13. NORTHEASTERN ILLINOIS PLANNING COMMISSION
400 West Madison Street, Chicago, Illinois 60606

13.1

Title: STREAM CLASSIFICATION - DUPAGE RIVER BASIN

P.I. Phillip Peters, Northeastern Illinois Planning Commission

S.O.F. Illinois Department of Energy and Natural Resources

F.L.C. B

Dates: May 1982 through August 1982

Obj: To look at the water quality standards, goals, and inherent characteristics of the river to see if the standards should be adjusted for the competing goals and uses of the river.

13.2

Title: URBAN STORMWATER RUNOFF: DETENTION STORAGE AND SOURCE CONTROL DEMONSTRATION

P.I. Gary C. Schaefer, Northeastern Illinois Planning Commission

S.O.F. Illinois Department of Energy and Natural Resources

F.L.C. C

Dates: June 1982 through August 1982

Obj: To examine two possible strategies for reducing the amounts of pollutants reaching streams in urban stormwater. The strategies are source control, which involves keeping pollutants out of stormwater, and detention storage, which allows pollutants to settle out of stormwater before it reaches a receiving station.

14. NORTHERN ILLINOIS UNIVERSITY
DeKalb, Illinois 60115

14.1

Title: MINERALOGICAL SOURCES OF BARIUM IN CAMBRO-ORDOVICIAN AQUIFER ROCKS, NORTHERN ILLINOIS

P.I. I. Edgar Odom, Department of Geology, Northern Illinois University

S.O.F. United States Department of the Interior

F.L.C. B

Dates: December 1980 through December 1982

Obj: The goal of this project is to evaluate whether the abundance of Ba ion occurring in groundwater at certain locations in northern Illinois is related to a mineralogical source in the aquifers.

14.2

Title: SULFUR AND OXYGEN ISOTOPE STUDY OF SULFATE IN SURFACE WATER OF SELECTED STREAMS IN NORTHERN ILLINOIS

P.I. E.C. Perry, Jr., Department of Geology, Northern Illinois University

S.O.F. United States Department of the Interior

F.L.C. A

Dates: October 1980 through March 1983

Obj: This study is an attempt to use the oxygen and sulfur isotope composition of sulfate in northern Illinois groundwater to trace the origin of the sulfate. Data collection is complete. Local stream sulfate patterns and seasonal patterns are evident. The effect of point source discharges can be readily detected. This is a preliminary study involving many parameters.

14.3

Title: ISOTOPIC AND GEOLOGICAL STUDIES TO DETERMINE THE MECHANISMS RESPONSIBLE FOR HIGH CONCENTRATIONS OF 226-RADIUM IN SOME ILLINOIS GROUNDWATER SUPPLIES

P.I. E.C. Perry, Jr., Department of Geology, Northern Illinois University; R.H. Gilkeson and K. Cartwright, Illinois State Geological Survey

S.O.F. United States Department of the Interior

F.L.C. C

Dates: October 1981 through October 1983

Obj: This research, principally on the Cambrian-Ordovician Aquifer of northern Illinois, has further outlined the distinctiveness of isotopically light, homogeneous water of the region near Peoria compared to water in the northern part of the state. It has also elucidated some of the characteristics of water with high U-234/U-238 in the northern part of the state. Specifically high disequilibrium ratios are associated directly with producing horizons rather than with shale units.

15. NORTHWESTERN UNIVERSITY
Evanston, Illinois 60201

15.1

Title: SIMULATION OF BLACKWATER TREATMENT IN COAL PREPARATION

P.I. Charles H. Dowding and Joseph A. FitzPatrick, Department of Civil Engineering, Northwestern University

S.O.F. United States Department of the Interior, Office of Domestic Mining Minerals, Fuel and Conservation

F.L.C. C

Dates: September 15, 1979, through June 30, 1982

Obj: To develop simulation models for blackwater cleaning processes, particularly static thickening and froth flotation. To compare design relations and simulation models to field data and extend model capability to preliminary preparation plant design and control systems.

15.2

Title: LEACHING OF TRACE METALS FROM LANDFILLED COAL-FIRED UTILITY WASTES

P.I. Joseph A. FitzPatrick, Department of Civil Engineering, Northwestern University

S.O.F. Industrial (Multiple Sources)

F.L.C. C

Dates: January 1, 1981, through December 30, 1982

Obj: Determine release of trace metals for scrubber sludge, fly ash mixtures under wide range of environmental solution conditions and leaching tests. Comparison of laboratory and simulated field results to chemical equilibrium computer models.

15.3

Title: SULFUR CHEMISTRY AND REMOVAL FROM GROUNDWATER SUPPLIES

P.I. Joseph A. FitzPatrick, Department of Civil Engineering, Northwestern University

S.O.F. City of Elgin, Department of Water

F.L.C. B

Dates: April 1, 1981, through June 30, 1982

Obj: Determine mechanisms, extent, and economics of removal of sulfide by precipitation and oxidation (including catalytic oxidation) from simulated and actual Elgin well waters. Chemicals evaluated include ferrous, ferric, ferrate, permanganate, and peroxide. Economic assessment.

16. PLANNING AND MANAGEMENT SERVICES, LTD.
P.O. Box 927, 808 West Main Street, Carbondale, Illinois 62901

16.1

Title: FLOODPLAIN RESIDENTS NOTIFICATION PROJECT

P.I. Duane Baumann, Planning and Management Services, Ltd.

S.O.F. Federal Emergency Management Agency-State Assistance Program, Supplementary Projects

F.L.C. D

Dates: September 1981 through September 1982

Obj: To design, conduct, and evaluate a field experiment to advise and motivate floodplain residents to take steps to protect themselves from flood damages. The project will require knowledge in the fields of psychology, social sciences, flood hazard mitigation, interviewing, and statistical analysis.

17. RESOURCE ASSOCIATES, INC.
53 West Jackson Boulevard, Suite 1632, Chicago, Illinois 60604

17.1

Title: CREATION OF WETLANDS HABITATS IN NORTHERN ILLINOIS

P.I. Donald Hey, Resource Associates, Inc.

S.O.F. Illinois Department of Energy and Natural Resources

F.L.C. C

Dates: December 1980 through December 1982

Obj: The project is Phase II of a study to determine the feasibility of establishing an artificial wetlands on a segment of the Des Plaines River. The wetlands project would provide a filtration mechanism for the river, improve water quality, increase flood storage capacity, and improve fish and wildlife diversity and habitat. Phase II work includes detailed design work and cost estimates for engineering, landscape development, and monitoring.

18. SOUTHERN ILLINOIS UNIVERSITY AT CARBONDALE
Carbondale, Illinois 62901

18.1

Title: COAL FINES RECOVERY AND UTILIZATION

P.I. J. W. Chen, A. C. Kent, C. B. Muchmore, Department of Thermal and Environmental Engineering, Southern Illinois University at Carbondale

S.O.F. United States Department of the Interior

F.L.C. D

Dates: October 1979 through January 1, 1983

Obj: Develop and construct a pilot plant at 2 tons per day capacity to recover coal fines from slurry ponds and to make them into a quality product in an environmentally acceptable manner. The process includes washing, oil agglomeration, and pelletization. Water in the process is treated and reused. Simultaneously, a computer model is developed to evaluate energy balance and economics of the process, including land reclamation and use.

18.2

Title: RELATIVE EFFECTS ON RECEIVING STREAM BIOTA OF REDUCED AMMONIA LEVELS IN SEWAGE DISCHARGE DUE TO INITIATING ADVANCED TERTIARY TREATMENT

P.I. Roy Heidinger and William Lewis, Fisheries Laboratory, Southern Illinois University at Carbondale

S.O.F. Illinois Department of Energy and Natural Resources

F.L.C. B

Dates: November 1981 through August 1982

Obj: To isolate and evaluate the environmental impacts of ammonia and residual chlorine in streams receiving secondary sewage effluents; and to evaluate the ecological effects of advanced tertiary effluents throughout the annual biological cycle.

19. SOUTHERN ILLINOIS UNIVERSITY AT EDWARDSVILLE
Edwardsville, Illinois 62026

19.1

Title: THE POST-MINING DEVELOPMENT OF SOUTHERN ILLINOIS STRIP-MINE LAKES

P.I. Richard B. Brugam, Department of Biological Sciences, Southern Illinois University

S.O.F. United States Department of the Interior

F.L.C. B

Dates: October 1980 through March 1983

Obj: The goal of this project is to determine if significant numbers of the acid lakes produced by surface-mining for coal neutralize with time. The approach has been to examine the sediment records of these lakes. Remains of fossils enclosed in the sediment and the chemical composition of the sediment provide information on rates of neutralization and recovery of mine lakes. The mechanisms of neutralization are also being examined.

20. STATE GEOLOGICAL SURVEY DIVISION OF THE ILLINOIS DEPARTMENT OF ENERGY AND NATURAL RESOURCES
Natural Resources Building, University of Illinois, Champaign 61820

20.1

Title: GEOLOGIC STUDIES TO IDENTIFY THE SOURCE FOR HIGH LEVELS OF RADIUM AND BARIUM IN ILLINOIS GROUNDWATER SUPPLIES

P.I. Keros Cartwright and Robert H. Gilkeson, Illinois State Geological Survey

S.O.F. United States Department of the Interior

F.L.C. C

Dates: October 1977 through March 1983

Obj: This study is an investigation of the geochemical mechanisms responsible for the occurrence of high concentrations of barium, radium-226, and radium-228 in groundwater from the Cambrian and Ordovician bedrock in certain regions of northern Illinois. The study has defined those regions of Illinois where barium and radium may occur at high concentrations in the Cambrian and Ordovician bedrock.

20.2

Title: SUPPLEMENTAL GROUNDWATER SUPPLIES FOR EIGHT COMMUNITIES - PART II

P.I. Keros Cartwright and Robert W. Ringler, Illinois State Geological Survey

S.O.F. Illinois Department of Transportation

F.L.C. C

Dates: January 1982 - On Hold

Obj: Subsurface investigations to determine the hydrogeologic setting for numerous water-short communities, mainly in Central Illinois, by reexamination of existing subsurface data and geophysical surveys to identify, characterize, and map the extent of aquifers present within practical water transport distance of each community.

20.3

Title: UNDISTURBED CORE METHOD FOR DETERMINING AND EVALUATING THE HYDRAULIC CONDUCTIVITY OF UNSATURATED GLACIAL TILL IN ILLINOIS

P.I. Keros Cartwright, Illinois State Geological Survey; and
Atef Elzeftawy, Water Resources Center, Desert Research Institute, University of Nevada

S.O.F. United States Department of the Interior

F.L.C. B

Dates: October 1978 through September 1982

Obj: This study refined the methodology of determination of the unsaturated and saturated hydraulic conductivity and soil-water diffusivity parameters of fine-grained sediments. These parameters are most useful in determining the potential environmental impact of municipal and industrial waste disposal sites and other nonpoint sources of pollution. They are also very useful in planning and managing efficient schemes of irrigation water.

20.4

Title: COLLECTION OF GEOLOGICAL AND GEOCHEMICAL DATA AND SAMPLES FROM SCHAUMBERG STATION WETLANDS

P.I. Jim Risatti, Illinois State Geological Survey

S.O.F. Illinois Department of Energy and Natural Resources

F.L.C. A

Dates: November through December 1981

Obj: The samples were collected at the wetlands before the site was altered by construction of the railway station and ancillary facilities. All field samples will be stored for two years. The information gained from the examination of the physical characteristics of the wetland will help determine civil engineering design factors (loading rates and detention time of runoff) when considering wetlands projects.

21. STATE WATER SURVEY DIVISION OF THE ILLINOIS DEPARTMENT OF ENERGY AND NATURAL RESOURCES
Water Resources Building, University of Illinois, Champaign 61820

21.1

Title: SEDIMENT DIAGENESIS IN FRESHWATER SYSTEMS

P.I. Michael J. Barcelona, Illinois State Water Survey

S.O.F. State of Illinois and Various Other Agencies

F.L.C. C

Dates: July 1980 through August 1984

Obj: The study of the role of organic compounds in the chemistry of sediment/water systems is the object of this program. Upon deposition of solid particles, a host of chemical and biologically mediated processes occur in the sediments that may result in the release of soluble trace metals and nutrients into overlying waters. Investigation of the identity and reactivity of soluble organic compounds, especially microbial metabolites, is the thrust of the preliminary stages of this program. Much of our initial activity has focussed on improved separation and analytical methods in sediments and sediment pore waters.

21.2

Title: GROUNDWATER SAMPLING FOR MONITORING PURPOSES

P.I. Michael J. Barcelona and James P. Gibb, Illinois State Water Survey

S.O.F. United States Environmental Protection Agency

F.L.C. D

Dates: June 1, 1982, through May 31, 1984

Obj: To determine the effects of well construction materials, pumps, and sampling strategies on the integrity of water samples drawn from monitoring wells. To publish a state-of-the-art manual on the subject.

21.3

Title: USEFULNESS OF SEDIMENT OXYGEN DEMAND AS A TOOL FOR IMPOUNDMENT MANAGEMENT

P.I. Michael Barcelona and Woodrow Wang, Illinois State Water Survey

S.O.F. United States Department of the Interior

F.L.C. B

Dates: October 1980 through August 1982

Obj: The goals of the project were to identify the principal chemical species that contribute to oxygen demand of freshwater sediments and to develop an optimized sediment oxygen demand technique that would lend itself to practical application in lake management efforts.

21.4

Title: A CONCEPTUAL MODEL OF EROSION AND SEDIMENTATION PROCESSES IN ILLINOIS

P.I. Nani Bhowmik, Illinois State Water Survey

S.O.F. Illinois Department of Energy and Natural Resources

F.L.C. C

Dates: September 1, 1982, through August 30, 1983

Obj: The purpose of this research project is to address Illinois's erosion/sediment issue, paying particular attention to impacts of sediment on stream biota and environment, water treatment plants, lake sedimentation; location and causes of sheet, gully, and stream bank erosion; effect of reduced field erosion on in-stream erosion; pollutants carried by sediments; and quantity and magnitude of sediment carried by Illinois streams. Despite all of the water resources inventories and data in Illinois, sediment loss from Illinois watersheds and its movement with water is one of the least understood processes within the state.

21.5

Title: HYDRAULICS OF FLOW AND SEDIMENT TRANSPORT IN THE KANKAKEE RIVER

P.I. Nani Bhowmik, Illinois State Water Survey

S.O.F. Illinois Department of Energy and Natural Resources

F.L.C. C

Dates: September 1978 through August 1983

Obj: The State Water Survey is collecting and analyzing data on the hydraulic and sediment transport aspects of the Kankakee River. The study was initiated to determine effects on the Illinois portion of the river due to man-induced management practices conducted in the State of Indiana (characterization, dredging, levee maintenance, snagging and cleaning operations). Data collection is aiding in determination of best management practices for maintenance of the river.

21.6

Title: LAKE SEDIMENTATION INVESTIGATIONS

P.I. Nani Bhowmik, Illinois State Water Survey

S.O.F. State Agencies or Municipalities

F.L.C. A

Dates: Variable for each project

Obj: To determine the rate of sedimentation, and the remaining storage volume available and to estimate the useful life of lakes in Illinois. Most of the lakes are used for public water supplies and the scheduling of remedial work or new sources of supply depend on accurate information on the existing lake. These projects are usually cooperative efforts between the Water Survey and the city or village that owns the lake.

21.7

Title: SEDIMENT MONITORING IN ILLINOIS

P.I. Nani Bhowmik, Illinois State Water Survey

S.O.F. Illinois Department of Energy and Natural Resources

F.L.C. C

Dates: September 1981 through August 1983

Obj: The project initially established a 50-station, sediment-monitoring network for measuring sediment transport through major streams and rivers throughout the state. The objective of the monitoring network was to determine rates of sediment transport and deposition due to soil erosion and their effect on water quality. Funding reductions will result in a reduction in the number of monitoring stations; however, data collection will still be conducted for approximately two-thirds of the state.

21.8

Title: DEVELOP AND TEST TECHNIQUES TO EVALUATE WEATHER MODIFICATION

P.I. Stanley A. Changnon and Chin-Fei Hsu, Illinois State Water Survey

S.O.F. National Science Foundation

F.L.C. D

Dates: July 1, 1981, through June 30, 1983

Obj: To devise innovative approaches and to study and assess statistical techniques for use in the weather modification operations. A few past operational projects in Kansas, Oklahoma, and Illinois were carefully selected for evaluation to test the statistical techniques.

21.9

Title: THE IMPACT OF WASTE FROM A WATER TREATMENT PLANT ON RECEIVING STREAM

P.I. Ralph Evans, Illinois State Water Survey

S.O.F. Illinois American Water Company

F.L.C. B

Dates: November 1, 1981, through March 31, 1983

Obj: To determine quantities, characteristics, and release patterns of waste generated within a water treatment plant and the impact of this waste on the waters and bottom sediments of receiving streams.

21.10

Title: IDENTIFICATION AND RELATIVE INFLUENCE OF NONPOINT SOURCES ON THE WATER QUALITY OF COURT CREEK

P.I. Ralph Evans, Illinois State Water Survey

S.O.F. Illinois Department of Energy and Natural Resources

F.L.C. C

Dates: December 1981 through August 1982

Obj: To develop an overall water quality management program, including specific demonstration projects, that will enhance the water quality of the streams in the 100 square mile Court Creek Watershed.

21.11

Title: PREDICTING THE INFLUENCE OF LAKE MICHIGAN DIVERSION ON THE WATER QUALITY AND CHARACTERIZING THE BOTTOM SEDIMENT OF THE ILLINOIS WATERWAY

P.I. Ralph Evans, Illinois State Water Survey

S.O.F. United States Army Corps of Engineers, and Illinois Department of Transportation, Division of Water Resources

F.L.C. C

Dates: January 1, 1982, through September 30, 1982

Obj: This particular study by the Illinois State Water Survey will examine the water quality impacts to the Illinois waterway from the Peoria pool to the Lockport powerhouse as a result of a lower diversion plan/s than earlier studied by the Corps of Engineers. In addition, the characteristics of the bottom sediments will be evaluated to determine if there are other limiting factors to improving water quality in the waterway. Water parameters to be analyzed include DO, ammonia nitrogen, nitrate and nitrite nitrogen, BOD; soil sediment parameters include particle size, moisture, volatiles, and benthic inhabitants.

21.12

Title: DETERMINATION OF THE IMPACT OF COMBINED SEWER OVERFLOWS AT PEORIA ON WATER QUALITY OF ILLINOIS WATERWAY

P.I. Ralph Evans and Thomas Butts, Illinois State Water Survey

S.O.F. City of Peoria

F.L.C. C

Dates: February 10, 1982, through July 10, 1983

Obj: To determine the effects of combined sewer overflows relative to near-shore bottom sediments and biota; to DO, NH_3, heavy metals and bacteria concentration in the water column; to areal extent of water quality changes, if any; and to a water quality model for prediction purposes.

21.13

Title: PREDICTING THE INFLUENCE OF VARYING REGIMES OF LAKE MICHIGAN DIVERSION ON WATER QUALITY OF ILLINOIS WATERWAY

P.I. Ralph Evans and Thomas Butts, Illinois State Water Survey

S.O.F. Division of Water Resources, Illinois Department of Transportation, and the United States Army Corps of Engineers

F.L.C. C

Dates: January 1, 1982, through March 30, 1983

Obj: To determine the minimum quantities of Lake Michigan diversion flows required to significantly improve the chemical and biological quality of the Illinois Waterway.

21.14

Title: ROTATING BIOLOGICAL CONTACTORS PROCESS AT PRINCETON WASTEWATER TREATMENT PLANT

P.I. Ralph Evans and Shundar Lin, Illinois State Water Survey

S.O.F. State of Illinois

F.L.C. C

Dates: January 1981 through September 1982

Obj: To evaluate the rotating biological contactors (RBC) process for secondary treatment (BOD_5 removal) and nitrification. The performance of each stage of RBC system is being investigated to provide information for RBC design criteria. Nineteen water quality parameters are being examined.

21.15

Title: INTERCOMPARISON FIELD STUDY OF DRY DEPOSITION MONITORS AND MEASUREMENT METHODS

P.I. Donald F. Gatz, Illinois State Water Survey

S.O.F. United States Environmental Protection Agency

F.L.C. D

Dates: April 1, 1981, through March 31, 1983

Obj: To host a one-month field intercomparison of dry deposition measurement methods and prepare a report comparing their results. These studies are providing methodologies for further studies on the relationship of dry deposition to water pollution.

21.16

Title: MEASUREMENT OF CRUSTAL AEROSOL COMPOSITION

P.I. Donald F. Gatz, and Gary J. Stensland, Illinois State Water Survey

S.O.F. National Science Foundation, Atmospheric Chemistry

F.L.C. D

Dates: March 1, 1981, through February 28, 1983

Obj: To develop and apply methods of generating soil aerosols for measurement of elemental composition; methods include the use of a wind tunnel, laboratory airjet devices, bulk sampling, and dry sieving with conventional sieves and ultrasonic techniques. These studies are providing methodologies for further studies on acid precipitation.

21.17

Title: SURVEY OF THE BENTHIC MACROINVERTEBRATES FOUND IN THE ALTON POOL OF THE ILLINOIS RIVER

P.I. Thomas Hill, Illinois State Water Survey

S.O.F. State of Illinois

F.L.C. A

Dates: June 1, 1981, and continuing

Obj: An attempt will be made to characterize the kinds and densities of the benthic macroinvertebrates found in the Alton Pool and relate their distribution to such factors as substrate type, particle size, mile point, depth, location on transect, and proximity to navigation.

21.18

Title: ILLINOIS WATER INVENTORY PROGRAM

P.I. James Kirk, Illinois State Water Survey

S.O.F. Illinois Department of Energy and Natural Resources

F.L.C. B

Dates: 1978 and continuing

Obj: The Illinois Water Inventory Program has been collecting water withdrawal data for use in the planning and management of water resources since 1978. The goal of the program is to document and disseminate water withdrawal information useful to the state. Current public interest in agricultural irrigation also suggests a need to improve the collection of data about irrigation in Illinois. A published brochure will address the competition for water issue and illustrate the latest water use patterns, including agricultural irrigation.
(see 21.32 and 22.9)

21.19

Title: AERATION-DESTRATIFICATION OF LAKE EUREKA USING A LOW ENERGY DESTRATIFIER

P.I. V. Kothandaraman, Illinois State Water Survey

S.O.F. City of Eureka and the State of Illinois

F.L.C. B

Dates: September 1, 1981, and continuing

Obj: Lake Eureka served as a water supply source to the city until 1979 when it switched to ground water as a source. The change was necessitated because of severe taste and odor problems in the finished waters. A lake management technique developed by the Water Survey involving total destratification of the lake in combination with periodic in-lake chemical treatments showed remarkable improvements in lake water quality characteristics. The city reverted to the lake as a water supply source on April 13, 1982. The annual savings in power and chemical costs are estimated to be between $35,000 and $40,000.

21.20

Title: CONTINUED AERATION/DESTRATIFICATION IN LAKE CATHERINE, FOX CHAIN OF LAKES

P.I. V. Kothandaraman, Illinois State Water Survey

S.O.F. Illinois Department of Transportation, Division of Water Resources

F.L.C. B

Dates: May 1, 1981, through December 31, 1982

Obj: An aerator device was installed in Lake Catherine in 1978 and has been in use since then. The aerator is operated continuously during the period - mid May to mid October each year. Oxygen resources of the lake and the water clarity in the lake have significantly improved. Fishing in the lake was reported to have improved. Two to four algicide applications were made to the lake during the past years and none is anticipated in 1982.

21.21

Title: DIAGNOSTIC-FEASIBILITY STUDY OF JOHNSON SAUK TRAIL LAKE (PHASES I & II)

P.I. V. Kothandaraman, Illinois State Water Survey

S.O.F. Department of Conservation, United States Environmental Protection Agency

F.L.C. C

Dates: January 1, 1981, through January 14, 1982

Obj: The objectives are to delineate the current lake conditions, and causes of degradation and to identify and quantify the sources of nutrients and other pollutants reaching the lake. Based on this information, various lake management alternatives will be evaluated. An economically and technically feasible lake management plan will be developed to restore and protect the lake water quality for improved fishing and other recreational opportunities.

21.22

Title: DIAGNOSTIC-FEASIBILITY STUDY OF LAKE LE-AQUA-NA (PHASES I AND II)

P.I. V. Kothandaraman, Illinois State Water Survey

S.O.F. United States Environmental Protection Agency and Illinois Department of Conservation

F.L.C. C

Dates: January 1, 1981, through January 14, 1983

Obj: The objectives are to delineate the current lake conditions and causes of degradation and to identify and quantify the sources of nutrients and other pollutants reaching the lake. Based on this information, various lake management alternatives will be evaluated. An economically and technically feasible lake management plan will be developed to restore and protect the lake water quality for improved fishing and other recreational opportunities.

21.23

Title: DIAGNOSTIC STUDIES OF GROWING SEASON RAINFALL FLUCTUATIONS IN CENTRAL NORTH AMERICA

P.I. Peter J. Lamb, Illinois State Water Survey

S.O.F. National Science Foundation, Climate Dynamics Program

F.L.C. D

Dates: September 1, 1981, through February 28, 1984

Obj: The fundamental goal is to quantify the climate system processes contributing to the late spring-summer rainfall of central North America for several years when this rainfall exhibited contrasting temporal and spatial patterns. Rawinsonde soundings will be used to evaluate each growing season's temporal and spatial variations in tropospheric divergence, static stability, and vertical motion, and in the amount, transport, and divergence of atmospheric water vapor. Since much of the late spring-summer water vapor over central North America emanates from the Gulf of Mexico, Caribbean Sea, and Western subtropical North Atlantic, we are also investigating the variability of the evaporation from these waters and the factors controlling it.

21.24

Title: WORKSHOP TO ASSESS THE PRESENT AND POTENTIAL USE OF CLIMATE INFORMATION BY THE PRIVATE AGRICULTURAL SECTOR

P.I. Peter J. Lamb, Illinois State Water Survey

S.O.F. National Science Foundation, Climate Dynamics Research Program

F.L.C. B

Dates: March 15, 1982, through September 14, 1983

Obj: To use a questionnaire survey and a workshop to establish the present use of climate information by this sector, the maximum possible such use for the future, the impediments to achieving this potential, and the research needed to assist the potential being realized and hence the minimization of the adverse socioeconomic consequences of climatic variability.

21.25

Title: FLOODPLAIN INFORMATION DEPOSITORY, ENGINEERING AND DISCHARGE REVIEW

P.I. John Lardner, Illinois State Water Survey

S.O.F. Illinois Department of Energy and Natural Resources

F.L.C. B

Dates: September 1981 through August 1983

Obj: The objective of this project is to provide maintenance of the state floodplain information repository. The repository provides technical data relevant to the information needs of state and federal programs, including the National Flood Insurance program. Information on floodplain studies, review of 100-year flood discharges, and other services are provided. An update of the computerized data research and retrieval system and revision of an informational brochure will be included.

21.26

Title: A DRAINAGE STUDY AT HENNEPIN CANAL NEAR PRINCETON

P.I. Ming T. Lee, Illinois State Water Survey

S.O.F. Illinois Department of Conservation

F.L.C. B

Dates: July 1, 1982, through September 15, 1982

Obj: Three main objectives are as follows: (1) to gather available data and field information regarding a small watershed in Bureau County and the culverts connecting to Bureau Creek; (2) to analyze all the data relating to gross erosion, sediment deposition, flood stage and rainfall-runoff process in the area; (3) to propose solutions to eliminate the drainage problems in the area.

21.27

Title: EROSION AND SEDIMENTATION ASSESSMENT IN THE BLUE CREEK WATERSHED, PIKE COUNTY, ILLINOIS

P.I. Ming T. Lee, Illinois State Water Survey

S.O.F. Illinois Environmental Protection Agency

F.L.C. C

Dates: September 1979 through February 1983

Obj: The primary objectives are: (1) to monitor and evaluate the most viable agricultural nonpoint source pollution control strategy; (2) to monitor and evaluate the strategic points within the watershed for documenting the movement of pollutants based on a continuous time frame and storm events.
(see 8.4)

21.28

Title: MONITORING AND EVALUATING THE RURAL CLEAN WATER PROGRAM IN HIGHLAND SILVER LAKE WATERSHED

P.I. Ming T. Lee, Illinois State Water Survey

S.O.F. Agricultural Stabilization and Conservation Service, United States Department of Agriculture

F.L.C. C

Dates: June 1, 1981, through December 31, 1986

Obj: The objectives of this project are: (1) to identify the nature and magnitude of nonpoint source pollution in surface runoff from agricultural watershed; (2) to determine and evaluate which Best Management Practices are most effective in reducing agricultural nonpoint source pollution.
(see 8.3)

21.29

Title: FIELD DETERMINATION OF VERTICALLY AVERAGED LONGITUDINAL DISPERSIVITY

P.I. Thomas G. Naymik, Illinois State Water Survey

S.O.F. Oklahoma State University

F.L.C. B

Dates: February 1, 1982, through August 31, 1982

Obj: To determine the longitudinal dispersivity of dissolved constituents in groundwater in a field situation over as long a time period and travel distance as feasible. To satisfy the assumption of vertical averaging inherent in planar mass transport models and thereby provide input values of dispersivities for these models.

21.30

Title: CORROSION PRODUCT - CORROSION RATE - WATER QUALITY INVESTIGATION IN BUILDING SYSTEMS

P.I. C. H. Neff, Illinois State Water Survey

S.O.F. United States Environmental Protection Agency

F.L.C. D

Dates: April 13, 1981, through April 12, 1982

Obj: The primary objective of the investigation is to determine the corrosion rates of copper and galvanized steel in seven water supplies of varying quality in Illinois. After determining the water chemistry and corrosion products from nineteen test sites over a two-year period, the data will be correlated to assist the USEPA in setting limits on corrosivity and corrective treatment for water supplies.

21.31

Title: GROUNDWATER AND ITS RELATIONSHIP TO SURFACE WATER IN THE SANGAMON RIVER BASIN (PART I)

P.I. Michael O'Hearn, Illinois State Water Survey

S.O.F. Illinois Environmental Protection Agency

F.L.C. C

Dates: September 1, 1982, through June 30, 1983

Obj: To provide pertinent information regarding the groundwater resources of the Sangamon River basin to be used in the development of a comprehensive plan for the long-term management of the water resources of the basin. To gather, compile, summarize, analyze, and interpret collected data in such a way as to make this information more useful in the planning and management process.

21.32

Title: STATEWIDE WATER USE INVENTORY

P.I. Ellis W. Sanderson and James R. Kirk, Illinois State Water Survey

S.O.F. United States Geological Survey, Water Resources Division

F.L.C. C

Dates: October 1, 1981, through September 30, 1982

Obj: To furnish 1980 aggregated withdrawal data to the National Water Use Data System. To update master mailing lists for public water supply systems and self-supplied industries for 1981 withdrawals. To canvass public water supplies and self-supplied industries, acquiring and storing water withdrawal data by township, hydrologic unit, and aquifer system. To develop a mailing list of irrigation well owners. To answer requests for water use data.
(see 21.18 and 22.9)

21.33

Title: GROUNDWATER LEVEL ANALYSIS BY COMPUTER MODELING, AMERICAN BOTTOMS GROUNDWATER STUDY

P.I. Richard J. Schicht, Illinois State Water Survey

S.O.F. United States Army Corps of Engineers, St. Louis District

F.L.C. C

Dates: August 13, 1981, through November 5, 1982

Obj: To prepare a history of groundwater levels in the American Bottoms. To develop and calibrate a groundwater-level computer model. To determine existing and to predict future groundwater-level exceedance probability without any proposed improvements, and to evaluate various alternatives to reduce groundwater levels. To prepare a user's manual for the computer model and provide training in its use.

21.34

Title: STUDY OF ATMOSPHERIC POLLUTANT SCAVENGING

P.I. Richard G. Semonin, Assistant Chief, Illinois State Water Survey

S.O.F. United States Department of Energy

F.L.C. D

Dates: Continuous

Obj: To measure and characterize the precipitation chemistry of North America, especially the eastern United States, to estimate the temporal and spatial variability of wet deposited pollutants, to estimate the sources (natural and man-made), and to assess the effects of source strength variations on wet deposition.

21.35

Title: EFFECTS OF DISCRETIONARY DIVERSION MANAGEMENT ON DISSOLVED OXYGEN RESOURCES OF ILLINOIS RIVER*

P.I. Krishan Singh and Thomas Butts, Illinois State Water Survey

S.O.F. Illinois Environmental Protection Agency

F.L.C. B

Dates: November 1, 1981, through November 1, 1982

Obj: To develop an optimal diversion scheme whereby Lake Michigan waters may be introduced into the waters of the Illinois Waterway that will have the maximum beneficial impact on the downstream dissolved oxygen resources of the waterway.

*A part of the project not related to 7-day, 10-year flow and flow system model portion of project.

21.36

Title: FEASIBILITY STUDY FOR THE LAKE OF THE WOODS

P.I. Krishan Singh and Ming T. Lee, Illinois State Water Survey

S.O.F. Illinois Environmental Protection Agency

F.L.C. B

Dates: August 1, 1981, through October 31, 1982

Obj: To identify and discuss the alternatives for pollution control and lake restoration; to identify and justify the most economical and practical alternatives for the Lake of the Woods; and to explore the costs and benefits associated with implementation of the desired alternatives.

21.37

Title: SEVEN-DAY, TEN-YEAR LOW FLOWS, FLOW SYSTEM MODEL, AND EFFECTS OF DISCRETIONARY DIVERSION MANAGEMENT ON THE DISSOLVED OXYGEN RESOURCES OF THE ILLINOIS RIVER

P.I. Krishan Singh and Ralph L. Evans, Illinois State Water Survey

S.O.F. Illinois Environmental Protection Agency

F.L.C. C

Dates: November 1, 1981, through September 30, 1982

Obj: To develop a 7-day, 10-year low flow map for the 1980 condition of effluents for the Des Plaines, DuPage, Fox, and Chicago waterways; to develop an Illinois River flow system model for simulation and increased diversion analyses; and to determine desirable discretionary diversion management and its effect on the dissolved oxygen resources of the Illinois River.
(see 8.6)

21.38

Title: CENTRAL ANALYTICAL LABORATORY FOR NATIONAL ATMOSPHERIC DEPOSITION PROGRAM

P.I. Gary J. Stensland and Richard G. Semonin, Illinois State Water Survey

S.O.F. Individual monitoring sites via many different state, federal, and private agencies

F.L.C. D

Dates: July 1, 1978, through June 30, 1983 (renewed annually)

Obj: To analyze samples for the National Atmospheric Deposition Program (NADP). The objectives of NADP are to operate a national atmospheric deposition network to determine spatial and temporal trends and to coordinate research on effects of this deposition.

21.39

Title: CHAMPAIGN, ILLINOIS NATIONWIDE URBAN RUNOFF PROGRAM

P.I. Michael L. Terstriep, Surface Water Section, Illinois State Water Survey

S.O.F. Illinois Environmental Protection Agency

F.L.C. C

Dates: July 1, 1982, through March 31, 1983

Obj: Original: determination of effectiveness of municipal street sweeping as urban runoff quality control measure. Current: assessment of impact of urban storm runoff on receiving stream.
(see 8.7)

21.40

Title: INTERACTIVE BASINWIDE WATER ASSESSMENT MODEL

P.I. Michael L. Terstriep and Krishan P. Singh, Illinois State Water Survey

S.O.F. Illinois Department of Transportation

F.L.C. C

Dates: January, 1982 - on hold

Obj: A methodology has been developed that will combine complex analysis of streamflow records with simple translation algorithms to provide an assessment of water availability at any stream location in the watershed. Each stream gage record will be adjusted for artificial withdrawals and returns within the watershed. The adjusted record will be analyzed to produce the product needed by users.

21.41

Title: UPDATE OF BULLETIN 51 AND SIDE-CHANNEL RESERVOIR STORAGE DESIGN

P.I. Michael L. Terstriep and Vernon Knapp, Illinois State Water Survey

S.O.F. Illinois Department of Transportation

F.L.C. C

Dates: June 30, 1978, through April 30, 1982

Obj: The goal of the study was to update Bulletin 51 with additional streamflow data for the period 1963 through 1978. The bulletin contains processed data for 164 gaging stations in Illinois, which allow a yield to be calculated for a reservoir anywhere in the state. Hydrologic design of side-channel reservoirs provides the appropriate analysis of data and formulation of side-channel storage design techniques.

21.42

Title: HYDROGEOLOGIC ASSESSMENT OF THE NORTHERN MIDWEST REGIONAL AQUIFER SYSTEM IN ILLINOIS

P.I. Adrian P. Visocky, Illinois State Water Survey

S.O.F. United States Geological Survey, Water Resources Division

F.L.C. B

Dates: April 1, 1979, through March 31, 1982

Obj: To work with USGS personnel to interpret aquifer and formation test data and water quality data. To work with the staffs of the USGS Water Resources Division and the Illinois State Geological Survey and to assume the lead role in developing a joint report of the Cambrian-Ordovician and basal Cambrian aquifer units in Illinois.

21.43

Title: IMPACT OF LAKE MICHIGAN ALLOCATIONS ON THE CAMBRIAN-ORDOVICIAN AQUIFER SYSTEM

P.I. Adrian Visocky, Illinois State Water Survey

S.O.F. Illinois Department of Transportation, Division of Water Resources

F.L.C. B

Dates: Just completed, July 1982

Obj: Overpumping of the Cambrian-Ordovician aquifer in the Chicago area has caused severe water level declines in portions of Cook, DuPage, Kane, and Will Counties. Recent changes in the accounting procedure involved in diversion of Lake Michigan water have released more water for public supplies. As communities currently withdrawing water from deep wells receive allocations of Lake Michigan water, deep pumpage will decrease in those areas and water levels will partially recover. Major cones of depression will shift southward to Joliet and westward to the Fox River communities north of Aurora. Critically low water levels caused by pumpage in these areas will result in a loss of as much as 19% of pumping capacity by the year 2020. Despite lake allocations, deep pumpage will grow again and will still exceed the practical sustained yield (65 mgd) of the aquifer. Continued growth in Wisconsin pumpage will also contribute an estimated additional decline of about 80 feet near the state line between 1980 and 2020.

21.44

Title: AQUATIC BIOASSAY BY USING COMMON DUCKWEED

P.I. W. C. Wang, Illinois State Water Survey

S.O.F. State of Illinois

F.L.C. B

Dates: January 1, 1982, and continuing

Obj: The objective is to develop a methodology for aquatic toxicological study by using common duckweed. Heavy metals Cd, Cu, Ni, and Zn are tested for their effect on duckweed. Special emphasis is to determine the precision and sensitivity of the duckweed bioassay method.

21.45

Title: NITROBACTER AS AN INDICATOR OF TOXICITY IN WASTEWATER

P.I. W. C. Wang, Illinois State Water Survey

S.O.F. Illinois Department of Energy and Natural Resources

F.L.C. C

Dates: February 1982 through August 1983

Obj: The objective is to assess the effectiveness and simplicity of using Nitrobacter as a method which can indicate toxins in wastewater. The first phase of research consisted of growing the Nitrobacter and testing it with model toxins. The second phase includes verification of the work in phase one and actually testing with "real" samples from treatment plants, streams, and lakes.

21.46

Title: POTENTIAL NITRATE CONTAMINATION OF GROUNDWATER IN THE ROSCOE AREA, WINNEBAGO COUNTY, ILLINOIS

P.I. H. Allen Wehrmann, Illinois State Water Survey, and Illinois Department of Energy and Natural Resources

S.O.F. Winnebago County Board, Rockford, Illinois, and Illinois Department of Energy and Natural Resources

F.L.C. C

Dates: February 1, 1982, through January 31, 1983

Obj: To carry out a study to provide a better understanding of the regional groundwater system in Winnebago County and how this system interacts with man-made influence to affect groundwater quality. To assess current and projected effects on groundwater due to continued development of the area so that intelligent decisions and planning can be implemented in the future development of the Roscoe area.

llinois 61801

WATER FLOW FROM SHEFFIELD LOW-LEVEL
TO THE HYDROLOGIC BOUNDARY

ry W. Mackey, United States Geological Survey

cal Survey

ugh September 30, 1982

ine possible flow paths through a pebbly sand
ie hydrologic properties of this unit and the
of the groundwater.

C CHARACTERISTICS OF STRIP MINES

and Jane V. Borghese, United States Geological

logical Survey

hrough September 30, 1982

fects of strip mining and subsequent reclamation
a small basin and to develop models that could
cts.

TECHNIQUES AND THEIR EFFECT ON UNIT-HYDROGRAPH
S

ed States Geological Survey

h September 30, 1982

f use of two rainfall loss-estimating
with which a hydrograph can be modeled;
rence in computed values of two unit
ne of concentration and storage
e of two rainfall loss-estimating

22.4

Title: AN EVALUATION OF BEDLOAD DATA IN ILLINOIS

P.I. Julia B. Graf, United States Geological Survey

S.O.F. United States Geological Survey

F.L.C. B

Dates: October 1, 1982, through September 30, 1982

Obj: To evaluate bedload data from 13 stations with the Helley-Smith sampler; to examine possibility of supplementing bedload records by indirect methods and to compare these methods with data collected outside Illinois; and to evaluate the suitability of each bedload sampling station.

22.5

Title: DISPERSION CHARACTERISTICS OF ILLINOIS STREAMS

P.I. Julia B. Graf and George Garklavs, United States Geological Survey

S.O.F. Cooperative

F.L.C. C

Dates: January 1, 1975, through September 30, 1982

Obj: To obtain a statewide data base of travel times and dispersion characteristics in Illinois streams and to develop a relationship between these data and basin or streamflow characteristics.

22.6

Title: EROSION AND LANDFORM MODIFICATION AT SHEFFIELD, ILLINOIS, LOW-LEVEL RADIOACTIVE WASTE DISPOSAL SITE

P.I. John R. Gray, United States Geological Survey

S.O.F. United States Geological Survey

F.L.C. D

Dates: October 1, 1980, through September 30, 1984

Obj: To determine geomorphic changes due to erosion and sedimentation; to determine potential for erosion and slumping and to identify problem areas; and to develop a comparative data base.

22.7

Title: HYDROLOGY OF UNSATURATED FLOW THROUGH POROUS MEDIA AT THE LOW-LEVEL RADIOACTIVE WASTE DISPOSAL SITE NEAR SHEFFIELD, ILLINOIS

P.I. Richard W. Healy, United States Geological Survey

S.O.F. United States Geological Survey

F.L.C. E

Dates: October 1, 1980, through September 30, 1984

Obj: To quantify and qualify the mechanisms that control the movement of water and transport of radionuclides from disposal trenches through the unsaturated zone to the water table.

22.8

Title: PRECIPITATION-RUNOFF MODELING OF COAL STRIP-MINING AREAS OF ILLINOIS

P.I. Alan R. Klinger, United States Geological Survey

S.O.F. United States Geological Survey

F.L.C. D

Dates: October 1, 1981, through September 30, 1983

Obj: To document the effects of strip mining and subsequent reclamation on the hydrology of small basins and to evaluate a model that can simulate these effects.

22.9

Title: ILLINOIS WATER USE DATA PROGRAM

P.I. T. R. Lazaro, United States Geological Survey

S.O.F. United States Geological Survey

F.L.C. C

Dates: 1978 through present

Obj: To collect, store, and publish a water-use inventory for the State of Illinois. To categorize by county and hydrologic unit, water withdrawals and water returns on an annual basis.
(see 21.18 and 21.32)

22.10

Title: EVALUATION OF SURFACE WATER DATA-COLLECTION NETWORK FOR ILLINOIS

P.I. Dean M. Mades, United States Geological Survey

S.O.F. Cooperative

F.L.C. C

Dates: October 1, 1981, through September 30, 1983

Obj: To document present and future streamflow-data needs; to evaluate available streamflow data to determine if these needs are being met; and to provide guidelines for maintaining a cost-effective surface-water network that satisfies these needs.

22.11

Title: TRITIUM MIGRATION IN A SHALLOW DOLOMITE AQUIFER NEAR CHICAGO, ILLINOIS

P.I. James R. Nicholas, United States Geological Survey

S.O.F. United States Geological Survey

F.L.C. D

Dates: October 1, 1981, through September 30, 1984

Obj: To define the hydrologic, geologic, and tritium transport characteristics of the dolomite aquifer and to calibrate and verify a transport model that can assist in management of the aquifer.

22.12

Title: HYDROGEOLOGIC ASSESSMENT OF THE NORTHERN MIDWEST REGIONAL AQUIFER IN ILLINOIS

P.I. Marvin G. Sherrill, Dean M. Mades, and James R. Nicholas, United States Geological Survey

S.O.F. United States Geological Survey

F.L.C. E

Dates: October 1, 1978, through September 30, 1982

Obj: To supply needed hydrogeologic data to the Regional Aquifer System Analysis (RASA) while refining our understanding of the deep aquifers in Illinois.

22.13

Title: GROUNDWATER QUALITY OF THE AMERICAN BOTTOMS, ILLINOIS

P.I. John K. Stamer and David C. Voelker, United States Geological Survey

S.O.F. United States Geological Survey

F.L.C. C

Dates: October 1, 1981, through September 30, 1982

Obj: To determine baseline groundwater quality; to determine which contaminants occur and areal extent of contamination; and to determine suitability of the groundwater for discharge to surface waters or for other beneficial uses.

22.14

Title: WASTE-LOAD ASSIMILATIVE CAPACITY OF THE SANGAMON RIVER, DECATUR TO SPRINGFIELD, ILLINOIS

P.I. John K. Stamer and David C. Voelker, United States Geological Survey

S.O.F. Cooperative

F.L.C. C

Dates: April 1, 1982, through September 30, 1982

Obj: To evaluate the waste-load assimilative capacity for a critical low-flow condition; to compute concentration profiles of constituents including dissolved oxygen; and to evaluate combinations of waste loads from the Decatur wastewater plant and flows from Lake Decatur.

22.15

Title: WATER MONITORING IN COAL-MINING AREAS

P.I. E. E. Zuehls, United States Geological Survey

S.O.F. United States Geological Survey

F.L.C. C

Dates: October 1, 1978, through September 30, 1983

Obj: To prepare summary reports that are designed to be useful to coal mine owners and operators, and to others by presenting information about the existing hydrologic conditions and by identifying sources of hydrologic information within selected coal-producing areas of the state.

23. UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
Urbana-Champaign, Illinois 61801

23.1

Title: DEVELOPMENT OF HYDROLOGIC AND WATER QUALITY INSTREAM FLOW NEEDS ASSESSMENT PROCEDURE FOR ILLINOIS

P.I. Vahid Alavian, Department of Civil Engineering, University of Illinois at Urbana-Champaign

S.O.F. Water Resources Center, University of Illinois at Urbana-Champaign

F.L.C. B

Dates: July 1980 through June 1982

Obj: The objective of the study was to calibrate and verify the hydraulic simulation component of the U.S. Fish and Wildlife Service's IFG2 model, developed for the assessment of aquatic habitat in high gradient western streams, for typically low gradient midwestern streams. It was concluded that the model can be modified and calibrated for use in low gradient midwestern streams provided that the stagnant water areas are identified and eliminated from the calibration data.

23.2

Title: HYDRAULIC AND AQUATIC CHARACTERIZATION OF RECIRCULATING REGIONS IN RIVERS

P.I. Vahid Alavian and Edwin E. Herricks, Department of Civil Engineering, University of Illinois at Urbana-Champaign

S.O.F. United States Department of the Interior

F.L.C. A

Dates: January 1, 1982, through December 30, 1982

Obj: To experimentally and analytically investigate the hydraulic properties (i.e., flow pattern, velocity distribution, and mass exchange) of recirculating or partially stagnant regions of rivers and streams. The results will be useful in estimating the residence time of pollutants trapped in the recirculating regions in an effort to more realistically predict the fate of pollutants in rivers and streams. In addition, the results will be used in evaluating the suitability of recirculating regions as habitat for aquatic life.

23.3

Title: ILLINOIS RURAL WATER DISTRICTS: AN INQUIRY

P.I. D.L. Chicoine, John A. Quinn, and Margaret R. Grossman, Department of Agricultural Economics, University of Illinois at Urbana-Champaign

S.O.F. United States Department of the Interior

F.L.C. B

Dates: July 1981 through June 1983

Obj: The rural water systems or districts of Illinois are being studied from economic, legal, and spatial-planning perspectives. Economic data is being collected to estimate variable operating costs, capital cost, and service demand models. The organization and legal structure of district governing bodies is being investigated. And the implications of the districts' growth for land use planning, population distribution, and other local policies will be identified.

23.4

Title: DESIGNS OF MARKETABLE WATER PERMIT SYSTEMS FOR HUMID REGIONS

P.I. J.W. Eheart and E.D. Brill, Jr., Department of Civil Engineering, University of Illinois at Urbana-Champaign; and Randolph M. Lyon, Department of Economics, University of Texas at Austin

S.O.F. United States Department of the Interior

F.L.C. B

Dates: July 1980 through June 1983

Obj: The objectives of this study are to develop and evaluate systems of rules and regulations for the management of water withdrawals in humid regions. The development of several systems, a thorough investigation of the considerations involved in designing such a system, and a qualitative evaluation of the alternative systems has been completed. In addition, a quantitative comparison of several management systems has been undertaken, using estimated values of water for corn irrigation and water supply (river flow) data for the Little Wabash River at Clay City, Illinois.

23.5

Title: METHODS FOR EVALUATION OF ASSESSMENT OF TRANSFERABLE DISCHARGE PERMITS FOR BIOLOGICAL OXYGEN DEMAND CONTROL

P.I. J. W. Eheart and E. D. Brill, Jr., Department of Civil Engineering, University of Illinois at Urbana-Champaign

S.O.F. National Science Foundation

F.L.C. D

Dates: August 1979 through December 1981

Obj: The objectives of the project are to: develop several environmentally meaningful definition bases for BOD permits and to test each for cost efficiency and equity, case of implementation, certainty of outcome, and water quality impacts. Several alternative rule sets have been developed and compared. Seemingly attractive rules may include zoning and transfer restrictions.

23.6

Title: PUBLIC WATERS IN ILLINOIS: AN INQUIRY AND ANALYSIS

P.I. Margaret R. Grossman, Department of Agricultural Economics, University of Illinois at Urbana-Champaign

S.O.F. Water Resources Center, University of Illinois at Urbana-Champaign

F.L.C. B

Dates: July 1982 through June 1983

Obj: This study is directed at an evaluation of the meaning of "public waters" in Illinois. It examines the judicial and legislative definitions of this term, with emphasis on the ability of state agencies and instrumentalities to develop, conserve, and protect public rights and to regulate the use of water resources. The research compares presently exercised control with potential regulatory power over Illinois waters.

23.7

Title: DEVELOPMENT OF INSTREAM FLOW REQUIREMENTS FOR AQUATIC INSECTS

P.I. Edwin E. Herricks, Department of Civil Engineering, University of Illinois at Urbana-Champaign

S.O.F. United States Department of the Interior

F.L.C. C

Dates: October 1980 through September 1983

Obj: The objectives of this project are to identify instream flow needs of aquatic insects and improve the assessment methods for instream flow needs through incorporation of aquatic insect (primary consumer) components. Both laboratory and field studies are being conducted. Initial project activities sought to establish a baseline of information for experimental studies. It is expected that the experimental results will include: (1) identification of current requirements and selectivity of three species of insects; (2) life stage specific microhabitat selection for these species; (3) species associations during the colonization process; (4) effects of periphyton on colonization; and (5) effects of sediment accumulation and organic carbon on aquatic insect distribution in defined hydraulic/flow conditions.

23.8

Title: EFFECTS OF BARGE PASSAGE ON THE NAVIGATION REACH OF THE KASKASKIA RIVER

P.I. Edwin E. Herricks, Department of Civil Engineering, University of Illinois at Urbana-Champaign

S.O.F. Upper Mississippi River Basin Commission

F.L.C. C

Dates: March 1981 through September 1981

Obj: An experimental study was conducted by observing the effect of barge passage on physical, chemical, and biological conditions in a reach of the Kaskaskia navigation channel typically not used for transportation. Results indicated increased suspended solids and invertebrate drift activity associated with barge passage. Differences were noted between upstream and downstream passage effects. Effects also differed between low-flow and high-flow conditions.

23.9

Title: STATE OF ILLINOIS WATER QUALITY MANAGEMENT INFORMATION SYSTEM - BIOLOGICAL COMPONENT

P.I. Edwin E. Herricks, Department of Civil Engineering, University of Illinois at Urbana-Champaign

S.O.F. Illinois Environmental Protection Agency

F.L.C. C

Dates: 1979 through June 1981

Obj: An interactive computer-based system was developed to provide information on fisheries habitat and water quality requirements, as well as statewide fisheries distribution information. Habitat requirements were developed through use of hydraulic geometry equations. Fish species preference for depth, velocity, substrate type, as well as changing preference for spawning, were provided in a fisheries matrix. Fisheries distribution information for each of the 18 river basins in Illinois was provided in relation to seven watershed area categories. The final report on the project has been submitted.

23.10

Title: ILLINOIS INSTREAM FLOW NEEDS ASSESSMENT (KANKAKEE)

P.I. Edwin E. Herricks and J. Wayland Eheart, Department of Civil Engineering, University of Illinois at Urbana-Champaign

S.O.F. Illinois Department of Transportation

F.L.C. C

Dates: June 30, 1981, through June 30, 1982

Obj: Specific framework studies contemplated as part of this research for Kankakee River instream flow needs assessment include analysis of withdrawal needs and potentials, compilation of other pertinent data, and support for detailed instream flow assessment activities.

23.11

Title: ILLINOIS INSTREAM FLOW NEEDS ASSESSMENT (SANGAMON)

P.I. Edwin E. Herricks and J. Wayland Eheart, Department of Civil Engineering, University of Illinois at Urbana-Champaign

S.O.F. Title III Federal Grant and Illinois Department of Transportation

F.L.C. C

Dates: July 1981 - on hold

Obj: Specific framework studies contemplated as part of this research for Sangamon River instream flow needs assessment include analysis of withdrawal needs and potentials and continuing development of instream flow assessment methodologies. Specifically, a methodology is being developed for extrapolation of habitat values for streams of small size.

23.12

Title: ILLINOIS STATEWIDE INSTREAM FLOW NEEDS ASSESSMENT

P.I. Edwin E. Herricks and J. Wayland Eheart, Department of Civil Engineering, University of Illinois at Urbana-Champaign

S.O.F. Illinois Department of Transportation

F.L.C. D

Dates: 1979 and continuing

Obj: The continuation of the assessment of instream flow needs in all major river basins in Illinois has included evaluation of instream flow needs for the Rock River basin. Research has included framework development of analysis techniques and analysis of water use patterns in the basin. Hydrologic models were calibrated to data from three reaches in the Rock River basin. Through the use of the U.S. Fish and Wildlife Service incremental methodology, habitat frequency information has been developed for each reach for several important fish species. Comprehensive analysis has included water quality and quantity investigations.

23.13

Title: TESTING OF MITIGATION STRUCTURES IN NAVIGATION CANALS

P.I. Edwin E. Herricks and Vahid Alavian, Department of Civil Engineering, University of Illinois at Urbana-Champaign

S.O.F. University of Illinois

F.L.C. A

Dates: January 1982 through December 1982

Obj: Research is being conducted to determine optimum configurations for structures that will mitigate the loss of habitat created by canalization of the Kaskaskia River. A physical-hydraulic model has been constructed and detailed studies are underway to determine the effectiveness of bank notching to provide shallow water habitat protected from high-velocity conditions. A number of channel deflection structures will be tested to determine the factors that will control sedimentation and scour to maintain proper habitat conditions.

23.14

Title: INFLUENCE OF CHLORINATION AND THE DISTRIBUTION SYSTEM ON MUTAGENS IN A POTABLE WATER SUPPLY

P.I. James B. Johnston, Institute for Environmental Studies, University of Illinois at Urbana-Champaign

S.O.F. United States Department of the Interior

F.L.C. C

Dates: July 1979 through March 1982

Obj: This study examined the distribution system of a central Illinois water supply as a source of mutagens in potable water. Both promutagens and chlorination-related, direct-acting mutagens were recovered by absorption on polyurethane foam and quantitated by the Ames Salmonella/microsome reversion assay. Assays indicated that the promutagens originated in the distribution system and that the direct-acting activity increased somewhat within it. Hypotheses on the origins of these mutagens are being examined further.

23.15

Title: INDEX OF BIOTIC INTEGRITY FOR USE IN ASSESSMENT OF WATER RESOURCE QUALITY

P.I. James R. Karr, Department of Ecology, Ethology and Evolution, University of Illinois at Urbana-Champaign

S.O.F. United States Environmental Protection Agency

F.L.C. D

Dates: October 1981 through December 1982

Obj: Test a recently developed multiparameter Index of Biotic Integrity using fish communities. The index is being evaluated in streams from the Dakotas and Nebraska to Michigan, Indiana, and Kentucky.

23.16

Title: HABITAT STRUCTURE AND FISH COMMUNITIES IN WARMWATER STREAMS

P.I. James R. Karr, Department of Ecology, Ethology and Evolution, University of Illinois at Urbana-Champaign

S.O.F. United States Environmental Protection Agency

F.L.C. D

Dates: November 1978 through November 1982

Obj: Identify the proximate and ultimate factors responsible for organization of fish communities with special emphasis on role of habitat structure, food availability, predation, and aspects of land use.

23.17

Title: PHYSICAL CRITERIA FOR AQUATIC HABITATS NECESSARY TO ACHIEVE FISHABLE WATERS IN MIDWEST STREAMS

P.I. James R. Karr, Department of Ecology, Ethology and Evolution, University of Illinois at Urbana-Champaign

S.O.F. United States Environmental Protection Agency

F.L.C. C

Dates: October 1980 through April 1982

Obj: Develop a "state-of-the-art" synthesis on the importance of physical characteristics of aquatic habitats to the structure of fish communities in midwest streams. A final report, now in review by USEPA, outlines the changes in the fish faunas of midwestern streams and their causes during the last 130 years. In addition, a detailed review of hydrological and biotic processes affecting physical habitat is provided along with detailed guidelines and recommendations for protection of stream habitat. The final report is entitled Habitat Preservation for Midwest Stream Fishes: Principles and Guidelines.

23.18

Title: AQUEOUS OZONATION OF COMPLEX HYDROCARBON MIXTURES

P.I. Richard A. Larson, Institute for Environmental Studies, University of Illinois at Urbana-Champaign

S.O.F. Water Resources Center, University of Illinois at Urbana-Champaign

F.L.C. B

Dates: July 1, 1982, through June 30, 1983

Obj: A comparison of the chemical reactivity of ozone toward an environmentally realistic mixture (water-soluble compounds from petroleum) at different pHs. Ozonation is frequently used for water treatment and waste treatment.

23.19

Title: DRAINABILITY OF THE HIGH CLAY CONTENT SOILS WITH A RESTRICTIVE LAYER

P.I. W. D. Lembke and C.J.W. Drablos, Department of Agricultural Engineering, University of Illinois at Urbana-Champaign

S.O.F. United States Soil Conservation Service

F.L.C. C

Dates: Current

Obj: Nine soils are being evaluated to determine their subsurface drainability. The evaluation procedure includes saturating a field soil profile and measuring drain outflow and water table drawdown.

23.20

Title: EFFICIENT WATER MANAGEMENT ON CLAYPAN SOIL IN ILLINOIS

P.I. W. D. Lembke, C.J.W. Drablos, and M. D. Thorne, Department of Agricultural Engineering, University of Illinois at Urbana-Champaign

S.O.F. United States Department of the Interior

F.L.C. C

Dates: October 1980 through December 1983

Obj: The combined effect of all aspects of water management are being analyzed for corn and soybeans on claypan soil field test plots in south central Illinois.

23.21

Title: LAKE BED SEDIMENTS FOR AGRICULTURAL PRODUCTION: TECHNIQUES AND WATER QUALITY IMPLICATIONS

P.I. W. D. Lembke and J. K. Mitchell, Department of Agricultural Engineering, University of Illinois at Urbana-Champaign; and M. J. Barcelona, Illinois State Water Survey, Champaign

S.O.F. United States Department of Agriculture and Illinois Department of Agriculture

F.L.C. B

Dates: September 30, 1981, through September 30, 1986

Obj: Sediment from Illinois lakes is being studied to determine economical ways of returning the sediment to agricultural production with a minimum impact on lake water quality.

23.22

Title: SEDIMENT YIELD FROM SMALL WATERSHED AREAS IN ILLINOIS

P.I. W. D. Lembke, J. K. Mitchell, and S. W. Park, Department of Agricultural Engineering, University of Illinois at Urbana-Champaign

S.O.F. United States Department of Agriculture

F.L.C. C

Dates: September 30, 1979, through September 30, 1983

Obj: Sediment transport models are being developed and validated for small (less than 40 ha) watersheds in Illinois.

23.23

Title: SOIL AND WATER CONTROL SYSTEMS APPLIED TO ILLINOIS

P.I. W. D. Lembke and J. K. Mitchell, Department of Agricultural Engineering, University of Illinois at Urbana-Champaign

S.O.F. United States Department of Agriculture

F.L.C. B

Dates: September 1978 through September 1982

Obj: Both laboratory and field experiments are being conducted to determine the effect of irrigation and drainage on plant growth and production.

23.24

Title: TREATMENT SYSTEMS FOR LIVESTOCK WASTES AND RURAL HOME SEWAGE

P.I. W. D. Lembke, D. L. Day, and D. H. Vanderholm, Department of Agricultural Engineering, University of Illinois at Urbana-Champaign

S.O.F. United States Department of Agriculture

F.L.C. B

Dates: September 30, 1981, through September 30, 1986

Obj: Emphasis is placed on low cost systems for areas where soils limit the practicality of conventional waste treatment.

23.25

Title: IMPROVED OPTIMIZATION TECHNIQUES FOR THE DESIGN OF WASTEWATER TREATMENT SYSTEMS

P.I. John T. Pfeffer, Department of Civil Engineering, University of Illinois at Urbana-Champaign

S.O.F. Water Resources Center, University of Illinois at Urbana-Champaign

F.L.C. A

Dates: July 1982 through July 1983

Obj: This study will investigate the optimization of treatment systems using unit process models that can accurately predict performance. Cost considerations will include both capital costs and operating and maintenance costs. An optimization technique commensurate with the sophistication of the process models will be utilized.

23.26

Title: THE EFFECT OF DIFFERENT SOIL TYPES ON THE MUTAGENIC PROPERTIES OF WASTE WATER

P.I. Michael J. Plewa and Philip K. Hopke, Institute for Environmental Studies, University of Illinois at Urbana-Champaign

S.O.F. Water Resources Center, University of Illinois at Urbana-Champaign

F.L.C. B

Dates: March 1982 through June 1983

Obj: The objectives of this study are (1) to analyze the effects of agriculturally important soil types on the mutagenicity of a chemically defined waste water, (2) to determine the carrying capacity of each soil type for different classes of mutagens removed from the waste water, (3) to determine if these mutagens can be taken up by corn plants and induce mutations in somatic and germinal cells, and (4) to predict the possible risks associated with the disposal of waste waters on agricultural lands that may result in contamination of groundwater supplies.

ORGANIC CHLORINE IN WATER SUPPLIES

of Civil Engineering, University of

1981

extent and kinetics of formation of total
e organic chlorine, and volatile organic
water supplies and evaluated their removal
lime softening.

ORGANIC SUBSTRATE REMOVAL BY BACTERIAL

rtment of Civil Engineering, University of
paign

University of Illinois at Urbana-Champaign

ctober 1982

biofilm reactors have demonstrated that the
ue can achieve very low effluent concentra-
fluent concentration is only a few micrograms

ON WITH AQUEOUS CHLORINE AND OTHER

nt of Civil Engineering, University of

Protection Agency

1984

g agent that readily reacts with the
lorine dioxide, and monochloramine in
estigation include the use of small
ermine which compounds will be produced
originate from the disinfect-adsorbed
cale columns are being used at dosages
nts to evaluate the total organic
lumn. Currently, samples are being
ic parameters, pyrohydrolysis for
gas chromatography-mass spectrometry
ion and quantification.

23.30

Title: REMOVAL OF BARIUM AND RADIUM FROM GROUNDWATER

P.I. Vernon L. Snoeyink, Department of Civil Engineering, University of Illinois at Urbana-Champaign

S.O.F. United States Environmental Protection Agency

F.L.C. D

Dates: September 1981 through September 1983

Obj: The objective of the proposed research is to determine whether weak acid ion exchangers with carboxylic functional groups can be used to remove Ba^{2+} and Ra^{226} as well as carbonate hardness. The procedure will involve the use of batch tests to determine selectivity, and column tests to determine capacity and regeneration requirements. Strong acid polystyrene resins will be tested similarly for comparison.

23.31

Title: TRANSFER FUNCTION MODEL FOR STOCHASTIC WATERSHED SYSTEM

P.I. Arni Snorrason and W. Hall C. Maxwell, Department of Civil Engineering, and Paul Newbold, Department of Economics, University of Illinois at Urbana-Champaign

S.O.F. University of Illinois

F.L.C. A

Dates: November 20, 1981, through December 31, 1982

Obj: The theoretical basis for the methodology is the theory of stochastic processes and multivariate time series theory. The practical basis for the study is the improvement of intermediate and long-term forecasting of riverflow and other hydrologic processes. Estimates and evaluations are made of possible relationships between the hydrological process of interest and other hydrological and meteorological processes, e.g., riverflow and precipitation, temperature and groundwater levels.

23.32

Title: MICROBIAL ATTACHMENT PROPERTIES IN EXPANDED-BED, ACTIVATED CARBON ANAEROBIC FILTERS

P.I. Makram T. Suidan and Bruce E. Rittmann, Department of Civil Engineering, University of Illinois at Urbana-Champaign

S.O.F. United States Department of the Interior

F.L.C. B

Dates: January 1982 through December 1982

Obj: The objective of this study is to evaluate the relative influences of residual organic concentration and turbulence due to liquid and gas mixing on the performance of a completely mixed, expanded-bed, granular activated carbon, anaerobic filter. The results of this research can improve our understanding of biofilms and the growth and attachment characteristics of Methanogenic organisms.

23.33

Title: GROUNDWATER POLLUTION BY GAS-PHASE TRANSPORT OF CONTAMINANTS THROUGH THE VADOSE ZONE

P.I. Albert J. Valocchi, Department of Civil Engineering, University of Illinois at Urbana-Champaign

S.O.F. Water Resources Center, University of Illinois at Urbana-Champaign

F.L.C. B

Dates: April 1, 1982, through June 30, 1983

Obj: To determine the importance of air-phase transport of volatile organic contaminants through the vadose zone as a potential pathway for pollution of shallow groundwater aquifers.

23.34

Title: VALIDITY OF THE LOCAL CHEMICAL EQUILIBRIUM ASSUMPTION FOR MODELING SOLUTE TRANSPORT THROUGH HETEROGENEOUS AQUIFERS

P.I. Albert J. Valocchi, Department of Civil Engineering, University of Illinois at Urbana-Champaign

S.O.F. National Science Foundation

F.L.C. C

Dates: June 1, 1982, through November 30, 1984

Obj: To study the microscopic and macroscopic mass transfer processes governing the advection, dispersion, and diffusion of adsorbing solutes in stratified, heterogeneous aquifers. To specify the conditions under which chemical and diffusion kinetic phenomena can be approximated by a local equilibrium assumption.

23.35

Title: EROSION AND SEDIMENT CONTROL ON ILLINOIS FARMLAND: THE FARMER IN CONFLICT WITH SOCIETY

P.I. J.C. van Es, Department of Agricultural Economics, University of Illinois at Urbana-Champaign

S.O.F. Water Resources Center, University of Illinois at Urbana-Champaign

F.L.C. B

Dates: July 1982 through September 1983

Obj: (1) To ascertain the current state of adoption of soil erosion and sediment control practices among Illinois farmers; (2) to measure farmer values and attitudes with regard to soil erosion and sedimentation; (3) to develop statistical models of the relationships between farm firm economic conditions, agronomic conditions, and the relevant farmer values and attitudes in explaining erosion control behavior; (4) to identify conflict and convergence between farmer values, attitudes, and behavior related to soil erosion and sedimentation; and (5) to suggest modifications in existing educational programs to bring about behavior change among farmers in light of the farmers' decision-making patterns.

24. WAPORA, INC.
35 East Wacker Drive, Suite 450, Chicago, Illinois

24.1

Title: CONSTRUCTION IMPACTS ON NATURAL CONDITIONS OF ILLINOIS STREAMS

P.I. WAPORA, Inc.

S.O.F. Federal Emergency Management Agency, via Illinois Department of Transportation

F.L.C. C

Dates: January 1982 through September 1982

Obj: Review of existing methodology for prediction of construction impacts on stream's natural conditions and selection/development of most appropriate method for use by Illinois Department of Transportation's Division of Water Resources and others for impact analysis of construction proposed in or near Illinois rivers and streams.

SUBJECT INDEX

AGRICULTURE

attitudes toward soil erosion 23.35

best management practices - see EROSION AND SEDIMENTATION

climate information 21.24

irrigation 20.3, 21.32, 23.20, 23.23

Lake Michigan diversion 6.1

mutagens 23.26

soil amendments 11.5, 11.6, 23.21, 23.26

soil drainage 23.19, 23.20, 23.23

AQUATIC AND RIPARIAN HABITAT:

algae 12.7

benthos 12.7, 12.11, 12.12, 12.14, 12.16, 21.17

biomanipulation 12.4

channel modification 8.1, 23.13

Chicago Metropolitan Area 11.1, 11.8 - see also WATER QUALITY, CHICAGO METROPOLITAN AREA

construction 24.21

effects of barge traffic 23.8

fish 11.1, 12.4, 12.7, 12.8, 12.9, 12.10, 12.13, 23.9, 23.16, 23.17

instream flow needs 23.1, 23.7, 23.10, 23.11, 23.12

invertebrates 2.2, 12.2, 12.11, 12.12, 12.14, 21.17, 23.7, 23.8

Lake Michigan diversion 12.5, 12.6, 12.9, 12.11, 21.13

Lakes - see LAKES, LIMNOLOGY

low flow conditions 22.14

macrophytes 12.4, 12.16

periphyton 2.1, 23.7

plankton 12.7

power plant cooling reservoirs 2.1, 2.2, 12.7

river ecosystems 11.1, 12.15

sewage 4.1

Schaumberg Station Wetlands 20.4

streams and rivers - see STREAMS, RIVERS

water fowl 12.1, 12.5, 12.6

water quality - see WATER QUALITY

wetlands 10.2, 17.1, 20.4

ATMOSPHERIC CHANGES AND MANAGEMENT:

aerosols 21.16

atmospheric deposition 5.1, 21.15, 21.16, 21.34, 21.38

information dissemination 21.24

rainfall fluctuations 21.23

weather modification 21.8

DRAINAGE, RUNOFF, WATERSHEDS:

erosion, sedimentation - see EROSION, SEDIMENTATION

flood stage 21.26

hydrographs 22.3

sediment transport - see EROSION, SEDIMENTATION

soil drainage 23.19, 23.20, 23.21, 23.22, 23.23

stochastic processes 23.31

strip mining 22.2, 22.8

urban runoff 8.7, 21.39

waste disposal sites 22.6

watershed drainage 21.26

ENERGY:

mining water treatment 15.1, 18.1

nuclear power plant discharge 11.2

ENERGY: (cont.)

ocean thermal energy conversion, 1.2

power plant cooling reservoirs, 2.1, 2.2, 12.7

strip-mine lakes 19.1, 22.2

strip-mined land 11.5, 11.6, 12.7, 22.2, 22.8, 22.15

utility wastes 15.2

EROSION, SEDIMENTATION:

best management practices 8.3, 8.4, 8.5, 21.10, 21.27, 21.28

dredged material disposal 1.3

farmer attitudes 23.35

lake sedimentation 8.3, 8.5, 21.28

models 21.4, 23.22

sediment - see WATER QUALITY

sediment transport 1.3, 8.3, 8.4, 8.5, 21.7, 21.26, 21.27, 21.28, 22.4, 23.22

waste disposal sites 22.6

water quality monitoring 8.3, 8.4, 8.5, 21.7, 21.27, 21.28

FLOODS, FLOOD MITIGATION:

drainage 21.26

floodplain information 21.25

resident education 16.1

wetlands 17.1

FLOW, HYDRAULICS:

dispersion 22.5

groundwater flow 22.1, 22.7, 22.11

Lake Michigan Diversion - see GREAT LAKES

pollutant transport 21.5

sediment transport - see EROSION, SEDIMENTATION

solute transport 15.2, 20.3, 21.29, 22.1, 23.33, 23.34

stochastic processes 23.31

streamflow 8.6, 21.37, 21.40, 21.41, 22.5, 23.2, 23.7, 23.31

waste disposal sites 22.7

GREAT LAKES:

Lake Michigan diversion 6.1, 8.6, 12.5, 12.6, 12.9, 12.11, 21.11, 21.13, 21.35, 21.37, 21.43

pollution 5.1, 11.2, 11.4

GROUNDWATER:

American Bottoms 21.33, 22.13

aquifer characteristics 14.1, 14.3, 20.2, 21.42, 22.11, 22.12 22.13

Cambro-Ordovician aquifer (northern Illinois) 14.1, 14.3, 20.2, 21.42, 21.43

contamination 21.29, 21.46, 22.1, 22.7, 22.13, 23.26

Elgin wells 15.3

management 8.2, 21.33, 21.46

models 21.29, 21.33, 22.11, 23.34

monitoring 21.2

quality 8.2, 21.42, 21.46, 22.13

radioactivity 20.1, 22.1, 22.7

resource assessment 8.2, 20.2, 21.31, 21.32, 21.42, 21.43, 22.12

solute transport 15.2, 21.29, 22.1, 23.33, 23.34

stochastic processes 23.31

sulfur removal 15.3

surface water/groundwater interaction 8.2, 21.31

waste disposal 20.3, 22.1

LAKES, LIMNOLOGY:

aquatic vegetation control 12.4

biomanipulation 12.4

Braidwood Cooling Pond 12.7

LAKES, LIMNOLOGY: (cont.)

Frank Holten Lake 12.3

Great Lakes - see GREAT LAKES

Highland Silver Lake 8.3, 21.28

Johnson Sauk Trail Lake 21.21

Lake Catherine 21.20

Lake Decatur 22.14

Lake Eureka 21.19

Lake Le-Aqua-Na 21.22

Lake of the Woods 21.36

lake management 21.3, 21.19, 21.20 21.21, 21.22

lake restoration 12.3, 21.19, 21.20, 21.21, 21.22, 21.36, 23.21

Lake Shelbyville 12.16

power plant cooling ponds - see ENERGY

sedimentation - see EROSION, SEDIMENTATION

strip-mine lakes 19.1

water quality 8.3, 12.3, 12.16, 21.3, 21.19, 21.20, 21.36, 22.21

NAVIGATION:

commodities 3.1, 7.1

ecological effects of navigation 23.8, 23.13

terminals 3.1, 7.1, 7.2

OCEANS:

kelp farming 1.1

thermal energy conversion 1.2

STREAMS, RIVERS:

Blue Creek, Pike County 21.27

Bureau Creek 21.26

Chicago Waterway 21.37

Court Creek 21.10

Des Plaines River 17.1, 21.37

Dupage River 13.1, 21.37

Fox River 21.37, 21.43

Illinois River 12.12, 12.13, 12.14, 12.15, 21.11, 21.12, 21.13, 21.17, 21.35, 21.37

Kankakee River 12.7, 23.8, 23.10

Kaskaskia River 12.16

Little Wabash River 23.3

Mississippi River 1.3

Okaw River 12.16

Sangamon River 8.2, 21.31, 22.14, 23.11

WATER DISTRIBUTION SYSTEMS:

corrosion 21.30

microbiological alterations of water quality 9.3

mutagens 23.14

WATER MANAGEMENT, INSTITUTIONS, LAWS, ECONOMICS:

data collection and monitoring 22.10

erosion control education 23.35

marketable water permit systems 23.4

models 21.40

reservoir management 21.41

resource assessment 21.31, 21.40, 21.41, 22.9

transferable discharge permits 23.5

water districts 23.3

water use law 23.6

water withdrawal data 21.18, 21.32, 22.9

WATER QUALITY:

aeration 11.7, 21.19, 21.20

WATER QUALITY: (cont.)

bacteria 11.3, 12.16, 21.12

channel modification 8.1, 23.13

chemicals 12.14, 12.16

Chicago Metropolitan Area 11.1, 11.2, 11.3, 11.4, 11.7, 11.8, 11.9, 21.37

dissolved solids 11.2, 12.16

atmospheric deposition - see ATMOSPHERIC CHANGES AND MANAGEMENT

fish - see AQUATIC AND RIPARIAN HABITAT

groundwater contamination 8.2, 20.3, 21.29, 21.46, 22.7, 22.13

heavy metals 12.14, 21.12, 21.44

Lake Michigan 11.2, 11.4

Lake Michigan diversion 8.6, 21.11, 21.13, 21.35, 21.37

lakes - see LAKES, LIMNOLOGY

management 8.2, 8.3, 8.4, 8.5, 8.7, 13.1, 21.10, 22.9

nonpoint source pollution 8.5, 20.3, 21.4, 21.10, 21.27, 21.28

pollution 5.1, 12.11, 12.12, 12.14

radioactivity 20.1, 22.6, 22.7

recirculating regions of streams 23.2

sediment 12.11, 12.12, 12.14, 21.1, 21.3, 21.4, 21.9, 21.11 - see also EROSION AND SEDIMENTATION

sewage 4.1, 11.5, 11.6, 18.2, 21.12

standards 13.1, 21.30

toxicological assays 21.44, 21.45

urban runoff 8.5, 8.7, 21.12, 21.39

waste-load capacity of streams 22.14

WATER TREATMENT, WASTE TREATMENT:

activated carbon 9.3, 23.29, 23.32

bacterial films 9.6, 23.28, 23.32

barium removal 23.30

chlorine 23.27, 23.29

ecological impacts 18.2, 21.9, 22.14

livestock wastes 23.24

mining water treatment - see ENERGY

metal speciation 9.2

mutagens 23.14, 23.18, 23.26

ozonation 23.18

radium removal 23.30

rotating biological contactors 21.14

small-scale treatment alternatives 10.1, 23.24

sorption/desorption processes 9.5

sulfur removal 15.3

system design 23.25

wastewater treatability 9.4