



*Profiling the
Ottawa River IV*

Wednesday, September 27, 2000

6:30PM to 9:30PM

Friendship Park Senior Center

2930 131st Street

Toledo, Ohio

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Overview of Maumee RAP and the Ottawa River Action Group

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Stickney West Industrial Park

Todd Davis, President, Hemisphere Ltd.

BREAK

Combined and Sanitary Sewer Overflow Projects on the Ottawa River

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Valuing the Ottawa River: Economic Values and Impacts of Recreational Boating

Leroy J. Hushak, Professor Emeritus, Ohio State University and Ohio Sea Grant

Mary Bielen, Ph.D.. Candidate, Bowling Green State University

Lake Erie Water Levels and the Ottawa River

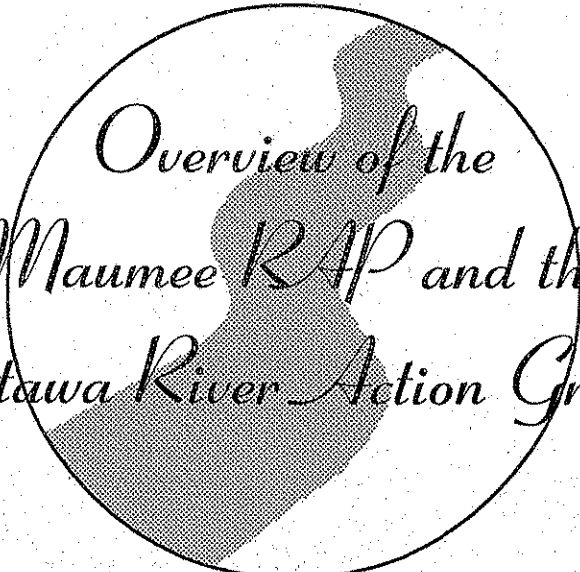
Scudder Mackey, Group Supervisor, Ohio Department of Natural Resources

Summary of the Accomplishments and Plans for the Future of the Ottawa River

Ed Hammett, District Chief, Ohio EPA Northwest District Office

Questions and Answers Session

Susan Aman, Public Involvement Coordinator, Ohio EPA



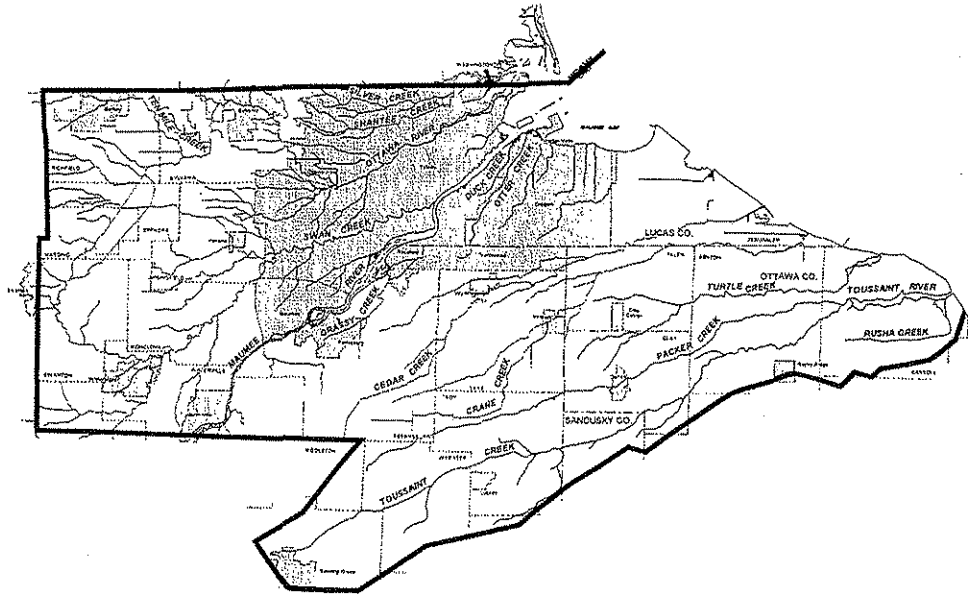
*Overview of the
Maumee RAP and the
Ottawa River Action Group*

By John Kusnier, Chair
Maumee RAP Committee

Overview of the Maumee RAP and the Ottawa River Action Group

John Kusnier
Chair Maumee RAP Committee

The Maumee RAP, began over twelve years ago as a community effort to restore the area's waters to "fishable and swimmable" condition. The Maumee "Area of Concern" includes: the Lower Maumee River from the Bowling Green water intake near Waterville to Maumee Bay, as well as other tributaries to Maumee Bay and Lake Erie such as Swan Creek, Ottawa River, Duck Creek, Otter Creek, Crane Creek, and the Toussaint River. The Maumee River RAP covers most of Lucas County, the northern third of Wood County, and the northwest half of Ottawa County.



The Maumee RAP is striving for abundant open space and a high quality natural environment; adequate floodwater storage capacities and flourishing wildlife; citizens who take local ownership in their resources, and river, streams, and lakes that are clean, clear, and safe for recreational use. This will stimulate economic growth, secure jobs, and assure quality of life.

The Maumee RAP is a cooperative effort of citizens, businesses, and industry as well as local, state, and federal governments. This joint venture stems from an agreement between the United States and Canada to clean up our Great Lakes basin. The agreement identified 42 specific Areas of Concern, or AOCs, where there were significant problems. The Maumee Area of Concern was one of the areas identified along with the three others areas in Ohio: Black River, Cuyahoga River, and Ashtabula River.

The Maumee RAP Committee makes the official decisions of the RAP and provides general oversight with regards to policy. The RAP Committee has eight action groups (sub-committees) which are integral to the progress of the Maumee RAP. These groups are identified as Issue Action Groups - which deal with specific issues that affect the AOC; Watershed Action Groups - which focus on a comprehensive watershed approach to cleaning up a specific watershed; and Support Action Groups - which assist the other action groups to more effectively accomplish their goals in a manner consistent with RAP guidelines and objectives.



By Paul Munn, Administrator
City of Toledo
Department of Public Service

Landfill Cleanup Progress on the Ottawa River

Paul F. Munn, PE, Administrator
Department of Public Service, City of Toledo

The current administration of the City of Toledo has made clean up of the Ottawa River a priority. This is reflected in the remediation of five contaminated landfill sites and an industrial spill site along the river among other activities.

The Dura Avenue Landfill is a 70-acre site in North Toledo on the west and north bank of the Ottawa River. It was used for the disposal of solid waste from about 1952 to 1980. The site contains hazardous materials because it accepted industrial and commercial wastes until 1968.

In 1993 Toledo began constructing a five-million-dollar Interim Remedial Measure (IRM) as a means to deal with the immediate need to intercept PCB-laden leachate that was seeping into the river from the worst part of Dura Landfill. The IRM consists of a 780-foot long barrier wall between the landfill and the Ottawa River and Sibley Creek and leachate collection and pretreatment systems. The IRM has been in operation since 1994 and has collected and treated an average of over 160,000 gallons of leachate per month for a total of over 8 million gallons by October 2000. It is interesting to note that the volume and concentrations of the collected leachate are significantly less than predicted by the Remedial Investigation. Reevaluation of the health risks for the site indicates that the IRM by itself brought the site risks within the acceptable range of 10^{-6} to 10^{-4} (one in a million to one in ten thousand) individual lifetime cancer risk.

Further remedial action at Dura was stymied for five years because various negotiations and legal actions to achieve settlement agreements and consent orders went nowhere. The logjam was broken in the spring of 1999 when a settlement agreement was reached between the City of Toledo and a group of industrial parties by building on relationships established and experience gained in the Stickney and Tyler Landfills projects. Construction of the final remedy at Dura began in October 1999, under a Consent Order between Ohio EPA, the City of Toledo, and a number of industrial parties.

The purpose of the Remedial Action at the Dura Avenue Landfill is to construct a landfill cover system consisting of various layers of soil and geosynthetic materials similar to that described below for the Stickney and Tyler Landfills. The cover system will reduce infiltration of rainwater through the fill/refuse material and the subsequent discharge of contaminated groundwater to the Ottawa River and Sibley Creek. A system of stormwater collection berms, trenches, catch basins, pipes, and letdown structures will channel runoff to the Ottawa River and Sibley Creek, thereby preventing runoff to Dura Avenue and adjacent properties. The finished product will resemble parkland; similar to the Removal Actions constructed at the Stickney Avenue Landfill and Tyler Street Landfill in 1998.

Completion of the synthetic membrane cover is anticipated by the end of 2000 at a capital cost of about 8.5 million dollars. The City is financing the capital cost through a loan from the Ohio Water Pollution Control Loan Fund. Settlement funds collected from a number of companies are being placed in a dedicated fund to cover any remaining capital costs and the City's costs for 30 years of ongoing operation and maintenance of the remedy.

of about \$300,000. Safety-Kleen EnviroSystems Company then assumed operation and maintenance of the system, which is still removing about 5000 gallons of leachate per week.

For a while Dura Avenue Landfill was tagged as the worst source of PCB pollution to the Lake Erie basin. I think it is clear now that reputation was unwarranted. A much worse source was an industrial spill site just slightly upstream from the landfill. Sediments under a formerly unnamed tributary now known as Fraleigh Creek were found to contain PCBs at concentrations up to 15,000 times higher than found anywhere else in the Ottawa River system. A cooperative effort by Toledo, USEPA, Ohio EPA, and GenCorp resulted in the 1998 rerouting of the tributary and removal of 2,000 cubic yards of sediments containing 56,000 pounds of PCBs from the old bed of the tributary. High concentrations of PCBs on the order of 1000 times those found elsewhere in the Ottawa River still remain in the river sediments at the former mouth of the tributary. The concentrations taper off sharply both from upstream and downstream.

The former North Cove Landfill is located on property extending from the east end of Hillcrest Avenue near Willys Park eastward under Interstate 75 and the Ottawa River to the Jeep Plant parking lot. In 1995 DaimlerChrysler Corporation, the City of Toledo, and the Ohio Department of Transportation began a cooperative effort to study the former North Cove Landfill. The Final Remedial Investigation Report was submitted to Ohio EPA in November 1997. The Final Feasibility Study was completed in January 1998.

In January 1999 the same three parties entered into a settlement agreement for construction of a remedy for the North Cove Landfill. Negotiation of a Consent Order with Ohio EPA is in progress, and the remedy is expected to be constructed in 2001. The main focus of the remedy is prevention of dermal contact by: installation of additional soil cover on the portion of the site owned by the City of Toledo west of I-75, armoring of the banks of Bowen Ditch and the Ottawa River, and planting of trees on the Ottawa River slope to enhance evapotranspiration of groundwater.

The City of Toledo would like to develop its portion of the North Cove site for recreational reuse. Daimler/Chrysler and ODOT are supportive of this effort and are working together with the City toward that end. Revisions to the remedy to incorporate recreational improvements are being prepared for review and approval by Ohio EPA. A public meeting will be held to receive neighborhood input.

Combined costs exceed \$50 million for the five disposal sites projects and one spill site project with cooperation and funding participation from a large number of parties including multiple federal, state, and local government offices and private businesses – all focused on four miles of river.



*Toledo Tie Treatment Facility
and King Road Landfill*

By Archie Lunsey II, Environmental Supervisor
Ohio Environmental Protection Agency
Division of Emergency and Remedial Response

Toledo Tie Treatment Plant

Archie L. Lunsey II
Ohio Environmental Protection Agency
Division of Emergency and Remedial Response

The Toledo Tie Treatment Plant (Toledo Tie) site is an approximately 21-acre located in the Arco Industrial Park in Toledo, Lucas County, Ohio. The site is bordered on the north and west by industrial and commercial property, on the south by the Conrail Railroad, and on the east by the Toledo Terminal Railroad. The site is made up of 17 individually owned lots within or near the industrial park. Several small industrial and commercial businesses are located on the site, including Spartan Chemical, Ohio Lottery, Wilkins Pipeyard, Toledo Cutting Tools, and LBA Custom Printing. Williams Ditch runs along the west side of the site.

The site was originally part of a 50-acre railroad tie treatment facility run by Federal Creosoting Company from 1923 to 1959. Facility operations included treatment of wooden railroad ties with coal tar creosote and drip-drying and storage of the treated ties. The facility had several aboveground storage tanks containing creosote and zinc chloride as well as creosote lagoons. In 1959, the facility was transferred to the American Creosoting Company. Operations continued until 1962, when the property was sold to the City of Toledo. The property, which was not used by the city, was purchased by Arco Realty, Inc., in 1969 for the development of the Arco Industrial Park.

From 1987 to 1990, the Ohio Environmental Protection Agency (Ohio EPA) as well as number of private parties did a series of on-site investigations and property assessments to identify all potential sources contributing to the declining water quality of the Maumee River Basin and Ottawa River. The investigations revealed that soil at the Toledo Tie site was contaminated with creosote products, including a variety of polynuclear aromatic hydrocarbons (PAHs). In 1993, Ohio EPA completed another investigation to determine the extent of soil, surface-water, and sediment contamination at the site. Samples were collected in a number of on-site areas and in Williams Ditch, a stream that flows north and empties into the Ottawa River several miles downstream from the site. Sample analytical results indicated that elevated levels of several PAHs, including benzo(a)pyrene, phenanthrene, fluoranthene, and pyrene, were present in subsurface soil and sediment in the former creosote lagoon area, the waste pile south of the lagoon area, and Williams Ditch. Surface-water samples collected from Williams Ditch downstream of the site contained high PAH concentrations. In addition, investigatory observations indicated that at least 1 foot of creosote made up the top layer of sediment in the ditch.

In 1997, after a major rainstorm, representatives of the United States Environmental Protection Agency (U.S. EPA) observed a sheen of unidentified, oil material on the stream in Williams Ditch. This oily material may have originated from buried coal tar creosote at the site and ditch sediments. U. S. EPA in conjunction with Ohio EPA determined that during storms or sever weather, this hazardous material could move from the site.

U.S. EPA and Ohio EPA determined that people who came in direct contact with contaminated soil at the site or ditch sediment risked exposure to hazardous materials. Because access to Williams Ditch was unlimited, adults and children who regularly waded in the ditch

King Road Landfill

Archie L. Lunsey II
Ohio Environmental Protection Agency
Division of Emergency and Remedial Response

In January 1954, the Lucas County Sanitary Engineer began operations at the King Road Landfill. On January 29, 1954, the Lucas County Health Commissioner had inspected the facility and found it to be a "very desirable site." No engineered plans or operational permits were obtained or required. A bulldozer was used to clear trees and brush, excavate soil, compact the waste, and apply soil cover. This operation initiated near the gate along King Road at the railroad embankment. The excavation/disposal operation progressed in a westerly-southwesterly direction.

Predominantly sandy soils were encountered during excavation of the landfill. Occasional clay seams were found, but very irregularly. The sand typically became wet at a depth of 3 feet to 4 feet below normal ground level. The total depth of excavation was restricted by the level of the ground water within the sandy soils. Quite frequently, a newly excavated area would be flooded with a couple feet of water or be filled partially by running sand. Typically, waste was dumped into the flooded areas because pumps were not available to remove the water. Soil excavation occurred as the landfill's capacity required. Typically, a relatively small area was open at any one time. No large pits or trenches were excavated.

As waste disposal operations began in 1954, only township and county residents used the landfill. Gradually, a few private waste haulers and local municipalities began bringing their wastes to the facility. Conventional household refuse, demolition materials, industrial wastes in liquid and solid forms, etc. were disposed. Although very little documentation exists relative to waste volumes received during the 1950's and 1960's, one source indicates that approximately 7000 cubic yards of waste was disposed per month. Initially, waste was disposed from the bottom of excavation to only 3 feet to 5 feet above previous normal ground surface. During the late 1960's and early 1970's, waste was piled above this level to increase the landfill's capacity.

Reportedly, the King Road Landfill began as a "well-kept model landfill" and gradually diminished to an open dump by late 1966. The Board of Lucas county Commissioners attempted to improve the operational quality of the landfill on May 8, 1967, by contracting Park Forrest Development, Inc. to take over daily operations. Under Park Forrest Development, Inc., the operations were improved, but concerns regarding the type and quantity of wastes forced the Board of Lucas County Commissioners to terminate the contract. On May 16, 1970, the Lucas County Sanitary Engineer regained responsibility of the landfill's operation.

During Park Forrest Development, Inc.'s operation, the majority of remaining unused land was cleared and excavated. Also, a railroad crossing was constructed to gain access to the 25 acre parcel north of the railroad tracks. This permitted excavation of soil for operational uses at the landfill. The number of commercial haulers and industries disposing waste at the landfill increased considerably during Park Forrest Development, Inc.'s operation. No records are known to exist now, but essentially, all types of waste (including industrial wastes, chemical wastes, paint solvents, liquid oils, etc.) were accepted.

On December 11, 1968, pursuant to new regulations of the Ohio Department of Health, the Lucas County Sanitary Engineer submitted a plan for operation of the King Road Landfill.



By Casey Stephens, Project Manager
City of Toledo
Division of Environmental Services

Jeep Expansion and Related Projects

**Casey Stephens, Project Manager
Division of Environmental Services, City of Toledo**

The City of Toledo has expended significant time and money to begin to rectify past practices that have affected the water quality of the Ottawa River.

- In 1998 an engineered cap was placed on the Stickney Ave. and Tyler St. Landfills.
- Also in 1998, the Fraleigh Creek (formerly known as the Unnamed Tributary) PCB remediation project was completed.
- In 1999 the Stickney West Industrial Park Project cleanup began.
- This year, an engineered cap was installed at the Dura Landfill.

The Development Agreement between the City of Toledo and DaimlerChrysler to construct the new Toledo Jeep Assembly Plant on Stickney Avenue has lead to two additional projects, a large scale mitigation project in Sandusky County, and the construction of an interpretive trail that will enhance the ability of the public to enjoy the Ottawa River. The following describes these two projects and another nearby demonstration project which capped contaminated sediments in place in the Ottawa River.

Sandusky County Wetland Mitigation

As part of its involvement in the DaimlerChrysler Jeep expansion project at 4000 Stickney Avenue, the City of Toledo was granted a fill discharge permit under Section 404 and water quality certification under Section 401 of the Clean Water Act to fill 25.21 acres of wetlands. To mitigate these unavoidable impacts to wetlands, the City of Toledo agreed to acquire and preserve 238 acres of property located near ODNR's Pickerel Creek Preserve in Sandusky County and to restore 53 acres of wetlands on that property.

With respect to the Sandusky County property, a search was conducted for a wetland mitigation site within the Maumee River watershed in Lucas County. Several sites were considered, however, at that time, no local wetlands areas could be identified that had sufficient acreage available to satisfy the permit requirements. Those sites in Lucas County included the workhouse property in Whitehouse, wetlands along the Ottawa River, and property in eastern Lucas County near Lake Erie. The Yellow Swale site in the Sandusky River watershed was recommended by the ODNR as a location for the wetland mitigation that would fulfill the mitigation acreage requirements. At the time of the permit issuance, the site was planted in row crops and draining excess surface water was necessary to keep it in agricultural production. The soil types and local hydrology strongly suggest that this area contained wetlands prior to being put into agricultural production. Construction by the ODNR of the wetland restoration project began in the Fall of 1999 and will be completed by the Spring of 2001.

Ottawa River Interpretive Trail

In addition to the wetland mitigation, as a part of the permit requirements the City of Toledo agreed to construct an interpretive walkway along the Ottawa River adjacent to the City



By Todd Davis, President
Hemisphere Ltd.

Stickney West Industrial Park

Todd S. Davis
Hemisphere Ltd.

Hemisphere Ltd., a nationally recognized brownfields redevelopment company, is cleaning up and redeveloping an old brownfield located on the banks of Sibley Creek and the Ottawa River. The first phase of the project involves a 27.5 acre site, nestled between three municipal solid waste landfills, that was operated as a fertilizer manufacturing plant by the now defunct Royster Corporation. It was later used as an unlicensed salvage yard.

Many environmental conditions at the site, known as the Gorney Property, posed a significant threat to both surface water and groundwater for many years. A tire pile of approximately 250,000 used tires threatened both Sibley Creek and the Ottawa River in the event of a fire. About 50,000 used railroad ties were stacked in one area of the site. Large stockpiles of old automobile fuel tanks generated as part of the salvage operation, and associated puddles of gasoline, were present at the site. Over 200 unmarked drums containing unidentified materials were located on site, as well as a number of abandoned above ground and underground storage tanks. Asbestos-containing transite was contained in a large dilapidated building on the property. Piles and bags of fertilizer and pesticides were left on the site. An acre of wetlands were illegally filled by prior owners/operators and contaminated soils were noted across the property.

Hemisphere's plans are to thoroughly investigate and remediate the Gorney Property and redevelop it, along with other neighboring properties, to support "just in time" manufacturing at the nearby new Jeep Plant. Hemisphere has forged a unique public/private partnership including the City of Toledo, U.S. EPA and Ohio EPA to redevelop this site. Utilizing a unique approach, and as a method for financing both future site development while at the same time conducting necessary remediation, Hemisphere will redevelop the site in two phases.

Hemisphere will clean up the site and create a construction and demolition debris (C&DD) landfill on the Gorney Property as a method to address environmental issues associated with historical operations. During construction of the C&DD landfill, Hemisphere will generate over 700,000 cubic yards of soil. About 400,000 cubic yards of soil will be used at the contiguous Dura landfill for final closure of its facility. The costs to improve the environmental conditions at the Dura landfill will be vastly reduced due to the low transportation costs associated with the adjacent site. Hemisphere will also beneficially reuse the scrap tires on site, which will be shredded, as part of the C&DD landfill leachate collection system.

Hemisphere anticipates that the useful life of the C&DD landfill will range between 3 and 7 years, however, the life of the facility may be reduced significantly depending on the amount of C&DD material generated by the City of Toledo related demolition projects. Hemisphere's license for the C&DD Landfill was approved on December 13, 1999.

Once the C&DD landfill reaches the end of its useful life, Hemisphere will close the fill with a cover system suitable for development and construct a light industrial park. Given the site's proximity to the new Jeep plant, the site will provide a compelling location for industrial/warehousing operations to support Jeep.

Hemisphere has already made significant headway on many of the environmental problems at the site, resulting in an immediate water quality improvement to the Ottawa River and Sibley Creek. At our direction, about 30,000 cubic yards of solid waste scattered across the



*Combined and Sanitary
Sewer Overflow Projects
on the Ottawa River*

By Scott Sibley, Manager
City of Toledo
Division of Engineering Services

Combined Sewer Overflow and Sanitary Sewer Overflow Projects on the Ottawa River

Scott B. Sibley, Manager
Division of Engineering Services
City of Toledo

Combined Sewer Overflows

Combined sewers, conveying both sanitary wastewater and storm water, serve the central portion of Toledo. This flow is normally conveyed to the Bay View Water Reclamation Plant, but during large storms the flow spills out to local watercourses. There are six such locations where combined sewer flow can discharge to the Ottawa River during large storms. These are located between Lagrange Street and Monroe Street as follows:

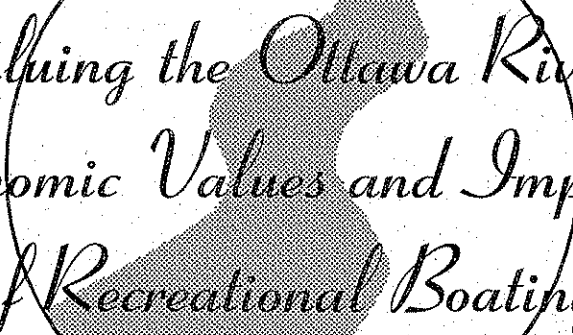
- Lagrange Street at Manhattan Boulevard
- Windermere Boulevard at Manhattan Boulevard
- Detroit Avenue at Phillips Avenue
- Lockwood Avenue at Hillcrest Avenue
- Ayers Avenue at South Cove Boulevard, and
- Monroe Street on the east side of the Ottawa River Bridge.

To date, the City has spent over \$51 million to abate the effects of these combined sewer overflows on the Ottawa River. Most of this expenditure has been for the Ten Mile Creek Relief Interceptor constructed in 1982. The completed projects are:

<u>Project</u>	<u>Completed</u>	<u>Cost (\$million)</u>
<input type="checkbox"/> Planning, I/I Study, and installation of monitoring equipment	1976	\$0.62
<input type="checkbox"/> Ten Mile Creek Relief Sewers, CSO regulator modifications, tide gates, and closure of Monroe North regulator	1982	48.64
<input type="checkbox"/> Updated CSO Facilities Plan	1995	0.125
<input type="checkbox"/> CSO regulator renovation	1995	0.97
<input type="checkbox"/> Partial separation of Devilbiss area	1997	0.20
<input type="checkbox"/> Relocated tide gate on Lockwood regulator	1997	0.10
<input type="checkbox"/> Combined Sewer Overflow Impact Study	1997	0.95

The 1997 Impact Study recommended the following additional projects to further abate CSO impacts to the Ottawa River:

<u>Project</u>	<u>Proposed</u>	<u>Cost (\$million)</u>
<input type="checkbox"/> Partial separation of Lagrange area	2000	\$1.2
<input type="checkbox"/> Partial separation of Monroe South area	2002	1.2
<input type="checkbox"/> Ottawa River CSO storage/treatment facility, Phase 1 (Lockwood, Ayers, and Monroe)	2002	25.8
<input type="checkbox"/> Ottawa River CSO storage/treatment facility, Phase 2 (Lagrange, Windermere, and Devilbiss)	2004	10.5



*Valuing the Ottawa River:
Economic Values and Impacts
of Recreational Boating*

By Leroy J. Hushak, Professor Emeritus,
Ohio State University and Ohio Sea Grant
and

Mary Bielen, Ph.D. Candidate
Bowling Green State University

Valuing the Ottawa River: The Economic Values and Impacts of Recreational Boating

**Leroy Hushak, Professor Emeritus,
Ohio State University**

and

**Mary Bielen, Ph.D. Candidate,
Bowling Green State University**

The purpose of this research is to provide the basis to build the necessary local financial support to make dredging of the Ottawa River possible. The study provides input for justification and financial support for both navigational dredging and contaminated sediment dredging. Previous Army Corps of Engineers studies in 1976 and 1991 found sufficient benefit-to-cost ratios existed to justify navigational dredging of the Ottawa River and channel to Lake Erie, but each project lacked a local sponsor to cost share it causing the Corp's deferment to dredge.

The Ottawa River area includes the Ottawa River downstream from the Suder Avenue bridge to the connecting channel in the north Maumee Bay plus Halfway Creek and Hooper Run in Michigan. Of the 16 yacht clubs and marinas, 11 are in Lucas County. The survey questions were addressed to Ottawa River stakeholders who are area residents, club members, marina occupants, and launch site users and businesses.

Existing Conditions

- The use of the lower Ottawa River for activities such as swimming, fishing, and related water activity was banned in the 1990's by the Toledo Department of Health and the Ohio Department of Health.
- Sedimentation and lake hydrologic effects are causing shallow Ottawa River channel depths resulting in diminished boater activity and decreasing dock occupancy.

Research Findings

- The estimated economic impact from current Ottawa River boater activity to the local economy is \$14 million in total annual sales of which \$8 million is value added from current boaters.
- The direct economic impact to local area businesses of dredging the Ottawa River and a connecting channel to Lake Erie, for navigational and environmental purposes, is nearly \$5 million of additional annual sales. Nearly \$3 million of this is additional income from new or higher paying jobs at these businesses at full current capacity use. With increased capacity, the increase in economic activity would be greater. In addition, if the dredging does not occur, the \$14 million in current annual sales, of which \$8 million is current annual income, will erode as navigation of the river becomes more difficult.

- Expand the support base for this project by seeking the involvement of new people representing the Ohio Division of Watercraft, banking community, colleges and universities, economic development agencies, and other private and public sector participation.
- Advertise progress and positive stakeholder attributes to the media.



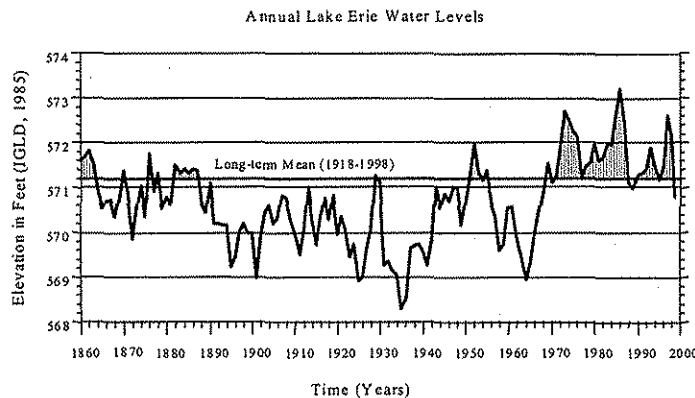
By Scudder Mackey, Group Supervisor
Ohio Department of Natural Resources
Lake Erie Geology Group

Lake Erie Water Levels and the Ottawa River

Scudder D. Mackey, Ph.D
Ohio Department of Natural Resources
Lake Erie Geology Group
Division of Geological Survey

Changing Lake Erie water levels have a direct impact on nearshore, coastal, and riverine areas. The Ottawa River is no exception. High lake levels promote recreational and commercial activities in areas that are historically unsuitable for those activities, reduce downstream flow velocities at the mouth of the river resulting in sediment deposition, and increases the potential for flooding of low-lying areas during major storm events. Low lake levels reduce boat access to existing facilities due to shallow water, result in erosion and re-suspension of sediments from the river bed, and reduces the potential for flooding of low-lying areas during major storm events. Moreover, coastal wetland habitat generally increases during low lake levels and decreases during high lake levels.

Lake Erie water levels vary over long-term, seasonal, and daily time scales. Changes in Lake Erie water level are due to changes in precipitation, evaporation, inflows, outflows, and to a lesser extent, the activities of man. Approximately 85% of the water in Lake Erie flows down the Detroit River and is derived from precipitation in the upper Great Lakes basin. Long-term historical fluctuations in lake level are illustrated in Figure 1.



Average elevation of Lake Erie is 571.2 feet IGLD 1985 for the period 1918 to 1998 (USACE). Note that for the past three decades, lake levels were generally well above normal due to increased precipitation in the upper Great Lakes basin. High lake levels resulted in the development and expansion of recreational boating activities in the Ottawa River, including the construction of numerous marinas within the estuary.

Within the last three years, Lake Erie water levels dropped approximately 2.5 feet (Figure 2). A lack of precipitation in the upper Great Lakes combined with high evaporation rates due to lack of ice cover result caused the decline in Lake Erie water levels. Even though local precipitation has allowed Lake Erie water levels to recover from the seasonal lows earlier this spring, lake levels are still slightly below the long-term average for this time of year.

and waterfowl that have not used the Ottawa River estuary within recent memory due to high lake levels. The establishment of wetland vegetation will (over the long term) improve water quality by trapping and stabilizing sediments and processing of contaminated sediment.

In summary, the impacts of changing lake levels are both positive and negative. Climate change is the primary driving force behind Lake Erie water level fluctuations. Current Lake Erie water levels are well within the "normal" range and in fact water level changes are necessary to maintain the diversity of Lake Erie's coastal region.

WORLD WIDE WEB SITES WITH LAKE ERIE INFORMATION

Water level information

Great Lakes Hydraulics & Hydrology Home Page

<http://huron.lre.usace.army.mil/hmpggh.html>

For monthly bulletin from U.S. Army Corps of Engineers--

<http://huron.lre.usace.army.mil/levels/cbulletin.pdf>

For a 6-month forecast--

<http://huron.lre.usace.army.mil/levels/erie.pdf>

For weekly levels and a 30-day forecast ---

<http://huron.lre.usace.army.mil/levels/weekly.html>

For historical information --

Data from water level recorders--

http://co-ops.nos.noaa.gov/data_res.html

For historical information on levels from the U.S. Army Corps of Engineers--

<http://huron.lre.usace.army.mil/levels/hleverie.html>

For maximum and minimum levels from U.S. Army Corps of Engineers--

<http://huron.lre.usace.army.mil/levels/maxmin.html>

Summary data from Great Lakes Information Network. Also provides access to the two previous web sites--

<http://www.great-lakes.net/envt/water/levelsh.html>

For historical information on levels from the Canadian Hydrographic Service--

<http://chswwww.bur.dfo.ca/danp/historical.html>

http://chswwww.bur.dfo.ca/danp/Erie_means.txt

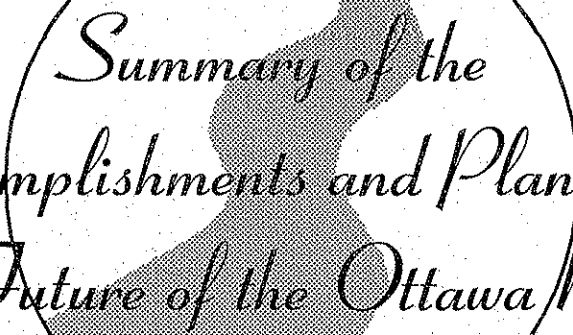
Buoys on Lake Erie

[http://seaboard.ndbc.noaa.gov/station_page.phtml?\\$station=45005](http://seaboard.ndbc.noaa.gov/station_page.phtml?$station=45005)

[http://seaboard.ndbc.noaa.gov/station_page.phtml?\\$station=45009](http://seaboard.ndbc.noaa.gov/station_page.phtml?$station=45009)

OSU Nowcasts and Forecasts of levels, temperatures, currents, etc.

<http://superior.eng.ohio-state.edu/>



*Summary of the
Accomplishments and Plans for
the Future of the Ottawa River*

By Ed Hammett, District Chief
Ohio Environmental Protection Agency
Northwest District Office

Summary of the Accomplishments and Plans for the Future of the Ottawa River

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Ohio Environmental Protection Agency
Northwest District Office

Accomplishments

The *Maumee RAP Recommendations Report* was finalized in 1991. Since that time there has been a substantial effort expended by federal, state, and local agencies as well as private entities to remove or remediate sources of pollution throughout the Maumee Area of Concern. Many significant projects are completed or in progress. General assessment of water quality conditions has been completed. Major sources of pollutants have been identified and targeted for clean up.

Over the years the *Profiling the Ottawa River* sessions have focused on many of these activities. The removal of PCB contaminated sediments in Fraleigh Creek (formerly the Unnamed Tributary), combined and sanitary sewer overflow improvement projects, capping of the Stickney Ave. and Tyler St. landfills, removal of contamination from the Toledo Tie property, and current activities at the Dura, North Cove and King Road landfills are all significant improvement projects. The seeds for all these projects were sown in the past 7-10 years through studies of water quality, sediment, fish and other biota, and the investigation of pollution sources.

Projects such as the Maumee Area of Concern Project (conducted by Ohio EPA with funding from US EPA) have built the data base needed to identify and prioritize problems. Data collection efforts have now shifted from screening efforts to hot spot delineation for sediment remediation and will include monitoring for aquatic restoration. In addition to characterizing the sources of contaminants, this data collection effort has also demonstrated that the sediment in the lower reaches of the Ottawa River is not as contaminated as originally believed. This significant finding means that dredging of the sediment and its disposal will not be as costly or difficult as for some of the upstream sediment.

Ottawa River Remediation Team

The Ottawa River Remediation Team (ORR-Team) was formed in early 1998 at the request of the Maumee RAP Ottawa River Action Group. The ORR-Team is a partnership of environmental professionals, including federal state and local governmental agencies, working to expedite the restoration of the beneficial uses through strategic watershed planning and coordination for the Ottawa River and western Lake Erie community in order to remediate this highly contaminated stream.

Through the collaborative efforts of the team, a task and timeline table has been created to identify many of the known activities that have and still need to occur to facilitate the restoration of the Ottawa River. By utilizing this table the ORR-Team has been able to coordinate the data collection and research activities being conducted by different agencies. It

While the numerous source removal activities that have occurred on the Ottawa River in the last five years are being completed, now is the time to begin outlining the next steps for the restoration of the River. A detailed evaluation of the in-stream contaminants has been underway. Much of this work has been conducted by Ohio EPA. This Ohio EPA sediment, water quality, fish, and macroinvertebrate data is being used to conduct a human and ecological risk assessment for the Ottawa River. This report which is being prepared by a consultant to TMACOG with funding from USEPA's Great Lakes National Program Office will be used to determine remediation alternatives for the improvement of the river. Specifically, this study will look at the contaminated sediment and provide information on hot spots based upon risk. This information can then be used to select the appropriate remedial alternatives based on the expected future uses for the Ottawa River or the upland area. Sediment removal and/or remediation may then be planned.

Once the sources have been eliminated and the contaminated sediment issues have been decided upon, then the restoration of the upland and aquatic ecosystem to a healthy state will complete the process. The tasks for addressing these issues are being developed by the partners of the ORR-Team.

Challenges

The challenges are directly tied to the next steps. Although the direction toward a cleaner and healthier Ottawa River is becoming clear, the greater challenge of funding these steps still is unresolved. The remaining steps are very costly. The challenge of paying for this remaining cleanup is a burden that the not only the governments, but the citizens of the community, and the users of the river will all have to bear. Through partnerships such as the Maumee RAP and the Ottawa River Remediation Team, progress is being made to restore the condition of the Ottawa River to a fishable and swimmable state for all who desire to use it.

