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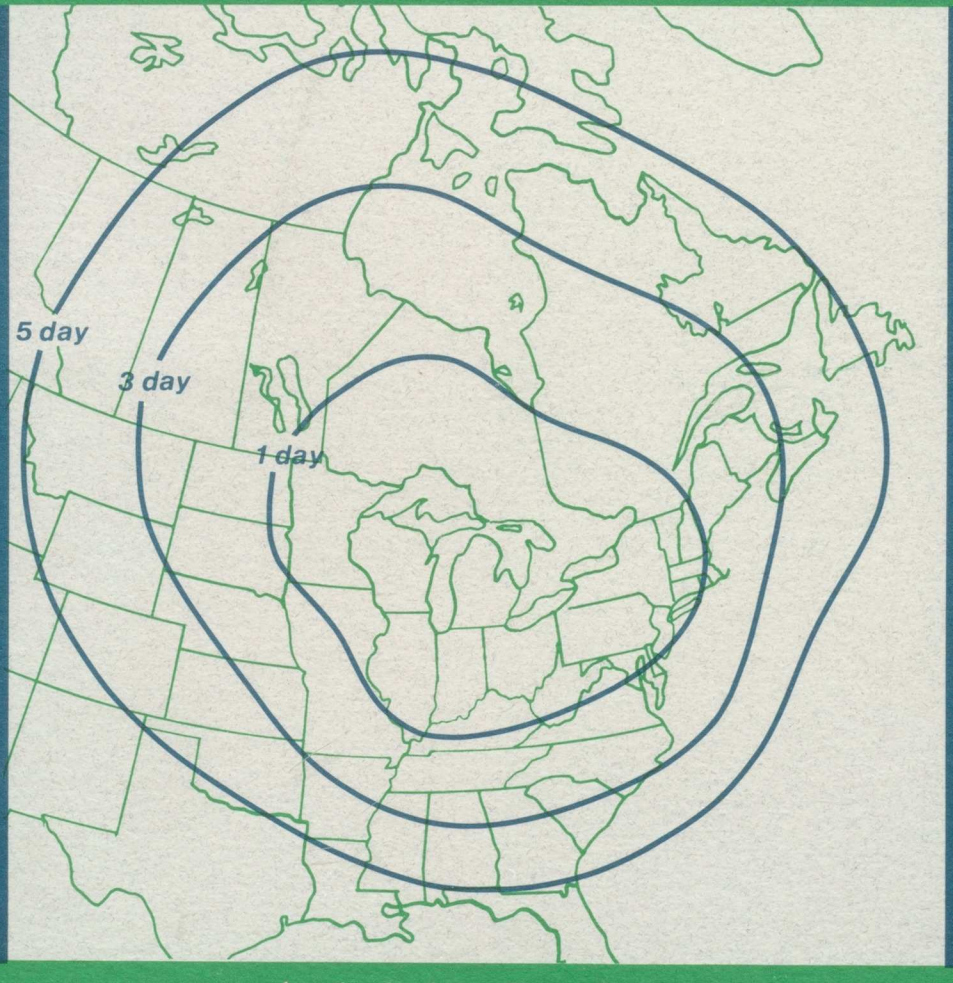
International Air Quality Advisory Board. Progress Report to the International Joint Commission. 16, September 1993

International Air Quality Advisory Board

International Air Quality Advisory Board

Progress Report 16
to the International Joint Commission



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September 1993

International Joint Commission
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International Joint Commission

International Air Quality Advisory Board

August 31, 1993

Mr. D.A. LaRoche
U.S. Secretary
International Joint Commission
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Washington, DC 20440
U.S.A.

Dr. P. Slyfield
Canadian Secretary
International Joint Commission
100 Metcalfe Street
Ottawa, Ontario K1P 5M1
Canada

Dear Sirs:

Progress Report of the International Air Quality Advisory Board

Enclosed is the 16th Progress Report of the International Air Quality Advisory Board. Formal presentation of the report will be given in September at the Commission's Semi-Annual Meeting.

Yours sincerely,

Lester Machta
Chairman
U.S. Section

James W.S. Young
Chairman
Canadian Section

Enclosure

cc: D. Besner
H. Garabedian
G. Foley
R. Artz
P. Lioy
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A. Schultz
W. Draper
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PROGRESS REPORT 16

to the

INTERNATIONAL JOINT COMMISSION

by the

INTERNATIONAL AIR QUALITY ADVISORY BOARD

for consideration at the

ANNUAL MEETING

Ottawa, Ontario, Canada

September 22, 1993

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1. DETROIT/WINDSOR - PORT HURON/SARNIA UPDATE

a. Plan for Assessing Environmental Impacts

The IAQAB proposes to organize a workshop to examine existing and future environmental problems in the Detroit-Windsor to Port Huron-Sarnia region resulting from air pollution. It would be held in Ann Arbor, MI (at the Great Lakes Environmental Research Laboratory of the U.S. National Oceanic and Atmospheric Administration) in the spring of 1994. It is expected that there will be no cost to the IJC for the meeting facilities but travel costs to bring selected specialists, otherwise unable to attend, may be sought from the Commission.

The proposed Workshop agenda is given below:

Tentative Agenda

Spring 1994 Workshop on

Environmental Impacts of Air Pollution in the
Detroit/Windsor - Port Huron/Sarnia Region

1. Resources at risk
2. Air qualities involved
3. For wetlands: air versus water pollution sources
4. Monitoring air concentrations, deposition, and the resources
5. Modelling air and/or deposition from local and distant sources (includes adequacy of emission inventories)
6. Evaluation of risk to environmental resources from pollution
7. Conclusions and recommendations; a plan for unresolved issues

The outcome of this meeting will be a draft plan by the IAQAB for the Commission to reduce or eliminate environmental problems in the region.

If clear cut recommendations emerge from the meeting, they will be promptly conveyed to the Commission through the IAQAB. If the problems are uncertain, the IAQAB will include their clarification as part of a plan to be submitted to the Commission within three months after the workshop.

b. Update on Activities

The U.S. Environmental Protection Agency (EPA) has indicated that the following items have been major recent areas of activity in the Detroit/Windsor - Port Huron/Sarnia region:

- EPA Region V and the State of Michigan are continuing the development of a Southeast Michigan Initiative which will be a multimedia program to monitor, assess, regulate, enforce, and remediate toxic air and water emissions in the connecting waterbasins between Lakes Huron and Erie.

- The State of Michigan has submitted its revised State Implementation Plan (see Section 1.c) addressing the deficiencies in its ozone attainment plan. This plan is likely to be accepted by EPA Region V and EPA Headquarters offices.

- The State of Michigan is making progress toward the development of its State Implementation Plan for small particulates (PM_{10}).

c. Detroit Area Air Pollution Control -- An Update

The southeast portion of Michigan (including Detroit) is classified as a moderate nonattainment area for ozone. This means that levels above the U.S. ozone standard of 120 ppb (parts per billion) but less than 160 ppb have been measured in the area. As a result, the U.S. Clean Air Act requires the State of Michigan, among other things, to achieve a 15% reduction in volatile organic compounds by 1996. To meet this 15% reduction objective, the State of Michigan has studied various control measures and has suggested the following for legislative consideration:

- lower the Reid Vapor Pressure (RVP) of gasoline in the summer season to 7.8 pounds per square inch;

- upgrade the existing auto emissions check program to better simulate actual vehicle operation (as outlined in section 3.a);

- improve gasoline vapor control technology on the retail storage of gasoline and expand these controls to a greater geographical region;

- develop a program to remove older, highly polluting automobiles from the road;

- expand control requirements on degreasing operations performed at stationary sources;

- adopt, when available from U.S. EPA, reasonably available control technology for industrial operations.

In addition to these specific air pollution control measures, the State of Michigan is proposing to incorporate an annual emissions fee of slightly more than $25 per ton of air pollution discharged, to cover program costs, and to substantially enhance enforcement capability against non-complying stationary sources.

As the slate of control measures are being advanced, parallel action is being taken by the State of Michigan to have the area redesignated from moderate nonattainment for ozone to attainment. According to EPA guidance, the most recent data may support such an action. Should the data be adequate to support a redesignation, two issues justify adoption of the control measures: maintaining ozone levels below the standard, and reducing health risks of airborne toxics.

The proposed control measures would result in meaningful reductions in not only smog producing air pollution, but also in airborne toxics which have been identified as important to air quality in the border region. These reductions would help to ensure that air quality is maintained as future growth and development occurs. Further, these reductions would advance the goal of reducing the human health risks from airborne toxic air pollution in this border region. For the above reasons, the IAQAB supports the adoption of the proposed air pollution control measures.

2. LAKE SUPERIOR STATUS REPORT

The IAQAB was asked to review the progress by the parties in "completing an inventory of toxic air emissions and in assessing toxic air deposition in the Lake Superior Basin".

Mr. Bill Moroz was contracted to prepare a status report (to be made available for use at the Biennial Meeting in Windsor, 22-24 October 1993). At the time of this writing, a first draft of the Moroz Report has been reviewed by the IAQAB and a final one is being prepared. Appendix A outlines the major findings and recommendations and the Board hopes to be able to forward the full report under separate cover on or before the Semi-Annual Meeting in Ottawa on 20 September 1993.

The Board agrees with the recommendations outlined in Appendix A.

3. CONTROL OF AUTOMOTIVE AIR POLLUTION

To control automotive air pollution, two types of strategies are necessary; one focused on the existing vehicles, and a second for vehicles to be manufactured.

a. Existing Vehicles: Inspection and Maintenance

The strategy for the existing vehicles on the road is usually termed "Inspection and Maintenance". These terms have evolved from the concepts on which the programs are based; evaluating emissions from the vehicles (Inspection) and directing the repair of those vehicles which have faulty air pollution control devices (Maintenance).

The State of Michigan has proposed to upgrade its current simple Inspection/Maintenance program (whereby cursory checks are made to idling engines) to a comprehensive program which simulates actual, in-use operation and tests all components of the emissions control system. At the same time, the Ontario Ministries of Transportation and Environment and Energy are considering adoption of a program similar to the proposed Michigan comprehensive program.

The comprehensive programs which Michigan and Ontario are considering should be supported. These programs have the potential for substantially greater pollution reductions than are possible

with the simple idle check programs. Data released by the U.S. EPA indicate that programs which simulate actual vehicle operation will result in vehicles being 30% cleaner for emissions of carbon monoxide (CO), 28% cleaner for hydrocarbons/volatile organic compounds (HCs/VOCs), and 9% cleaner for nitrogen oxides (NO_x). The simple idle program will not reduce NO_x emissions, and at best will reduce emissions of CO and VOCs by 3 to 6%.

The IAQAB encourages the Commission to express its strong support to the State of Michigan and the Province of Ontario for the adoption of comprehensive automotive Inspection and Maintenance programs.

b. New Vehicle Emission Standards

In Progress Report 15 to the International Joint Commission, the IAQAB provided background addressing the importance of not only continuing the control of automotive related air pollution, but in advancing the standards for new vehicles. This is particularly important given the continued growth in the use of motor vehicles in both the United States and Canada. In the United States, national auto emission standards are set by Congress, except for the state of California which is not preempted by Federal Law. States other than California have the option of "opting in" for California emission standards. A number of states, particularly in the northeastern U.S. are actively pursuing the idea of opting for the California emission standards because they will ultimately be 50% to 90% more stringent than the federal limits.

Analysis indicates that these more stringent California emissions limits on new cars are necessary for areas to maintain the recent gains which have been made in reducing automotive air pollution. For the New England region it has been determined that if more stringent standards are not adopted, the growth in the use of the motor vehicles will begin to overtake earlier advances made in cleaning up individual vehicles by the end of the decade. An analysis to show the need for more stringent limits has been done for nitrogen oxides (NO_x) and nonmethane hydrocarbons (NMHC). Nitrogen oxides are also associated with acid rain, smog formation and airborne toxics; NMHCs are associated with smog formation and airborne toxics.

The IAQAB recommends that the International Joint Commission ask governments to analyze the air quality benefits to the border region of both countries that would result from adoption of the California emission standards.

4. JOINT OZONE STANDARD

On 1 March 1993, the U.S. EPA announced that at this time it would not revise the National Ambient Air Quality Standard (NAAQS) for ground level ozone, but will review new health effects studies as quickly as possible to determine whether a future revision of the standard is warranted. The current U.S. standard is 0.12 ppm which differs from the Canadian standard of 0.082 ppm.

The EPA decision was based on studies and data published up to early 1989 in the peer-reviewed scientific literature. Since a number of new and significant scientific studies have been published since 1989, a rigorous scientific assessment of these new studies has already begun. The Clean Air Act requires that EPA review its NAAQS every five years, and, if appropriate, revise them. EPA intends to move the review process along as quickly as possible and, if appropriate, to propose revision of the standards at the earliest possible date.

It concerns the IAQAB that the U.S. and Canada have different standards for ozone, recognizing that they share a common airshed where ozone and its precursors often exceed one or both of the standards. It is unlikely that the U.S. and Canadian standards will be identical, unless actions are taken by both governments to jointly develop a North American standard.

It is recommended by the IAQAB that the Commission encourage the governments under the Air Quality Accord to enter into discussions for a joint U.S.-Canada standard as the U.S. begins its next review of the ozone standard.

5. HAZARDOUS WASTE INCINERATION

a. An Introduction to the Combustion Debate

The role that combustion plays in hazardous waste management has changed dramatically over the last decade and a half. Early on, disposal of hazardous waste primarily involved putting wastes into landfills and surface impoundments. As we reached the mid 1980's, there arose a widespread recognition that land-based disposal practices were continuing to present long term pollution problems, particularly with respect to contamination of the nation's ground water.

In North America, new legislation in the mid-1980s resulted in a new course for hazardous waste management away from historic land disposal practices and towards much greater use of treatment technologies prior to disposal. Additionally, efforts began to emphasize pollution prevention as the first and primary goal for the waste management program.

As a result of this change, combustion of hazardous waste in incinerators and boilers and industrial furnaces (BIFs) began to increase substantially. Concurrent with increased use of combustion as a form of waste management, public concerns began to be voiced about the safety and reliability of combustion facilities. In addition, citizens began to ask whether an overabundance of combustion capacity serves to undercut reduction of waste generated at industrial facilities. In short, it recently became obvious that it was time to take a fresh look at how to achieve a fully integrated waste management program in which source reduction is given its proper emphasis and in which the role of combustion is carefully considered.

The environmental and public health issue which needs to be addressed is that, as society has moved to protect the environment and public health by banning certain land-based disposal practices, greater threats to the environment and public health may have been created. The

synthesis and subsequent release of toxic substances to the atmosphere through incineration may be exacerbating human and environmental exposure of some toxic materials.

b. Hazardous Waste Incineration in Cement Kilns -- A Brief Update for the State of Michigan

The border region between the U.S. and Canada is not immune from any of the problems and questions surrounding the various methods of disposal of hazardous wastes. In the border region, specifically in the Detroit - Windsor area, much of the current friction is between the Lafarge cement kiln operators in Michigan and residents of Michigan and neighboring Ontario that feel threatened by their emissions.

The use of cement kilns looks like an obvious and relatively innocuous method to incinerate hazardous waste. The kilns operate at extremely high temperatures as compared to typical incineration units designed specifically for the purpose, supposedly eliminating the formation of many hazardous chlorinated organic materials such as dioxins and furans. Cement kilns also operate at a very even temperature which eliminates much of the release of partially combusted wastes. The waste materials can be an attractive source of raw energy, not a small matter for cement factories where 40% of the operation budget is due to the cost of virgin fuel materials. The major problem, however, is that cement kilns have been implicated in the release of lead, chromium, radioactive materials, dioxins and furans, and many other materials to the atmosphere. As a result, the use of cement kilns for hazardous waste disposal has come under increasing attack.

The saga of the Lafarge Cement Company cement kilns in Alpena, Michigan is as follows. Several years ago, Lafarge began incinerating wastes at two kilns. Plans to expand their incineration effort to all five have been canceled. While there have been continuing skirmishes between LaFarge and the State of Michigan, hazardous waste burning at the two remaining kilns continues, and will likely continue indefinitely. LaFarge was in violation of its permit for dioxin/furan emissions. However, the permit has been amended to allow this level of emission because it is quite low and puts the risk level well below the apparent threshold for the risk of an incident of cancer at one in a million. LaFarge was also in violation of their permit for VOC (volatile organic compounds) emissions. Much of this problem was apparently traced to some of the materials (slate!) used to create the cement, rather than the waste fuel. Adjustment of the raw materials apparently has resulted in the current emissions being within the permit specifications.

A current issue between LaFarge and the public is the disposal of bottom ash which is high in metals. Bottom ash may adversely affect the environment in the form of fugitive dust or through groundwater leaching. Metals contamination (in both the air emissions and the bottom ash) is the result of materials entering the waste stream during the production of paints and other industrial processes. The bag houses have been estimated to be 95-99% effective in removing these from the stack gases. Metals release is likely to be a problem in one form or another regardless of the method of waste management.

According to Greg Edwards of the State of Michigan Permit Staff, other industrial operations have made plans to incinerate, or are currently incinerating, waste materials in the State of Michigan. Plans to develop a hazardous waste disposal facility between Detroit and Ann Arbor have been canceled. Dow Chemical currently operates two private hazardous waste incinerators in Midland, and Upjohn operates a single incinerator in Kalamazoo. Each of these companies dispose of their own wastes; apparently neither disposes of wastes from other manufacturers. Any problems regarding these two operations have not been reported. Cement kilns currently or planning to burn hazardous waste include Lafarge facilities in Nova Scotia and Alpena, Michigan, and St. Lawrence Cement in Mississsauga, Ontario. Another cement facility ceased incineration of hazardous materials in St.Marys, Michigan following a protracted battle over violation of emissions standards.

It is clear that cement kilns are not without some hazard, the full extent of which is unknown. However, little evidence currently exists to suggest that emissions are higher than those associated with destruction of wastes using specially designed incinerators. It has been argued in at least one case that the cement kilns are being forced to meet standards much more rigorous than for hazardous waste incinerators. One conclusion to this situation may be that it is unsafe to dispose of some of these materials by any method. What could result is the substitution of different manufacturing processes or the switch to alternative materials to avoid the production of such wastes in the first place.

c. Future Incineration Reports to the Commission

Large amounts of waste are still being incinerated, even though the total number of incinerators has probably diminished over the past several years. Many of the facilities that have been closed were small, very dirty, and poorly regulated incinerators associated with hospitals, apartment complexes, etc.

In the future, the IAQAB will update the situation regarding the current situation, by providing a summary of the number of types of facilities currently operated in the U.S. and Canada, and will outline the plans by governments to minimize risk from emissions. Such plans include comprehensive risk assessment and aggressive waste minimization efforts.

In addition to incineration of hazardous wastes (primarily organic materials created as a by-product of manufacturing processes) incineration of other materials such as railroad ties, tires, and biomedical wastes has been proposed or is currently underway. The IAQAB will also report on these issues in future reports.

6. PRESERVING NATIONAL PARKS, WILDERNESS AREAS AND OTHER UNIQUE RESOURCES ALONG THE BORDER

Both Canada and the United States have designated parks and preserves in the boundary region as requiring "special protection" of resources including air quality.

In the United States the Clean Air Act Amendments of 1977 (CAAA) designated "Class 1" areas, where air quality deterioration was to be minimized. The following agencies administer Class 1 areas within the U.S.: National Park Service (48), U.S. Fish and Wildlife Service (21), and the USDA-Forest Service (88) (see Figures 1-3). Class 1 protection has also been afforded to a U.S. Canada International Park, Roosevelt Campobello International Park, located in the Gulf of Maine. Most of the other natural areas under the management of the Federal Government are designated "Class 2", which means that moderate deterioration in air quality, associated with managed industrial growth, is allowed. For example, all but one of the National Park Service units in Alaska have Class 2 status. There are numerous other areas with unique ecosystems or natural features that should be protected from air quality degradation. These include state and local parks and international reserves designated under UNESCO's Man and the Biosphere (MAB) program (see Figure 4). The U.S. has 46 MAB reserves.

Within Canada there are 37 national parks (see Figure 5) and numerous provincial parks, heritage sites, and wilderness areas that are protected because of unique natural, cultural, or historic values. Canada has six MAB reserves. Protected areas in Canada are grouped into categories defined by the International Union for the Conservation of Nature. These IUCN areas are designated as: (1) scientific reserves and wilderness areas, (2) national and equivalent reserves, (3) national monuments, (4) habitat and wildlife management areas, and (5) protected landscapes and seascapes. Although no specific regulations exist for protection of air quality in these protected areas, the Canadian Environmental Assessment and Review Process and the new Canadian Environmental Assessment Act can be used to evaluate potential effects of air pollution from new sources on these reserves.

In officially protected areas in the U.S., resources to be preserved and enhanced include the following air quality related values (AQRVs): visibility, flora, fauna, odor, and geological resources; archeological, historical, and other cultural resources; and soil and water resources. These resources are protected in Class 1 areas within the U.S. under the requirements of the CAAA calling for "prevention of significant deterioration" (PSD). Under the PSD program, Federal Land Managers (FLMs) act as advisers to states and the U.S. EPA in the review of possible impacts of new point sources of air pollution on AQRVs.

Parks and preserves in the boundary region are primarily affected by regional pollutants: regional haze, ozone, and acid deposition. These pollutants come from both stationary sources (power plants, smelters) and non-point sources (vehicles, uncontrolled burning). Numerous sources contribute to regional air quality degradation. For this reason, protection of natural, historical, and cultural resources in designated protected areas can only be achieved through regional cooperation and coordination of programs across political boundaries.

In subsequent semi-annual reports, the IAQAB will report on current and planned monitoring activities in protected areas on both sides of the border and describe the current status of air quality and sensitive resources in these preserves. For the fall 1994 report the Board will describe the current regulatory activities by the U.S. and Canada to protect air quality in these areas. We will also report on cooperative programs being developed by agencies in the U.S. and Canada.

NPS Class I Areas

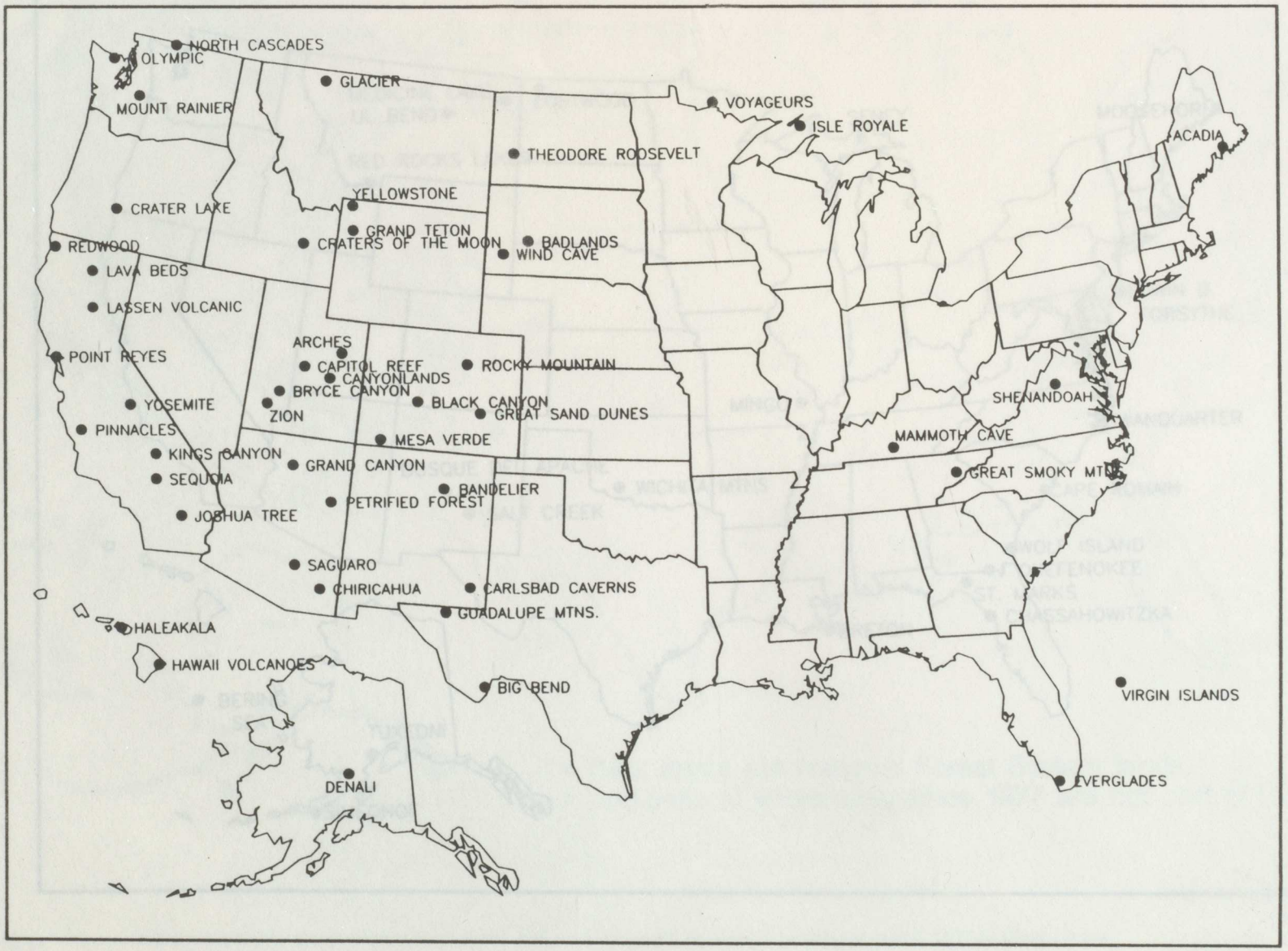


Figure 1

Map 2 Class I Areas

FWS Class I Areas

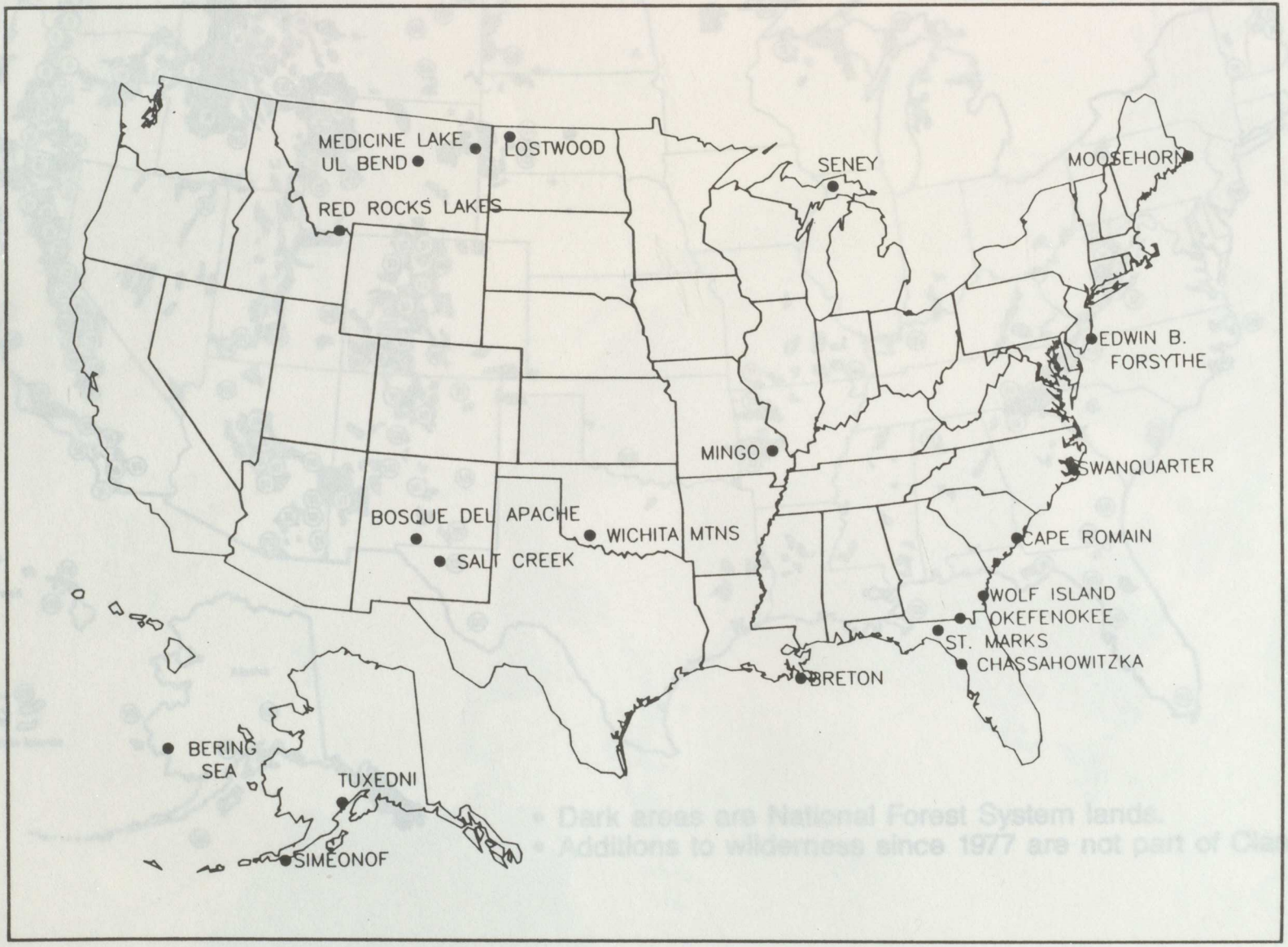
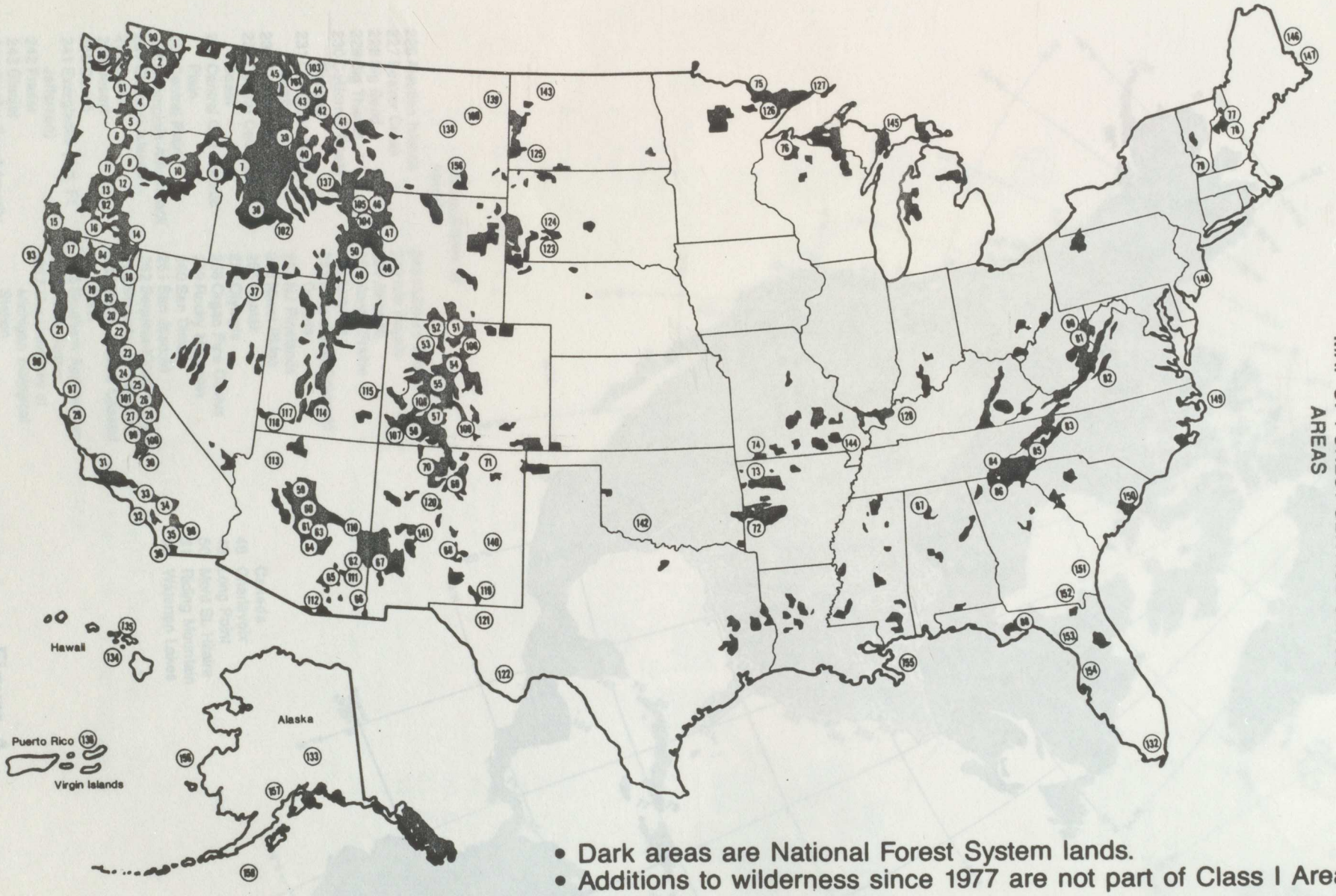


Figure 2

EWS Class I Areas

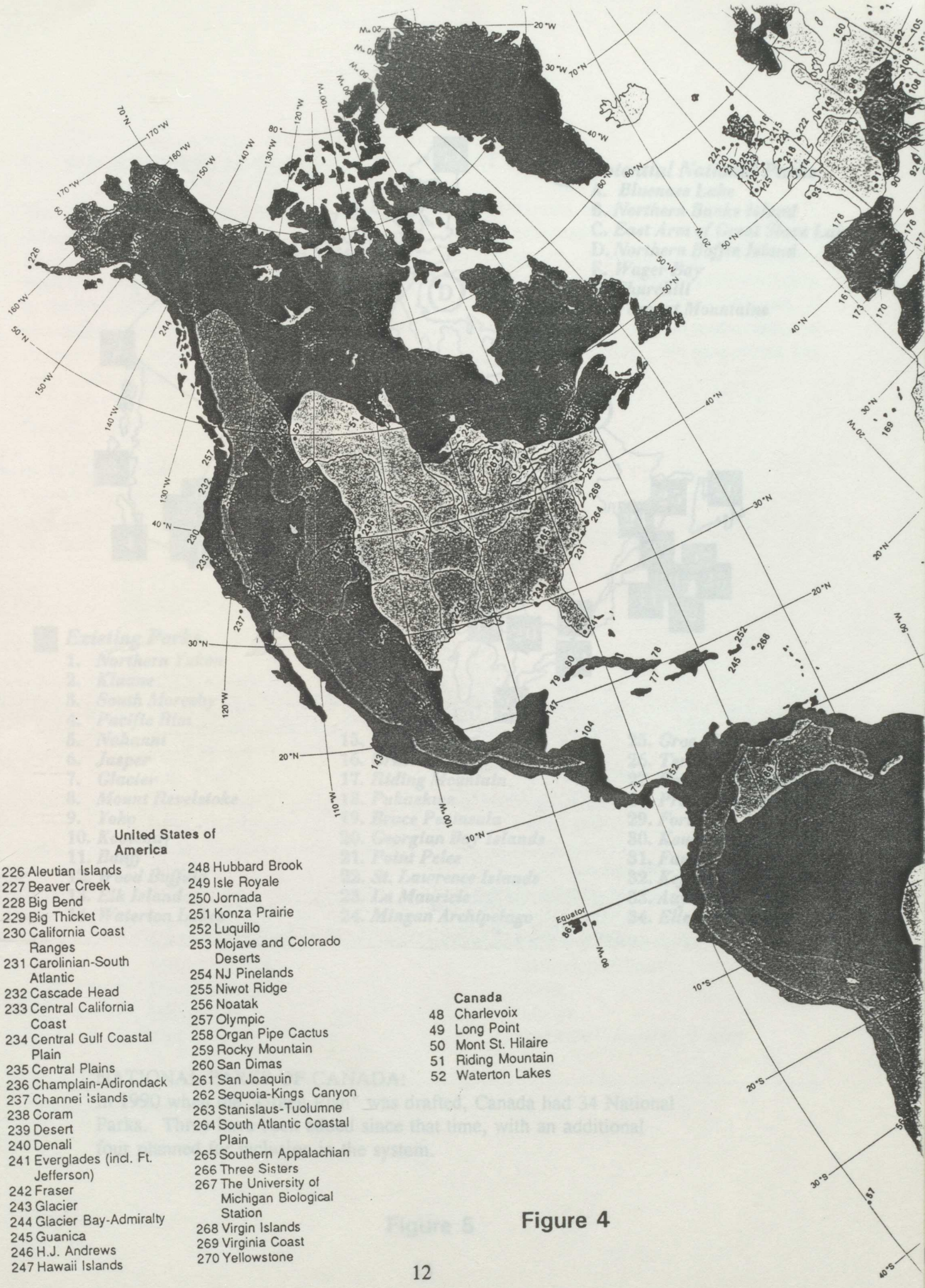
MAP OF FOREST SERVICE CLASS I AREAS



- Dark areas are National Forest System lands.
- Additions to wilderness since 1977 are not part of Class I Areas.

USDA Forest Service wildernesses and acreages designated by Congress August 7, 1977 as Class I areas.

Figure 3



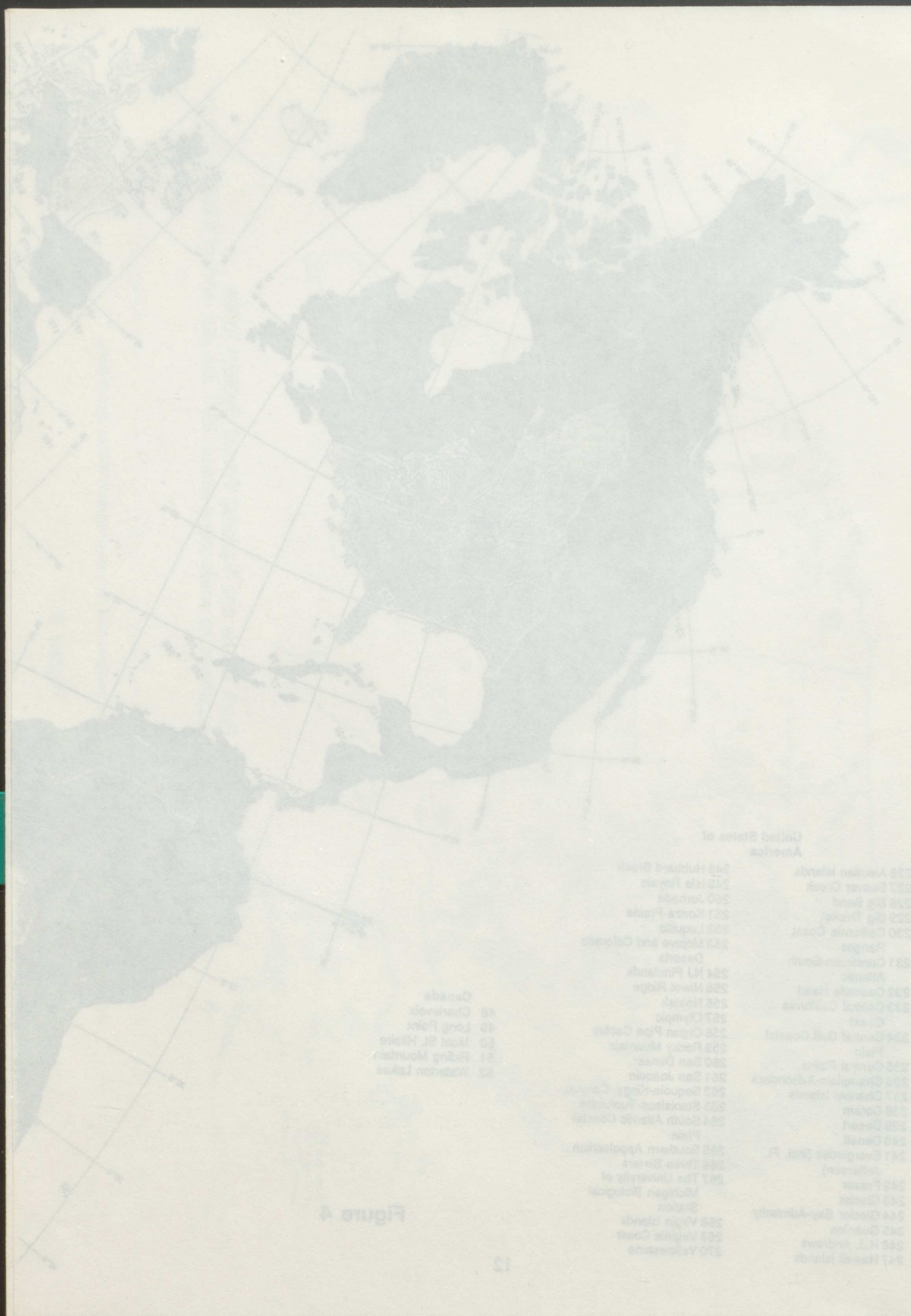
United States of America

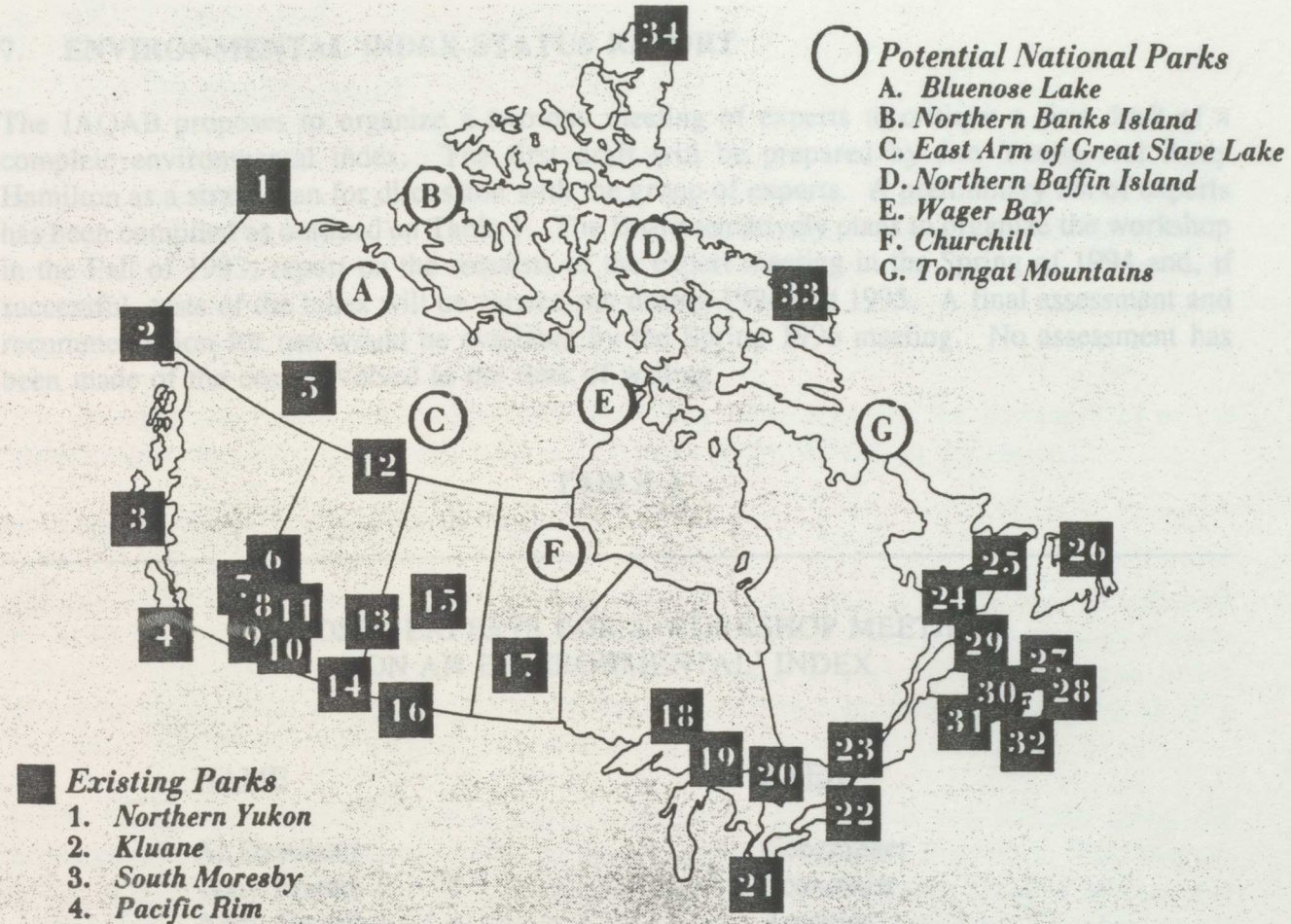
226 Aleutian Islands
227 Beaver Creek
228 Big Bend
229 Big Thicket
230 California Coast Ranges
231 Carolinian-South Atlantic
232 Cascade Head
233 Central California Coast
234 Central Gulf Coastal Plain
235 Central Plains
236 Champlain-Adirondack
237 Channel Islands
238 Coram
239 Desert
240 Denali
241 Everglades (incl. Ft. Jefferson)
242 Fraser
243 Glacier
244 Glacier Bay-Admiralty
245 Guanica
246 H.J. Andrews
247 Hawaii Islands
248 Hubbard Brook
249 Isle Royale
250 Jornada
251 Konza Prairie
252 Luquillo
253 Mojave and Colorado Deserts
254 NJ Pinelands
255 Niwot Ridge
256 Noatak
257 Olympic
258 Organ Pipe Cactus
259 Rocky Mountain
260 San Dimas
261 San Joaquin
262 Sequoia-Kings Canyon
263 Stanislaus-Tuolumne
264 South Atlantic Coastal Plain
265 Southern Appalachian
266 Three Sisters
267 The University of Michigan Biological Station
268 Virgin Islands
269 Virginia Coast
270 Yellowstone

Canada

48 Charlevoix
49 Long Point
50 Mont St. Hilaire
51 Riding Mountain
52 Waterton Lakes

Figure 4





NATIONAL PARKS OF CANADA:
In 1990 when the "Green Plan" was drafted, Canada had 34 National Parks. Three have been added since that time, with an additional four planned for inclusion in the system.

Figure 5

7. ENVIRONMENTAL INDEX STATUS REPORT

The IAQAB proposes to organize a two-day meeting of experts to critique a first draft of a complete environmental index. The first draft will be prepared by Jim Young and Andy Hamilton as a straw-man for discussion with the group of experts. A preliminary list of experts has been compiled as outlined on Table 1. The Board tentatively plans to organize the workshop in the Fall of 1993, report on the requests of the expert meeting in the Spring of 1994 and, if successful, tests of the index will be carried out during 1994 and 1995. A final assessment and recommendation for use would be available by the Spring 1996 meeting. No assessment has been made of the costs involved to the time of writing.

TABLE 1

PROPOSED EXPERTS FOR A WORKSHOP MEETING
ON AN ENVIRONMENTAL* INDEX

NAME	AREA
Al Davidson	Geographer
Tony Friend	Economist
Andy Hamilton	Aquatics
Tony Hodge	Economics
Jean Thie	Forester/Index Systems
Bill Gummer	Water Quality
Bruce Bandurski	Philosophy
Cathy Starrs	Economist
Bill Rees	Environmental Science System
Buzz Holling	Ecosystem Modeler
Jag Maini	Forest Ecologist
John Magnusson	Limnologist/Networks
Mike Donahue	Institutions/Charter
David Besner	Odour
Wayne Ott	Indices
Phil Ross	Statistics/Comparative Risk

* Ecosystem/Economy/Society

8. GULF OF MAINE

a. Joint Workshop Proposed

The proposed International Joint Commission/Gulf of Maine Workshop intended to deal with pollutant deposition to the Gulf of Maine (and its associated watershed) has been linked to the Atlantic Region Ecological Monitoring and Research Network Meeting scheduled for late February or early March 1994, and will be held in Saint John, New Brunswick. It was felt that many of the scientists attending the "Network" meeting would also represent the audience of interest for the IJC Gulf of Maine Workshop.

The resultant delay of a few months will also allow more time for the development of the "framework" document which will serve as the basis of the Workshop discussions.

b. North Atlantic Regional Experiment

As part of the North Atlantic Regional Experiment (NARE), NOAA is studying the transport of ozone and its precursors over the remote marine environment of the North Atlantic Ocean. Linked to this effort is an initiative in the Gulf of Maine to characterize ozone and ozone precursor occurrences along the coast of Maine and southern Maritime Provinces and identify the source regions for the ozone and its precursors.

Initial monitoring results indicate a region-wide plume of ozone which extends along the northeastern portion of the United States up into the southern Maritime Provinces. Exceedences of the U.S. standard for ozone have been measured along the southern coast of Maine, and exceedences of the Canadian ozone standard have been measured in southern New Brunswick and Nova Scotia.

Because of the region-wide nature of the problem, a coordinated approach to developing solutions to the problem are needed — like the provision of the U.S. Clean Air Act which sets up an ozone control region for the northeastern portion of the United States. It is only through a coordinated and integrated approach that appropriate air pollution control measures can be effectively developed and implemented to achieve standards in this border region.

APPENDIX A

PROGRESS BY THE PARTIES IN COMPLETING AN INVENTORY OF TOXIC AIR EMISSIONS AND IN ASSESSING TOXIC AIR DEPOSITION IN THE LAKE SUPERIOR BASIN

MAJOR FINDINGS

A1. Inventory Development

1.1 *The current inventory of airborne toxics in the Lake Superior Basin is quite inadequate.*

There currently exists no adequate inventory of emissions to the atmosphere for the Lake Superior Basin. In the U.S.A. a preliminary inventory has been developed using both the Toxics Release Inventory (TRI), which is a national program for reporting toxic releases, and the 1985 acid rain inventory. This is considered to be a very crude first estimate. It currently does not have the detail nor the reliability needed to be useful for modelling atmospheric deposition to Lake Superior. In Canada, the National Pollutant Release Inventory (NPRI) has been launched and data are to be reported for 1993 and subsequent years. Pesticides and ozone depleting substances are not included in this list at the present time. As is the case with the U.S. national inventory, it is not anticipated that this inventory will provide adequate data for modelling atmospheric deposition of toxic substances to Lake Superior.

In cooperation with the Air Quality Administrators of the eight Great Lakes states, the Great Lakes Commission is compiling an inventory of toxic air emissions. This effort is being funded by the Great Lakes Protection Fund.

The Province of Ontario has an inventory created as a routine part of their air pollution control program. It is incomplete and is of poor quality with respect to toxics.

In summary, models predictions cannot be improved until a better inventory is available.

A2. Assessment of Deposition

2.1 *There is no apparent focus on estimating deposition (loading) to the Lake Superior Basin or refining the current deposition estimates.*

Although the Parties have established a binational, multi-agency Lake Superior Work Group to coordinate the development and implementation of the Binational Program, there has been little progress in estimating loadings to Lake Superior or in refining

current deposition estimates. Annual average mass balance of PCB's for Lake Superior have been estimated by several authors. While there is order of magnitude agreement on some terms in the mass balance, others are still an order of magnitude apart. The estimates of this parameter have reduced from 1900 kg/year in 1988 to about 800 kg/year in 1993. One author McKay (1992) has produced a complete balance (without using a closure term) using a dynamic numerical model.

2.2 *Substantial progress has been made in monitoring of the air and precipitation concentrations of toxic substances in the Lake Superior Basin.*

As part of their programs under Annex 15 of the Great Lakes Water Quality Agreement, the Parties have begun implementation of an Integrated Atmospheric Deposition Monitoring Network (IADN). As part of this network a Master Monitoring Station has been established at Eagle Harbor (and approved by the Parties) as well as two satellite stations (not formally accepted by the Parties) at Turkey Lakes, Ontario and Finland, Minnesota.

2.3 *There is currently no quality assurance/quality control program in place for the Lake Superior Basin measurements.*

The Integrated Atmospheric Deposition Network Implementation Plan presented to the Parties (November 1990) calls for compliance with data quality objectives in the Quality Assurance Plan to be demonstrated by October 1991. A draft plan is currently under review but no formal action has been taken. When approved, these procedures will apply to the IADN Monitoring Stations on Lake Superior. Each of the agencies involved with monitoring activities in the Lake Superior Basin has its own quality assurance procedures. There has been some intercomparison of data between the Parties for the lower lakes but there is no formal mechanism in place for Lake Superior.

2.4 *There appears to be no focus on meteorological observations in the Lake Superior Basin, especially at the satellite stations.*

There is a need for an in-depth analysis of existing meteorology or more stations measuring meteorological parameters in order that:

(a) the correct distribution of precipitation can be estimated across the Lake;
(b) wind statistics which will drive volatilization are identified;
(c) the distribution of particles and gases across the Lake can be estimated correctly;
(d) the wet vs. dry (gases and particles) deposition can be understood; and
(e) the wind speed and wind direction can be clearly understood across the Lake so that correct source/receptor relationships can be established.

2.5 *The research focus seems to be getting lost, not only for Lake Superior, but also for all the Great Lakes.*

A plan was published by the Parties in November 1990 laying out requirements and a schedule for the Integrated Atmospheric Deposition Network which has resulted in substantial progress on the network (especially in Lake Superior). No similar plan or progress is evident for the research component under Annex 15, especially with respect to atmospheric deposition to Lake Superior.

2.6 *Attempts to model deposition of various chemicals to the Lake Superior Basin, even with an inadequate emissions inventory, have (1) advanced our understanding of transport and deposition processes and (2) pointed out weaknesses in the emissions inventory.*

The modelling effort is producing research questions rather than converging on a better estimate of deposition to Lake Superior. This will only change with an improved inventory.

A3. General

3.1 *There appears to be no atmospheric focus in the Lake Superior program and very weak bilateral co-ordination of the Parties research efforts.*

While a Bilateral Lake Superior Work Group has been established, the atmospheric portion of the program seems to be a fortuitous spin-off from the IADN activity and the Great Waters Program.

3.2 *While the Parties continue to uphold the Great Lakes as an environmental priority, continuing support for the air program seems to be eroding in Canada and uncertain in the United States.*

The United States has allocated funds to the Office of Air Quality Planning and Standards, universities, and others, as a result of the Clean Air Act Amendments of 1990 to encourage research on Great Waters issues. Additional funds have been allocated to support the IADN program through 1993. The United States has yet to establish stable funding for the IADN program to assure its continuity. Canadian funds continue to be mostly focused on government laboratories (with very few university programs) and, specifically in the atmospheric area, are being cut and re-assigned to other activities. While Ontario funds to support the satellite stations on Lake Superior are in place for the year 1993/94, they are by no means certain beyond this fiscal year.

RECOMMENDATIONS

1. Major

1.1 The inventory of toxic emissions should be given the highest priority by the Parties over the next biennial cycle.

1.2 Inventory activity should be focussed on two to four toxic chemicals for the next three years.

1.3 A binational group should be convened to review, co-ordinate and suggest new studies in order to (a) identify the data requirements of investigators who would use the inventory; (b) develop guidelines for the preparation of an integrated emission inventory; (c) develop a priority ranking scheme for chemicals to be inventoried; (d) set time frames for developing specific inventories; and (e) to strengthen the atmospheric focus of research efforts to determine deposition to the Lake Superior Basin.

1.4 Resources in both countries need to be focussed on Lake Superior and maintained over the next biennial cycle. Of specific importance is Ontario's funding for the satellite stations on Lake Superior, Canada's funding of atmospheric processes research, and secure funding for the IADN program in both Canada and the United States.

2. Minor

2.1 A formal review of existing satellite stations in the Lake Superior Basin should be undertaken by the Parties to ensure that they meet the IADN criteria.

2.2 A bilateral QA/QC plan for the data from Lake Superior monitoring stations needs to be put in place by the Parties as soon as possible to ensure that quality data are available for assessment purposes.

2.3 A research plan, with specific priorities leading to an estimate of deposition to the Lake Superior Basin, needs to be prepared before the end of 1993. This plan should outline goals and milestones over the biennial cycle.

2.4 The research plan should include more emphasis on meteorological parameters, transfer coefficients and gas exchange processes.

APPENDIX B

IAQAB CLIPPING SERVICE

1. U.S. National Ambient Air Quality Standards - Ozone

As a result of a review of health and welfare criteria, EPA found that revisions of the primary and secondary standards for (tropospheric) ozone are not appropriate at this time. (Also see page 4.) The Clean Air Act calls for review of the standards every five years. It is anticipated that revisions will be proposed when the next review is due. Work on the next version of the scientific Criteria Document on ozone has been initiated starting the five year process. This decision became effective on April 8, 1993.

2. U.S. National Ambient Air Quality Standards (NAAQS) - Lead

EPA is assessing new health effects information that has become available regarding lead and will make a decision for or against a change in the NAAQS. EPA has prepared a staff paper which has been reviewed and approved by the Clean Air Act Scientific Advisory Committee.

3. U.S. National Ambient Air Quality Standards - Sulfur Oxides

a. EPA proposes to retain the existing NAAQS for sulfur oxides. Adding an alternative 1-hour primary standard of 0.4 ppm to replace the 3-hour standard (0.5 ppm) is being considered. EPA also proposes to revise the significant harm levels, the Pollutant Standards Index for SO_x, and certain monitoring and reporting requirements. EPA incorporates additional material into the dockets for the proposed revisions to the Ambient Air Quality Surveillance requirements.

b. On 21 May 1993 EPA announced its final decision not to revise the secondary standards for sulfur oxides. EPA still needs to issue a final decision regarding whether or not to revise the primary standards.

4. U.S. National Ambient Air Quality Standards - Carbon Monoxide

The U.S. EPA will review ongoing studies on health effects of carbon monoxide and make a decision for or against a change in the NAAQS.

5. National Environmental Standards for Hazardous Air Pollutants - 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 are warranted.

6. U.S. Air Emission Standards for VOCs from Tanks and Impoundments at Hazardous Waste Facilities - Phase II

EPA proposes air emission standards for emissions of volatile organics from tanks and impoundments at hazardous waste facilities. The standards would require that organic emission controls be installed and operated on tanks, surface impoundments, containers, and certain miscellaneous units if any hazardous waste having a volatile organic concentration equal to or greater than 500 ppm by weight is placed in the unit.

7. Hazardous Organics

The U.S. EPA proposes to control emissions of hazardous organic chemicals from storage tanks, process vents, equipment leaks, transfer operations, and wastewater treatment in synthetic organic chemicals manufacturing plants.

8. Medical Waste Incineration

The U.S. EPA will propose new source performance standards and emission guidelines for existing medical waste incineration sources to reflect the maximum degree of reductions in emissions that have been demonstrated for new units.

9. Federal Use of Alternative Fueled Vehicles - Executive Order

On April 21, 1993, the President of the United States signed Executive Order 12844 requiring federal agencies to acquire alternative fuel vehicles in numbers that exceed by 50 percent the requirement established in the Energy Policy Act of 1992 for 1993 through 1995. This new requirement is subject to the availability of funds and to consideration of the life cycle costs of these vehicles. The order states, "The use of alternative fueled motor vehicles can, in some applications, substantially reduce pollutants in the atmosphere, create significant domestic economic activity and stimulate jobs creation, utilize domestic fuel sources..., and reduce vehicle maintenance costs." The Secretary of Energy is directed to provide assistance to other agencies that acquire alternative fueled vehicles by providing, within the available appropriations, payment of the incremental cost of alternative fueled vehicles. All vehicles, whether conversions or purchases as original equipment, must comply with all applicable federal and state emission and safety standards. The head of each agency will report annually to the Secretary of Energy on that agency's actions and progress toward meeting the goal of acquiring alternative fuel vehicles. The Secretaries of Defense and the Treasury and the Attorney General are excluded from this order. They must determine the extent to which the requirements apply to the national security and protective and law enforcement activities of their respective agencies.

10. Fairbanks Bans Gasoline Mixed With Methyl-tert-butyl Ether (MTBE)

In December of 1992, Fairbanks, AK, banned gasoline mixed with methyl-tert-butyl ether (MTBE); Anchorage will follow suit. MTBE is used to oxygenate gasoline to cut down air pollution by CO and benzene (ethanol is an alternative fuel oxygenator) in metropolitan areas that have cold winters. In Fairbanks, however, residents complained of allergic reactions, headaches, and sore throats. Researchers will try to determine which is worse for health in the winter air of Alaska: MTBE and byproducts from MTBE-treated gasoline or CO and benzene from unreformulated gasoline. They are expected to complete their work late this year. Winter air over many parts of Alaska contains sharp temperature inversions that can trap air pollutants. MTBE is listed as one of 189 hazardous air contaminants for which EPA must develop source categories and mandate maximum available control technology.

Note that a national meeting on the health effects of MTBE ("Technical Conference on Health Effects of MTBE") was held in Falls Church, Virginia on 26-28 July 1993. The Board is scheduled to receive a copy of the proceedings and will report on relevant findings in the near future.

11. National Academy of Sciences (NAS) Issues Report on Visibility in U.S. Parks and Wilderness Areas

The NAS recently published a report "Protecting Visibility in National Parks and Wilderness Areas" (National Academy Press, 1993) based on its study of the regional nature of visibility impairment. The committee on Haze in National Parks and Wilderness Areas was created to deal with the real problem of loss of visual range in protected areas. For example, in the western U.S. the average visual range is about 1/2 to 2/3 of the visibility that would exist in the absence of air pollution. This report calls on the U.S. Federal Land Managers (Department of Interior and Department of Agriculture) to work with the Environmental Protection Agency to organize regional programs to monitor visibility and to control emissions that contribute to haze. The Committee noted that control strategies need to be different in the West and East because of higher existing level of air pollutants in the East and the contribution of water vapor in the East to visibility reduction.

12. Radiation Protection of the Public and the Environment - Proposed Rule

The U.S. Department of Energy (DOE) issued a proposed rule for the protection of the public and environment against radiation. The requirements govern activities conducted by or for DOE that might result in release of radioactive material, exposure of members of the public to radiation, or contamination of the environment with radionuclides from DOE activities. Specifically, DOE is proposing to require that radiation exposures to individuals in the general public from all combined radiation sources and exposure pathways from routine DOE activities not exceed an effective dose equivalent of 100 mrem (1 mSv) in a year. The proposed system would also continue the application of the ALARA ("as low as is reasonably achievable") process to activities involving exposures to radioactive material and radiation. All DOE operations, except those under the jurisdiction of the Director of Naval Nuclear Propulsion

Programs, would be required to comply with the dose limits and ALARA requirements of the proposal. To reduce the potential for radiological contamination of natural resources (e.g., land, ground and surface water, and ecosystems), the proposal requires the use of the Best Available Technology (BAT) for treating liquid waste discharges containing radioactive material. The ALARA process would apply to these discharges. Finally, DOE proposes criteria that must be met for the release of property containing residual radioactive material resulting from DOE activities.

13. Procurement Requirements and Policies for Federal Agencies for Ozone-Depleting Substances - Executive Order

Under the authority of the Constitution and the laws of the United States of America, including the 1990 amendments to the Clean Air Act (CAA), the President of the United States issued Executive Order (E.O.) 12843 to reduce the federal government's procurement and use of substances that cause stratospheric ozone depletion. The E.O. establishes the policy of the federal government that federal agencies: (1) implement cost-effective programs to minimize the procurement of materials and substances that contribute to the depletion of stratospheric ozone and (2) give preference to the procurement of alternative chemicals, products, and manufacturing processes that reduce overall risks to human health and the environment by lessening the depletion of ozone in the upper atmosphere. Specifically, federal agencies are to take several actions including: (1) minimizing, where economically practicable, the procurement of products containing or manufactured with Class I substances (i.e., chlorofluorocarbons, halons, carbon tetrachloride, methyl chloroform, and any other substance so designated by EPA at a later date); (2) altering existing equipment and/or procedures to make use of safe alternatives to Class I substances; and (3) amending existing contracts, to the extent permitted by law and where practicable, to require the use of safe alternatives. In developing procurement policies, federal agencies are also to be aware of the phaseout schedule for Class II substances (i.e., hydrochlorofluorocarbons and any other substances so designated by EPA at a later date). These actions are to be taken no later than November 21, 1993.

14. Status of Report to Congress

Under section 112(m) of the 1990 Clean Air Act, the U.S. EPA is to report to Congress on its program to identify and assess the extent of atmospheric deposition of hazardous air pollutants to the Great Lakes, the Chesapeake Bay, Lake Champlain and coastal water (Great Waters Program). The report is on track for the November 15, 1993 delivery to Congress. A draft report for external review is expected by October.

15. Lake Champlain/Sutton Mountain Biosphere Reserve

The Lake Champlain Basin is currently a designated Biosphere Reserve under the United Nations "Man and the Biosphere Program". However, the designated reserve terminates at the international border with Canada. An effort is underway in Quebec to have a reserve designated in the southern part of the Province and to link that reserve with the Lake Champlain Reserve,

thereby creating an international Biosphere Reserve and cross border commitment to management of natural resources and environmental protection.

16. Development of International Air Pollution Protocols

Preparatory work is underway for the negotiation of three new international protocols that could have a bearing on how transboundary air pollution between Canada and the United States is managed. Under the United National Economic Commission for Europe's Convention on Long-Range Transboundary Air Pollution, member countries are preparing the necessary substantiation for possible new protocols on Persistent Organic Pollutants and Heavy Metals and for the Second Step of the Existing NO_x Protocol which both Canada and the U.S. have signed and ratified. For the first two of these, candidate lists of pollutants and pollution sources are being identified and reduction opportunities are being evaluated. Decisions on whether to proceed with negotiation of protocols are expected to be taken in 1994. For the Second Step NO_x Protocol, nations continue to work on refining their understanding of the role of nitrogen in acidification. The ECE has targeted to have the protocol completed in 1994. The second step calls for targets and schedules for further NO_x reductions based on critical loads to the environment by 1 January, 1996.

17. Western Canada/Pacific Northwest Visibility Issues Discussed at An International Workshop Held at Harrison Hot Spring, B.C.

A workshop on "Protecting Visibility in Western Canada and the Pacific Northwest" was held in March 1993 to allow research and policy experts from Canada and the U.S. to discuss current methods for measuring visibility reducing particles and the evaluate methods for determining the sources of those particles. Sponsors of the meeting included: American Waste Management Association, the Greater Vancouver Regional District, the B.C. Ministry of Environment, and Environment Canada (AES). In the B.C./Pacific Northwest regional sources of visibility-reducing particles include urban emissions (cars, industry), point sources of pollution (power plants), and smoke from residential and forestry burning. There was considerable discussion of policy options available to governments in the transboundary region to remedy or protect visibility. A summary of the meeting is available from Peter Reid, B.C. Ministry of Environment.

18. Quebec Tires

Quebec has funded a $7M (Canadian) test project to examine various disposal options for the 12 million used tires facing disposal each year. The test project will consider the environmental implication for various options evaluated.

19. Canada/Quebec Acid Rain Agreement

On August 23, 1993, the Province of Quebec and the Federal Government formally amended the Canada/Quebec acid rain agreement. The amendment reduces the provincial SO_2 cap by 100 000 tonnes, from 600,000 tonnes to 500,000 tonnes, beginning in 1994. The New Brunswick

and Nova Scotia acid rain agreements were also recently amended to reduce their 1994 SO_2 caps by 10 000 and 15 000 tonnes respectively. These are important steps in ensuring Canada's commitment under the Canada/U.S. Air Quality Agreement to maintain SO_2 emissions in Eastern Canada below 2.3 million tonnes for the 1994 - 2000 period is met.

20. Canadian National Air Issues Management Mechanism

A new national air issues management mechanism has been established between the Canadian federal government and the provinces. The new mechanism is a partnership arrangement between Environment and Energy departments. The new mechanism consists of a National Air Issues Steering Committee at the Deputy Minister level and a supporting National Air Issues Coordinating Committee at the Assistant Deputy Minister level. Both have federal/provincial, energy/environment co-chairs. The new mechanism will be the forum for developing national and regional plans and strategies for managing all air issues in Canada and an advisory forum on international negotiating positions. It will make recommendations and deliver products to various Ministerial councils, not just to the Canadian Council of Ministers of the Environment. Although it has already begun to function, the formal launching of the new mechanism will occur at a joint meeting of Energy and Environment Ministers in November, 1993.

INTERNATIONAL JOINT COMMISSION
Canadian Section

COMMISSION MIXTE INTERNATIONALE
Section canadienne

MEMORANDUM/NOTE DE SERVICE

PREVIOUSLY SENT BY FAX

To: Commissioners
A:

File:
Dossier:

From: E.A. Bailey and J. Fisher
De:

Date: September 13, 1993

Subject:
Object: **Progress Report 16 - IAQAB**

Following a review of the IAQAB'S Progress Report 16, submitted for consideration at the September 1993 Semi-Annual Meeting, and recognizing the Commission's request for suggestions for specific tasks to be assigned to the Board, we have proposed the following for consideration by the Commission.

A. Tasks Currently Outstanding

Currently the Board has been assigned the following two tasks by the Commission.

1. Assess Parties progress in developing an inventory of toxic air emissions and toxic air deposition to Lake Superior.

A status report is presented on Page 3 of the Progress Report. The Board's findings and recommendations are outlined in Appendix A. The task is essentially complete. The Commission must discuss what action it intends to take on the recommendations. Options include:

- distribute the Board's findings and recommendations at the Biennial Meeting.
- incorporate into upcoming biennial report to governments.
- send a separate letter to governments on this matter.

2. Detroit-Windsor/Port Huron-Sarnia Reference

Progress in developing a suitable plan for further studies under this 1988 Reference has been slow.

Following a request from the Commission in July 1992, the Board presented a plan in its spring 1993 report which essentially called for ongoing tracking of Governments' regulatory efforts in the region. Environmental impacts or further studies of human health effects of air pollutants were not addressed. The Board agreed to review governments' activities related to environmental effects and to report to the Commission in the fall of 1993.

An update is given on Pages 1 to 3 of the Progress Report.

Recommendation: Further studies under this Reference should be the Board's primary focus over the next two years.

In our opinion, holding a workshop in the spring of 1994 as proposed, does not advance activity under this reference in a timely manner.

Recommendation: The Commission should consider:

- appointing a separate study group to advance activity under the Reference.

- whether reporting on activities as presented in the Board's Progress Report (Pages 1 and 2) is adequate for purposes of the Reference. We question whether updates including such statements as: continuing development, is making progress toward, is proposing, etc. really assist the Commission in assessing the impacts of air pollutants. Would it not be better to identify controls actually put in place. Perhaps, no progress is being made.

- requesting that a trend analysis of all available monitoring data (toxics and parameters listed in the 1975 Reference) be undertaken for the region to update earlier analyses.

Questions: Page 1 - Progress Report

- Does the Board intend to focus the workshop on impacts of air pollution? The title should probably read "Environmental Impacts of Air Pollution ..."

- The outcome of the meeting will hopefully be a plan for further studies related to environmental impacts or recommendations for the Commission to pass on to governments. Surely not as indicated "... for the

environmental problems in the region." This is not the Commission's role.

B. Other Tasks Approved by the Commission

1. Environmental Index

The Commission approved the staged development of an Environmental Index the pursuit of which is to be reviewed following various steps in its development. A status report is given on Page 14 of the Progress Report.

Questions:

- The Board indicates it has tentative plans to organize a workshop in the Fall of 1993. Once again progress is slow. Jim Young's term as Chairman expires December 31, 1993 and he is the lead Board member on this task.

- The proposed list of experts for the workshop does not appear to include human health expertise. Is this an oversight on the part of the organizers?

2. Gulf of Maine Workshop

The status report on Page 15 indicates that this workshop will be held in early March 1994.

Question:

- The Board should be asked if and when the $5,000 previously allocated to this activity will be required. Due to the delay, the Commission must consider whether the money is still available in its budget.

C. Proposed New Tasks

1. Great Lakes Priorities

The IAQAB is expected to assist the Commission with atmospheric components of the priority issues under the Great Lakes Water Quality Agreement for the next biennial cycle. Although yet undefined, this could involve effort in the following areas:

- identification of state of knowledge with respect to atmospheric inputs to Lake Erie. As the Board found in its review of atmospheric inputs to Lake Superior, lack of good emission inventories has resulted in very little progress in deposition estimates. This is no doubt also true for the Lake Erie basin. However, a review of monitoring, research and

modelling efforts specific to atmospheric deposition to Lake Erie would be useful.

- the IAQAB could be asked to assist the SAB with the Climate Change priority. Although no funding has been allocated to this priority, a joint SAB/IAQAB task group could enhance the delivery of this priority project.

D. Initiatives of the Board

The Board's directive provides for matters to be referred to the Board by the Commission or identified by the Board and brought to the attention of the Commission. Under the latter category the Board has identified several initiatives which it reports on and when appropriate makes recommendations to the Commission. Currently these include:

1. Control of Automotive Air Pollution
2. Ozone Standard
3. Hazardous Waste Incineration
4. Preserving National Parks, Wilderness Areas and Other Unique Resources along the Border
5. Clipping Service

We support the Board's pursuit of items 1 to 4 and any other matters the Board considers relevant. With respect to item 5 - Clipping Service, the Board once again discussed the usefulness of this summary at its July meeting. The concern being that it is a difficult task to ensure comprehensive coverage for all relevant air issues and activities. Based on the understanding that Commissioners felt the service was useful, the members agreed to continue including it in their reports.

Recommendation: The Commission should consider whether they find the Clipping Service a useful component of the Board's report.

Summary:

We have not at this time proposed any new tasks for the IAQAB as it appears that they have more than enough issues on their agenda. However, we would suggest that the Commission make it clear to the Board that its priorities are as follows:

1. Detroit-Windsor/Port Huron Sarnia Air Pollution Reference
2. Great Lakes Priorities
   - atmospheric inputs to Lake Erie
   - SAB/IAQAB joint project on Climate Change
3. Automotive Emissions
4. Hazardous Waste and Incineration
5. Environmental Index
6. Other Initiatives of the Board