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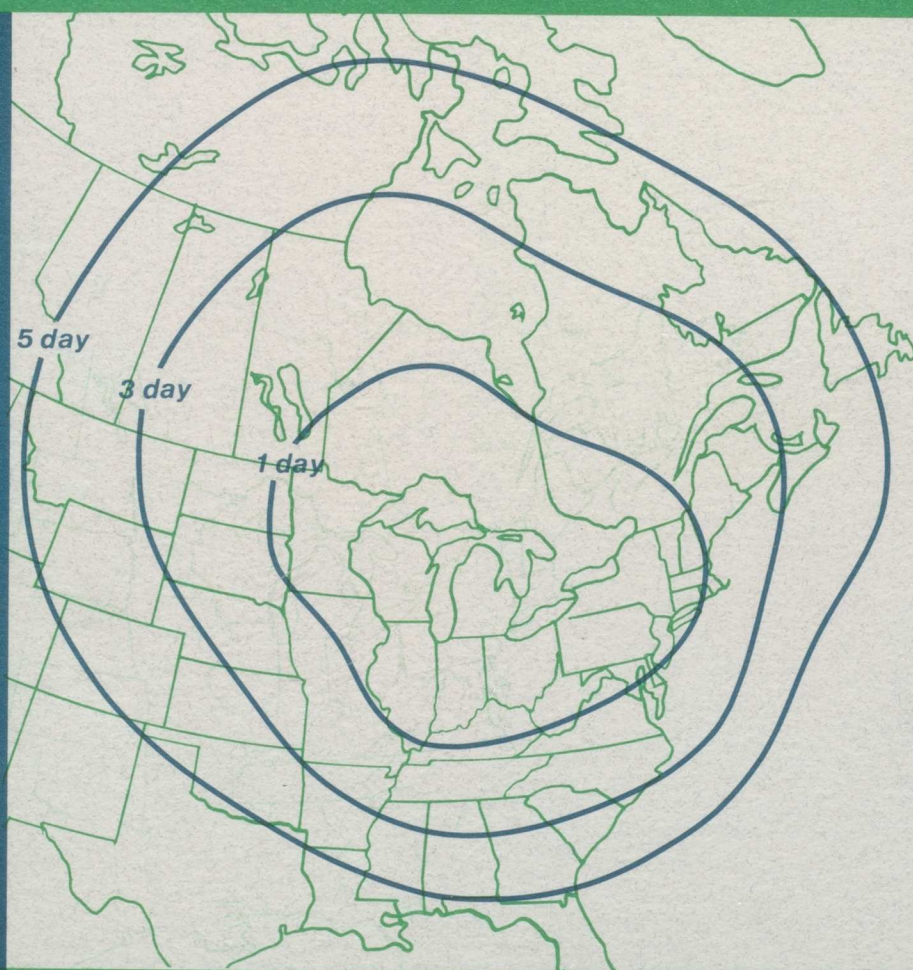
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# International Air Quality Advisory Board

## Progress Report Thirteen to the International Joint Commission



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April 1992



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IAQAB  
13  
1992

Cover Figure: Lines of the median location of air parcel starting points one to five days prior to arrival in the Great Lakes region. A 3-day line indicates that half the time the air in the Great Lakes region would have originated 3 days earlier within that line and half the time beyond it.

**PROGRESS REPORT 13**

to the

**INTERNATIONAL JOINT COMMISSION**

by the

**INTERNATIONAL AIR QUALITY ADVISORY BOARD**

for consideration at the

**ANNUAL MEETING**

Washington, DC USA

April 23, 1992

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Cover Figure: Lines of the median locations of air parcel starting points one to five days prior to arrival in the Great Lakes region. The 3-day line indicates that half the time the air in the Great Lakes region would have originated 3 days earlier within that line and half the time beyond it.

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# 1. TRANSBOUNDARY INTEGRATED MONITORING REVISITED

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The IADAB has reviewed and discussed the Expert Group Report and has the following comments:

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Occasionally experts would get together to discuss progress. A series of coordinated measurements were made in the region, resulting in a major research program involving the collection of data on monitoring all parameters in one area (e.g., a watershed) and the collection of data began. Once together, as a result, concepts and ideas were shared to appear. This is now common practice in the Great Lakes region and is a good measurement concept. It is now common practice in the Great Lakes region and is a good measurement concept. It is now common practice in the Great Lakes region and is a good measurement concept.

When we do not know, when we are asked a question, is which is the right measurement may actually start to look like a mess. The real danger of "integrated" starts with defining the question. Once the question is clearly stated, a set of measurements, integrated to the degree required by the question, can be made at risk in the way already described. "Integration" is as much an interaction among disciplines as the collecting of measurements.

The main conclusion of the Expert Group report is that any monitoring effort must be the question being addressed. The question defines the methodology, time and space of the monitoring effort. For example, if one is interested in the impact of ozone on human health, taking measurements in the urban area would be most appropriate. One would need measurements near and far from the source, and monitors in the urban area. The study in cities as well as (1) measurements of the frequency of the atmosphere in terms of the city; (2) measurements of ozone which is a by-product of the atmosphere; (3) measurements to understand how ozone is created and how it is destroyed.

## 1. TRANSBOUNDARY INTEGRATED MONITORING REVISITED

The IAQAB has reviewed and discussed the Expert Group Report and has the following comments:

The term "integrated monitoring" is very broad and may in fact be too all-encompassing for a scientific group to adequately define. The Expert Group evolved the development of the concept but only looked at scientific issues, when in practice, there are also matters of value and policy involved. We offer in the next paragraph a brief summary of how the concept of "integrated monitoring" has matured.

Initially, integrated monitoring was defined as "measuring all parameters of interest at one spot and analyzing them". This immediately creates a problem if, for example, there is no lake nearby in which water quality measurements can be conducted, or if limited terrestrial systems are available for land use studies.

Scientific experts frequently have a difficult time communicating with each other. Occasionally experts would get together and a large measure of progress occurred. A series of coordinated measurements were actually analyzed together, resulting in a major improvement in understanding as occurred during the acid rain debate, circa 1982. The acid rain research program broadened the concept of integration to "measuring all parameters in one area (e.g., a watershed)" and the collection of a rich heritage of data began. Once every two or three years, researchers from these areas would convene and study their data together; as a result, concepts and theories on how ecosystems work started to appear. This is now common practice in the Great Lakes Basin. Such an area-of-measurement concept became scientifically valid when measurements at a desired location were made over a time period relevant to the parameters being measured. Scientists then started discussing how one parameter influenced another. The IAQAB even tried to include human health into the concept of integrated monitoring (now being successfully applied to understand acid rain) under the assumption that the human was the most critical receptor.

What we do not know, when we are asked a question, is whether or not the right measurements may actually already have been made. The real concept of "integration" starts with defining the question. Once the question is clearly stated, a cost effective series of measurements, integrated to the degree required by the question, can be made to add to the data already archived. "Integration" is as much an interaction among people as the collocating of measurements.

The main conclusion of the Expert Group report is that any monitoring effort must fit the question being addressed. The question defines the boundaries (time and space) of the monitoring effort. For example, if one is concerned with understanding the impact of ozone on human health, taking measurements in the middle of a forest would be nearly useless. One would need measurements near, and perhaps even in, the receptors (the humans who live mainly in cities) as well as: (1) measurements of the chemistry of the atmosphere upwind of the city; (2) measurements of ozone where it is formed; and (3) a series of detailed measurements to understand how ozone is created and transported. Similarly, to

study the impact of toxic substances on the Great Lakes ecosystem requires monitoring of concentration in fish, wildlife, sediment, water, atmosphere, streams, etc.

In order to maintain the current level of dialogue about integrated monitoring, we recommend that:

**The Expert Group report "Monitoring for Integrated Analysis, October 1991" be published as an IAQAB working paper and circulated to all regional workshop participants as well as members of the Great Lakes science community (about 400 copies).**

Seven years ago, as this integrated monitoring program of the IAQAB was begun, the Commissioners stated the following question:

*WHAT IS THE HEALTH OF THE ENVIRONMENT IN THE  
TRANSBOUNDARY REGION AND HOW IS IT CHANGING?*

The Board and its Expert Group, over these past seven years, we have explored ways of answering the question. However, we have also explored ways of reformulating the question and explored reasons why integrated monitoring perhaps may not be able to answer the question. We are now more knowledgeable, but also now more wary of the task at hand as we try to go forward.

For this reason we recommend that:

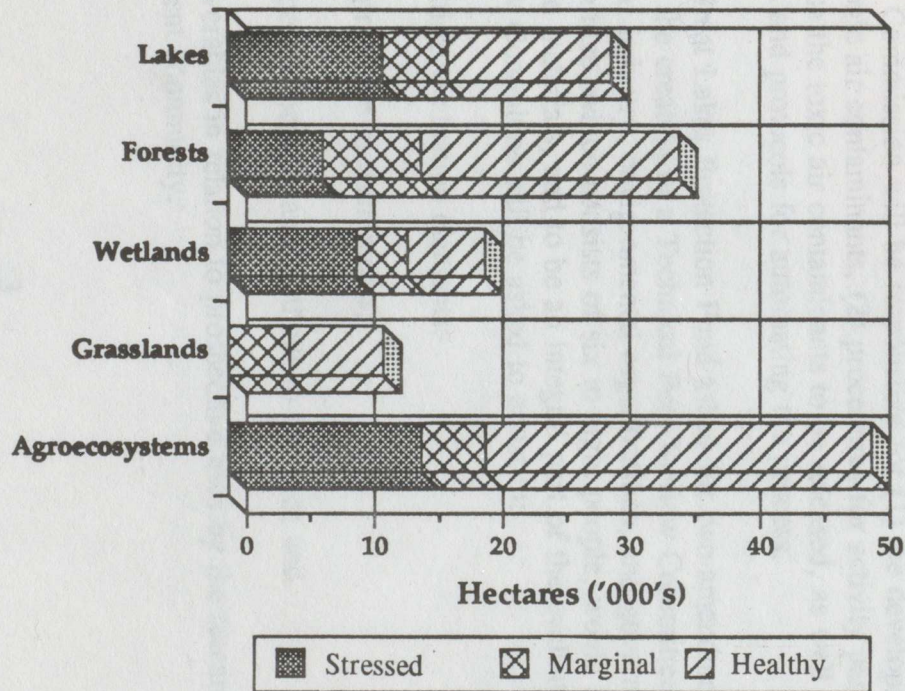
**The IAQAB schedule an informal conference between the Commission, the chairmen of the Expert Group, the IAQAB and the Staff to review the recommendations and conclusions, to discuss the possible next monitoring steps for the IAQAB and to agree on a specific work plan. We propose this for June in Montreal, if suitable dates can be worked out.**

As a "think piece", possibly relevant to the Commissioner's initial question and this proposed meeting, consider Figure 1 as a hypothetical outcome from an integrated monitoring network designed to answer the question. This figure focuses on five ecosystems present in some portion of the border region.

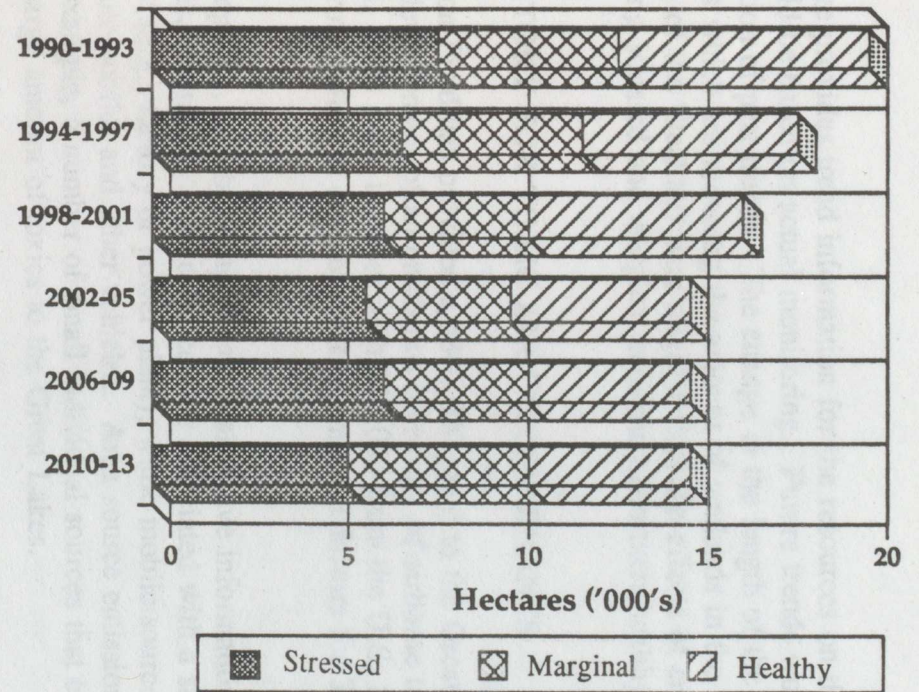
The bar graph on the left provides information on the extent and the status of the ecosystem resources. The length of the bars shows the total surface area of each of the ecosystems in the region. The shadings of the sections of the bars give a view of the health of the ecosystem. The term "Healthy" could mean that the ecosystem is performing all of the functions expected of it in an acceptable manner. Examples of functions could be a lake producing trout, grasslands providing grazing, or a forest having a certain biodiversity. "Stressed" and "Marginal" would result if stressors, such as pollution, climate change, or land use changes, affected these functions negatively. One could imagine that in other similar figures, the shaded sections of the bars could display the cause of the stressed ecosystems.

# Potential Status and Trends Assessment

## Status and Extent of Resources



## Potential Trends for Wetlands





The right side of the figure provides trend information for the resources on the left. These trends, if in the past, could be based on actual monitoring. Future trends would be predicted by modeling or extrapolation of past trends. The change in the length of the bars would suggest land use decisions which are reducing the amount of wetlands in the border region. The changes in the length of the "healthy" bars might reflect the effects of environmental decisions aimed at restoring stressed and marginal ecosystems to their healthy state.

## 2. EMISSIONS INVENTORY FOR TOXIC AIR CONTAMINANTS

The Great Lakes Protection Fund has provided a \$300,000 grant to the Great Lakes Commission to fund the development of an emissions inventory of airborne toxic pollutants in the Great Lakes region. This grant together with \$25,000 from the U.S. Environmental Protection Agency will provide for the development of emission factors for 30 toxic air contaminants of concern.

This inventory, when completed, will be comprehensive and have information on point, area, and mobile sources of these pollutants. Point sources are associated with a stack or identifiable emission point (e.g., factory or power plant), while mobile source emissions include pollutants from automobiles and other vehicles. Area source emissions are defined by geographic areas for example, a number of small individual sources that can be shown to collectively contribute a large amount of toxics to the Great Lakes.

The first phase of this effort was a scoping phase, leading to the design of Phase II. In Phase II, the Great Lakes Commission will be responsible for (1) the development of emission factors for the toxic air contaminants, (2) procedures for activity parameters for those activities which cause the toxic air contaminants to be released, as well as (3) the development of guidelines and protocols for automating the process.

In funding Phase II, the Great Lakes Protection Fund asked for two amendments to the submitted plan. One was the creation of a Technical Peer Review Committee made up of individuals from academia, industry, environmental organizations, and government agencies. The purpose of this Committee, which consists of six to eight people, would be to provide critical review of projected materials, and to be an integral part of the evaluation process. In particular the Peer Review Committee will be asked to assist in:

- developing critical evaluation elements;
- identifying appropriate measurements;
- defining the specific process and methods to be used; and
- assessing deliverables in relation to prospective uses by the research and management community.

The second amendment the Protection Fund requested was that the project formally provide for greater Canadian participation. While members of the Ontario Ministry of the Environment and Environment Canada were involved with Phase I on the project, the amended Phase II plan formally invites these organizations, as well as the Province of Quebec, to designate representatives to serve as advisors to the Technical Steering Committee. Formal coordination with Canadian efforts and interests is essential to ensure that data are consistent in the transboundary region.

The International Joint Commission, through the International Air Quality Advisory Board, has been invited to participate in this project as a member on the Technical Peer Review Committee. A further outstanding issue is that of a permanent home for the emissions inventory — where it would reside and be maintained following completion of the project.

**The Board recommends that the Commission concur with the appointment of the International Air Quality Advisory Board to the Technical Peer Review Committee for the Development of an Inventory of Toxic Air Contaminants for the Great Lakes States. Further, the Board recommends that the International Joint Commission evaluate the merit and feasibility of being the host for the Inventory of Toxic Air Contaminants for The Great Lakes States upon completion of the project along with other roles the Commission could play to facilitate the access and use of the data by the researchers and resource managers of the region.**

### 3. LAKE CHAMPLAIN MANAGEMENT CONFERENCE

On 17-19 December 1991, a "Workshop on Monitoring and Research Needs for Lake Champlain" was held in Burlington, Vermont. The workshop was sponsored by the Lake Champlain Management Conference, the U.S. EPA, and the Lake Champlain Research Consortium, with invitations extended to federal and state/provincial scientists of both the United States and Canada. The workshop addressed the need for data to characterize and quantify the environmental threats to the Lake and Basin.

The Atmospheric Processes and Deposition Group was formed during the Workshop and is now continuing to identify the atmospheric issues of concern for Lake Champlain such as:

- atmospheric deposition of toxics;
- resolving direct (lake) and indirect (watershed) pathways for atmospheric deposition to lake;
- resolving direct (atmospheric) and indirect (drinking water, fish consumption, etc.) pathways of human exposure to airborne contaminants;

- clarifying the role of the lake as a source or sink for certain pollutants;
- understanding changes in regional pollution patterns;
- improving our understanding of micro- and meso-scale meteorological processes; and
- visibility degradation.

The Atmospheric Processes and Deposition Group went on to identify the contaminants of initial concern, the status of currently planned monitoring and research in the region, and to identify the opportunities for cooperation and coordination. The Group also formulated a set of specific monitoring and research recommendations which would lead to an improved state of understanding of the role of atmospheric processes in transporting toxic air contaminants to the environmental resources of the Lake Champlain Basin. The Group also recommended establishment of an Atmospheric Science Advisory Group to provide technical expertise and advice for studies related to atmospheric processes in the Basin.

Subsequent to the Workshop, plans for enhanced data collection and data analysis are being implemented by the New York and Vermont Departments of Environmental Conservation. The U.S. National Atmospheric and Oceanic Administration (NOAA) is formulating a program to analyze the atmospheric transport and deposition of airborne contaminants which will compliment these state efforts.

Lake Champlain is a significant and important resource which straddles the Canada U.S. border. The Basin has been designated a unique biosphere under the United Nations Environmental Programme. The managers of this resource are beginning to address environmental threats similar to those which have been recognized as threats to the Great Lakes.

**To assist in this effort, it is recommended that the International Joint Commission be represented on the Lake Champlain Atmospheric Science Advisory Group through its International Air Quality Advisory Board.**

#### **4. DEPOSITION OF TOXIC SUBSTANCES TO LAKE SUPERIOR**

Both the U.S. and Canadian government have ongoing programs to monitor and calculate deposition of toxic substances to Lake Superior as well as the other Great Lakes.

##### Monitoring Deposition

The U.S. EPA has monitored both air concentration and deposited chemicals as part of the Binational Integrated Atmospheric Deposition Network at Eagle Harbor, Michigan on the southern shore of Lake Superior, the northern tip of Keneewaw Peninsula, for over a year.

A copy of a black and white photo of the facility appears as Figure 2. In time, there will be additional atmospheric monitoring sites close to Lake Superior after the first year of measurements have been analyzed.

The Eagle Harbor site is part of a binational effort which, in time, will contain at least one location on each of the five Great Lakes monitoring an array of toxic substances in both air and precipitation. The U.S. analyses are performed by the Illinois State Water Survey in Champaign, Illinois. Results from the first year of monitoring are now becoming available.

PCBs and other toxic substances are deposited onto water surfaces and their basins by three methods. First, rain or snow can capture or absorb the toxics in the atmosphere and bring them down with the falling droplet or snowflake. Second, toxic substances can form particles or attach to atmospheric particles and these may, during dry weather, impact on the water or basin soil or foliage. Finally, again in dry weather, the toxic gases may be taken up by the water, soil or foliage. Alternatively, if the water, soil or foliage already contains the toxic substance, a gaseous form of the toxic can escape or volatilize into the air.

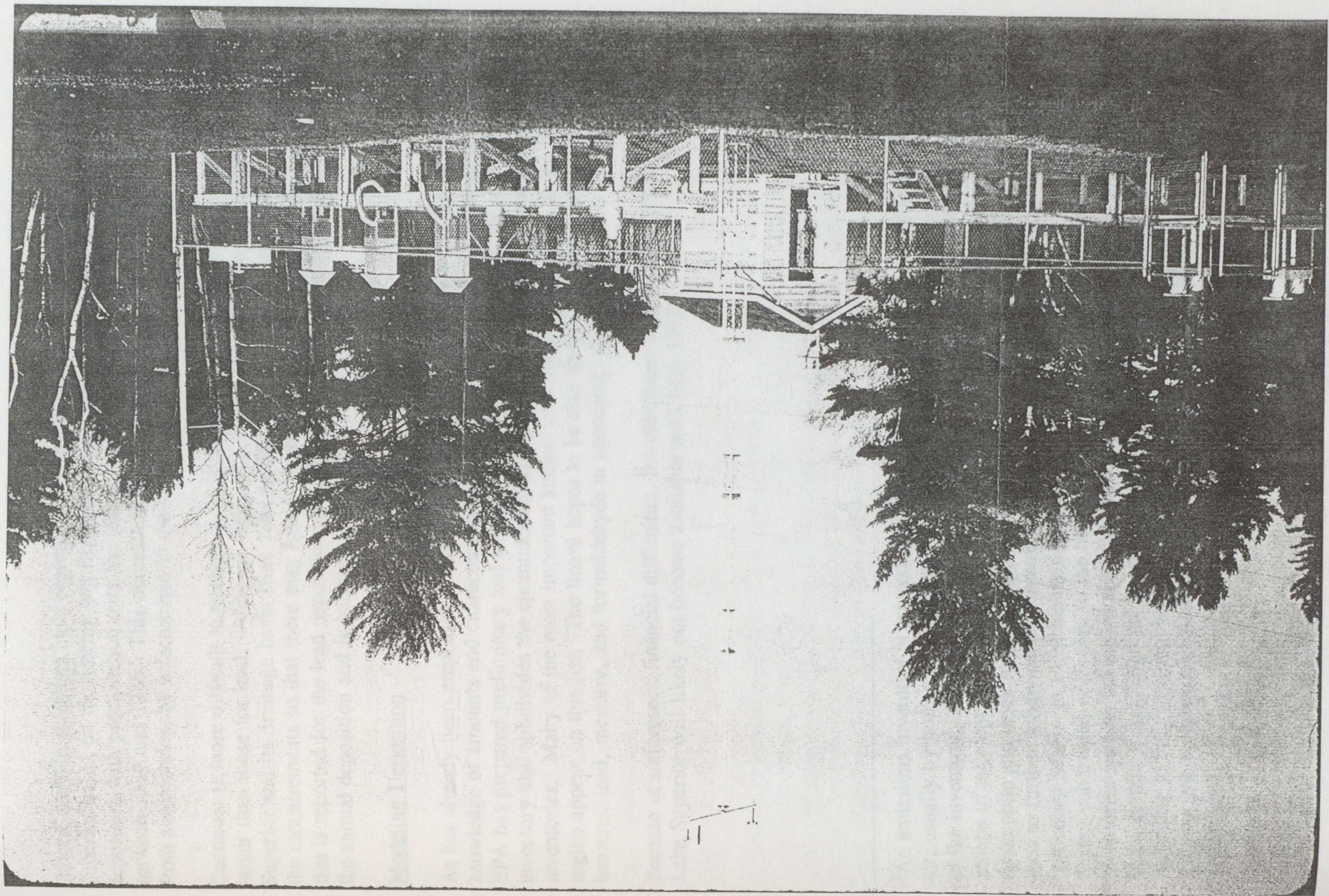
In the case of the PCBs, there is still no consensus whether the net transfer occurs from the air to the lake water and basin or from the water, soil, and foliage back to the air. This topic formed part of the discussion at a Workshop on Deposition to the Great Lakes held in Burlington, Ontario on 1 and 2 February 1992. When the workshop findings are published and evaluated, there may be a better consensus in the scientific community on this important point. It should be noted that even if scientists find that the net transfer is out of the lakes, this will not justify allowing an increase in man-made emissions to the atmosphere. The net transfer of gas from lake to air can be slowed or even reversed if the air concentration of the toxic grows.

In a recent paper reporting observations and analyses of toxic substances in Canada by Hoff et al.<sup>1</sup> the nature of volatilization of PCB's is discussed. The sampling location was at Egbert, ON (44°N and 80°W) near the south tip of Georgian Bay in 1988-89. The higher air concentrations occurred when the air temperatures at Egbert and much of eastern North America were high. The authors attribute this latter relationship to (1) the volatilization of the PCB's from the soil during the warm weather in the summer; and (2) the fact that virtually all of the soils of eastern North America, as well as elsewhere, are contaminated by previously deposited PCBs. The volatilization, especially during warm weather, will thus result in future elevated concentrations of PCBs in air even though their current application and use have ceased.

For organochlorine pesticides, meteorological backwards trajectories by Hoff et al., indicated that the higher concentrations at Egbert came from the Mississippi Valley and the Caribbean areas. The backtracks for the elevated PCBs showed no preferential source areas.

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<sup>1</sup>Hoff et al., 1992. Annual Cycle of Polychlorinated Biphenyls and Organohalogen Pesticides in Air of Southern Ontario. 2. Atmospheric Transport and Sources. Environmental Science and Technology 26(2):276-283.



Other Canadian scientists have reported on estimates of lead and cadmium deposition to Lake Superior based on monitoring wet deposition at a number of monitoring locations. The lead deposition with precipitation over the lake and drainage basin has decreased more than 40% between 1984 and 1986. This decrease reflects the reduction in emission of lead, primarily from automobiles, by a factor two in the same time interval from both Canada and the U.S.

Cadmium is more difficult to analyze in the laboratory so that its measurement errors are larger than those for lead. Although there is an increase in cadmium deposition to Lake Superior and its drainage basin from 1984 to 1986, the changes lie within the error bars of the measurements so that there may have been little or no change in reality. The decrease that is reported for the lead deposition, however, lies outside the uncertainties in determining the annual deposition and is believed to be real.

### Modeling Deposition

As has already been emphasized, calculations of deposition of toxic substances requires knowledge of amounts and characterization of the sources of the toxic substances. The U.S. EPA has prepared preliminary and admittedly incomplete inventories<sup>2</sup> for some toxics. This inventory also subdivides the chemicals according to the confidence in the accuracy of the inventories. Many of the most important known toxic substances present in the border region appear on this list. The Board hopes to be able to discuss several of them including benzene, lead, mercury, and formaldehyde in upcoming reports.

Because of unforeseen financial difficulties, the calculated deposition by the U.S. EPA for Lake Superior will likely not become available until May 1992.

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<sup>2</sup>An emissions inventory is primarily a listing of the amounts of a substance emitted to the air, usually by human activities, in specific areas. The size of the area varies with the nature of the inventory. Sometimes the amounts emitted from single point locations (e.g., single or groups of adjacent stacks) are presented separately from area sources (e.g., from patterns of automobile and truck use). Sometimes the chemical's physical and chemical properties are used to further subdivide the amounts released to the air (e.g., amounts of sulfur as SO<sub>2</sub> or particulate SO<sub>4</sub>). In some highly developed inventories, the amounts of the pollutant are further subdivided according to the height of emission. There are also natural emission inventories such as the emission of volatile organic compounds released to the air by flora (e.g., certain trees). Natural emission inventories also list the amounts of emissions according to their geographical area. Finally, in some instances, both the natural and anthropogenic emissions inventories are broken down according to the time of year and/or year by year.

## 5. PROGRESS REPORT ON ANNEX 15

At the end of the first two-year phase of work in support of Annex 15, two workshops were held. The Canadian workshop, held in November 1991, indicated that the Pt. Petre master station has produced considerable data on toxic chemicals in the atmosphere. These data, as expected, illustrated a number of issues to be resolved before the Integrated Atmospheric Deposition Network (IADN) becomes fully operational.

These include:

- issues related to sampling methodologies, protocols and schedules;
- issues related to analysis for specific toxic chemicals (e.g., PCBs);  
and
- issues related to the QA/QC plan for the network.

The overall recommendation of the workshop was to delay some aspects of the IADN (especially the establishment of satellite stations) until these issues are resolved.

The Binational Workshop was held in Toronto in January 1992. The five master stations have been installed and data will be available from them shortly. The overall recommendation was that a detailed binational progress report should be prepared and submitted to the Parties. The foundation of a joint program to develop QA/QC plans as well as an overall plan for the Integrated Atmosphere Deposition Network was also made the responsibility of a Binational QA/QC Working Group.

Research associated with ANNEX 15 also continued on several fronts. Hexachlorohexanes were measured at seven sites north of the lakes. These measurements show somewhat higher values of some toxics in urban than rural areas. The ratios of  $\alpha$  to  $\tau$  HCHs (two very similar compounds) also indicate that these toxic substances had been in the atmosphere for a long period implying transport from distant sources.

Measurements at Egbert show a definite seasonal cycle in levels of many toxic chemicals. This will be an important consideration in designing control strategies.

Progress was made in studies of air/soil and air/water exchanges (these are very important to be able to assess the movement of toxic chemicals both in and out of water and soil). Research showed that pesticide emissions from soil are highly dependent on the meteorology. Studies of lake gas exchange based on boat sampling on Lake Ontario will be initiated, while studies of air/waste fluxes are continuing.

Progress was also made in placing several contracts to begin the establishment of Canadian emission inventories to support modelling of the atmospheric transport of toxic chemicals. Work continued on developing more robust methodologies for sampling mercury. Modelling of mercury using the ADOM model also continued.

Plans for a cooperative effort between the Canadian Atmospheric Environment Service and the Canadian Institute for Research in Atmospheric Chemistry in the establishment of a facility for studying chemical transformations in the atmosphere were accepted and the facility will be built in 1992-93.

Progress continued to be made in analyzing the samples collected by the IADN. Work for the upcoming year will consist mainly of continuation of projects already initiated since resources are being pushed to the limit. Costs of the ongoing sampling and analysis required as part of IADN continue to dominate the program.

## 6. ATLANTIC REGION OXIDANTS WORKING GROUP

The Atlantic Region Oxidants Working Group consists of representatives from New Brunswick, Nova Scotia, Maine, Environment Canada, and the U.S. Environmental Protection Agency. The group is working cooperatively to establish a common monitoring framework and quality assurance procedures in the transboundary Atlantic Region for the measurement of ozone.

The working group will meet on April 28, 1992 to develop siting criteria for placement of monitors to demonstrate the proper operation and maintenance of instruments, the transfer and reporting of data, as well as regulatory initiatives in both the United States and Canada for the abatement of this pollutant.



## APPENDIX: CLIPPING SERVICE

Please note: Much of the material from the U.S. Legislation/Regulation section was adapted from the Environmental Regulatory Update Table prepared by L.M. Houlberg, G.T. Hawkins, and M.S. Salk of the Oak Ridge National Laboratory. Some additional material was adapted from the 27 February 1992 volume of Inside EPA's Clean Air Report.

### I. U.S. LEGISLATION/REGULATION

#### 1. Metals Emissions Controls for Hazardous Waste Incinerators

EPA proposes to amend the hazardous waste incinerator regulations to improve control of toxic metal, hydrogen chloride, and residual organic emissions; to define plasma arc and infrared incinerators; to regulate carbon regeneration units as thermal treatment devices; and to make minor revisions to the permitting procedures.

Final rule is due in June 1992.

#### 2. Identification and Listing of Wastes from Coke By-Product Industries

EPA proposes to amend the regulations for hazardous waste listing by adding seven additional wastes generated during the production, recovery, and refining of coke by-products produced from coal to the list of hazardous wastes; to designate these wastes as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); and to adjust the reportable quantities (RQs) applicable to these wastes from the statutory level of one pound to their final RQs.

Final rule is due in July 1992.

#### 3. Addition of Air Toxics to Toxics Release Inventory

EPA will propose to add 17 chemicals to the list of toxic chemicals subject to reporting requirements. Sixteen were designated hazardous air pollutants under the Clean Air Act Amendments of 1990; the seventeenth is extremely toxic to aquatic organisms.

Notice of Proposed Rule Making (NPRM) was due in February 1992. (The Board will update this material when the outcome of the NPRM is known.)

#### 4. General Provisions for Major Point and Area Sources of Air Toxics

General standards for regulating 189 hazardous air pollutants are being developed by EPA to comply with Section 112 of the Clean Air Act Amendments of 1990.

A final rule is due in November of 1992.

#### 5. Chromium Industrial Cooling Towers

Chromium compounds are listed as hazardous air pollutants in the Clean Air Act Amendments of 1990. Industrial process cooling towers that use chromate-based water treatment programs have been identified as potentially significant sources of chromium air emissions and as a source category for which National Environmental Standards for Hazardous Air Pollutants (NESHAPS) are warranted.

Notice of Proposed Rule Making is due in October 1992. A final rule is due in November of 1993.

#### 6. PCB Disposal Amendments

EPA is considering amending its PCB disposal regulations to address alternative disposal methods to those currently permitted which do not pose an unreasonable risk of injury to human health and the environment. The new regulations would extend to classes of PCBs not contemplated by the disposal regulations, and to regulatory requirements for existing classes of PCBs.

Notice of Proposed Rule Making is due in May 1992.

#### 7. Benzene Delay

EPA has delayed the effective date of its benzene emission standard which has generally pleased oil refiners but disappointed environmentalists who contend that staying the rule's effectiveness is illegal.

#### 8. Acid Rain

Approximately 15 utilities, facing a 1995 deadline for meeting acid rain emission reduction requirements, have reached agreement on a plan for pooling bonus allowances to ensure that they each will get some credit for scrubbing high-sulfur coal. Industry sources say all the technical issues have been resolved, but a formal announcement is being delayed while several other utilities decide whether they want to join the program.

## 9. Stratospheric Ozone Protection

A. Under Section 609 of the Clean Air Act Amendments of 1990, EPA proposes requirements for servicing of motor vehicle air conditioners.

A final rule was due in January 1992.

B. Under Section 608, EPA will propose establishing standards and requirements regarding the use and disposal of chlorofluorocarbons during the service, repair, or disposal of appliances and industrial process refrigeration that maximizes recapture and recycling.

A final rule is due in July 1992.

## 10. Administration Unveils Plan to Accelerate Ozone Depletor Phaseout

The Bush Administration has unveiled a far-reaching proposal to accelerate the phaseout of ozone-depleting chemicals, a move spurred by recent scientific findings of high levels of chlorine monoxide in the north temperate latitudes. The Administration expects to incorporate these unilateral actions into a proposal for revision to the Montreal Protocol, the international treaty drafted to protect the ozone layer, at a meeting of signatory nations in April 1992.

The acceleration of the phaseout, seen by many observers as inevitable after release of the dramatic scientific findings, has drawn mixed reactions from industry and environmentalists. Some industry officials say they will be hard-pressed to find safe alternatives for chlorofluorocarbons and other ozone depletors under the tightened deadline. But environmentalists counter that the acceleration must be accomplished on an even faster schedule than the Administration has proposed.

Under the President's plan, announced February 11, 1992, the U.S. will ban production of CFCs, methyl chloroform, carbon tetrachloride and halons by Dec. 1995, beating by four years the deadline established in the Montreal Protocol. The Administration also has asked industry to voluntarily cut production of ozone depletors by 50% in 1992 "to accelerate progress in the near term".

## 11. Requirements for the Enhanced Monitoring of Ozone and its Precursors

EPA will propose a rule for the enhanced monitoring of ozone, nitrogen oxides, and VOCs in areas designated as nonattainment for ozone. The rule will address locations, minimum number of monitors per area, and sampling frequency for each class of pollutant.

A final rule is due in August of 1992.

## 12. Global Warming

A group of leading environmentalists has expressed deep pessimism on the fate of world climate change talks after a meeting with top White House officials. Charging that the Bush Administration has fundamentally misunderstood the costs and benefits of controlling emissions of carbon dioxide, they released a new report that claims emissions can be slashed at tremendous savings to the economy.

## 13. Fuel Economy

A federal appeals court has overturned, on safety grounds, the government's 1990 auto fuel economy standard, potentially stalling congressional proposals for stiffening the standard from 27.5 to 40-miles per gallon or more. The grounds for overturning the standard were based on the assumption that larger cars are safer cars and that restricting the manufacture of large cars would sacrifice lives. This is the first time a court has overturned the corporate average fuel economy standard.

## 14. Mobile Sources

Despite expected White House resistance, EPA has forged ahead with a proposal to require enhanced auto inspection and maintenance programs for states. However, agency sources are skeptical the White House will approve such a plan because the impact on small service stations may be too severe to ignore during an election year.

Meanwhile, air regulators from the mid-Atlantic and Northeast corridor are disappointed that Maryland and Virginia did not act on legislation that would have required new cars to meet the lower pollution requirements of California. The requirement for cars to meet the cleaner California standards has been adopted by the states of Massachusetts and New York, and is pending in several other states.

## 15. Coal Scrubbing

The Army Corps of Engineers is considering a first-time environmental study of pollution control equipment at an Ohio power plant; a development that could set a precedent for requiring extensive studies for all such scrubbers proposed for construction. While environmentalists say the study is required under the National Environmental Policy Act, utility industry sources believe it would kill the Ohio project and introduce fatal delays into other projects that are already on a tight deadline, creating a major roadblock for high sulfur coal scrubbing nationwide.

## 16. Control of Automobile Re-Fueling Emissions

In a speech to auto-makers, President Bush announced that the federal government would not require the control device for capturing air pollution from re-fueling cars on the vehicle (the so-called "onboard" option) rather the strategy for controlling these toxic fumes (gasoline contains benzene, a known human carcinogen) would rely on the vapor control devices on the pump.

## 17. Utilities and Mercury

The Washington-based Center for Clean Air Policy has released the results of a three-year study on the long-range transport of mercury and other toxic pollutants from electric utilities. Unlike most industries, utilities are not required by the U.S. EPA to report or control their emissions of toxic substances, but the 1990 Clean Air Act Amendments require EPA to decide by 1993 whether to regulate such emissions. The report urges EPA to consider the effects of long-range transport and bioaccumulation in making its determination.

## II. **CANADIAN REGULATIONS/LEGISLATION**

### A. **Canadian Federal Information**

#### 1. Green Plan Initiative Speeds Up Action on Reducing Toxic Substances

A \$95-million Green Plan initiative designed to keep toxics out of the environment was unveiled today by Environment Minister Jean Charest on 24 February 1992. The initiative provides additional resources to accelerate and expand the federal government's regulatory action plan to control toxic substances under the Canadian Environmental Protection Act (CEPA) and the Fisheries Act. Under this initiative, a National Pollutants Release Inventory will be established. This will identify sources of major pollutants from industry. It will also provide an inventory database of estimated releases of selected pollutants. Industry will be required, under CEPA, to report its releases. The first inventory report will be published in 1994, and reports will appear on a regular basis thereafter.

Under the CEPA priority substances list, scientific assessments will be accelerated, and the list will be expanded from 44 to 100 substances to be assessed by the year 2000. Substances assessed to be toxic will then be examined to determine what regulatory action or other controls are necessary. Assessment reports on 16 substances will be released this year. Reports on the original 44 substances under CEPA will be completed by 1994.

By 1994, ten "control options reports" will be completed. These spell out regulatory or other options to control toxic substances for major industrial sectors. Regulations or other

controls will then be introduced under CEPA. Other components include the assessment of six high-volume chemicals in international trade by 1994; the introduction of Good Laboratory Practice Regulations; and the review and updating of regulations on toxic substances every five years.

One of the partnerships generated by the Green Plan goal to eliminate persistent toxic substances from the environment is the New Directions Group. A proposal from this group has resulted in a new co-operative effort among industry, labor, environmental groups and government to accelerate the reduction and elimination of toxic substances. The advisory group has begun work to identify lists of persistent toxics that should be sunseting, and others that should be progressively reduced to non-harmful levels.

The Green Plan sets out a series of comprehensive environmental action plans to ensure a safe and healthy environment for all Canadians. Other recent Green Plan initiatives to reduce toxic substances in the environment include: The Federal Pulp and Paper Regulatory Reform package, the National Toxicology Network to improve the understanding of the risks of toxic substances, new resources to improve the enforcement of environmental regulations revised Federal Pesticide Regulation System, strengthened controls on ocean dumping, and a federal Waste Reduction Plan. The virtual elimination of persistent toxic substances from the environment remains a pivotal cornerstone to the aims and goals of the Green Plan.

Further initiatives under the toxics initiative will be announced by the Department of Fisheries and Oceans in the coming days.

## 2. Environment Minister Launches "Ozone Watch"

A new program to report on the state of the ozone layer over Canada was launched on 11 March 1992 in Ottawa by Environment Minister Jean Charest. The "Ozone Watch" publication has been developed in response to predictions by some scientists that the protective ozone layer in the earth's upper atmosphere may show some increased thinning this spring.

The "Ozone Watch" will be issued on a weekly basis every Friday, beginning March 13. It will provide Canadians with up-to-date information on the status of the ozone layer, and on implications for the level of the sun's "burning" or ultraviolet rays.

This new initiative is part of the Green Plan program to protect the ozone layer announced in August 1991. The Ozone Watch is the first step in the acceleration of a Green Plan commitment to keep Canadians informed about the risk of excessive exposure to the sun's ultraviolet rays. As a second step, in late spring when the sun's rays naturally become stronger, daily information will be provided on ultraviolet rays.

Excessive exposure to the sun's ultraviolet rays can lead to sunburn, and in some cases, skin cancer and eye cataracts. Health and Welfare Canada recommends that we spend less time

in the sun, use sun screen and wear a hat and other protective clothing. Spring skiers should exercise particular caution, as the sun reflecting off the white snow can quickly cause sunburn.

Environment Canada scientists have tracked a modest, but significant thinning of the ozone layer over southern Canada over the past ten years. This depletion is greatest in the spring. Fortunately, this is at a time when the ozone layer is naturally at its thickest. This spring, because of higher levels of ozone-depleting chemicals in the atmosphere, there is a possibility of greater losses.

Industrial chemicals, such as CFCs (chlorofluorocarbons), have been eroding the earth's ozone layer for the past decade. Natural causes, including volcanic eruptions also contribute to ozone depletion. Some scientists feel that increased depletions may be expected this spring over North America, due to a combination of industrial chemicals and the volcanic eruption of Mount Pinatubo over the Philippines last year. Material from the volcano has circled the earth, and still lingers in the upper atmosphere.

Under Canada's Green Plan, increased research efforts will shed more light on what is happening to the ozone layer. A new ozone observatory is being built in Canada's high Arctic at Eureka, to determine if depletions similar to those over the South Pole will occur there.

### 3. Economic Commission for Europe Task Force on Emission Inventories

Following recommendations from the Fifth Seminar on Emission Control Technology for Stationary Sources and from the 1991 EMEP Workshop on International Emission Inventories, the Executive Body for the Convention on Long-Range Transboundary Air Pollution agreed to a new work-plan item:

to evaluate emissions inventory requirements of the Cooperative Programme for Monitoring and Evaluation of the Long-Range Transmission of Air Pollutants in Europe (EMEP) to ensure an adequate flow of reliable information to support the work under the Convention and to take account of the emissions data needs of other relevant bodies under the Executive Body.

To meet these requirements a Task Force, chaired by the United Kingdom was established. An important aspect of the work of the Task Force will be to attempt to harmonize existing and future emissions inventories including emission factors, methodologies and guidelines among the countries. Specialists from North America and Europe have been invited to the first meeting of the Task Force.

As there presently appears to be little or no coordination between emissions inventory activities in North America, the UNECE Task Force may provide a reasonable forum for such work.

#### 4. Economic Commission for Europe Task Force On Persistent Organic Pollutants

The Executive Body (EB) of the Convention on Long-range Transboundary Air Pollution decided at its eighth meeting in November 1990 to establish a Task Force under the leadership of Canada and Sweden concerned with persistent organic pollutants.

In November 1991 at the 9th meeting of the Executive Body, further direction was provided to the Task Force. The EB's work plan provides the following framework.

**Action:** Parties will undertake the work necessary to substantiate information on: (a) emissions, (b) long-range transport, (c) distribution between media, and (d) abatement of persistent organic pollutants, giving priority to dioxins, furans and polychlorinated biphenyls (PCBs), to provide by 1994, the basis for elements of a possible protocol.

There are similarities between the work undertaken by this Task Force and that by the Virtual Elimination Task Force of the International Joint Commission.

#### 5. Accelerated Reduction/Elimination of Toxic Substances in Canada (ARETS)

ARETS is a new Canadian initiative led by Environment Canada and involves a multi-year effort which is intended to complement ongoing regulatory and compliance activity based upon the Canadian Environmental Protection Act. This emanates from work of the New Direction Group (composed of representatives of government, industry, and the public), the provinces, Canadian Labour, and others in 1991, and represents a convergence of needs to expedite the reduction or outright elimination or phase-out of toxic substances, in particular those which are persistent and bio-accumulative.

A scoping meeting was held February 10-12, 1992, to define a workplan.

#### **B. Province of Ontario Information**

##### 1. Monitoring

Ontario's Great Lakes Toxics Deposition Network continues operating at a level of six stations. Current activities focus on data quality assurance, and the intercomparability of stations contributing data to the IADN.



## 2. Windsor/Detroit

The Windsor Air Toxics Study has been underway since June 1991. All monitoring stations are now in place. A survey was conducted in August 1991 using the Ministry's mobile mass spectrometer, TAGA 6000. Two personal exposure/indoor air quality surveys have been conducted. A detailed toxic emissions inventory for the Windsor area is nearing completing, and the inventory for Detroit is being improved. Preliminary study results were presented to the public at an Open House on February 16, 1992.

## 3. Emissions and Abatement

Work has continued on compiling an emissions inventory for Ontario. Early in 1992, a Canada-Ontario Work Group was put in place to prepare a 1990 toxics inventory by 1994. An inventory for the industrial sector is being prepared by the Canadian Chemical Producers Association. An emissions inventory for global warming gases (CH<sub>4</sub>, N<sub>2</sub>O, CFC's, and CO<sub>2</sub>, among others) has just been completed which gives emission sinks and net amount released by the Province.

## 4. Modelling

Preliminary work on the Eulerian model for mercury has been completed. Further work is awaiting improved emissions numbers. The work will eventually be extended to the pollutant lead as well.

## 5. Air Strategy

Work continued on the development of Ontario's Air Management Strategy, which covers a wide spectrum of issues, including global warming and stratospheric ozone depletion, NO<sub>x</sub>/VOC control, acid rain, and airborne toxics. In the latter area, a four-pronged approach is envisaged, including bans and phaseouts of some targeted toxics, revision and updating of existing regulations, controls on large sources, and a community approach to air management.

## C. New Brunswick Information

### 1. SO<sub>2</sub> Emissions Cap

Early estimates for 1991 indicate significant progress towards meeting new proposed SO<sub>2</sub> emission cap of 175,000 tonnes/year (down from 185,000). Negotiations on

Federal/Provincial Agreement are currently underway. In the meantime, New Brunswick Power is currently constructing the first two SO<sub>2</sub> scrubbers to be used by a Canadian utility.

## 2. CFC Ban

The New Brunswick Department of the Environment is finalizing a comprehensive regulation that will ban or rapidly phase out certain uses of CFCs and Halons, requiring recovery/reuse/recycling as and where appropriate. To ensure that other problems are not created, the replacement chemicals will also be regulated.

## 3. Clean Air Strategy

The New Brunswick Government has announced its intention to proceed with the development of a comprehensive Clean Air Strategy during the 1992-93 fiscal year, culminating in the enactment of a Clean Air Act. This commitment was made in light of growing recognition of the global nature of many air quality issues, and the need to be proactive to reduce environmental threats from acid deposition, ozone layer destruction, climate change, etc. In addition, it signals the intent to develop a coordinated, consistent approach to traditional ambient air quality issues.

## D. Nova Scotia Information

### 1. Global Warming

The Nova Scotia Government recently released a draft document "Nova Scotia Action Strategy on Global Warming - First Phase" which outlined the intended approach aimed at the stabilization of man-made greenhouse gas emissions at 1990 levels.

## III. *UPCOMING MEETINGS*

### ECE Task Force on Emissions Inventories

London, England, First Meeting, May 5-7, 1992

### ECE Task Force on Persistent Organochlorines

Egbert, Ontario, May 17-21, 1992

### IAGLR '92

Conference sponsored by the International Association of Great Lakes Research, Waterloo, Ontario, May 31-June 4, 1992

Sessions include: Inputs of pollutants to the Great Lakes and Great Lakes Meteorology

International Conference on Mercury as a Global Pollutant

Conference sponsored by the Electric Power Research Institute, the U.S. EPA, Vattenfall, and Environment Canada: AES, Monterey, California, May 31-June 4, 1992

Workshop on Global Emissions Inventory Activities under the International Biosphere Program

Oslo, Norway, June 21-42, 1992

9th World Clean Air Congress and Exhibition

Montreal, Que, August 30-September 4, 1992