NO. W71-05154

**TWELFTH CONFERENCE ON GREAT LAKES RESEARCH,**

**MICHIGAN UNIV., ANN ARBOR. GREAT LAKES RESEARCH DIV.; AND BUREAU OF  
COMMERCIAL FISHERIES, ANN ARBOR. GREAT LAKES FISHERY LAB.**

**DAVID C. CHANDLER, AND GEORGE Y. HARRY.**

**PROCEEDINGS TWELFTH CONFERENCE ON GREAT LAKES RESEARCH, MAY 5-7, 1969,  
UNIVERSITY OF MICHIGAN, ANN ARBOR: INTERNATIONAL ASSOCIATION FOR GREAT  
LAKES RESEARCH, 1969. 923 P.**

**DESCRIPTORS:**

**\*CONFERENCES, \*LIMNOLOGY, \*GREAT LAKES, LAKE SUPERIOR, LAKE HURON, LAKE  
MICHIGAN, LAKE ONTARIO, LAKE ERIE, WATER POLLUTION EFFECTS, BOTTOM  
SEDIMENTS, SEDIMENTATION, SAMPLING, WATER QUALITY, WATER BALANCE, WATER  
RESOURCES DEVELOPMENT, WATER MANAGEMENT(APPLIED).**

**IDENTIFIERS:**

**GREAT LAKES RESEARCH CONFERENCE.**

**ABSTRACT:**

**THE TWELFTH CONFERENCE WAS HELD MAY 5-7, 1969, AT ANN ARBOR, MICHIGAN,  
CO-HOSTED BY THE GREAT LAKES FISHERY LABORATORY OF THE U.S. BUREAU OF  
COMMERCIAL FISHERIES AND THE GREAT LAKES RESEARCH DIVISION OF THE  
UNIVERSITY OF MICHIGAN. EMPHASIS IN THE GENERAL SESSIONS WAS ON THE  
RESOURCE VALUES OF THE GREAT LAKES AND THEIR ROLE IN THE NATIONAL  
PROGRAM OF MARINE SCIENCE. AUTHORITIES AT THE REGIONAL AND NATIONAL  
LEVELS FROM CANADA AND THE UNITED STATES WERE PARTICIPANTS IN THESE  
GENERAL SESSIONS. CONTRIBUTED PAPERS COVERED THE USUAL SCIENTIFIC  
DISCIPLINES IN ADDITION TO SPECIAL TOPICS SUCH AS: RESOURCE MANAGEMENT  
AND ECONOMICS; WATER MANAGEMENT; LIMNOLOGICAL ENGINEERING; AND PHYSICAL  
LAKE MODELS. THE SYMPOSIA WERE ON QUATERNARY HISTORY OF THE GREAT LAKES  
REGION, PESTICIDES AND THE GREAT LAKES, THE POTENTIAL APPLICATION OF  
REMOTE SENSING TO GREAT LAKES PROBLEMS, AND INSTRUMENTATION FOR STUDIES  
IN PHYSICAL LIMNOLOGY. (SEE ALSO W71-05562 THRU W71-05571)(KNAPP-USGS)**

**FIELD 02H, 02J, 05B**

**ACCESSION NO. W71-05561**

ORGANIC MATTER IN THE SEDIMENTS OF LAKES ONTARIO AND ERIE,

DEPARTMENT OF ENERGY, MINES AND RESOURCES, BURLINGTON (ONTARIO). CANADA  
CENTER FOR INLAND WATERS.

A. L. W. KEMP.

IN: PROCEEDINGS TWELFTH CONFERENCE ON GREAT LAKES RESEARCH, MAY 5-7, 1969,  
UNIVERSITY OF MICHIGAN, ANN ARBOR: INTERNATIONAL ASSOCIATION FOR GREAT  
LAKES RESEARCH, P 237-249, 1969. 13 P, 4 FIG, 2 TAB, 24 REF.

DESCRIPTORS:

\*BOTTOM SEDIMENTS, \*ORGANIC MATTER, \*LAKE ERIE, \*LAKE ONTARIO, CORES,  
SAMPLING, SILTS, CLAYS, MUD, HUMIC ACIDS, FULVIC ACIDS, SEDIMENTATION,  
PALEOCLIMATOLOGY, PALEOHYDROLOGY, LAKES, SEDIMENT-WATER INTERFACES,  
GREAT LAKES.

ABSTRACT:

ORGANIC CARBON AND CARBONATE CARBON WERE DETERMINED IN SIX PISTON CORES FROM LAKE ONTARIO AND FOUR PISTON CORES FROM LAKE ERIE. THE CHANGES IN ORGANIC CARBON WITH DEPTH OF BURIAL ARE RELATED TO SEDIMENT TYPE AND EH. NITROGEN, BITUMENS, HUMIC ACIDS, FULVIC ACIDS AND KEROGEN WERE MEASURED IN THREE SURFACE SEDIMENT SAMPLES FROM EACH LAKE. THE BASIN SEDIMENTS OF LAKE ONTARIO CONSISTED OF BLACK LAMINATED GREY SILTY CLAY MUDS OVERLYING GREY GLACIAL CLAY, WITH MUD THICKNESSES RANGING FROM 4.6 TO 13.8 M IN THE CORES. ORGANIC CARBON CONTENT DECREASED 50% IN THE TOP 20 CM OF SEDIMENT AND THEN GRADUALLY DECREASED TO 1% AT THE GLACIAL CLAY CONTACT. A COMPLEX ORGANIC CARBON HORIZON WAS FOUND TWO THIRDS OF THE WAY DOWN THE POST GLACIAL MUD COLUMN AT EACH CORE STATION AND WAS ATTRIBUTED TO A WARMER CLIMATE BETWEEN 4000 AND 7500 YEARS BP. BITUMENS ACCOUNTED FOR 3 TO 6% OF THE ORGANIC MATTER, HUMIC AND FULVIC ACIDS FOR 19 TO 27% AND KEROGEN FOR 35 TO 49% IN THE SURFACE CENTIMETER OF SEDIMENT, IN THE MAIN BASINS OF THE TWO LAKES. (SEE ALSO W71-05561)(KNAPP-USGS)

FIELD 02J, 02H

ACCESSION NO. W71-05565

HIGH RESOLUTION REFLECTION SEISMIC SURVEY IN WESTERN LAKE ERIE,

GEOLOGICAL SURVEY OF CANADA, OTTAWA (ONTARIO); GEOLOGICAL SURVEY OF CANADA,  
BURLINGTON (ONTARIO); AND OHIO STATE GEOLOGICAL SURVEY, SANDUSKY.

GEORGE D. HOBSON, C. E. HERDENDORF, AND C. F. M. LEWIS.

IN: PROCEEDINGS TWELFTH CONFERENCE ON GREAT LAKES RESEARCH, MAY 5-7, 1969,  
UNIVERSITY OF MICHIGAN, ANN ARBOR: INTERNATIONAL ASSOCIATION FOR GREAT  
LAKES RESEARCH, P 210-224, 1969. 15 P, 9 FIG, 13 REF.

DESCRIPTORS:

\*SURVEYS, \*BATHYMETRY, \*SEISMIC STUDIES, \*STRATIGRAPHY, \*LAKE ERIE,  
BOTTOM SEDIMENTS, GLACIAL DRIFT, SOUNDING, OHIO, TOPOGRAPHY, PROFILES,  
GREAT LAKES.

IDENTIFIERS:

\*SEISMIC SURVEY(LAKE ERIE).

ABSTRACT:

THE GEOLOGICAL SURVEY OF CANADA, IN COOPERATION WITH THE OHIO  
GEOLOGICAL SURVEY, UNDERTOOK A CONTINUOUS MARINE SEISMIC PROFILING  
SURVEY IN THE WESTERN PART OF LAKE ERIE DURING AUGUST-SEPTEMBER 1968.  
SEISMIC COVERAGE, TOTALLING 818 MI, WAS OBTAINED APPROXIMATELY EVERY 5  
MINUTES OF LATITUDE AND LONGITUDE WEST OF POINT PELEE IN BOTH CANADIAN  
AND UNITED STATES WATERS. RECORD QUALITY VARIES CONSIDERABLY OVER THE  
SURVEY AREA. EAST OF PELEE AND KELLEYS ISLANDS, DATA ARE GOOD AND  
PROVIDE A RELIABLE INTERPRETATION OF THICKNESS OF BOTTOM SEDIMENTS AND  
STRATIFICATION WITHIN THEM. THE WESTERNMOST PORTION OF THE BASIN,  
YIELDS POOR DATA; THIS IS PROBABLY DUE TO GASEOUS ORGANIC MATERIAL,  
SAND BODIES, OR BURIED PEAT DEPOSITS. DRIFT THICKNESS FROM DRILL HOLES  
AND FROM THE SURVEY CORRELATE WELL AND RANGE FROM ZERO UP TO 120 FT. A  
MAJOR REFLECTOR WITHIN THE DRIFT INDICATES THE SURFACE OF GLACIAL  
DEPOSITS AND THE GENERAL PATTERN OF LATE GLACIAL AND POSTGLACIAL  
DRAINAGE DURING LOW-LEVEL PHASES OF LAKE ERIE. OFFSHORE BEDROCK  
ELEVATION VARIES BETWEEN 390 AND 571 FT ABOVE SEA LEVEL. BEDROCK HIGHS  
UNDERLIE POINT PELEE AND THE ISLANDS WHEREAS BEDROCK LOWS IN  
INTER-ISLAND AREAS AND THE CENTRAL BASIN ARE READILY OUTLINED. AN  
INTERPRETATION OF PREGLACIAL DRAINAGE IS PRESENTED. (SEE ALSO  
W71-05561)(KNAPP-USGS)

FIELD 02H, 02J

ACCESSION NO. W71-05567

MONTHLY VARIATION IN PHOSPHATE AND RELATED CHEMICALS FOUND IN THE SEDIMENT IN THE ISLAND AREA OF LAKE ERIE, 1967-68, WITH REFERENCE TO SAMPLES COLLECTED IN 1964, 1965, AND 1966,

JOHN CARROLL UNIV., CLEVELAND, OHIO; AND OHIO STATE UNIV., COLUMBUS.

EDWIN J. SKOCH, AND N. WILSON BRITT.

IN: PROCEEDINGS TWELFTH CONFERENCE ON GREAT LAKES RESEARCH, MAY 5-7, 1969, UNIVERSITY OF MICHIGAN, ANN ARBOR: INTERNATIONAL ASSOCIATION FOR GREAT LAKES RESEARCH, P 325-340, 1969. 16 P, 6 FIG, 3 TAB, 33 REF. OWRR PROJECT A-008-OHIO(2).

DESCRIPTORS:

\*SAMPLING, \*BOTTOM SEDIMENTS, \*LAKE ERIE, \*PHOSPHATES, IRON, ORGANIC MATTER, CHEMICAL ANALYSIS, DATA COLLECTIONS, WATER CHEMISTRY, EUTROPHICATION, NUTRIENTS, PATH OF POLLUTANTS, GREAT LAKES.

ABSTRACT:

SAMPLES OF SEDIMENT COLLECTED IN LAKE ERIE IN 1964, 1965, 1966, AND ON A MONTHLY BASIS FROM MAY, 1967 THROUGH NOVEMBER, 1968 WERE ANALYZED FOR TOTAL PHOSPHATE, IRON AND ORGANIC CARBON. SAMPLES WERE COLLECTED BY MEANS OF AN EKMAN DREDGE AND BY CORING. THE CORES WERE SECTIONED AT 2.5 CM INTERVALS AND EACH OF THE SIX SECTIONS WAS ANALYZED. RESULTS OF THE ANALYSES SHOWED ONLY A SLIGHT INCREASE ON PHOSPHATE SINCE 1964. HOWEVER ALL THREE FACTORS SHOWED A DEFINITE INCREASE FROM MAY, 1967 THROUGH NOVEMBER, 1968. MONTHLY VARIATION WAS QUITE DISTINCT AND MORE SEVERE THAN THE DIFFERENCES BETWEEN YEARS. THE SEDIMENT WAS FOUND TO CONSIST OF TWO DISTINCT LAYERS, WITH THE UPPER 5 CM OF SEDIMENT USUALLY HIGHER IN CONCENTRATIONS OF MATERIALS THAN THE LOWER PORTIONS. (SEE ALSO W71-05561)(KNAPP-USGS)

FIELD 05A, 02K, 02H

ACCESSION NO. W71-05571



BANGIA ATROPURPUREA (ROTH) A. IN WESTERN LAKE ERIE,

OHIO STATE UNIV., COLUMBUS. DEPT. OF BOTANY.

JACK KISHLER, AND CLARENCE E. TAFT.

THE OHIO JOURNAL OF SCIENCE, VOL 70, NO 1, P 56-57, JANUARY 1970. 1 FIG, 5  
REF.

DESCRIPTORS:

\*RHODOPHYTA, \*LAKE ERIE, OHIO, ALGAE.

ABSTRACT:

BANGIA ATROPURPUREA WAS COLLECTED 2 MARCH 1969 AT THE STATE HIGHWAY  
PARK ON THE EAST SHORE OF MARBLEHEAD PENINSULA, OTTAWA COUNTY, OHIO.  
THIS IS THE FIRST RECORD OF BANGIA IN WESTERN LAKE ERIE. IT APPEARED AS  
LAX RED-PURPLE TUFTS, 3/4 INCH LONG, COVERING A FLAGSTONE ON THE  
SHORELINE WHERE THERE WAS AN OPENING IN THE ICE. (LITTLE-BATTELLE).

FIELD 05A, 05C, 02H

ACCESSION NO. W71-05630

**POLLUTION OF LAKE ERIE, LAKE ONTARIO AND THE INTERNATIONAL SECTION OF THE ST. LAWRENCE RIVER. VOLUME I - SUMMARY.**

**INTERNATIONAL LAKE ERIE WATER POLLUTION BOARD; AND INTERNATIONAL LAKE ONTARIO-SAINT LAWRENCE RIVER WATER POLLUTION BOARD.**

**REPORT TO THE INTERNATIONAL JOINT COMMISSION ON THE POLLUTION OF LAKE ERIE, LAKE ONTARIO AND THE INTERNATIONAL SECTION OF THE SAINT LAWRENCE RIVER, VOLUME 1, SUMMARY, 1969. 151 P, 4 FIG, 11 TAB, 5 PLATE.**

**DESCRIPTORS:**

**\*POLLUTANTS, \*PHYSICOCHEMICAL PROPERTIES, \*BIOLOGICAL PROPERTIES, WATER POLLUTION SOURCES.**

**IDENTIFIERS:**

**LAKE ERIE, LAKE ONTARIO, ST. LAWRENCE RIVER.**

**ABSTRACT:**

**LAKE ERIE, LAKE ONTARIO AND THE INTERNATIONAL SECTION OF THE SAINT LAWRENCE RIVER ARE BEING POLLUTED ON BOTH SIDES OF THE U.S.- CANADIAN BOUNDARY. FLOW STUDIES CONDUCTED BY AGENCIES IN BOTH COUNTRIES INDICATE THAT THERE IS SUBSTANTIAL MIXING OF THESE WATERS TO HAVE MADE CONCENTRATION LEVELS OF POLLUTANTS UNIFORM THROUGHOUT EACH OF THESE BODIES OF WATER. POLLUTION SOURCES, CHARACTER AND DISPOSITION OF WASTE INPUTS, WATER QUALITY PROBLEMS, WATER QUALITY OBJECTIVES AND REMEDIAL MEASURES INCLUDING INSTITUTIONAL ARRANGEMENTS AND LEGISLATION ARE PRESENTED. (SEE ALSO W71-05806 AND W71-05807) (ENSIGN-PAI)**

**FIELD 05G, 06E**

**ACCESSION NO. W71-05805**

POLLUTION OF LAKE ERIE, LAKE ONTARIO AND THE INTERNATIONAL SECTION OF THE SAINT LAWRENCE RIVER, VOLUME II - LAKE ERIE.

INTERNATIONAL LAKE ERIE WATER POLLUTION BOARD; AND INTERNATIONAL LAKE ONTARIO-SAINT LAWRENCE RIVER WATER POLLUTION BOARD.

REPORT TO THE INTERNATIONAL JOINT COMMISSION ON THE POLLUTION OF LAKE ERIE, LAKE ONTARIO AND THE INTERNATIONAL SECTION OF THE SAINT LAWRENCE RIVER, VOLUME II, LAKE ERIE, 1969. 151 P, 5 FIG, 8 REF.

DESCRIPTORS:

\*WATER POLLUTION SOURCES, \*POLLUTANTS, \*PHYSICOCHEMICAL PROPERTIES,  
\*BIOLOGICAL PROPERTIES.

IDENTIFIERS:

LAKE ERIE.

ABSTRACT:

A DESCRIPTION OF THE PHYSICAL FEATURES, LAND AND WATER USES AND NEARBY POPULATIONS OF LAKE ERIE IS PRESENTED AS BACKGROUND TO THIS POLLUTION STUDY. POLLUTION SOURCES, PHYSICO-CHEMICAL AND BIOLOGICAL CHARACTERISTICS, AND DEVELOPING PROBLEMS ARE STUDIED AND THE EFFECTS OF THESE FACTORS ARE EVALUATED. WATER QUALITY OBJECTIVES ARE DISCUSSED. (SEE ALSO W71-05805) (ENSIGN-PA1)

FIELD 05G, 06E

ACCESSION NO. W71-05806

TRACE ELEMENTS IN LAKE ERIE,

DEPARTMENT OF ENERGY, MINES AND RESOURCES, BURLINGTON (ONTARIO). CANADA  
CENTER FOR INLAND WATERS.

V. K. CHAWLA, AND Y. K. CHAU.

IN: PROCEEDINGS TWELFTH CONFERENCE ON GREAT LAKES RESEARCH, MAY 5-7, 1969,  
UNIVERSITY OF MICHIGAN, ANN ARBOR: INTERNATIONAL ASSOCIATION FOR GREAT  
LAKES RESEARCH, P 760-765, 1969. 6 P, 4 FIG, 2 TAB, 10 REF.

DESCRIPTORS:

\*WATER CHEMISTRY, \*TRACE ELEMENTS, \*LAKE ERIE, DISTRIBUTION PATTERNS,  
COPPER, IRON, SAMPLING, DATA COLLECTIONS, GREAT LAKES. LAKES,  
VARIABILITY, WATER QUALITY, \*POLLUTANT IDENTIFICATION.

IDENTIFIERS:

LEAD, ZINC, LITHIUM, NICKEL.

ABSTRACT:

THE DATA ON TRACE ELEMENTS OBTAINED FROM SIX CRUISES DURING THE PERIOD  
JUNE TO OCTOBER 1967 ON LAKE ERIE WERE EXAMINED TO STUDY THEIR  
CONCENTRATIONS AND DISTRIBUTIONS BOTH HORIZONTALLY AND VERTICALLY. OF  
THE 11 ELEMENTS STUDIED, THE CONCENTRATIONS OF CADMIUM, CHROMIUM AND  
COBALT WERE BELOW THE DETECTION LIMITS. THE ANNUAL AVERAGE VALUES OF  
IRON, MANGANESE, STRONTIUM AND COPPER OF SURFACE WATERS WERE  
COMPARATIVELY HIGHER THAN THE AVERAGE OF SOME FRESH WATER LAKES OF  
NORTH AMERICA. CONCENTRATIONS OF ZINC, NICKEL, LITHIUM AND LEAD WERE  
QUITE COMPARABLE. THE HORIZONTAL DISTRIBUTIONS OF COPPER, ZINC, NICKEL,  
LITHIUM AND LEAD WERE UNIFORM IN THE MAIN WATER BODY OF THE WESTERN,  
CENTRAL AND EASTERN BASINS. IRON AND MANGANESE WERE HIGHER IN THE  
WESTERN AND CENTRAL THAN THE EASTERN BASINS, HOWEVER, STRONTIUM ON THE  
CONTRARY WAS LOWER IN THE WESTERN BASIN. (SEE ALSO W71-05561)  
(KNAPP-USGS)

FIELD 05A, 02H

ACCESSION NO. W71-05880

SOME VARIATION IN THE QUALITY OF WATER FROM THE SOURCE AND MOUTH OF THE NIAGARA RIVER,

STATE UNIV. OF NEW YORK, BUFFALO. DEPT. OF BIOLOGY.

THOMAS H. SIBLEY, AND K. M. STEWART.

IN: PROCEEDINGS TWELFTH CONFERENCE ON GREAT LAKES RESEARCH, MAY 5-7, 1969, UNIVERSITY OF MICHIGAN, ANN ARBOR: INTERNATIONAL ASSOCIATION FOR GREAT LAKES RESEARCH, P 774-785, 1969. 12 P, 5 FIG, 1 TAB, 30 REF.

DESCRIPTORS:

\*LAKE ONTARIO, \*LAKE ERIE, \*WATER QUALITY, \*WATER POLLUTION SOURCES, HARDNESS(WATER), POTASSIUM, SODIUM, CHLORIDES, DISSOLVED OXYGEN, HYDROGEN ION CONCENTRATION, ALKALINITY, WATER TEMPERATURE, GREAT LAKES, MAGNESIUM, STREAMFLOW, SOLUTES, PATH OF POLLUTANTS, WATER POLLUTION EFFECTS.

IDENTIFIERS:

\*NIAGARA RIVER.

ABSTRACT:

AN INVESTIGATION IN 1967 AND EARLY 1968 COMPARED SIMILARITIES AND DIFFERENCES IN SELECTED VARIABLES OF WATER QUALITY FROM THE SOURCE AND MOUTH OF THE NIAGARA RIVER. THE SOURCE OF THE RIVER IS THE LARGE VOLUME DISCHARGE FROM LAKE ERIE AND THE MOUTH IS THE POINT AT WHICH THIS DISCHARGE EMPTIES INTO LAKE ONTARIO. INDUSTRIAL AND MUNICIPAL WASTES AND SOME RUNOFF FROM AGRICULTURAL AREAS ARE DISCHARGED INTO THE RIVER ALONG PORTIONS OF WESTERN NEW YORK (USA) AND ONTARIO (CANADA). COMPARISONS WERE MADE OF TEMPERATURE, DISSOLVED, OXYGEN, PH, HARDNESS, ALKALINITY, CALCIUM, MAGNESIUM, SODIUM, POTASSIUM, CHLORIDES, TOTAL RESIDUE, FIXED SOLIDS AND CONDUCTIVITY. CHLORIDES AND CONDUCTIVITY WERE CONTINUOUSLY HIGHER AT THE MOUTH. THE MEAN VALUES OF ALL PARAMETERS, EXCEPT TOTAL RESIDUE AND FIXED SOLIDS, WERE SLIGHTLY HIGHER AT THE MOUTH. ALTHOUGH THE INCREASES WERE RELATIVELY SLIGHT, THE DISCHARGE FROM LAKE ERIE IS SO GREAT THAT EVEN SLIGHT CHANGES IN WATER QUALITY BETWEEN THE SOURCE AND MOUTH REPRESENT IMPRESSIVE INPUTS INTO THE RIVER. (SEE ALSO W71-05561) (KNAPP-USGS)

FIELD 05A, 02K, 05B

ACCESSION NO. W71-05881

DISSOLVED MINERAL QUALITY OF GREAT LAKES WATERS,

DEPARTMENT OF ENERGY, MINES AND RESOURCES, BURLINGTON (ONTARIO). CANADA  
CENTER FOR INLAND WATERS.

R. R. WEILER, AND V. K. CHAWLA.

IN: PROCEEDINGS TWELFTH CONFERENCE ON GREAT LAKES RESEARCH, MAY 5-7, 1969,  
UNIVERSITY OF MICHIGAN, ANN ARBOR: INTERNATIONAL ASSOCIATION FOR GREAT  
LAKES RESEARCH, P 801-818, 1969. 18 P, 5 FIG, 5 TAB, 15 REF.

DESCRIPTORS:

\*WATER QUALITY, \*WATER CHEMISTRY, \*WATER POLLUTION SOURCES, \*GREAT  
LAKES, TRACE ELEMENTS, SOLUTES, CHLORIDES, CALCIUM, MAGNESIUM, SODIUM,  
POTASSIUM, SULFATES, BICARBONATES, FLUORINE, SAMPLING, INDUSTRIAL  
WASTES, LAKE SUPERIOR, LAKE HURON, LAKE ERIE, LAKE ONTARIO, MONITORING,  
DATA COLLECTIONS, PATH OF POLLUTANTS.

IDENTIFIERS:

\*WATER QUALITY MONITORING.

ABSTRACT:

IN 1968 THE CANADA CENTER FOR INLAND WATERS (CCIW) UNDERTOOK A  
SYSTEMATIC MONITORING OF LAKES ONTARIO, ERIE, HURON AND SUPERIOR IN A  
STUDY OF THE MAJOR (CA, MG, NA, K, SO<sub>4</sub>, CL, HCO<sub>3</sub> AND F) AND TRACE (ZN,  
CU, PB, FE, NI, CR, MN AND SR) ELEMENTS. THE DATA GATHERED ON MAJOR  
ELEMENTS DURING THE PERIOD JULY TO NOVEMBER 1968 WERE EXAMINED AND THE  
RESULTS COMPARED ON A LAKE-WIDE BASIS WITH EARLIER COMPILATIONS TO  
APPRAISE RECENT TRENDS AND CHANGES IN THE COMPOSITION OF THESE WATERS.  
BECAUSE THE CONCENTRATIONS OF ALL MAJOR IONS FOR WHICH DATA ARE  
AVAILABLE IN LAKE SUPERIOR HAVE NOT CHANGED FOR THE LAST 70-80 YEARS,  
THEIR LEVELS ARE APPARENTLY CONTROLLED BY THE BALANCE BETWEEN THE  
AMOUNT OF DISSOLVED SUBSTANCES ADDED BY RUNOFF FROM THE DRAINAGE BASIN  
AND THAT LOST THROUGH ST. MARY'S RIVER. CHLORIDE AND SULPHATE HAVE  
INCREASED IN LAKES MICHIGAN AND HURON. THIS INCREASE IS MOST LIKELY  
CAUSED BY HUMAN ACTIVITIES. IN LAKES ERIE AND ONTARIO, ALL THE MAJOR  
IONS EXCEPT BICARBONATE AND MAGNESIUM HAVE SHOWN A DRAMATIC INCREASE  
SINCE 1910. PREVIOUS TO THAT, THE LAKES WERE ESSENTIALLY UNAFFECTED BY  
HUMAN ACTIVITIES. THE MEDIAN VALUES OF MINOR ELEMENTS (EXCEPTING SR) IS  
GENERALLY BELOW 10 MICROGRAMS/LITER IN THE GREAT LAKES. SORPTION BY  
OXIDES OF MANGANESE AND IRON AND BY SUSPENDED ORGANIC AND INORGANIC  
MATERIAL SEEMS A PLAUSIBLE MECHANISM FOR THE REMOVAL OF MINOR ELEMENTS  
FROM THE LAKES. (SEE ALSO W71-05561) (KNAPP-USGS)

FIELD 05A, 02K, 05B

ACCESSION NO. W71-05883

GEOCHEMICAL SYSTEMS IN ONONDAGA LAKE (CENTRAL NEW YORK STATE) COMPARED WITH THE GREAT LAKES,

SLIPPERY ROCK STATE COLLEGE, PA. DEPT. OF GEOLOGY.

JEFFREY C. SUTHERLAND.

IN: PROCEEDINGS TWELFTH CONFERENCE ON GREAT LAKES RESEARCH, MAY 5-7, 1969, UNIVERSITY OF MICHIGAN, ANN ARBOR: INTERNATIONAL ASSOCIATION FOR GREAT LAKES RESEARCH, P 357-363, 1969. 7 P, 6 FIG, 18 REF. FWQA GRANT WPRD 66-01-68.

DESCRIPTORS:

\*WATER CHEMISTRY, \*CLAY MINERALS, \*LAKES, SILICA, CALCIUM, SODIUM CHLORIDES, PHOSPHATES, LAKE HURON, LAKE ERIE, GREAT LAKES, EQUILIBRIUM, AQUEOUS SOLUTIONS, ION EXCHANGE, CARBONATES, KAOLINITE, MONTMORILLONITE.

IDENTIFIERS:

ONONDAGA LAKE(NY).

ABSTRACT:

ONONDAGA LAKE IS SHALLOW, EUTROPHIC, AND CONTAINS UNUSUALLY HIGH CONCENTRATIONS OF DISSOLVED CA, NA, CL,  $\text{SiO}_2$ , AND  $\text{PO}_4$ . INTERPRETATIONS OF CHEMICAL AND MINERALOGICAL DATA TESTED IN EQUILIBRIUM MODELS ARE COMPARED WITH THOSE FOR THE GREAT LAKES. THE AVERAGE ANNUAL CONDITION OF NEAR EQUILIBRIUM WITH CALCITE AND DOLOMITE IS INHERITED FROM INFLUENT STREAMS. LAKE ERIE IS IN EQUILIBRIUM WITH HYDROXYAPATITE, BUT ONONDAGA LAKE IS OVERSATURATED, APPROACHING EQUILIBRIUM IN WINTER ONLY. WHEREAS LOWER LIMITS OF SILICA IN THE NORTH CHANNEL AND LAKE HURON ARE PROBABLY ESTABLISHED THROUGH DISSOLUTION OF KAOLINITE, UPPER LIMITS UPON SILICA IN ONONDAGA LAKE MAY PARTLY BE A FUNCTION OF REACTION OF KAOLINITE TO FORM K FELDSPAR. CONCENTRATIONS OF SILICA IN SEDIMENT-ENCLOSED WATERS OF THE NORTH CHANNEL AND ONONDAGA LAKE APPROACH EQUILIBRIUM VALUES WITH AMORPHOUS SILICA. EQUILIBRIUM BETWEEN MONTMORILLONITE AND KAOLINITE MAY DEPEND UPON RATIOS OF CALCIUM TO SODIUM, AMONG OTHER FACTORS: IN CARBORATE MINERAL-BEARING GREAT LAKES SEDIMENTS KAOLINITE APPROACHES EQUILIBRIUM WITH CA MONTMORILLONITE, BUT IN ONONDAGA LAKE APPROACH TO EQUILIBRIUM WITH NA MONTMORILLONITE IS INFERRED. (SEE ALSO W71-05561) (KNAPP-USGS)

FIELD 02H, 02K

ACCESSION NO. W71-05888

WIND INDUCED CIRCULATION PATTERN IN A ROTATING MODEL OF LAKE ERIE,

STATE UNIV. OF NEW YORK, BUFFALO. FACULTY OF ENGINEERING AND APPLIED SCIENCES.

PETER J. BUECHI, AND RALPH R. RUMER.

IN: PROCEEDINGS TWELFTH CONFERENCE ON GREAT LAKES RESEARCH, MAY 5-7, 1969,  
UNIVERSITY OF MICHIGAN, ANN ARBOR: INTERNATIONAL ASSOCIATION FOR GREAT  
LAKES RESEARCH, P 406-414, 1969. 9 P, 10 FIG, 8 REF. FWQA GRANT WP-00837.

DESCRIPTORS:

\*WATER CIRCULATION, \*LAKE ERIE, \*CURRENTS(WATER), WINDS, WAVES(WATER),  
SEICHES, DISTRIBUTION PATTERNS, MODEL STUDIES, HYDRAULIC MODELS,  
HYDRAULIC SIMILITUDE, FLOW, GREAT LAKES.

IDENTIFIERS:

LAKE CIRCULATION.

ABSTRACT:

EXPERIMENTAL STUDIES TO DETERMINE THE EFFECTS OF A PREVAILING WESTERLY WIND ON THE CIRCULATION PATTERNS IN A VERTICALLY DISTORTED FROUDE MODEL OF LAKE ERIE WERE PERFORMED IN A ROTATING LABORATORY THAT HOUSED THE MODEL LAKE, ALL NECESSARY INSTRUMENTATION, AND PERSONNEL. A VERTICAL SCALE OF 1:500 AND A HORIZONTAL SCALE OF 1:200,000 WERE USED. WIND STRESSES WERE SIMULATED USING A BATTERY OF BLOWERS. MODEL WIND VELOCITIES COULD BE VARIED FROM ZERO TO 13 FT/SEC. PRELIMINARY CORRELATION WITH PROTOTYPE WIND SPEEDS WAS OBTAINED BY MEASURING WATER LEVEL CHANGES IN THE EASTERN END OF THE MODEL LAKE AND COMPARING WITH AVAILABLE PROTOTYPE FIELD OBSERVATIONS FOR KNOWN WIND CONDITIONS. MOTION PICTURE STUDIES WITH DYES SERVING AS TRACERS WERE USED IN THE COLLECTION OF DATA. COMPARISON WITH EARLIER CIRCULATION STUDIES PERFORMED IN THE ABSENCE OF WIND STRESS REVEALS SIGNIFICANT CHANGES IN THE OVERALL CIRCULATION PATTERN AND THE APPEARANCE OF SIGNIFICANT DIFFERENCES BETWEEN SURFACE AND SUBSURFACE CIRCULATION PATTERNS. (SEE ALSO W71-05561) (KNAPP-USGS)

FIELD 02H

ACCESSION NO. W71-05891



WAVE FORCES IN LAKE ERIE,

MICHIGAN UNIV., ANN ARBOR. DEPT. OF METEOROLOGY AND OCEANOGRAPHY.

ALAN L. COLE.

SUPPORTED BY US LAKE SURVEY, ARMY CORPS OF ENGINEERS. IN: PROCEEDINGS TWELFTH CONFERENCE ON GREAT LAKES RESEARCH, MAY 5-7, 1969, UNIVERSITY OF MICHIGAN, ANN ARBOR: INTERNATIONAL ASSOCIATION FOR GREAT LAKES RESEARCH, P 540-552, 1969. 13 P, 11 FIG, 2 TAB, 2 REF.

DESCRIPTORS:

\*WAVES(WATER), \*LAKE ERIE, \*ENERGY, \*COASTAL ENGINEERING, GREAT LAKES, EROSION, SHORE PROTECTION, DATA COLLECTIONS, SURGES, SHORES, HARBORS, PRESSURE.

IDENTIFIERS:

\*WAVE FORCES(LAKE ERIE).

ABSTRACT:

DIRECT MEASUREMENT OF THE PRESSURE OF GREAT LAKES' WAVES ON A BREAKWATER IN LAKE ERIE AT LORAIN, OHIO WAS UNDERTAKEN TO PRODUCE DATA TO BE USED IN AN EVALUATION OF THE APPLICABILITY OF EXISTING THEORIES TO GREAT LAKES CONDITIONS AND TO PROVIDE EMPIRICAL RELATIONSHIPS FOR BREAKWATER DESIGN, SHIP DESIGN, AND OTHER PRACTICAL NEEDS IN THE GREAT LAKES. THE EAST BREAKWATER SHOREARM AT LORAIN, OHIO WAS CHOSEN TO BE INSTRUMENTED BECAUSE OF ITS LOCATION, ORIENTATION, TYPE OF CONSTRUCTION AND OWNERSHIP. THE FIELD PROJECT WAS INITIATED IN SEPTEMBER, 1968 AND WAS TERMINATED BY ICE CONDITIONS IN DECEMBER, 1968, WITH DATA TAKEN IN NOVEMBER AND DECEMBER, 1968. WAVE PRESSURE DECREASES BELOW THE STILL WATER LEVEL AS PREDICTED BY SAINFLOU. (SEE ALSO W71-05561) (KNAPP-USGS)

FIELD 02H

ACCESSION NO. W71-05894

**SOME UNUSUAL SURFACE WATER TEMPERATURE PATTERNS IN THE GREAT LAKES, AS DETECTED  
BY AIRBORNE RADIATION THERMOMETER SURVEYS,**

**METEOROLOGICAL SERVICE OF CANADA, TORONTO (ONTARIO).**

**J. G. IRBE.**

**IN: PROCEEDINGS TWELFTH CONFERENCE ON GREAT LAKES RESEARCH, MAY 5-7, 1969,  
UNIVERSITY OF MICHIGAN, ANN ARBOR: INTERNATIONAL ASSOCIATION FOR GREAT  
LAKES RESEARCH, P 583-607, 1969. 25 P, 21 FIG, 5 TAB, 25 REF.**

**DESCRIPTORS:**

**\*WATER TEMPERATURE, \*WATER CIRCULATION, \*GREAT LAKES, \*WEATHER, \*REMOTE  
SENSING, AIRCRAFT, LAKE ONTARIO, LAKE ERIE, METEOROLOGY, DATA  
COLLECTIONS, THERMOMETERS.**

**IDENTIFIERS:**

**AIRBORNE RADIATION THERMOMETRY.**

**ABSTRACT:**

**SINCE 1966 THE METEOROLOGICAL SERVICE OF CANADA HAS UNDERTAKEN A  
PROGRAM OF MONTHLY SURFACE WATER TEMPERATURE SURVEYS OF THE GREAT LAKES  
BORDERING ON CANADA USING AN AIRBORNE INFRARED TEMPERATURE SENSING  
INSTRUMENT. DURING THE THREE YEAR PERIOD THAT THE PROGRAM HAS BEEN IN  
PROGRESS, MANY INTERESTING FEATURES OF THE DISTRIBUTION OF SURFACE  
WATER TEMPERATURE HAVE BEEN FOUND. MAPS SHOWING SOME OF THE MORE  
UNUSUAL ISOTHERM PATTERNS DEDUCED FROM THESE SURVEYS ARE PRESENTED AND  
DISCUSSED WITH REFERENCE TO LAKE CIRCULATION AND METEOROLOGICAL  
CONDITIONS. (SEE ALSO W71-05561). (KNAPP-USGS)**

**FIELD 07B, 02H**

**ACCESSION NO. W71-05898**

**ALDRIN: REMOVAL FROM LAKE WATER BY FLOCCULENT BACTERIA,**

**OHIO STATE UNIV., COLUMBUS. DEPT. OF MICROBIAL AND CELLULAR BIOLOGY.**

**WALTER O. LESHNIOWSKY, PATRICK R. DUGAN, ROBERT M. PFISTER, JAMES I. FREA,  
AND CHESTER I. RANGLES.**

**AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, VOL 169, P 993-995,  
1970. 1 FIG, 22 REF.**

**DESCRIPTORS:**

**\*ALDRIN, \*CHLORINATED HYDROCARBON PESTICIDE, \*FLOCCULATION, \*BACTERIA,  
LAKE ERIE, ADSORPTION, COLLOIDS, SEDIMENTS, DIATOMS, DETRITUS,  
SUSPENDED LOAD, INSECTICIDES, SILTS, PESTICIDES, LAKES.**

**IDENTIFIERS:**

**\*FLOC FORMING BACTERIA, INORGANIC PARTICLES, MICROPARTICULATES,  
FLAVOBACTERIUM, PROTAMINOBACTER, BACILLUS.**

**ABSTRACT:**

**STUDIES OF CHLORINATED HYDROCARBON INSECTICIDES IN A WATER COLUMN  
INDICATED THAT FLOC-FORMING BACTERIA ISOLATED FROM LAKE ERIE ADSORB AND  
CONCENTRATE ALDRIN FROM COLLOIDAL DISPERSION AND THE SUBSEQUENT  
SETTLING OF THE BACTERIAL FLOCS REMOVE ALDRIN FROM THE WATER PHASE. ONE  
BACTERIUM WAS AN ORANGE-RED PIGMENTED GRAM-NEGATIVE ROD, TENTATIVELY  
IDENTIFIED AS EITHER A FLAVOBACTERIUM OR PROTAMINOBACTER. THE OTHER WAS  
A GRAM-POSITIVE SPECIES OF BACILLUS. GRAM-NEGATIVE BACTERIA ADSORPTION  
IS SLOWER AS COMPARED TO THE GRAM-POSITIVE, WITH CONSIDERABLE  
CONCENTRATING EFFECT. CONTEMPORARY SEDIMENTS FORMING IN LAKE ERIE  
CONTAIN ALDRIN AND COULD ADSORB MORE. THE PRESENCE OF BOTH ALDRIN AND  
DIELDRIN WAS DETECTED BY BOTH GAS CHROMATOGRAPHY AND MICROCOULOMETRY.  
ELECTRON MICROSCOPIC EXAMINATION OF LAKE ERIE CONTEMPORARY SEDIMENTS  
SHOW THAT THESE SEDIMENTS CONSIST OF A CONGLOMERATE FLOC OF BACTERIA,  
DIATOMS, AND INORGANIC AND DETRITAL PARTICLES. FLOCCULENT BACTERIA ALSO  
ADSORB MICROPARTICULATES, AND THIS ADSORPTION CAPACITY REPRESENTS A  
MECHANISM FOR SEDIMENT FORMATION, AND FOR THE REMOVAL OF SUSPENDED  
PARTICLES INCLUDING ALDRIN FROM THE WATER COLUMN. (JONES-WISCONSIN)**

**FIELD 05G**

**ACCESSION NO. W71-06000**

THE CONSERVANCY DISTRICT LAW (OUTLINE AND TEXT OF OHIO CONSERVANCY DISTRICT LAW).

OHIO DEPT. OF NATURAL RESOURCES, COLUMBUS. DIV. OF WATER.

N.D. 65 P, 9 PHOTO, 1 CHART.

DESCRIPTORS:

\*OHIO, \*ADMINISTRATIVE AGENCIES, \*DRAINAGE DISTRICTS, \*WATER RESOURCES DEVELOPMENT, STATE GOVERNMENTS, WATER CONSERVATION, WATER RESOURCES, WATER POLICY, WATER MANAGEMENT(APPLIED), WATER SUPPLY, AREA REDEVELOPMENT, MULTIPLE-PURPOSE PROJECTS, RIVER BASIN DEVELOPMENT, LOCAL GOVERNMENTS, WATER LAW, LEGISLATION, EMINENT DOMAIN, CONDEMNATION, RIVERS, STREAMS, LAKES, FLOODS, FLOOD CONTROL.

ABSTRACT:

ALTHOUGH ORIGINALLY FLOOD CONTROL AGENCIES, THE OHIO CONSERVANCY DISTRICTS ARE NOW EMPOWERED TO CONSERVE AND DEVELOP WATER SUPPLY, IMPROVE DRAINAGE, COLLECT AND DISPOSE OF WASTES, PROVIDE FOR IRRIGATION, AND ARREST EROSION OF THE LAKE ERIE SHORE. THIS BOOKLET DISCUSSES THE ORGANIZATION OF A CONSERVANCY DISTRICT, THE STEPS IN DEVELOPMENT OF A DISTRICT, QUESTIONS AND ANSWERS CONCERNING CONSERVANCY DISTRICTS, AND THE TEXT OF THE OHIO CONSERVANCY DISTRICT LAW. THE LAW ITSELF IS SET FORTH IN EIGHT PARTS: (1) DEFINITIONS; (2) ORGANIZATION OF A DISTRICT; (3) POWERS, DUTIES, AND ORGANIZATION OF CONSERVANCY DISTRICT BOARDS OF DIRECTORS; (4) APPRAISAL OF BENEFITS; (5) FINANCIAL ADMINISTRATION; (6) INTERCORPORATE RELATIONS AND CONFLICT IN JURISDICTION; (7) POLICE POWERS AND REGULATIONS; AND (8) CONSTRUCTION AND INTERPRETATION OF THE LAW. IN ADDITION TO PREVIOUSLY MENTIONED POWERS, THE DISTRICT MAY: (1) ALTER THE COURSE OF RIVERS AND STREAMS; (2) FILL ANY ABANDONED OR ALTERED WATERCOURSE; (3) CONSTRUCT AND OPERATE DAMS; (4) PLANT FORESTS ON DISTRICT LAND; AND (5) ACQUIRE BY PURCHASE OR POWER OF EMINENT DOMAIN EASEMENTS OR LANDS TO EFFECT THE PURPOSES OF THE ACT. (HART-FLORIDA)

FIELD 06E

ACCESSION NO. W71-06046

WATER POLLUTION PROBLEMS AND CONTROL PROGRAMS IN MICHIGAN'S PORTION OF THE GREAT LAKES.

MICHIGAN WATER RESOURCES COMMISSION, LANSING.

EXCERPTED FROM CLEAN WATER...IT'S UP TO YOU. TYPESCRIPT, 10 P.

DESCRIPTORS:

\*MICHIGAN, \*GREAT LAKES, \*WATER POLLUTION CONTROL, \*WATER POLLUTION SOURCES, WATER QUALITY CONTROL, WATER RESOURCES DEVELOPMENT, POLLUTION ABATEMENT, LAKE ERIE, LAKE HURON, LAKE MICHIGAN, LAKE SUPERIOR, WASTE TREATMENT, ADMINISTRATIVE AGENCIES, STATE GOVERNMENTS, FEDERAL GOVERNMENT, THERMAL POLLUTION, STORM RUNOFF, OIL, SHIPS, IRRIGATION EFFECTS, RUNOFF, ACID MINE WATER, SEDIMENTS, ESTUARINE ENVIRONMENT, EUTROPHICATION.

ABSTRACT:

A SURVEY OF WATER QUALITY CONDITIONS OF THE GREAT LAKES SURROUNDING MICHIGAN SHOWS THAT THE LAKES ARE OF HIGH QUALITY AND RELATIVELY UNPOLLUTED, WITH THE EXCEPTION OF LAKE ERIE AND PORTIONS OF LAKE MICHIGAN. THE MICHIGAN WATER RESOURCES COMMISSION IS EFFECTIVE IN ANTI-POLLUTION EFFORTS, ESPECIALLY THROUGH VOLUNTARY POLLUTION ABATEMENT. THE COMMISSION SPECIFIES RESTRICTIONS ON WASTE DISCHARGES, AND A DEADLINE IS ESTABLISHED FOR MEETING THESE LIMITATIONS. WHERE VOLUNTARY COMPLIANCE IS INEFFECTIVE, THE COMMISSION DOES NOT HESITATE IN SEEKING COURT ACTION OR PURSUING THE PENALTY PROVISIONS OF THE LAW. A SURVEY IS MADE OF VARIOUS ENFORCEMENT CONFERENCES CALLED BY THE SECRETARY OF THE INTERIOR. THE TOP PRIORITY POLLUTION PROBLEMS REQUIRING DEVELOPMENT OF IMPROVED CONTROL TECHNIQUES INCLUDE: (1) THERMAL POLLUTION FROM POWER PLANTS AND INDUSTRY; (2) STORM WATER OVERFLOWS WHICH BYPASS SEWAGE TREATMENT PLANTS; (3) OIL SPILLS; (4) VESSEL POLLUTION IN HARBORS AND HEAVILY USED WATERWAYS; (5) IRRIGATION POLLUTION RESULTING IN CONCENTRATED SALTS AND MINERALS; (6) AGRICULTURAL RUNOFF; (7) ACID MINE DRAINAGE; (8) INCREASE IN SEDIMENT VOLUMES; (9) DESTRUCTION OF ESTUARIES BY POLLUTION, DREDGING, AND FILLING; AND (10) EUTROPHICATION BY ADDITION OF EXCESSIVE NUTRIENTS. A BRIEF SURVEY OF WASTE TREATMENT METHODS IS INCLUDED.  
(SMILJANICH-FLORIDA)

FIELD 05G, 06E

ACCESSION NO. W71-06053

MONTHLY VARIATION IN PHOSPHATE AND RELATED CHEMICALS FOUND IN THE SEDIMENT IN THE ISLAND AREA OF LAKE ERIE, 1967-68, WITH REFERENCE TO SAMPLES COLLECTED IN 1964, 1965, AND 1966,

OHIO STATE UNIV., COLUMBUS. WATER RESOURCES CENTER.

N. WILSON BRITT, AND EDWIN J. SKOCH.

AVAILABLE FROM NTIS AS PB-198 128, \$3.00 IN PAPER COPY, \$0.95 IN MICROFICHE. OHIO WATER RESOURCES CENTER PROJECT COMPLETION REPORT NO 333X, 1970. 30 P, 3 TAB, 6 FIG, 33 REF. OWRR PROJECT A-008-OHIO(2).

DESCRIPTORS:

\*LAKE ERIE, \*PHOSPHOROUS, \*IRON, \*EUTROPHICATION, GREAT LAKES, MUD-WATER INTERFACES, DISSOLVED OXYGEN, WATER POLLUTION SOURCES.

IDENTIFIERS:

\*BOTTOM SAMPLING, \*SEDIMENT ANALYSIS, SUBSTRATE, ORGANIC CARBON, OXYGEN CONSUMED.

ABSTRACT:

SAMPLES OF SEDIMENT COLLECTED IN 1964, 1965, 1966, AND ON A MONTHLY BASIS FROM MAY 1967 THROUGH NOVEMBER 1968, WERE ANALYZED FOR TOTAL PHOSPHATE, IRON AND ORGANIC CARBON. SAMPLES WERE COLLECTED BY MEANS OF A CORE TECHNIQUE DEVELOPED BY E. J. SKOCH. THE CORES WERE SECTIONED AT 2.5 CM INTERVALS AND EACH OF THE SIX SECTIONS WAS ANALYZED FOR THE SAME FACTOR. RESULTS OF THE ANALYSES SHOWED ONLY A SLIGHT INCREASE IN PHOSPHATE SINCE 1964. HOWEVER, ALL THOSE FACTORS SHOWED A DEFINITE INCREASE FROM MAY 1967 THROUGH NOVEMBER 1968. THE TWO SAMPLING METHODS YIELDED SLIGHTLY DIFFERENT RESULTS. THE SEDIMENT WAS FOUND TO CONSIST OF TWO DISTINCT LAYERS, WITH THE UPPER 5 CM OF SEDIMENT BEING USUALLY HIGHER IN CONCENTRATIONS OF MATERIALS THAN THE LOWER PORTION.

FIELD 05B, 05A

ACCESSION NO. W71-06187

APPLIES EXISTING TECHNOLOGY FOR A CLEANER LAKE ERIE.

AM CITY, VOL 85, NO 4, P 18, APR 1970.

DESCRIPTORS:

\*WASTE TREATMENT, \*STORAGE, INSTRUMENTATION, STORM RUNOFF.

IDENTIFIERS:

\*LAKE ERIE, MONITORING SYSTEM, STORMWATER STORAGE.

ABSTRACT:

THE DETROIT METROPOLITAN WATER SERVICE IS PUTTING EXISTING TECHNOLOGY INTO EFFECT TO HELP DECELERATE THE AGING OF LAKE ERIE. PROPOSED PROGRAMS INCLUDE: SOLIDS REDUCTION BY ADDITION OF MECHANISMS TO THE REGIONAL WASTE WATER PLANT, COLIFORM REMOVAL THROUGH CHLORINATION, PHOSPHATE REDUCTION USING PICKLE LIQUOR FROM STEEL MILLS, WASTE OIL AND GREASE REMOVAL USING OIL SKIMMERS, CONSTRUCTION OF PHENOL-REMOVING SYSTEMS, AND INSTALLATION OF SMOKESTACK AIR CLEANERS TO PREVENT AIR POLLUTION. A MONITORING SYSTEM TO REDUCE STORMWATER OVERFLOWS IS ALSO BEING BUILT TO WARN OF APPROACHING RAINFALL, THUS ALLOWING SEWERS TO BE PUMPED BEFORE THE STORM. THIS WILL PERMIT SEWERS TO STORE CONTAMINATED STORMWATER, THE DIRTIEST WATER BEING SENT TO THE TREATMENT PLANT. FURTHER LONG RANGE PLANS ARE BEING MADE TO MEET FUTURE DEMANDS OF THE REGION.

FIELD 05G

ACCESSION NO. W71-06359

STORM WATER TREATMENT AT CLEVELAND,

GEORGE D. SIMPSON, AND LAMONT W. CURTIS.

J. WATER POLLUTION CONTROL FED, VOL 41, NO 2, PART 1, P 151-168, FEB 1969.  
PAPER FROM AM WATER WORKS ASSOC - 88TH ANNUAL CONFERENCE, CLEVELAND, OHIO  
JUNE 2-7, 1968.

DESCRIPTORS:

\*WATERSHEDS(BASINS), \*MULTIPLE-PURPOSE PROJECTS, \*PRESSURE CONDUITS,  
\*PUMPING PLANTS, \*WATER POLLUTION CONTROL, \*CHLORINATION, \*POLLUTION  
ABATEMENT, \*LAKE ERIE, BIOLOGICAL TREATMENT, REDUCTION(CHEMICAL),  
RECREATION FACILITIES.

IDENTIFIERS:

\*GRAVITY SEWER, \*CLEVELAND, OHIO.

ABSTRACT:

A FEASIBILITY STUDY WAS CONDUCTED FOR THE FWPCA OF A PROPOSED OFFSHORE STABILIZATION-RETENTION BASIN, FOR THE TREATMENT OF VARIOUS POLLUTING FLOWS NOW BEING DISCHARGED TO LAKE ERIE. THE BASIN WOULD RECEIVE TREATED EFFLUENT FLOW FROM THE CITY'S EASTERLY WASTE WATER TREATMENT PLANT, AS WELL AS FLOW FROM SIX LARGE COMBINED SEWER OVERFLOW OUTFALLS, AND FLOW FROM FIVE POLLUTED STREAMS WHICH DRAIN THE SERVICE AREA. THE PROPOSED BASIN WOULD BE APPROXIMATELY 900 ACRES IN AREA, WITH A MEAN WATER DEPTH OF 33.5 FT. A SHORELINE COLLECTION SYSTEM IS INCLUDED TO CONVEY FLOWS TO TWO CENTRAL POINTS FOR DISCHARGE INTO THE BASIN. THE COLLECTION SYSTEM WILL CONSIST OF A COMBINATION OF GRAVITY AND PRESSURE CONDUITS, WITH TWO PUMPING STATIONS. TWO BASIC TYPES OF PURIFICATION PROCESSES WILL TAKE PLACE IN THE BASIN. BIOLOGICAL AND CHEMICAL OXIDATION WILL RESULT IN REDUCTION OF BOD AND COD; THIS PROCESS WILL REQUIRE AN AEROBIC ENVIRONMENT. SEDIMENTATION OF FINE SUSPENDED SOLIDS, PARTICULARLY THE ACTIVATED SLUDGE CELL MATTER IN THE TREATMENT PLANT EFFLUENT, WILL REQUIRE QUIESCENT SETTLING. TO MEET THESE TWO CONDITIONS, A TWO STAGE BASIN IS CONTEMPLATED. THE FIRST STAGE WILL BE MAINTAINED IN AEROBIC CONDITION BY AIR-LIFT OR MECHANICAL PUMPING. IN THE QUIESCENT SEDIMENTATION STAGE, IT IS EXPECTED THAT AN UPPER LAYER OF FIVE TO TEN FEET OF WATER WILL BE AEROBIC, WITH THE REMAINDER OF THE DEPTH ANAEROBIC. THE BASIN WILL CREATE A SHELTERED BAY AT THE SHORELINE, WHICH WILL BE USED FOR BOATING, FISHING AND SWIMMING. A SMALL BOAT MARINA IS CONTEMPLATED AS PART OF THE OVERALL PROJECT. THE BASIN WILL BE PROVIDED WITH FACILITIES FOR CHLORINATION. EFFLUENT WILL BE DISCHARGED AT ABOUT 8,000 FT. FROM SHORE IN A WATER DEPTH OF APPROXIMATELY 42 FT. THE BASIN HAS BEEN FOUND FEASIBLE FROM THE STANDPOINT OF POLLUTION ABATEMENT AND REDUCTION OF BACTERIAL CONTAMINATION OF THE CITY'S BEACHES RESULTING FROM POLLUTED DISCHARGES.

FIELD 05D

ACCESSION NO. W71-06389



THE QUANTITY AND QUALITY OF SEDIMENTS DEPOSITED IN CLEVELAND HARBOR AT  
CLEVELAND, OHIO,

CORPS OF ENGINEERS, CHICAGO, ILL.

DAVID L. SVEUM.

IN: PROCEEDINGS OF A SEMINAR ON SEDIMENT TRANSPORT IN RIVERS AND RESERVOIRS,  
CORPS OF ENGINEERS HYDROLOGIC ENGINEERING CENTER, APRIL 7-9, 1970, DAVIS,  
CALIFORNIA, PAPER NO 8, 1970. 16 P, 5 PLATE, 6 TAB, 8 REF.

DESCRIPTORS:

\*SEDIMENTATION, \*SILTING, \*WATER POLLUTION SOURCES, \*LAKE ERIE, \*OHIO,  
HARBORS, PROVENANCE, SEDIMENTS, SEDIMENT LOAD, WATER POLLUTION EFFECTS,  
DREDGING, WASTE DISPOSAL, LANDFILLS.

IDENTIFIERS:

CLEVELAND HARBOR.

ABSTRACT:

EROSION OF THE CUYAHOGA RIVER VALLEY AND ITS TRIBUTARIES BRING LARGE  
QUANTITIES OF SEDIMENT TO THE MAIN STREAM, WHICH ARE CARRIED INTO  
CLEVELAND HARBOR. EROSION OF AREAS DISTURBED BY CONSTRUCTION ALSO  
PRODUCES SEDIMENT. CONSIDERABLE QUANTITIES OF MUNICIPAL WASTES, FLUE  
DUST AND OTHER FORMS OF INDUSTRIAL WASTE ARE DEPOSITED IN THE HARBOR.  
ALL OF THE MATERIALS WHICH ARE DEPOSITED IN THE NAVIGATION CHANNEL MUST  
BE REMOVED BY MAINTENANCE DREDGING. THE MATERIALS SO REMOVED ARE  
CONSIDERED TO BE GROSSLY POLLUTED, AND CONTINUATION OF THE HISTORICAL  
PRACTICE OF DISPOSING THEREOF BY PUMPING IN DEEP WATERS OF LAKE ERIE,  
IS CONSIDERED TO BE INIMICAL TO THE ECOLOGY OF THE LAKE. THE AVERAGE  
ANNUAL VOLUME OF THE SEDIMENT INFLOW TO CLEVELAND HARBOR IS ABOUT  
1,242,000 CUBIC YARDS. THE CHEAPEST EFFECTIVE METHOD OF DISPOSAL, AS AN  
ALTERNATE TO OPEN LAKE DISPOSAL, IS THE USE OF DIKED CONTAINMENT AREAS  
NEAR NAVIGATION PROJECTS. DISPOSAL BY LOADING THE MATERIAL FROM THE  
SETTLING BASIN INTO TRUCKS FOR TRANSPORTATION TO LANDFILL SITES APPEARS  
TO HAVE MERIT FOR THIS LOCATION AND IS BEING GIVEN FURTHER  
CONSIDERATION. A PILOT PROGRAM INCLUDED CONSTRUCTION OF PILOT SCALE  
DIKED DISPOSAL AREAS AT A FEW LOCATIONS. (SEE ALSO W71-06675)  
(KNAPP-USGS)

FIELD 02J, 05B

ACCESSION NO. W71-06679

A PLAN FOR ENDING LAKE ERIE POLLUTION,

JAMES C. LAMB.

PUBLIC WORKS, VOL 100, NO 6, P 79-82, JUN 1969.

DESCRIPTORS:

\*POLLUTION ABATEMENT, STORM RUNOFF, SEWAGE TREATMENT, SEPARATION TECHNIQUES, \*LAKE ERIE, WATER QUALITY.

IDENTIFIERS:

COMBINED SEWERS.

ABSTRACT:

SOURCES AND EFFECTS OF POLLUTANTS IN LAKE ERIE ARE DESCRIBED ALONG WITH PLANS AND RECOMMENDATIONS FOR THE ELIMINATION OF POLLUTION FROM THE LAKE. URBAN RUNOFF AND COMBINED SEWER OVERFLOWS ARE MAJOR SOURCES OF POLLUTION CONTRIBUTING BOD, BACTERIA, AND NUTRIENTS--ESPECIALLY PHOSPHORUS. DETROIT, CLEVELAND, AND TOLEDO ARE THE LARGEST OFFENDERS IN THE AREA OF STORM WATER RUNOFF. SUGGESTED STATE WATER QUALITY PROGRAMS ARE OUTLINED IN ADDITION TO AREAS REQUIRING RESEARCH AND DEVELOPMENT SUCH AS: TERTIARY TREATMENT, NUTRIENT REMOVAL, SEDIMENT EVALUATION, PESTICIDE POLLUTION, RADIOACTIVE AND THERMAL POLLUTION, INDUSTRIAL SLUDGE DISPOSAL, OXYGEN DEFICIENT ZONES, AND EUTROPHICATION. EXPENSIVE SEPARATE SEWERAGE SYSTEMS ARE RECOMMENDED ONLY WHERE FEASIBLE, SUCH AS IN REDEVELOPMENT PROJECTS. HOWEVER, WHERE COMBINED SEWERS EXIST, OVERFLOWS SHOULD BE DISINFECTED BEFORE BEING DISCHARGED TO A BODY OF WATER, AND FUTURE PLANS FOR STORAGE AND TREATMENT SHOULD BE MADE.

FIELD 05G, 05B

ACCESSION NO. W71-06747

THE ROLE OF THE FEDERAL WATER POLLUTION CONTROL ADMINISTRATION IN FARM ANIMAL WASTE AND THE BY-PRODUCT MANAGEMENT,

FEDERAL WATER POLLUTION CONTROL ADMINISTRATION, CHICAGO, ILL. GREAT LAKES REGION.

FRANK E. HALL.

IN: PROCEEDINGS OF FARM ANIMAL WASTE AND BY-PRODUCT MANAGEMENT CONFERENCE, UNIVERSITY EXTENSION, UNIVERSITY OF WISCONSIN, P 92-95, NOVEMBER 6-7, 1969.

DESCRIPTORS:

\*FARM WASTES, \*WATER POLLUTION, RESEARCH AND DEVELOPMENT, FEDERAL GOVERNMENT, DISPOSAL, GRANTS, WATER POLLUTION CONTROL, LAKE ERIE, WATER QUALITY, STANDARDS, LEGISLATION.

IDENTIFIERS:

\*FWPCA, ANIMAL WASTE DISPOSAL, AGRICULTURAL PRACTICES, FEEDLOTS, ENFORCEMENT ACTIONS, WATER QUALITY STANDARDS.

ABSTRACT:

A DISCUSSION IS PRESENTED STATING HOW THE PROGRAMS OF THE FEDERAL WATER POLLUTION CONTROL ADMINISTRATION RELATE TO FARM ANIMAL WASTES AND BY-PRODUCT MANAGEMENT. EXAMPLES ARE GIVEN OF GOVERNMENT AND IN-HOUSE RESEARCH ACTIVITIES. MENTION IS GIVEN OF THOSE FWPCA SUPPORTED ACTIVITIES THAT RELATE DIRECTLY TO THE CONTROL OF POLLUTION FROM FARM ANIMALS. THESE INCLUDE POLLUTION SURVEILLANCE AND WATER QUALITY MONITORING AMONG OTHERS. THE AUTHOR FEELS THAT THE MOST SIGNIFICANT RECENT ACCOMPLISHMENT IN WATER POLLUTION CONTROL IS THE ESTABLISHMENT OF WATER QUALITY STANDARDS. (SEE ALSO W71-06810) (WHITE-IOWA STATE)

FIELD 05G

ACCESSION NO. W71-06825

DETERMINATION OF SOME CHEMICAL AND PHYSICAL RELATIONSHIPS FROM RECORDING METERS  
IN LAKES,

ONTARIO WATER RESOURCES COMMISSION, TORONTO.

MERV D. PALMER, AND J. BRYAN IZATT.

WATER RESEARCH, VOL 4, NO 12, P 773-786, DECEMBER 1970. 14 P, 6 FIG, 9 TAB, 9  
REF.

DESCRIPTORS:

\*PATH OF POLLUTANTS, \*MONITORING, \*WATER QUALITY, \*LAKES, \*LAKE ERIE,  
WATER POLLUTION SOURCES, WATER POLLUTION EFFECTS, POLLUTANT  
IDENTIFICATION, INSTRUMENTATION, STATISTICAL METHODS, CURRENT METERS,  
DISSOLVED OXYGEN, HYDROGEN-ION CONCENTRATION.

IDENTIFIERS:

\*WATER QUALITY MONITORING.

ABSTRACT:

HOURLY READINGS OF CURRENT, CONDUCTIVITY, PH AND DISSOLVED OXYGEN WERE  
COLLECTED DURING MAY AND JUNE, 1969, 1.6 KM OFFSHORE AT THE MID-DEPTH  
OF A TOTAL DEPTH OF 6 M ON LAKE ERIE. THE NEAREST MAJOR SEWAGE OUTFALL  
IS 6 KM TO THE WEST OF THE MEASURING LOCATION. DATA COLLECTED IN THIS  
MANNER REQUIRES EXTENSIVE CONDITIONING BEFORE MEANINGFUL TIME SERIES  
ANALYTICAL TECHNIQUES ARE APPLIED. CONDUCTIVITY WAS FOUND TO CORRELATE  
DIRECTLY WITH WATER MOVEMENT IN THE NEARSHORE AREAS OF LAKES, AND IS  
CONSIDERED TO BE TRANSPORTED BY THE CURRENTS. PH WAS RELATED TO  
CURRENTS FOR ONE MONTH ONLY. DISSOLVED OXYGEN IS INDEPENDENT OF  
CURRENTS AND REQUIRES INFORMATION OTHER THAN CURRENTS TO EXPLAIN THE  
MEASURED VALUES. PROBABILITY TECHNIQUES WERE SUCCESSFULLY USED TO  
DESCRIBE CONDUCTIVITY, PH AND DISSOLVED OXYGEN. (KNAPP-USGS)

FIELD 05A, 02K, 02H

ACCESSION NO. W71-07045

CONSIDERED LAKE ERIE-LAKE ONTARIO WATERWAY; HYDRAULIC MODEL INVESTIGATION,  
ARMY ENGINEER WATERWAYS EXPERIMENT STATION, VICKSBURG, MISS.

T. E. MURPHY.

SPONSORED BY US ARMY ENGINEER DISTRICT, BUFFALO. US ARMY ENGINEER WATERWAYS  
EXPERIMENT STATION, VICKSBURG, MISSISSIPPI, TECHNICAL REPORT H-70-3, APR  
1970. 14 P, 8 TAB, 8 PHOTO, 10 PL.

DESCRIPTORS:

\*INLAND WATERWAYS, \*HYDRAULIC MODELS, NAVIGATION CONDITIONS, LOCKS.

IDENTIFIERS:

\*LAKE ERIE-LAKE ONTARIO WATERWAY.

ABSTRACT:

INVESTIGATION WAS CONDUCTED TO ASSIST IN DETERMINATION OF THE ECONOMIC JUSTIFICATION OF A WATER ROUTE CONNECTING LAKE ERIE AND LAKE ONTARIO. SPECIFICALLY, THE STUDIES INVOLVED DETERMINATION OF THE MOST FUNCTIONAL AND ECONOMICAL LOCATION FOR A LOCK IN THE VICINITY OF BUFFALO, N.Y., AND EVALUATION OF NAVIGATION CONDITIONS AT THE ENTRANCE TO AN OVERLAND CANAL JOINING THE AMERICAN CHANNEL OF THE NIAGARA RIVER NORTHWEST OF NORTH TONAWANDA, N.Y. AN EXISTING MODEL OF THE NIAGARA RIVER WITH A HORIZONTAL SCALE OF 1:360 AND A VERTICAL SCALE OF 1:60 AND A NEW UNDISTORTED MODEL OF THE CANAL ENTRANCE WITH A 1:120 SCALE WERE USED IN THE INVESTIGATION. TESTS DEMONSTRATED THE DESIRABILITY OF PLACING THE NEW LOCK IN THE VICINITY OF BUFFALO AS FAR DOWNSTREAM AS IS FEASIBLE WITHOUT RENDERING THE EXISTING BLACK ROCK LOCK AND CANAL INOPERABLE DURING THE CONSTRUCTION PERIOD. NAVIGATION PROBLEMS AT THE CANAL ENTRANCE WERE NOT AS SEVERE AS HAD BEEN CONTEMPLATED AND A SMALL AMOUNT OF OVEREXCAVATION RESULTED IN SATISFACTORY CONDITIONS. (MURPHY-WES)

FIELD 06B, 04A, 08A

ACCESSION NO. W71-07172

DESIGN FOR FLOOD CONTROL AND WAVE PROTECTION, CHAGRIN RIVER, EASTLAKE, OHIO;  
HYDRAULIC MODEL INVESTIGATION,

ARMY ENGINEER WATERWAYS EXPERIMENT STATION, VICKSBURG, MISS.

C. E. CHATHAM, JR.

SPONSORED BY US ARMY ENGINEER DISTRICT, BUFFALO. US ARMY ENGINEER WATERWAYS  
EXPERIMENT STATION, VICKSBURG, MISSISSIPPI, TECHNICAL REPORT H-70-11, SEPT  
1970. 18 P, 11 TAB, 33 PHOTO, 26 PL.

DESCRIPTORS:

\*FLOOD CONTROL, \*WAVES(WATER), \*HYDRAULIC MODELS, BREAKWATERS, LAKE  
ERIE, \*SHORE PROTECTION.

IDENTIFIERS:

\*CHAGRIN RIVER, \*EASTLAKE(OHIO).

ABSTRACT:

A 1:75-SCALE MODEL OF THE LOWER 2000 FT OF THE CHAGRIN RIVER AND  
SUFFICIENT OFFSHORE AREA IN LAKE ERIE TO PERMIT GENERATION OF THE  
REQUIRED TEST WAVES WAS USED TO INVESTIGATE THE ARRANGEMENT AND DESIGN  
OF CERTAIN PROPOSED IMPROVEMENTS WITH RESPECT TO WAVE ACTION AND FLOOD  
CONTROL. PROPOSED IMPROVEMENT PLANS CONSISTED OF (1) ARROWHEAD  
BREAKWATERS IN LAKE ERIE AT THE MOUTH OF THE RIVER, AGGREGATING ABOUT  
2360 FT IN LENGTH; (2) REALIGNMENT AND ENLARGEMENT OF THE RIVER CHANNEL  
FROM LAKE ERIE THROUGH THE CITY OF EASTLAKE, WITH LEVEES WHERE REQUIRED  
TO SUPPLEMENT CHANNEL ENLARGEMENT; (3) A SPUR CHANNEL AND AN ACCESS  
CHANNEL FOR NAVIGATION; (4) RECREATIONAL FACILITIES AT THE RIVER MOUTH;  
AND (5) THE ADDITION OF BEACH FILL AND PROTECTIVE GROINS ALONG THE  
SHORELINE EAST OF THE EAST BREAKWATER. A 60-FT-LONG WAVE MACHINE AND  
ELECTRICAL WAVE-HEIGHT MEASURING AND RECORDING APPARATUS WERE UTILIZED  
IN MODEL OPERATION. CONCLUSIONS FROM TEST RESULTS ARE GIVEN.  
(CHATHAM-WES)

FIELD 08B

ACCESSION NO. W71-07180

WATER CONFLICTS ON LAKE ERIE,

PENNSYLVANIA DEPT. OF HEALTH, HARRISBURG, PA.

WALTER LYON.

IN: GREAT LAKES WATER RESOURCES CONFERENCE, TORONTO, HYDRO-ELECTRIC POWER  
COMMISSION OF TORONTO, P 115-120, 1968.

DESCRIPTORS:

\*WATER QUALITY, \*MANAGEMENT, \*POLLUTION, \*LAKE ERIE, \*REGIONAL  
ANALYSIS, FISHERIES, RECREATION, POPULATION, LAKES, STREAMS,  
MATHEMATICAL STUDIES, COSTS, SOCIAL ASPECTS, INDUSTRIAL WASTES.

IDENTIFIERS:

\*ECONOMIC OBJECTIVES, \*REGIONAL ECONOMY, \*POLLUTION ABATEMENT, TRAPPED  
SEGMENTS, PUBLIC POLICY.

ABSTRACT:

ATTEMPTS ARE MADE TO CLARIFY THE FACTS ABOUT THE CONDITION OF LAKE ERIE  
IN ORDER TO OFFSET THE ADVERSE ECONOMIC EFFECT OF REPORTS THAT LAKE  
ERIE IS 'DEAD' AND A POLLUTED HEALTH HAZARD. LAKE ERIE IS 'SICK' RATHER  
THAN 'DEAD', HAVING SUFFERED SERIOUS INJURY BECAUSE MANY OF ITS USES  
HAVE BEEN ABUSED BY ECONOMIC OBJECTIVES WHICH FAILED TO RELATE THE  
REGIONAL ECONOMY TO THE PROTECTION OF THE LAKE AS A NATURAL RESOURCE.  
SOME OF THE LAKE'S PROBLEMS WHICH ARE SPECIFIED INCLUDE THE ECOLOGICAL  
IMBALANCE OF OVERFERTILIZATION BY PHOSPHATES, THE CHANGE IN THE SPECIES  
COMPOSITION OF FISH, AND THE ACCUMULATION OF RESIDUAL POLLUTANTS FROM  
TREATED SEWAGE AND INDUSTRIAL WASTE DISCHARGES. THREE STEPS ARE  
PROPOSED TO IMPROVE THE WATER QUALITY OF THE LAKE, NAMELY  
IMPLEMENTATION OF THE POLLUTION ABATEMENT PROGRAM, IMPROVEMENT OF  
FISHERIES, AND DEVELOPMENT OF A CONCEPTUAL POLICY FRAMEWORK BASED ON A  
MODEL OF THE LAKE WHICH CONSIDERS ECOLOGIC, HYDROLOGIC, AND BIOCHEMICAL  
AND OTHER SUBSYSTEMS OPERATIVE IN THE LAKE AND WHICH WOULD RELATE  
POLLUTION ABATEMENT TO RESULTANT WATER QUALITY AND USE IMPROVEMENTS.  
(SEE ALSO W71-07565) (MURPHY-RUTGERS)

FIELD 05C, 02H

ACCESSION NO. W71-07569

ORGANIZATION AND PLANNING OF WATER QUALITY CONTROL,

ONTARIO WATER RESOURCES COMMISSION, TORONTO.

W. A. STEGGLES.

IN: GREAT LAKES WATER RESOURCES CONFERENCE, TORONTO, THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO, P 449-470, 1968.

DESCRIPTORS:

\*WATER QUALITY, \*GREAT LAKES, \*WATER MANAGEMENT, GOVERNMENT, POLLUTION, DRAINAGE BASIN, RIVERS, SEWERS, TRANSPORTATION, POPULATION, CHLORIDE, WASTE TREATMENT, STREAMS, EROSION, CANALS.

IDENTIFIERS:

\*QUALITY CONTROL POLICY, \*ECONOMIC INCENTIVES, GROSS PRODUCTS.

ABSTRACT:

THE GROWING POLLUTION PROBLEMS OF THE GREAT LAKES ARE INDICATED; SUCH PROBLEMS ARE CONTROLLABLE BY SUITABLE PLANNING, REGULATION AND OTHER PROCEDURES. THIS END COULD BEST BE ACHIEVED BY COUPLING WATER QUALITY GOALS WITH ECONOMIC INCENTIVES TO REDUCE POLLUTANTS AT THE SOURCE. GREATLY IMPROVED WATER POLLUTION CONTROL TECHNOLOGY IS NEEDED AS THE TECHNOLOGY, ECONOMY, AND STANDARD OF LIVING INCREASE IN THE GREAT LAKES AREA, AS SHOWN BY SUCH EXAMPLES AS GROSS PRODUCTS, HUMAN AND ANIMAL POPULATIONS, SEAWAY AND CANAL TRAFFIC, CHLORIDE CONTENT OF LAKES, AND NUTRIENTS IN LAKE ERIE. THE THREE MAJOR AREAS OF CONCERN FOR APPROPRIATE WATER MANAGEMENT ARE PROPOSED AS DEVELOPMENT OF PLANS FOR OPTIMAL WATER USE, STUDY OF TOLERANCE FOR WASTE WATER, AND A WATCH TO DETECT UNUSUAL WASTE SPILLS AND OVERLOADS FROM TREATMENT FACILITIES. VARIOUS WATER QUALITY OBJECTIVES AND STANDARDS ARE SURVEYED FROM BOTH THE CANADIAN AND US VIEWPOINTS, AND SUGGESTIONS ARE PRESENTED FOR IMPLEMENTATION OF THE NEW POLICIES. (SEE ALSO W71-07565) (MURPHY-RUTGERS)

FIELD 06B, 05G

ACCESSION NO. W71-07576



POLLUTION OF LAKE ERIE, LAKE ONTARIO AND THE INTERNATIONAL SECTION OF THE ST. LAWRENCE RIVER.

TECHNICAL ADVISORY BOARD ON AIR POLLUTION, INTERNATIONAL JOINT COMMISSION (CANADA).

REPORT BY THE INTERNATIONAL JOINT COMMISSION CANADA AND UNITED STATES, 1970.  
174 P, 5 FIG, 4 TAB.

DESCRIPTORS:

\*WATER POLLUTION SOURCES, \*WATER POLLUTION EFFECTS, \*POLLUTANTS,  
\*MONITORING, \*LEGAL ASPECTS, LAKE ERIE, LAKE ONTARIO, ST. LAWRENCE RIVER.

IDENTIFIERS:

\*POTENTIAL, REMEDIAL MEASURES, PROPOSED OBJECTIVES.

ABSTRACT:

THE INTERNATIONAL JOINT COMMISSION REPORTS ON AN INQUIRY INTO THE POLLUTION OF LAKE ERIE, LAKE ONTARIO AND THE INTERNATIONAL SECTION OF THE ST. LAWRENCE RIVER. THE LOCATIONS, CAUSES AND EXTENT OF POLLUTION WERE STUDIED. RECOMMENDATIONS FOR WATER QUALITY OBJECTIVES WERE MADE IN THE HOPES THAT BOTH CANADA AND THE UNITED STATES WOULD ADOPT THEM AND ENTER INTO AGREEMENT ON PROGRAMS AND MEASURES TO ACHIEVE THOSE OBJECTIVES. AUTHORITY BY THE COMMISSION TO MONITOR THE WATER QUALITY AND ABATEMENT PROGRESS WAS RECOMMENDED. THE IJC ALSO RECOMMENDED THAT THE REFERENCE OF OCTOBER 1964 BE EXTENDED TO AUTHORIZE POLLUTION STUDIES IN THE REMAINING BOUNDARY WATERS OF THE GREAT LAKES AND TRIBUTARY WATERS. (ENSGN-PAI)

FIELD 05C

ACCESSION NO. W71-07671

CLEVELAND FACES POLLUTION SUIT.

CHEMICAL WEEK, VOL 107, NO 9, P 18, AUG 26, 1970.

DESCRIPTORS:

\*LEGAL ASPECTS, \*WATER POLLUTION SOURCES, WATER POLLUTION CONTROL, LAKE ERIE, TREATMENT FACILITIES, CITY PLANNING, CONTRACTS, OHIO, SEWERS, \*CHLORINATION.

IDENTIFIERS:

\*CLEVELAND(OHIO), \*INTERCEPTOR SEWERS.

ABSTRACT:

THE OHIO WATER POLLUTION CONTROL BOARD HAS DIRECTED ATTORNEY GENERAL PAUL BROWN TO FILE SUIT AGAINST CLEVELAND FOR FAILURE IN MEETING A JUNE 15, 1970 DEADLINE TO INSTALL TEMPORARY CHLORINATION FACILITIES IN ITS SEWAGE TREATMENT PLANTS WHICH POLLUTE LAKE ERIE. THE CITY ALSO FAILED TO MEET A JULY 1ST DEADLINE TO CONTRACT FOR SANITARY INTERCEPTOR SEWER PLANS IN VARIOUS PARTS OF THE CITY.

FIELD 05G, 06E, 05B

ACCESSION NO. W71-07853

HYDROBIOLOGICAL EVALUATION OF STREAM AND NEARSHORE SYSTEMS: FIELD STUDIES,

MICHIGAN STATE UNIV., EAST LANSING. INST. OF WATER RESEARCH.

M. E. STEPHENSON, E. D. ANDERSON, AND R. A. COLE.

PROCEEDINGS OF THE NATIONAL SYMPOSIUM ON DATA AND INSTRUMENTATION FOR WATER QUALITY MANAGEMENT, CONFERENCE OF STATE SANITARY ENGINEERS AND WISCONSIN UNIVERSITY, JULY 21-23, 1970, MADISON, WIS., P 299-309, 1970. 11 P, 3 FIG, 1 TAB.

DESCRIPTORS:

\*MONITORING, \*WATER QUALITY, \*BIOINDICATORS, SAMPLING, MICHIGAN, WATER POLLUTION EFFECTS, POLLUTANT IDENTIFICATION, THERMAL POLLUTION, LAKE ERIE, PLANKTON, AQUATIC LIFE, ECOLOGY, AQUATIC ENVIRONMENT.

IDENTIFIERS:

\*WATER QUALITY MONITORING.

ABSTRACT:

HYDROBIOLOGICAL EVALUATIONS MAY BE CONDUCTED UNDER THE ASSUMPTION THAT THE MOST REPRESENTATIVE INDICATORS OF CHANGING WATER QUALITY ARE FUNCTIONS OF THE INDIGENOUS BIOLOGICAL COMMUNITY. THESE RESPONSES MAY OCCUR AS A RESULT OF THE INTRODUCTION OF FOREIGN BIOLOGICAL POPULATIONS OR CHANGE IN PHYSICAL AND CHEMICAL PROPERTIES. FIELD INVESTIGATIONS WERE MADE ON FOUR MICHIGAN STREAM SYSTEMS AND A NEARSHORE ENVIRONMENT IN WESTERN LAKE ERIE TO EVALUATE THE RESPONSE OF THESE ENVIRONMENTS TO URBANIZATION AND AGRICULTURE PRACTICES. AN ECOLOGICAL EVALUATION OF THERMAL DISCHARGE FROM A FOSSIL FUEL POWER PLANT AT THE MOUTH OF THE RAISIN RIVER IN WESTERN LAKE ERIE WAS INITIATED IN JULY, 1969. COMMUNITY COMPONENTS ELECTED TO CHARACTERIZE CHANGES ARE PHYTOPLANKTON, PERIPHYTON, ZOOPLANKTON, BENTHOS, FISH, AND WATERFOWL. THE PHYSICAL AND CHEMICAL PARAMETERS INCLUDE TEMPERATURE, OXYGEN, PHOSPHORUS, ORGANIC NITROGEN, TOTAL NITROGEN, NITRATE, AMMONIA, ORGANIC CARBON, AND SILICA. IN ADDITION, PESTICIDE ANALYSES ARE BEING PERFORMED ON THE FISH COLLECTED IN THE BIOLOGICAL PROGRAM. (SEE ALSO W71-08550) (KNAPP-USGS)

FIELD 05A, 05C

ACCESSION NO. W71-08880

SHORELINE ALGAE OF WESTERN LAKE ERIE,

OHIO STATE UNIV., COLUMBUS. GRADUATE STUDIES IN BOTANY.

RACHEL COX DOWNING.

THE OHIO JOURNAL OF SCIENCE, VOL 70, NO 5, P 257-276, 1970. 97 FIG, 37 REF.

DESCRIPTORS:

\*LAKE SHORES, \*ALGAE, \*LAKE ERIE, AQUATIC HABITATS, LAKES, AQUATIC ENVIRONMENT.

IDENTIFIERS:

\*ALGAL SPECIES, WESTERN LAKE ERIE, ARNOLDIELLA CONCHOPHILA MILLER.

ABSTRACT:

IN SPITE OF SOME 70 YEAR INVESTIGATIONS OF ALGAE INHABITING WESTERN LAKE ERIE, ALMOST NOTHING WAS KNOWN PRIOR TO THIS STUDY OF THE SHORELINE AS A SPECIFIC HABITAT OF THESE ORGANISMS. THIS SITE HARBORS 61 TAXA, 39 OF WHICH ARE NEW RECORDS FOR THIS PART OF THE LAKE, AND ONE, ARNOLDIELLA CONCHOPHILA MILLER, WAS PREVIOUSLY REPORTED ONLY FROM CENTRAL RUSSIA. (WILDE-WISCONSIN)

FIELD 05C

ACCESSION NO. W71-09156

DUMPING GROUND REGULATIONS (REGULATION OF DUMPING IN INTEREST OF NAVIGATION).

CODE OF FEDERAL REGULATIONS, ~~TITLE 33~~, CHAP 11, PART 205 (1970). 14 P.

DESCRIPTORS:

\*NAVIGABLE WATERS, \*NAVIGATION, \*WASTE DISPOSAL, \*WASTE DUMPS, BODIES OF WATER, REGULATION, INSPECTION, PERMITS, STANDARDS, MONITORING, ADMINISTRATIVE AGENCIES, ADMINISTRATION, WATER POLLUTION, PACIFIC OCEAN, ATLANTIC OCEAN, NAVIGABLE RIVERS, GREAT LAKES, DREDGING, WASTES, COSTS, FEDERAL GOVERNMENT.

ABSTRACT:

IN AN EFFORT TO CONTROL THE DUMPING OF WASTE MATERIALS INTO VARIOUS NAVIGABLE BODIES OF WATER, THESE FEDERAL REGULATIONS DELINEATE: (1) THE TYPES OF MATERIALS WHICH MAY BE DUMPED, (2) THE AREAS WHERE THEY MAY BE DUMPED, (3) PROCEDURES FOR OBTAINING PERMISSION TO DUMP WASTE MATERIALS, AND (4) METHODS FOR REGULATING PERMISSIBLE DUMPING. BODIES OF WATER COVERED BY THESE REGULATIONS INCLUDE: (1) NEW YORK HARBOR AND ADJACENT WATERS; (2) THE CHESAPEAKE BAY OFF KENT ISLAND, MARYLAND; (3) ASHLEY RIVER AND CHARLESTON HARBOR, SOUTH CAROLINA; (4) LAKE MICHIGAN AROUND CHICAGO, ILLINOIS; (5) LAKE SUPERIOR IN MINNESOTA AND WISCONSIN; (6) THE WEST END OF LAKE ERIE; (7) VARIOUS APPROACHES TO BAYS AND RIVERS IN THE PACIFIC OCEAN; AND (8) ENTRANCES TO SEAPORTS. THE PRIMARY AIM OF THE REGULATIONS IS TO ASSURE UNHINDERED NAVIGATION IN THESE WATERS, ALTHOUGH POLLUTION CONTROL APPEARS TO BE AN ADDITIONAL FACTOR. IN ALL WATERS COVERED THE DUMPING OF FLOATABLE WASTES OR WASTES EASILY TRANSPORTED BY CURRENTS IS PROHIBITED. IN MANY WATERS METALLIC OBJECTS MAY NOT BE DUMPED. VARIOUS PROVISIONS PRESCRIBE METHODS OF OBTAINING DUMPING PERMITS, SUPERVISORY CONTROL OF THE DUMPING, AND INSPECTION OF DUMPING AREAS. (DUSS-FLORIDA)

FIELD 06E .

ACCESSION NO. W71-09196

**LAKE ERIE: COMMON EFFORT CAN SAVE IT.**

**BUREAU OF COMMERCIAL FISHERIES, WASHINGTON, D.C.**

**COMMERCIAL FISHERIES REVIEW, VOL 32, NO 8-9, P 19-20, AUG-SEPT, 1970. 4 FIG.**

**DESCRIPTORS:**

**\*LAKE ERIE, \*LAKE FISHERIES, \*FISHERIES, \*FISH MANAGEMENT, \*FISH POPULATIONS, \*AQUATIC ENVIRONMENT, \*FISH HARVEST, \*DISSOLVED SOLIDS, \*WATER TEMPERATURE, \*DDT, \*HEAVY METALS, GREAT LAKES, MARKET VALUE, WHITE BASS, YELLOW PERCH, LAKE TROUT, FISH CONSERVATION, FISH FOOD ORGANISMS, FISHKILL, POUNDS FISH PER ACRE, FISH POPULATIONS, BENTHIC FAUNA, DISSOLVED OXYGEN, WATER POLLUTION EFFECTS, REHABILITATION, PERCHES.**

**IDENTIFIERS:**

**\*MERCURY, CATCH STATISTICS, SOLIDS, CLIMATIC CHANGES, LAKE REHABILITATION.**

**ABSTRACT:**

**A GENERAL REVIEW IS GIVEN OF THE FISHERIES STATUS OF THE GREAT LAKES IN REGARD TO THE EFFECT OF ENVIRONMENTAL CHANGES. THERE HAS BEEN A SHIFT IN THE CATCH FROM HIGH VALUE FISH TO LOW VALUE FISH, SUCH AS YELLOW PERCH AND WHITE BASS. TOTAL DISSOLVED SOLIDS HAVE INCREASED 50 PPM DURING THE PAST 50 YEARS. WATER TEMPERATURES HAVE INCREASED 20F SINCE 1920 DUE TO CLIMATE CHANGES. DEGRADATION OF THE OXYGEN REGIME HAS ALTERED THE POPULATIONS OF BOTTOM ORGANISMS, WHICH WERE VALUABLE AS FISH FOOD. THE POUNDAGE OF FISH TAKEN HAS MAINTAINED ITSELF, BUT THE SPECIES SHIFT HAS REDUCED THE VALUE OF THE CATCH. DDT VALUES ARE BELOW 5 PPM, BUT MERCURY CONTAMINATION IS SERIOUS. THE ENVIRONMENTAL PROBLEMS OF LAKE ERIE ARE REGARDED AS COMPLEX AND DISCOURAGING.  
(KATZ-WASHINGTON)**

**FIELD 05C, 02H**

**ACCESSION NO. W71-09387**

LAKE ERIE ALIVE BUT CHANGING,

MICHIGAN UNIV., ANN ARBOR. GREAT LAKES RESEARCH DIV.

DEAN E. ARNOLD.

THE CONSERVATIONIST, VOL. 25, NO. 3, P. 23-30, DEC. - JAN 1970-71, 3 FIGURES.

DESCRIPTORS:

\*WATER POLLUTION SOURCES, \*POLLUTION ABATMENT, \*FISHERIES, LAKE ERIE.

IDENTIFIERS:

DETROIT RIVER, MAUMEE RIVER.

ABSTRACT:

THIS ARTICLE DESCRIBES THE PROBLEMATIC ECOLOGICAL SITUATION INTO WHICH LAKE ERIE HAS EVOLVED, THE CAUSES OF THIS CONDITION, THE EFFECTS OF IT AND THE POSSIBLE SOLUTIONS. THE FISHERIES INDUSTRY IS A MAJOR FOCUS OF THE ARTICLE, SUGGESTING WAYS FOR BRINGING IT BACK TO THE LAKE AS WELL AS A DETAILED EXAMINATION OF WHAT SPECIES OF FISH HAVE BEEN ELIMINATED FROM LAKE ERIE AND WHAT NEW SPECIES HAVE BEEN INTRODUCED. THE AUTHOR CONCLUDES THAT 'IF CHANGES OF SOME SORT ARE NOT MADE IN MAN'S USE AND MISUSE OF THE LAKE ERIE RESOURCE, HE WILL LOSE IT ENTIRELY.'  
(HOLMES-RUTGERS)

FIELD 05B

ACCESSION NO. W71-09409

PHYTOPLANKTON DYNAMICS AND PRODUCTIVITY IN A SHALLOW, HIGHLY EUTROPHIC LAKE:  
WITH SPECIAL REFERENCE TO MELOSIRA AMBIGUA (GRUN.) O. MULL. AND M. GRANULATA  
(EHR.) RALFS,

WISCONSIN UNIV., MADISON. WATER RESOURCES CENTER.

WILLIAM E. SLOEY.

DOCTOR OF PHILOSOPHY THESIS, DEPT OF BOTANY, UNIVERSITY OF  
WISCONSIN-MILWAUKEE, 1969, 162 P, 22 FIG, 6 TAB, 126 REF. OWRR PROJECT  
A-011-WIS(2).

DESCRIPTORS:

\*PHYTOPLANKTON, \*DIATOMS, \*TURBULENCE, \*AQUATIC PLANTS, \*WATER  
TEMPERATURE, \*DISSOLVED OXYGEN, \*DISSOLVED SOLIDS, \*LAKE, \*WATER  
CHEMISTRY, WISCONSIN, \*EUTROPHICATION.

IDENTIFIERS:

\*POPULATION DYNAMICS, \*MELOSIRA GRANULATA (EHR) RALFS, \*M AMBIGUA  
(GRUN) O MULL, THERMAL STABILITY, SECCHI DISC TRANSPARENCIES, NITRATE  
VARIATION, PHOSPHATE VARIATION, CARBON-14 PRODUCTIVITY, STEPHANODISCUS  
NIAGARAE EHR, S HANTZSCHII GRUN, ANABAENA, MICROCYSTIS, APHANIZOMENON.

ABSTRACT:

THE PHYTOPLANKTON POPULATION DYNAMICS, CARBON-14 PRIMARY PRODUCTIVITY  
AND CERTAIN PHYSICO-CHEMICAL PROPERTIES OF THE SHALLOW AND HIGHLY  
EUTROPHIC LAKE BUTTE DES MORTS, WISCONSIN WAS STUDIED IN 1966-69. TWO  
CO-DOMINANT SUMMER DIATOMS, MELOSIRA GRANULATA (EHR.) RALFS AND M.  
AMBIGUA (GRUN.) O. MULL., WIDELY RECOGNIZED AS INDICATORS OF EUTROPHY,  
WERE EMPHASIZED IN THE STUDY. PERIODICITIES OF OTHER PLANKTONIC MEMBERS  
OF THE GENUS MELOSIRA HAVE BEEN SHOWN TO BE RELATED PRIMARILY TO WATER  
TURBULENCE, AND PERENNATION IS DUE TO SURVIVAL AS VEGETATIVE CELLS IN  
THE BOTTOM SEDIMENTS DURING PERIODS OF THERMAL STABILITY. LAKE BUTTE  
DES MORTS IS A PORTION OF THE LARGER WINNEBAGO POOL AND HAS AN AREA OF  
37.79 SQUARE KILOMETERS, A MEAN DEPTH OF 1.42 METERS, AND A THEORETICAL  
RETENTION TIME OF ONLY 2 TO 14 DAYS. THE TROPHIC STATE OF THE LAKE IS  
COMPARABLE TO WESTERN LAKE ERIE AND THE LAKE IS PRESENTLY UNDERGOING A  
SIGNIFICANT LOSS OF AQUATIC MACROPHYTES AND TURBIDITY IS INCREASING.  
THERMAL STABILITY WAS FOUND TO BE TEMPORARY DURING OPEN WATER PERIODS  
AND OCCURRED ONLY DURING CALM CONDITIONS. THE WATER QUALITY  
CHARACTERISTICS OF THE LAKE WERE EVALUATED IN TERMS OF WATER  
TEMPERATURE, DISSOLVED OXYGEN, SECCHI DISC TRANSPARENCIES, DISSOLVED  
SOLIDS, NITRATE, AND PHOSPHATE VARIATION DURING SEASONAL CHANGES. BOTH  
MELOSIRA AMBIGUA AND M. GRANULATA WERE FOUND ALIVE IN THE BOTTOM  
SEDIMENTS TO DEPTHS OF 7 CENTIMETERS, WHILE FEW OTHER FORMS SURVIVED AT  
ANY DEPTH. TEMPERATURE IS THE DOMINANT FACTOR APPARENTLY REGULATING  
POPULATION GROWTH RATES OF THESE TWO SPECIES AND DATA FROM THE STUDY  
AND FROM THE LITERATURE WERE COLLECTED TO CHARACTERIZE THESE SPECIES.

FIELD 05C, 02H

ACCESSION NO. W71-09561



DOW SUED BY ONTARIO FOR POLLUTION DAMAGE.

CHEMICAL WEEK, VOL. 108, NO. 12, P. 12, MARCH 24, 1971.

DESCRIPTORS:

\*HEAVY METALS, WATER POLLUTION CONTROL, \*JURISDICTION, \*LAKE ERIE, STANDARDS, CHLORINE, WATER POLLUTION EFFECTS.

IDENTIFIERS:

\*MERCURY, DOW CHEMICAL OF CANADA, ONTARIO, \*ST. CLAIR RIVER, \*DETROIT RIVER.

ABSTRACT:

THE ONTARIO GOVERNMENT'S \$25 MILLION MERCURY POLLUTION SUIT AGAINST DOW CHEMICAL OF CANADA MAY SET A PRECEDENT IN INSTANCES WHERE INDUSTRY ALLEGEDLY DESPOILS THE ENVIRONMENT. IN ADDITION, THE SUIT ASKS THAT DOW RENDER HARMLESS THE MERCURY SEDIMENTS ON THE BOTTOM OF ST. CLAIR AND DETROIT RIVERS, LAKE ST. CLAIR AND LAKE ERIE OR PAY THE PROVINCE AN ADDITIONAL \$10 MILLION FOR DREDGING THE BOTTOM. THE NEW FEDERAL DEPARTMENT OF ENVIRONMENT FOR RENEWABLE RESOURCES SAID THAT IT WILL REQUIRE FOR ALL PLANTS A MAXIMUM DISCHARGE OF 0.005 LB. MERCURY/TON OF CHLORINE BY SEPTEMBER 1, 1971, AND BY THE END OF THE YEAR LIMITATION TO THE NATURAL BACKGROUND. IT IS REPORTED THAT DOW HAS REDUCED ITS RELEASE TO 0.0009 LB. OF MERCURY/TON CHLORINE. (OLESZKIEWICZ-VANDERBILT)

FIELD 05C, 06E

ACCESSION NO. W71-09784

SOME FACTORS ASSOCIATED WITH THE DECLINE OF THE LAKE ERIE COMMERCIAL FISHING  
INDUSTRY IN OHIO,

TOLEDO UNIV., OHIO.

DONALD W. LEWIS.

IN: PROCEEDINGS, TWELFTH CONFERENCE ON GREAT LAKES RESEARCH, ANN ARBOR,  
BRAUN-BRUMFIELD, INC, 1969, P 834-842.

DESCRIPTORS:

\*LAKE ERIE, \*FISHING, \*ECONOMIC ANALYSIS, TIME, COSTS, ECONOMIC  
EFFICIENCY, TECHNOLOGY, POPULATION, SALTING, CAPITAL COSTS.

IDENTIFIERS:

\*POLITICAL FACTORS, \*BIOLOGICAL FACTORS, REAL VALUE OF CATCH, STORAGE,  
FREEZING.

ABSTRACT:

THE PROBLEMS ASSOCIATED WITH THE DECLINE OF THE COMMERCIAL FISHING  
INDUSTRY ON LAKE ERIE IN OHIO ARE CONSIDERED. THE REAL VALUE OF THE  
FISHING CATCH IS USED AS A MEASURE OF THE STATE OF THE INDUSTRY. AN  
ANALYSIS OF THE TIMING PLACES THE START OF THE DECLINE ABOUT 1943. THE  
ADVERSE EFFECT OF THE CHANGING FISH POPULATION IS CONSIDERED A FACTOR,  
ALTHOUGH THIS IS THOUGHT TO BE ONE OF THE LESSER CAUSES. COMPETITION  
FOR THE OHIO INDUSTRY IS CATEGORIZED AS LARGELY BETWEEN SPORTSMEN AND  
THE ONTARIO COMMERCIAL INDUSTRY. PROBLEMS OF COMPETITIVE LABOR COSTS,  
LABOR PRODUCTIVITY, PERMISSIVE REGULATION, AND STAGNANT TECHNOLOGY ARE  
ALSO CITED. THE INDUSTRIAL STRUCTURE IS CHARACTERIZED AS WEAK AND  
MARKET COMPETITION FROM NON-FISH PROTEIN SOURCES AND FRESHWATER FISHERY  
PRODUCTS IS INDICATED AS A STRONG FACTOR CONTRIBUTING TO THE DECLINE.  
THE CONCLUDING REMARKS BLAME ECONOMIC AND POLITICAL FACTORS FOR THE  
DECLINE OF THE INDUSTRY, IN WHICH BIOLOGICAL FACTORS HAVE ALSO  
CONTRIBUTED A NOTICEABLE DELETERIOUS EFFECT. (MURPHY-RUTGERS)

FIELD 06B

ACCESSION NO. W71-09897

ATMOSPHERIC CONTROLS OF WATER EXCHANGE IN GREAT LAKES BASIN,

ILLINOIS STATE WATER SURVEY, URBANA.

STANLEY A. CHANGNON, JR.

WATER RESOURCES BULLETIN, VOL 7, NO 3, P 473-483, JUN 1971. 11 P, 7 FIG, 19 REF.

DESCRIPTORS:

\*WATER BALANCE, \*GREAT LAKES REGION, \*METEOROLOGY, \*WEATHER MODIFICATION, \*EVAPORATION, PRECIPITATION(ATMOSPHERIC), SNOWFALL, CLOUD SEEDING, AIR POLLUTION, REGIONAL ANALYSIS, URBANIZATION, CITIES, HYDROLOGIC CYCLE, SYNOPTIC ANALYSIS.

ABSTRACT:

EXISTING METEOROLOGICAL CONTROLS OF WATER EXCHANGE BY PRECIPITATION AND EVAPORATION ON THE GREAT LAKES ARE ALMOST ENTIRELY INADVERTENT AND RELATED TO MAN'S URBAN-INDUSTRIAL COMPLEXES AND THEIR EFFECT UPON PRECIPITATION PROCESSES. THESE INADVERTENT EFFECTS HAVE LED TO 10 TO 40% INCREASES IN PRECIPITATION IN LOCALIZED AREAS WITHIN THE BASIN. ENVISIONED GROWTH OF URBAN-INDUSTRIAL COMPLEXES WITHIN THE GREAT LAKES REGION SHOULD LEAD TO MORE INADVERTENT WEATHER MODIFICATION IN THE BASIN. THE ONLY EXISTING PLANNED WEATHER MODIFICATION EFFORTS ARE THOSE AT LAKE ERIE WHICH ARE ATTEMPTING TO ELIMINATE BY REDISTRIBUTION THE CONCENTRATION OF LAKE-DERIVED HEAVY SNOWFALL ALONG THE SOUTH SHORE. PRACTICAL INCREASES OF LAKE PRECIPITATION ON THE ORDER OF 5-20% COULD BE ACHIEVED ON AN OPERATIONAL BASIS OVER THE GREAT LAKES IN THE NEXT 10 YEARS, BUT THE TIME OF ACCOMPLISHMENT WILL DEPEND ON NATIONAL PRIORITIES, INTERNATIONAL COOPERATION, AND ECONOMIC FACTORS. THESE ACTIVITIES MIGHT PRODUCE A SIZEABLE INCREASE IN THE WATER QUANTITY OF THE GREAT LAKES AND SHOULD RESULT IN AN IMPROVEMENT OF WATER QUALITY. OPERATIONAL METHODS OF EVAPORATION SUPPRESSION APPLICABLE TO THE LAKES ARE NOT AVAILABLE. METEOROLOGICAL CONTROLS TO AMELIORATE CERTAIN UNDESIRABLE LAKE-EFFECT SNOWSTORMS ARE A NEAR REALITY. (KNAPP-USGS)

FIELD 03B, 02B, 02D

ACCESSION NO. W71-10026

ADSORPTION OF CHLORINATED HYDROCARBON PESTICIDES BY MICROBIAL FLOC AND LAKE  
SEDIMENT AND ITS ECOLOGICAL IMPLICATIONS,

OHIO STATE UNIV., COLUMBUS. DEPT. OF MICROBIAL AND CELLULAR BIOLOGY.

WALTER D. LESHNIOWSKY, PATRICK R. DUGAN, ROBERT M. PFISTER, JAMES I. FREA,  
AND CHESTER I. RANGLES.

INTERNATIONAL ASSOCIATION OF GREAT LAKES RESEARCH, PROCEEDINGS 13TH  
CONFERENCE GREAT LAKES RESEARCH, P 611-618, 1970. 5 FIG, 18 REF. OWRR  
PROJECT NO B-013-OHIO(3).

DESCRIPTORS:

\*ADSORPTION, \*ORGANIC PESTICIDES, \*SEDIMENTS, LAKES, \*CHLORINATED  
HYDROCARBON PESTICIDES, AEROBIC BACTERIA, LAKE ERIE, ALDRIN,  
FLOCCULATION, PATH OF POLLUTANTS, TOXICITY, LABORATORY TESTS, SILTS,  
CLAYS, MICROORGANISMS.

IDENTIFIERS:

\*MICROBIAL FLOC.

ABSTRACT:

THE FATE OF CHLORINATED HYDROCARBON PESTICIDES IN THE WATER COLUMN AND  
THEIR ADSORPTION TO SILT AND FLOC FORMING BACTERIA WAS STUDIED. OF 38  
AEROBIC BACTERIA ISOLATED FROM LAKE ERIE, 14 FORMED FLOCS IN AT LEAST  
ONE OF SIX DIFFERENT MEDIA. TWO OF THESE FLOC FORMERS AND LAKE SILT  
WERE EXAMINED BY GAS LIQUID CHROMATOGRAPHY TO DETERMINE THEIR ABILITY  
TO ACCUMULATE AND CONCENTRATE ALDRIN FROM SOLUTION. BACTERIAL FLOCS  
ADSORBED ALDRIN FROM SOLUTION GIVING A 625X CONCENTRATION FACTOR WITHIN  
20 MINUTES WITH NO FURTHER CONCENTRATION WITH TIME. MICROSCOPIC  
EXAMINATION OF CONTEMPORARY LAKE ERIE SEDIMENT SAMPLES INDICATED THAT  
SEDIMENT ADSORPTION OF ALDRIN WAS SIMILAR TO BACTERIAL FLOCS; SEDIMENTS  
REVEALED A CONGLOMERATE OF BACTERIA, DIATOMS, INORGANIC AND DETRITAL  
PARTICULATES. FLOC FORMING MICROBES SETTLING FROM A WATER COLUMN REMOVE  
PESTICIDES AND REPRESENT A NATURAL PURIFICATION PROCESS. ONCE SETTLED  
FROM SUSPENSION THE FATE OF PESTICIDES IS IN QUESTION, BUT THEY MAY BE  
DEGRADED UNDER ANAEROBIC CONDITIONS. IT IS LIKELY THAT PESTICIDE  
CONCENTRATIONS IN BOTTOM SEDIMENTS EVEN FOR SHORT PERIODS EXERT AN  
INSECTICIDAL EFFECT ON SUSCEPTIBLE FAUNA, WHICH MAY EXPLAIN THE  
DISAPPEARANCE OF CERTAIN INSECTS (MAYFLIES) FROM LAKE ERIE AND THE  
PERSISTENCE OR INCREASE OF OTHER INSECTS AND ORGANISMS.  
(JONES-WISCONSIN)

FIELD 05C

ACCESSION NO. W71-10065

OHIO V WYANDOTTE CHEMICALS CORP (SUPREME COURT DECLINES ORIGINAL JURISDICTION  
OVER WATER POLLUTION COMPLAINT BY STATE),

91 SUP CT 1005-1017 (1971). 13 P.

DESCRIPTORS:

\*OHIO, \*WATER POLLUTION, \*HEAVY METALS, \*FEDERAL JURISDICTION,  
CHEM-CONTROL, CHEMICAL WASTES, STATE JURISDICTION, POLLUTION ABATEMENT,  
ADMINISTRATIVE AGENCIES, LAKE ERIE, STREAMS, LEGAL ASPECTS, JUDICIAL  
DECISIONS, ADJUDICATION PROCEDURE, REMEDIES.

ABSTRACT:

PLAINTIFF STATE, SEEKING TO INVOKE THE ORIGINAL JURISDICTION OF THE  
UNITED STATES SUPREME COURT MOVED FOR LEAVE TO FILE A COMPLAINT AGAINST  
DEFENDANT CHEMICAL COMPANIES. DEFENDANTS WERE ALLEGED TO HAVE  
DISCHARGED MERCURY INTO STREAMS WHICH ULTIMATELY REACH LAKE ERIE,  
THEREBY CONTAMINATING PLAINTIFFS' ENVIRONMENT. THE ACTION WAS FOR  
ABATEMENT OF A PUBLIC NUISANCE. THE SUPREME COURT ACKNOWLEDGED ITS  
JURISDICTION OVER THE CONTROVERSY, BUT HELD THAT IT MIGHT DECLINE TO  
ENTERTAIN A COMPLAINT BROUGHT BY A STATE AGAINST CITIZENS OF ANOTHER  
STATE ONLY WHERE: (1) REFUSING JURISDICTION WOULD NOT CONFLICT WITH THE  
POLICIES UNDERLYING THE ARTICLE III JURISDICTIONAL GRANT, AND (2) THE  
REASONS FOR REFUSING JURISDICTION ARE CONSISTENT WITH THE COURT'S OTHER  
RESPONSIBILITIES. PLAINTIFF'S MOTION WAS DENIED. THE COURT NOTED THAT  
NO SERIOUS FEDERAL QUESTION WAS RAISED, AND THAT PLAINTIFF COULD OBTAIN  
JURISDICTION OVER DEFENDANTS IN ITS OWN COURTS AND DECIDE THE QUESTION  
ON THE SAME NUISANCE BASIS. FURTHERMORE, THE COURT BELIEVED THE PROBLEM  
MORE PROPERLY SOLVED BY COOPERATIVE STUDY AND CONCILIATORY ACTION BY  
VARIOUS ADMINISTRATIVE AGENCIES. THE ABSENCE OF EXPERTISE IN POLLUTION  
MATTERS WAS NOTED AS A SERIOUS DETERRENT TO ADEQUATE ADJUDICATION IN  
THE SUPREME COURT. (HART-FLORIDA)

FIELD 06E, 05G

ACCESSION NO. W71-10153

ORGANIC CARBON AND NITROGEN IN THE SURFACE SEDIMENTS OF LAKES ONTARIO, ERIE,  
AND HURON,

DEPARTMENT OF ENERGY, MINES AND RESOURCES, BURLINGTON (ONTARIO). CANADA  
CENTER FOR INLAND WATERS.

A. L. W. KEMP.

JOURNAL OF SEDIMENTARY PETROLOGY, VOL 41, NO 2, P 537-548, JUNE 1971. 12 P, 5  
FIG, 4 TAB, 49 REF.

DESCRIPTORS:

\*ORGANIC MATTER, \*BOTTOM SEDIMENTS, \*GREAT LAKES, WATER POLLUTION  
SOURCES, BIODEGRADATION, LAKE ONTARIO, LAKE ERIE, LAKE HURON, MUD,  
NITROGEN, SEDIMENT-WATER INTERFACES, MUD-WATER INTERFACES, PATH OF  
POLLUTANTS, WATER CHEMISTRY, BENTHOS, SURVEYS, POLLUTANT IDENTIFICATION.

ABSTRACT:

ANALYSES OF 355 SURFACE SEDIMENT SAMPLES (TOP CM) FROM LAKES ONTARIO,  
ERIE AND HURON WERE CARRIED OUT FOR ORGANIC CARBON, CARBONATE CARBON,  
EH, PH, NITROGEN AND SEDIMENT TEXTURE. SIMILAR ANALYSES WERE CARRIED  
OUT ON A REPRESENTATIVE CORE FROM EACH LAKE AT CLOSE INTERVALS DOWN TO  
20 CM. THE DISTRIBUTION OF ORGANIC MATTER IN THE SEDIMENTS OF EACH LAKE  
WAS RELATED TO THE TOPOGRAPHIC FEATURES OF THE LAKES. ORGANIC CARBON  
CONTENT WAS FOUND TO BE DIRECTLY PROPORTIONAL TO THE CLAY CONTENT OF  
THE SEDIMENT, RANGING FROM LESS THAN 1% IN THE COARSE NEAR SHORE SANDS  
TO OVER 4% IN THE FINE CLAY MUDS WITHIN THE INDIVIDUAL LAKE SUB-BASINS.  
THE ORGANIC CARBON CONTENT OF LAKE ERIE SEDIMENTS WAS GENERALLY LOWER  
THAN THAT OF LAKES HURON AND ONTARIO, AND IS ATTRIBUTED TO DILUTION OF  
THE SEDIMENTS WITH COARSER NON-CLAY PARTICLES. NITROGEN WAS DIRECTLY  
PROPORTIONAL TO ORGANIC CARBON WITH CARBON-NITROGEN RATIOS RANGING FROM  
7 TO 13 IN THE SURFACE SEDIMENT. ORGANIC CARBON AND NITROGEN DECREASED  
SHARPLY FROM THE SURFACE DOWN TO ABOUT 10 CM IN EACH CORE. THE DECREASE  
IS DUE PARTLY TO MINERALIZATION OF ORGANIC MATTER BY BOTTOM ORGANISMS  
AND PARTLY TO AN INCREASING INPUT OF ORGANIC MATTER TO THE LAKES IN THE  
LAST 30 YEARS. (KNAPP-USGS)

FIELD 05A, 05B, 02H

ACCESSION NO. W71-10327

NUTRIENTS AND NUTRIENT BUDGETS IN THE BAY OF QUINTE, LAKE ONTARIO,

ONTARIO WATER RESOURCES COMMISSION, TORONTO.

M. G. JOHNSON, AND G. E. OWEN.

JOURNAL OF WATER POLLUTION CONTROL FEDERATION, VOL 43, NO 5, P 836-853, 1971.  
8 FIG, 7 TAB, 37 REF.

DESCRIPTORS:

\*NUTRIENTS, \*LAKE ONTARIO, \*EUTROPHICATION, LAKE ERIE, ALGAE, NITROGEN, PHOSPHORUS, DRAINAGE, INDUSTRIES, MUNICIPAL WASTES, TURNOVERS, SEDIMENTS, HUMAN POPULATION, TOURISM, WATERSHEDS(BASINS), TROPHIC LEVELS, TURBIDITY, OXYGEN, FISH, RECREATION, INVERTEBRATES, RIVERS, CYANOPHYTA, GEOLOGIC FORMATIONS, BENTHOS, MAYFLIES, TUBIFICIDS, DIATOMS, WATER POLLUTION EFFECTS, WATER POLLUTION CONTROL, DISSOLVED OXYGEN, CARBON, SAMPLING, EQUATIONS, WATER POLLUTION SOURCES, RAINFALL, MIDGES, INPUT-OUTPUT ANALYSIS, MUD, BACTERIA.

IDENTIFIERS:

\*NUTRIENT BUDGETS, \*BAY OF QUINTE(ONTARIO), NUTRIENT INPUTS, CHIRONOMUS PLUMOSUS, CHIRONOMUS ATTENUATUS, CHIRONOMUS ANTHRACINUS, LIMNODRILUS HOFFMEISTERI, TUBIFEX TUBIFEX, APHANIZOMENON, CLADOPHORA.

ABSTRACT:

ALGAL BLOOMS, TURBIDITY, DEPLETION OF DEEP-WATER OXYGEN, AND CHANGES IN COMPOSITION OF THE BIOTA ARE INCREASINGLY OBVIOUS IN BAY OF QUINTE, LAKE ONTARIO. CLARIFICATION OF RESPECTIVE SIGNIFICANCE OF NUTRIENT CONTRIBUTIONS FROM TRIBUTARY RIVERS AND FROM MUNICIPAL-INDUSTRIAL SOURCES ARE DESCRIBED. THE BAY RECEIVED ABOUT 9,700,000 POUNDS OF NITROGEN AND 700,000 POUNDS OF PHOSPHORUS IN 1968. 89% OF THE NITROGEN AND 60% OF THE PHOSPHORUS WERE ATTRIBUTABLE TO LAND DRAINAGE AND THE REMAINDER TO MUNICIPAL-INDUSTRIAL SOURCES. COMPARISONS BASED ON 'NET INPUTS', THE AMOUNT OF NUTRIENT CONTAINED IN AN INPUT IN EXCESS OF THE AMOUNT OF NUTRIENT IN THE EQUIVALENT VOLUME OF WATER DISPLACED AT THE OUTLET, ARE PROPOSED. ABOUT 50% OF THE 'NET INPUT' OF NITROGEN AND 85% OF PHOSPHORUS WERE CONTRIBUTED BY MUNICIPAL-INDUSTRIAL SOURCES IN 1968. IT IS RECOMMENDED THAT PHOSPHORUS BE REMOVED FROM THESE SOURCES. THE WATER TURNOVER RATE IN THE BAY, FIVE TIMES ANNUALLY, TRANSLOCATES RESUSPENDED NUTRIENTS IN SEDIMENTS OF THE INNER BAY SHALLOW WATERS TO SEDIMENTS IN DEEPER WATERS OF THE OUTER BAY AND LAKE ONTARIO, THUS IMPROVING WATER QUALITY. ESTIMATED PHOSPHORUS REMOVAL COST, \$200,000 DOLLARS/YEAR, IS JUSTIFIED ON THE BASIS OF ECONOMICS INCOME FROM RECREATION AND TOURISM. (JONES-WISCONSIN)

FIELD 05C

ACCESSION NO. W71-11009

RATIONALE, BACKGROUND, AND DEVELOPMENT OF EXPERIMENTAL LAKE STUDIES IN  
NORTHWESTERN ONTARIO,

FISHERIES RESEARCH BOARD OF CANADA, WINNIPEG (MANITOBA). FRESHWATER INST.

W. E. JOHNSON, AND J. R. VALLENTYNE.

JOURNAL FISHERIES RESEARCH BOARD OF CANADA, VOL 28, NO 2, P 123-128, 1971. 1  
FIG, 11 REF.

DESCRIPTORS:

\*LAKES, \*INVESTIGATIONS, \*EUTROPHICATION, DATA COLLECTIONS, ECOLOGY,  
NUTRIENTS, POLLUTANTS, REMEDIES, POPULATION, CLIMATES, GEOLOGY,  
TOXICITY, BIOASSAY, SEDIMENTS, OLIGOTROPHY, LAKE ERIE, FISH, LIMNOLOGY,  
ECOSYSTEMS, PRODUCTIVITY, TROPHIC LEVEL, WATER POLLUTION EFFECTS, WATER  
POLLUTION CONTROL, CLASSIFICATION.

IDENTIFIERS:

\*NORTHWESTERN ONTARIO, \*EXPERIMENTAL LAKES AREA, CANADIAN LAKES,  
MORPHOMETRY, MESOTROPHIC, MANITOBA, CULTURAL EUTROPHICATION, NATURAL  
EUTROPHICATION.

ABSTRACT:

THIS SUMMARIZES THE NECESSITY FOR EXPERIMENTAL LAKE STUDIES AND  
OUTLINES THE PROGRAM PLANNED FOR THE EXPERIMENTAL LAKES AREA OF  
NORTHWESTERN ONTARIO. THE HISTORY, GEOLOGY, GENERAL DESCRIPTION, AND  
REASONS FOR CHOOSING THESE LAKES IS GIVEN. SMALL NATURAL LAKES OCCUPY A  
POSITION IN LIMNOLOGY ANALOGOUS TO THAT OF TRIAL FIELD PLOTS USED IN  
AGRICULTURAL SCIENCE, THAT IS, A MEANS OF ASSESSING EFFECTS ON A  
REDUCED SCALE. TO DEAL EFFECTIVELY WITH SUCH COMPLEX PROBLEMS AS  
EUTROPHICATION, DETAILED INFORMATION ON ECOSYSTEM RESPONSES TO  
ENVIRONMENTAL MODIFICATIONS CAN ONLY BE PROVIDED BY FIELD TESTS.  
FORTY-SIX LAKES WERE CHOSEN TO SERVE FOR A BETTER UNDERSTANDING OF  
CULTURAL EUTROPHICATION BY EXPERIMENTATION INVOLVING CONTROLLED  
ADDITIONS OF CHEMICAL NUTRIENTS AND TESTING OF REMEDIAL MEASURES. OTHER  
NEARBY LAKES ARE BEING STUDIED IN THEIR NATURAL CONDITION AS CONTROLS.  
WITH THE INCREASING COMPLEXITY OF WATER POLLUTION PROBLEMS IN MODERN  
SOCIETY, NEED FOR CONTROLLED STUDIES IN AREAS FREE FROM PUBLIC AND  
INDUSTRIAL INTERFERENCES INCREASES. THE USE OF SMALL ISOLATED LAKES FOR  
EXPERIMENTAL PURPOSES WILL IMMEASURABLY ENHANCE OUR KNOWLEDGE OF LAKES  
AND EFFICACY OF SPECIFIC POLLUTION ABATEMENT MEASURES.  
(JONES-WISCONSIN)

FIELD 05C

ACCESSION NO. W71-11011



WASTEWATER LOADING GUIDELINES FOR THE GRAND RIVER BASIN.

ONTARIO WATER RESOURCES COMMISSION, TORONTO.

ONTARIO WATER RESOURCES COMMISSION, CANADA, INTERIM REPORT, JANUARY 1971. 1  
FIG, 1 TAB, APPEND.

DESCRIPTORS:

\*WASTE WATER(POLLUTION), \*WASTE ASSIMILATION CAPACITY, \*ORGANIC LOADS, NUTRIENTS, DISSOLVED OXYGEN, AQUATIC LIFE, MUNICIPAL WASTES, PHOTOSYNTHESIS, RESPIRATION, WATER QUALITY, STREAMFLOW, AGRICULTURE, INDUSTRIES, WASTE TREATMENT, WATERSHEDS(BASINS), PHOSPHORUS, ALGAE, ORGANIC MATTER, LAKE ERIE, EFFLUENTS, SEWAGE, DETERGENTS, PLANTS, LAND USE, BIOCHEMICAL OXYGEN DEMAND, FISHERIES, RESERVOIRS, PIPELINES, ESTIMATING, ANALYSIS.

IDENTIFIERS:

\*LOADING GUIDELINES, \*GRAND RIVER BASIN(ONTARIO), CANADA, BUFFER CAPACITY.

ABSTRACT:

IN CONSIDERING WATER QUALITY OF THE GRAND RIVER BASIN, ONTARIO, ACCEPTABLE LOADINGS, BASED ON THE NEW DISSOLVED OXYGEN CRITERIA ADAPTED BY ONTARIO WATER RESOURCES COMMISSION IN 1970, UPGRADE THE MINIMUM DISSOLVED OXYGEN LEVEL FROM 4.0 TO 5.0 MG/L IN ALL STREAMS EXCEPT THOSE SUPPORTING COLDWATER FISHERIES WHERE MINIMUM DISSOLVED OXYGEN CRITERIA IS 6.0 MG/LITER. AS A RESULT, PREVIOUSLY ACCEPTABLE WASTE DISCHARGES NOW EXCEED PRESENT LOADING GUIDELINES. THE PHOSPHORUS INPUT, CONSIDERED THE CONTROLLING NUTRIENT IN ALGAL PRODUCTION, FROM THE MUNICIPAL SEWAGE TREATMENT PLANTS IS ESTIMATED AS 70% TO 80% OF THE TOTAL ANNUAL INPUT OF THIS NUTRIENT INTO THE BASIN. REDUCTION OF NUTRIENT AND ORGANIC LOADINGS ARE REQUIRED FOR WATER QUALITY IMPROVEMENT AND PROTECTION OF LAKE ERIE. ALTERNATIVES, INCLUDING EFFLUENT POLISHING AND STREAMFLOW AUGMENTATION, WHICH CAN BE UTILIZED TO INCREASE THE POTENTIAL VARIOUS RIVER USES, WHILE REDUCING POLLUTION PRESSURES ARE CONSIDERED. IN MAKING ESTIMATES OF ACCEPTABLE ORGANIC LOADINGS, THE WATERSHED WAS DIVIDED INTO EIGHT SUB-BASINS. THE LOADINGS FOR EACH SUB-BASIN, EXPRESSED IN TERMS OF FIVE-DAY BIOCHEMICAL OXYGEN DEMAND FROM TREATMENT SOURCES, WERE DETERMINED ON BASIC ASSUMPTIONS, DISSOLVED OXYGEN CRITERIA, DESIGN STREAMFLOWS, AND EXISTING WASTEWATER LOADINGS. RESULTS ARE TABULATED; DETAILS APPENDED. (JONES-WISCONSIN)

FIELD 05C, 06B

ACCESSION NO. W71-11017

DETERMINATION OF MERCURY IN BIOLOGICAL AND ENVIRONMENTAL SAMPLES BY NEUTRON  
ACTIVATION ANALYSIS,

WESTERN NEW YORK NUCLEAR RESEARCH CENTER, INC., BUFFALO.

K. K. SIVASANKARA PILLAY, CHARLES C. THOMAS, JR., JAMES A. SONDEL, AND  
CAROLYN M. HYCHE.

TPYESCRIPT; PRESENTED AT 161ST NATIONAL MEETING OF THE AMERICAN CHEMICAL  
SOCIETY AT LOS ANGELES, CALIFORNIA, MARCH 31, 1971.

DESCRIPTORS:

\*SAMPLING, \*ENVIRONMENT, \*NEUTRON ACTIVATION ANALYSIS, RADIOACTIVITY,  
ADSORPTION, FISH, LAKE ERIE, SEDIMENTS, SILTS, PLANKTON, ALGAE, TRACE  
ELEMENTS, VOLATILITY, FREEZE DRYING, X-RAYS, ELECTROLYSIS, COMPUTER  
PROGRAMS, GAMMA RAYS, POLLUTANT IDENTIFICATION, COLORIMETRY, TRACERS.

IDENTIFIERS:

\*MERCURY, \*BIOLOGICAL TISSUES, MERCURY ISOTOPES, HUMAN BRAIN,  
LOW-TEMPERATURE OVEN DRYING, ASHING, EXTRACTIVE DIGESTION,  
NEUROANATOMY, OXYGEN PLASMA ASHING, ATOMIC ABSORPTION, TITRATION.

ABSTRACT:

THE MINUTE QUANTITIES AND VOLATILE NATURE OF MERCURY CREATES PROBLEMS  
IN SAMPLING AND ANALYSIS. OF VARIOUS MERCURY DETERMINATION PROCEDURES,  
ONLY A LIMITED NUMBER CAN BE READILY ADAPTED TO BIOLOGICAL AND  
ENVIRONMENTAL SAMPLING FOR MONITORING. THE FOLLOWING PROCEDURES WERE  
DEVELOPED FOR THE INVESTIGATION OF THE MERCURY POLLUTION OF LAKE ERIE  
AND ITS AQUATIC LIFE. PRE-IRRADIATION PROCESSING OF SAMPLES HAS BEEN  
SYSTEMATICALLY INVESTIGATED. AFTER REACTOR IRRADIATION, THE SAMPLES ARE  
WET ASHED WITH MERCURY CARRIER UNDER REFLUX CONDITIONS. A PRELIMINARY  
SULFIDE PRECIPITATION IS FOLLOWED BY FURTHER PURIFICATION AND EVENTUAL  
ISOLATION OF MERCURY BY ELECTRODEPOSITION OR BY PRECIPITATION AS  
MERCURIC OXIDE. THE RADIOACTIVITIES FROM MERCURY-197 AND MERCURY-197-M  
ISOTOPES ARE MEASURED BY SCINTILLATION GAMMA RAY SPECTROMETRY USING A  
THIN SODIUM IODIDE DETECTOR TO DETERMINE THE MERCURY LEVELS IN VARIOUS  
SAMPLES. THESE ANALYTICAL PROCEDURE RESULTS ARE COMPARED WITH OTHER  
TECHNIQUES. TRACER STUDIES INDICATED THAT THE ERRORS OF THIS PROCEDURE  
WERE LESS THAN 15% AT 0.01 PPM LEVEL AND LESS THAN 5% AT 2 PPM LEVEL OF  
MERCURY IN BIOLOGICAL TISSUES. ANALYSIS OF FISH SAMPLES AND SEDIMENTS  
SAMPLES CONTAINING NATURAL FORMS OF MERCURY SHOWED A STANDARD DEVIATION  
OF LESS THAN 5% AT 5 PPM LEVELS, LESS THAN 7% AT 1.5 PPM LEVELS AND  
LESS THAN 17% AT 0.01 PPM LEVELS. (JONES-WISCONSIN)

FIELD 05B, 07B

ACCESSION NO. W71-11036

A VISUAL DEMONSTRATION OF THE BENEFICIAL EFFECTS OF SEWAGE TREATMENT FOR PHOSPHATE REMOVAL ON PARTICULATE MATTER PRODUCTION IN WATERS OF LAKES ERIE AND ONTARIO,

FISHERIES RESEARCH BOARD OF CANADA, WINNIPEG (MANITOBA). FRESHWATER INST.; AND ONTARIO WATER RESOURCES COMMISSION, TORONTO.

J. R. VALLENTYNE, W. E. JOHNSON, AND A. J. HARRIS.

JOURNAL OF THE FISHERIES RESEARCH BOARD OF CANADA, VOL 27, NO 8, P 1493-1496, AUGUST 1970. 1 FIG, 1 TAB, 5 REF.

DESCRIPTORS:

\*SEWAGE TREATMENT, \*PHOSPHATES, \*EUTROPHICATION, \*WATER POLLUTION CONTROL, SEWAGE EFFLUENTS, AQUATIC ALGAE, LAKE ERIE, LAKE ONTARIO, NUTRIENTS, NITROGEN, FILTRATION, MICROSCOPY, INDUSTRIAL WASTES, DETERGENTS, AMMONIA, NITRITES, NITRATES.

IDENTIFIERS:

ORTHOPHOSPHATES.

ABSTRACT:

A PROGRAM TO CONTROL EUTHROPHICATION IN LAKES ERIE AND ONTARIO BY DECREASING THE SUPPLY OF PHOSPHORUS COMPOUNDS HAS BEEN DEVELOPED. THIS STUDY WAS CONDUCTED TO DETERMINE THE EFFECT OF REMOVING PHOSPHATE FROM SEWAGE ON ALGAL GROWTH. FILTERED SAMPLES OF RAW SEWAGE, BIOLOGICALLY TREATED SEWAGE, AND SEWAGE TREATED CHEMICALLY FOR PHOSPHATE REMOVAL WERE ADDED TO UNFILTERED WATERS FROM LAKES ERIE AND ONTARIO, AND PARTICULATE RESIDUES (PR) ON MILLIPORE FILTERS PHOTOGRAPHED AFTER INCUBATION IN LIGHT FOR 10 AND 30 DAYS. PR LEVELS IN THE SEWAGE-ENRICHED FLASKS WERE LEAST IN THE CASE OF SEWAGE TREATED FOR REMOVAL OF PHOSPHATES. ADDITION OF PHOSPHATE TO THE PHOSPHATE-DEPLETED EFFLUENT INCREASED ITS PR GENERATING ABILITY TO THAT OF RAW AND BIOLOGICALLY TREATED SEWAGE. THE REMOVAL OF PHOSPHATES FROM SEWAGE WASTES THUS APPEARS TO ELIMINATE THEIR FERTILIZING EFFECT. (MORTLAND-BATTELLE)

FIELD 05C, 05D, 02H

ACCESSION NO. W71-11507

LAKE ERIE PHYSICAL LIMNOLOGY CRUISE, MIDSUMMER 1967,

OHIO DEPT. OF NATURAL RESOURCES, COLUMBUS. DIV. OF GEOLOGICAL SURVEY.

CHARLES E. HERDENDORF.

OHIO GEOLOGICAL SURVEY REPORT OF INVESTIGATIONS NO. 79, 1970. 77 P. 33 FIG,  
13 TAB, 8 REF.

DESCRIPTORS:

\*LAKE ERIE, \*LIMNOLOGY, OHIO, BOTTOM SEDIMENTS, HYDROGEN-ION  
CONCENTRATION, DISSOLVED OXYGEN, ELECTRICAL CONDUCTANCE, COLOR,  
CHLORIDES, TURBIDITY, WATER TEMPERATURE, CURRENTS(WATER), WAVES(WATER),  
WATER LEVELS, METEOROLOGICAL DATA, SAMPLING, IONS, WATER QUALITY,  
WINDS, SEDIMENTS.

IDENTIFIERS:

LAKE ST. CLAIR(MICHIGAN), DETROIT RIVER(MICHIGAN), NIAGARA RIVER(NEW  
YORK).

ABSTRACT:

IN JULY AND AUGUST 1967 A CRUISE WAS UNDERTAKEN TO PROVIDE NEW  
INFORMATION ON THE PHYSICAL LIMNOLOGY OF LAKE ERIE, WITH PARTICULAR  
ATTENTION TO CIRCULATION PATTERNS AND TO CHANGES THAT OCCUR IN THE  
QUALITY OF THE WATER AS IT PASSES THROUGH THE LAKE. THE OBJECTIVE OF  
THE FIELD SURVEY WAS TO MEASURE SEVERAL PHYSICOCHEMICAL PROPERTIES OF  
LAKE ERIE WATER FROM ITS MAJOR INFLOW AT THE DETROIT RIVER TO OUTFLOW  
IN THE NIAGARA RIVER. THIS WAS DONE BY MAKING THIRTEEN TRANSECTS ACROSS  
LAKE ERIE AND ITS CONNECTING WATERWAYS. OBSERVATIONS OF WATER  
PROPERTIES AND MOVEMENTS WERE MADE AT 110 STATIONS, AND IN MOST CASES  
CONSISTED OF PROFILE MEASUREMENTS WITH READINGS AND SAMPLES TAKEN AT  
VARIOUS DEPTHS FROM SURFACE TO BOTTOM FROM ABOARD THE OHIO DIVISION OF  
GEOLOGICAL SURVEY RESEARCH VESSEL, GS-1. THE PROPERTIES AND CONDITIONS  
INVESTIGATED ON THE CRUISE WERE (1) WATER TEMPERATURE, (2) SPECIFIC  
CONDUCTANCE, (3) WATER COLOR, (4) TRANSPARENCY, (5) HYDROGEN-ION  
CONCENTRATION (PH), (6) DISSOLVED-OXYGEN CONTENT, (7) CHLORIDE-ION  
CONCENTRATION, (8) TURBIDITY, (9) CURRENTS, (10) WAVES, (11) WATER  
LEVELS, (12) METEOROLOGICAL CONDITIONS, (13) WATER DEPTH, AND (14)  
BOTTOM DEPOSITS. (MORTLAND-BATTELLE)

FIELD 05C, 05A, 02H

ACCESSION NO. W71-11551

**MERCURY POISONING (OR) THE FISH YOU CATCH CAN KILL YOU.**

**FIELD AND STREAM, VOL 75, NO 3, P 44-45, 49-51, JULY 1970.**

**DESCRIPTORS:**

**\*HEAVY METALS, \*FISH, LAKE HURON, LAKE ERIE, ST. LAWRENCE RIVER,  
COMMERCIAL FISHING, SPORT FISHING, TOXICITY.**

**IDENTIFIERS:**

**\*LAKE ST. CLAIR, \*ST. CLAIR RIVER, \*MERCURY, DETROIT RIVER, WABIGOON  
RIVER(CANADA), CLAY LAKE(CANADA), LAKE WINNIPEG(CANADA), SASKATCHEWAN  
RIVER(CANADA), CEDAR LAKE(CANADA), HOWE SOUND(CANADA), LAKE ST.  
FRANCIS(CANADA), BALL LAKE(CANADA), INDIAN LAKE(CANADA), GRASSY NARROWS  
LAKE(CANADA), LOUNT LAKE(CANADA), SEPARATION LAKE(CANADA), UMFREVILLE  
LAKE(CANADA), TETU LAKE(CANADA), SWAN LAKE(CANADA), EAGLENEST  
LAKE(CANADA), CANADA, BIOLOGICAL MAGNIFICATION.**

**ABSTRACT:**

**THE DISCOVERY IS TRACED OF MERCURY IN FISH IN LAKE ST. CLAIR AND IN  
MANY OTHER LAKES AND RIVERS IN CANADA AND THE UNITED STATES. THE  
SOURCES, LEVELS, EFFECTS OF, AND REACTIONS TO THE IDENTIFICATION OF  
MERCURY CONTAMINATION ARE ALSO REVIEWED. (LITTLE-BATTELLE)**

**FIELD 05B, 05C**

**ACCESSION NO. W71-11682**

MEASURING THE BIOLOGICAL EFFECTS OF HEATED DISCHARGES,

LA SALLE COLL., PHILADELPHIA, PA.

CHARLES B. WURTZ, AND JOHN S. PENNY.

PROCEEDINGS OF THE AMERICAN POWER CONFERENCE, VOL 31, P 344-349, 1969. 5 REF.

DESCRIPTORS:

\*THERMAL POLLUTION, \*STATISTICAL ANALYSIS, \*DATA PROCESSING, LAKE ERIE, DIATOMS, SUSQUEHANNA RIVER(PENNSYLVANIA), WATER TEMPERATURE, FLORIDA, SCHUYLKILL RIVER(PENNSYLVANIA), INVERTEBRATES, SAMPLING, BIOINDICATORS.

IDENTIFIERS:

LAKE ST. CROIX, MACROINVERTEBRATES, DATA INTERPRETATION.

ABSTRACT:

THERMAL EFFECTS IN AN AQUATIC HABITAT REPRESENT BUT ONE OF A MULTIPLICITY OF ENVIRONMENTAL FACTORS. BIOLOGICAL STUDIES DIRECTED TOWARD THE EFFECT OF A HEATED DISCHARGE MUST INCLUDE SATISFACTORY MEASUREMENTS OF THE BIOLOGICAL STRUCTURE OF THE HABITAT IN RELATION TO ALL MAJOR ENVIRONMENTAL FACTORS. ANY OF SEVERAL SAMPLING AND DATA-PROCESSING METHODS CAN BE USED TO SECURE ADEQUATE INFORMATION. THE PARTICULAR METHOD EMPLOYED SHOULD BE THE ONE WHERE MAXIMUM INFORMATION IS SECURED AT MINIMUM COST, WHICH IS TO SAY, BY THE LEAST TIME-CONSUMING METHOD. IN THE AUTHORS' OPINION, THE MOST SATISFACTORY APPROACH TO BIOLOGICAL STUDIES UNDER MOST CONDITIONS IS A STUDY BASED ON THE TOTAL NUMBER OF MACROINVERTEBRATE SPECIES FORMING THE RESIDENT COMMUNITY. THE COLLECTED DATA SHOULD BE PROCESSED BY STANDARD STATISTICAL METHODS AND THE RESULTS EXPRESSED IN TERMS OF THESE STATISTICS. SUCH TERMS ARE MEANINGFUL DESCRIPTIVE TERMS AND CAN BE USED FOR DIRECT COMPARISON WITH RESULTS FROM OTHER SURVEYS.  
(MORTLAND-BATTELLE)

FIELD 05C

ACCESSION NO. W71-11899

MAY BE INESCAPABLE--MEDDLESOME MERCURY.

SCIENCE NEWS, VOL 99, P 7, JANUARY 2, 1971. 1 FIG.

DESCRIPTORS:

\*INDUSTRIAL WASTES, \*PULP AND PAPER INDUSTRY, \*TOXICITY, LAKE ERIE, PULP WASTES, COALS, OIL, FISH, FOOD CHAIN, DETERGENTS, TRACE ELEMENTS, PATH OF POLLUTANTS.

IDENTIFIERS:

\*MERCURY, LAKE ST. CLAIR, SAN JOAQUIN RIVER, HYDROCARBONS, CHLORINE-ALKALI PLANTS, NTA.

ABSTRACT:

A BRIEF REVIEW OF THE SOURCES OF MERCURY IN THE ENVIRONMENT AND OF MEANS OF CONTROLLING MERCURY POLLUTION ARE PRESENTED. THE LARGEST INDUSTRIAL USE OF MERCURY IS IN CHLORINE-ALKALI PLANTS, AND POLLUTION FROM THIS SOURCE HAS BEEN LARGELY HALTED. OTHER SOURCES ARE MUCH MORE DIFFICULT TO IDENTIFY AND CONTROL. IT IS SUGGESTED THAT ONE MEANS OF CONTROLLING HUMAN INTAKE IS THROUGH CAREFUL SELECTION OF SMALLER SPECIES OF FISH FOR FOOD SINCE MERCURY CONCENTRATES IN ORGANISMS UP THE FOOD CHAIN. THERE HAS BEEN LITTLE RESEARCH ON THE EFFECTS OF LOW-LEVEL CHRONIC DOSES OF MERCURY AND LITTLE WORK ON POSSIBLE SYNERGISTIC EFFECTS. IT IS KNOWN THAT THE TOXICITY OF METHYL MERCURY IS GREATLY INCREASED IN COMBINATION WITH NTA. (MORTLAND-BATTELLE)

FIELD 05B, 05C

ACCESSION NO. W71-11910

THE INFLUENCE OF SUSPENDED MICROSCOPIC SUBSTANCES ON THE METABOLIC ACTIVITIES  
OF MICROORGANISMS RESPONSIBLE FOR BIOLOGICAL ENRICHMENT OF WATER,

OHIO STATE UNIV., COLUMBUS. WATER RESOURCES CENTER.

ROBERT M. PFISTER.

AVAILABLE FROM THE NATIONAL TECHNICAL INFORMATION SERVICE AS PB-202 581,  
\$3.00 IN PAPER COPY, \$0.95 IN MICROFICHE. WATER RESOURCES CENTER FINAL  
REPORT, 1971. 125 P, 22 FIG, 10 TAB, 19 PHOTOS, 100 REF. OWRR A-006-OHIO(4).

DESCRIPTORS:

\*SUSPENDED LOAD, \*METABOLISM, \*MICROORGANISMS, \*CHLORINATED HYDROCARBON  
PESTICIDES, WATER ANALYSIS, ALDRIN, LAKE ERIE, BACTERIA, ELECTRON  
MICROSCOPY, FLOCCULATION, AQUATIC MICROORGANISMS, DIELDRIN, ECOLOGY,  
WATER POLLUTION, DISSOLVED OXYGEN, CYTOLOGICAL STUDIES, ADSORPTION,  
SEDIMENTS, COLLOIDS, PSEUDOMONAS, SPECTROPHOTOMETRY, CARBOHYDRATES,  
ENVIRONMENTAL EFFECTS, ACTIVATED CARBON, GROWTH RATES, ANALYTICAL  
TECHNIQUES, PESTICIDES, WATER PURIFICATION, EUTROPHICATION.

IDENTIFIERS:

\*MICROSCOPIC SUBSTANCES, \*BIOLOGICAL ENRICHMENT, GROWTH  
CHARACTERISTICS, FLOCCULATED BACTERIA, MICROPARTICULATES.

ABSTRACT:

MICROBIAL ECOLOGY AND WATER POLLUTION, PARTICULATE SUSPENDED COLLOIDAL  
MATERIAL IN THE WATER COLUMN OF LAKE ERIE HAS BEEN INVESTIGATED ON A  
PHYSICAL, CHEMICAL, AND BIOLOGICAL BASIS. VARIOUS INORGANIC AND  
DETRITAL FRACTIONS HAVE BEEN CHARACTERIZED USING DIFFERENTIAL AND  
GRADIENT CENTRIFUGATION IN CONJUNCTION WITH ELECTRON MICROSCOPY. THE  
PARTICULATES ARE COMPRISED OF SUBSTANCES OF VARYING DENSITIES AND  
SIZES; FRACTIONS EXERT AN INFLUENCE ON GROWTH AND METABOLISM OF  
MICROORGANISMS. VARIOUS PESTICIDES ARE ASSOCIATED WITH THESE FRACTIONS,  
SUCH AS THE CHLORINATED HYDROCARBONS, ENDRIN, ALDRIN, HEPTACHLOR, AND  
LINDANE. THE SIGNIFICANCE OF THE INVOLVEMENT OF SUCH PESTICIDES IN THE  
MICRO-ECOLOGY IS GREAT SINCE IT IS NOW KNOWN THAT MICROBIAL CELL  
YIELDS, DNA, RNA, AND PROTEIN PATTERNS OF SYNTHESIS ARE AFFECTED. THESE  
FACTS STRONGLY SUGGEST THAT PRESENCE OF CHLORINATED HYDROCARBONS IN  
WATER SERIOUSLY ALTER MICROBIAL METABOLISM AND IN TURN AFFECT HIGHER  
LIFE FORMS IN WAYS PRESENTLY NOT UNDERSTOOD. EXPERIMENTS ON REMOVAL OF  
ALDRIN FROM LAKE WATER USING FLOCCULENT BACTERIA SHOWED THAT FLOC  
FORMING BACTERIA ADSORBED AND CONCENTRATED ALDRIN FROM A COLLOIDAL  
DISPERSION. THE SETTLING OF THE BACTERIAL FLOCS REMOVED THE CHEMICAL  
FROM THE WATER PHASE. (JONES-WISCONSIN)

FIELD 05C

ACCESSION NO. W71-12064



EUTROPHICATION AND THE CURRENT CONTROVERSY OVER ITS CAUSES AND CURES,

FISHERIES RESEARCH BOARD OF CANADA, WINNIPEG (MANITOBA). FRESHWATER INST.

A. L. HAMILTON.

PRESENTED AT 22ND ANNUAL CONVENTION, WESTERN CANADA WATER AND SEWAGE  
CONFERENCE, SEPTEMBER 23-25, 1970, HELD AT WINNIPEG, P 67-71, 1970. 1 FIG,  
11 REF.

DESCRIPTORS:

\*WATER POLLUTION CONTROL, \*EUTROPHICATION, \*WATER POLLUTION SOURCES,  
POPULATION, INDUSTRIES, WASTE DISPOSAL, MONITORING, NUTRIENTS, ALGAE,  
INSECTICIDES, HERBICIDES, HEAVY METALS, TASTE, ODOR, RECREATION,  
PHOSPHORUS, CARBON, LAKE ERIE, DETERGENTS, LAKE ONTARIO, TERTIARY  
TREATMENT, INTERNATIONAL JOINT COMMISSION.

IDENTIFIERS:

MERCURY, PHOSPHORUS REMOVAL, LAKE WASHINGTON(WASH).

ABSTRACT:

ACUTENESS OF THE WASTE DISPOSAL PROBLEM IS DUE TO BOTH POPULATION AND  
INDUSTRIAL GROWTH. WASTES EMPTIED INTO AQUATIC ENVIRONMENTS BELONG TO  
TWO BROAD GROUPS: NUTRIENTS WHICH STIMULATE LIFE AND TOXIC SUBSTANCES  
DEPRESSING LIFE. THE FIRST POLLUTANTS, GROWTH STIMULATORS, CONTRIBUTE  
TO EUTROPHICATION, THE MAJOR SYMPTOMS OF WHICH ARE ACCUMULATION OF  
ALGAE, REDUCED TRANSPARENCY, UNPLEASANT TASTE AND ODOR, OXYGEN  
DEFICITS, AND REDUCTION IN RECREATION POTENTIAL. MAJORITY OF  
LIMNOLOGISTS SUPPORT THE ARGUMENT THAT PHOSPHORUS IS THE KEY LIMITING  
NUTRIENT AND ITS INPUT TO LAKES CAN BE CONTROLLED MORE EFFECTIVELY THAN  
THAT OF OTHER NUTRIENTS. EFFICIENT AND RELATIVELY INEXPENSIVE METHODS  
CAN REMOVE PHOSPHORUS DURING SEWAGE TREATMENT, AND ELIMINATION OF  
PHOSPHATES FROM DETERGENTS WOULD LOWER COSTS OF REDUCING PHOSPHORUS  
LEVELS IN EFFLUENTS. THE SINGLE MOST CONVINCING PROGRAM OF PRACTICAL  
BENEFITS IN REDUCING PHOSPHORUS IS EXEMPLIFIED BY THE DIVERSION OF  
SEWAGE AROUND LAKE WASHINGTON, PROVIDING STRONG EVIDENCE THAT  
PHOSPHATES WERE THE LIMITING NUTRIENT AND A CONCLUSIVE DEMONSTRATION  
THAT EUTROPHICATION WAS, AT LEAST IN THIS INSTANCE, A REVERSIBLE  
PROCESS. VARIOUS ARGUMENTS FAVORING REDUCTION OF PHOSPHORUS INPUTS MAY  
NOT BE ENTIRELY CONCLUSIVE BUT COMBINED THEY CONSTITUTE A VERY STRONG  
CASE FOR TAKING MEANINGFUL REMEDIAL ACTIONS - NOW. (JONES-WISCONSIN)

FIELD 05C

ACCESSION NO. W71-12091

SHORELINE ALGAE OF WESTERN LAKE ERIE,

RACHEL COX DOWNING.

OHIO J SCI. 70(5): 257-276. ILLUS. MAPS. 1970 (RECD. 1971).

DESCRIPTORS:

\*ALGAE, \*CHLOROPHYTA, \*CYANOPHYTA, \*LAKES, RHODOPHYTA, SHORES.

IDENTIFIERS:

ARNOLDIELLA-CONCHOPHILA, LAKE ERIE.

ABSTRACT:

THE ALGAE OF WESTERN LAKE ERIE HAVE BEEN EXTENSIVELY STUDIED FOR MORE THAN 70 YR, BUT, UNTIL THIS STUDY, CONDUCTED BETWEEN APRIL AND OCT., 1967; ALMOST NOTHING WAS KNOWN OF THE SHORELINE AS A SPECIFIC ALGAL HABITAT. A TOTAL OF 61 TAXA WERE IDENTIFIED FROM THE SHORELINES. THE (23 CHLOROPHYTA, 37 CYANOPHYTA, 1 RHODOPHYTA) FOUND 39 ARE NEW RECORDS FOR WESTERN LAKE ERIE, AND ONE, ARNOLDIELLA CONCHOPHILA MILLER, APPEARS TO BE A NEW USA RECORD, HAVING BEEN PREVIOUSLY REPORTED ONLY FROM CENTRAL RUSSIA.--COPYRIGHT 1971, BIOLOGICAL ABSTRACTS, INC.

FIELD 02H, 05C

ACCESSION NO. W71-12489

NUMERICAL CALCULATIONS OF THE WIND-DRIVEN CURRENTS IN LAKE ERIE AND COMPARISON WITH MEASUREMENTS,

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION, CLEVELAND, OHIO. LEWIS RESEARCH CENTER.

R. I. GEDNEY, AND W. LICK.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA) TECHNICAL MEMORANDUM NASA TM X-67804, 1971. 19 P, 7 FIG, 1 TAB, 7 REF. (PAPER PRESENTED AT 14TH GREAT LAKES CONF, TORONTO, CANADA, APRIL 19, 1971).

DESCRIPTORS:

\*WATER CIRCULATION, \*WINDS, \*CURRENTS(WATER), \*LAKE ERIE, \*NUMERICAL ANALYSIS, MODEL STUDIES, MATHEMATICAL STUDIES, DATA COLLECTIONS, WIND VELOCITY, LAKES.

IDENTIFIERS:

\*WIND-DRIVEN WATER CURRENTS.

ABSTRACT:

THE STEADY-STATE, WIND DRIVEN VELOCITIES IN LAKE ERIE WERE CALCULATED NUMERICALLY USING A SHALLOW LAKE MODEL. THE THREE-DIMENSIONAL VELOCITIES AS A FUNCTION OF DEPTH AND HORIZONTAL POSITION ARE DISPLAYED FOR THE PREVAILING SOUTHWEST WINDS. THE VELOCITIES VARY GREATLY FROM POSITION TO POSITION AND DEPEND STRONGLY ON THE BOTTOM TOPOGRAPHY AND BOUNDARY GEOMETRY. FOR THE NUMERICAL CALCULATIONS, A 0.805 KILOMETER GRID SIZE IN AN ISLAND REGION AND A 3.22 KILOMETER GRID SIZE IN THE REST OF THE LAKE WAS INCORPORATED TO ADEQUATELY REPRESENT THE LAKE ERIE GEOMETRY. THE CALCULATED VELOCITIES AGREE QUANTITATIVELY WITH CURRENT METER MEASUREMENTS MADE AT MID-DEPTHS IN THE CENTRAL AND EASTERN BASINS. THE MAGNITUDES OF THE AVERAGE EDDY VISCOSITY USED IN THE CALCULATIONS AGREE WITH MEASUREMENTS MADE IN THE GREAT LAKES. STEADY CURRENTS USUALLY OCCUR AFTER TWO DAYS OF FAIRLY UNIFORM WINDS. (WOODARD-USGS)

FIELD 02H

ACCESSION NO. W71-13449

BOARD OF COMMISSIONERS OF LAKE COUNTY V. MENTOR LAGOONS, INC. (PRIVATE  
LANDOWNERS REMEDIES AGAINST COUNTY COMMISSIONERS MAINTAINING A NUISANCE).

216 N. E. 2D 643-647 (C. P. LAKE COUNTY OHIO 1965).

DESCRIPTORS:

\*OHIO, \*SEWAGE TREATMENT, \*POLLUTION ABATEMENT, \*LOCAL GOVERNMENTS,  
WATER POLLUTION CONTROL, WATER QUALITY CONTROL, JUDICIAL DECISIONS,  
LEGAL ASPECTS, WATER LAW, WATER POLLUTION, WATER POLLUTION SOURCES,  
WATER QUALITY, ENVIRONMENTAL SANITATION, SEWAGE DISPOSAL, LOCAL  
GOVERNMENTS, SANITARY ENGINEERING, SEWERS, EMINENT DOMAIN, DAMAGES.

IDENTIFIERS:

INJUNCTION(PROHIBITORY), LAKE ERIE.

ABSTRACT:

PLAINTIFF BOARD OF COUNTY COMMISSIONERS BROUGHT AN ACTION SEEKING AN  
EASEMENT OVER DEFENDANT'S LAND FOR A SEWER LINE. DEFENDANT OWNED A  
MARINA ON LAKE ERIE. DEFENDANT FILED A CROSS PETITION SEEKING DAMAGES  
FOR BREACH OF CONTRACT AND AN INJUNCTION AGAINST THE MAINTENANCE OF A  
PUBLIC NUISANCE. THE DISCHARGE OF INADEQUATELY TREATED SEWAGE INTO LAKE  
ERIE CONSTITUTED THE ALLEGED NUISANCE. PLAINTIFF MAINTAINED THAT A  
BOARD OF COUNTY COMMISSIONERS IS NOT SUBJECT TO LIABILITY FOR DAMAGES  
AND THAT DEFENDANT HAD NO CAUSE OF ACTION FOR AN INJUNCTION. THE COURT  
OF COMMON PLEAS OF LAKE COUNTY OHIO HELD THAT A BOARD OF COUNTY  
COMMISSIONERS IS NOT LIABLE FOR DAMAGES FOR NEGLIGENCE OR NUISANCE.  
HOWEVER, THE COURT RULED THAT A LITTORAL OWNER MAY ENJOIN A BOARD OF  
COUNTY COMMISSIONERS FROM MAINTAINING A PUBLIC NUISANCE CONSISTING OF  
AN IMPROPERLY FUNCTIONING SEWAGE PLANT. THE COURT UPHELD THE DEMURRER  
AS TO DAMAGES AND OVERRULED THE DEMURRER TO THE INJUNCTION.  
(ROBINSON-FLORIDA)

FIELD 06E, 05G

ACCESSION NO. W71-13536

ENVIRONMENTAL PROGRESS DURING 1970.

MICHIGAN WATER RESOURCES COMMISSION, DEPARTMENT OF NATURAL RESOURCES,  
LANSING, MICHIGAN, JANUARY 1971. 7 P.

DESCRIPTORS:

\*MICHIGAN, \*WATER POLLUTION CONTROL, \*PROGRAMS, \*WATER POLLUTION SOURCES, WATER RESOURCES DEVELOPMENT, WATER POLLUTION, WATER POLLUTION TREATMENT, POLLUTION ABATEMENT, WATER QUALITY CONTROL, PHOSPHATES, CHEMICAL WASTES, POLLUTANTS, THERMAL POLLUTION, LEGISLATION, REGULATION, ADMINISTRATIVE AGENCIES, SHIPS, WASTE DISPOSAL, METALS, INDUSTRIAL WASTES, LAKE ERIE, LEGAL ASPECTS.

ABSTRACT:

SIGNIFICANT ENVIRONMENTAL PROGRAMS AND DEVELOPMENTS IN MICHIGAN ARE SUMMARIZED FOR THE YEAR 1970. WITH RECENT LEGISLATIVE ENACTMENTS, THE STATE'S POLLUTION CONTROL STATUTE IS THE MOST COMPREHENSIVE IN THE NATION. RESULTS OF MONTHLY MEETINGS OF THE WATER RESOURCES COMMISSION ARE LISTED. THE PHOSPHORUS REMOVAL PROGRAM DECREASED THE AMOUNT OF PHOSPHORUS ENTERING WATER BODIES, BUT CONCERN DEVELOPED OVER THE POLLUTION POTENTIAL OF SUBSTITUTE CHEMICALS. MERCURY POLLUTION IN THE GREAT LAKES WAS A MAJOR PROBLEM. A FISHING BAN WAS INITIATED, AND INDUSTRIES USING MERCURY IN MANUFACTURING PROCESSES WERE ORDERED TO HALT FURTHER DISCHARGE OF MERCURY. LEGISLATION WAS PROPOSED TO CONTROL MERCURY POLLUTION. A SURVEY WAS MADE OF INDUSTRIAL USES OF METALS WHICH, IF DISCHARGED, COULD CONTAMINATE LAKES AND STREAMS. A PROPOSED RULE WOULD LIMIT DISCHARGES OF SUCH METALS. CONTAMINATION OF WELLS THROUGH IMPROPER SALT STORAGE LED TO A PROPOSED RULE PROHIBITING SUCH POLLUTION OF GROUNDWATER. THE VESSEL POLLUTION CONTROL ACT REGULATES THE USE OF PORTABLE HOLDING TANKS FOR WASTES ON VESSELS. DIRECT AND INDIRECT WATER DISCHARGE OF SEWAGE IS A VIOLATION OF THE STATUTE. OTHER DEVELOPMENTS DISCUSSED INCLUDE DISPOSAL OF POLLUTED DREDGE SPOIL, POLLUTION CONFERENCES, THERMAL POLLUTION, AND LAKE ERIE POLLUTION. (SMILJANICH-FLORIDA)

FIELD 05G, 06E

ACCESSION NO. W71-13709

SUMMARY OF WATER QUALITY STANDARDS FOR DESIGNATED USE AREAS IN MICHIGAN  
INTERSTATE WATERS.

MICHIGAN WATER RESOURCES COMMISSION, LANSING. DEPT. OF NATURAL RESOURCES.

NOVEMBER, 1968. 29 P, 10 MAP, 1 TAB.

DESCRIPTORS:

\*MICHIGAN, \*STANDARDS, \*WATER QUALITY CONTROL, \*WATER UTILIZATION, ENVIRONMENTAL ENGINEERING, DREDGING, WASTE DISPOSAL, REGULATION, ADMINISTRATIVE AGENCIES, LEGAL ASPECTS, LAKE MICHIGAN, LAKE HURON, LAKE ERIE, LAKE SUPERIOR, WATER POLLUTION, WATER POLLUTION CONTROL, INTERSTATE, CHANNEL IMPROVEMENT, EFFLUENTS, WATER POLLUTION SOURCES, RIVER BASINS, INTERSTATE RIVERS.

ABSTRACT:

INTERSTATE STANDARDS, WATER USE DESIGNATIONS, AND IMPLEMENTATION PLANS OF THE MICHIGAN WATER RESOURCES COMMISSION ARE HEREIN SUMMARIZED. DESIGNATED USE AREAS CONSIDERED BY THIS PUBLICATION INCLUDE: (1) THE ST. JOSEPH RIVER BASIN; (2) LAKE MICHIGAN; (3) LAKE HURON; (4) THE ST. CLAIR RIVER-LAKE ST. CLAIR, DETROIT RIVER-LAKE ERIE, MAUMEE RIVER BASIN; (5) LAKE SUPERIOR AND THE ST. MARYS RIVER; AND (6) THE MENOMINEE AND MONTREAL RIVER BASINS IN MICHIGAN AND OTHER MICHIGAN-WISCONSIN INTERSTATE BOUNDARY WATERS. STANDARDS WILL NOT APPLY DURING PERIODS OF AUTHORIZED DREDGING FOR NAVIGATION PURPOSES, BUT WILL APPLY TO AREAS AFFECTED BY THE DISPOSAL OF SPOIL FROM SUCH OPERATIONS. WHEN WATERS ARE CLASSIFIED UNDER MORE THAN ONE DESIGNATED WATER USE, IT IS INTENDED THAT THE MOST RESTRICTIVE INDIVIDUAL STANDARDS OF THE DESIGNATED USE SHALL BE ADHERED TO. IN AREAS ADJACENT TO OUTFALLS STANDARDS APPLY ONLY AFTER ADMIXTURE OF WASTE EFFLUENTS WITH THE PUBLIC WATERS, BUT IN NO INSTANCE SHALL THE MIXING ZONE ACT AS A BARRIER TO FISH MIGRATION OR INTERFERE UNREASONABLY WITH THE DESIGNATED USES OF THE AREA. A SUMMARY OF THE LEGISLATIVE BASES OF MICHIGAN'S PROGRAM TO CONTROL AND ABATE POLLUTION IS SET FORTH. (JOHNSON-FLORIDA)

FIELD 05G, 06E

ACCESSION NO. W72-00199

GREAT LAKES POLLUTION,

J. D. DINGELL.

IN: THE GREAT LAKES--HOW MANY MASTERS CAN THEY SERVE. 11TH ANNUAL CONFERENCE, MICHIGAN NATURAL RESOURCES COUNCIL, LANSING, MICHIGAN, P 19-26, OCTOBER 1968. 8 P.

DESCRIPTORS:

\*WATER POLLUTION SOURCES, \*WATER POLLUTION CONTROL, \*POLLUTION ABATEMENT, \*GREAT LAKES, WATER POLLUTION, WATER POLLUTION EFFECTS, WATER QUALITY, WATER QUALITY CONTROL, POLLUTANTS, ENVIRONMENTAL SANITATION, WATER POLICY, LAKE ERIE, LAKE HURON, LAKE ONTARIO, LAKE MICHIGAN, LAKE SUPERIOR, FEDERAL GOVERNMENT, STATE GOVERNMENTS, LOCAL GOVERNMENTS, CITIES, STANDARDS, REGULATION.

ABSTRACT:

FEDERAL ACTION IS NECESSARY TO CONTROL AND ABATE POLLUTION: STATE AND LOCAL GOVERNMENTS DO NOT HAVE THE RESOURCES, AND POLLUTION IS NOT MERELY A LOCAL PROBLEM. THE FOLLOWING FACTORS CONSTITUTE THE MAJOR PROBLEMS FACING THE GREAT LAKES; (1) OVER-ENRICHMENT, (2) A BUILDUP OF DISSOLVED SOLIDS, (3) BACTERIAL CONTAMINATION, (4) CHEMICAL CONTAMINATION FROM INDUSTRIAL WASTE DISCHARGES, AND (5) OXYGEN DEPLETION. THE PRESENT STATE OF POLLUTION OF EACH OF THE GREAT LAKES IS EXPLAINED. WATER POLLUTION CAN BE CONTROLLED. ALL OF THE STATES AND TERRITORIES HAVE FILED LETTERS OF INTENT TO ESTABLISH WATER QUALITY STANDARDS. A LIST OF SIXTEEN IMMEDIATE ACTIONS NECESSARY TO SAVE THE GREAT LAKES IS SET FORTH. THE SECRETARY OF INTERIOR SHOULD HAVE THE AUTHORITY TO SET STANDARDS FOR INTRA-STATE WATERS AS WELL AS INTERSTATE. (ROBINSON-FLORIDA)

FIELD 05G; 06E

ACCESSION NO. W72-00247

THE GREAT LAKES CONTAINER DILEMMA,

WISCONSIN UNIV., MILWAUKEE. CENTER FOR GREAT LAKES STUDIES.

E. SCHENKER, AND M. BUNAMO.

IN: TRANSPORTATION RESEARCH FORUM PAPERS/1970, NEW ORLEANS, LOUISIANA, P 327-336. 7 TAB, 12 REF.

DESCRIPTORS:

\*ST. LAWRENCE SEAWAY, \*GREAT LAKES, \*INVESTMENT, \*TRANSPORTATION,  
\*ECONOMIC IMPACT, INCOME, SHIPS.

IDENTIFIERS:

\*CONTAINERS, \*CONTAINER FACILITIES, CARGO PORTS, CARGO DIVERSION.

ABSTRACT:

LAKE PORTS FACE AN IMMEDIATE DILEMMA: UNLESS THEY UNDERTAKE A COORDINATED INVESTMENT PROGRAM IN CONTAINER FACILITIES TO RETAIN THEIR GENERAL CARGO TRAFFIC, SIGNIFICANT DIVERSIONS OF CONTAINER TRAFFIC WILL OCCUR, RESULTING IN A SUBSTANTIAL LOSS OF PORT-RELATED INCOME FOR THE REGION. DIRECT AND INDIRECT INCOME LOSSES COULD EXCEED \$100,000,000. LAKE PORTS COULD AVOID THESE LOSSES BY PURSUING ONE OR MORE OF THE FOLLOWING THREE ALTERNATIVES: (1) MORE EXTENSIVELY UTILIZE MONTREAL OR QUEBEC CITY LOAD CENTER'S SPECIALIZED CONTAINER FACILITIES, (2) PROVIDE FOR A FULLER UTILIZATION OF THE SEAWAY AND ITS EXISTING FACILITIES BY, SAY, CONSTRUCTING SPECIALIZED CONTAINER-HANDLING FACILITIES OR REMODELING EXISTING BERTHS FOR LIMITED CONTAINER OPERATIONS, (3) CONSTRUCT TWO MODERN FULLY-INTEGRATED CONTAINER FACILITIES, ONE AT THE SOUTHERN END OF LAKE MICHIGAN TO SERVE CHICAGO AND MILWAUKEE, THE OTHER ON LAKE ERIE TO SERVE EASTERN LAKE PORTS. THE FIRST TWO ALTERNATIVES REPRESENT SHORT-RUN PLANS DESIGNATED TO REDUCE THE FLOW OF CONTAINER CARGO DIVERSION; THE THIRD ALTERNATIVE IS A LONG-RUN SOLUTION, LINKING IMPROVED AND EXPANDED CONTAINER OPERATIONS WITH CERTAIN NECESSARY IMPROVEMENTS OF THE ENTIRE SEAWAY SYSTEM. SEVERAL TABLES PROVIDE DATA ON THE EXISTING AND EXPECTED CONTAINERSHIP REGISTRY AND ON THE ANTICIPATED IMPACT OF CONTAINERIZATION ON LAKE PORTS. (SETTLE-WISCONSIN)

FIELD 06C, 06B

ACCESSION NO. W72-00385



LAKE ERIE: POLLUTION ABATEMENT, THEN WHAT,

WRIGHT STATE UNIV., DAYTON, OHIO. DEPT. OF BIOLOGY.

JERRY H. HUBSCHMAN.

SCIENCE (WASHINGTON). 171(3971): 536-540. MAP. 1971.

IDENTIFIERS:

ABATEMENT, BIOTA, CANADA, ERIE, LAKE, POLLUTION.

ABSTRACT:

POLLUTION FACTORS ACTING ON LAKE ERIE AND THEIR EFFECT ON THE BIOTA, PRODUCTIVITY AND THE ADVANTAGEOUS UTILIZATION OF LONG-TERM EUTROPHICATION ARE DISCUSSED.--COPYRIGHT 1971, BIOLOGICAL ABSTRACTS, INC.

FIELD 05C

ACCESSION NO. W72-00703

PROCEEDINGS THIRTEENTH CONFERENCE ON GREAT LAKES RESEARCH, PART I AND II.

GREAT LAKES RESEARCH CENTER, DETROIT, MICH.

AVAILABLE FROM TREASURER, P. O. BOX 640, ANN ARBOR, MICH. 48107. PRICE \$18.00  
A SET. 1970. 1063 P.

DESCRIPTORS:

\*GREAT LAKES, \*LAKES, EUTROPHICATION, ALGAE, \*LAKE SUPERIOR, \*LAKE  
MICHIGAN, \*LAKE HURON, \*LAKE ONTARIO, \*LAKE ERIE, WATER POLLUTION  
EFFECTS, WATER POLLUTION SOURCES, LIMNOLOGY.

ABSTRACT:

THE THIRTEENTH CONFERENCE ON GREAT LAKES RESEARCH WAS HELD 1-3 APRIL,  
1970 AT BUFFALO, NEW YORK AND CO-HOSTED BY CORNELL AERONAUTICAL  
LABORATORY INC. AND THE GREAT LAKES LABORATORY OF THE STATE UNIVERSITY  
COLLEGE AT BUFFALO. (SEE ALSO W72-01095 THRU W72-01112)

FIELD 02H, 05C

ACCESSION NO. W72-01094

NEUTRON ACTIVATION ANALYSIS OF SEDIMENTS IN WESTERN LAKE ERIE,

OHIO STATE UNIV., COLUMBUS. COLL. OF BIOLOGICAL SCIENCES.

PAUL L. ZUBKOFF, AND WALTER E. CAREY.

INTERNATIONAL ASSOCIATION FOR GREAT LAKES RESEARCH, PROCEEDINGS 13TH  
CONFERENCE ON GREAT LAKES RESEARCH, PART 1, P 319-325, 1970. 2 FIG, 3 TAB,  
11 REF.

DESCRIPTORS:

\*SEDIMENTS, \*ANALYTICAL TECHNIQUES, \*NEUTRON ACTIVATION ANALYSIS,  
\*CHEMICAL ANALYSIS, GREAT LAKES, EUTROPHICATION, NUTRIENTS, ALGAE,  
BACTERIA, LAKE ERIE, ALUMINUM, MANGANESE, SODIUM, CHROMIUM, IRON.

IDENTIFIERS:

VANADIUM, LANTHANUM, SCANDIUM.

ABSTRACT:

THE CENTERS OF 1 CM LATERAL SECTIONS OF 15 CM SEDIMENT CORES WERE  
WASHED FREE OF INTERSTITIAL WATER AND SUBJECTED TO A  $2.0 \times 10^8$  CM<sup>-2</sup> 11  
POWER NEUTRON 0.01 CM 0.1 SEC FLUX IN RESEARCH REACTOR. ANALYSIS OF  
GAMMA-RAY SPECTRA, OBTAINED WITH A NAI(TL) CRYSTAL, INDICATED A UNIFORM  
CONCENTRATION OF AL, V, MN, NA, LA, CR, AND SC. THE CONTENTS OF  
VANADIUM AND CHROMIUM ARE AT LEAST THREE TIMES AS GREAT AS FOUND IN  
SOILS. (SEE ALSO W72-01094) (WILDE-WISCONSIN)

FIELD 05C, 02H

ACCESSION NO. W72-01101

CIRCULATION PATTERNS AND A PREDICTIVE MODEL FOR POLLUTANT DISTRIBUTION IN LAKE ERIE,

NEW YORK STATE UNIV., BUFFALO.

JOHN A. HOWELL, KENNETH M. KISER, AND RALPH R. RUMER.

INTERNATIONAL ASSOCIATION FOR GREAT LAKES RESEARCH, PROCEEDINGS 13TH  
CONFERENCE ON GREAT LAKES RESEARCH, PART 1, P 434-443, 1970. 7 FIG, 1 TAB,  
6 REF.

DESCRIPTORS:

\*WATER CIRCULATION, \*MATHEMATICAL STUDIES, \*PROBABILITY, \*WATER  
POLLUTION, FORECASTING, LAKE ERIE, MODEL STUDIES, WATER QUALITY  
CONTROL, WIND PRESSURE.

IDENTIFIERS:

\*POLLUTANT DISTRIBUTION, CIRCULATION EFFECTS, TRANSITION PROBABILITY  
MATRIX.

ABSTRACT:

DISTRIBUTION OF POLLUTANTS IN THE WESTERN BASIN OF LAKE ERIE FOR ZERO  
WIND STRESS WAS OUTLINED BY USE OF THE TRANSITION PROBABILITY MATRIX  
(TPM) IN CONJUNCTION WITH A PHYSICAL MODEL OF THE LAKE. THE MODEL  
PREDICTED THE STEADY STATE CONCENTRATION IN COMBINATION WITH THE  
ROTATING LAKE MODEL PROMISES TO FACILITATE THE WATER QUALITY  
MANAGEMENT. (SEE ALSO W72-01094) (WILDE-WISCONSIN)

FIELD 05C, 05A, 02H

ACCESSION NO. W72-01102

DRY WEIGHT OF THE MACROBENTHOS AS AN INDICATOR OF EUTROPHICATION OF THE GREAT LAKES,

CALIFORNIA STATE COLL., LOS ANGELES. DEPT. OF ZOOLOGY; AND MICHIGAN UNIV., ANN ARBOR. GREAT LAKES RESEARCH DIV.

WAYNE P. ALLEY, AND CHARLES F. POWERS.

INTERNATIONAL ASSOCIATION FOR GREAT LAKES RESEARCH, PROCEEDINGS 13TH CONFERENCE ON GREAT LAKES RESEARCH, PART 2, P 595-600, 1970. 3 FIG, 2 TAB, 16 REF.

DESCRIPTORS:

\*EUTROPHICATION, \*GREAT LAKES, \*BENTHOS, \*INDICATORS, BIOMASS, SAMPLING, AMPHIPODA, ALIGOCHAETES, LAKE SUPERIOR, LAKE MICHIGAN, LAKE HURON, LAKE ERIE.

IDENTIFIERS:

\*MACROBENTHOS, CHIRONOMIDS, SPHAERIIDS.

ABSTRACT:

THE EUTROPHICATION LEVELS OF FOUR GREAT LAKES WERE DELINEATED ON THE BASIS OF DRY WEIGHT OF MACROBENTHOS, INCLUDING AMPHIPODS, OLIGOCHAETES, SPHAERIIDS, AND CHIRONOMIDS. THE FOLLOWING GRAND AVERAGES IN G PER SQ M WERE ESTABLISHED: LAKE SUPERIOR - 0.9, LAKE HURON - 1.48, LAKE MICHIGAN - 3.40, AND LAKE ERIE - 4.63. IN TERMS OF RAWSON'S CLASSIFICATION OF CANADIAN LAKES, LAKE ERIE IS DEFINITELY EUTROPHIC, LAKE MICHIGAN - MODERATELY EUTROPHIC, LAKE HURON - MESOTROPHIC, AND LAKE SUPERIOR - TRULY OLIGOTROPHIC. (SEE ALSO W72-01094) (WILDE-WISCONSIN)

FIELD 05C, 02H

ACCESSION NO. W72-01105

PLANKTON PRODUCTIVITY STUDIES IN LAKE ST CLAIR,

WINDSOR UNIV. (ONTARIO). DEPT. OF BIOLOGY; AND WAYNE STATE UNIV., DETROIT,  
MICH. DEPT. OF BIOLOGY.

JOHN M. WINNER, J. ADRIAN, AND ROBERT G. FERGUSON.

INTERNATIONAL ASSOCIATION FOR GREAT LAKES RESEARCH, PROCEEDINGS 13TH  
CONFERENCE ON GREAT LAKES RESEARCH, PART 2, P 640-650, 1970. 4 FIG, 3 TAB,  
17 REF.

DESCRIPTORS:

\*PLANKTON, \*PRODUCTIVITY, \*PHYTOPLANKTON, \*ZOOPLANKTON, CYANOPHYTA,  
HARDNESS(WATER), NITROGEN, PHOSPHORUS, RUNOFF, NUTRIENTS, SILICA,  
NITRATES, ROTIFERS, STANDING CROP, CHLOROPHYLL, SAMPLING, CHEMICAL  
ANALYSIS, EUTROPHICATION.

IDENTIFIERS:

\*LAKE ST CLAIR(ONTARIO), CHLOROPHYLL A, AGRICULTURAL RUNOFF.

ABSTRACT:

PLANKTON POPULATION STUDIES OF LAKE ST CLAIR (ONTARIO) WERE  
ACCOMPLISHED BY WEEKLY SAMPLING AT TWO NEARSHORE STATIONS DURING MAY 31  
- AUGUST 7, 1969. A RELATIONSHIP WAS ESTABLISHED BETWEEN COMMUNITY  
PRODUCTIVITY AND CHEMICAL PROPERTIES OF WATER, INCLUDING ALKALINITY,  
HARDNESS, AND CONTENTS OF N, P, AND SI. A HIGH CONTENT OF NITRATES (5  
MG/L) INDICATED THE INFLUENCE OF AGRICULTURAL RUNOFF. CYANOPHYTA,  
PARTICULARLY OSCILLATORIA, DOMINATED THE PHYTOPLANKTON. THE ZOOPLANKTON  
CONSISTED PREDOMINATLY OF ROTIFIERS, 19 SPECIES OF WHICH WERE RECORDED;  
KERATELLA COCHLEARIS WAS THE MOST ABUNDANT. THE LAKE EXHIBITED A  
EUTROPHICATION LEVEL EXCEEDING THAT OF ADJACENT LAKE ERIE. THE NET  
PRODUCTIVITY AVERAGED 200 MG C/CU M PER HOUR. (SEE ALSO W72-01094)  
(WILDE-WISCONSIN)

FIELD 05C, 02H

ACCESSION NO. W72-01106

AQUEOUS PHOSPHATE AND LAKE SEDIMENT INTERACTION,

GREAT LAKES RESEARCH CENTER, DETROIT, MICH.

R. C. GUMERMAN.

INTERNATIONAL ASSOCIATION FOR GREAT LAKES RESEARCH, PROCEEDINGS 13TH  
CONFERENCE ON GREAT LAKES RESEARCH, PART 2, P 673-682, 1970. 8 FIG, 1 TAB,  
8 REF.

DESCRIPTORS:

\*PHOSPHATES, \*SEDIMENT-WATER INTERFACES, ADSORPTION, LAKES, NUTRIENTS,  
LAKE ERIE, LAKE SUPERIOR, LABORATORY TESTS, TEMPERATURE, ALGAE,  
PHOSPHORUS, ION EXCHANGE, OXIDATION-REDUCTION POTENTIAL, HYDROGEN ION  
CONCENTRATION.

IDENTIFIERS:

SEDIMENTARY PHOSPHORUS RELEASE.

ABSTRACT:

THIS LABORATORY STUDY OF STERILE SEDIMENTS FROM LAKE ERIE AND LAKE  
SUPERIOR DISCLOSED THAT THE PHOSPHORUS-SEDIMENT COMPLEX IS FORMED UNDER  
THE INFLUENCE OF BOTH PHYSICAL AND CHEMICAL ADSORPTION. MAXIMUM REMOVAL  
OF AQUEOUS P OCCURS WITHIN THE PH RANGE OF 4.5 TO 5.5. LOWERING REDOX  
POTENTIAL TO ZERO MAY OR MAY NOT EFFECT A RELEASE OF P FROM THE  
SEDIMENT. THE MAXIMUM ADSORBING CAPACITY OF SEDIMENTS IS IN SURFACE  
LAYERS LESS THAN 3.5 MM DEEP, AND IS ZERO AT A DEPTH EXCEEDING 14 MM  
BELOW SEDIMENT-WATER INTERFACE. AS LONG AS THE SEDIMENT CONTAINS SOME  
ADSORBED PHOSPHORUS, ITS RELEASE WILL MAINTAIN A MINIMUM CONCENTRATION  
OF 0.1 MG/L OF AQUEOUS PHOSPHATE RADICAL. IN TURN, UNDER SUCH  
CONDITIONS CESSATION OF PHOSPHATE INPUT MAY NOT EFFECT A REDUCTION OF  
NUISANCE ALGAL GROWTH FOR A LONG TIME. (SEE ALSO W72-01094)  
(WILDE-WISCONSIN)

FIELD 05C, 02H

ACCESSION NO. W72-01108

CARBONATE EQUILIBRIA IN LAKE ERIE,

STATE UNIV. (COLL.), FREDONIA, N.Y.

KENNETH G. WOOD.

INTERNATIONAL ASSOCIATION FOR GREAT LAKES RESEARCH, PROCEEDINGS 13TH  
CONFERENCE ON GREAT LAKES RESEARCH, PART 2, P 744-750, 1970. 3 FIG, 2 TAB,  
18 REF.

DESCRIPTORS:

\*LAKE ERIE, \*CARBONATES, \*EQUILIBRIUM, INORGANIC COMPOUNDS, CARBON  
DIOXIDE, ALKALINITY, HYDROGEN ION CONCENTRATION, GASES, EQUATIONS,  
MATHEMATICAL STUDIES.

IDENTIFIERS:

SODIUM CARBONATE SOLUTIONS, VAN SLYKE ANALYSIS, REVELLE EQUATION.

ABSTRACT:

DETERMINATIONS OF PH, TOTAL ALKALINITY, AND TOTAL CARBON DIOXIDE  
(MODIFIED VAN SLYKE METHOD) PERMITTED TO ESTABLISH A RELATIONSHIP  
BETWEEN THE THREE CHARACTERISTICS IN DILUTE SODIUM CARBONATE SOLUTION  
AND WATER FROM LAKE ERIE. THE RESULTS INDICATED THAT THE COMMONLY USED  
EQUATION, ASCRIBED TO REVELLE, DOES NOT FULLY EXPRESS THE CARBONATE  
EQUILIBRIA AS SUCH AS INFLUENCED BY THE IRON-PAIR COMPLEXES. LAKE ERIE  
WATER IS NOT SIMILAR TO DILUTE SOLUTION OF SODIUM CARBONATE AND  
CONTAINS LESS CARBON DIOXIDE AT PH 8.3 TO 9.5 THAN IS PREDICTED BY THE  
EQUATION. (SEE ALSO W72-01094) (WILDE-WISCONSIN)

FIELD 05B, 02H, 05C

ACCESSION NO. W72-01111



**MERCURY POLLUTION: MICHIGAN'S ACTION PROGRAM,**

**MICHIGAN WATER RESOURCES COMMISSION, LANSING.**

**W. G. TURNEY.**

**JOURNAL WATER POLLUTION CONTROL FEDERATION, VOL 43, NO 7, P 1427-1438, JULY 1971. 1 FIG.**

**DESCRIPTORS:**

**\*WATER POLLUTION SOURCES, \*HEAVY METALS, \*TRACE ELEMENTS, \*DATA COLLECTIONS, \*MICHIGAN, SURFACE WATERS, SEDIMENTS, SAMPLING, STREAMS, RESERVOIRS, LAKES, BOTTOM SEDIMENTS, INDUSTRIAL WASTES, MUNICIPAL WASTES, POLLUTANTS.**

**IDENTIFIERS:**

**\*MERCURY.**

**ABSTRACT:**

ON FEBRUARY 11, 1970, MEMBERS OF THE MICHIGAN DEPARTMENT OF PUBLIC HEALTH AND THE WATER RESOURCES COMMISSION STAFF MET IN TORONTO AT A REGULAR MEETING OF THE ADVISORY BOARD OF INTERNATIONAL JOINT COMMISSION ON THE CONTROL OF POLLUTION OF INTERNATIONAL BOUNDARY WATERS. IN RESPONSE TO THIS MEETING, THE MICHIGAN WATER RESOURCES COMMISSION BEGAN A STATE-WIDE SAMPLING PROGRAM OF INDUSTRIAL WASTE DISCHARGES TO CHECK FOR MERCURY CONTENT. THIS SCREENING PROGRAM INCLUDED THE GATHERING OF BOTTOM SEDIMENT SAMPLES FROM THE MOUTHS OF MAJOR RIVERS ENTERING THE GREAT LAKES, AND DOWNSTREAM OF MUNICIPAL AND INDUSTRIAL WASTE TREATMENT PLANT OUTLETS. TRACE CONCENTRATIONS OF MERCURY WERE FOUND IN SOME OF THE SAMPLES. IN ALL CASES, THE CONCENTRATION WAS BELOW 1 MG/KG. THE MICHIGAN DEPARTMENT OF PUBLIC HEALTH COOPERATED BY GATHERING SAMPLES OF RAW WASTEWATER IN MORE THAN THIRTY COMMUNITIES THROUGHOUT THE STATE WHERE INDUSTRIES DISCHARGE WASTE EFFLUENT INTO THE MUNICIPAL COLLECTION AND TREATMENT SYSTEM. TRACE LEVELS OF MERCURY WERE DETECTED IN SOME OF THE LARGER COMMUNITIES. WATER SUPPLY SAMPLES TAKEN FROM ALL COMMUNITIES USING WATER FROM THE ST. CLAIR RIVER, LAKE ST. CLAIR, THE DETROIT RIVER, AND LAKE ERIE SHOWED NEGATIVE MERCURY RESULTS. (WOODARD-USGS)

**FIELD 05B, 05A**

**ACCESSION NO. W72-01995**

SNOW IN OHIO,

OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER, WOOSTER.

M. E. MILLER, AND C. R. WEAVER.

AVAILABLE FROM THE NATIONAL TECHNICAL INFORMATION SERVICE, SPRINGFIELD, VA., 22151, AS COM-71-00773, \$3.00 IN PAPER COPY, \$0.95 IN MICROFICHE. OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER RESEARCH BULLETIN 1044, APRIL 1971. 23 P, 5 FIG, 8 TAB, 15 REF. (NOAA REPORT NO 71061814). 5201105/11H301200.

DESCRIPTORS:

\*SNOW, \*SNOWFALL, \*HYDROLOGIC DATA, \*DATA COLLECTIONS, \*OHIO, CLIMATOLOGY, PRECIPITATION GAGES, LAKE ERIE, WEATHER PATTERNS, SNOW SURVEYS.

IDENTIFIERS:

\*SNOWFALL RECORDS(OHIO).

ABSTRACT:

USING SNOWFALL RECORDS AVAILABLE FOR OHIO, THIS REPORT PROVIDES INFORMATION ON MEAN MONTHLY AND ANNUAL SNOWFALL AMOUNTS; FREQUENCY OF SELECTED SNOWFALLS; THRESHOLD DATES OF FIRST 1-, 3-, AND 4-INCH SNOWFALLS OF THE WINTER SEASON; DURATION OF SNOW COVER; EXTREME SNOWFALLS AND SNOW DEPTHS; AND SOME NOTABLE SNOWSTORMS OR UNUSUALLY SNOWY WINTERS. THE HEAVIEST SNOWFALL IN OHIO OCCURS NEAR CHARDON IN THE HEART OF OHIO'S SNOWBELT WHERE A TOTAL OF 106.1 INCHES IS NORMAL AND 161.5 INCHES FELL DURING THE WINTER OF 1959-1960. THE SOUTHERNMOST COUNTIES NEAR THE OHIO RIVER RECEIVE AN AVERAGE OF 13 TO 17 INCHES OF SNOW EACH WINTER. IT IS NOT A RARE OCCURRENCE, HOWEVER, FOR SOUTHERN OHIO TO RECEIVE MORE SNOWFALL FROM AN INDIVIDUAL SNOWSTORM THAN CENTRAL OR NORTHERN AREAS. (WOODARD-USGS)

FIELD 02C, 02B

ACCESSION NO. W72-02027

**CIRCULATION AND WATER MOVEMENT IN LAKE ERIE,**

**DEPARTMENT OF ENERGY, MINES AND RESOURCES, OTTAWA (ONTARIO). INLAND WATERS  
BRANCH.**

**P. F. HAMBLIN.**

**CANADA DEPARTMENT OF ENERGY, MINES AND RESOURCES INLAND WATERS BRANCH  
SCIENTIFIC SERIES NO 7, 1971. 49 P, 25 FIG, 36 REF, APPEND.**

**DESCRIPTORS:**

**\*WATER CIRCULATION, \*PATH OF POLLUTANTS, \*LAKE ERIE, \*DIFFUSION,  
\*MOVEMENT, TRACKING TECHNIQUES, TRACERS, DYE RELEASES, HYDROLOGIC DATA,  
CURRENTS(WATER), AQUATIC DRIFT, DRIFT BOTTLES, DATA COLLECTIONS, LAKES,  
MIXING.**

**IDENTIFIERS:**

**\*PLUME STUDY.**

**ABSTRACT:**

**AVAILABLE KNOWLEDGE OF THE CIRCULATION, WATER MOVEMENTS, AND DIFFUSIVE  
PROCESSES OCCURRING IN LAKE ERIE ARE SUMMARIZED FROM PUBLISHED WORKS  
AND STUDIES CONDUCTED AT THE CANADA CENTER FOR INLAND WATERS. IN  
ADDITION, THE RESIDENCE TIME, THEORY OF LAKE CIRCULATION AND DIFFUSION  
ARE DISCUSSED. AN ATLAS OF MONTHLY AVERAGED CURRENTS IS PROVIDED IN AN  
APPENDIX. KNOWLEDGE OF WATER CIRCULATION AND DIFFUSION PROCESSES  
PROVIDE A MEANS OF GAINING INSIGHT INTO CERTAIN PHYSICAL PROCESSES AND  
MECHANISMS OCCURRING WITHIN THE LAKE. FROM A PRAGMATIC VIEWPOINT, AN  
IMPORTANT ASPECT IS TO BE ABLE TO PREDICT THE RESPONSE OF THE WATER  
QUALITY OF A LAKE TO CHANGING LEVELS OF INPUTS. DESCRIPTIONS OF THE  
DIRECTLY AND INDIRECTLY DETERMINED CIRCULATIONS, AND THE MEASUREMENTS  
OF DIFFUSION ARE DIVIDED INTO THREE SEPARATE SECTIONS FOR EACH OF THE  
WESTERN, CENTRAL AND EASTERN BASINS OF LAKE ERIE. THE BOUNDARIES OF  
THESE REGIONS AND GEOGRAPHICAL NAMES ARE PROVIDED. (WOODARD-USGS)**

**FIELD 02H, 05B**

**ACCESSION NO. W72-02277**

ADSORPTION OF CHLORINATED HYDROCARBON PESTICIDES BY MICROBIAL FLOC AND LAKE SEDIMENT AND ITS ECOLOGICAL IMPLICATIONS,

OHIO STATE UNIV., COLUMBUS. DEPT. OF MICROBIAL AND CELLULAR BIOLOGY.

W. O. LESNIEWSKY, P. R. DUGAN, R. M. PFISTER, J. I. FREA, AND C. I. RANGLES.

PROCEEDINGS THIRTEENTH CONFERENCE ON GREAT LAKES RESEARCH, APRIL 1-3, 1970, STATE UNIVERSITY COLLEGE, BUFFALO, N Y, PART 2: INTERNATIONAL ASSOCIATION FOR GREAT LAKES RESEARCH, P 611-618, 1970. 6 FIG, 18 REF.

DESCRIPTORS:

\*PATH OF POLLUTANTS, \*ADSORPTION, \*FLOCCULATION, \*PESTICIDES, \*BOTTOM SEDIMENTS, LAKES, LAKE ERIE, GREAT LAKES, AQUATIC BACTERIA, AQUATIC MICROORGANISMS, CHLORINATED HYDROCARBON PESTICIDES.

IDENTIFIERS:

\*BACTERIAL FLOCS.

ABSTRACT:

OF 38 AEROBIC BACTERIA ISOLATED FROM LAKE ERIE, 14 FORMED FLOCS IN AT LEAST ONE OF SIX DIFFERENT MEDIA USED. TWO OF THESE FLOC FORMERS WERE EXAMINED FOR ABILITY TO ACCUMULATE ALDRIN FROM SOLUTION. ALDRIN WAS DISSOLVED IN ACETONE AND ADDED TO FLASKS CONTAINING PREGROWN BACTERIAL FLOCS SUSPENDED IN WATER. FLOCS WERE SHAKEN FOR VARIOUS TIME INTERVALS AND SEPARATED FROM SOLUTION BY CONTRIFUGATION. BOTH WERE ANALYZED SEPARATELY FOR PRESENCE OF ALDRIN USING GAS LIQUID CHROMATOGRAPHY. CONTEMPORARY SEDIMENT COLLECTED FROM LAKE ERIE WAS EXAMINED MICROSCOPICALLY AND ANALYZED FOR PESTICIDE CONTENT AND ABILITY TO ABSORB ALDRIN. BACTERIAL FLOCS ABSORBED ALDRIN FROM SOLUTION GIVING A 625X CONCENTRATION FACTOR WITHIN 20 MIN, AFTER WHICH THERE WAS NO FURTHER INCREASE. THE COLLECTED SEDIMENT BEHAVED SIMILARLY. FLOC-FORMING MICROBES SETTLING FROM A WATER COLUMN REMOVE PESTICIDES AND REPRESENT A NATURAL PURIFICATION PROCESS. THE PESTICIDES MAY THEN ACCUMULATE IN BOTTOM SEDIMENTS AND EXERT A TOXIC EFFECT ON SUSCEPTIBLE FAUNA. (SEE ALSO W72-01094 THRU W72-01112 AND W72-02878 THRU W72-02890) (KNAPP-USGS)

FIELD 02H, 05B

ACCESSION NO. W72-03115

ATMOSPHERIC CONSTITUENTS NEAR LAKE ERIE,

ATMOSPHERIC PHYSICS AND CHEMISTRY LAB., BOULDER, COLO.

P. A. ALLEE, T. B. HARRIS, JR., AND R. PROULX.

PROCEEDINGS THIRTEENTH CONFERENCE ON GREAT LAKES RESEARCH, APRIL 1-3, 1970,  
STATE UNIVERSITY COLLEGE, BUFFALO, NY, PART 2: INTERNATIONAL ASSOCIATION  
FOR GREAT LAKES RESEARCH, P 779-789, 1970. 15 FIG, 23 REF.

DESCRIPTORS:

\*METEOROLOGICAL DATA, \*DATA COLLECTIONS, \*AIR POLLUTION, \*METEOROLOGY,  
\*SNOWFALL, LAKE ERIE, GREAT LAKES, NUCLEATION, AEROSOLS, AIR  
ENVIRONMENT, POLLUTANT IDENTIFICATION, AIR POLLUTION EFFECTS,  
ATMOSPHERIC PHYSICS.

ABSTRACT:

DURING THE FALL SEASONS OF 1968 AND 1969 AN AIRCRAFT PROBED THE  
ATMOSPHERE ABOVE AND IN THE VICINITY OF LAKE ERIE TO STUDY VARIOUS  
METEOROLOGICAL CONDITIONS WITH SPECIAL EMPHASIS UPON THOSE DAYS WHEN  
THE LAKE-EFFECT SNOWSTORMS WERE PRESENT. AMONG THE PARAMETERS MEASURED  
DURING THESE FLIGHTS WERE THE CONCENTRATION OF AITKEN NUCLEI, CLOUD  
DROPLET CONDENSATION NUCLEI, AND ICE NUCLEI. ON FAIR WEATHER FLIGHTS IN  
THE VICINITY OF BUFFALO, NEW YORK, ADDITIONAL MEASUREMENTS WERE MADE OF  
THE CONCENTRATION OF CARBON DIOXIDE, OXIDANT, REDUCTANT, AND OZONE.  
LOCAL HUMAN CONTRIBUTIONS TO THESE ATMOSPHERIC CONSTITUENTS CAN BE  
DETECTED AND MEASURED, AND SOME OBSERVATIONS SUGGEST POSSIBLE EFFECTS  
UPON THE WEATHER. (SEE ALSO W72-01094 THRU W72-01112 AND W72-02878 THRU  
W72-02890) (KNAPP-USGS)

FIELD 02H, 02B

ACCESSION NO. W72-03121

SPECTRA OF MONTHLY MEAN WATER LEVEL IN THE GREAT LAKES,

DEPARTMENT OF ENERGY, MINES AND RESOURCES, OTTAWA (ONTARIO). MARINE SCIENCES  
BRANCH.

L. F. KU.

PROCEEDINGS THIRTEENTH CONFERENCE ON GREAT LAKES RESEARCH, APRIL 1-3, STATE  
UNIVERSITY COLLEGE, BUFFALO, NY, PART 2: INTERNATIONAL ASSOCIATION FOR  
GREAT LAKES RESEARCH, P 844-861, 1970. 19 FIG, 6 TAB, 12 REF.

DESCRIPTORS:

\*WATER LEVEL FLUCTUATIONS, \*GREAT LAKES, \*VARIABILITY, \*FREQUENCY  
ANALYSIS, \*FOURIER ANALYSIS, ANNUAL, TIME SERIES ANALYSIS, STATISTICS,  
STATISTICAL METHODS.

ABSTRACT:

THE ANNUAL VARIATION AND ITS HARMONICS ARE SIGNIFICANTLY PARTS OF THE  
SPECTRA OF MONTHLY MEAN WATER LEVEL IN THE GREAT LAKES. THE ENERGY OF  
THE SPECTRA IS CONCENTRATED IN LOW FREQUENCIES AND THE PLOTS OF  
BACKGROUND IN THE SPECTRA AT ALL STATIONS ARE SIMILAR. THE COHERENT  
ENERGY BETWEEN LAKE SUPERIOR AND EACH OF THE OTHER LAKES IS RELATIVELY  
LOWER THAN THAT OF OTHER PAIRS. THE PHASE OF ANNUAL VARIATION INCREASES  
FROM EAST TO WEST. IN LAKE SUPERIOR IT LAGS ABOUT 2 MONTHS BEHIND THAT  
OF LAKE ONTARIO. THE AMPLITUDE DECREASES AS THE NUMBER OF POINTS  
INCREASES. FOR LAKES SUPERIOR, HURON, AND ERIE THE AMPLITUDES APPROACH  
6 CM WHEN 48 YEARS OF DATA ARE USED. THE AMPLITUDE IN LAKE SUPERIOR IS  
THE SAME AS THAT IN LAKE ERIE, AND ITS VALUE IN LAKE ONTARIO IS 12 CM  
LARGER THAN THAT IN LAKE HURON. OWING TO THE RELATIVELY SMALL  
CONTRIBUTION TOWARDS THE VARIANCE BY THE ANNUAL TERM AND ITS HARMONICS,  
IT IS NOT PRACTICAL TO PREDICT THE MONTHLY MEAN WATER LEVEL USING ONLY  
THE PERIODIC COMPONENTS. (SEE ALSO W72-01094 THRU W72-01112 AND  
W72-02878 THRU W72-02890) (KNAPP-USGS)

FIELD 02H

ACCESSION NO. W72-03123

WIND-GENERATED CIRCULATIONS IN LAKES ERIE, HURON, MICHIGAN AND SUPERIOR,

DEPARTMENT OF ENERGY, MINES AND RESOURCES, OTTAWA (ONTARIO). MARINE SCIENCES  
BRANCH.

T. S. MURTY, AND D. B. RAO.

PROCEEDINGS THIRTEENTH CONFERENCE ON GREAT LAKES RESEARCH, APRIL 1-3, 1970,  
STATE UNIVERSITY COLLEGE, BUFFALO, NY, PART 2: INTERNATIONAL ASSOCIATION  
FOR GREAT LAKES RESEARCH, P 927-941, 1970. 8 FIG, 11 REF.

DESCRIPTORS:

\*GREAT LAKES, \*WATER CIRCULATION, WINDS, CURRENTS(WATER), LAKE ERIE,  
LAKE HURON, LAKE MICHIGAN, LAKE SUPERIOR, CLIMATOLOGY.

IDENTIFIERS:

\*LAKE CIRCULATION.

ABSTRACT:

THE WIND-GENERATED CIRCULATIONS IN LAKES ERIE, HURON, MICHIGAN, AND  
SUPERIOR WERE COMPUTED USING A STEADY STATE LINEAR MODEL WITH  
TOPOGRAPHY AND ROTATION TAKEN INTO ACCOUNT. THIS HOMOGENOUS MODEL  
APPLICABLE TO LATE FALL AND EARLY SPRING SITUATIONS ONLY. THE LAKE ERIE  
CIRCULATION PATTERN HAS THREE CELLS. AN ELONGATED CLOCKWISE CELL NEAR  
THE SOUTHERN SHORE TERMINATES AT ITS WESTERN BASIN. THIS CELL BECOMES  
STRONG TO THE EAST OF ERIE AND PERSISTS TO MIDWAY BETWEEN SILVER CREEK  
AND BUFFALO. THE SECOND CELL IS CLOCKWISE AND IS IN THE NORTHERN PART  
OF THE LAKE. THE THIRD CELL IS CLOCKWISE AND IT IS IN THE NORTHEASTERN  
PART OF THE LAKE. THE CIRCULATION PATTERN IN LAKE HURON HAS FOUR CELLS.  
IN THE EASTERN PART THERE IS A STRONG COUNTERCLOCKWISE CELL. IN THE  
WESTERN PART THERE IS A CLOCKWISE CELL. MOST OF THE GEORGIAN BAY IS  
OCCUPIED BY AN INTENSE COUNTERCLOCKWISE CELL. THERE IS A WEAK CLOCKWISE  
CELL IN THE WESTERN PART OF THE GEORGIAN BAY. IN LAKE MICHIGAN THERE  
ARE TWO CELLS: A CLOCKWISE CELL IN THE WESTERN PART AND A  
COUNTERCLOCKWISE CELL IN THE EASTERN PART. THE CIRCULATION IN LAKE  
SUPERIOR IS BY FAR THE MOST UNORGANIZED WITH GENERALLY COUNTERCLOCKWISE  
MOTION IN THE SOUTHERN PORTIONS AND WEAK CLOCKWISE MOTIONS IN THE  
NORTHERN PORTIONS. (SEE ALSO W72-01094 THRU W72-01112 AND W72-02878  
THRU W72-02890) (KNAPP-USGS)

FIELD 02H

ACCESSION NO. W72-03124

IMPROVEMENT OF NAVIGATION CONDITIONS, CONNEAUT HARBOR, OHIO; HYDRAULIC MODEL INVESTIGATION,

ARMY ENGINEER WATERWAYS EXPERIMENT STATION, VICKSBURG, MISS.

R. Y. HUDSON, AND H. B. WILSON.

AVAILABLE FROM THE NATIONAL TECHNICAL INFORMATION SERVICE AS AD-724 140, \$3.00 IN PAPER COPY, \$0.95 IN MICROFICHE. REPT NO. AEWES-TR-2-617, JAN 1963, 93 P, 5 TAB, 59 FIG, 5 REF.

IDENTIFIERS:

\*BREAKWATERS, \*HYDRAULIC MODELS, \*GREAT LAKES, HARBOR MODELS, LAKE WAVES, STORMS, NAVIGATION, TEST METHODS, MECHANICAL DRAWINGS, PHOTOGRAPHS, OHIO, CONNEAUT HARBOR, SEICHES, LAKE ERIE.

ABSTRACT:

A HYDRAULIC MODEL INVESTIGATION OF THE HARBOR AT CONNEAUT, OHIO, WAS CONDUCTED TO DETERMINE THE EFFECTS ON WAVES AND SEICHE CURRENTS AT THE ENTRANCE TO AND WITHIN THE INNER-HARBOR AREA OF VARIOUS PROPOSED MODIFICATIONS TO THE EAST PIER AND EXTENSIONS TO THE EAST BREAKWATER. THE STUDY WAS PERFORMED ON A 1:125-SCALE, FIXED-BED-TYPE-MODEL CONSTRUCTED OF CONCRETE AND EQUIPPED WITH A WAVE GENERATOR, ELECTRICAL WAVE-HEIGHT MEASURING AND RECORDING DEVICES, AND A WATER CIRCULATING SYSTEM FOR SIMULATING CURRENTS RESULTING FROM THE ACTION OF LONGITUDINAL SEICHES CHARACTERISTIC OF LAKE ERIE.

FIELD 08B, 08A

ACCESSION NO. W72-03138



THE LAKE ERIE CONGRESS - THE PROCEEDINGS OF THE FIRST SESSION.

GREAT LAKES RESEARCH INST., ERIE, PA.

JULY 12-14, 1971, ERIE, PENNSYLVANIA. 41 P, 5 APPEND.

DESCRIPTORS:

\*PLANNING, \*DECISION MAKING, \*ENVIRONMENT, \*CONTROL, \*CONSERVATION,  
\*WATER.

IDENTIFIERS:

\*POLLUTION CONTROL, \*LAKE ERIE CONGRESS, \*POLICY MAKING, RESOLUTIONS,  
PRIVATE AND PUBLIC SECTORS, COMMUNITY INTEREST, COMMITTEES,  
QUESTIONNAIRES.

ABSTRACT:

THE LAKE ERIE CONGRESS WAS ENVISIONED AS A NOVEL AND INTENSIVE EFFORT TO GATHER TOGETHER AN ENTIRE COMMUNITY OF DIRECT INTEREST IN LAKE ERIE FROM BOTH THE PRIVATE AND PUBLIC SECTORS OF THE UNITED STATES AND CANADA. THE INDEPENDENT WORK OF SIX BASIC COMMITTEES PRESENTED EIGHTEEN RESOLUTIONS WHICH MET THE APPROVAL OF THE CONGRESS AS A WHOLE. THIS REPORT CHRONICLES THE STRUCTURE AND PROCESS OF THE LAKE ERIE CONGRESS. THE EIGHTEEN RESOLUTIONS OF THE LAKE ERIE CONGRESS, THE COMMITTEE PAPERS WHICH CONTAIN THE FRAMEWORK OF THE RESOLUTIONS, AND THE CONGRESSIONAL KEYNOTE ADDRESSES, ARE PRESENTED. THE APPENDICES INCLUDE (1) A SUMMARY OF A POST-CONGRESSIONAL QUESTIONNAIRE, (2) A SYNOPSIS OF THE DEVELOPMENT OF A MACRO-SYSTEM DECISION-MAKING PROCESS FOR ADDRESSING ENVIRONMENTAL PROBLEMS, (3) COMMITTEE TASK DESCRIPTIONS, (4) THE CONGRESSIONAL PROGRAM SCHEDULE, AND (5) A LIST OF THE PARTICIPANTS IN THE LAKE ERIE CONGRESS. (STRACHAN-CHICAGO)

FIELD 06B, 05G, 02H

ACCESSION NO. W72-03947

DETROIT AIMS FOR SAVINGS WITH PURE OXYGEN AERATION,

DETROIT METRO WATER DEPT., MICH.

G. REMUS, D. SUHRE, AND G. HUBBELL.

PAPER PRESENTED AT THE ANNUAL CONFERENCE, WATER POLLUTION CONTROL FEDERATION, SAN FRANCISCO, OCTOBER 3-8, 1971. 16 P, 16 FIG.

DESCRIPTORS:

\*OXYGENATION, \*AERATION, \*SEWAGE TREATMENT, \*WASTE WATER TREATMENT, \*ACTIVATED SLUDGE, MICHIGAN, LAKE ERIE, WATER POLLUTION CONTROL, TREATMENT FACILITIES, COST-BENEFIT ANALYSIS, BIOCHEMICAL OXYGEN DEMAND, BACTERIA, AEROBIC TREATMENT, SANITARY ENGINEERING, SLUDGE TREATMENT.

IDENTIFIERS:

\*DETROIT(MICH), PURE OXYGEN AERATION.

ABSTRACT:

THE DETROIT METRO WATER DEPARTMENT IS PRESENTLY CONSTRUCTING \$220 MILLION OF WATER POLLUTION CONTROL WORKS, AND THE CITY PLANS \$193 MILLION MORE IN 1972. AN ADDITIONAL \$400 MILLION OF CAPITAL EXPENDITURES IS PLANNED BY THE END OF 1979. SEWAGE DISPOSAL OF THE DETROIT METROPOLITAN AREA IS HANDLED BY A SINGLE INTERCEPTOR SYSTEM AND A SINGLE TREATMENT PLANT. IN MEETING COMMITMENTS TO PROVIDE SEWAGE DISPOSAL SERVICE FOR THE ENTIRE METROPOLITAN AREA, WITH MINIMUM LAND REQUIREMENTS AND WITHOUT DEMOLISHING USABLE RESIDENCES IN THE AREA, STUDIES WERE MADE OF MEANS OF OPTIMIZING BACTERIAL ACTION BY USING PURE OXYGEN AERATION TO SUPPORT THE ACTIVATED SLUDGE PROCESS. IN FEBRUARY 1971, CONSTRUCTION BEGAN ON A TWO-TANK AERATION MODULE THAT WILL CONSIST OF ONE TANK OF 150 MGD CAPACITY ON THE DEEP TANK, HIGH RATE, AIR AERATED PROCESS, AND A 300 MGD TANK ON THE OXYGENATED ACTIVATED SLUDGE PROCESS. OPERATION IS SCHEDULED FOR FEBRUARY 1973. AN ADDITIONAL 600 MGD OXYGENATION FACILITY IS PLANNED TO BE PUT INTO OPERATION IN 1976. ALL IN ALL, AS COMPARED TO CONVENTIONAL ACTIVATED SLUDGE, DETROIT IS AIMING FOR SAVINGS FAR IN EXCESS OF THE \$2.50/MIL GAL EXPECTED TO BE REALIZED WITH THE OXYGENATED ACTIVATED SLUDGE. EARLY ESTIMATES ARE THAT ON A PLANT-WIDE BASIS, OVERALL OPERATING AND CAPITAL COSTS WILL HAVE BEEN TRIMMED BY \$21.35/MIL GAL THROUGH INNOVATIVE DESIGN FEATURES. (POERTNER)

FIELD 05D, 08C

ACCESSION NO. W72-03972

POLLUTION CONTROL PROGRAM FOR THE DETROIT REGIONAL WATERSHED.

DETROIT DEPT. OF WATER SERVICE, MICH.

SEPTEMBER 1966. 42 P, 3 FIG, 4 TAB.

DESCRIPTORS:

\*PLANNING, \*WATER RESOURCES DEVELOPMENT, \*ADMINISTRATION, \*FUTURE PLANNING(PROJECTED), \*WATER POLLUTION ABATEMENT, \*LAKE ERIE, CITIES, URBANIZATION, MICHIGAN, WASTE WATER TREATMENT, SEWAGE DISPOSAL, SEWERAGE, TREATMENT FACILITIES, INVESTMENT, SANITARY ENGINEERING, PROGRAMS, WATER POLLUTION CONTROL.

IDENTIFIERS:

\*DETROIT(MICH), REGIONAL WASTE WATER DISPOSAL.

ABSTRACT:

THE WATER POLLUTION CONTROL PROGRAM ADOPTED BY THE DETROIT BOARD OF WATER COMMISSIONERS IN 1966, IS EXPLAINED. THE PROGRAM CALLS FOR CAPITAL EXPENDITURES OF \$327 MILLION BETWEEN 1966 AND 1975, AND \$595 MILLION IN THE PERIOD 1976-2000. THE PROGRAM IS DESIGNED TO PROVIDE THE ORDERLY AND EFFECTIVE GROWTH OF WATER POLLUTION CONTROL FACILITIES AND COMMUNITY WASTE COLLECTION SYSTEMS. MAJOR OBJECTIVES ARE: (1) SYSTEMATIC AND ORDERLY DEVELOPMENT OF A SINGLE POLLUTION CONTROL SYSTEM FOR THE DETROIT REGIONAL WATERSHED; (2) CONSTRUCTION OF AN AREA-WIDE WASTEWATER INTERCEPTOR SYSTEM; (3) INSTALLATION AND OPERATION OF FACILITIES FOR ADVANCED WASTEWATER TREATMENT; (4) FURTHER REDUCTION OF STORMWATER OVERFLOWS; (5) ACCELERATION OF INDUSTRIAL WASTEWATER CONTROL ON A COOPERATIVE GOVERNMENT-INDUSTRY BASIS; (6) IMPROVED METHODS OF WASTE DISPOSAL FOR PLEASURE BOATS AND FREIGHTERS; (7) REGULATION OF WATER LEVELS IN THE LAKE ST. CLAIR-DETROIT RIVER-LAKE ERIE COMPLEX TO AID IN STREAM AND SHORELINE BEAUTIFICATION; (8) TIGHTER CONTROL OF LAKE AND RIVER DREDGING AND LANDFILL PRACTICES; (9) INTERNATIONAL ASSURANCE THAT THE CANADIAN COMMUNITIES WILL TAKE EQUIVALENT ACTION TO ENHANCE THE WATER QUALITY OF THE GREAT LAKES; AND (10) CONTINUATION OF A BROAD AND SOUND FINANCING BASE (FOUNDED UPON USER CHARGES) TO ASSURE UNINTERRUPTED PROGRESS. ACCELERATION IS POSSIBLE THROUGH USE OF FEDERAL AND STATE GRANTS. EQUIPMENT FOR THE REMOVAL OF PHOSPHATES IS BEING INCLUDED IN THE CONSTRUCTION AND ACCOMPANYING PROCESSES STUDIED, IN AN ATTEMPT TO RESTORE THE QUALITY OF LAKE ERIE. THOUGH THE MAJOR EMPHASIS IN THE NEXT SEVERAL YEARS WILL BE ON ADVANCED TREATMENT, MASSIVE PROGRAMS ARE ALSO PLANNED FOR REGIONAL INTERCEPTORS, SEWERS, AND OVERFLOW CONTROLS. (POERTNER)

FIELD 05D, 05G

ACCESSION NO. W72-03973

THE NORTHWEST OHIO WATER DEVELOPMENT PLAN.

BURGESS AND NIPLE LTD., COLUMBUS, OHIO.

OHIO WATER COMMISSION, DEPARTMENT OF NATURAL RESOURCES, COLUMBUS, JANUARY, 1967. 318 P, 64 FIG, 111 TAB.

DESCRIPTORS:

\*PLANNING, \*WATER RESOURCES DEVELOPMENT, \*ADMINISTRATION, \*OHIO, WATER SUPPLY, WATER QUALITY, INDUSTRIAL WATER, AGRICULTURE, HUMAN POPULATION, RECREATION, STREAMFLOW, FLOOD CONTROL, UNDERGROUND STORAGE, WATER QUALITY ACT, FINANCE, GROUNDWATER, RESERVOIRS, LAKE ERIE, PIPELINES, WATER POLLUTION ABATEMENT.

ABSTRACT:

THE NORTHWEST OHIO WATER DEVELOPMENT PLAN PROVIDES A COMPREHENSIVE PLAN FOR THE DEVELOPMENT OF WATER RESOURCES THAT WILL GIVE MAXIMUM SUPPORT TO THE GROWTH AND DEVELOPMENT OF THE REGION AND THE STATE. IN ADDITION, IT PRESENTS PROGRAMS FOR THE TOTAL MANAGEMENT OF WATER SO THAT OPTIMUM ECONOMIC AND SOCIAL BENEFITS MAY BE REALIZED. A COMPREHENSIVE AND BALANCED PLAN FOR ALL PHASES OF WATER MANAGEMENT ARE PROVIDED BY THE STUDY INCLUDING: PUBLIC, INDUSTRIAL, AND AGRICULTURAL WATER SUPPLY; STREAM WATER QUALITY CONTROL; STREAM FLOW IMPROVEMENTS; RECREATIONAL NEEDS; AND FLOOD CONTROL. TWO ESTIMATES OF FUTURE WATER NEEDS FOR EACH CITY AND VILLAGE HAVING A PUBLIC WATER SUPPLY, AND FOR INDUSTRY, ARE PRESENTED. ONE IS BASED ON A PROJECTION OF HISTORIC GROWTH RATES, AND THE OTHER IS BASED ON AN ACCELERATED GROWTH RATE THAT COULD OCCUR IF WATER IS NOT LIMITING IN QUANTITY OR QUALITY. THE RECOMMENDED WATER PLAN IS BASED ON THE ACCELERATED GROWTH THAT WOULD BE SUSTAINED BY THE FULLY DEVELOPED ECONOMIC POTENTIAL OF THE REGION. THE PUBLIC WATER SUPPLY PORTION OF THE PLAN HAS BEEN LIMITED TO THE DELIVERY OF RAW WATER TO EXISTING OR FUTURE WATER TREATMENT PLANTS. EXPANDABLE CAPACITIES OF EXISTING PUBLIC WATER SUPPLIES ARE SHOWN. SUPPLIES FROM STREAM FLOW, UPGROUND OR ONSTREAM STORAGE, UNDERGROUND SOURCES, AND PIPELINES FROM LAKE ERIE ARE PRESENTED AS ALTERNATE POSSIBILITIES TO THE RECOMMENDED PLAN. POLLUTION ABATEMENT PHASES OF THE PLAN ARE DESIGNED TO MEET STREAM WATER QUALITY STANDARDS IN ACCORDANCE WITH THE FEDERAL WATER QUALITY ACT OF 1965. FINANCING METHODS AND RECOMMENDATIONS FOR ADMINISTRATION ARE ALSO DISCUSSED. (POERTNER)

FIELD 06D, 04B

ACCESSION NO. W72-03976

ECOLOGICAL EFFECTS OF A THERMAL POWER PLANT ON THE AQUATIC HABITAT OF A LARGE FRESH WATER LAKE IN THE UNITED STATES,

DETROIT EDISON CO., MICH.; AND MICHIGAN STATE UNIV., EAST LANSING.

J. J. ROOSEN, AND R. C. BALL.

PAPER 2.1-47, 8TH WORLD ENERGY CONFERENCE, BUCHAREST, ROMANIA, JUNE-JULY, 1971. 19 P, 4 FIG, 2 REF.

DESCRIPTORS:

\*ECOLOGY, \*THERMAL POLLUTION, \*THERMAL POWERPLANTS, FISH, \*ENVIRONMENTAL EFFECTS, WATER POLLUTION, AQUATIC ENVIRONMENT, BIOLOGY, WATERFOWL, ELECTRIC UTILITIES, INDUSTRIAL PLANTS, SAMPLING, PHYSICAL PROPERTIES, WATER QUALITY, \*LAKES, INVESTIGATIONS, AQUATIC LIFE.

IDENTIFIERS:

\*LAKE ERIE, GREAT LAKES.

ABSTRACT:

THE 5 GREAT LAKES PROVIDE A LARGE SUPPLY OF FRESH WATER AND VAST WATER RESOURCES TO NORTH CENTRAL AND NORTHEASTERN U S AND SOUTHERN CANADA. THE DETROIT EDISON CO, IN SOUTHEASTERN MICHIGAN, USES THESE WATERS FOR A VARIETY OF PURPOSES; THE LARGEST USE IS THE ECONOMICAL CONDENSATION OF STEAM FROM THERMAL PLANTS PROVIDING A LOW-COST AND RELIABLE SOURCE OF ELECTRIC POWER. RECENT EXPANSION OF ELECTRICAL USE IN THE AREA HAS RESULTED IN THE SITING OF A 3200-MW FOSSIL-FUELED PLANT ON THE MICHIGAN SHORE OF LAKE ERIE. THE CHEMISTRY AND BIOLOGY OF THE AQUATIC ENVIRONMENT OF THE LAKE RECEIVING DISCHARGES FROM THE LARGE GENERATING PLANT ARE DESCRIBED. THE DESIGN BASIS AND DESCRIPTION OF THE 4-YR ECOLOGICAL PROGRAM FORMULATED BY MICHIGAN STATE UNIVERSITY TO DETERMINE THE IMPACT OF THE PLANT ON THE AQUATIC HABITAT ARE INCLUDED. INFORMATION WILL BE COLLECTED ON: (1) BASIC PLANT PRODUCING GROUPS--THE PERIPHYTON, THE PHYTOPLANKTON AND THE MACROPHYTES, (2) ZOOPLANKTON, (3) BOTTOM FAUNA, (4) FISH, AND (5) WATERFOWL. PHYSICAL AND CHEMICAL STUDIES ARE ALSO DESCRIBED. SIGNIFICANCE OF PHYSICAL, CHEMICAL, AND BIOLOGICAL CHANGES ARE DISCUSSED FROM THE STANDPOINTS OF MINIMIZING DETRIMENTAL ECOLOGICAL CHANGES AND CONSERVING THE LARGE FRESH WATER RESOURCES AVAILABLE FOR MULTIPURPOSE USE. (USBR)

FIELD 05C, 02H, 06G

ACCESSION NO. W72-04110

LAW AND THE ECOSYSTEM: DOES NATURE HAVE A LEGAL PERSONALITY,

WISCONSIN UNIV., GREEN BAY.

A. E. BEDROSIAN, J. E. BERRY, J. W. KOLKA, AND T. W. THOMPSON.

PRESENTED AT PROCEEDINGS OF THE SYMPOSIUM ON ENVIRONMENTAL QUALITY AND SOCIAL RESPONSIBILITY, GREEN BAY, WISCONSIN, APRIL 22, 1971. 6 P, 4 REF. OWRR. B-046-WIS(5).

DESCRIPTORS:

\*POLITICAL ASPECTS, GOVERNMENTS, ECOSYSTEM, INTERSTATE, \*WATER LAW,  
\*LAKE ERIE, GREAT LAKES REGION, JUDICIAL DECISIONS, POLLUTING  
ABATEMENT, SOCIAL ASPECTS.

IDENTIFIERS:

SUPREME COURT, INTERDISCIPLINARY APPROACH.

ABSTRACT:

THE SUPREME COURT OF THE UNITED STATES REFUSES ORIGINAL JURISDICTION IN A MULTI-STATE CASE OF MERCURY POLLUTION IN LAKE ERIE. LEGAL CONCEPTIONS OF THE PHYSICAL UNIVERSE TEND TO BE ANTHROPOCENTRIC. A HUMAN CENTERED UNIVERSE INHIBITS RECOGNITION OF HUMANS AS COMPLEX ORGANISMS INHABITING AN ECOSYSTEM. MEANINGFUL SOLUTIONS TO ECOLOGICAL PROBLEMS WILL ULTIMATELY COMPEL LEGAL RECOGNITION OF ECOSYSTEMS AND HUMAN ACTIVITIES WITHIN THESE SYSTEMS.

FIELD 06E, 06A

ACCESSION NO. W72-04290

STRATEGIES FOR CONTROL OF MAN-MADE EUTROPHICATION,

COMMITTEE ON PUBLIC WORKS (U.S. SENATE).

R. D. GRUNDY.

ENVIRONMENTAL SCIENCE AND TECHNOLOGY, VOL 5, NO 12, P 1184-1190, DECEMBER 1971. 6 FIG, 5 REF.

DESCRIPTORS:

\*EUTROPHICATION, \*PHOSPHATES, \*WATER POLLUTION CONTROL, \*WASTE WATER TREATMENT, \*COST-BENEFIT ANALYSIS, DETERGENTS, PHOSPHORUS, NITROGEN, NUTRIENTS, SEWAGE, WATER TEMPERATURE, LIGHT PENETRATION, CARBON, LAKE ERIE, RUNOFF, EROSION, CHLORELLA, SODIUM COMPOUNDS, ALKALINITY, MINING, BIOCHEMICAL OXYGEN DEMAND, ECONOMICS, ALGAE, AGRICULTURAL CHEMICALS, LEGISLATION.

IDENTIFIERS:

POTOMAC RIVER, ALAFIA RIVER, CHLORELLA PYRENOIDOSA, SODIUM SILICATE, SODIUM METASILICATE, LAKE WASHINGTON, NITRILOTRIACETATE, HUMAN FECES.

ABSTRACT:

SOURCES OF PHOSPHATES, AND OTHER NUTRIENTS IN THE AQUATIC ECOSYSTEM INCLUDE NOT ONLY DETERGENTS, BUT ALSO SEWAGE, EROSION, AND AGRICULTURAL RUNOFF. ON A NATIONAL BASIS, DETERGENTS PROVIDE 30 TO 40 PERCENT OF ALL THE PHOSPHORUS ENTERING THE AQUATIC ENVIRONMENT. HOWEVER, THIS FIGURE IS SHOWN TO VARY ON A REGIONAL BASIS. BECAUSE THERE ARE MANY OTHER SOURCES OF PHOSPHATES, THEIR CONTROL IN DETERGENTS IS NOT IN ITSELF A SUFFICIENT STRATEGY TO CONTROL EUTROPHICATION. ALSO, ANY REGULATION ON PHOSPHATES IN DETERGENTS SHOULD NOT BE UNDERTAKEN WITHOUT CAREFUL CONSIDERATION OF THE PUBLIC HEALTH AND ENVIRONMENTAL IMPLICATIONS OF ALTERNATIVE FORMULATIONS. VALID CONTROL STRATEGIES SHOULD INCLUDE ADVANCED WASTE WATER TREATMENTS, DIVERSION, DILUTION, AND LAND DISPOSAL. WASTE WATER TREATMENT USING CHEMICAL PRECIPITATION PROCESSES, NOT ONLY REMOVES PHOSPHORUS BUT ALSO FACILITATES THE REMOVAL OF BOD, TOXICANTS, AND OTHER NUTRIENTS. ECONOMIC CONSIDERATIONS SHOW THAT 90 PERCENT OF MUNICIPAL WASTE WATER COULD BE TREATED FOR PHOSPHORUS REMOVAL AT LESS COST TO THE CONSUMER THAN THE INCREASED PRODUCT COSTS FOR DETERGENT PHOSPHATE SUBSTITUTES. IT IS ALSO SIGNIFICANT THAT TREATMENT REDUCES TOTAL PHOSPHATE LEVELS WHILE PRODUCT CONTROLS AFFECT DETERGENT PHOSPHATE ALONE. (MORTLAND-BATTELLE)

FIELD 05D, 05G, 05C

ACCESSION NO. W72-04734

EXPANDED PROGRAM FOR PESTICIDE MONITORING OF FISH,

BUREAU OF SPORT FISHERIES AND WILDLIFE, WASHINGTON, D.C.

A. INGLIS, C. HENDERSON, AND W. L. JOHNSON.

PESTICIDES MONITORING JOURNAL, VOL 5, NO 1, P 47-49, JUNE 1971. 1 FIG, 1 TAB,  
4 REF.

DESCRIPTORS:

\*PESTICIDE RESIDUES, \*MONITORING, \*LIPIDS, DDT, DIELDRIN, ALDRIN, ENDRIN, HEPTACHLOR, COLORADO RIVER, COLUMBIA RIVER, DELAWARE RIVER, HUDSON RIVER, MISSISSIPPI RIVER, MISSOURI RIVER, OHIO RIVER, RIO GRANDE, LAKE ERIE, LAKE HURON, LAKE MICHIGAN, LAKE ONTARIO, LAKE SUPERIOR, ST. LAWRENCE RIVER, TENNESSEE RIVER.

IDENTIFIERS:

DDE, TDE, BHC, HEPTACHLOR EPOXIDE, CHLORDANE, TOXAPHENE, MERCURY, ARSENIC, LEAD, POLYCHLORINATED BIPHENYLS.

ABSTRACT:

BEGINNING IN THE FALL OF 1970, 50 NEW STATIONS WERE ADDED TO THE ORIGINAL 50 STATIONS SAMPLED ANNUALLY BY THE BUREAU OF SPORT FISHERIES AND WILDLIFE FOR MONITORING PESTICIDE RESIDUES IN FISH. THE ORIGINAL 50 STATIONS, SAMPLED SINCE THE SPRING 1967, WILL BE RETAINED IN THE EXPANDED PROGRAM. THREE COMPOSITE SAMPLES, EACH CONTAINING 3-5 ADULT FISH OF A SINGLE SPECIES, WILL BE COLLECTED. ALL COMPOSITE SAMPLES WILL BE REPLICATED FOR A TOTAL OF 600 SAMPLES ANALYZED ANNUALLY. RESIDUE ANALYSES WILL BE PERFORMED FOR THE IDENTIFICATION AND QUANTITATION OF DDT, DDE, TDE, DIELDRIN, ALDRIN, ENDRIN, BHC, HEPTACHLOR, HEPTACHLOR EPOXIDE, CHLORDANE, TOXAPHENE, MERCURY, ARSENIC, AND LEAD. SAMPLES WILL BE SCREENED FOR THE PRESENCE OF INTERFERING POLYCHLORINATED BIPHENYL COMPOUNDS (PCB'S). FISH WILL BE COLLECTED AND HANDLED IN SUCH A MANNER AS TO PREVENT CONTAMINATION OF THE SAMPLE WITH EXTRANEIOUS CHEMICALS. (MORTLAND-BATTELLE)

FIELD 05A, 05B, 07A

ACCESSION NO. W72-04740



SNOWFALL FROM LAKE-EFFECT STORMS,

STATE UNIV., ALBANY, NEW YORK.

J. E. JIUSTO, AND M. L. KAPLAN.

MONTHLY WEATHER REVIEW, VOL 100, NO 1, P 62-66, JANUARY 1972. 4 FIG, 5 TAB, 8  
REF. NOAA GRANT E22-13-69(G).

DESCRIPTORS:

\*SNOWFALL, \*GREAT LAKES, \*STORMS, CLIMATOLOGY, METEOROLOGY, GREAT LAKES  
REGION, SNOW, WEATHER, WEATHER PATTERNS, DISTRIBUTION PATTERNS.

IDENTIFIERS:

\*LAKE-EFFECT SNOWSTORMS.

ABSTRACT:

THREE YR OF WINTER LAKE-STORM DATA WERE ANALYZED TO DETERMINE SNOWFALL  
DISTRIBUTION PATTERNS DOWNWIND OF LAKE ERIE AND LAKE ONTARIO. THE TOTAL  
AMOUNT OF SNOWFALL AND THE AREA OF GROUND COVERED IN EACH OF 23  
LAKE-EFFECT STORMS WERE DETERMINED FOR BOTH LAKES. TOTAL SNOWFALL MASS  
WAS HIGHLY DEPENDENT ON TIME OF YEAR; NOVEMBER AND EARLY DECEMBER  
STORMS WERE TWO TO FIVE TIMES MORE PRODUCTIVE THAN JANUARY STORMS. A  
CONSIDERABLE VARIATION IN SNOW DENSITY (SNOWFALL DEPTH TO MELT WATER  
RATIO) COULD BE ATTRIBUTED MAINLY TO DIFFERENCES IN SNOW CRYSTAL TYPE.  
(KNAPP-USGS)

FIELD 02B, 02C

ACCESSION NO. W72-04845

ORGANIC CARBON AND NITROGEN IN THE SURFACE SEDIMENTS OF LAKES ONTARIO, ERIE AND HURON,

DEPARTMENT OF ENERGY, MINES AND RESOURCES, BURLINGTON (ONTARIO). CANADA  
CENTRE FOR INLAND WATERS.

A. L. W. KEMP.

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IDENTIFIERS:

BOTTOM, CANADA, CARBON, ERIE, HURON, LAKES, NITROGEN, ONTARIO, ORGANIC, ORGANISMS, SEDIMENTS, SURFACE.

ABSTRACT:

ANALYSES OF 355 SURFACE SEDIMENT SAMPLES (TOP CM) FROM LAKES ONTARIO, ERIE AND HURON WERE CARRIED OUT FOR ORGANIC C, CARBONATE C, EH, PH, N AND SEDIMENT TEXTURE. SIMILAR ANALYSES WERE CARRIED OUT ON A REPRESENTATIVE CORE FROM EACH LAKE AT CLOSE INTERVALS DOWN TO 20 CM. THE DISTRIBUTION OF ORGANIC MATTER IN THE SEDIMENTS OF EACH LAKE WAS RELATED TO THE TOPOGRAPHIC FEATURES OF THE LAKES. ORGANIC CARBON CONTENT WAS FOUND TO BE DIRECTLY PROPORTIONAL TO THE CLAY CONTENT OF THE SEDIMENT, RANGING FROM LESS THAN 1% IN THE COARSE NEARSHORE SANDS TO OVER 4% IN THE FINE CLAY MUDS WITHIN THE INDIVIDUAL LAKE SUB-BASINS. THE ORGANIC C CONTENT OF LAKE ERIE SEDIMENTS WAS GENERALLY LOWER THAN THAT OF LAKES HURON AND ONTARIO, AND IS ATTRIBUTED TO DILUTION OF THE SEDIMENTS WITH COARSER NON-CLAY PARTICLES. NITROGEN WAS DIRECTLY PROPORTIONAL TO ORGANIC C WITH C-N RATIOS RANGING FROM 7 TO 13 IN THE SURFACE SEDIMENT. ORGANIC C AND N DECREASED SHARPLY FROM THE SURFACE DOWN TO ABOUT 10 CM IN EACH CORE. THE DECREASE IS DUE PARTLY TO MINERALIZATION OF ORGANIC MATTER BY BOTTOM ORGANISMS AND PARTLY TO AN INCREASING INPUT OF ORGANIC MATTER TO THE LAKES IN THE LAST 30 YR.--COPYRIGHT 1971, BIOLOGICAL ABSTRACTS, INC.

FIELD 02H, 02J

ACCESSION NO. W72-05003

ABCS OF CULTURAL EUTROPHICATION AND ITS CONTROL: PART 2--WASTEWATERS,

METCALF AND EDDY, INC., BOSTON, MASS.

CLAIR N. SAWYER.

WATER AND SEWAGE WORKS, P 322-327, OCTOBER 1971. 9 FIG, 1 TAB, 4 REF.

DESCRIPTORS:

\*EUTROPHICATION, \*WATER POLLUTION CONTROL, \*WASTE WATER(POLLUTION), VIRGINIA, NUTRIENTS, NITROGEN, PHOSPHORUS, SEWAGE EFFLUENTS, SEWAGE TREATMENT, ALGAE, WATER POLLUTION SOURCES, CHLOROPHYTA, CYANOPHYTA, WASHINGTON, DIVERSION, LAKE ERIE, NITROGEN FIXATION, DETERGENTS, CARBON DIOXIDE, ALKALINITY, BURNING, DOMESTIC WASTES, INDUSTRIAL WASTES, AGRICULTURE, SURFACE RUNOFF, WISCONSIN.

IDENTIFIERS:

\*NITROGEN:PHOSPHORUS RATIO, LAKE WAUBESA(WIS), OCCOQUAN RESERVOIR(VA), MADISON(WIS), LAKE MENDOTA(WIS), LAKE MONONA(WIS), LAKE KEGONSA(WIS), LAKE WASHINGTON(WASH), GREEN LAKE(WASH).

ABSTRACT:

WASTEWATERS AS A NUTRIENT SOURCE BECOMES APPARENT IN THE CULTURAL EUTROPHICATION PROBLEM. DATA PRIOR TO THE ADVENT OF SYNTHETIC DETERGENTS CONTAINING PHOSPHATES WERE COLLECTED FROM LAKE WAUBESA, WISCONSIN. OCCOQUAN RESERVOIR, VIRGINIA, INDICATED A LARGER RELATIVE INCREASE IN PHOSPHORUS, AS COMPARED TO NITROGEN THAN THAT ENTERING LAKE WAUBESA, PROBABLY DUE TO THE HIGHER PHOSPHORUS CONTENT OF MODERN SEWAGES DUE TO PHOSPHATE-BEARING SYNTHETIC DETERGENTS. CULTURAL EUTROPHICATION CONTROL DEPENDS UPON LIMITING THE INPUT OF BOTH PHOSPHORUS AND NITROGEN. OF THE MAJOR INORGANIC NUTRIENT SOURCES, DOMESTIC AND INDUSTRIAL WASTEWATERS ARE EASIEST TO CONTAIN AND TREAT WHILE AGRICULTURAL SOURCES ARE PROBABLY THE MOST DIFFICULT TO CONTROL; PHOSPHORUS CONTROL ALONE MAY SUFFICE IN SOME LOCATIONS. LAKES WAUBESA AND KEGONSA (WISCONSIN) AND LAKE WASHINGTON HAVE RECOVERED AFTER DIVERSION OF SEWAGE. THE BASIC PHILOSOPHY IS SCIENTIFICALLY CORRECT THAT, IF THE DEGREE OF CULTURAL EUTROPHICATION IS RELATED TO THE DEGREE OF FERTILIZATION, ANY REDUCTION IN WASTEWATER QUANTITY OR IN EQUIVALENT NUTRIENTS SHOULD REDUCE PRIMARY PRODUCTIVITY. ELIMINATION OF PHOSPHATES IN DETERGENTS WOULD BE BENEFICIAL TO THE GREAT LAKES; REMOVAL OF 80% OF PHOSPHORUS FROM WASTEWATERS MAY OR MAY NOT BE ADEQUATE, DEPENDING UPON LAKE SIZE AND DETENTION TIME. (JONES-WISCONSIN)

FIELD 05C

ACCESSION NO. W72-05473

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