
PROJECT PROPOSAL

Climate Fluctuations and the Great Lakes Basin: Socio-economic Dimensions and Policy Implications

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Climate Fluctuations and the Great Lakes Basin: Socio-economic Dimensions and Policy Implications

I. GOALS STATEMENT

The Great Lakes Commission proposes to undertake a project titled *Climate Fluctuations and the Great Lakes Basin: Socio-economic Dimensions and Policy Implications*. The goal of this investigation is to strengthen understanding of climate-human interactions and, in so doing, identify policies and management procedures to promote human adaptation to climate fluctuations. Among others, the project will yield enhanced collection and reporting procedures for relevant data; analysis of, and dialogue on, climate-human interactions and implications; and the development of a Great Lakes Water Resources Management Program. The latter is a policy framework that will establish a process by which government jurisdictions (state, federal, provincial) in the Great Lakes Basin can anticipate and adapt to the impacts of climate change through the informed use, development and protection of their shared water resources.

This project will address a key provision in the 1985 Great Lakes Charter signed by the Great Lakes governors and premiers to strengthen water resources policy and management through the development of a multi-jurisdictional Great Lakes Water Resources Management Program. It responds to climate change priorities of the International Joint Commission (IJC) and the Great Lakes Commission and complements the Great Lakes climate change initiatives underway or planned by NOAA's Great Lakes Environmental Research Laboratory (GLERL) and Environment Canada's Atmospheric Environment Service.

II. PROBLEM STATEMENT

The Great Lakes of North America constitute the world's greatest freshwater resource, and play a vital role in the regional and national economies of the United States and Canada. The sheer magnitude of the resource has, over the years, fostered the perception that the Great Lakes offer a virtually inexhaustible supply of fresh water that can accommodate all current and projected uses. In reality, the system's water resources are finite, intensively used and ecologically fragile. Climate change models predict that residents of the Great Lakes Basin will experience pronounced changes in lake levels, average temperatures and precipitation patterns due to global warming, bringing about a gradual yet fundamental shift in the characteristics of the resource base and associated socio-economic activity. Implications of this shift for water policy and management are profound. Despite the uncertainty associated with the regional consequences of global climate change, policymakers must assume an anticipatory mode, formulating strategies to adapt to, mitigate or otherwise minimize disruptions to the integrity of Great Lakes water resources and the regional economy.

A comprehensive, coordinated water resources management program is needed to provide the research, policy and management framework to enhance decisionmaking efforts in the Great Lakes Basin. Such a program, however, has yet to be developed. Until it is, federal, state and provincial governments (as well as all Basin interests) will be unable to adequately address major water use issues (e.g., diversion, consumptive use, water conservation, levels management) associated with climate change.

III. BACKGROUND STATEMENT

The Great Lakes System: Its Socio-economic and Public Policy Significance

The binational Great Lakes system is one of virtually unfathomable expanse and corresponding complexity. Its myriad characteristics are inextricably linked to—and in large part the determinants of—the region's environmental health, economic well-being and overall quality of life. Yet, the expansiveness and complexity of the resource belies its fragility. Even minor stresses—whether they be physical, biological or political—can have lasting impacts upon the sustainable use, development and protection of the resource.

The Great Lakes system enjoys global prominence, containing some 6.5 quadrillion gallons of fresh surface water, a full 20% of the world's supply and 95% of the United States' supply! Its component parts—the five Great Lakes—are all among the fifteen largest freshwater lakes in the world. Collectively, the Lakes and their connecting channels comprise the world's largest body of fresh surface water. They lend not only geographic definition to the region, but help define the region's distinctive socio-economic, cultural and quality of life attributes as well.

An international resource shared by the United States and Canada, the system encompasses some 95,000 square miles of surface water and a drainage area of almost 200,000 square miles.² Extending some 2,400 miles from its western-most shores to the Atlantic, the system is comparable in length to a trans-Atlantic crossing from the east coast of the United States to Europe. Recognized in U.S. federal law as the nation's "fourth seacoast," the Great Lakes system includes well over 10,000 miles of coastline. The coastal reaches of all Basin jurisdictions are population centers and the locus of intensive and diverse water-dependent economic activity. Almost 20% of the U.S. population and 40% of the Canadian population resides within the Basin.

The role of the Great Lakes system in advancing and sustaining regional, national and binational economic development has long been recognized. The physical presence, geographic configuration, biological diversity and climatological characteristics of the Lakes and their related land resources have been, and continue to be, determinants of locational decisions for business and industry.³ Much of the early economic activity during settlement of the region was directly attributable to resource exploitation potential (e.g., fisheries, trapping, mining, forestry) and the availability of water-based transport. While the industrial base has diversified over the years, the Basin's water resources continue to exercise a substantive role in the attraction, retention and day-to-day operation of industry. Every day, for example, over 980 billion gallons of water are withdrawn or used instream for industrial, municipal, agricultural, power generation and other purposes.⁴ Every year, Basin industry accounts for 70% of all U.S. steel production, one-fifth of U.S. heavy manufacturing, and one-half of Canada's heavy manufacturing.⁵ The Great Lakes St. Lawrence Seaway contributes \$3.0 billion annually to the region's economy.⁶ The sport fishery is valued at \$2.0-4.0 billion annually in direct and indirect benefits.⁷ Economic activities as diverse as agriculture, recreational boating, and water-based tourism are all multi-billion dollar industries.

These various resource uses in the Great Lakes Basin share two characteristics relevant to the issue and implications of climate change. All are highly dependent upon access to reliable sources of abundant and relatively high quality water. They are also highly sensitive to variations in the resource.⁸ For the most part, water-based industries have become dependent on a small seasonal variation in lake levels, typically 12-24" in seasonal variation over the course of a year. Even a modest, gradual departure from long-term averages can translate into tens of millions of dollars in economic loss or benefit. For example, a prolonged one-inch reduction from the long-term average can translate into reduced hydropower capacity

and can compromise the efficiency of interlake and ocean-going vessels that typically use every inch of dredged shipping channels. Conversely, modest increases in levels can—and have had—devastating effects on shoreline erosion, structures and other property. Climate change scenarios suggest prolonged alteration of levels and flows; precipitation and evaporation patterns; air and water temperatures; biological diversity and composition; and all attendant population, socio-economic, legal/institutional, water usage and demand characteristics.

The climate change issue is also significant from a policy standpoint in that it may signal a departure from the time-tested crisis response decisionmaking mode. The development, application and critique of general circulation models has received a notable degree of attention to date, and policy implications have been discussed and acknowledged—albeit in cursory fashion—in water resource plans of various Basin jurisdictions. Under the best circumstances, however, the active implementation of adaptive strategies is likely to be years away for any individual jurisdiction or the Basin as a whole.

Climate change is an issue that has a multi-dimensional character and demands a multi-disciplinary, multi-jurisdictional response. It defies precise quantification, and is a case study of decisionmaking under uncertainty, with both limited and sometimes contradictory information. The ability of the Great Lakes leadership to formulate and implement scientifically sound, socio-economically viable, and environmentally responsible policies of this type may well pave the way for enlightened public policy on other complex issues with similar characteristics.

Climate Change Projections and Impacts

In recent years, a number of climate change scenarios have been developed for the Great Lakes Basin? Many reflect the application and interpretation of three general circulation models based upon the assumption that carbon dioxide concentrations will double over pre-industrial levels by the middle of the next century. These include models of the Goddard Institute for Space Studies (GISS); the Geophysical Fluid Dynamics Laboratory (GFDL); and Oregon State University (OSU); all developed in the early to mid-1980s.¹⁰

In 1989, at the request of the U.S. Congress, the U.S. Environmental Protection Agency (U.S. EPA) used these three models as a basis for examining the potential impacts of climate change on health and environment in the United States. The Great Lakes was one of four regions of particular interest. The reliability and validity of all such models is particularly suspect on a region-specific basis, yet such applications can be useful in suggesting the likely direction and, to a lesser extent, the magnitude of change for different parameters. The U.S. EPA review did find substantial variability among the three models, although the direction of change was consistent.¹¹ At the global level, for example, all indicate an increase in average air temperatures and annual precipitation. In the Great Lakes Basin, U.S. EPA-commissioned studies derived from these models suggest, among others, lowered lake levels, reduced ice cover, a lengthened shipping season, increased shipping and dredging costs, adverse water quality impacts including reduced dissolved oxygen levels, and increased fish productivity.

A brief discussion of anticipated climate change impacts on these and other hydrologic characteristics/resource uses follows:

- **Lake Levels:** Although projections vary from one model to the next, it is generally agreed that the doubled carbon dioxide scenario will lead to a precipitous drop in average lake levels, due to higher air temperatures, an attendant reduction in the snowpack and an increase in evaporation. Levels may be lowered from .4 to 2.5 meters, depending upon the lake, according to NOAA's Great Lakes Environmental Research Laboratory (GLERL).¹² Historic lows would be

experienced for Lakes Michigan, Huron and Erie.

- **Ice Cover:** Research at GLERL has found that Great Lakes ice cover would be significantly reduced under a doubled carbon dioxide scenario.¹³ While a climate change-induced reduction in wind speed may temper the impact, these findings point to the virtual disappearance of ice cover from central and eastern Lake Erie, and a substantial reduction in Lake Superior, likely from four to one-and-one-half months per year.
- **Shipping:** Climate change impacts are mixed for waterborne transportation. Reduced ice cover will extend the shipping season, while lower average lake levels will limit cargo capacity, require substantial increases in dredging activity in ports and connecting channels, and necessitate infrastructure adjustments (e.g., docks, water supply sources).^{14, 15, 16}
- **Water Quality:** The higher average annual water temperatures associated with various climate change scenarios are expected to lead to accelerated eutrophication.¹⁷ Changes in the thermal structure of the Lakes (particularly areas such as Lake Erie's central basin) will include prolonged stratification and attendant dissolved oxygen problems. Warmer surface temperatures may keep the Lakes from thoroughly mixing each year, affecting the mixing of nutrients. Lowered levels, coupled with nonpoint source pollution in the form of urban and agricultural run-off, suggest the possibility of exacerbated nearshore water quality problems due to increased concentrations of contaminants. Also, exposure of toxic substances in present-day wetlands is a concern.
- **Biological Diversity:** The impact of climate change on biological diversity is more a matter of speculation than interpretation of research. However, it is recognized that lower average lake levels may cause a decline in the number and size of estuaries and wetlands, reducing spawning and breeding grounds for fish and waterfowl.¹⁸ Attendant water quality problems, noted earlier, will be a factor as well. Climate conditions will shift ecological regions northward, and the resultant change in agricultural and forestry characteristics—as well as development, population and industrial patterns—will affect both the viability and migration of current plant and animal species, and the influx of non-indigenous species that may compete with established species. As one example, warmer average water temperatures would likely accelerate the spread of zebra mussel populations and exacerbate their adverse impacts on native clams and their disruption of the food chain.
- **Agriculture:** Benefits associated with climate change scenarios for the Great Lakes includes a longer growing season, an extension and shift of crop ranges that may increase viable agricultural acreage in the Basin, and the possibility of higher crop yields due to increased rates of photosynthesis in some species.¹⁹ Adverse impacts include an increase in the activity and geographic range of unwanted insects and plants that prey on or compete with crops, suggesting the potential for increased usage of herbicides and pesticides. Increased evaporation suggests lowered soil moisture and yields, likely prompting a pronounced increase in irrigation activity.
- **Fisheries:** As with agriculture, research into the projected impact of climate change on the Great Lakes fishery yields mixed results.²⁰ Higher water temperatures will accelerate phytoplankton and zooplankton production, lengthen the growing season and, for many species, expand the thermal habitat. On the other hand, the higher metabolism associated with fish in warmer weather may increase competition, placing pressure on the forage base. Summer habitat could actually be reduced due to dissolved oxygen problems. Further, as noted earlier, such changes are likely to promote the introduction and spread of aquatic nuisance species such as the zebra mussel.

The Policy Implications of Climate Change

The policy implications of climate change in the Great Lakes Basin are appropriately examined at two levels. The first level entails a sector-by-sector examination of water use activity to determine specific impacts and the associated policy responses/implications for that activity. This approach is fairly straightforward and intuitive, at least on a qualitative basis. For any given sector of water use activity, there is likely to be both positive and negative impacts, and the relative magnitude of each will help shape and define the debate over the nature of the appropriate policy response. For example:

- A climate change-induced lowering of water levels—at least to a point—would likely be welcomed by riparians who have endured years of shoreline erosion, flooding and property damage. On the negative side, adverse impacts are noted for hydro-electric power generation efficiency, impediments to commercial and recreational navigation, alteration of nearshore aquatic habitat, alteration of coastal development pressures and patterns, and reduced access to water resources for instream or withdrawal purposes. The policy decision involves lake regulation. Can lake regulation plans currently maintained by the International Joint Commission accommodate projected impacts on lake levels of climate change? How will tradeoffs among competing resource users best be handled? How should anticipated impacts on lake levels be addressed by state/provincial coastal zone management plans, zoning ordinances and other land use policies?
- Ice free or reduced ice conditions will lengthen the navigation season, but reduced cargo capacity and increased maintenance dredging costs will affect the viability of Great Lakes transportation. At what point, if any, will the economic costs and environmental implications of such dredging outweigh the benefits of maritime transportation vs. other modes? Who should pay for the increased costs, and where should the contaminated dredge materials be deposited?
- Climate change impacts point to pronounced near shore water quality problems, and increased sensitivity to both point source discharges and urban and agricultural runoff. Will existing standards need to be strengthened to ensure acceptable water quality? Will urban and agricultural land use practices need to shift from largely voluntary compliance to a regulatory mode? What compliance costs will accrue to business and industry, and will those costs outweigh the benefits of access to Great Lakes water?
- Higher average water temperatures will promote fisheries production, but the range and mix of species will be altered. If such a scenario is inevitable, how will near and long-term fish stocking programs be affected? Should strategies for the control of aquatic nuisance species such as the zebra mussel and ruffe be redirected, enhance or altogether terminated? Should prevention strategies now be implemented for aquatic nuisance species that cannot presently thrive in the Great Lakes, but could with higher average water temperatures?
- The loss of biological diversity and compromised viability of rare and endangered wildlife and vegetation species is a consequence of climate change. Should our policy approach entail managing the ecosystem to remain in its current state, or to ease its transition to a new state? Should habitat enhancement/wetlands creation programs be accelerated in anticipation of the loss of present wetlands? Should current endangered species protection programs be enhanced, or abandoned on the basis of their inevitable failure due to climate change effects?

- The quality of human health will be affected to some degree under any climate change scenario, given the existence of climate related ailments, the likely anticipation of exposure pathways to concentrations of toxic chemicals, and overall changes in air and water quality. What is the magnitude and direction of anticipated human health impacts? Are they significant enough to warrant extensive research, perhaps at the expense of other human health research priorities? What adaptive responses (e.g., immunizations, disease control) may be required, and at what cost to society and the individual?

That is but a modest sampling of the issue/sector-specific policy questions that arise when climate change is introduced as a variable in the long-term planning process. To pose a further challenge, however, is a second level of anticipated impacts and policy responses that transcend the boundaries of any single water use issue or sector. At this level, questions of regional and international significance arise that challenge the very foundation upon which Great Lakes water resource policy has historically been based. Three issues are of predominant concern:

- Climate change scenarios are not Great Lakes-specific; they will reduce water supplies and profoundly effect water usage patterns in non-Basin areas as well. The impact will be particularly severe in areas, such as the southwestern United States, that have long been plagued by extended droughts and dependent upon inter-basin transfer for adequate water supplies. One inevitable consequence is increased pressure for diversions from water-rich regions such as the Great Lakes. Further, low water crises conditions may generate political pressure for diversions into the Basin; such as the GRAND Canal scheme so vehemently opposed in years past. Inter-regional conflict over water diversion, fueled by a real or perceived crisis and past federal court rulings defining water as an article of interstate commerce, will escalate.

It is also likely that the spirit of cooperation and common purpose shared by Great Lakes jurisdictions will be severely tested under climate change-induced water shortages. Recent intra-regional diversion proposals [e.g., Pleasant Prairie (WI), Lowell (IN), Mud Creek (MI)] subjected to the prior notice and consultation process of the 1985 Great Lakes Charter have raised questions concerning the viability of that process, and have strained interstate relations.²¹

In sum, climate change impacts on water supply and availability will exacerbate inter and intra-regional conflict and competition. The nature, profile, complexity and consequence of water resource policy and management in the Great Lakes Basin will be elevated accordingly.

- The philosophical and legal basis of Great Lakes water policy is not one of managing for scarcity and attendant conflict, but one of managing for abundance and, at times, overabundance.²² The Basin's entire institutional infrastructure, policy framework and programmatic orientation reflects this fact. Unlike states in water-scarce regions of the country, Great Lakes jurisdictions (with limited exceptions in some localities) lack the legal framework or administrative structure to allocate water supplies, monitor use, employ real-cost pricing mechanisms, implement conservation practices, or consider water availability and usage as a factor in growth management planning.

The Basin's legal and institutional infrastructure, like the resource user community in general, has evolved on the assumption that lake level/water availability—both seasonally and over the longer term—will vary in a modest and reasonably predictable way. This infrastructure exhibited signs of severe stress during the high lake level years of 1986-87 and, in its current configuration, can be expected to endure a similar degree of stress under low level conditions.

Policy deliberations associated with climate change impacts in the Great Lakes Basin must not regard the current legal institutional framework as either untouchable or immovable. Its ability to facilitate—or propensity to impede—adaptation to climate change impacts must be assessed. If the latter is the case, a fundamental revision to—or outright rejection of—this framework must be considered. The magnitude of such a task must not be underestimated, as decades may be required to effect the transition to a new framework.

- The policy response to climate change will not be limited to governments alone; impacts will ultimately affect all Basin residents. Issues of water availability and environmental quality are important factors in locational decisions for business and industry, and are central to quality of life expectations of Basin residents.²³ Migration and settlement patterns of current and future Basin residents will be affected by changing socio-economic conditions brought on by climate change. Conflicts among resource users competing for once plentiful water supplies will increasingly be played out in the courts. The prospective implementation of mandatory water conservation practices or related resource use restrictions will have widespread behavioral change implications. Given these many and varied implications for those who live and work in the Great Lakes Basin, the acceptance and ultimate success of any adaptive strategy must be grounded in a strong partnership among all Basin stakeholders.

Options for a Policy Response

Many options are available when developing a public policy response to climate change. These can range from outright rejection of the theory itself to prompt and concerted action on the basis of the "worst case" scenario. The imprecision of current general circulation models accounts for the diversity of public policy perspectives at this time; the models do have limitations.²⁴ Their projections are uncertain and cannot be verified; their accuracy at a Basin-specific level is suspect; their reliability is greater on a latitudinal as opposed to longitudinal basis; and they embrace many assumptions concerning current and future climate variability. As a consequence, they are most appropriately viewed as vehicles for describing various likely future scenarios, rather than outright predictions.

One vehicle for addressing Great Lakes water resources issues as they relate to climate change is the 1985 Great Lakes Charter, a "good faith" agreement among the Great Lakes governors and premiers which calls for the development of a comprehensive, coordinated water resources management program. This Great Lakes Water Resources Management Program is needed to provide the research, policy and management framework to enhance regional decisionmaking efforts. As noted earlier, such a program has yet to be developed. This proposed project is directed specifically at resolving this problem through the design and development of a Great Lakes Water Resources Management Program, the expansion and acceleration of regional water use data and collection activities, and the convening of a symposium to strengthen the understanding of climate-human interactions and implications in the Great Lakes Basin.

IV. METHODOLOGY

The proposed project will be undertaken in two distinct yet interrelated phases, each of approximately one year's duration. Phase One focuses on the identification and characterization of the socio-economic dimensions and policy implications of climate fluctuations; three critical steps include a scoping exercise; research and analysis effort; and the planning and conduct of a major symposium comprise the three critical steps. Phase Two has an application orientation; Phase One findings presented in symposium proceedings will provide the basis for the development, refinement and implementation of a Great Lakes Water Resources Management Program. The Program will provide practical guidance to -and a defined

process for- state, federal and provincial agencies that must incorporate climate change fluctuations into their planning, policy and resource management activities. It is envisioned that the Program document and process will also be of interest to nongovernmental organizations, resource users, and others with an interest in the socio-economic dimensions of- and policy responses to- climate fluctuation. Three key steps associated with Phase Two include drafting of the Management Program; interjurisdictional coordination to facilitate refinement and acceptance; and implementation and technical assistance to ensure that the Management Program is incorporated into federal, state, provincial and regional water resource management activities. Additional discussion of each project step is presented below.

Phase One: Characterizing the Socio-economic Dimensions of Climate Fluctuations

The importance of addressing the socio-economic dimensions of climate fluctuations was a recurrent theme at a March 1994 "Great Lakes Climate Change Project" symposium sponsored by NOAA's Great Lakes Environmental Research Laboratory, the Great Lakes Commission and the Cooperative Institute for Limnology and Ecosystems Research. In his opening presentation, Dr. Barry Rubin of Indiana University stated, "Global climate change has been widely discussed in the academic literature and the popular press. Yet beyond sweeping generalizations or lists of possible effects, this discussion has not addressed what global climate change will mean for individuals in specific terms of job losses and gains, wage and income effects, unemployment impacts, or population change." Dr. Rubin argues that three critical research priorities are in need of prompt attention:

- a) documenting economic system and sector trends that determine economic inputs and sensitivities to global change;
- b) focusing studies on economic issues surrounding inputs, consequences, and responses to global change; and
- c) developing interdisciplinary linkages that cross-cut the natural and economic sciences.

These concerns were echoed by Dr. Peter Timmerman of the University of Toronto, who added that "The social dynamics of climate change continue to represent the most intractable area of the climate change issue." On the basis of these and other presentations, the more than seventy symposium participants -all recognized experts in some aspect of climate fluctuation- concluded that an assessment framework is needed to pursue critical questions as to how the socio-economic and policy issues can be fully integrated into climate fluctuation studies to yield guidance to policy practitioners and resource managers.

Phase One activities are designed to meet this challenge. Collectively, the three Phase One steps will provide both the institutional infrastructure and data/information base upon which the socio-economic and policy dimensions can be characterized and translated into application-oriented guidance for governmental jurisdictions and other interested parties.

Step One: Project Scoping

The institutional infrastructure for pursuing the project will be maintained at two levels. First, the Great Lakes Commission principal investigators will work directly with an existing Water Resources Management Committee (WRMC) which includes representatives from the eight Great Lakes states (Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania and Wisconsin) and the two Great Lakes provinces (Ontario and Quebec). The WRMC is a standing Committee of the Council of Great Lakes Governors (with staff support provided by the Great Lakes Commission) and is the body

responsible for advising the Great Lakes Governors and Premiers on water use issues and for implementation of the Great Lakes Charter.

Both the principal investigators and the WRMC will be supported/assisted by an Advisory Committee with membership from various regional interests with special expertise on climate change issues. This will include the Great Lakes states and provinces.

The WRMC will meet on a regular basis with principal investigators; likely 4-6 times over the project's 24 month duration. Meetings with the full Advisory Committee will be scheduled as needed. An initial task will involve project scoping; transforming proposal elements into specific, detailed tasks consistent with the funding and timeline parameters established or approved by the funding entity. Committee formation and project scoping/detailed workplan development will both be completed during the first project quarter.

Step Two: Research and Analysis

With guidance from the WRMC and Advisory Committee, principal investigators at the Great Lakes Commission will assemble and analyze existing literature on climate-human interactions, with an emphasis on Great Lakes Basin experiences. Socio-economic and policy dimensions of climate fluctuation will be distilled from the literature, and research and policy needs identified for consideration in subsequent project steps. A special emphasis will be placed upon the impacts of climate fluctuation on water supplies and availability, and attendant environmental and economic implications.

The research and analysis component will be multi-faceted, consisting of a computerized literature search, review of relevant documents, interviews with leading researchers, policy practitioners and resource managers, and one or more "focus groups" assembled to review research results, interpret them, and define associated policy and management needs for the Great Lakes Basin and beyond. The latter will consist of a subset of WRMC and Advisory Committee members, as well as invited guests with special expertise. Focus group activities will be pursued in a workshop setting.

The computerized literature search will be conducted by the Great Lakes Commission with support from the University of Michigan Library System. This initiative will be augmented by the acquisition and review of relevant reports, with a special emphasis on governmental publications. The Great Lakes Commission will draw heavily on its past involvement in this issue area and its extensive regional/national/international network to ensure that its research acquisition and analysis effort is a comprehensive one.

Step Two activities will yield a descriptive inventory of relevant research materials, accompanied by a summary report documenting research and management needs and priorities associated with the socio-economic dimensions of climate fluctuation. Also included will be a discussion of a framework for the Great Lakes Water Resources Management Program.

Step Three: Symposium on the Socio-Economic and Policy Dimensions of Climate Fluctuation

The Great Lakes Commission will sponsor a major symposium at which the results of research and analysis activities will be presented. This presentation will be accompanied by a series of invited papers specifically designed to address the research and management priorities identified earlier in the project. A draft framework for the Great Lakes Water Resources Management Program will be presented and, through the use of facilitated break-out groups, will provide the vehicle by which participants can translate and apply research findings to existing resource management and policy issues. The objective of

the Program, as stated earlier, is to establish a process by which government jurisdictions (state, federal, provincial, regional) in the Great Lakes Basin can anticipate and adapt to the impacts of climate change through the informed use, development and protection of their shared water resources.

The two-day symposium will target the above-mentioned government jurisdictions (including policymakers, resource managers, economists and social scientists) as well as the array of nongovernmental entities (such as academic institutions, research institutes, industry, citizen organizations, and others) with interest and expertise in the topic. A special effort will be made to involve Canadian representatives presently involved in Environment Canada's Great Lakes Climate Change initiative. A proceedings document will be generated, and include the text of invited papers, summaries of break-out group discussions, the draft framework for the Great Lakes Water Resources Management Program, and findings and recommendations. This document will serve as the basis for much of the Phase Two activities.

Phase Two: From Concept to Application: Incorporating Socio-economic Dimensions of Climate Fluctuation in Great Lakes Policy

As noted in the background statement, the policy implications of climate fluctuation in the Great Lakes Basin are multi-faceted and complex. The significance of these implications is highlighted in the final report of the Levels Reference Study Board (March 1993), which examined the issue of lake level fluctuations at the request of the U.S.- Canada International Joint Commission. The uncertainty associated with future climate fluctuation scenarios prompted the Board to carefully qualify many of its principal recommendations. The Board stated, " There remains a considerable amount of uncertainty in the scientific community over the potential magnitude of specific hydrologic impacts of climate change; however, there is a general consensus that climate change is taking place and that the potential impacts of global warming should be considered in decisions relating to the Great Lakes-St. Lawrence River System." The Board goes on to note that this will require "an improved understanding of social, technological and economic processes" that are contributing factors.

The Great Lakes Basin has often been described as the world's largest freshwater laboratory; a bellwether of scientific inquiry with national and international relevance and applications. The Basin might also be described as the world's largest freshwater laboratory for institutional experimentation and policy inquiry. A resource with multi-jurisdictional and multiple-use characteristics, the Great Lakes region is noted for the strength of its natural resource/socio-economic linkages. Thus, progress in exploring climate-human interactions and associated resource policy and management needs/consequences will have relevance for beyond Basin boundaries. The importance the state, federal and regional agencies place on this issue is by the numerous letters of support included in the appendix to this proposal.

The three steps presented below are designed to address these important socio-economic and policy issues by supporting the development and application of a Great Lakes Water Resource Management Program that provides a framework for assessing and adapting to the impacts of climate fluctuation.

Step Four: Developing a Draft Great Lakes Water Resources Management Program

Products from the initial project steps (i.e., symposium proceedings, associated papers, findings and recommendations) will provide the basis for development of the Great Lakes Water Resources Management Program. The Program will consist of a policy framework document that will establish policies, procedures and guidelines for monitoring Great Lakes water use and availability; assessing future conditions on the basis of available forecasts; implementing a prior notice and consultation process for diversion and consumptive use proposals (consistent with provisions in the 1985 Great Lakes

Charter); coordinating federal, state and provincial policies and programs; ensuring ongoing consideration of, and inquiry into socio-economic dimensions and impacts; and developing adaptive strategies to assist these various jurisdictions and their residents in both reducing and coping with the uncertainties associated with climate fluctuation.

The Great Lakes Water Resources Management Program is appropriately viewed as framework; a living document that will be revised and expanded over time to address evolving needs and acknowledge new information and policy priorities. As such, it will provide a much needed yet previously unavailable focal point to ensure that consideration of the socio-economic dimensions of climate fluctuation is institutionalized within the Great Lakes policy community. Development of the draft Program will be the responsibility of the aforementioned Water Resources Management Committee, which will draw, as needed, from the Advisory Committee.

Step Five: Review and Acceptance of the Great Lakes Water Resource Management Program

The WRMC, assisted by the principal investigators at the Great Lakes Commission, will design and conduct a review process to solicit and incorporate comments on the draft program. The review process will include the Advisory Committee; other relevant federal, state and provincial policymakers; various Basin interests (industry, citizen organizations); appropriate experts from academia; and others with an interest or expertise in the topic. Close coordination will be pursued with the Canadian Climate Change Program at Environment Canada, and with all related efforts that are or will be in place in the United States. A primary objective of the review process is to generate a final draft of the document that is acceptable to the state and provincial jurisdictions responsible for implementing it, consistent with the terms of the 1985 Great Lakes Charter. The review process is anticipated to be multi-faceted, consisting of special presentations to interested groups, hearings for public input, mail distribution, and meetings among state and provincial officials responsible for implementation.

Step Six: Implementation and Technical Assistance

The principal investigators will provide ongoing support and assistance to the WRMC to ensure that the Management Program and related findings and recommendations are considered and incorporated (wherever possible) in state and provincial water resource management and policy activities. This support will continue beyond the project duration, given the Great Lakes Commission's long-term commitment to this critical area of resource management and policy. The WRMC will remain in place as a forum for ongoing consideration, discussion and action on the socio-economic and policy implications of climate fluctuation.

In the area of technical assistance, this step will yield a more complete, accurate and uniform base of data for the Great Lakes Basin through the modification and expansion of a regional water use data base currently housed at, and operated by the Great Lakes Commission.

Technical assistance will also entail working with the Great Lakes states and provinces to pursue several activities needed to accommodate the uncertainties associated with climate fluctuations. These include initiatives to develop consistent and uniform practices to estimate and measure consumptive uses of Great Lakes water, maintaining a forum to discuss and develop water conservation policies, and establishing practices and procedures for identifying and estimating future water demand related to withdrawals, diversions and consumptive uses of Great Lakes water, vis-a vis various climate fluctuation scenarios.

Table 1

**Climate Fluctuations and the Great Lakes Basin:
Socio-economic Dimensions and Policy Implications**

PROJECT BUDGET SUMMARY

ITEM	Year 1	Year 2	Total
1. Personnel/Staff/Salaries			
a. Executive Director (10%)	\$9,500	\$9,950	\$19,450
b. Program Manager, Res. Mgmt. (15%)	7,500	7,800	15,300
c. Program Specialist, Res. Mgmt. (40%)	11,230	11,860	23,090
Sub Total	\$28,230	\$29,610	\$57,840
2. Benefits			
35% of a and b	5,950	6,213	12,163
8% of c	898	950	1,848
Sub Total	\$6,848	\$7,163	\$14,011
3. Travel			
Staff (assistance for 2 members) 2 WRMC/Advisory Committee Meetings @\$200, ¹ 4WRMC/Advisory Committee Meetings @\$50 ²	600	750	1,350
Staff (assistance for 3 members) 1 Symposium @\$50 ²			
Speakers and/or Committee members at each of the above 7 meetings at \$350 each) ³	3,150	4,200	7,350
Sub Total	\$3,750	\$4,950	\$8,700
4. Supplies			
Postage	450	750	1,200
Photocopying ⁴	150	250	400
Office Supplies (Word processing and related writing supplies) ⁵	100	350	450
Sub Total	\$700	\$1,350	\$2,050
5. Printed Materials			
Meeting Materials	500	1,000	1,500
Proceedings Design and Production	-0-	5,000	5,000
Sub Total	\$500	\$6,000	\$6,500
6. Contractual ⁶			
Upgrade and Expansion of Water Use Database	13,500	4,500	18,000
Research and Analysis Support	3,500	5,000	8,500
Sub Total	\$17,000	\$9,500	\$26,500
7. Other			
Meeting Expenses (room rental) ⁷	975	1,300	2,275
Telephone (including conference calls)	700	800	1,500
Sub Total	\$1,675	\$2,100	\$3,775
TOTAL DIRECT COSTS	\$58,703	\$60,673	\$119,376
TOTAL INDIRECT COSTS			
34% of Project Costs excluding travel and contractual ⁸	\$12,904	\$15,716	\$28,620
TOTAL GRANT REQUEST	\$71,607	\$76,389	\$147,996
NON FEDERAL MATCH (5%) (Program Specialist, Commission 10%)⁹	\$3,769	\$4,021	\$7,790
TOTAL PROJECT COSTS	\$75,376	\$80,410	\$155,786

BUDGET FOOTNOTES

1. Staff Travel to Chicago for two members @ \$200 each. Based on average air fares from Detroit to Chicago.
2. Staff Travel to Detroit/Ann Arbor @\$50 each. Based on Commission per Diem.
3. Non-federal Speaker and/or Committee member travel to meetings @\$350 each. Based on average estimated air fare to Detroit/Chicago from various locations around the Basin.
4. Photocopying estimates based on \$.05 per copy.
5. Includes pens, pencils, paper clips, notepads, computer diskettes, etc.
6. Subcontractors will be selected on a competitive basis.
7. Based on average meeting room rental cost of \$325 for Detroit/Chicago.
8. The Great Lakes Commission uses an indirect cost recovery rate of 34% of total project costs, excluding travel and consultants. This rate has been submitted for approval and has been accepted on a provisional basis by numerous federal agencies.
9. Personnel/staff/salaries
 - a) Program Manager, Communications (10%)
 - Year 1 - \$2,450
 - Year 2 - \$2,614
 - b) Benefits (35% of a)
 - Year 1 - \$1,319
 - Year 2 - \$1,407Total Match \$7,790

Table 2

**Climate Fluctuations and the Great Lakes Basin:
Socio-economic Dimensions and Policy Implications**

**Task and Activity Timeline
(by Quarter)**

Task	1	2	3	4	5	6	7	8
1. Project Scoping/Plan Initial Meeting/ WRMC/Advisory Committee	X							
Phase One								
2. Initial Meeting; WRMC and Advisory Committee	X							
3. Background Research/Literature Review	X			X				
4. Upgrade/Expand Regional Water Use Database		X		X				
5. Preparation of Summary Report on Research/ Management Needs			X		X			
6. 2nd Meeting; WRMC			X					
7. Symposium Planning		X		X				
8. Development of Water Resources Mgmt. Program Framework/Outline		X			X			
9. 3rd Meeting; WRMC				X				
10. Symposium Conduct					X			
Phase Two								
11. Preparation of Symposium Proceedings					X		X	
12. Preparation of Draft Water Resources Mgmt. Program					X	X		
13. 4th Meeting; WRMC and Advisory Committee						X		
14. Review of Draft Water Resources Mgmt. Program						X		
15. 5th Meeting; WRMC							X	
16. Revise and Circulate Final Draft Program to Jurisdictions for Approval						X	X	
17. Print and Distribute Symposium Proceedings							X	X
18. Project Implementation: Identification of Issues for WRMC Action								X
19. Final Meeting; WRMC and Advisory Committee								X
20. Approval of Final Water Resource Management Program								X

VII. KEY PERSONNEL

Project oversight and coordination will be provided by the Great Lakes Commission staff under the direction of Dr. Michael J. Donahue, Executive Director. Project management will be provided by Thomas Crane, Program Manager, Resource Management and Environmental Quality. Other project personnel will include a Program Specialist, a Research Associate and support from administrative and secretarial staff as needed. Consultants will be secured to upgrade the water use database, and to assist in the review, analysis and implementation of the socio-economic literature.

Dr. Michael J. Donahue, has been the Executive Director of the Great Lakes Commission since 1987. He will provide project oversight and contribute to all aspects of project research, design and conduct. Dr. Donahue has fifteen years of experience in water resources policy, planning and management issues. He has authored many papers and given numerous presentations on a variety of water resources and climate change topics. Dr. Donahue is an Advisor to Environment Canada's binational Climate Change Program and has worked closely with NOAA's Great Lakes Environmental Research Laboratory on the development of the U.S. component of the binational program. Donahue holds a Ph.D. degree in Urban, Technological and Environmental Planning from the University of Michigan. He is an Adjunct Assistant Professor in the University of Michigan's School of Natural Resources and Environment where he designs and teaches courses in regional water resources policy and management.

Thomas R. Crane, was hired as the Commission's Natural Resources Management Specialist in 1986 and appointed as Program Manager for Resource Management and Environmental Quality in 1990. Mr. Crane will provide project management services to this project. Mr. Crane has served as Secretariat to the Water Resources Management Committee since 1986 and has managed the Regional Water Use Database since it became operational in 1988. Mr. Crane has provided lead staff support to Great Lakes Commission Task Forces on Lake Levels, Flooding and Shoreline Erosion and Drought Management. Mr. Crane holds a Master's degree in Water Resources Management from the University of Michigan. A multi-jurisdictional project team consisting of water resources and policy experts from state, provincial and federal agencies will provide project oversight and guide Commission staff in the conduct of project activities. A formal body which includes many of these key individuals is already in place as the Water Resources Management Committee (WRMC) of the Council of Great Lakes Governors to serve this function. The WRMC consists of state and provincial water resources/policy experts appointed by the Great Lakes governors and premiers to advise them on Great Lakes water quantity issues and advance the recommendations of the Great Lakes Charter. (See Attachment #1). An Advisory Committee consisting of other Great Lakes water resources and climate change experts from both the U.S. and Canada, representatives from industry, citizen groups and academia will advise the WRMC on the development of the Great Lakes Water Resources Management Program.

APPENDIX

1. Footnotes
2. Letters of Support
3. Principal Investigations - Curriculum Vitae
4. Members, Water Resources Management Committee
5. Organizational Background - Great Lakes Commission

FOOTNOTES

1. Donahue, Michael J. (1987). Institutional Arrangements for Great Lakes Management: Past Practices and Future Alternatives. Chapter Two: "The Great Lakes Ecosystem: Placing the Physical Resource and Management Framework in Perspective." Michigan Sea Grant College Program, MICHU-SG-87-200T. Ann Arbor, Michigan.
2. Great Lakes Basin Commission (1979). Great Lakes Fact Sheets. Ann Arbor, Michigan.
3. Schenker, Eric, H.N. Mayer and H.C. Brockel (1976). The Great Lakes Transportation System. University of Wisconsin Sea Grant College Program. Technical Report 230. Madison, Wisconsin.
4. Great Lakes Commission (1993). Annual Report of the Great Lakes Regional Water Use Data Base. Ann Arbor, Michigan.
5. Supra Note 1.
6. St. Lawrence Seaway Development Corporation (1984). "The Seaway." Seaway Review, July-August.
7. Talhelm, Daniel R. (1981). Current Estimates of Great Lakes Fisheries Values: 1979 Status Report (1981 Update). Great Lakes Fishery Commission, Ann Arbor, Michigan.
8. Quinn, Frank H. (1992). "The Sensitivity of Water Resource Management to Climate Change: A Great Lakes Case Study." Great Lakes Environmental Research Laboratory, National Oceanic and Atmospheric Administration. Ann Arbor, Michigan. 13 pp.
9. Ohio Sea Grant College Program (1991). Global Change in the Great Lakes: Scenarios. NA90AA-D-SG496, project E/AID-2. Columbus, Ohio.
10. U.S. Environmental Protection Agency (1989). The Potential Effects of Global Climate Change on the United States. Report to Congress, J.B. Smith and D.A. Tirpak, eds. EPA-230-05-89-050. Washington, D.C.
11. Supra Note 10.
12. Croley, Thomas E. II (1990). "Laurentian Great Lakes Double CO₂ Climate Change Hydrological Impacts," Climate Change 17:27-47.
13. Assel, R.A., C.R. Snider, and R. Lawrence (1985). "Comparison of 1983 Great Lakes Winter Weather and Ice Conditions with Previous Years." Monthly Weather Review, Vol. 113.
14. Supra Note 14
15. Canadian Climate Program Board (1991). "Climate Change and Canadian Impacts: The Scientific Perspective." 30 pp. Prepared for Climate Change Digest, Atmospheric Environment Service, Environment Canada.
16. Koshida, Grace and B.N. Mills (1993). Climate Sensitivities, Variability and Adaptation Issues in the Great Lakes-St. Lawrence Basin: A Reference Document (Draft). Atmospheric Environment

Service, Environment Canada, Downsview, Ontario. 43 pp.

17. Supra Notes 10, 15 and 16.
 18. Ohio Sea Grant College Program (1991). "Will Biological Diversity in the Great Lakes Region Suffer?" Scenario #2 in Global Change in the Great Lakes: Scenarios. NA90AA-D-SG 496, project E/AID-2. Columbus, Ohio.
 19. Supra Notes 9, 10, 15 and 16.
 20. Supra Notes 9, 10, 15 and 16.
 21. Injerd, Daniel (1993). "Managing Great Lakes Water Diversion: A Diversion Manager's Viewpoint." Buffalo Environmental Law Journal. Fall, 1993. Vol. 1, No.2 pp. 299-305. Buffalo, New York.
 22. Supra Note 1.
 23. Great Lakes Commission (1992). Liquid Asset: Great Lakes Water Quality and Industry Needs. Ann Arbor, Michigan.
 24. Supra Note 16.
-
1. Staff Travel to Chicago for two members @ \$200 each. Based on average air fares from Detroit to Chicago.
 2. Staff Travel to Detroit/Ann Arbor @\$50 each. Based on Commission per Diem.
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 - Year 2 - \$2,614
 - b) Benefits (35% of a)
 - Year 1 - \$1,319
 - Year 2 - \$1,407
- Total Match \$7,790



Illinois Department of Transportation

Division of Water Resources
3215 Executive Park Drive / P.O. Box 19484 / Springfield, Illinois / 62794-9484
Telephone 217/782-2152

August 1, 1994

AUG 3 1994

Mr. Joseph K. Hoffman
Chairman
Great Lakes Commission
The Argus II Building
400 Fourth Street
Ann Arbor, Michigan 48103-4816

Dear Mr. Hoffman:

Joe

I would like to convey Illinois' interest and support for the Great Lakes Commission's project proposal entitled "Climate Fluctuations and the Great Lakes Basin: Socio-economic Dimensions and Policy Implications." In addition to furthering our understanding of the impacts that climate change will have on the Great Lakes, this project will also address the need for the Great Lakes region to complete the Great Lakes Water Resources Management Program, as called for in the Great Lakes Charter.

The Illinois Division of Water Resources would be pleased to work with the Commission on this project and stands ready to provide in-kind support. I welcome the Commission's involvement in this project and hope that this proposal is funded this fiscal year. Please feel free to contact me if I can be of any further assistance to the Commission in this matter.

Sincerely,

A handwritten signature in black ink, appearing to read "Donald R. Vonnahme".

Donald R. Vonnahme
Director



OFFICE OF THE GOVERNOR

INDIANAPOLIS, INDIANA 46204-2797

EVAN BAYH
GOVERNOR

April 4, 1994

Mr. Joseph K. Hoffman
Great Lakes Commission
The Argus II Building
400 Fourth Street
Ann Arbor, MI 48103-4816

Dear Joseph:

Thank you for your letter soliciting my support of the efforts of the Great Lakes Commission and the Water Resource Management Committee to seek funds for developing a framework for a Basin Water Resources Management Program.

Both the Indiana Department of Natural Resources and I support this important initiative. In signing the Great Lakes Charter, Indiana committed to the development of a regional water resource management plan for the Great Lakes Basin including the collection of water use data. This commitment was made in recognition of the fact that such a plan was absolutely essential to making decisions regarding water use issues such as diversion proposals, new consumptive use proposals and lake level management scenarios. Informed decision making is absolutely essential in evaluating these issues which could potentially impact commercial shipping, industry, power generation, commercial, and sport fishing, public water supply, wetlands, and wildlife habitats throughout the entire Great Lakes region.

Unfortunately, very little progress has been made in the development of a plan. Indiana's experience in 1991 and 1992 with the proposed diversion of 1.7 million gallons of water per day from Lake Michigan to meet the water supply needs of the Town of Lowell, Indiana has greatly increased our awareness of the need to expeditiously develop a management framework within which future diversion proposals could be judged. The Lowell proposal was reviewed by representatives of the Great Lakes States and Canadian Provinces and several environmental groups. Most of these individuals noted that the impact of the Lowell proposal itself would be immeasurable. However, the expressed concern that approval would set a dangerous precedent that might reduce the ability of the Great Lakes community to disapprove future diversion proposals that individually or cumulatively would have

Mr. Joseph K. Hoffman
April 4, 1994
Page 2

negative impacts on the Great Lakes water resource. The proposal was finally disapproved; however, we continue to question whether the reasons offered for the disapproval provide a legally defensible basis for considering future proposals or represent good management of the basin's water resource.

It is almost certain that new or increased diversions and/or consumptive uses of the waters of the Great Lakes will be proposed. Despite a general consensus that a better framework must be developed for considering such proposals, little if any progress has been made since the Lowell situation. A method must be developed whereby these proposals can be evaluated and their impacts to the Great Lakes System assessed. The development of a regional Great Lakes' water resource management plan is critical to this effort. Continued delay in initiating this program proposal will hamper our abilities to develop a reasoned and legally defensible management strategy for the Great Lakes water resource.

As you know, Mr. James Hebenstreit of the Indiana Department of Natural Resources serves as Indiana's representative on the Water Resource Management Committee. In his role as Assistant Director of the Department's Division of Water, he has worked to insure the enhancement of Indiana's water use and reporting system since its beginning in 1984 and will continue to do so to meet the needs of the Great Lakes Regional Data Base. He will continue to actively participate in the work of the Water Resources Management Committee and advise his superiors and my office of any policy issues under discussion.

In closing, let me reiterate my support of the Commission's efforts to undertake this important task. If I can be of further assistance in obtaining funding for this much needed project, please let me know.

Sincerely,



Evan Bayh

EB/MSD/tr



STATE OF MICHIGAN



JOHN ENGLER, Governor

DEPARTMENT OF NATURAL RESOURCES

Stevens T. Mason Building, P.O. Box 30028, Lansing, MI 48909

ROLAND HARMES, Director

NATURAL RESOURCES
COMMISSION

JERRY C. BARTNIK
LARRY DEVUYST
PAUL EISELE
JAMES P. HILL
DAVID HOLLI
JOEY M. SPANO
JORDAN B. TATTER

July 28, 1994

Mr. Joseph K. Hoffman, Chairman
Great Lakes Commission
The Argus II Building
400 Fourth Street
Ann Arbor, MI 48103-4370

Dear Mr. Hoffman:

I am pleased to offer support of the Great Lakes Commission's proposal to NOAA's, Office of Global Programs, titled "Climate Fluctuations and the Great Lakes Basin: Socio-Economic Dimensions and Policy Implications." This project will provide a valuable contribution to the development of a comprehensive, coordinated Water Resources Management Program called for by the Great Lakes Charter. The proposal offers an opportunity to assemble and analyze the available information on climate change effects to water resources in the Great Lakes Basin. This information will then be utilized to help guide important policy and management deliberations in the region, to be sponsored by the Commission as a part of this project. A framework for the Great Lakes Water Resources Management Program will be developed, along with much needed improvements to the regional water use database. These efforts are very important to the long-term protection and management of the Great Lakes.

The Office of the Great Lakes will support this project through its participation in the discussions anticipated with this proposal. We look forward to working with the Great Lakes Commission staff on this project.

If you have any questions, please feel free to contact me, or Sharon Hanshue of my staff at 517-335-4058.

Sincerely,

A handwritten signature in black ink, appearing to read "G. Tracy Mehan, III".

G. Tracy Mehan, III
Director
Office of the Great Lakes
517-335-4056

cc: Sharon Hanshue





STATE OF
MINNESOTA
DEPARTMENT OF NATURAL RESOURCES

500 LAFAYETTE ROAD • ST. PAUL, MINNESOTA • 55155-40 32

DNR INFORMATION
(612) 296-6157

August 4, 1994

Joseph K. Hoffman, Chair
Great Lakes Commission
The Argus II Building
400 Fourth Street
Ann Arbor, MI 48103-4816

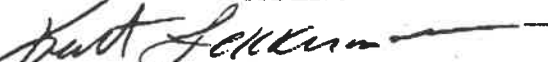
Dear Mr. Hoffman:

**PROJECT PROPOSAL CLIMATE FLUCTUATIONS AND THE GREAT LAKES BASIN:
SOCIO-ECONOMIC DIMENSIONS AND POLICY IMPLICATIONS**

The Minnesota Department of Natural Resources believes that the proposed project will help identify components that need to be included in a water resources management program. The Department will continue to provide water use data that can be used in the project. Additional effort related to the proposed project will have to be provided by telephone and review of material. Due to our current budget situation we will not be able to commit to increased out-of-state travel.

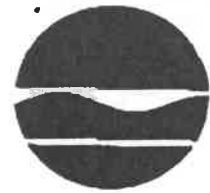
The Division of Waters will be the primary contact for the Department of Natural Resources. You can reach me or Jim Japs at the above address or by telephone at 612/296-4810.

Sincerely,
• DIVISION OF WATERS


Kent Lokkesmoe
Director

KL/JJ:fw

New York State Department of Environmental Conservation
Office of Policy and Program Analysis - Room 601
50 Wolf Road, Albany, New York 12233-1250
(518) 457-6610



Langdon Marsh
Commissioner

Mr. Joseph K. Hoffman
Chair,
Great Lakes Commission
The Argus II Building
400 Fourth St.
Ann Arbor, MI 48103-4816

August 4, 1994

Dear Mr. Hoffman:

This letter is written in support of the Great Lakes Commission's funding proposal titled: *Climate Fluctuations and the Great Lakes Basin: Socio-Economic Dimensions and Policy Implications*, that you are sending to NOAA's Office of Global Programs for consideration. If funded, this proposal will allow the Great Lakes Commission to begin identifying components of a water resources management program for the Great Lakes Basin that will relate policy development and socio-economic concerns to climate change.

We are particularly interested in the support of the Water Resources Management Committee under this project and the subsequent development of a Great Lakes Water Resources Management Program. As noted in the proposal, this should include a process for developing consistent, uniform practices to evaluate consumptive uses of Great Lake water and establishing procedures for identifying and evaluating future water demand related to withdrawals, diversions and consumptive uses under various climate change scenarios.

We welcome the Commission's leadership on this proposal and appreciate the opportunity to be active participants in the project, if funded.

Sincerely,

Gerald F. Mikol
Great Lakes/Lake Champlain
Programs Coordinator



George V. Voinovich • Governor
Frances S. Buchholzer • Director

August 1, 1994

Mr. Joseph K. Hoffman
Chair, Great Lakes Commission
The Argus II Building
400 Fourth Street
Ann Arbor, Michigan 48103-4816

Dear Mr. Hoffman:

This letter is in regard to the Great Lakes Commission (GLC) proposal entitled "Climate Fluctuations and the Great Lakes Basin: Socio-Economic Dimensions and Policy Implications" which has been prepared for submission to the National Oceanic and Atmospheric Administration's Office of Global Problems. I want to voice my strong support for this proposed project and commend the GLC staff for its fine work in developing the proposal.

The State of Ohio has expressed its commitment for continued involvement with the Great Lakes Water Management Committee and its recommendation for the development of a Great Lakes Basin Water Management Program. Because this proposed project would establish a process by which government jurisdictions could anticipate and adapt to climate change through the informed use, development, and protection of their shared water resources, it would serve as the initial framework of a Basin Water Management Program. As such, it should be given a high priority for implementation.

Thank you for the opportunity to comment on this proposal. I look forward to our future involvement with the GLC and the other Great Lakes states and provinces in implementing the proposed project, if funded.

Sincerely,



FRANCES S. BUCHHOLZER
Director

FSB\LPB\eh



DEPARTMENT OF THE ARMY
NORTH CENTRAL DIVISION, CORPS OF ENGINEERS
111 NORTH CANAL STREET
CHICAGO, ILLINOIS 60606-7205

AUG 3

August 1, 1994

REPLY TO
ATTENTION OF:

Policy and Long Range
Planning Branch

Mr. Joseph K. Hoffman
Chairman
Great Lakes Commission
400 Fourth Street
Ann Arbor, Michigan 48103-4816

Dear Mr. Hoffman:

Your proposal to the Climate and Global Change Program, "Climate fluctuations and the Great Lakes Basin: Socio-Economic Dimensions and Policy Implications," is timely and would provide essential information for the Great Lakes Water Resources Management Program. Considerable information relevant to this project is available from the recent International Joint Commission Water Levels Reference and it would be appropriate to take direct advantage of the data and findings.

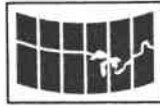
The project goals and objectives would be of value to many of the Corps' efforts on the Great Lakes, such as water level management, consumptive uses, navigation, flood damage reduction, and our damage reporting system for flooding and erosion along the Great Lakes shoreline.

A coordinated management program for responding to climate change on the Great Lakes will help to ensure the optimum use of agency resources, which is essential during these times of stringent budgets in both the public and private sectors. We strongly support your proposal.

Sincerely,

A handwritten signature in cursive script, reading "Dudley M. Hanson", is written over a circular stamp.

Dudley M. Hanson, P.E.
Director, Engineering and
Planning Directorate



International Joint Commission
Commission mixte internationale

July 25, 1994

Mr. Joseph K. Hoffman
Chairman, Great Lakes Commission
The Argus II Building
400 4th St.
Ann Arbor, Michigan 48103-4816

Dear Mr. Hoffman:

As Director of the Great Lakes Regional Office of the International Joint Commission, I support the proposed *Climate Fluctuations and the Great Lakes Basin: Socio-economic Dimensions and Policy Implications* project.

The implications from climate change on the integrity of the Great Lakes has been considered an important priority by the International Joint Commission. The work outlined in the project proposal compliments the interest and activities of the International Joint Commission in the climate change issue. The involvement of the IJC in overseeing the actions of the U.S. and Canada in meeting their commitments under the Great Lakes Water Quality Agreement has reinforced the significance of the Great Lakes to both countries and heightened awareness of the impact that climate change could have on this great resource.

This office supports your proposal, and look forward to being kept informed as it progresses.

Very truly yours,

Douglas McTavish

DAM:sk

GREAT LAKES WATER RESOURCES MANAGEMENT COMMITTEE

ILLINOIS

Mr. Daniel Injerd, Chief
Lake Michigan Mgmt. Section
Illinois Dept. of Transportation
310 S. Michigan Ave., 10th Floor
Chicago IL 60604
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Fax: (312) 793-5968

INDIANA

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MICHIGAN

Ms. Sharon Hanshue
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NEW YORK

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Policy Analysis Division
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Executive Assistant
Ohio Water Development Authority
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Fax: (614) 644-9964

Mr. Leonard Black
Ohio DNR, Division of Water
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PENNSYLVANIA

Mr. Joseph K. Hoffman
Assistant Director
Bureau of Water Supply & Comm.
Health
PA Dept. of Envir. Resources
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WISCONSIN

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Bureau of Water Resources Mgmt.
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Ph: (608) 266-1955

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Ms. Gail Beggs, Director
Aquatic Ecosystems Branch
Ontario MNR
90 Sheppard Ave. East
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Fax: (416) 314-1140

Mr. John Kinkead, Manager
Water Mgmt. & Conservation
Authorities Section
Aquatic Ecosystem Branch
Ontario MNR, 5th Floor
90 Sheppard Ave., E.
N. York, ONT M2N 3A1
Ph: (416) 314-1978
Fax: (416) 314-1995

QUEBEC

Mr. Andre Carpentier
Direction de l'hydraulique
Environnement Quebec
2360 chemin, Sainte Foy
1e etage, boite 29
Sainte Foy, Quebec G1V 4H2
Ph: (418) 644-3430
Fax: (418) 643-6900

GREAT LAKES COMMISSION

Mr. Thomas Crane, Program Manager
Resource Mgmt & Environmental
Quality
Argus II Building
400 Fourth St.
Ann Arbor, MI 48103
Ph: (313) 665-9135
Fax: (313) 665-4370

COUNCIL OF GREAT LAKES
GOVERNORS

Ms. Cristena Bach
Executive Director
Council of Great Lakes Governors
35 East Wacker Dr.
Suite 1850
Chicago, IL 60601
(312) 407-0177

8-4-94



The Argus II Building □ 400 Fourth St., Ann Arbor, Michigan 48103-4816
Office (313) 665-9135 □ Fax (313) 665-4370

EXECUTIVE DIRECTOR
MICHAEL J. DONAHUE, Ph.D.

OVERVIEW

The Great Lakes Commission is an interstate compact commission comprised of gubernatorially appointed and legislatively mandated representatives of the eight Great Lakes states. Established by joint legislative action of the Great Lakes States in 1955 and granted Congressional consent in 1968, the Great Lakes Commission seeks "to promote the orderly, integrated, and comprehensive development, use and conservation of the water resources of the Great Lakes Basin" (Article I, Great Lakes Basin Compact). Objectives associated with this overall goal, as stated in the Compact, include:

1. To plan for the welfare and development of the water resources of the Basin as a whole as well as for those portions of the Basin which may have problems of special concern.
2. To make it possible for the states of the Basin and their people to derive the maximum benefit from utilization of public works, in the form of navigational aids or otherwise, which may exist or which may be constructed from time to time.
3. To advise in securing and maintaining a proper balance among industrial, commercial, agricultural, water supply, residential, recreational, and other legitimate uses of the water resources of the Basin.
4. To establish and maintain an intergovernmental agency to the end that the purposes of this compact may be accomplished more effectively.*

The Commission pursues this broad mandate via three principal functions: 1) information sharing among the Great Lakes states; 2) coordination of state positions on issues of regional concern; and 3) advocacy of those positions on which the states agree.

The Commission addresses a range of issues involving environmental protection, resource management, transportation and economic development. A committee and task force structure, in which Commissioners and Advisors from all states participate, is the vehicle for identifying and developing issues, and subsequently recommending the adoption of positions by the full membership. Federal and provincial observers are invited to participate, but do not vote, in many Commission activities.

The Great Lakes Commission is the only Great Lakes organization with a statutory mandate to represent the collective views of the eight Great Lakes states. As such, the Commission's structure, program and staff is determined by, and solely accountable to, its member states. The Commission is based in Ann Arbor, Michigan.



The Argus II Building □ 400 Fourth St., Ann Arbor, Michigan 48103-4816
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EXECUTIVE DIRECTOR
MICHAEL J. DONAHUE, Ph.D.

FUNCTIONS

The Great Lakes Commission, by virtue of the provisions of the Great Lakes Basin Compact, is empowered to pursue a range of functions consistent with its mandate. These functions are broadly defined in the Compact itself and have evolved over time on the basis of interpretation by the parties to the Compact. The three broad functional areas are presented below.

1. **Information Sharing.** The Commission serves as a clearinghouse for Great Lakes-related information of interest to its member states and other government entities, interest groups, organizations and individuals in the region. Although diverse, such information is generally oriented toward pertinent state and federal legislative, policy and program initiatives, impending Congressional actions, and resource-based problems and opportunities in the region. This information-sharing function serves two essential functions. First, it provides a formalized network for information exchange and education among Basin jurisdictions and other interested organizations and individuals; it promotes a regional consciousness and identity. Second, this function serves as a vehicle for early identification of regional issues warranting further consideration and subsequent action by the Commission.
2. **Coordination of State Positions on Issues of Regional Concern.** The Commission identifies issues of potential regional concern, prepares and disseminates descriptive and/or analytical materials, facilitates discussion of such issues and, where appropriate, implements collective actions. In so doing, the Commission functions as a "forum" in which the universe of regional issues is screened, reduced to a prioritized subset, and subjected to intensive review by the member states.
3. **Advocacy of Positions.** A third principal function of the Commission is to advocate those positions on which a majority of the member states agree. The Commission has historically been oriented toward a resolution format for its policy positions, augmenting such with prepared testimony and related correspondence. Advocacy efforts have been targeted primarily at the federal level, including the Great Lakes Congressional Delegation, pertinent House and Senate committees/subcommittees, and pertinent federal officials.

GREAT LAKES BASIN COMPACT

(With State & Federal Legislative History)

Reprinted by

**Great Lakes Commission
The Argus II Building
400 Fourth Street
Ann Arbor, MI 48103-4816**

GREAT LAKES BASIN COMPACT

The party states solemnly agree:

ARTICLE I

The purposes of this compact are, through means of joint or cooperative action:

1. To promote the orderly, integrated, and comprehensive development, use, and conservation of the water resources of the Great Lakes Basin (hereinafter called the Basin).
2. To plan for the welfare and development of the water resources of the Basin as a whole as well as for those portions of the Basin which may have problems of special concern.
3. To make it possible for the states of the Basin and their people to derive the maximum benefit from utilization of public works, in the form of navigational aids or otherwise, which may exist or which may be constructed from time to time.
4. To advise in securing and maintaining a proper balance among industrial, commercial, agricultural, water supply, residential, recreational, and other legitimate uses of the water resources of the Basin.
5. To establish and maintain an intergovernmental agency the end that the purposes of this compact may be accomplished more effectively.

ARTICLE II

- A. This compact shall enter into force and become effective and binding when it has been enacted by the legislatures of any four of the States of Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin and thereafter shall enter into force and become effective and binding as to any other of said states when enacted by the legislature thereof.
- B. The Province of Ontario and the Province of Quebec, or either of them, may become states party to this compact by taking such action as their laws and the laws of the Government of Canada may prescribe for adherence thereto. For the purposes of this compact the word 'state' shall be construed to include a Province of Canada.

ARTICLE III

The Great Lakes Commission created by Article IV of this compact shall exercise its powers and perform its functions in respect to the Basin which, for the purposes of this compact shall consist of so much of the following as may be within the party states:

1. Lakes Erie, Huron, Michigan, Ontario, St. Clair, Superior, and the St. Lawrence River, together with any and all natural or manmade water interconnections between or among them.
2. All rivers, ponds, lakes, streams, and other watercourses which, in their natural state or in their prevailing conditions, are tributary to Lakes Erie, Huron, Michigan, Ontario, St. Clair, and Superior or any of them or which comprise part of any watershed draining into any of said lakes.

ARTICLE IV

- A. There is hereby created an agency of the party states to be known as The Great Lakes Commission (hereinafter called the Commission). In that name the Commission may sue and be sued, acquire, hold and convey real and personal property and any interest therein. The Commission shall have a seal with the words 'The Great Lakes Commission' and such other design as it may prescribe engraved thereon by which it shall authenticate its proceedings. Transactions involving real or personal property shall conform to the laws of the state in which the property is located, and the Commission may by by-laws provide for the execution and acknowledgement of all instruments in its behalf.
- B. The Commission shall be composed of not less than three commissioners nor more than five commissioners from each party state designated or appointed in accordance with the law of the state which they represent and serving and subject to removal in accordance with such law.
- C. Each state delegation shall be entitled to three votes in the Commission. The presence of commissioners from a majority of the party states shall constitute a quorum for the transaction of business at any meeting of the Commission. Actions of the Commission shall be by a majority of the votes cast except that any recommendations made pursuant to Article VI of this compact shall require an affirmative vote of not less than a majority of the votes cast from each of a majority of the states present and voting.
- D. The commissioners of any two or more party states may meet separately to consider problems of particular interest to their states but no action taken at any such meeting shall be deemed an action of the Commission unless and until the Commission shall specifically approve the same.
- E. In the absence of any commissioner, his vote may be cast by another representative or commissioner of his state provided that said commissioner or other representative casting said vote shall have a written proxy in proper form as may be required by the Commission.
- F. The Commission shall elect annually from among its members a chairman and vice-chairman. The Commission shall appoint an Executive Director who shall also act as secretary-treasurer, and who shall be bonded in such amount as the Commission may require. The Executive Director shall serve at the pleasure of the Commission and at such compensation and under such terms and conditions as may be fixed by it. The Executive Director shall be custodian of the records of the Commission with authority to affix the Commission's official seal and to attest to and certify such records or copies thereof.
- G. The Executive Director, subject to the approval of the Commission in such cases as its by-laws may provide, shall appoint and remove or discharge such personnel as may be necessary for the performance of the Commission's function. Subject to the aforesaid approval, the Executive Director may fix their compensation, define their duties, and require bonds of such of them as the Commission may designate.
- H. The Executive Director, on behalf of, as trustee for, and with the approval of the Commission, may borrow, accept, or contract for the services of personnel from any state or government or any subdivision or agency thereof, from any inter-governmental agency, or from any institution, person, firm or corporation; and may accept for any of the Commission's purposes and functions under this compact any and all donations, gifts, and grants of money, equipment, supplies, materials, and services from any state or government or any subdivision or agency thereof or inter-governmental agency or from any institution, person, firm or corporation and may receive and utilize the same.

- I. The Commission may establish and maintain one or more offices for the transacting of its business and for such purposes the Executive Director, on behalf of, as trustee for, and with the approval of the Commission, may acquire, hold and dispose of real and personal property necessary to the performance of its functions.
- J. No tax levied or imposed by any party state or any political subdivision thereof shall be deemed to apply to property, transactions, or income of the Commission.
- K. The Commission may adopt, amend and rescind by-laws, rules and regulations for the conduct of its business.
- L. The organization meeting of the Commission shall be held within six months from the effective date of the compact.
- M. The Commission and its Executive Director shall make available to the party states any information within its possession and shall always provide free access to its records by duly authorized representatives of such party states.
- N. The Commission shall keep a written record of its meetings and proceedings and shall annually make a report thereof to be submitted to the duly designated official of each party state.
- O. The Commission shall make and transmit annually to the legislature and Governor of each party state a report covering the activities of the Commission for the preceding year and embodying such recommendations as may have been adopted by the Commission. The Commission may issue such additional reports as it may deem desirable.

ARTICLE V

- A. The members of the Commission shall serve without compensation, but the expenses of each commissioner shall be met by the state which he represents in accordance with the law of that state. All other expenses incurred by the Commission in the course of exercising the powers conferred upon it by this compact, unless met in some other manner specifically provided by this compact, shall be paid by the Commission out of its own funds.
- B. The Commission shall submit to the executive head or designated officer of each party state a budget of its estimated expenditures for such period as may be required by the laws of that state for presentation to the legislature thereof.
- C. Each of the Commission's budgets of estimated expenditures shall contain specific recommendations of the amount or amounts to be appropriated by each of the party states. Detailed commission budgets shall be recommended by a majority of the votes cast, and the costs shall be allocated equitably among the party states in accordance with their respective interests.
- D. The Commission shall not pledge the credit of any party state. The Commission may meet any of its obligations in whole or in part with funds available to it under Article IV(H) of this compact, provided that the Commission takes specific action setting aside such funds prior to the incurring of any obligations to be met in whole or in part in this manner. Except where the Commission makes use of funds available to it under Article IV(H) hereof, the Commission shall not incur any obligations prior to the allotment of funds by the party states adequate to meet the same.

- E. The Commission shall keep accurate accounts of all receipts and disbursements. The receipts and disbursements of the Commission shall be subject to the audit and accounting procedures established under the by-laws. However, all receipts and disbursements of funds handled by the Commission shall be audited yearly by a qualified public accountant and the report of the audit shall be included in and become a part of the annual report of the Commission.
- F. The accounts of the Commission shall be open at any reasonable time for inspection by such agency, representative or representatives of the party states as may be duly constituted for that purpose and by others who may be authorized by the Commission.

ARTICLE VI

The Commission shall have power to:

- A. Collect, correlate, interpret, and report on data relating to the water resources and the use thereof in the Basin or any portion thereof.
- B. Recommend methods for the orderly, efficient, and balanced development, use and conservation of the water resources of the Basin or any portion thereof to the party states and to any other governments or agencies having interests in or jurisdiction over the Basin or any portion thereof.
- C. Consider the need for and desirability of public works and improvements relating to the water resources in the Basin or any portion thereof.
- D. Consider means of improving navigation and port facilities in the Basin or any portion thereof.
- E. Consider means of improving and maintaining the fisheries of the Basin or any portion thereof.
- F. Recommend policies relating to water resources including the institution and alteration of flood plain and other zoning laws, ordinances and regulations.
- G. Recommend uniform or other laws, ordinances, or regulations relating to the development, use and conservation of the Basin's water resources to the party states or any of them and to other governments, political subdivisions, agencies of inter-governmental bodies having interests in or jurisdiction sufficient to affect conditions in the Basin or any portion thereof.
- H. Consider and recommend amendments or agreements supplementary to this compact to the party states or any of them, and assist in the formulation and drafting of such amendments or supplementary agreements.
- I. Prepare and publish reports, bulletins, and publications appropriate to this work and fix reasonable sales prices therefore.
- J. With respect to the water resources of the Basin or any portion thereof, recommend agreements between the governments of the United States and Canada.
- K. Recommend mutual arrangements expressed by concurrent or reciprocal legislation on the part of Congress and the Parliament of Canada including but not limited to such agreements and mutual arrangements as are provided for by Article XIII of the Treaty of 1909 Relating to Boundary Waters and Questions Arising Between the United States and Canada. (Treaty Series, No 548).

- L. Cooperate with the governments of the United States and of Canada, the party states and any public or private agencies or bodies having interests in or jurisdiction sufficient to affect the Basin or any portion thereof.
- M. At the request of the United States, or in the event that a Province shall be a party state, at the request of the Government of Canada, assist in the negotiation and formulation of any treaty or other mutual arrangement or agreement between the United States and Canada with reference to the Basin or any portion thereof.
- N. Make any recommendation and do all things necessary and proper to carry out the powers conferred upon the Commission by this compact, provided that no action of the Commission shall have the force of law in, or be binding upon, any party state.

ARTICLE VII

Each party state agrees to consider the action the Commission recommends in respect to:

- A. Stabilization of lake levels. B. Measures for combating pollution, beach erosion, floods and shore inundation.
- C. Uniformity in navigation regulations within the constitutional powers of the states.
- D. Proposed navigation aids and improvements.
- E. Uniformity or effective coordinating action in fishing laws and regulations and cooperative action to eradicate destructive and parasitical forces endangering the fisheries, wildlife and other water resources.
- F. Suitable hydroelectric power developments.
- G. Cooperative programs for control of soil and bank erosion for the general improvement of the Basin.
- H. Diversion of waters from and into the Basin.
- I. Other measures the Commission may recommend to the states pursuant to Article VI of this compact.

ARTICLE VIII

This compact shall continue in force and remain binding upon each party state until renounced by the act of the legislature of such state, in such form and manner as it may choose and as may be valid and effective to repeal a statute of said state, provided that such renunciation shall not become effective until six months after notice of such action shall have been officially communicated in writing to the executive head of the other party states.

ARTICLE IX

It is intended that the provisions of this compact shall be reasonably and liberally construed to effectuate the purposes thereof. The provisions of this compact shall be severable and if any phrase, clause, sentence or provision of this compact is declared to be contrary to the constitution of any party state or of the United States, or in the case of a Province, to the British North America Act of

1867 as amended, or the applicability thereof to any state, agency, person or circumstance is held invalid, the constitutionality of the remainder of this compact and the applicability thereof to any state, agency, person or circumstance shall not be affected thereby, provided further that if this compact shall be held contrary to the constitution of the United States, or in the case of a Province, to the British North America Act of 1867 as amended, or of any party state, the compact shall remain in full force and effect as to the remaining states and in full force and effect as to the state affected as to all severable matters.

STATE LEGISLATIVE HISTORY:

Illinois: (69th GA House Bill, No. 983, 1955)

Indiana: (Chapter 220 (H. 216, Approved March 10, 1955)

Michigan: (Act No. 28, Public Acts of 1955, Approved by Governor April 14, 1955)

Minnesota: (Laws of Minnesota 1955, Chapter 691; S.F. No. 1982)

New York: (Chapter 643, Laws of 1960)

Ohio: (Amended House Bill 415, Effective October 9, 1963, 105 General Assembly)

Pennsylvania: (Act of Pennsylvania General Assembly, No. 421, 1955-56 Session)

Wisconsin: (No. 294 A, Chapter 275, Laws of 1955)

The Commission was officially organized and established December 12, 1955 subsequent to ratification of the compact by five states (Illinois, Indiana, Michigan, Minnesota and Wisconsin). The Commission office was established on the Campus of the University of Michigan in early 1956.

CONGRESSIONAL CONSENT - LEGISLATION:

All interstate compacts require Congressional consent (Article I, Sec. 10, Clause 3, Constitution of the United States) in order to achieve full force and effect. Numerous bills were considered beginning in 1956. In 1968, Congress enacted S. 660 (PL 90-419) giving limited consent to the compact as follows:

"Public Law 90-419
90th Congress, S. 660
July 24, 1968

"AN ACT

"Granting the consent of Congress to a Great Lakes Basin Compact, and for other purposes.

"Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the consent of Congress is hereby given, to the extent and subject to the conditions hereinafter set forth, to the Great Lakes Basin Compact which has been entered into by the States of Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania and Wisconsin in the form as follows:

"GREAT LAKES BASIN COMPACT"

(The full text of the State adopted Compact text is included in PL 90-419 at this point.)

"SEC. 2. The consent herein granted does not extend to paragraph B of article II or to paragraphs J, K, and M of article VI of the compact, or to other provisions of article VI of the compact which purport to authorize recommendations to, or cooperation with, any foreign or international governments, political subdivisions, agencies or bodies. In carrying out its functions under this Act the Commission shall be solely a consultative and recommendatory agency which will cooperate with the agencies of the United States. It shall furnish to the Congress and to the President, or to any official designated by the President, copies of its reports submitted to the party states pursuant to paragraph O of article IV of the compact.

"SEC. 3. Nothing contained in this Act or in the compact consented to hereby shall be construed to affect the jurisdiction on, powers, or prerogatives of any department, agency, or officer of the United States Government or of the Great Lakes Basin Committee established under title II of the Water Resources Planning Act, or of any international commission or agency over or in the Great Lakes Basin or any portion thereof, nor shall anything contained herein be construed to establish an international agency or to limit or affect in any way the exercise of the treaty-making power or any other power or right of the United States.

"SEC. 4. The right to alter, amend, or repeal this Act is expressly reserved. "Approved July 24, 1968."

FEDERAL LEGISLATIVE HISTORY:

PL 90-419 (90th Congress, S 660)
HOUSE REPORT No. 1640 (Comm. on Foreign Affairs).
SENATE REPORT No. 1178 (Comm. on the Judiciary).
CONGRESSIONAL RECORD, Vol. 114 (1968):
June 12: Considered and passed Senate.
July 15: Considered and passed House.
July 24: Signed by the President