The glacial history of the Great Lakes basin and the tremendous influence of the lakes themselves create unique conditions. These support a wealth of biological diversity, including many species and communities of global significance. The basin’s sand dunes, coastal marshes, rocky shorelines, lakeplain prairies, savannas, forests, fens and other landscapes contain features that are either unique to or are best represented within the Great Lakes basin. The remarkable biodiversity of the Great Lakes basin is illustrated by the Indiana Dunes National Lakeshore. This park ranks third among U.S. National Parks in plant diversity, yet its area is less than three percent of either of the top two, Great Smoky Mountains and Grand Canyon.

A recently completed project by The Nature Conservancy’s Great Lakes Program evaluated the biodiversity features of the entire Great Lakes basin, human activities that put those features at risk and opportunities for protection.

The network of state and provincially operated Natural Heritage programs, which identify and track the status of key biodiversity features, has identified 131 elements within the Great Lakes basin that are critically imperiled (22), imperiled (30) or rare (79) on a global scale. These globally significant elements include 31 natural community types, 49 plants, 21 insects, 12 mollusks, nine fish, five birds, three reptiles and one mammal. Nearly half (61) occur exclusively or predominantly in the basin or have some of their best examples here.

For instance, the world’s last known population of the white catsaw pearly mussel (Epioblasma obliquata perobliqua) is found in Fish Creek, a small tributary at Fish Creek, a tributary of the Maumee River in Ohio and Indiana, watershed residents, government agencies and private organizations have joined to protect the stream’s remarkable fish and mussel diversity. Credit: Susan Crispin, The Nature Conservancy.
of the Maumee River in Indiana and Ohio. The copper redhorse (Moxostoma hubbsi) is a fish whose world distribution is limited to the lower Richelieu River (which drains Lake Champlain) and the adjacent St. Lawrence River. The Great Lakes themselves support several fish species of global significance. Among the basin’s glo-

bally rare fish is a recently-evolved complex of deepwater fish known as ciscoes. These fish played dominant ecological and economic roles in the fisheries of the Great Lakes. Unfortunately, overfishing and other factors drove several into extinction. Most of those still surviving are considered imperiled (shortnose cisco—Coregonus reighardii) or rare (kiyi—Coregonus kiyi and shortjaw cisco - Coregonus zeminthus).

Perhaps more than any other natural system, the Great Lakes sand dunes characterize the uniqueness and remarkable beauty of these coasts. One of the largest systems of freshwater sand dunes in the world, they range from high, forested dunes and linear dune ridges commonly backing sand beaches, to active dune fields covering thousands of acres, such as those near Ludington, Michigan. As plants and animals adapted to the unique dune environment, several evolved into new species and varieties. The dune thistle (Cirsium pitcheri), Houghton’s goldenrod (Solidago houghtonii) and the Lake Huron locust (Trimerotropis huroniana) are examples of recently evolved species endemic to the Great Lakes dunes.

The extensive freshwater marshes of the Great Lakes coasts are also unique in ecological character, size and variety. They occupy a remarkable diversity of settings, each resulting in different ecological dynamics and species composition. They range from small wetlands nestled in scattered bays to extensive shoreline wetlands such as those of southwestern Lake Erie, freshwater estuaries such as the Kakagon Sloughs of northern Wisconsin and the enormous freshwater delta marshes of the St. Clair River.

Surprisingly, some of the last, best examples of the continent’s most imperiled savanna communities lie along the lakeplains of the southern Great Lakes. The St. Clair River Delta, the Windsor area, the southern shores of Lake Michigan and the Chippewa/Illinois Dunes area harbor especially large, rich examples of this system, which has been lost throughout most of its range. Also occurring in the lakeplains is a unique community of arctic and prairie species that persists from the colder, then dryer climatic periods following glaciation. Often called by the Scandinavian name “alvar,” these communities are scattered in an arc that follows the Niagara Escarpment from upper Michigan through southern Ontario and to northwestern New York. Never widespread, this remarkable open bedrock landscape remains intact in only a handful of places.

Historically the lack of attention to biological diversity, the working capital of the basin’s ecological systems, has resulted in economic hardships for segments of the basin’s human population. In the early 1800s, the virgin forests of the basin appeared to be without limit. They were harvested to support the building boom in the basin, often with a view to farming the cleared land. Frequently, poorer soils could not support agriculture after the forests were cleared. The farms failed and the forests have yet to be fully regenerated. The Great Lakes commercial fishery reached its peak in the late 1800s. An entire industry, and the families it supported, suffered because of the introduction of exotic species, the overharvest of the lakes and pollution. Today, only pockets remain of the once much larger commercial fishery.

In the last 20 years, much has been done to stem the input of nutrients and toxic chemicals into the basin, initiating a rebound in the health of the ecosystem. Although some lake communities have undergone major changes, and some species have been lost, the ecosystem as a whole still supports special biological resources. However, certain human activities
continue to pose threats to the maintenance of biodiversity in the Great Lakes basin.

Agricultural practices, air emissions, land development, exotic species, in-place pollutants, mining, solid waste disposal, recreation, the management of living resources, water discharges and the control of water levels all pose threats to the biodiversity of the Great Lakes ecosystem. While all these activities are important, the greatest sources of stress to biodiversity in the basin are likely to include land development, agriculture and the control of water levels.

Protecting the biodiversity in the Great Lakes ecosystem requires strategic attention to the major threats to its key components. Efforts need to focus on those components that are most important to the basin’s biodiversity and are the most threatened. They also need to concentrate on those stresses that negatively impact the most biodiversity. Due to the different socioeconomic and political settings related to these stresses, a range of challenges will need to be addressed. As we learn more about the survival needs of species and communities, our understanding of the challenges will continue to increase. Focusing on these issues, a toolbox of conservation techniques and strategies can be developed that is tailored to the conservation needs and challenges in the basin.

Although such ecological conservation activities require a range of experience, resources and actors, an essential ingredient is that the work be designed and carried out by residents of the areas that sustain these special resources. Protection projects must be done by the residents of an area, not to them. Thus, the residents of the basin can begin to shape an economy that satisfies social needs while protecting the ecological processes that sustain us. Regional institutions, both public and private, can facilitate such projects.

Although significant challenges remain, the governments, industries and people in the basin have shared important victories in restoring the environmental quality of this ecosystem. The Great Lakes can continue to be a place where innovative environmental management approaches are developed, tested and institutionalized. The conservation of biodiversity is an important and logical next step.

For more information contact David Rankin or Susan Crispin, The Nature Conservancy, Great Lakes Program, 79 West Monroe Street, Suite 1309, Chicago, Illinois 60603, telephone (312) 759-8017.
Global Convention Sets Framework for Protecting Biological Diversity

by Andrew Hamilton

Biodiversity, or simply “biodiversity,” has become an important rallying point for mobilizing public and private support to conserve the planet’s biological heritage. The preceding article describes an important project that draws attention to our important “biodiversity heritage” in the Great Lakes basin. Similar regional and national initiatives are occurring in all parts of the globe. It is likely that more and more of these initiatives will be packaged as part of national efforts to implement the new global Convention on Biological Diversity.

The Convention on Biological Diversity became international law on December 29, 1993. This marked a significant step in the world’s approach to stemming the accelerating loss of biodiversity. The convention was one of two international conventions negotiated during the lead-up to the United Nations Conference on Environment and Development, or “Earth Summit,” held in Rio de Janeiro in 1992. More than 150 nations formally signed the convention at the summit. Canada and the United States have both signed the convention and Canada was the first “developed” nation to formally ratify it. On September 30, 1993 Mongolia became the thirtieth country to ratify the convention and by so doing ensured that it would come into force. The first high level meeting of countries that have formally ratified the convention will be held in late 1994.

The convention reflects the international recognition that sustainable development, if it is to be more than rhetoric, must have at its core a serious commitment to address the continuing loss of the earth’s biological diversity. Millions of years of evolution have resulted in diverse but interconnected living systems that collectively provide much of the planet’s life support as well as the food and many other resources on which humans and human economies depend. These biological resources -- genetic resources, organisms or parts of organisms, populations, or any other biotic component of any ecosystem with actual or potential use to humanity -- are renewable, and with proper care can support human needs indefinitely.

The Convention on Biological Diversity is arguably the first global convention that reflects a sustainable development perspective. Article 1 of the convention sets out the most ambitious purpose of the convention:

“The objectives of this convention ... are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilizing of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and technologies, and by appropriate funding.”

The convention provides a strong and compelling impetus for informed and responsible action to change the underlying factors that are contributing to the rapid loss of biodiversity. The convention is, in a sense, a bargain between the developed and developing nations of the world. It provides an agreed-upon framework for cooperation between states, institutions and individuals and many of the actions that are called for will need to be collective actions or mutually agreed actions.

Like the Great Lakes Water Quality Agreement -- which challenges the United States and Canada to restore and maintain the chemical, physical and biological integrity of the waters of the Great Lakes Basin Ecosystem -- the Convention on Biological Diversity calls upon its signatories to achieve objectives that are very challenging and which will in time likely lead to some very different ways of doing business. It also provides a timely warning that human societies and human economies are inextricably linked to and dependent on the richness, diversity and productivity of the living systems of the planet. It is an important reminder to us, collectively and individually, that we must learn to manage ourselves and our economies in ways that conserve the biological diversity and the ecological carrying capacity of the planet.

For further information, particularly on Canadian activities under the convention, contact the Biodiversity Convention Office, Environment Canada, 351 St. Joseph Boulevard, Hull Quebec K1A 0H3.
Sommaire


La Convention est la matérialisation de la prise de conscience à l’échelle internationale du fait que le développement durable, s’il doit devenir une réalité, doit s’appuyer sur un engagement sérieux pour lutter contre la diminution croissante de la diversité biologique à l’échelle de la planète. Plusieurs millions d’années d’évolution ont produit des systèmes vivants diversifiés mais interdépendants qui répondent collectivement à l’essentiel des besoins vitaux de la planète et qui constituent la principale réserve d’aliments et de bon nombre d’autres ressources dont sont tributaires les humains et leur économie. Ces ressources biologiques, génétiques, ces organismes ou parties d’organismes, ces populations et autres éléments biotiques de tout écosystème présentant une utilité réelle ou potentielle pour l’humanité sont renouvelables et, si l’on prend les précautions qui s’imposent, peuvent répondre indéfiniment à nos besoins vitaux.

La Convention donne un élan irrésistible à la prise d’initiatives éclairées et responsables visant à corriger les facteurs à l’origine de l’appauvrissement rapide de la biodiversité. Elle représente, dans un sens, un compromis entre les priorités des nations industrialisées et celles des nations en voie de développement. Elle fournit un cadre, accepté par les différentes parties, à la coopération entre les États, les institutions et les individus et bon nombre de gestes qui devront être posés devront être des gestes collectifs ou concertés.

Bioindicators: Living Creatures Show Success of Cleanup Efforts

by Frank Bevacqua

Picture trying to track all poisonous chemicals such as PCBs, dioxins, furans, DDT and others entering the Great Lakes. Your ledger shows numerous inputs from the land, air, submerged sediments and other sources. You know that progress to stop many of these releases is being made, but how do you arrive at a bottom line assessment?

An advisory task force to the International Joint Commission recently recommended a range of investigative tools to accomplish just that. Coming from a 1992 workshop, the recommendations are detailed in a report entitled Bioindicators as a Measure of Success for Virtual Elimination of Persistent Toxic Substances.

Looking at the biological resources in the Great Lakes ecosystem for signs of progress would seem logical. After all, stopping the injury to fish, wildlife and other creatures such as humans was the reason the Commission recommended a comprehensive strategy earlier this year to virtually eliminate long-lasting poisons, or persistent toxic substances (see Focus, March/April 1994, page one).

Unlike most other measures of progress, such as reducing pollution to supposedly safe levels, bioindicators can provide direct evidence that biological injury is decreasing. If this is the case, then the net release of toxic substances from the wide range of sources would also be decreasing.

What is a bioindicator? According to the recent report, a bioindicator is an organism or biological process whose change in numbers, structure or function points to changes in the integrity or quality of the environment.

Many people think of bioindicators as things that happen to populations of animals, such as the ability of bald eagles to reproduce successfully. Others think of injury to individual animals, such as double-crested cormorants born with crossed beaks. These are good examples and they have shown improvement in areas where the release of toxic substances has been reduced.

While such bioindicators are important, effects seen in populations or individuals are most useful for measuring recovery from widespread injury that has already occurred. In addition, other factors such as habitat loss, overharvesting, exotic species and...
infections also contribute to effects such as population declines and make the role of toxic substances more difficult to determine.

Another group of bioindicators looks inside the animal for signs of toxic exposure. These are much more sensitive and can provide an early warning before the injury becomes widespread. For a number of these bioindicators, low-cost standardized tests already exist and the results are relatively unaffected by the other factors mentioned above. Discussions at the 1992 workshop centered on bioindicators that have already been developed and on the animal species that would be best to examine.

Some of these bioindicators involve the body's response when it tries to rid itself of an unwanted chemical. This is the case with mixed function oxidases (MFOs), enzymes which generally add oxygen to a target substance so that it can dissolve in water and be excreted. Certain MFO enzymes respond to PCBs, dioxins and similar substances. They are useful bioindicators since they are produced in a wide range of animals, including humans, and play a central role in detoxification. In addition, tests for certain MFOs are well established and have sufficient field verification.

Others bioindicators, such as Vitamin A storage and thyroid function, can signal a disruption of normal body processes. Though Vitamin A depletion can be related to nutrition, it is probably the most sensitive bioindicator for PCB and related compounds that has been field validated. The thyroid plays an essential role in many body processes. It is also sensitive to a number of toxic substances, including those that mimic its hormones.

Participants at the workshop felt that information from bioindicators would be useful for regulators and policy makers in addition to scientists. Making bioindicators understandable to the general public was seen as an important challenge. Most people are likely to get more excited about the return and successful breeding of bald eagles on Great Lakes shorelines than about MFO activity in the same eagles. However, awareness of certain bioindicators has had a tremendous impact on our attitudes toward health. For example, few people realized 25 years ago that blood cholesterol levels could be a warning signal for the onset of heart disorders.

The Commission has a continuing interest in indicators of progress to restore the Great Lakes ecosystem and is planning a workshop related to this topic in fall 1994. To request a copy of Bioindicators as a Measure of Success for Virtual Elimination of Persistent Toxic Substances, contact the Commission's Washington, Ottawa or Windsor office.

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Sommaire

Imaginez que vous avez décidé de faire le relevé de tous les composés chimiques toxiques qui parviennent dans les Grands Lacs, comme les BPC, les dioxines, les furanes, le DDT et autres. Vos registres font état de nombreux apports par le sol, l'air, les sédiments submergés et d'autres sources. Vous savez que des progrès sont accomplis et qu'on rejette beaucoup moins de ces substances, mais comment parviendrez-vous à établir un bilan exact dans votre évaluation?

Récemment, un groupe de travail consultatif de la Commission mixte internationale a recommandé l'adoption de toute une série d'instruments d'enquête pour parvenir à ce résultat précis. Issue d'un atelier de travail qui s'est tenu en 1992, la recommandation est détaillée dans un rapport intitulé Bioindicators as a Measure of Success for Virtual Elimination of Persistent Toxic Substances.

Contrairement à la plupart des autres mesures du progrès accompli, comme l'abaissement de la pollution jusqu'à un niveau supposément sans danger, les bioindicateurs peuvent nous apporter la preuve directe que les lésions subies par les organismes sont en régression. Lorsque c'est le cas, on arrive à la conclusion que le dégagement net de substances toxiques qui proviennent de toute une série de sources, diminue également.

Alors, que sont les bioindicateurs? Bon nombre de personnes pensent à ce qu'il advient de populations animales comme celle des pygargues à tête blanche et leurs problèmes de reproduction. D'autres vont penser aux lésions subies par des animaux comme le Cormoran à aigrettes dont certains petits naissent avec le bec croisé. Voilà de bons exemples d'animaux dont la situation s'est améliorée dans les secteurs où le dégagement de substances toxiques a été réduit.

Il existe un autre groupe de bioindicateurs qui demande un examen interne des animaux pour trouver les symptômes d'une exposition à des substances toxiques. Ces indicateurs sont beaucoup plus sensibles que les autres et peuvent nous prévenir de problèmes bien avant que les lésions ne deviennent généralisées dans la population. On a mis au point des tests normalisés et peu coûteux pour bon nombre de ces bioindicateurs; les résultats de ces tests sont assez peu modifiés par d'autres facteurs tels que les pertes d'habitat, la surexploitation et l'introduction d'espèces exotiques. À l'atelier de 1992, les échanges ont porté sur les bioindicateurs qui existaient déjà ainsi que sur les espèces animales qui se prêtaient le mieux aux tests.
Susan Bayh and Alice Chamberlin
Appointed as New Commissioners

Susan Bayh of Indianapolis, Indiana and Alice Chamberlin of Warner, New Hampshire were nominated to the International Joint Commission by President Bill Clinton and confirmed by the United States Senate on March 26, 1994.

Commissioner Bayh was a corporate attorney who served with the Pharmaceutical Division of Eli Lilly and Company from 1989 until early 1994. Previously, she served as associate attorney with the firm of Barnes and Thornburg from 1985-1989 and with Gibson, Dunn and Crutcher from 1984-1985.

Commissioner Bayh chairs the board of directors for the Indiana Literacy Foundation in Indianapolis and is a member of the board of directors for a number of other organizations including Girls, Inc. in New York, New York, Habitat for Humanity in Atlanta, Georgia, Reading is Fundamental in Washington, D.C. and the United Way in Indianapolis. She is also a distinguished visiting professor at the Butler University College of Business Administration in Indianapolis.

After graduating in 1981 from the University of California at Berkeley, Commissioner Bayh earned a juris doctor degree in 1984 at the University of Southern California Law Center in Los Angeles. She is a member of the bar associations of Washington, D.C. and Indiana, and served on the Indiana Bar Association Ethics Commission from 1991-1992.

Alice Chamberlin is an attorney whose background includes 12 years of experience in environmental positions in state, county and municipal government. She served as chair and board member of the Warner Conservation Commission from 1988-1992, as board member of the Warner Planning Board from 1988-1990 and as executive committee member of the Central New Hampshire Regional Planning Commission from 1986-1988. As environmental policy assistant to Governor Hugh Gallen from 1981-1982, Commissioner Chamberlin served as the governor’s representative on interstate low-level radioactive waste negotiations and worked to implement the governor’s agenda on acid rain.

As environmental health director for the New Hampshire Lung Association in Manchester from 1980-1981, Commissioner Chamberlin pursued advocacy work for the New Hampshire Air Resources Agency and with industry and business. During the same period, she chaired the New Hampshire Citizens’ Task Force on Acid Rain. She also served as executive director of the Environmental Law Council of the Franklin Pierce Law Center in Concord (1983-1984) and as a professor in the Environmental Studies Program at Antioch Graduate School in Keene, New Hampshire (1985).

Commissioner Chamberlin earned a bachelor of arts degree at the State University of New York at Purchase in 1974 and a juris doctor degree at the Franklin Pierce Law Center in 1978. She is a member of the New Hampshire Bar Association.

Confirmation de la nomination de Mmes Susan Bayh et Alice Chamberlin à titre de Commissaires


La Commissaire Bayh préside le conseil d'administration de l'Indiana Literacy Foundation d'Indianapolis et elle fait partie du conseil d'administration de nombreuses autres organisations, notamment Girls, Inc. de New York, New York, Habitat for Humanity d'Atlanta, Georgie, Reading is Fundamental de Washington, D.C. et de l'United Way à Indianapolis. Elle est aussi professeur distinguée invitée du Butler University College of Business Administration d'Indianapolis.


**Simon Llewellyn** de l'Environnement Canada's Ontario Region a été récemment nommé par l'International Joint Commission comme membre du Comité des Grands Lacs. Il a été membre du Comité International du Plan de l'eau des Grands Lacs et du Comité de la qualité de l'eau des Grands Lacs.

**Maurice Lewis, James Donald McCuaig**, directeur de l'Environnement Canada's Water and Habitat Conservation Branch a été nommé par l'International Joint Commission comme membre du Comité des Grands Lacs. Il a été membre du Comité des Grands Lacs.

**Nelson Thomas**, directeur du l'Environnement Canada's Water and Habitat Conservation Branch, a été nommé par l'International Joint Commission comme membre du Comité des Grands Lacs.

**Robert Chang**, du Ontario Ministry of Natural Resources a été membre du Comité des Grands Lacs. Il a été membre du Comité des Grands Lacs.

**Duncan Ellison**, le coprésident américain sortant, restera membre du Conseil.

**Kenneth G. Hamilton**, d'Environnement Canada, Région de l'Atlantique, a été nommé coprésident canadien du Conseil consultatif international de lutte contre la pollution de la rivière Sainte-Croix.

M. Hamilton succède à Ed Norrena.

La Commission a également nommé Robert Chang, du ministère des Richesses naturelles de l'Ontario, membre du Conseil international de contrôle de la rivière Niagara pour remplacer le membre sortant Maurice Lewis, James Donald McCuaig, directeur de la Direction de la conservation de l'eau et des habitats d'Environnement Canada, a été nommé par la Commission membre du Conseil technique international des rivières Souris et Rouge. M. McCuaig succède à Duncan Ellison.
the Minister of the Environment is convening a consultation process of multi-stakeholders to do exactly this, to try and define an action plan to reduce, prohibit and substitute the use of chlorine. This action plan should be ready by the late spring of this year.”

In a related development on April 18, 1994, the Canadian Government announced the six-year, $150 million federal Great Lakes 2000 Program. Great Lakes 2000 targets action toward three objectives: restoration of degraded sites, prevention and control of pollution and conservation of human and ecosystem health. As one of its key objectives, the program will take steps to eliminate persistent toxic substances identified by the International Joint Commission for priority action.

Minister Copps cautioned that the successful achievement of the targets calls for the support of all sectors of Canadian society, coupled with actions in the United States. “I intend to meet my American counterpart, (U.S. Environmental Protection Agency Administrator) Carol Browner, later this spring to discuss improved Canada-U.S. cooperation on Great Lakes issues, including binational strategies for dealing with persistent toxic sub-

stances,” added Minister Copps.

As we go to press, the Governments of Canada and Ontario are close to signing a new Canada-Ontario Agreement Respecting the Great Lakes Basin Ecosystem. While no details are available at press time, it is expected to be constructive and responsive to International Joint Commission recommendations. An important element of the new agreement will be emphasis on the ecosystem and the need to involve all elements of society as partners in decision-making.

Also on April 18, 1994, the Governments of Canada and Quebec announced their intent to contribute $100 million and $91 million respectively to the St. Lawrence Vision 2000 action plan. By signing the St. Lawrence Vision 2000 agreement, which will expire on March 31, 1998, the federal and provincial governments intend to maintain efforts of the St. Lawrence Action Plan (see Focus, July/August 1993, pages 7-9). These include reducing liquid toxic waste, preventing pollution and conserving ecosystems. For more information on these initiatives contact Duncan Dee, Press Secretary, Office of the Deputy Prime Minister and Minister of the Environment at (819)997-1441; fax (819)953-3457 or Eleanor Kulin, Environment Canada, Ontario Region, 25 St. Clair Avenue East, Toronto, ON M4T 1M2, (416)973-8632; fax (416)973-7438.

New regulations that came into effect on July 1, 1994 require new chemicals to be tested and assessed for potential environmental and health effects before they are introduced into Canada. Manufacturers and importers will have to supply the Canadian Government specified information on such areas as chemical identity, toxicological and environmental effects data and manufacturing information. The regulations are a major shift away from the traditional approach of assessing substances after they have entered the environment. The New Substances Notification Regulations were developed through extensive consultations with environmental groups, affected industries and other interested organizations. For more information contact Desmond Mahon, Environment Canada at (819)997-4336; fax (819)953-7155.

Several initiatives affecting Great Lakes water quality have been announced by the Government of Canada. On February 18, 1994, Deputy Prime Minister and Minister of the Environment Sheila Copps stated, “We are prepared to table within the next four to six months, a list of timetables and schedules for the sunsetting of all problem chemicals, including the possibility of sunsetting organochlorines.” Minister Copps made the announcement before Parliament when asked how the government would respond to recommendations in the International Joint Commission’s Seventh Biennial Report on Great Lakes Water Quality.

Further clarification of the announcement was provided on March 21, 1994 by Clifford Lincoln, parliamentary secretary to Minister Copps. He stated, “Through the Great Lakes action plans and programs in place already and through close interaction with other countries, especially the United States, we need to establish strategies along with our neighbors to the south to reduce, prohibit and substitute for the use of chlorine and chlorinated compounds. ... Currently

In April, Dr. Lester Machta (center) was thanked by Thomas Baldini, Susan Bayl and the other commissioners of the International Joint Commission for serving nine years as U.S. Section chair of the International Air Quality Advisory Board.
The Great Lakes Ecosystem Charter is expected to be signed in a ceremony at the Great Lakes Commission’s annual meeting in Dearborn, Michigan this October by representatives from U.S. and Canadian agencies, tribal authorities, regional organizations and groups representing economic and citizen environmental interests. Development of the Ecosystem Charter was coordinated by the Great Lakes Commission with support from the Joyce Foundation.

While many laws, programs, policies and institutions in the Great Lakes-St. Lawrence basin support the concept of an ecosystem approach, application of the concept is difficult due to their often narrow, single-medium or issue-specific mandates.

The Ecosystem Charter summarizes, in a concise and convenient form, commonly held principles drawn from existing laws, treaties, agreements and policies. It includes a vision statement and a series of principles in the categories of rights and responsibilities, ecological integrity and diversity, sustainable communities, institutional relations, and public information, education and participation. It includes a series of actions that all members of the Great Lakes-St. Lawrence basin community can endorse or undertake in support of these principles.

While not legally binding, the Ecosystem Charter is a good faith agreement among its signatories. It is a tool for organizing, coordinating and periodically assessing public and private sector efforts to implement an ecosystem approach. It is a tool for information and education, offering a vision statement and a means to achieve it. Finally, it is a tool for advocating the interests of the basin ecosystem and its inhabitants, a statement of unity acknowledging that all partners in the collective management effort -- despite differences -- subscribe to a single set of fundamental principles.

The International Joint Commission has commended the Great Lakes Commission for leading the development of this important document that draws interests across the basin together in support of ecosystemic principles.

The Ecosystem Charter was circulated in draft and revised following a public comment period and workshops. Interested agencies, organizations and jurisdictions throughout the Great Lakes-St. Lawrence basin are currently invited to endorse the document. For more information contact Victoria Pebbles, Great Lakes Commission, 400 Fourth Street, Ann Arbor, MI 48103-4816. Telephone (313)665-9135; fax (313)665-4370; email GLC@Great-Lakes.CIC.Net.

In a major new U.S. federally-funded study, 2,500 people from five states will give health officials blood samples over the next few years to test for 
PCB levels caused by eating Great Lakes fish -- especially large fish like salmon and lake trout, which collect chemical pollutants in their bodies. Great Lakes charter boat captains or their immediate family members will participate in the study. Boat captains were chosen because they eat fish regularly. The studies might show the extent to which laws to clean up the Great Lakes have helped protect human health.

In 1982, a Michigan Department of Health study examined blood samples from 572 people who ate Great Lakes fish. The study concluded that regular fish-eaters had higher levels of PCBs in their blood than others. PCBs are one of the critical pollutants recommended for priority action by the International Joint Commission because they are associated with a range of health effects. A 1989 followup study showed the levels had not declined. Dr. Henry Anderson is heading the current study that will focus on the health effects of PCBs. For more information contact Dr. Henry Anderson, Chief Medical Officer, State of Wisconsin Division of Health, 1414 East Washington Avenue, Room 96, Madison, WI 53703-3044.

Yellow Fish Road raises public awareness in Canada that toxic chemicals poured into storm sewers go directly into rivers, lakes and streams and into the food chain. Volunteers paint a yellow fish symbol beside storm sewer drains and hang a yellow fish-shaped brochure on each door in the community. Trout Unlimited and the Canada Department of Fisheries and Oceans are spearheading the program and Health Canada has also become active by adding health information to the community package of materials. If you would like to initiate this program in your community, contact Pierre Paquette, Department of Fisheries and Oceans, 867 Lakeshore Road, Burlington, ON L7R 4A6. In Canada telephone (800)668-5222.
**Paradoxe à la Commission mixte internationale:**
**Évolution sociétale et stabilité sociale**

*par Claude Lanthier, ing.*

**Évolution sociétale**

Depuis mes quatre courtes années passées comme commissaire à la Commission mixte internationale, j'ai beaucoup entendu parler du rôle vraiment spécial assumé par notre organisme. Oh! je sais qu'on qualifie cette vénérable institution comme étant à caractère unique. Mais permettez-moi de vous soumettre ma modeste conception personnelle de l'évolution sociétale qui a caractérisé notre évolution en fonction des changements imposés par la progression de nos deux pays en pleine effervescence.

En effet, depuis quelque quatre-vingt ans, plus précisément depuis la réunion inaugurale de 1912, la Commission mixte internationale a grandement aidé nos deux gouvernements des États-Unis et du Canada à prévenir ou résoudre des différends, principalement en ce qui a trait à la qualité et aux débits des cours d'eau qui sont communs ou traversent nos frontières et ce, depuis l'océan Atlantique jusqu'au Pacifique.

Certes, au tout début de son existence, la Commission mixte internationale se considérait principalement, et était effectivement, un tribunal judiciaire. Cet état des choses se reflétait d'ailleurs dans les procédures utilisées durant les premières années de son existence.

Mais voilà qu'à partir des années 1930, même avec son rôle traditionnellement judiciaire, la Commission mixte internationale s'est engagée définitivement dans le virage technologique. Dorénavant, cette nouvelle voie servira de fondation aux avis, recommandations et décisions. Il s'agissait à l'époque, de se mettre au pas d'une évolution sociétale imposée par le développement de la civilisation.

Dans les années suivantes (1950), le Traité concernant la diversion de la rivière Niagara, les ententes binationales concernant l'exploitation de la puissance génératrice du fleuve Saint-Laurent ainsi que les négociations concernant la rivière Columbia, toutes ces approches ont reflété des ententes plutôt binationales qu'internationales entre nos deux pays amis. Même si ces ententes étaient négociées d'une façon binationale, ces traités furent ensuite relégués à la Commission mixte internationale en vue de leur application.

Plus tard, dans les années 1970, la signature par nos deux gouvernements de l'Entente concernant la qualité de l'eau des Grands Lacs a introduit une autre nouvelle notion d'opérer. Il s'agissait alors de procéder à la Commission mixte internationale un rôle d'intervenir direct dans l'exécution de nos recommandations et l'implémentation des préceptes préconisés par les gouvernements. Voilà qui rétablit l'ordre des choses, les représentants des Hautes parties contractantes ont alors démontré, sans équivoque, leur confiance envers leur institution de méthode alternative de règlement de leurs différends, en confiant à ce tribunal, que nous sommes, le plus important dossier de notre histoire.

Plus récemment encore, dans les années 1980, un important ordre de renvoi concernant les mesures destinées à atténuer les conséquences néfastes des fluctuations de niveaux d'eau du Saint-Laurent et des Grands Lacs a procuré à la Commission mixte internationale une nouvelle méthode d'étude comportant une additionnelle dimension sociétale. Pour cet ordre de renvoi, les consultations populaires ont alors pris une toute nouvelle envergure, et ce, à la mesure directe de l'engagement des autorités gouvernementales, des citoyens, des industries et des organisations environnementales concernés.

Maintenant, dans les années 1990, les méthodes contemporaines et innovatrices de communications avec les différents publics concernés nous conduisissent vers des engagements nouveaux, comme celui d'un processus de prise de décisions politiques hautement exposé aux critiques directes et compétentes. Constamment à l'affût des problèmes émanant de conditions sans cesse changeantes, la Commission mixte internationale doit s'adapter instantanément aux fréquents virages technologiques contemporains.

Somme tout, nous n'avons d'autre alternative que de faire nôtre cette politique inévitale du changement constant, autant dans la nature des problèmes prévalents que dans la variation de la disponibilité de leurs solutions. La différence de réalités entre les années passées de 1970 et la nouvelle ère des années 1990 à laquelle nous devons tous nous adapter, peut s'illustrer ainsi:

En 1970, la régularité était la règle et le changement était l'exception, mais en 1990, le changement est la règle et la régularité est l'inquiétante exception.

**Stabilité sociale**

Maintenant, une autre réalité tout aussi présente et celle-là, contrairement à la précédente théorie est tout-à-fait constante, consiste en ce que la Commission mixte internationale se doit de...
compter que sur sa crédibilité établie qui représente une stabilité sociale rassurante à notre époque troublante de changements révolutionnaires effrénés.

La Commission mixte internationale se doit de maintenir jalousement intacte une telle réputation aussi solidement établie que délicate et, hélas, vulnérable, auprès des gouvernements, des professions engagés, des groupes industriels et activistes, ainsi qu’aujourd’hui grand public en général. Une bonne crédibilité est fondée sur deux piliers angulaires morales, soit une indépendance affirmée et une compétence confirmée.

Les recherches, conclusions et recommandations de la Commission mixte internationale doivent être appuyées sur une argumentation raisonnable et endossée sur de solides données défendables. Ces réalisations sont d’autant plus difficiles à se manifester lorsqu’il s’agit de nouveaux problèmes qui présentent des caractéristiques incertains, une carence d’expérimentation, d’extrapolations dans des encadrements d’échelle globale et de dimensions temporelles illimitées. La compétence requise de nos ressources humaines pour la réalisation de nos recherches doit être établie sur une excellente éducation originale renforcée d’une assidue formation continue.

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Mais la composante primordiale de la crédibilité de la Commission mixte internationale est son indépendance. La puissance et la valeur de nos recommandations auprès des gouvernements sont confirmées par le fait de l’isolement administratif de nos effectifs. Cette indépendance intellectuelle ainsi que notre liberté d’action est garantie d’un débat indépendant qui assure l’objectivité de nos décisions et de leurs impacts. Parfois conflictuels qui nous les confrontent. Nous nous devons de connaître à fond tous les intérêts en cause, mais il est aussi de notre devoir de se parer de le confirmer à qui que ce soit lors des débats concernés, que ces parties soient les gouvernements, les institutions pour gouvernementales, les associations industrielles ou les mouvements sociaux.

Pour exercer ses fonctions normalement et efficacement, notre organisme doit jouer d’une liberté d’action sans obligation de rendre compte de ses actions journalières, autrement dit dans un cadre préétabli et global. Il va de soi que la Commission mixte internationale doit montrer qu’elle agit dans l’élaboration de ses jugements sans aucune contrainte établie qui pourrait apparaître en faveur d’un gouvernement ou d’intérêts privés. D’autres facteurs importants entrent aussi en ligne de compte lorsqu’on considère la formation et les opérations de nos comités consultatifs. Nous nous efforçons de former ceux-ci en y invitant de compétents scientifiques provenant des nombreux intérêts engagés. Ces délégués ne représentent pas les organismes-déléguants, ni les intérêts de ceux-ci, mais ces membres de nos groupes de travail siègent en leur capacité personnelle et professionnelle.

Le défi d’un environnement durable requiert maintenant une intégration des conseils techniques, scientifiques, juridiques et sociaux qui sont entièrement différents qu’elle soit auparavant. Il est dorénavant incompatible de considérer des limites au monde de la communication, ni d’autres frontières qui cloisonneraient les disciplines professionnelles. La société d’aujourd’hui exige qu’on s’adresse aussi à l’interrelation entre les problèmes de l’heure. N’avons-nous pas été précurseur de l’utilisation de l’approche écosystémique dans le traitement des problèmes environnementaux? Le développement durable exige aussi que ses problèmes soient traités en les abordant d’une façon intégrée et non d’une manière simpliste et réductionniste, telle que l’ont jadis préconisé nos traditionnelles limitations professionnelles. D’ailleurs la diversité des disciplines et ses experts oeuvrant au sein de nos comités consultatifs nous assurent une variété bienfaisante d’approches par des compétences variées.

A maintes reprises, on réfère à la Commission mixte internationale comme un tribunal quasi-judiciaire. Il est encourageant de constater qu’ingénieurs et avocats sont maintenant soutenus dans leurs efforts de trouver de nouvelles avenues de règlements de différends par des moyens alternatifs comme l’arbitrage et la médiation. A et plus par la prolifération des tribunaux internationaux, parallèles ou alternatifs, notre méthode usuelle de conciliation qui mène à des conclusions de consensus est certainement à la page. On peut aisément conclure que les Pères du Traité relatif aux eaux limitrophes, l’acte de
The paradox of the International Joint Commission: Societal change versus social stability

by Claude Lanthier, Eng.

Societal change

In my four short years as a commissioner, I have often heard mention of the truly special role played by the International Joint Commission (IJC). Although this venerable institution is considered unique, I would like to discuss how, in my view, societal change has affected the evolution of the IJC within the context of the development of our two growing countries.

Since its inaugural meeting over 80 years ago in 1912, the Commission has done a great deal to help the United States and Canada prevent or settle disputes, primarily concerning the quality and flows of watercourses that are common to or cross the borders of both countries, from the Atlantic to the Pacific coasts.

When it first came into being, the Commission considered itself primarily, and in fact was, a judicial tribunal. This was reflected in the procedures that were used during its early years.

Beginning in the 1930s, however, while maintaining its traditionally judicial role, the Commission embraced technological change. Henceforward, this new outlook would serve as a basis for its opinions, recommendations and decisions. The idea, at the time, was to keep pace with societal change stemming from the development of civilization.

In the decade of the 1950s, the Niagara River Diversion Treaty, the various bilateral agreements to harness the power generating capacity of the St. Lawrence River, and the negotiations concerning the Columbia River were all reflective of the bilateral rather than international approach preferred by our two friendly countries. Although these treaties were negotiated bilaterally, most of their application was relegated to the Commission.

Later, in the 1970s, the signing of the Canada-U.S. Great Lakes Water Quality Agreement introduced a new operating approach by providing the Commission an ongoing role in its implementation. The proper order of things was thus restored, as representatives of the contracting parties unequivocally demonstrated their confidence in the IJC as an alternative dispute settlement institution by assigning to it what amounts to the most important docket in its history.

Even more recently, in the 1980s, an important reference concerning methods of alleviating the adverse consequences of fluctuating water levels in the Great Lakes-St. Lawrence River basin provided the Commission with a new study method bringing with it another societal dimension. For this mandate, public consultations took on a new degree of importance directly proportionate to the level of commitment made by the government authorities, citizens, industries and environmental organizations concerned.

Now, in the 1990s, the modern and innovative methods available for communicating with various stakeholders are carrying us towards new commitments, such as a political decisionmaking process that is highly exposed to direct and knowledgeable criticism. Always abreast of problems...
arising out of ever-changing conditions, the IJC must adapt immediately to frequent changes in modern technology.

In short, we have no alternative but to embrace this inevitable policy of constant change, as much in the nature of prevalent problems as in the varying availability of solutions to these problems. The difference between the 1970s and the new era of the 1990s, to which we must all adapt, is simple:
- In the 1970s, continuity was the rule and change was the exception;
- In the 1990s, change is the rule and consistency is the worrisome exception.

Social stability

Another very real and entirely consistent (unlike the preceding theory) fact of life is that the Commission must rely on its established credibility, which is a reassuring emblem of social stability in our disquieting era of unbridled revolutionary change.

The Commission must guard the solidified established reputation it has with governments, professional sectors, industrial groups and activists, as well as with the general public. The moral cornerstones of sound credibility are affirmed independence and confirmed competence.

The research, findings and recommendations of the IJC must be supported by reasonable arguments and backed by sound, defensible data. These achievements are all the more difficult for new problems with uncertain characteristics, a lack of experimentation, extrapolation in global frameworks and unlimited time dimensions. The skills and abilities required of our human resources to conduct our research must be based on excellent academic qualifications reinforced by assiduous professional training.

But the key factor in the Commission's credibility is its independence. The power and value of our recommendations to governments are reinforced by the administrative isolation of our personnel. This intellectual autonomy and our freedom of action—guarantee a level of detachment that is essential in ensuring the objectivity of our decisions pertaining to the varied and sometimes conflicting interests that confront us. We must be thoroughly familiar with all of the interests involved, but we also have a duty to avoid seeming to identify with any of the parties involved in a particular debate, regardless of whether those parties are governments, paragovernmental institutions, industrial associations or social groups.

In order to perform its tasks normally and effectively, the Commission must be free to act without having to report on its everyday activities, other than in a predetermined and global framework. The Commission must demonstrate that its decisions are not predetermined, are arrived at without constraints and do not favor one government or private interest over another.

Other important factors also come into play in the establishment and operation of our advisory bodies. We strive to form these committees by inviting the participation of qualified scientists covering the many interests involved. These delegates do not represent the delegating agencies or their interests, but rather sit on our working groups in their personal and professional capacities.

The challenge of a sustainable environment now requires a completely different integration of technical, scientific, legal and social advice than in the past. It is now unacceptable to consider setting limits on the world of communication, or other boundaries that would compartmentalize professional disciplines. Present-day society is demanding that we also address the interrelation between current problems. Were we not a forerunner in the use of an ecosystem-oriented approach to address environmental problems? Sustainable development also requires that problems be addressed comprehensively and not in a simplistic or reductionist manner, as previously dictated by our traditional professional limitations. The diversity of disciplines and expertise in our advisory committees is such that we can be assured of a refreshing variety of approaches involving a variety of skill areas.
The Commission has been referred to as a quasi-judicial tribunal on numerous occasions. It is encouraging to note that engineers and lawyers are now supported, in their efforts to find new dispute settlement mechanisms, by alternative means such as arbitration and mediation. Judging by the proliferation of international, parallel or alternative tribunals, our usual method of seeking solutions leading to consensus is certainly still very popular. Thus the architects of the Boundary Waters Treaty, under which the Commission was created, were indeed visionary in terms of the accuracy in scale and scope of their conception, at that time, of the future of our tribunal.

The Commission can take pride and satisfaction in the results of its recommendations; a great deal remains to be done, however, and society is becoming more and more demanding – and rightly so. I feel that we now have a greater responsibility to the general public than we ever did before. The multi-faceted means at our disposal for solving the latest problems (e.g. advisory committees, working groups, public hearings and meetings, scientific and administrative sessions, conference calls, interactive television, our newsletter Focus and other public education projects) all favor a positive integration of approaches.

The Commission has a rich history and long tradition of conciliation, arduously arrived at consensus, major achievements by consensus, complex environmental decisions and scientific recommendations that have now gained widespread acceptance.

I shall look forward to any debate or challenges that may be elicited by this brief essay. These may be addressed to Claude Lanthier, Canadian Section Chair, International Joint Commission, 100 Metcalfe Street, 18th Floor, Ottawa, Ontario K1P 5M1.

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**Great Lakes Water Level Conditions Stay Relatively Stable in 1994**

Conditions remained relatively stable this winter and spring as water levels on Lakes Erie and Ontario fell from the high levels of 1993 and levels on the upper Great Lakes are similar to where they were at this time last year.

As we go to press in early June, Lake Superior is two centimeters (1 inch) higher, Lakes Michigan and Huron are 1 centimeter (half an inch) lower, Lake Erie is 13 centimeters (5 inches) lower and Lake Ontario is 51 centimeters (20 inches) lower than the levels in June 1993.

Presently, the levels of all Great Lakes are within the middle third of their historic range of fluctuation, which is approximately 1.2 meters (four feet) for Lake Superior, 1.8 meters (six feet) for Lakes Michigan, Huron and Erie and two meters (6.5 feet) for Lake Ontario.

Despite heavy snowfall in areas, the water content of the snowpack on the Lake Ontario basin at the beginning of March measured only slightly more than the 32-year average. Lake Ontario water levels returned to more average conditions this year, a welcome relief from the extreme high levels of a year ago (see Focus, July/August 1993, pages 20-22).

The severe winter of 1993-1994 brought extensive ice to the St. Lawrence River, but few ice problems were experienced. A solid and stable ice cover formed quickly over much of the river in January due to persistent arctic conditions. In addition, no significant flooding has occurred to date along the St. Lawrence River.

Though heavier-than-usual ice created the potential for ice jams in the Great Lakes connecting channels and for shoreline damage caused by loose ice floes, no significant events of this nature were reported.

Average water level conditions, such as those now prevalent on the Great Lakes, reduce the potential for harm to shoreline property owners, boaters and other interests. However, flooding, erosion and hazardous conditions to boating can still occur, particularly from wind-driven waves and short-term water-level fluctuations caused by wind and atmospheric pressure changes.

To obtain detailed information about Great Lakes water levels in a free monthly bulletin, write to Department of the Army, Detroit District, Corps of Engineers, Attn: CENCE-EDL, P.O. Box 1027, Detroit, Michigan 48231-1027, or to Canadian Hydrographic Service, Canada Centre for Inland Waters, 867 Lakeshore Road, P.O. Box 5050, Burlington, Ontario, L7R 4A6.

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**Sommaire**

Les conditions sont demeurées stables durant l’hiver et le printemps dernier. En effet, le niveau des lacs Érié et Ontario était inférieur à celui de l’an dernier tandis que le niveau des lacs en amont n’as pas changé depuis l’an dernier.

Au moment d’aller sous presse au début juin, le niveau du lac Supérieur a augmenté de 2 cm (1 po), celui des lacs Michigan et Huron a baissé de 1 cm (5 po), celui du lac Érié de 13 cm (5 po) et celui du lac Ontario de 51 cm (20 po) par rapport aux niveaux enregistrés en juin 1993.
À l’heure actuelle, les niveaux de tous les Grands Lacs se situent aux deux tiers supérieurs de leur intervalle historique de fluctuation, ce qui correspond environ à 1,2 m (4 pi) pour le lac Supérieur, 1,8 m (6 pi) pour les lacs Michigan, Huron et Érié, et 2 m (6,5 pi) pour le lac Ontario.
En dépit des fortes précipitations de neige, la teneur en eau de la neige accumulée du bassin du lac Ontario au début du mois de mars n’était que très légèrement supérieure à la moyenne de 32 ans. Le niveau des eaux du lac Ontario est revenu à des conditions plus proches de la moyenne cette année, ce qui constitue un soulagement par rapport aux valeurs extrêmement élevées enregistrées il y a un an (se reporter à Focus, juillet/août 1993, p. 20-22).
Les conditions hivernales rigoureuses observées en 1993-1994 se sont traduites par une couche importante de glace sur le Saint-Laurent, laquelle a cependant causé peu de perturbation. De surcroît, il n’y a eu à ce jour aucune inondation des berges du fleuve.
Les valeurs proches de la moyenne du niveau des eaux telles que celles qui prévalent actuellement dans les Grands Lacs réduisent les risques de dommages pour les propriétaires riverains, les plaisanciers et les autres personnes intéressées. Toutefois, les risques de crue, d’érosion et de conditions dangereuses pour la navigation de plaisance n’ont pas pour autant disparu, en particulier si l’on considère la moule et les fluctuations à court terme du niveau de l’eau causées par le vent et les variations de la pression atmosphérique.

The Thunder Bay Takes a Unique Ecosystem Approach to Remedial Action

by Patrick Morash and Karen Bray

Like other Great Lakes ports cities, Thunder Bay’s waterfront is primarily industrial. The result is an aesthetically displeasing waterfront and a lake community that is largely isolated from the majestic body that shaped its evolution. This purely utilitarian approach to land use has resulted in a severed link between community and environment, pitting prosperity versus habitat. The ecosystem approach challenges this outmoded paradigm.

The Thunder Bay Area of Concern is one of four on the north shore of Lake Superior. The 1991 Remedial Action Plan (RAP) Stage 1 report, which defined the environmental problems, indicated that sediment contamination in the inner harbor was the most significant impairment in the Area of Concern. Stage 2, which identifies cleanup actions, is underway and options are being considered that would recognize the importance of both biological and physical ecosystem components and human influence.

The economic significance of the Thunder Bay Harbour is recognized in the first of 26 water use goals developed by the RAP Public Advisory Committee:

The Thunder Bay Area of Concern is one of the world’s largest shipping ports and ... waterfront industrial activities form an important part of the local economy ...
The complete list of goals addresses the 10 environmental use impairments in the Area of Concern.

Based on these objectives, the Public Advisory Committee and the RAP Team have proposed a creative concept for managing a vexing issue: creosote and pentachlorophenol soil and sediment contamination at a waterfront industrial site. Northern Wood, Inc. operates a sawmill and wood preserving plant using pentachlorophenol, creosote and chromated copper arsenate. The plant has been operating since the 1930s under several different owners and recent site investigations estimate some 150,000 cubic meters (195,000 cubic yards) of contaminated soil and sediments require remediation.

The site is a microcosm of the entire Area of Concern. Impairments include degradation of aesthetics and conditions for bottom-dwelling creatures, restrictions on dredging, and loss of fish and wildlife habitat with subsequent impacts to fish and wildlife populations. In 1989 pools of creosote were removed from the harbor bottom in the vicinity of Northern Wood. Because the site is in a central and highly visible location, and the issue of the creosote “harbor blob” has been widely publicized, the community is expecting responsible action.

The proposed concept (see figure) provides a blueprint for this action. It takes into consideration results of past technical studies, Public Advisory Committee recommendations and, most importantly, the water use goals for the Thunder Bay Area of Concern.

Representatives of the Public Advisory Committee, Ontario Ministry of Environment and Energy, Environment Canada and Northern Wood have achieved consensus on the need for the following remedial works:

- **Prevention** of further site contamination through construction of a drip collection system;
- **Containment** of contaminated soil in the vicinity of the wood preserving operation to prevent further seepage into the harbor;
- **Removal** of contaminated lake sediments and appropriate treatment/disposal;
- **Long-term remediation** of contaminated soils.

To the greatest extent possible, the site rehabilitation concept embodies each water use goal. These goals go beyond simple remediation of contaminants. Extensive public discussion to determine a vision for Thunder Bay Harbour resulted in agreement that the harbor is a very important resource, not only from a water quality perspective, but within a broad context of interrelating social, economic and environmental values.

Specific examples illustrate how these values have been integrated in the Northern Wood concept. Site containment is attained through creative berm construction that also creates aquatic habitat. Polluted stormwater treatment is achieved by rehabilitating a previously degraded wetland. Potential expansion and consolidation of current private industrial operations is realized through a lakefill component that incorporates significant public greenspace. And public access to the waterfront via a walkway, viewing/fishing platforms and interpretive signage all present aesthetically appealing opportunities for tourism in a working harbor.

This proposal marries actions and values traditionally viewed as being in direct competition for resources. Including these components as integral features -- wetland rehabilitation, public access and tourism opportunities -- encourages the participation of partners who would otherwise have little interest in a project focused solely on remediating contaminants. The Thunder Bay RAP has forged many fruitful partnerships in habitat restoration and creation projects through use of this integrated approach. Of most significance is a commitment from the community itself. Continuing in this tradition, participation in the Northern Wood project is not
limited to resource management agencies and industry, but may include other government agencies, private landowners and interested community organizations.

This is a serious proposal for developing sustainability. At the head of the Great Lakes, Thunder Bay grew from a need for transshipment. The waterfront is justifiably dominated by grain elevators and other industries, and is further isolated from the community by a maze of railway tracks. As the Thunder Bay Harbour was developed, shoreline habitat was lost and public access became limited. The Northern Wood site rehabilitation concept recognizes economic realities while encompassing environmental and social values and thereby providing the potential for the emergence of a fully integrative industrial waterfront site.

For further information on this and other Lake Superior projects contact Jake Vander Wal, Thunder Bay Remedial Action Plan Coordinator, 1194 Dawson Road, R.R. No 12, Site 8, Comp. 16, Thunder Bay, Ontario P7B 5E3, telephone (807)768-2104; fax (807)768-1889.

Grain elevators are a prominent feature of the Thunder Bay shoreline.

**Sommaire**

Le secteur riverain de Thunder Bay, comme celui d'autres villes portuaires des Grands Lacs, a une vocation avant tout industrielle, qui a eu pour conséquence d'enlaidir le paysage et de couper la communauté lacustre du majestueux lac qui est à l'origine de son développement. Cette approche purement utilitaire de l'aménagement du territoire se traduit par une dégradation du lien entre la collectivité et son milieu où la prospérité est privilégiée au détriment de l'habitat. L'approche écosystémique remet en question ce paradigme dépassé.

Sur la base d'objectifs définis collectivement, le comité consultatif public et l'équipe du Plan d'action correctrice ont proposé un concept créatif de gestion d'un problème épineux : la contamination des sédiments et du sol par la créosote et le pentachlorophénol dans un site industriel du secteur riverain. La société Northern Wood Inc. exploite une scierie et une usine de préservation du bois qui utilise du pentachlorophénol, de la créosote et de l'arséniate de cuivre chromé.

Certains exemples concrets illustrent la manière dont ces valeurs ont été intégrées dans le concept de Northern Wood. Pour délimiter le site, on a construit un talus d'une conception novatrice qui crée également un habitat aquatique. Pour le traitement des eaux pluviales polluées, on a remis en valeur un milieu humide précédemment dégradé. Pour permettre l'expansion et la consolidation des opérations industrielles privées, on a recours au remblayage en accordant une large place aux espaces verts publics. Par ailleurs, l'accès public au secteur riverain par des voies piétonnières, des plates-formes d'observation et de pêche et la signalisation à vocation didactique sont autant de possibilités de rendre plus attrayante pour les visiteurs la promenade dans un port en pleine activité.

Cette proposition a l'avantage de concilier des mesures et des valeurs traditionnellement considérées comme entrant en compétition directe pour l'exploitation des ressources et d'encourager la participation de partenaires qui auraient sinon peu d'intérêt pour un projet axé principalement sur la dépollution.
Opinion Surveys Help Define Strategies for the Black River Watershed

by Christie L. Vargo

Investigations to identify pollution sources to the Black River in Stage 1 of the Remedial Action Plan (RAP) process began in 1991. Early in the process, the Black River RAP Coordinating Committee perceived that the public was generally unaware and apathetic about pollution in the watershed, which is located in the Lake Erie basin about 30 miles west of Cleveland.

The Stage 1 investigations also revealed a decided shift over the last decade in the significance of nonpoint source pollution problems compared with point source pollution. These nonpoint problems included severe erosion, urban runoff and high levels of fecal coliform. Such problems cannot be addressed without public support and participation, and a public education campaign cannot be launched without first gauging where the public stands.

In 1992 the Lorain County General Health District commissioned a public opinion survey to explore public perceptions and attitudes regarding the Black River. The survey targeted the business community and residents within the watershed, including samples from the farming community and people who own home sewage treatment systems. Research methods included a series of focus groups with a variety of stakeholder groups, telephone surveys of residents and a mail survey of the business community.

The findings of the survey were comparable to national findings in similar studies. Residents felt that they were informed about environmental issues in general, but seemed to be less informed about Black River issues. Most people expressed negative impressions of the Black River. One third felt the river conditions were worse than 20 years ago. Relatively few people used the Black River for recreational purposes, but nearly half the respondents indicated they would likely do so if the quality of the river improved.

While people assessed the quality of the river based on what they could see or smell, they ranked industrial waste as the number one source of pollution to the Black River. Residents also believed that industry is most responsible for cleaning and protecting the river and for the associated costs. Sewage from home sewage treatment systems took the least blame. People were reluctant to see their own behavior as contributing to the pollution problem. However, a majority of residents (90 percent) indicated that they would take more steps to protect the Black River and needed more information on how to do so.

The study found that a significant percentage of home sewage treatment systems and aeration systems were not operating properly. In addition, farmers seemed to be very aware of farming practices that best reduce erosion, but only 60 percent of all farmers have used any of these practices.

Businesses also had generally negative impressions of the Black River, but a larger proportion of business respondents (nearly 50 percent) tended to perceive an improvement in river quality over the last 20 years than general residents (30 percent).

Proportionately more business and industry respondents defined a clean river based on levels of pollutants rather than on a visual assessment of the river. Like the residents, they ranked industry and chemicals as the most significant contributors to the pollution problems in the Black River. They too saw industry as being responsible for (80 percent) and bearing the costs of (80 percent) cleaning and protecting the Black River.

While a majority of business representatives (80 percent) believe that process design, substitution and pollution prevention are important, only a small fraction indicated that they use pollution prevention and education practices. Only 40 percent of the
business respondents indicated that they felt industry is doing an excellent or good job regarding its voluntary compliance with regulatory standards to curb emissions and discharges. Business and industry indicated a significant willingness (80 percent) to educate their employees about nonpoint source pollution.

The Black River RAP Coordinating Committee is using the information gleaned in this survey to develop a strategic plan for educating and engaging the public in protecting and cleaning up the river. Some of the implications for an educational campaign are listed below:

- Focus on the impact of nonpoint pollution and the ways in which individuals contribute to the problems of the river;
- Encourage individual and community responsibility for protecting and cleaning up the river;
- Target residents with home sewage treatment systems and stress both the proper maintenance of those systems and how improperly operating systems impact the river;
- Hold community forums in which all facets of the community explore potential solutions, priorities, responsibilities and costs;
- Develop programs and opportunities to help people establish a sense of connectedness to the river;
- Work with business and industry to establish employee education programs addressing nonpoint source pollution;
- Encourage pollution prevention programs;
- Develop educational programs that incorporate awareness-building, information about the issues, values clarification, skill-building and opportunities for participation and involvement.

The public opinion survey provides baseline data against which the RAP Coordinating Committee will be able to measure any shifts in attitudes and perception as the community moves through the next two stages of the RAP process.

For more information about the surveys of residents and businesses in the Black River watershed, contact Christie L. Vargo, Executive Director, Seventh Generation, 25 Lake Avenue, Elyria, Ohio 44035.

Sommaire

Les recherches menées dans le cadre de l'étape 1 du Plan d'action correctrice de la rivière Black ont mis en lumière un changement décisif au cours de la dernière décennie en ce qui concerne l'importance relative des problèmes de pollution imputables aux sources diffuses par rapport aux sources ponctuelles. Il s'agit notamment de la forte érosion, du ruissellement urbain et du nombre élevé de colifichets fécaux. La résolution de tels problèmes passe nécessairement par le soutien et la participation du public; par ailleurs, il est impossible de lancer une campagne d'information des citoyens sans avoir en premier lieu leur opinion.

En 1992, le Lorain County General Health District a commandé un sondage d'opinion publique afin d'explorer les perceptions et les attitudes du public à l'égard de la rivière Black. Les résidents ont évalué la qualité de l'eau de la rivière sur la base de ce qu'ils pouvaient voir ou sentir et ont placé les eaux usées industrielles au premier rang des sources de pollution de la rivière Black.

Les eaux usées produites par les égouts domestiques figurent au dernier rang des sources de pollution. Les citoyens sont peu enclins à considérer leur propre comportement comme une source de pollution. Toutefois, une majorité de résidents (90 p. cent) ont indiqué vouloir poser davantage de gestes pour sauvegarder la rivière Black et souhaiter être mieux informés sur la manière de procéder.

Le sondage d'opinion publique permet de préciser l'orientation de la campagne d'information du public et fournit des données de base par rapport auxquelles on pourra mesurer tout changement d'attitude et de perception pendant que l'on passera aux deux prochaines étapes du processus du Plan d'action correctrice.
**RAP Highlights**

In its review of the *Stage 1 Remedial Action Plan (RAP)* for the Niagara River (Ontario), the International Joint Commission stated that, for the most part, the problem definition was well done and consistent with the requirements of the Great Lakes Water Quality Agreement. Two areas identified for further consideration are examining more fish species for possible tumors and determining if detergents are responsible for discoloration of Niagara Falls. The Commission also noted that this RAP had an excellent public participation program.

The Commission was dissatisfied with the split into Ontario and New York RAPs, however, and noted that this is inconsistent with the ecosystem approach. Possibilities to resolve this problem were suggested by the Commission. These ranged from participants attending each other’s meetings to developing joint goal statements and problem definitions.

The major role of the Citizens Advisory Group in driving the Remedial Action Plan (RAP) process and informing the community at large was highlighted in the International Joint Commission’s review of the Waukegan Harbor Stage 1 RAP. The review noted that the U.S. Superfund Program activities at Waukegan Harbor, located in Illinois, represent the largest cleanup to date of PCBs at any of the Great Lakes-St. Lawrence River Areas of Concern. The need to determine whether fish tumors are present, particularly in fish inside the harbor, was also noted. (For more information about the Waukegan RAP, see *Focus*, July/August 1993, pages 23-24.)

The Rochester Embayment Remedial Action Plan (RAP) process has clearly made a significant effort at working toward a comprehensive ecosystem approach, according to the International Joint Commission’s review of the Stage 1 RAP by this New York community. The Commission noted that the Monroe County Water Quality Management Advisory Committee took an integrated approach to the entire watershed affecting the Rochester Embayment. Committees were formed to develop plans for each of the subwatersheds. Local air emissions and other atmospheric inputs were also examined, and a thorough listing of water uses, land uses, wetlands and other features was compiled. Participation by many sectors of federal, state and local government, academia, utilities, industry, environmental groups and others in the RAP’s development was abundantly clear. In addition, the involvement of the community in developing a local fish consumption advisory was a significant achievement that brought the human health issue into the RAP process.

Community members joined technical reviewers and International Joint Commission representatives at a meeting to review the Spanish Harbour Stage 1 Remedial Action Plan (RAP) on March 16, 1994. Though the RAP team is active at the local level, some members expressed a need for stronger communication with RAP participants around the Great Lakes-St. Lawrence River basin. The Commission has encouraged dialogue among RAP participants by convening RAP forums and other means, and will continue to seek opportunities to encourage such communication on an ongoing basis.

Wake Up to Your Waterfront ‘94 takes place in Thunder Bay, Ontario on July 16. The Thunder Bay Remedial Action Plan (RAP) hopes to equal the success of the inaugural community shoreline cleanup in 1993 when more than 2,500 volunteers collected 55.5 tonnes of debris from the shoreline, riverbanks and creeks of Thunder Bay.

New this year is an industry challenge to encourage waterfront industries and businesses to clean up their own properties. Participating industries will track the number of employee hours worked, amounts of garbage collected and unusual debris discovered in order to qualify for a trophy cosponsored by the Thunder Bay RAP Public Advisory Committee and the Thunder Bay Harbour Commission.

Earlier this year, the International Joint Commission distributed copies of a video and report documenting Wake Up to Your Waterfront and invited other communities to host their own waterfront cleanups. Several RAPs will be organizing volunteer cleanup events this summer and fall.

Copies of the Wake Up to Your Waterfront video and report are available from Lake Superior Programs Office, 1194 Dawson Road, R.R. 12, Site 8-16, Thunder Bay, Ontario, P7B 5E3. (807)768-1826; fax (807)768-1889.

**BOOKSHELF**

International Joint Commission Reports may now be requested directly from the Great Lakes Regional Office in Windsor, Ontario by dialing (519)257-6734. If a person is not available to receive your order, you may leave your name, address, telephone number and title of report with the voice messaging system and your order will be filled as soon as possible.

Applying Weight of Evidence, Issues and Practice, a report on a workshop held during the 1993 Biennial Meeting on Great Lakes Water Quality, is now available from the International Joint Commission’s Windsor office.
A new poster, Restoring Areas of Concern — through the Remedial Action Plan Process is a full-color poster showing a satellite image of the 43 Areas of Concern around the Great Lakes basin. To receive a free poster in English or French contact the International Joint Commission Windsor, Ottawa or Washington offices.

Re-evaluation of Dioxin, a presentation by Linda Birnbaum, U.S. Environmental Protection Agency, to the Great Lakes Water Quality Board on July 15, 1993, has been published and may be requested from the International Joint Commission’s Windsor, Ottawa or Washington offices.

Based on water quality analyses provided by 53 states, territories and jurisdictions, the U.S. Environmental Protection Agency has recently released data in the National Water Quality Inventory: 1992 Report to Congress. To request a copy write to Barry Burgan, Nonpoint Source Control Branch (WH-553), U.S. Environmental Protection Agency 401 M Street SW, Washington, DC 20460.

Emerging controversies over renewing Superfund, the Clean Water Act and other U.S. federal environmental and energy statutes can be found in the 1994 Briefing Book. The book, including four updates, sells for $75 (US) and may be obtained from Environmental and Energy Study Institute, 122 C Street NW, Suite 700, Washington, DC 20001, Attention Box P. (202)628-1400; fax (202)628-1825.

A report entitled Great Lakes Environmental Assessment is now available electronically through the Great Lakes Information Network. The report was prepared by LTI-LimnoTech, Inc., under contract with the National Council of the Paper Industry for Air and Stream Improvement, Inc. Current status and trends in the Great Lakes ecosystem are examined in ten areas including water and sediment quality, habitat, exotic species, human uses and health effects on aquatic life, wildlife and humans. The 270-page report is available in both ASCII and Microsoft Word formats and its bibliography is available in Paradox database format. Access to the Great Lakes Information Network can be gained on the Internet via the CICNet Gopher server or via file transfer protocol at ftp.great-lakes.net.

For assistance in accessing the report, contact Carol Ratza, Great Lakes Commission by telephone (313)665-9135; fax (313)665-4370; email cratza@glc.org; or contact Ron Emaus, CICNet by telephone (313)998-6419; fax (313)998-6105; email remaus@ cic.net.

The Mighty River is a 24-minute animation video on the history of human effects, both native and European, on the St. Lawrence River. The video is being distributed throughout North America by MTC of Michigan. For further information contact Jim St. Clair, MTC Inc., 3410 Hyde Road, Carsonville, Michigan 48419. Telephone (810)657-9372; fax (810)657-9373; toll free in U.S. (800)234-2423.

A 20-minute video on Zebra Mussels: Spawning through Settlement can be ordered by sending check or money order for $15 (US) to The Ohio State University, Sea Grant Publications, 1314 Kinnear Road, Columbus, OH 43212-1194.

The Great Lakes Geographer is inviting submissions of manuscripts covering all fields of geography, particularly those concerned with the Great Lakes region. Submissions and inquiries may be addressed to Dr. Milford B. Green, The Great Lakes Geographer, Department of Geography, The University of Western Ontario, London, ON N6A 5C2, telephone (519)679-2111 ext. 5025 or email GREEN@sscl.uwo.ca. Members’ annual subscription rate is $12 (Cdn) plus tax and postage.

The February-March 1994 issue of Lake Superior Magazine contains a special report on the state of the lakes. To order this issue, or to subscribe to the bimonthly full-color publication, contact Lake Superior Magazine, 325 Lake Avenue South, Suite 600, Duluth, MN 55802. (800)635-0544.

https://scholar.uwindsor.ca/jcfocus/vol19/iss2/1
Pollution Stinks is a new book by Arjen E.J. Wals containing stories told by children. The author contends that those who are most directly exposed to environmental threats are also the ones who receive little environmental education for change. The 244-page document (ISBN 90-5478-015-0) can be purchased for $22.50 (plus postage and handling) through Academic Book Center, P.O. Box 132, 2678ZJ DeLier, The Netherlands. Telephone 31 1745 17811; fax 31 1745 1455.

An educational package entitled The Life of the Lakes: The Great Lakes Fishery provides a 55-minute video, a booklet, a supplemental curriculum and a set of six posters on how the Great Lakes ecosystem functions. To order the complete package, send check or money order payable to Michigan State University for $40 (US). For information about individual components, or other Great Lakes materials, contact Carol Swinehart, Michigan Sea Grant Extension, 334 Natural Resources Building, East Lansing, MI 48824-1222. Telephone (517)353-9723; fax (517)353-6496; email swinehar@msuces.canr.msu.edu.

The eighth edition of the Field Manual for Water Quality Monitoring: An Environmental Education Program for Schools by Mark K. Mitchell and William B. Stapp is the product of ten years of extensive experience working with middle and secondary schools throughout the world. This 272-page guide contains 90 drawings and is available postpaid for $9.95 (US) within the U.S. or $10.95 (US) outside the U.S. from William B. Stapp, 2050 Delaware, Ann Arbor, MI 48103.

Hormone Copycats, by Wayne A. Schmidt, presents evidence that common chemicals disrupt the hormone systems of humans and a range of wildlife species. Portions of the report, prepared by the Great Lakes Natural Federation's Great Lakes Natural Resource Center in April 1994, also update a previous publication written by Ann Lukens in August 1993. Single copies of Hormone Copycats are available for $6 (US) from the National Wildlife Federation, Great Lakes Natural Resource Center, 506 East Liberty Street, Ann Arbor, MI 48104. For multiple copy pricing call (313)769-3351.

Earthscore: Your Personal Environmental Audit and Guide is an interactive guide designed to analyze lifestyles and demands we make on the planet. To receive a copy, send check or money order for $10.50 US (includes shipping and handling) to Morning Sun Press, P.O. Box 413, Lafayette, CA 94549. Discounts are available.

New studies by Inform, Inc. examine successful programs to track toxic chemicals and manage solid waste. A Clearer View of Toxics: New Jersey Reporting Requirements as a Model for the United States finds that reporting required in New Jersey allows for far more effective assessments of toxic risks to workers, communities and the environment than the federal reporting requirements. The report, which includes narrative and plant profiles, is available for $15 (US) plus postage.

Germany, Garbage, and The Green Dot reviews the 1991 requirements that packages on the German market must be taken back, reused or recycled by industry. Copies are available for $25 (US) plus postage. Both reports may be ordered from INFORM, Inc. 381 Park Avenue South, New York, NY 10016-8806. (212)689-4040.

A video program narrated by baseball legend Hank Aaron encourages young minorities to seek information on career opportunities in the fields of environmental sciences and engineering. To order a copy of Racing to Save the Planet send $15 (US) plus tax to FM Media and Associates, 894 Wheatfield Place, Decatur, GA 30030.

The Lake Michigan LaMP Education Project is a summary report by the Great Lakes Sea Grant Network on activities conducted to encourage public participation in the development of the Lake Michigan Lakewide Management Plan (LaMP). For a free copy contact Jeanette Morris-Collins or Gary Kohlhepp, U.S. Environmental Protection Agency, Region V (5WQ-16), 77 West Jackson Boulevard, Chicago, IL 60604. Telephone (312)886-0152 or (312)886-4680 respectively.

For LaMP fact sheets and Great Lakes water quality materials including slide shows, contact Karen Vigmstad, Michigan Sea Grant Extension, Michigan State University, 334 Natural Resources Building, East Lansing, MI 48824-1224. (517)336-1628.

The W.K. Kellogg Foundation has produced a new brochure on Water Resources programming that describes current projects aimed at protecting drinking water resources in the Great Lakes region. To receive the brochure or information, contact the Water Resources Program, W.K. Kellogg Foundation, One Michigan Avenue East, Battle Creek, MI 49017-4058. (616)969-2060; fax (616)968-0413.

Guideline on Environmental Labelling (publication Z761-93) is designed to help businesses establish guidelines for environmental claims on product and package labelling. In addition, Industry Canada's Guiding Principles for Environmental Labelling and Advertising is also included. The book is available for $59 (Cdn), plus tax and shipping, from CSA, 178 Rexdale Boulevard, Rexdale, ON M9W 1R3. (416)747-4044; fax (416)747-2475.

The Alliance for Environmental Education has compiled a directory of 700 environmental education tools about environmental protection as a catalog and a searchable database. To identify the nearest environmental education center and view the directory, or to order a copy for $9.95 (US) plus $2.50 shipping and handling (Virginia residents add $.45 tax) contact the Alliance for Environmental Education, 9309 Center Street, Suite 101, Manassas, VA 22110. (703)330-5667; fax (703)330-3268.
Duluth to Host 1995 Biennial Meeting

The International Joint Commission will hold its next Biennial Meeting on Great Lakes Water Quality in Duluth, Minnesota from September 23-26, 1995.

Biennial meetings allow the Commission to listen to the views of all interested parties on achieving the goals of the 1978 Great Lakes Water Quality Agreement. Over 1,900 people from across the Great Lakes-St. Lawrence River basin attended the 1993 Biennial Meeting in Windsor, Ontario to participate in the public discussion.

As the 1995 Biennial Meeting will be the first held on Lake Superior, a special focus will be given to the 1991 commitment by the United States, Canada, Ontario, Minnesota, Wisconsin and Michigan to make Lake Superior a demonstration area for eliminating the discharge of persistent toxic substances.

Look for the 1995 Biennial Meeting program and registration materials in a future issue of Focus.

Duluth sera l’hôte de la Réunion biennale de 1995


Les réunions biennales donnent l’occasion à la Commission d’entendre les points de vue de toutes les parties intéressées par l’atteinte de buts fixés en 1978 par l’Accord relatif à la qualité de l’eau dans les Grands Lacs. Plus de 1900 de personnes provenant du bassin des Grands Lacs et du Saint-Laurent ont assisté à la réunion biennale de 1993 à Windsor (Ontario) afin de participer aux discussions publiques.

Comme la réunion biennale de 1995 sera la première à se tenir sur les rives du lac Supérieur, on y mettra tout particulièrement l’accent sur l’engagement pris en 1991 par les États-Unis, le Canada, l’Ontario, le Minnesota, le Wisconsin et le Michigan dans le but de faire du lac Supérieur une région pilote pour l’élimination du rejet des substances toxiques rémanentes.

On trouvera dans une prochaine livraison de Focus tous les détails sur le programme et l’inscription à la Réunion biennale de 1995.
The following includes meetings scheduled by the International Joint Commission and its various boards. Please contact a Commission office for further information.

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**General Conferences**

"Catch the Conservation Wave" is this year's theme for the Soil and Water Conservation Society's Forty-Ninth Annual Meeting and Expo to be held in Norfolk, Virginia from August 7-10, 1994. For complete program details contact Nancy Herselius, 7515 North-east Ankeny Road, Ankeny, IA 50021-9764. (515)289-2331; fax (515)289-1227; toll-free in U.S. (800)843-7645 ext. 18.

The 1994 Aquatic Resource Education Conference, "Widening the Net," will be held August 13-17, 1994 in State College, Pennsylvania. For more information contact Kim Mumper or Carl Richardson at the Pennsylvania Fish and Boat Commission, P.O. Box 67000, Harrisburg, PA 17106-7000. (717)657-4518; fax (717)657-4549.

The Canadian Forest Service and Ontario Ministry of Natural Resources, in association with the International Union of Forest Research Organizations, are holding a conference and workshop on Global to Local: Ecological Land Classification in Thunder Bay, Ontario from August 15-16, 1994. For more information contact Global to Local: Ecological Land Classification, c/o Canadian Forest Service, P.O. Box 490 Sault Ste. Marie, ON P6A 5M7. Telephone (705)949-9461; fax (705)759-5700; email ELC@FCOR.GLFC.FORESTRY.CA.

The International Great Lakes-St. Lawrence Mayors' Conference will be held September 14-16, 1994 in Superior, Wisconsin. Hosted by Herbert W. Bergson and Robert Morrow, the mayors of Superior and Hamilton, Ontario, the conference provides a forum for discussion and cooperation among cities in order to protect and develop the Great Lakes-St. Lawrence system. Sessions will address themes such as the environment, sustainable development, waterfront development, marine transport and economy and waterfront tourism. Lake Superior will also be a special focus of this year's conference. For more information contact Claude Mailloux at (418)648-4674; fax (418)648-4627 or Steve Thorp at (313)665-9135; fax (313)665-4370.

The Fourth Annual Symposium on Groundwater and Soil Remediation will be held on September 21-23, 1994 in Calgary, Alberta. For more information contact Lise Gagné, Technical Seminar Coordinator, Technology Development Directorate, 425 St. Joseph Boulevard, Third floor, Hull, PQ K1A 0H3. (819)953-5227; fax (819)953-7253.

The North American Association for Environmental Education (NAAEE) conference will be held in Quintana Roo, Mexico from September 23-27, 1994. This year's theme is "Collaboration and Opportunity in North America: Energy through Diversity." For information about the conference, contact NAAEE, P.O. Box 400, Troy, OH 45373. (513)676-2514.

The Twenty-first Annual Aquatic Toxicity Workshop, to be held in Sarnia, Ontario on October 2-5, 1994, will focus on challenges in large ecosystems such as the Great Lakes basin. To learn more about the conference contact Marianne Lines, Great Lakes Pollution Prevention Centre, 265 Front Street North, Suite 112, Sarnia, ON N7T 7X1. (519)337-3429; fax (519)337-3486.
Please let us know if you wish to continue receiving Focus.

If you did not return the reader survey in the last issue of Focus, you must return this postcard by August 12, 1994 to continue your subscription. Please mark any address corrections next to the label (on reverse side), cut out and return this card.

Veuillez nous faire savoir si vous désirez encore recevoir FOCUS.

Si vous n'avez pas répondu au sondage qui a paru dans le dernier numéro de FOCUS et que vous désirez toujours recevoir cette publication, veuillez retourner cette carte postale au plus tard le 12 août 1994. Nous vous demandons d'indiquer tous changements d'adresse côté de l'étiquette et nous faire parvenir cette information aux adresses suivantes.

The 1994 Fall Conference of the Wisconsin Association for Environmental Education (WAEE), "The Earth's Strength is in Diversity," will be held October 26-29, 1994 at the Country Inn Conference Center, Pewaukee, Wisconsin. For more information contact WAEE Conference, 6141 North Hopkins Street, Milwaukee, WI 53209. (414)527-0232

A conference to celebrate Canada's River Heritage will be held from October 28-30, 1994 at Trent University in Peterborough, Ontario. For more information contact the Rivers Conference, c/o The Frost Centre, Trent University, Peterborough, ON K9J 7B8. (705)748-1750; fax (705)748-1801.

The Fifteenth Annual Meeting of the Society of Environmental Toxicology and Chemistry (SETAC) will be held October 30-November 3, 1994 at the Colorado Convention Center in Denver, Colorado. This year's meeting theme is "Ecological Risk: Science, Policy, Law and Perception." For additional information contact Rod Parrish, 1010 North 12th Avenue, Pensacola, FL 32501-3307, telephone (904)469-1500; fax (904)469-9778 or contact Program Chairs Bill Stubblefield, (303)493-8878; fax (303)493-8935 and Tom LaPointe, (803)646-2237; fax (803)646-2277.

The Second International Conference on Environmental Fate and Effects of Bleached Pulp Mill Effluents will be held at the Hotel Vancouver in Vancouver, British Columbia from November 6-10, 1994. For more information contact Dr. Kelly Munkittrick, Department of Fisheries and Oceans, P.O. Box 5050, Burlington, ON L7R 4A6. (905)336-4864; fax (905)336-6437.


The Great Lakes Environmental Regulations Conference assists those who design compliance programs by walking them through the regulatory requirements and technological developments related to U.S. federal and state environmental laws. The conference will be held at the Westin Hotel in Chicago on November 14-15, 1994. For information, contact Executive Enterprises, Inc. 22 West 21st
Street, New York, NY 10010-6990. Call toll free in U.S. (800) 831-8333 or fax (212) 645-8689.

The Seventeenth International Symposium on Wastewater Treatment, the Sixth Workshop on Drinking Water and the Tenth Regional Eastern Canada Conference of the Canadian Association of Air Quality will be held at the Hôtel Le Méridien, November 15-17, 1994 in Montreal, Quebec. To receive more information, contact AQTE-Symposium '94, 407 Saint-Laurent Boulevard, Suite 500, Montreal, PQ H2Y 2Y5. Fax (514) 866-4020.

From May 4-7, 1995, the Seventh Conference of the Hawk Migration Association of North America will be held at the Ramada Inn Hotel in Windsor, Ontario. For more information contact Betty Learmouth, 2405 Princess Street, Windsor, ON N8T 2V1. (519) 944-0825.

What is in a name?

Duluth

The first inhabitants in the area at the head of the Great Lakes, that is now Duluth, were the Sioux, followed by the Chippewa or Ojibway. Then came French and English explorers and fur traders. Among these was Daniel de Greysolon Sieur du Lhut, who arrived in 1679 from France. Du Lhut was a nobleman, soldier, explorer, frontier diplomat, friend of the aboriginals and respected citizen of France and New France. Along with his name, he left behind an adventurous career that ranks him among the great early explorers of North America.