

## Public Comment Sought on Strategy to Virtually Eliminate Persistent Toxic Substances

by Douglas McTavish

The Virtual Elimination Task Force, appointed by the International Joint Commission in the summer of 1990 to recommend a strategy for virtually eliminating the input of persistent toxic substances to the Great Lakes environment, has released its draft final report for public comment.

The virtual elimination policy was set by the Governments of Canada and the United States in the Great Lakes Water Quality Agreement of 1978. Article II of the Agreement states, "It is the policy of the Parties that the discharge of toxic substances in toxic amounts be prohibited and the discharge of any or all persistent toxic substances be virtually eliminated."

For the past decade, the Commission has expressed increasing concern about the lack of progress in preventing further releases of persistent toxic substances to the air, land and water of the region, which also then enter the waters of the Great Lakes Basin Ecosystem.

The recommendations of the task force will help the Commission advise the two governments on developing a strategy to meet their Water Quality Agreement commitments regarding virtual elimination.

To form the task force, the Commission appointed a diverse set of members from government, academia, industry and environmental organizations in the United States and Canada with backgrounds in environmental sciences and other disciplines.

Studies and reports on injury to fish, wildlife and human health linked to toxic compounds, particularly persistent toxic substances which bioaccumulate in the tissue of living organisms,

Many persistent toxic substances reach the waters of the Great Lakes basin through the atmosphere.



(Credit: Tim McCabe, U.S. Soil Conservation Service)

have been considered by the task force. These considerations provided a basis for the strategy it developed.

In July 1991, the task force submitted an interim report to the Commission and presented the findings in October 1991 at the Commission's Biennial Meeting on Great Lakes Water Quality in Traverse City, Michigan. Public meetings in Milwaukee and Hamilton, roundtable discussions sponsored by the Commission, and written submissions from other interested persons also played a prominent role in preparing the interim report.

The task force recognizes that substantial recovery in environmental conditions in recent years has resulted from improved effluent treatment, restricted use and bans of production of certain persistent toxic substances such as PCBs, and modified production processes to diminish the use of particular substances. To a large extent, however, these efforts have been directed toward traditional pollutants and have not resulted in a strategy to virtually eliminate persistent toxics as called for in the Agreement.

An important part of a virtual elimination strategy is to identify criteria for selecting substances of concern and the mechanism to eliminate those substances. In effect, criteria are needed to decide "where do we start?" The task force's interim report called for

### Inside:

Dépister les produits toxiques trouvés dans les bélugas du Saint-Laurent	3
Tracking Toxic Contaminants in St. Lawrence Belugas	4
WQB Examines Risk Assessment	5
Governments Reaffirm Commitment to 1978 Agreement	6
Mayors Conference to be in Montréal	6
7ième Conférence des Maires	7
Water Levels Study Nears Completion	11
Human Health Issues in RAPS	13
Rouge River Basin Selected for National Demonstration Program	14
Public Comments on Progress under Canada-U.S. Air Quality Agreement	19
Columns	
Briefs	8
Lake Levels Update	11
RAP Updates	13
RAP Highlights	16
Bookshelf	17
Events	21



governments to begin planning in this area and not wait for the final task force report.

Governments responded to this challenge in a number of ways. For example, the Ontario Ministry of the Environment released a report in April 1992, *Candidate Substances List for Bans or Phase-Outs*, that identifies 21 candidate substances and an approach to select additional substances. The task force's interim report was cited as a catalyst for the Ontario report. This list and those produced by other agencies were considered in detail as the task force developed criteria to include in its final report.

The draft final task force report reviews the tools to achieve the virtual elimination goal, including available technologies, legislation, economic and social factors, and monitoring methods to measure improvements as the strategy is applied. A workshop on

legislation conducted by the Commission's Great Lakes Water Quality Board identified needed improvements such as a stronger multimedia approach, but also determined that the authority to implement much of the virtual elimination strategy can be found in existing legislation.

For many substances of concern, implementing a virtual elimination strategy will mean stopping their production altogether. Different actions may be needed to eliminate substances that are unintentional byproducts of production processes. The availability of substitute substances and processes, as well as the benefit to society from using a substance, must all be weighed in implementing virtual elimination strategies, particularly in deciding on a timeline for action. The draft final report provides conceptual guidelines for these considerations and emphasizes the need for public participation by governments, industries and others as they implement virtual elimination strategies.

Ceasing the production of substances of concern may not provide sufficient environmental protection in some cases. Destroying the material in use or storage, or removing and destroying a substance already in the environment may be required. The report also addresses these important areas.

Public participation and consultation continues to be an essential ingredient of the task force's process. Before submitting its final report to the Commission, the draft report is being widely distributed to find out if its advice is properly focused and practical. Public comment is invited at the public consultation sessions to be held in the evening at the locations listed below.

- April 27, 1993  
Marc Plaza  
509 West Wisconsin Avenue  
Milwaukee, WI
- April 28, 1993  
Cobo Conference / Exhibition Center  
1 Washington Boulevard  
Detroit, MI

## Sommaire

Le Groupe de travail sur l'élimination virtuelle, mis sur pied par la Commission mixte internationale à l'été de 1990 et chargé de recommander une stratégie pour l'élimination virtuelle du rejet de substances toxiques rémanentes dans l'écosystème des Grands Lacs, sollicite l'avis du public sur l'ébauche de son rapport final.

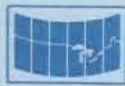
La Commission mixte internationale s'appuiera sur les recommandations du Groupe de travail pour conseiller les gouvernements du Canada et des États-Unis sur la façon de respecter leur engagement «...de tâcher d'éliminer les rejets de toutes les substances toxiques rémanentes» aux termes de l'Accord de 1978 relatif à la qualité de l'eau dans les Grands Lacs.

Toutes les personnes intéressées pourront se faire entendre à l'occasion des trois audiences publiques prévues, dont une avec services d'interprétation, le 15 avril 1993, à Toronto. Le Groupe de travail tiendra également compte de tout mémoire reçu avant le 10 mai 1993 inclusivement. On trouvera à la fin de l'article des informations sur la façon d'obtenir copie du rapport préliminaire en français ou en anglais, ainsi que sur les audiences publiques.

- April 29, 1993  
Westin Harbour Castle  
1 Harbour Square  
Toronto, ON  
(Simultaneous interpretation provided)

For those unable to attend the sessions, written comments received by May 10, 1993 will be taken into account by the task force.

For a copy of the draft final report in either English or French, or more information about the public consultation sessions, contact Dr. Marty Bratzel, International Joint Commission, 100 Ouellette Avenue, Eighth floor, Windsor, Ontario N9A 6T3, or P.O. Box 32869, Detroit, Michigan 48232-2869. In Canada, call (519)256-7821, and in the United States (313)226-2170.



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*Des chercheurs de l'Institut national d'écotoxicologie du Saint-Laurent nourrissent ce jeune béluga qu'ils ont trouvé isolé de sa mère. (Credit: Robert Michaud, Group de recherche et d'éducation sur les mammifères marins)*

*Researchers at St. Lawrence National Institute of Ecotoxicology feed a baby beluga found after it had become isolated from its mother.*

## Dépister les produits toxiques trouvés dans les bélugas du Saint-Laurent

par Pierre Béland

**E**n 1988, je débutai une présentation par une diapositive sous-marine montrant un gros plan de la tête d'un béluga, et le commentaire suivant: "Voici le type d'aspirateur idéal pour le nettoyage des Grands-Lacs". Cette phrase sarcastique m'avait été inspirée par les observations étonnantes que nous avions faites sur ce mammifère marin.

L'animal souriant qui remplissait l'écran faisait partie d'une petite population vivant en permanence dans les eaux salées du Saint-Laurent, à des centaines de kilomètres en aval du Lac Ontario. Il n'avait même jamais entendu parler des chutes du Niagara! Pourtant, l'ensemble des travaux réalisés par notre équipe de l'Institut national d'écotoxicologie du Saint-Laurent en collaboration avec plusieurs institutions (dont Pêches et Océans Canada, Environnement Canada et l'Université de Montréal), confirment que les produits toxiques les plus concentrés dans les tissus des bélugas du Saint-Laurent font partie de la liste des produits les plus préoccupants dans le système des Grands-Lacs.

En rétrospective, sachant que les Lacs se déversent dans le Saint-Laurent, et que le volume est immense comparé à celui du fleuve, ce résultat n'est pas étonnant. Cependant, la faible contamination de la région de l'estuaire et du Golfe utilisée par les bélugas ne laissait pas prévoir un tel résultat. Les niveaux moyens



d'organochlorés et de métaux lourds dans les sédiments, les invertébrés benthiques et les poissons résidents sont peu élevés, et certainement pas alarmants. A première vue, il ne semblerait pas que même un prédateur à la tête de ces réseaux alimentaires puisse atteindre des niveaux alarmants. Et pourtant, on a déjà mesuré plus de 600 ppm de PCB chez un jeune béluga du Saint-Laurent, soit une des concentrations les plus élevées trouvées dans un organisme vivant. L'espèce est beaucoup plus contaminée que les autres mammifères marins du Saint-Laurent, même en tenant compte des différences de poids corporel, de longévité et d'habitudes alimentaires. Bien sûr, le béluga a une couche de graisse importante qui constitue un excellent réservoir pour les organochlorés. Mais à quelle source les bélugas puisent-ils ces contaminants?

Pour concilier ces propositions apparemment contradictoires et en proposer une explication logique, il a fallu récolter pendant plusieurs années des données sur plusieurs aspects de la biologie du béluga. Des recensements aériens nous ont permis

de réaliser que la population était stable et qu'elle ne comptait que 450-500 animaux. L'examen des carcasses trouvées sur la rive nous a permis de connaître non seulement leur état de santé et les niveaux de contaminants organochlorés dans le gras des animaux des deux sexes et de divers âges, mais aussi leur poids corporel total, le poids de la couche de graisse, ainsi que la structure d'âge de la population.

Nous avons ainsi pu faire un calcul de balance de masse pour déterminer les quantités totales de PCB, de DDT et autres organochlorés qu'on pourrait "extraire" de l'ensemble de ces animaux en admettant que la chose soit techniquement possible! Les résultats confirmèrent que les poissons locaux n'étaient pas assez contaminés pour fournir tous ces produits toxiques aux bélugas (à moins que ces derniers n'en consomment des quantités phénoménales!). Il fallait donc trouver une autre source importante.

L'indice nous en a été fourni par la présence d'un autre produit rare retrouvé en concentration relativement élevée chez les bélugas: le Mirex. Ce nom nous orienta rapidement vers



*Beluga carcasses found along the St. Lawrence River contain high levels of persistent toxic contaminants. The tape measure shows the actual scale of the photograph.*

*(Credit: Robert Michaud, Group de recherche et d'éducation sur les mammifères marins)*

le Lac Ontario, point chaud de la contamination par ce produit toxique. Sur la liste des poissons du Saint-Laurent et de leurs contaminants, seule l'Anguille et précisément celle en provenance du Lac Ontario contenait des quantités significatives de Mirex.

Un second calcul démontra que seulement deux semaines par an d'alimentation sur ces anguilles, au moment où elles font leur migration annuelle vers l'Atlantique, suffisait à procurer aux bélugas tout leur Mirex. Qui plus est, ces mêmes baleines recevaient en même temps la moitié de tous les autres organochlorés qui ont été trouvés dans leurs tissus! Nos projets d'avenir? Répondre à la question: d'où vient l'autre moitié? Pour de plus amples renseignements, veuillez contacter: M. Pierre Béland, Institut National d'écotoxicologie, 3872 Parc Lafontaine, Montréal, Québec H2L 3M6, téléphone (514) 524-8711.

## Tracking Toxic Contaminants in St. Lawrence Belugas

by Pierre Béland

**I**n 1988 I began a presentation by showing an underwater shot of the head of a beluga and making the comment, "Here's what we need to vacuum up the Great Lakes." My bit of levity was inspired by some surprising observations we have made concerning the extremely high levels of toxic contaminants we have found in this marine mammal.

The smiling cetacean on the screen is one of a small number living permanently in the salt water of the St. Lawrence River, hundreds of kilometers downstream from Lake Ontario.



The whale had never heard of Niagara Falls, yet research carried out at the St. Lawrence National Institute of Ecotoxicology in cooperation with several institutions -- including Fisheries and Oceans Canada, Environment Canada and the University of Montreal -- has shown that major pollutants in the Great Lakes system make up the heaviest concentrations of toxic substances found in the tissues of the St. Lawrence River belugas.

This is not surprising, given that the Great Lakes empty into the St. Lawrence River and that their volume is immense compared to the river. However, the low level of contamination in the St. Lawrence River estuary and Gulf of St. Lawrence areas used by the belugas does not presage such a result. The average levels of organochlorides and heavy metals in the area's sediments, the benthic invertebrates and the resident fish are not high, and are certainly not alarming. At first glance, it does not appear that even a predator at the end of these food chains would show very high levels. A young beluga from the

St. Lawrence River has, however, been found to contain more than 600 parts per million PCBs, one of the highest concentrations ever found in a living creature. The species is far more contaminated than other marine mammals of the St. Lawrence ecosystem, even considering the differences in body weight, longevity and feeding habits. While the beluga has a thick layer of fat which provides an excellent reservoir for organochlorides, what is the source of these contaminants in the belugas?

In order to reconcile these apparently contradictory realities, information was gathered over several years on various aspects of the beluga's biology. Aerial censuses showed that the population was stable, numbering only 450-500 animals. By examining carcasses found on the shore we learned not only their general health and the levels of organochloride contaminants in the fat of male and female animals of various ages, but their total body weight, weight of the fat layer, and the age structure of the population.

Using a mass balance equation to

determine overall quantities of PCBs, DDT and other organochlorides in these animals, we found that the local fish were not adequately contaminated to pass on all the toxic products to the belugas, unless phenomenal quantities of fish were consumed. We felt that there must be another major source.

The answer came when we detected mirex, another rare persistent toxic compound found in relatively high concentrations in belugas. This discovery immediately brought to mind Lake Ontario, an area highly contaminated by this toxic substance. Among the fish of the St. Lawrence River and the contaminants found in them, only eels -- and precisely those

from Lake Ontario -- contained significant amounts of mirex.

A second calculation showed that all mirex in the belugas was ingested during just two weeks each year, when the eels make their annual migration to the Atlantic Ocean. Even more surprisingly, these same whales ingested half of all the other organochlorides in their tissue during this same time! Our plans for the future? To find out where the other half comes from.

For further information, contact Pierre Béland, St. Lawrence National Institute of Ecotoxicology, 3872 Parc Lafontaine, Montreal, Québec H2L 3M6, telephone (514)524-8711.

demonstrated the importance of being forthright and involving all interested parties in the assessment and analysis process. This was considered particularly true when decisions involving landfill sitings or chemical exposure are at stake. Numerous factors, ranging from data adequacy to moral outrage, were shown to contribute to the public acceptability of a risk management decision.

The discussions were lead by Lori Walker of Simon Fraser University and June Fessenden MacDonald of Cornell University. Denis Davis, Canadian co-chair of the Water Quality Board, moderated a closing discussion.

For more information contact Michael Gilbertson, International Joint Commission, 100 Ouellette Avenue, Eighth floor, Windsor, Ontario N9A 6T3 or P.O. Box 32869, Detroit, Michigan 48232. Telephone (519)256-7821 in Canada or (313)226-2170 in the United States.

## Water Quality Board Examines Risk Assessment Methods

by Geoffrey Thornburn

**M**ethodologies used in the United States and Canada for human health and environmental risk assessment were discussed and compared recently in a workshop sponsored by the International Joint Commission's Great Lakes Water Quality Board. The workshop, held February 1-2, 1993 at St. Catharines, Ontario, also examined case studies and issues related to communicating decisions based on risk assessments.

While basic methodologies were shown to be similar in both countries, the regulatory regimes for implementation differ. Approaches to deal with a number of issues were explored, including low dose and low risk situations, uncertainty, joint exposures, relative risks, risk perception and how various problems are addressed in setting standards and guidelines.

These approaches were covered in presentations by Bill Farland, U.S. Environmental Protection Agency; Bob Huggett, Virginia Institute of Marine Sciences; Dan Krewski, Health and Welfare Canada; and Bill Smith, Environment Canada.

Presentations on case studies of fish advisories, wildlife criteria and discharge limits helped to clarify the issues discussed in the earlier session. Factors that complicate technical assessments, such as resource sustainability, and economic, social and moral issues were also noted. The presentations were given by Ed Horn, New York State Department of Health; Alan Hayton and Doug Spry, Ontario Ministry of the Environment; Milton Clark, U.S. Environmental Protection Agency and John Sullivan, Wisconsin Department of Natural Resources.

A discussion of risk communication principles and practical problems

### Sommaire

Les méthodologies employées aux États-Unis et au Canada dans l'évaluation des risques pour l'environnement et la santé des personnes ont été discutées et comparées lors d'un atelier organisé par le Conseil de la qualité de l'eau des Grands Lacs de la Commission mixte internationale. Les participants de l'atelier, qui s'est déroulé les 1<sup>er</sup> et 2 février 1993 à St. Catharines (Ontario), ont également fait l'examen d'études de cas et de questions relatives à la communication des décisions prises à partir des évaluations du risque. Les méthodologies de base des deux pays se comparent, mais la réglementation diffère sur le plan de l'application.



## Governments Reaffirm Commitment to 1978 Great Lakes Water Quality Agreement

The Governments of the United States and Canada have formally agreed to follow the recommendation of the International Joint Commission to "focus on how to improve programs and methods to achieve the requirements and overall objectives" of the 1978 Great Lakes Water Quality Agreement, rather than to negotiate further amendments to the Agreement at this time.

Article X calls for the governments to conduct a comprehensive review of the operation and effectiveness of the Agreement following every third biennial report by the Commission. After the *Third Biennial Report*, the governments adopted a protocol in 1987 reflecting a broader understanding of the Great Lakes ecosystem and adding new annexes to address atmospheric pollution, contaminated sediments, groundwater, pollution from nonpoint sources, and Remedial Action Plans and Lakewide Management Plans.

In its *Sixth Biennial Report*, however, the Commission concluded that the existing Agreement's purpose, objectives and programs remain a firm foundation for the work that is needed to restore and maintain the Great Lakes Basin Ecosystem. "Much remains to be done, and efforts should be

directed toward implementing what the Parties have previously agreed to," according to the Commission.

By similar letters to the Commission, the two governments agreed to accept this recommendation and "in consultation with the Great Lakes States and Provinces, focus on how to improve programs and methods to achieve the requirements and overall objectives of the Agreement." The letters stated that the governments continue to review the other 12 recommendations contained in the Commission's *Sixth Biennial Report*.

### Sommaire

Les gouvernements des États-Unis et du Canada ont convenu de suivre l'avis de la Commission mixte internationale, qui leur recommandait de chercher «des façons pour que les programmes et les mesures permettent de mieux répondre aux exigences et aux objectifs généraux» de l'Accord de 1978 relatif à la qualité de l'eau dans les Grands lacs, plutôt que de négocier maintenant autres amendements à l'Accord.

## Great Lakes-St. Lawrence Mayors Association to Hold Seventh International Conference in Montréal

by Jean Doré, Mayor of Montréal

From May 12-14, 1993, the City of Montréal will host the Seventh International Great Lakes-St. Lawrence Mayors Conference (see also *FOCUS*, Volume 17, Issue 3, p. 12).

The St. Lawrence-Great Lakes system contains 20 percent of the Earth's surface freshwater, and includes nearly 700 towns and cities in eight American states and two Canadian provinces.

The political decisionmakers and local authorities in these municipalities have created an annual forum to promote greater understanding and cooperation to improve the quality of life, economic and ecological health, and management of the Great Lakes-St. Lawrence River basin. Cooperation is essential between the municipal level and other parties who share a concern for the Great Lakes-St. Lawrence River system.

The risks and challenges of economic growth are particularly numerous in the basin, and events of the past year compel us to take them seriously. For example, the recent shipwreck of the oil tanker Braer in the Shetland Islands has rekindled our concern with environmental issues. An International Joint Commission study included public meetings concerning fluctuating water levels in the basin, a problem affecting the shoreline, environment and marine trans-

*Jean Doré, Mayor of Montréal.*

port of all municipalities. The integration of the North American economy also raises questions about the changing role and future of marine transport and our port facilities. Finally, the towns in this region like most of their American and Canadian counterparts, recognize the need to maintain and redesign aging infrastructure.

As in previous years, the Montréal conference will create an opportunity to review the current situation in the Great Lakes-St. Lawrence River system. Concurrent workshops will allow participants to review and discuss case studies concerning the environment, marine transport, urban development and tourism. A half-day forum for mayors will include detailed discussion of the topic, "Municipal Infrastructure: Improvements and Financing." All participants are invited to attend.

During field trips and complementary activities, conference participants will visit the international award-winning development projects in the Old Port of Montréal, the Biodome, and the Parc des Îles, concrete examples of improvements that integrate the concept of sustainable development.

I am happy to have arranged this conference in May, when the city blossoms, and my colleagues and I look forward to meeting you in Montréal. For more information contact Claude Mailloux, Coordinator of the Mayors' Conference, 385 Grande Allée Est, Québec, Québec G1R 2H8. Telephone (514)872-7537 or (418)523-7720.

## 7ième Conférence internationale des Maires des Grands Lacs et du Saint-Laurent aura lieu à Montréal

*par Jean Doré, maire de Montréal*

**L**es 12, 13 et 14 mai prochains, Montréal aura le plaisir d'être l'hôtesse de la 7e Conférence Internationale des maires des Grands Lacs et du Saint-Laurent. (voir aussi: *FOCUS*, volume 17, numéro 2, page 12).

Le bassin Saint-Laurent/Grands Lacs renferme 20% des réserves d'eau douce de la planète et 700 municipalités réparties sur 8 États américains et 2 provinces canadiennes, lui doivent leur existence.

Au fil des dernières années, les décideurs politiques locaux et tous

ceux qui ont un intérêt dans le développement de la région se sont donné une extraordinaire tribune sous la forme de cette Conférence Internationale des maires des Grands Lac et du Saint-Laurent. Regroupés, ils peuvent mettre en commun leurs connaissances des mécanismes qui influencent la qualité de vie des résidents et la santé économique ou écologique de la région. Ils peuvent ainsi travailler en vue du bien commun.

Les préoccupations de tous ordres qu'entraîne le développement humain de la région ne manquent pas. L'année 1992 et le début de 1993 auront été riches en événements qui devraient servir d'arrière-plan à nos réflexions. Le naufrage du pétrolier Brauer au large des îles Shetland a, par exemple, soulevé de nouveau certaines préoccupations environnementales. D'un autre côté, les audiences publiques tenues par la Commission mixte internationale sur les niveaux d'eau dans le bassin devraient nous faire réfléchir quant aux effets des décisions à prendre à ce sujet puisque toutes les municipalités en seront

*Les nouveaux aménagements du Vieux-Port ont valu nombre de prix internationaux. Development projects in the old Port of Montréal have won international awards.*





affectées. Ici, il faut penser aux berges, à l'environnement et au transport maritime. Par ailleurs, il est important de chercher à évaluer la nature et l'importance des impacts possibles de l'intégration de l'économie nord-américaine, sur le rôle et le devenir du transport maritime et de nos installations portuaires. Plus généralement, comme la plupart de leurs consœurs américaines et canadiennes, les villes du bassin sont confrontées avec un problème majeur, celui de l'entretien et de la réfection d'infrastructures vieillissantes.

Comme par les années passées, la Conférence de Montréal permettra de faire le point sur l'ensemble de la situation qui prévaut dans le bassin Saint-Laurent/Grands Lacs. Des ateliers permettront aux participants de se pencher sur des études de cas. L'environnement, le monde maritime, l'aménagement et le tourisme comptent parmi les sujets qui seront ainsi abordés. Par ailleurs, les maires consacreront une demi-journée à discuter plus spécifiquement des "Infrastructures municipales : leur amélioration et leur financement". tous les participants sont invités à assister à cet échange.

Dans le cadre d'ateliers mobiles ou d'activités diverses, les participants à la Conférence pourront également visiter de nombreux équipements : les nouveaux aménagements du Vieux-Port, qui ont valu à ce dernier nombre de prix internationaux, le Biodôme ou le parc des îles, dont l'aménagement répond, en tous points, aux exigences du développement durable.

Je suis heureux de vous fixer rendez-vous au mois de mai à Montréal. Mes collègues et moi-même serons ravis de vous accueillir. Pour obtenir de plus amples renseignements, n'hésitez pas à communiquer avec monsieur Claude Mailloux, coordonnateur du Secrétariat de la Conférence des maires au (514) 872-7537 ou au (418) 523-7720.

## BRIEFS

**Patricia M. Burke**, from the Minnesota Pollution Control Agency in St. Paul, replaces **Timothy K. Scherkenbach** as the Minnesota member on the International Joint Commission's Great Lakes Water Quality Board. **Marc Sinotte** from the Québec Ministry of Environment replaces **Denyse Gouin** as a member of the Commission's Virtual Elimination Task Force.

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Patricia M. Burke, de l'Agence de contrôle de la pollution du Minnesota à Saint-Paul, remplace Timothy K. Scherkenbach en tant que représentant de l'état du Minnesota sur le Conseil de la qualité de l'eau des grands lacs de la Commission mixte internationale. Marc Sinotte du Ministère de l'Environnement du Québec remplace Denyse Gouin comme membre du Groupe de travail de la Commission mixte internationale sur l'élimination virtuelle.

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In November 1992, the second Rachel Carson Award was presented by the Society of Environmental Toxicology and Chemistry to **Dr. John R. Vallentyne**, Research Scientist Emeritus with the Canadian Department of Fisheries and Oceans at the Canada Centre for Inland Waters in Burlington, Ontario. The award was given to Vallentyne for his key role in reducing the levels of phosphates in detergents in the Great Lakes basin during the early 1970s, for getting the ecosystem approach into the Great Lakes Water Quality Agreement of 1978, and for his book, *The Algal Bowl: Lakes and Man*.

Vallentyne is widely known as "Johnny Biosphere," and has travelled around the world with a globe on his back since 1980 to dramatize environmental issues among school children, leaving a simple message: Save our Biosphere, or else! The award was presented on the 30th anniversary of the publication of Carson's book, *Silent Spring*.

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**A North Fork of the Flathead River Conceptual Strategy** has been completed by a steering committee of landowner, conservation and industry organizations, and federal, state and local government managers in the North Fork area of Montana. The steering committee was organized on the request of Montana Governor Stan Stephens in response to an International Joint Commission recommendation that the United States and Canada define and implement compatible, equitable and sustainable development activities and management strategies in the upper Flathead River basin.

The conceptual strategy will be used to initiate discussion with the appropriate officials in British Columbia and continue discussion in the United States to determine how best to implement the strategy. For more information contact Mark Holston, Flathead Basin Commission, 723 Fifth Avenue East, Kalispell, MT 59901. (406)752-0081.

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Ontario Environment Minister Ruth Grier recently released a **comprehensive clean water regulation** targeting a wide range of substances from Ontario's 26 pulp and paper mills. The pulp and paper industry will be required to eliminate the discharge of organochlorines in stages and develop plans to eliminate the use of chlorine. Ontario's goal is zero discharge of organochlorines by 2002. The clean water regulation will help to meet goals of Remedial Action Plans in eight Ontario areas on the Great Lakes affected by pulp and paper mill pollution.

To receive a copy of the *Draft Effluent Limits Regulations for the Pulp and Paper Sector (PIBS #2100)* and supporting technical materials contact the Ontario Ministry of the Environment, Public Information Centre, 135 St. Clair Avenue West, Suite 100, Toronto, ON M4V 1P5. (416)323-4321.



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The **Lake Erie Alliance**, a network of community groups from the Lake Erie basin, has recently been created with assistance from the Gund Foundation. The Alliance will help groups concerned with Lake Erie issues communicate with one another and develop strategies for joint action on behalf of the Lake Erie bioregion.

The alliance is publishing a quarterly newsletter, *Erie Connection*. For more information contact Mary Ginnebaugh, Great Lakes United, 76 University Avenue West, Suite 303, Windsor, ON N9A 5N7, telephone (519)255-7141 or Cheryl Wolfe, Friends of the Black River, 25 Lake Avenue, Elyria, OH 44035, telephone (216)322-4187.

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In October 1992, Ontario Minister of the Environment Ruth Grier presented the Ontario Waste Management Corporation (OWMC) **Waste Reduction Performance Achievement Award** to the **Chrysler Canada-Windsor Assembly Plant**. The Chrysler plant has completely elimi-

nated hazardous chlorinated solvents, reduced wastes from hazardous glue, sealer and paint by up to 50 percent, and replaced conventional air conditioning refrigerants with a formulation that has no potential for depleting the atmospheric ozone layer. These waste reduction measures saved the Chrysler assembly plant close to \$2 million Cdn.

OWMC is a Provincial Crown Agency set up to provide waste reduction information and assistance to Ontario industries, and to design, site, build and operate a hazardous waste treatment and disposal system for the Province of Ontario. For more information, contact Murray Creed, Ontario Waste Management Corporation, 2 Bloor Street West, Eleventh floor, Toronto, ON M4W 3E2. (416)923-2918.

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The **Motor Vehicle Manufacturers Association** of the United States held a forum in October 1992 on pollution prevention to update Canadian and American suppliers to the automotive industry on progress under a volun-

tary agreement between Chrysler, Ford, General Motors and the Michigan Department of Natural Resources to reduce releases of persistent toxic substances to the Great Lakes basin. Information provided at the forum will be mailed to several thousand automotive suppliers to further increase awareness.

For more information contact the Motor Vehicle Manufacturers Association, Public Affairs Office, 1620 I Street NW, Suite 100, Washington, DC 20006. (202)775-2716.

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On roadways in British Columbia, Winnipeg, Calgary and Newfoundland, children are happily doing something their parents and the provinces may not usually allow -- painting pavement drains with blue and yellow fish. These symbols are meant to remind us that fish are at the other end of each drain, and that sooner or later what we throw out of our homes ends up in their homes.

The **Storm Drain Marking Program** aims to protect fish habitats and was originated in Canada in 1986 as a joint



The Province of Ontario's goal is zero discharge of organochlorines from pulp and paper mills by 2002.

project of the federal Department of Fisheries and Oceans and the British Columbia Ministry of the Environment. It has since spread to Ontario, where the Department of Fisheries and Oceans has joined forces with Trout Unlimited Canada to carry out the program in the Great Lakes basin. Ontarians were introduced to the effort during a series of Teachers Action Plan workshops held at the Ontario Science Centre in Toronto in February 1993. The program was well received and teachers may adopt it as part of their curriculum by conducting marking excursions during Earth Day and Environment Week celebrations in April and May 1993.

For more information on the Ontario program, contact Pierre Paquette, Communications Officer, Department of Fisheries and Oceans, 867 Lakeshore Road, Burlington, ON L7R 4A6. In Canada telephone 1-800-668-5222.

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The **European rudd** (*Scardinius erythrophthalmus*) is another in a series of aquatic exotics causing trouble in the Great Lakes. Anglers have used the rudd, which resembles a golden shiner, as a baitfish for years and the nonindigenous minnow has established populations in the Great Lakes and the waters of at least eight states. Rudd eat large amounts of aquatic vegetation and discharge 70 to 80 percent of that mass back into the water as high-phosphorus waste. This produces the same effect as nonpoint pollution which increases algal blooms and lowers water quality. For more information on the rudd contact David MacNeill, New York Sea Grant, 248 Hartwell Hall, State University of New York, Brockport, NY 14420. (716)395-2638.

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**Edible and biodegradable food containers** may soon be available, according to food science professor Buncha Ooraikul from the University of Alberta in Edmonton. Ooraikul says the technology may be applied to a wide range of food containers, and edible ink and any desired flavor may

also be added. The major components are wheat flour and potato starch, with some protein and minerals. The exact recipe is a trade secret, as is the composition of the most important part, the sealant. If not eaten by humans the containers can be collected for animal feed, or they will break down quickly if thrown away. For technical information contact Dr. Buncha Ooraikul, Food Science Department, University of Alberta, Edmonton, AB T6G 2E1, telephone (403)492-3268. For business information contact Ted Robinson, Synectics Corporation, Suite 505, 520 Fifth Avenue SW, Calgary, AB T2P 3R7, telephone (403)237-0640.

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If you happen to be pulled over in southeastern Michigan by a state trooper, it may be part of an environmental study. The Big Three automakers, the U.S. Environmental Protection Agency and the State of Michigan are evaluating the effectiveness of remote-sensing devices to determine whether routine vehicle maintenance has a significant impact on vehicle emissions. Under the auspices of the **Environmental Research Consortium**, researchers from Chrysler, Ford and General Motors are identifying 60 late-model, high-emitting vehicles for more extensive study of their emissions. Benefits provided to vehicle owners include a cash incentive for agreeing to the dynamometer test and free repairs for high-emitting vehicles.

For more information on the program, contact the United States Council for Automotive Research, Suite 100, Fairlane Plaza South, 330 Town Center Drive, Dearborn, MI 48126. Fax (313)248-4303.

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What do "Pepto Bismol" and bird shot have in common? Throughout the United States and in Canada's nontoxic shot zones such as Lake St. Clair, sport and subsistence water fowl hunters were recently required to switch from traditional, inexpensive and ballistically superior but **toxic lead shot** to the only available alternative -- inconsistent, ballistically inferior,

erosive and inefficient steel shot. Concerns have been raised among the shooting fraternity that ballistically inferior steel shot is causing increased numbers of crippled waterfowl. Owners of tightly choked, thin or soft-barrelled smaller gauge vintage shotguns, which could not use the alternative shot, were upset.

Now, John Brown of St. Catharines, Ontario has developed a **bismuth alloy shot** which appears to have all the favorable characteristics of lead, but has been shown in recent University of Illinois studies to be nontoxic when ingested by waterfowl. Bismuth, which lies next to lead on the periodic table of elements, is the active ingredient in the popular antacid preparation "Pepto Bismol." The new bismuth shot received tentative approval from the Canadian Wildlife Service and may receive final approval by 1994. This environmental protection initiative was completely funded by hunting organizations.

For more information on the bismuth shot, contact Dr. Glen Sanderson, Principal Scientist, Center for Wildlife Ecology, Illinois Natural History Survey, 608 East Peabody Drive, Champaign, IL 61820. (217)333-6880.

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A bill entitled the **Groundwater and Freshwater Protection Act** has been introduced into the Michigan Legislature to encourage prevention of groundwater contamination from agricultural and nonagricultural sources of pesticides and fertilizers, primarily through the adoption of voluntary groundwater stewardship practices. The bill proposes to establish inter-agency teams providing educational programs, technical assistance and groundwater quality analysis for pesticide and fertilizer users. The bill also defines threshold levels above which mandatory groundwater protection rules may be adopted. For more information contact Mark Swartz, Michigan Department of Agriculture, Fourth floor north, Ottawa Building, Lansing, MI 48909. (517)335-6545.

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## Water Levels Study Nears Completion

*Final Report Goes to  
Commission on March 31*

*by Ruth Edgett*

**A**fter more than two years of work and an intensive public involvement program, the final phase of the Great Lakes-St. Lawrence River Levels Reference Study is all but complete. The Levels Reference Study Board will present its final report to the International Joint Commission on March 31.

In approximately 150 pages, the report will summarize scientific and technical work, together with other activities of the second and final phase of the study, which began in the fall of 1990. The first part of the study began in 1986 and ended in a progress report to the Commission in 1989.

A major goal of the study is to present recommendations for practical steps that governments in the United States and Canada could take to alleviate problems associated with fluctuating water levels -- in other words, to make recommendations that could be readily acted upon.

"We want to make sure that our report doesn't end up gathering dust on someone's bookshelf," said John D'Aniello, the United States co-chair of the study board. "We are designing our recommendations so that they can be readily put into effect by the responsible agencies."

"Our entire process for evaluating the actions that we will be recommending was oriented toward making sure, not only that they are technically possible, but that they make economic, environmental and social sense," added

Tony Wagner, the Canadian co-chair.

The study arose out of a Reference, or formal request, issued by the Governments of Canada and the United States in August 1986. In response to widespread public concern about high Great Lakes water levels, the two governments asked the Commission to examine and report on methods that could alleviate the adverse consequences of fluctuating water levels in the Great Lakes and St. Lawrence River. The word "fluctuating" recognized that extremely low water levels can also result in problems for users of the system.

The study board's final report will present recommendations for action in six key areas:

1. Guiding principles that the Governments of the United States and Canada can use for management of water levels and flows;
2. Measures (specific projects or programs) to alleviate the adverse consequences of fluctuating Great Lakes-St. Lawrence River water levels;
3. Emergency preparedness planning for high or low water level crises;
4. Institutional arrangements to assist in implementing other recommendations;

5. Improvements in communications with the general public on water level issues; and

6. Management and operational improvements to deal with future water levels issues.

A draft report containing more than 30 draft recommendations underwent public review in February. In addition to being summarized in the study's newsletter, *UPDATE/AUCOURANT*, the draft report was discussed in late February at a series of four public forums in Sault St. Marie, Ontario; Chicago, Illinois; Buffalo, New York; and Dorval, Quebec. Copies of the draft report were also made available upon request.

The February forums marked the end of the study's intensive program of 17 public events during the approximately 2-year project. Study participants traveled the length and breadth of the Great Lakes-St. Lawrence River Basin to meet with local citizens, hear their concerns and to tell citizens about the study.

The first series of six public sessions allowed the study board to introduce citizens to the study, and to gain first-hand knowledge about local

*Numerous citizens expressed their views about the Levels Reference Study at public forums held throughout the basin. (Credit: Frank Bevacqua)*



# LAKE LEVELS UPDATE

concerns. These were held, beginning in February of 1991, in Windsor, Ontario; Alexandria Bay, New York; Cleveland, Ohio; Port Rowan, Ontario; Duluth, Minnesota; and Traverse City, Michigan.

In the spring of 1992, three public meetings reviewed progress to date in the key areas of the study and solicited public input. They were held in Baraga, Michigan; Toledo, Ohio; and Burlington, Ontario.

Then, between November 30 and December 3 of the same year, study participants presented the range of options for recommendations to the public in a set of public forums at Thunder Bay, Ontario; Milwaukee, Wisconsin; Sarnia, Ontario; and Watertown, New York. Comments from these forums helped the study board complete its draft final report, which was reviewed in the second round of forums of February 1993.

In addition to numerous public events, the study has kept in touch with citizens of the basin through its newsletter. Circulation of *UPDATE/AU COURANT* began at approximately 1,200 and has grown to 3,600, including elected federal, state provincial and local officials, as well as citizens. The final issue of the newsletter will coincide with transmittal of the final report to the Commission on March 31.

The study board was assisted by the Citizens Advisory Committee in its attempts to include as many points of view as possible. This committee, composed of 18 citizens of varied backgrounds and basin locations, participated in the activities of all four working committees and had four representatives on the study board. Members of this group were also very helpful in spreading information about the study in their communities and within their interest groups.

For a copy of the final report, please contact the International Joint Commission's Washington or Ottawa offices.



*Levels Reference Study Board Co-chairs John D'Aniello and Tony Wagner respond to questions from public forum participants. (Credit: Frank Bevacqua)*

## Sommaire

Après plus de deux ans de travail et un vaste programme de participation publique, la phase 2 de l'Étude des renvois sur les fluctuations du niveau des eaux des Grands Lacs est presque terminée. Le Conseil de l'étude des renvois sur les niveaux remettra son rapport final à la Commission le 31 mars prochain.

L'étude résulte d'un renvoi, c'est-à-dire d'une demande officielle, présenté par les gouvernements du Canada et des États-Unis en août 1986. À la suite de l'inquiétude générale suscitée par les niveaux d'eau élevés dans les Grands Lacs, les Gouvernements ont demandé à la Commission de faire enquête et rapport sur les moyens susceptibles d'atténuer les conséquences néfastes des fluctuations du niveau des eaux des Grands Lacs et du fleuve Saint-Laurent. L'emploi du terme "fluctuations" dénote le fait que des niveaux d'eau extrêmement bas peuvent également causer des problèmes aux usagers du réseau. Le premier volet de l'étude a débouché sur la présentation d'un rapport d'étape à la Commission mixte internationale en 1989.

On peut obtenir copie du rapport final en s'adressant aux bureaux de la Commission mixte internationale, à Ottawa ou à Washington.





## RAP UPDATES

*Shipping activity at the mouth of the Rouge River, where it flows into the Detroit River.*

### Roundtable Participants Explore Human Health Issues in RAPs

*by Geoffrey Thornburn*

The need to address human health issues in Remedial Action Plans (RAPs) and integrate health professionals into the RAP process was explored at a roundtable discussion convened by the International Joint Commission on January 27-28, 1993 in Toronto, Ontario. RAP coordinators, Public Advisory Committee members, public health workers and physicians were among the 18 participants to join Commissioners in the roundtable discussion.

The roundtable method has been used since 1990 to bring together a wide range of knowledgeable persons about specific topics and broaden the base of expert and public input to Commission deliberations. Commissioners can thus be advised of a range of opinions and gain additional knowledge about an issue prior to developing recommendations.

Human health problems can be both an indicator and a result of environmental and social stresses related to the degradation of water quality in the geographical Areas of Concern

included in the RAP process. Clearly such problems should be seen as part of the "comprehensive ecosystem approach" to RAPs required by the revised 1978 Great Lakes Water Quality Agreement.

Examples of human health problems related to RAPs raised in the discussion include the impacts of persistent toxic chemicals on fish-eating birds and animals, the risks to humans who eat contaminated fish and wildlife, and the increased incidence of diet-related diseases afflicting populations no longer able to consume the fish.

Roundtable participants generally agreed that human health concerns need to be identified in RAPs. Further, RAPs should go beyond conventional biological effects to include psychological and social disfunctionality that can result when individuals and communities confront the changing environmental, economic and cultural impacts of pollution. Concerns were expressed, however, about how this can be achieved within the limits of regulatory mandates and financial resources.

One key to the further integration



*Opportunities to include health concerns in the RAP process were explored by roundtable participants (from left) Peter Orris, Cook County Hospital; Julie Letterhos, Ohio Environmental Protection Agency; Ted Robinson, Ontario College of Family Physicians; Jake Vander Wal, Ontario Ministry of the Environment; Trevor Hancock, Ontario Healthy Communities Project; Rosalie Bertell, Great Lakes Science Advisory Board; and Brian Gibson, Hamilton-Wentworth Department of Public Health Services. (Credit: Mark Breederland)*

of these issues is communication and education among health professionals, who can become more aware of environmental health concerns and play effective roles in addressing them. For example, environmental factors can be identified by asking pertinent questions about possible routes of exposure to chemicals in

patients' histories. (A Commission roundtable discussion on physician awareness is discussed in *Focus*, Volume 17, Issue 3, and a similar roundtable is planned for March 29-30, 1993.)

A summary of the Human Health Issues in Remedial Action Plans roundtable discussion will be prepared for circulation to RAP coordinators and public advisory committee members, as well as other interested persons. When available, the summary will be announced in the Bookshelf column of a future issue of *Focus*.

### Sommaire

L'intégration des questions concernant la santé des personnes aux plans d'action correctrice et la participation des professionnels de la santé au processus du plan d'action correctrice ont été examinées lors d'une table ronde organisée par la Commission mixte internationale, les 27 et 28 janvier 1993, à Toronto (Ontario). Des coordonnateurs des plans d'action correctrice des membres des comités consultatifs publics, des médecins et travailleurs en santé publique étaient au nombre des 18 personnes ayant participé aux discussions avec les commissaires.

On a discuté de divers problèmes de santé, notamment les incidences des substances toxiques rémanentes sur les oiseaux et les animaux piscivores, les risques auxquels s'exposent les personnes consommant les poissons et les animaux contaminés, et l'incidence accrue des maladies liées à l'alimentation chez les populations qui ne peuvent plus consommer de poisson.

## Rouge River Basin Selected for National Demonstration Program

by John Bona

The Rouge River basin in Southeast Michigan has been selected as the site of a federally-supported national demonstration program addressing combined sewer overflows and urban runoff, which are major sources of pollution identified by the Rouge River Remedial Action Plan (RAP).

The Rouge River National Wet Weather Demonstration Program will develop comprehensive plans and specific project designs to remedy pollution from combined sewer overflows and urban runoff that occur during rainfall and snow melt events. Work in the Rouge basin will demonstrate how similar problems can be remedied in urban watersheds throughout the United States.

Through the efforts of Congressmen John Dingell and William Ford and retired Congressman Bob Traxler, Wayne County has received \$46 million in federal funding for the program. It is anticipated that a subsequent \$82 million appropriated by Congress in fall 1992 would be spent on further nonpoint source pollution studies and construction of remedial measures.

Wayne County Executive Edward McNamara is committed to taking a basinwide approach in the project and has involved officials from the entire watershed, including Oakland and Washtenaw Counties, in setting the course for the effort.

Many Rouge River basin communities are served by sewer systems designed to carry sanitary sewage from domestic and industrial sources, as well as runoff from rainstorms, within a

single pipe. Since the volumes of flow generated during a storm cannot all be handled by the treatment plant, portions of this "combined sewage" overflows to the river. The demonstration program will fund various designs aimed at controlling these overflows to reduce their impact on the Rouge.

In areas of the Rouge River basin where sanitary sewers and storm drains are separate, urban runoff remains a problem. The rain that cleanses the landscape often has the opposite effect on urban rivers as pollutants which have accumulated on the streets, parking lots, industrial facilities and lawns are washed into the river. Contaminants can also be traced to abandoned landfills or illegal connections to storm drains. The demonstration program will consider methods to remove contaminants from stormwater and reduce these pollutants at their sources.

The currently funded phase of the program will take place over three years and establish levels of pollution control to be required in the future. The effort consists of a number of technical components, including:

- A geographic information system, or computerized map, will accurately locate the river and each of its many tributaries, display existing and expected water quality conditions, locate combined sewer and storm drainage discharges, relate land use to river location and water quality, and allow for similar comparisons of complex data.
- A large number of water quality samples will be collected and analyzed to help pinpoint sources of pollution and establish their severity. Samples will be taken through-





*The Rouge River flows around Zug Island and enters the Detroit River.*

out the watershed and at known and suspected pollution sources to help quantify local impacts and effects on the river as a whole.

- A number of computer models will be developed to predict the quality of water throughout the Rouge River basin following rain storms. These models will indicate how the current pollutant loadings and proposed improvements would affect the river, and thus will provide powerful tools to determine which improvements will have the most favorable effect on overall water quality.
- Designs will be completed for several different combined sewer overflow control structures and sewer separations.
- A detailed study of pollutant loads from urban runoff will be undertaken and various means of reducing these loadings will be tested. Results will be compared with pollutant load reductions from combined sewer overflow controls to develop a comprehensive plan to reduce wet weather pollution within the Rouge River basin.

Additionally, the demonstration effort will evaluate the institutional and financial impacts of the proposed remedial actions. To be successful, actions recommended by this program must be feasible within existing or modified governmental structures and institutional arrangements, and equitable financing mechanisms must be developed. The program will analyze

current arrangements and, if necessary, suggest alternatives.

Finally, education is one of the program's major goals. The Rouge is a valuable resource and all who live within its watershed must understand how our actions affect the condition of the river. From elected officials, to businessmen, manufacturers, homeowners and schoolchildren, we must all learn how we can join forces to return the Rouge to its past vitality.

For additional information contact James E. Murray, Director, Wayne County Division of Public Works, 415 Clifford Street, Detroit, Michigan 48226. (313)224-3630.

### Sommaire

On a choisi le bassin de la rivière Rouge situé dans l'État du Michigan pour réaliser un programme national de démonstration financé par le gouvernement fédéral et portant sur les débordements d'égouts unitaires et le ruissellement urbain, deux sources importantes de pollution recensées dans le Plan d'action correctrice de la rivière Rouge.

Le programme national de démonstration par temps de pluie de la rivière Rouge comprendra des plans complets et des projets spécifiques pour corriger la pollution due aux débordements d'égouts unitaires et au ruissellement urbain qui se produisent pendant les fortes pluies et la fonte des neiges. On montrera au moyen du travail réalisé dans le bassin de la Rouge comment il est possible de résoudre des problèmes similaires dans l'ensemble des bassins hydrographiques urbains des États-Unis.




 RAP  
 UPDATES


 RAP Highlights

In its January 1993 review of the Stage 1 Remedial Action Plan (RAP), the International Joint Commission commended the local **Ashtabula RAP** Advisory Council and the Ohio Environmental Protection Agency for their commitment to restore water quality conditions in the lower Ashtabula River.

The Commission was particularly impressed with the cooperation among representatives of local industries, marina operators, city and county government and the interested public toward the goal of remediating the existing use impairments in the Ashtabula River Area of Concern.

Contaminated sediments, which have resulted in such use impairments as the presence of fish tumors and restrictions on dredging, are a major concern in the Ashtabula River Area of Concern. The Commission's review stated that detailed quantification of existing sources of toxic substances, especially nonpoint sources, will be necessary to allow proper evaluation of possible remedial strategies within an ecosystem framework.

While additional data will be needed to properly quantify some water use impairments, the Commission concluded that there is sufficient information in nearly all areas for the Ashtabula River RAP to proceed from Stage 1 to Stage 2 of the RAP process. The review of the Stage 1 RAP for the Ashtabula River Area of Concern may be obtained by contacting an International Joint Commission office.

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In the past four months, the International Joint Commission has conducted review meetings for Stage 1 Remedial Action Plans in four of the Great Lakes connecting channels Areas of Concern: **St. Lawrence River** at Massena, New York and Cornwall, Ontario, and the binational RAPs on the **St. Marys** and **St. Clair Rivers**. The meetings form a central part of the Commission's RAP review process and bring together members of the local RAP team, public advisory committee, technical reviewers,



*The recreational boating industry in the Ashtabula River is concerned about contaminated sediments, which have resulted in local dredging restrictions. (Credit: Mark Breederland)*

Commissioners and Commission staff to discuss issues in the RAP document and technical reviews.

During this period, the Commission has also received Stage 1 RAP documents for the Cuyahoga and St. Louis River Areas of Concern. Technical review teams have been assembled, and the review process is underway. Watch for more information in future issues of *Focus*.

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We're almost ready to fling the champagne bottle as the International Joint Commission launches *The RAP Catalyst*, a new newsletter to share success stories and increase communication among Remedial Action Plan (RAP) teams, public advisory committees and others involved in the RAP process throughout the Great Lakes basin. Submissions from participants in the RAP process are encouraged to the *The RAP Catalyst*, which will begin circulating in May 1993 and appear three times per year in between issues of *Focus*.

For information or to receive *The RAP Catalyst*, contact Mark Breederland, International Joint Commission, 100 Ouellette Avenue, Eighth floor, Windsor, Ontario N9A 6T3 or P.O. Box 32869, Detroit, Michigan 48232. Telephone (519)256-7821 in Canada or (313)226-2170 in the United States.

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A 1993 **Remedial Action Plan directory** listing federal, state, provincial or local contacts for all 43 Areas of Concern has been prepared by the International Joint Commission Great Lakes Regional Office. Contact a Commission office to obtain a copy.

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A successful workshop on integrating **fishery management and remedial action planning** in the 43 Great Lakes Areas of Concern was held February 4, 1993 at the Maumee Bay State Park Lodge, near Toledo, Ohio. Sponsored by the U.S. Environmental Protection Agency and Environment Canada in cooperation with the Great Lakes Fishery Commission's Habitat Advisory Board and Wayne State University, the workshop brought together 40 Remedial Action Plan (RAP) and fishery management personnel from around the Great Lakes basin.

Overviews of fishery management planning activities in the Areas of Concern were presented by officials from New York, Ontario, Ohio, Michigan and Wisconsin. Recommendations were then developed in breakout sessions to move fishery management and remedial action planning forward in a complementary and reinforcing fashion. The issues addressed included the need for quantitative fish objectives and targets, barriers and incentives for fishery resource managers working on RAPs, and developing criteria to achieve integration of water quality and fishery programs in RAPs.

A background report for the workshop entitled *A Survey of Fish Community and Habitat Goals/Objectives/Targets and Status in Great Lakes Areas of Concern* lists specific information on integrating fishery management with each of the 43 RAPs. A final workshop report is also being prepared. For more information, contact John Hartig or Neely Law, Department of Environmental Engineering, Wayne State University, 5050 Anthony Wayne Drive, Detroit, MI 43202. (313)577-3608.

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## BOOKSHELF

The International Joint Commission has recently released a *Synthesis of Views on the March 1992 Progress Report of the Air Quality Committee under the United States/Canada Air Quality Agreement*.

The views were submitted in response to the Commission's invitation for public comment on the first Progress Report of the government-appointed Air Quality Committee under the **1991 Air Quality Agreement**. To receive the Commission's synthesis, contact an International Joint Commission office. (To obtain the Progress Report of the Air Quality Committee, see information at the end of the article on page 19.)

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On peut obtenir copie du document intitulé *Synthèse des opinions exprimées sur le Rapport d'étape de mars 1992 du Comité de la qualité de l'air en vertu de l'Accord entre le Canada et les États-Unis sur la qualité de l'air en s'adressant à l'un des bureaux de la Commission mixte internationale*. (Pour obtenir le Rapport d'étape du Comité de la qualité de l'air, prière de vous référer de l'article à la page 20.)

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The following reports may be obtained free of charge while supplies last, or until September 1993. Contact the International Joint Commission, 100 Ouellette Avenue, Eighth floor, Windsor, Ontario N9A 6T3 or P.O. Box 32869, Detroit, Michigan 48232-2869.

- ❑ *A Review of Lake Ontario Water Quality with Emphasis on the 1981-1982 Intensive Years*. 1988, 300 pp.
- ❑ *Rehabilitation of Lake Ontario: The Role of Nutrient Reduction and Food Web Dynamics*. 1988, 75 pp.
- ❑ *A Plan for Assessing Atmospheric Deposition to the Great Lakes*. Summary Report. 1988, 35 pp.
- ❑ *A Plan for Assessing Atmospheric Deposition to the Great Lakes*. 1988, 90 pp.
- ❑ *Proceedings of the Workshop on Cause-Effect Linkages*. 1989, 51 pp.

The following reports may also be

obtained from the International Joint Commission Windsor Office while supplies last.

- ❑ *A Review of Lake Superior Water Quality with Emphasis on the 1983 Intensive Survey*. 1990, 220 pp.
- ❑ *Exotic Species and the Shipping Industry*. 1990, 77 pp.
- ❑ *Les espèces exotiques et la marine marchande*. 1990, 55 pp.
- ❑ *Futures Workshop on Great Lakes 2000: Building a Vision*. (Two volumes) 1990, 136 pp.
- ❑ *Proceedings of a Workshop on the Role of Epidemiology in Assessing the Effects of Great Lakes Water Quality on Human Health*. 1990, 30 pp.
- ❑ *Register of Great Lakes Dredging Projects 1980-84*. 1990, 209 pp.
- ❑ *A Proposed Framework for Developing Indicators of Ecosystem Health*. 1991, 50 pp.
- ❑ *Cleaning Up Our Great Lakes*. 1991, 47 pp.
- ❑ *Proceedings of the Expert Consultation Meeting on Mink and Otter*. 1991, 26 pp.
- ❑ *Proceedings of the Mass Balance Workshop*. 1991, 95 pp.
- ❑ *Stage 2 Remedial Action Plans: Content and Key Issues*. 1991, 32 pp.
- ❑ *Summary of Remedial Action Plan Forum*. 1991, 10 pp.
- ❑ *Great Lakes-St. Lawrence Research Inventory*. 1992, 110 pp.

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*Chemically-Induced Alterations in Sexual and Functional Development: The Wildlife/Human Connection* assesses what is known about compounds found in the Great Lakes basin that are capable of disrupting the endocrine systems of fish, wildlife and humans. The book, published in July 1992, presents findings from a 1991 meeting held at Wingspread in Racine, Wisconsin. To obtain a copy, send a check for \$68 US plus \$3 US shipping and handling to Princeton Scientific Publishing Company, Inc., P.O. Box 2155, Princeton, NJ 08543. (609)683-4750; fax (609)683-0838.

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*Changing by Degrees: Steps to Reduce Greenhouse Gases*, produced by the U.S. Office of Technology Assessment, is an assessment of strategies by which industrialized and developing countries can reduce emissions of greenhouse gases over the next 25 years.

The book is available for \$49 US from Cutter Information Corporation, 37 Broadway Street, Arlington, MA 02174-5539; fax (617)648-8707.

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*Behind the Smokescreen: the State of Canada's Air* is a Pollution Probe publication, written by Janis Haliniak and Ellen Schwartzel in November 1992, and is available for \$12.84 Cdn (GST included) plus \$2 Cdn postage and handling. To receive a copy write to Pollution Probe, 12 Madison Avenue, Toronto, ON M5R 2S1.

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The U.S. Environmental Protection Agency has recently released a report on *Chemical Residues in Fish*, a followup effort to the 1986 National Dioxin Study that further evaluates the presence of dioxin and dioxin-like compounds. The followup study includes data from samples of bottom-feeding and game fish collected at 388 sites around the United States from 1986 to 1989 that were analyzed for pollutants such as PCBs, dioxins, furans and mercury. To receive the report or further information, contact U.S. Environmental Protection Agency, Office of Science and Technology, Standards and Applied Science Division (WH-585), Washington, DC 20460, telephone (202)260-9843 or (202)260-7812; fax (202)260-9830.

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Aspects of the great **Lake Superior** are related on a bimonthly basis in *Lake Superior Magazine*. To subscribe, contact Lake Superior Magazine, P.O. Box 16417, Duluth, MN 55816-0417. Telephone (218)722-5002 or in the United States call (800)635-0544.

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The *Grand Traverse Bay Region Development Guidebook* is a 104-page illustrated book offering suggestions for solving problems of urban sprawl, land division, road access, damage to wetlands, water quality, rural open space and remedial action techniques to reduce the negative impacts of existing development. Also available is a companion report entitled *Grand Traverse Bay Region Sample Regulations*. The guides are available for a

prepayment of \$25 US each from the Grand Traverse County Planning Commission, 400 Boardman Avenue, Traverse City, MI 49684. (616)922-4676; fax (616)922-4636.

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Three publications addressing current issues in Great Lakes resource use and protection have been released by the Great Lakes Commission. *A Guidebook to Groundwater Resources and Education Opportunities in the Great Lakes Region* (\$10 US) examines the physical and environmental characteristics of groundwater resources, *Keeping it on the Land: Improving Great Lakes Water Quality by Controlling Soil Erosion and Sedimentation* (first copy free) is a brochure highlighting soil erosion and sedimentation problems in the Great Lakes basin, and a report on *Liquid Asset: Great Lakes Water Quality and Industry Needs* (\$5 US) talks about the importance of water quality and water quantity when promoting economic investment in the Great Lakes region.

To order these publications contact the Great Lakes Information Clearinghouse, 400 Fourth Street, Ann Arbor, MI 48103-4816. (313)665-9135; fax (313)665-4370.

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The *Great Lakes Action Plan Bulletin* will begin circulating quarterly in English and French in April 1993. The bulletin includes Canadian federal Great Lakes basin success stories and a calendar of community events. For information contact Pierre Paquette, Communications Officer, Department of Fisheries and Oceans, 867 Lakeshore Road, Burlington, ON L7R 4A6. In Canada telephone (800)668-5222.

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Le bulletin *Plan d'action pour les Grands Lacs* commencera à paraître en avril 1993. Trimestriel bilingue, le bulletin relate les succès des projets fédéraux réalisés dans le bassin des Grands Lacs et contient un calendrier des activités communautaires. Pour de plus amples renseignements, s'adresser à Pierre Paquette, agent de communications, ministère des Pêches et Océans, 867, chemin Lakeshore, Burlington (Ontario) L7R 4A6. Au Canada, on peut composer le 1-800-668-5222.

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*Education and the Environment: Learning to Live with Limits* is published by the State University of New York Press for \$12.95 US paperback and \$39.50 US hardcover plus postage and handling, and taxes where applicable, from CUP Services, P.O. Box 6525, Ithaca, NY 14851. (607)277-2211 or fax (800)688-2877.

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*A Universal Manual for Purple Loosestrife Control* by Cathy Keddy, is available for \$16 Cdn (plus shipping and handling) from the Ontario Federation of Anglers and Hunters, Box 2800, Peterborough, ON K9J 8L5. (705)748-6324.

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The Metropolitan Water Board of New York recently released its 1992 *Lake Ontario Monitoring Program* report. Since 1976, Lake Ontario waters have been monitored for a variety of compounds commonly found in drinking water. To obtain the report contact the Metropolitan Water Board, Alexander F. Jones Administration Center, 4170 Route 31, Clay, NY 13041. (315)652-8656; fax (315)652-1977.

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The **status of Great Lakes water quality** and the role the International Joint Commission plays in progress under the Great Lakes Water Quality Agreement are explored in an indepth article in the latest issue of *Harrowsmith Country Life*. The bimonthly magazine on country living, with special interest in ecology, energy efficient shelter, gardening and healthy food, is circulated to 200,000 subscribers and is available at most newstands in the United States and Canada.

If not available in your area, contact the magazine at Ferry Road, Charlotte, VT 05445, telephone (802)425-3961.

## RSVP

Readers will notice we have added a French language summary with all English language articles.

We would like to hear your comments and suggestions on any aspect of this publication. Please address all correspondence to Editors, *FOCUS on International Joint Commission Activities*, 100 Ouellette Avenue, Eighth floor, Windsor, Ontario N9A 6T3 or P.O. Box 32869, Detroit, Michigan 48232. Letters printed in future issues may be edited to meet space requirements. Please include your name and address with all correspondence.

Nos lecteurs remarqueront que nous avons ajouté un résumé en français de tous les articles publiés en anglais.

N'hésitez pas à nous envoyer vos commentaires ou vos suggestions sur n'importe quel aspect de la publication. Veuillez adresser toute correspondance et demande d'abonnement aux éditeurs de *FOCUS on International Joint Commission Activities*, 100, avenue Ouellette, 8<sup>e</sup> étage, Windsor (Ontario) N9A 6T3 ou P.O. Box 32869, Detroit, Michigan 48232. Il se peut que les lettres qui seront publiées soient raccourcies pour des raisons d'espace. Veuillez inscrire vos nom et adresse sur tous vos envois.





## Public Comments on Progress Under Canada-U.S. Air Quality Agreement

by Ted Bailey and Frank Bevacqua

*"Significant progress is being made toward fulfillment of the Canada-United States Air Quality Agreement ... and the continuing pursuit of activities to reduce acidic deposition will eventually lead to better health for humans and all natural life forms."*

*"(The progress report) fails to articulate any action plan to deal with the issues at hand."*

These views were included in the 22 submissions received by the International Joint Commission in response to its invitation for public comment (see *Focus*, Volume 17, Issue 2) on the first progress report of the Air Quality Committee appointed by the Governments of Canada and the United States under the Air Quality Agreement.

The Air Quality Agreement was signed March 13, 1991 by President George Bush and Prime Minister Brian Mulroney to establish "a practical and effective instrument to address shared concerns regarding transboundary air pollution." Under the Agreement, the United States and Canada are responsible for meeting a number of general and specific air quality objectives, as well as coordi-

nating a number of scientific and technical activities. The two governments appointed an Air Quality Committee to help coordinate bilateral activities and prepare periodic progress reports.

The Agreement assigns the International Joint Commission responsibility for inviting comments on the Air Quality Committee's progress reports, submitting a synthesis of the views received to the two governments and the record of such views if either government requests, and publicly releasing the synthesis of views. The Commission invited public comment through public announcements, news releases and letters in June 1992 following the release of the first progress report.

Several respondents were strongly supportive of the Agreement and the need for increased cooperative action, as well as individual actions, on the

parts of Canada and the United States to control transboundary air pollution. However, several also commented that the progress report fails to mention delays and obstacles in both countries to achieving the goals established in the Agreement. In particular, these included delays in publishing rules to meet legislated requirements for reducing acid deposition, the promulgation of weak rules, long delays in attaining specific targets for emission reductions in the United States, and the long timeframes established for targets to be met. Some felt that the target reductions for acid deposition are not stringent enough to protect lakes and soils in eastern Canada, even if the terms of the Agreement are fully implemented.

Strong support was expressed for expanding the scope of issues covered under the Agreement to include toxic air emissions and ground level ozone, as well as a number of other air quality issues. Governments were encouraged to develop cooperative arrangements under the Agreement to ensure that these priority issues receive the attention they require. The importance

*Public comments expressed support for continuing research to understand the effects of acid deposition on forests. (Photo Credit: Frank Bevacqua)*



*Progress in reducing acid deposition in the United States and Canada is the focus of the Air Quality Committee's first progress report. (Credit: Frank Bevacqua)*

of improving emission inventories was stressed, as the inventories serve as the basis for all analysis and deductive work.

As some emissions that contribute to acid deposition are related to other environmental concerns, such as ground level ozone and greenhouse gas buildup, respondents suggested that programs to address these issues should be integrated. This was seen as a way of sharing the costs among the programs and achieving multiple benefits from the same strategies. It was also suggested that future reports attempt to quantify the relative contributions of conservation, efficiency and control to emission reductions.

Many comments also addressed specific aspects of the emission reduction, effects research and monitoring programs. The Commission has compiled the public comments into a re-



port, *Synthesis of Views on the March 1992 Progress Report of the Air Quality Committee under the United States/Canada Air Quality Agreement*. To receive a copy, contact an International Joint Commission office.

To obtain the Progress Report of the Air Quality Committee, contact

the Acid Rain Division, U.S. Environmental Protection Agency, Mail Code 6204J, 401 M Street SW, Washington, DC 20460, or telephone (617)641-5377. In Canada, contact Environment Canada, Enquiry Centre, 351 St. Joseph Boulevard, Hull, Québec, K1A 0H3, telephone (819)997-2800.

## Sommaire

*«Il y a des progrès importants dans la réalisation de l'Accord entre le Canada et les États-Unis sur la qualité de l'air ... et l'on peut s'attendre à ce que la poursuite des activités visant à réduire les dépôts acides finisse par améliorer la santé des personnes et de toutes les autres formes de vie.»*

*«(Le Rapport d'étape) ne contient aucun plan d'action précis face aux enjeux actuels.»*

Voilà deux des commentaires exprimés dans les 22 mémoires que la Commission mixte internationale a reçus après avoir sollicité l'opinion du public (voir *Focus*, volume 17, numéro 2) sur le premier Rapport d'étape du Comité de la qualité de l'air mis sur pied par les gouvernements du Canada et des États-Unis en vertu de l'Accord sur la qualité de l'air.

Signé le 13 mars 1991 par le président George Bush et le Premier ministre Brian Mulroney, l'Accord sur la qualité de l'air vise à établir «un instrument pratique et efficace pour chercher à résoudre les sujets de préoccupation communs en ce qui a trait à la pollution

atmosphérique transfrontière». En vertu de cet Accord, les deux Gouvernements doivent respecter des objectifs généraux et des objectifs spécifiques en matière de qualité de l'air, et coordonner un certain nombre d'activités scientifiques et techniques. Les Gouvernements ont mis sur pied le Comité de la qualité de l'air pour assurer la coordination des activités bilatérales et la production des rapports d'étape périodiques.

L'Accord confère à la Commission mixte internationale la responsabilité de sonder l'opinion publique sur les rapports d'étape du Comité de la qualité de l'air, de soumettre aux Gouvernements une synthèse des opinions présentées ainsi qu'un compte rendu de ces opinions si l'un des Gouvernements le demande, et de rendre publique la synthèse de ces opinions. La Commission mixte internationale a sollicité l'opinion du public au moyen d'annonces, de communiqués de presse et de lettres parus en juin 1992, après la publication du premier Rapport d'étape.

On trouvera à la fin de l'article des informations sur la façon d'obtenir copie du rapport de la Commission mixte internationale et du rapport d'étape du Comité de la qualité de l'air.



## EVENTS

The following includes meetings scheduled by the International Joint Commission and its various boards. Please contact a Commission office for further information.

March	10-12	Council of Great Lakes Research Managers Atlanta, GA
	15-17	Great Lakes Water Quality Board Toronto, ON
	18	Educators Advisory Council Detroit, MI
	29-30	Health Care Professionals Roundtable Toronto, ON
April	20-23	International Joint Commission Semi-Annual Meeting Washington, DC
	27	Virtual Elimination Task Force Public Session Milwaukee, WI
	28	Virtual Elimination Task Force Public Session Detroit, MI
	29	Virtual Elimination Task Force Public Session Toronto, ON
May	10-11	Great Lakes Science Advisory Board Windsor, ON
June	16-17	International Joint Commission Executive Session Ottawa, ON

The **EarthPeace International Film Festival** will be held from April 14-18, 1993 in Burlington, Vermont. The festival will examine topics that address issues of global concern. For more information, contact Lorraine B. Good, Executive Director, EarthPeace International Film Festival, c/o Burlington City Arts, City Hall, Burlington, VT 05401. (802)660-2600.

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**In Touch with the Earth** is this year's theme for the Michigan Alliance for Environmental and Outdoor Education annual conference to be held April 30-May 2, 1993 at Camp Cavell, located north of Lexington, Michigan.

For more information, contact Don Place, Michigan Alliance for Environmental and Outdoor Education, 5615 Chickadee Lane, Clarkston, MI 48346. (313)625-2390.

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The Great Lakes Fishery Commission will hold its **38th Annual Meeting** May 24-28, 1993 at the Sheraton Centre in Toronto, Ontario. For more information contact the Great Lakes Fishery Commission, 2100 Commonwealth Boulevard, Suite 209, Ann Arbor, MI 48105-1563. (313)662-3209; fax (313)741-2010.

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## General Conferences

For those interested in natural resource use and management, pollution prevention and control, and planning and development, a **Watershed '93** conference will be held March 21-24, 1993 in Alexandria, Virginia.

To receive more information contact Jennifer Paugh, 1000 Connecticut Avenue, NW, Suite 802, Washington, DC 20036. (202)833-8317; fax (202)466-8554.

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The University of Wisconsin Sea Grant Institute's second **Workshop on Maintenance Dredging of Small Craft Facilities** will be held March 22-23, 1993 at the Wisconsin Center in Madison. Topics include re-use and

disposal of dredged material, alternatives to conventional dredging and creating aquatic habitat.

For more information, contact Philip Keillor, Coastal Engineer, University of Wisconsin Sea Grant Advisory Services, 1800 University Avenue, Madison, WI 53705-4094. (608)263-5133; fax (608)263-2063.

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The National Science Teachers Association is holding its **41st National Convention** in Kansas City, Missouri on April 1-4, 1993. To register, contact Tina Brent, the National Science Teachers Association, 1742 Connecticut Avenue NW, Washington, DC 20009-1171. (202)328-5800.

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La corporation Saint-Laurent\Grands Lacs récidive avec l'activité Fleuve et musique "Salut les Jeunes!" du 25 mai au 4 juin 1993 au Parc des Rapides de ville LaSalle. Pour de plus amples informations: Contacter Fleuve et musique au 514 582-2359 ou écrire au 522 Notre-Dame, Repentigny, (Québec) J6A 2T8. Bélinos: 514 582-6974.

## Mark Your Calendars for the 1993 Biennial Meeting

The International Joint Commission invites all who are interested in work under the Great Lakes Water Quality Agreement to attend the **1993 Biennial Meeting on Great Lakes Water Quality October 22-24, 1993 in Windsor, Ontario**. Presentations by the Commission's technical and policy advisors will be followed by opportunities for public comment on work under the Agreement. No fee will be charged to participate in the meeting sessions. Detailed information about the Biennial Meeting and the registration form will be included in the July/August issue of *Focus*.



La Commission mixte internationale invite tous ceux qui sont intéressés aux travaux réalisés en vertu de l'Accord canado-américain relatif à la qualité de l'eau dans les Grands Lacs à participer à la **conférence biennale sur la qualité de l'eau des Grands Lacs, qui doit avoir lieu à Windsor du 22 au 24 octobre 1993**. Les organismes consultatifs de la Commission déposeront des rapports sur la qualité de l'eau des Grands Lacs. Le public et les groupes d'intérêt seront invités à faire connaître leurs vues sur ces rapports et sur les progrès réalisés par les deux pays par rapport aux objectifs de l'Accord. De plus amples informations concernant la réunion biennale et l'inscription vous seront transmises dans l'édition de juillet/août de *Focus*.

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The Saint-Lawrence and Great Lakes Corporation will present for the second year the activities of the Fleuve et musique "Salut les Jeunes!" program from May 25th to June 4th, 1993. For further information contact Fleuve et musique, 522 Notre-Dame, Repentigny, PQ J6A 2T8. (514)582-2359; Fax (514)582-6974

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Three short courses will be given at **Colorado State University** this summer: Design of Water Quality Monitoring Networks, June 7-11; Activated Sludge Process Control June 21-25; and Water Resources Development and Environmental Protection: Problems, Issues and Solutions, June 28-July 2.

For additional information contact, Thomas G. Sanders, Program Leader, Environmental Engineering, Department of Civil Engineering, Colorado State University, Fort Collins, CO 80523. (303)491-5448; fax (303)491-7727.

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The International Association for Great Lakes Research is holding its **36th Annual Conference on Great Lakes Research** June 6-10, 1993 in DePere, Wisconsin to promote information exchange on all aspects of research applicable to understanding large lakes of the world and the human societies surrounding them.

Professionals and students from science and technology emphasizing large lake studies are encouraged to attend. For additional information contact John Kennedy, Green Bay Metropolitan Sewerage District, P.O. Box 19015, Green Bay, WI 54307-9015. (414)432-4893; fax (414)432-4302.

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The **4th Aliia International Exhibition of Fisheries and Aquacultures** will be held in Thessaloniki, Greece June 11-14, 1993. For more information contact the Aliia Secretariat at 154, Egnatia Street, 546 36 Thessaloniki, Greece. Telephone 031-291.111 or fax 031-229116.

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The **40th Ontario Conference on the Environment** will be held June 13-16, 1993 at the Four Seasons Inn on the Park in Toronto, Ontario. Emphasis is on waste reduction using a multimedia approach to pollution prevention. For conference information contact Murray Cheetham, Environment Ontario, Waste Management Branch, 14th Floor, 2 St. Clair Avenue West, Toronto, ON M4V 1L5. (416)323-5184; fax (416)323-5031.

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The **Great Lakes Voyage of Discovery** sails June 16-19, 1993 on the waters of northern Lake Michigan aboard the schooner *Manitou*. This three-day class includes shipboard programs on limnology, island ecology, marine geology, meteorology and Great Lakes history, and is sponsored by the Inland Seas Education Association in cooperation with the Traverse Tall Ship Company of Traverse City and Eastern Michigan University. The \$375 US cost plus tax includes materials, and room and meals aboard the schooner. Graduate credit may be arranged separately through the Eastern Michigan University Depart-



Five **Great Lakes Basin Environmental Education Institutes** will be held in summer 1993 for educators throughout the Great Lakes region.

The institutes seek to provide educators with the knowledge, skill and confidence necessary to teach students and other educators about the Great Lakes Basin Ecosystem. Activities at each week-long institute include field trips, guest speakers, resource materials and development of integrative processing skills. Graduate credit is available. For more information, contact the following:

Date	Location	Contact	Telephone or fax
June 13-19 LAKE ERIE	South Bass Island, OH	JoAnn Damon	(614)292-8949 fax (614)292-4364
August 1-6 LAKE ONTARIO	St. Catharines, ON	Wally Poole	(416)688-5550 ext. 3938; fax (416)685-4131
August 1-6 LAKE HURON	Alpena, MI	Sally DeRoo	(313)451-6600 ext. 271; fax (313)453-5220
August 2-5 LAKE MICHIGAN	Green Bay, WI	Al Stenstrup	(608)264-6282 fax (608)264-6293
August 16-22 LAKE SUPERIOR	Isle Royale, MI	Mike Link	(612)245-2648 fax (218)372-3126

ture and environmental quality. For more information contact Marilyn Krueger, St. Louis County Commissioner, 100 North 5th Avenue, Room 206, Duluth, MN 55802. (218)726-2450; Fax (218)726-2469.

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Joint responsibility for shared resources is the theme of the 1993 annual meeting of the **American Fisheries Society** to be held August 28-September 3, 1993 in Portland, Oregon. For more information contact Jerry Bouck and Steve Smith, American Fisheries Society, Technical Program Chairs, Bonneville Power Administration (Mailing Code PJ), P.O. Box 3621, Portland, OR 97208-3621. (503)230-5213 or -5365.

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The **Great Lakes Bioregional Congress** will hold a four-day community celebration in Chicago September 16-19, 1993. Approaches to ecologically sustainable and socially just production processes and lifestyles will be discussed. Congress participants will also tour urban environments and clean up a segment of shoreline during the Great Lakes Beach Sweep (see *Focus*, Volume 17, Issue 3, pages 13-14.). For more information contact Beatrice Briggs, Wild Onion Alliance, 3432 North Bosworth, Chicago, IL 60657. (312)929-5565.

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The **First International Association for Water Pollution Research and Control Specialized Conference on Diffuse (Nonpoint) Pollution: Sources, Prevention, Impact and Abatement** will be held September 20-24, 1993 in Chicago, Illinois.

For information, contact Dr. Vladimir Novotny, Conference Chair, International Association for Water Pollution and Control, Department of Civil and Environmental Engineering, Marquette University, 1515 West Wisconsin Avenue, Milwaukee, WI 53233. fax (414)288-7082.

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ment of Continuing Education. Class size is limited to 22 persons and the registration deadline is April 15, 1993.

For more information, contact the Inland Seas Education Association, P.O. Box 4223, Traverse City, MI 49685-4223. (616)271-3077.

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The **Canadian Water Resources Association** will present its 46th annual conference on Water and the Wilderness in Banff, Alberta June 16-19, 1993. This conference will explore key issues on the connecting medium of water. To receive more information contact Canadian Water Resources Association, Conference Committee, c/o Eastern Irrigation District, P.O. Bag 8, Brooks, AB T1R 1B2. (403)362-1400; fax (403)362-6206.

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"Change: Are You Prepared?" is the title of a joint meeting of **The American Society of Agricultural Engineers**

and the **Canadian Society of Agricultural Engineering** to be held June 20-23, 1993 in Spokane, Washington. To receive a program contact the American Society of Agricultural Engineers, 2950 Niles Road, St. Joseph, MI 49085-9659. (616)429-0300; fax (616)429-3852.

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**Geological Sciences #694: Principles of Oceanography** will be offered to science teachers June 20-26, 1993. Contact Dr. Larry Krissek, 247 Orton Hall, 155 South Oval, Ohio State University, Columbus, OH 43210. (614)292-1924, -8746 or -2721.

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The **Great Lakes Council of County Associations** will hold its annual conference August 12-14, 1993 in Duluth, Minnesota. The council provides a forum for county officials to discuss water-related issues they share in common such as economic development, transportation, agricul-

The 20th in a series of **Annual Aquatic Toxicity Workshops** will be held October 17-20, 1993 at the Chateau Frontenac in Quebec City, Quebec. To receive more information contact Raymond Van Coillie, Environment Canada, C-P, Quebec Region, 1179, de Bleury Street, Montreal, PQ H3B 3H9. (514)496-6858; fax (514)283-4423.

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An **International Symposium on Chemistry and Biology of Municipal Water Treatment: Current Status and Future Directions** will be held October 24-29, 1993 at the Canada Centre for Inland Waters, Burlington, Ontario. The purpose of the symposium is to enhance the knowledge base of providers, regulators and users of municipal water with respect to state-of-the-art developments in the drinking water industry.

To receive further information, contact Dr. B.K. Afghan, Analytical Chemistry Research, Research and Applications Branch, National Water Research Institute, Canada Centre for Inland Waters, Burlington, ON L7R 4A6. (416)336-4661; fax (416)336-4989.

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The International Association for Sediment Water Science will hold its **Sixth International Symposium on Interactions Between Sediments and Water** December 5-8, 1993 in Santa Barbara, California. Current research on all aspects of freshwater and marine systems, their sediments and the management of water resources will be discussed.

To obtain further information contact Wilbert Lick, Department of Mechanical and Environmental Engineering, University of California, Santa Barbara, CA 93106. (805)893-4295; fax (805)893-8651.

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The American Society of Agricultural Engineers is sponsoring the **Integrated Management and Landscape Modification for Environmental Protection** conference December 13-14, 1993 in Chicago, Illinois. State-of-the-art information on land management,

changes and issues dealing with environmental protection are a few of the topics. For conference information, contact Saied Mostaghimi, VPI & SU, Agricultural Engineering Department, 308 Seitz Hall, Blacksburg, VA 24061. (703)231-7605; fax (703)231-3199.

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