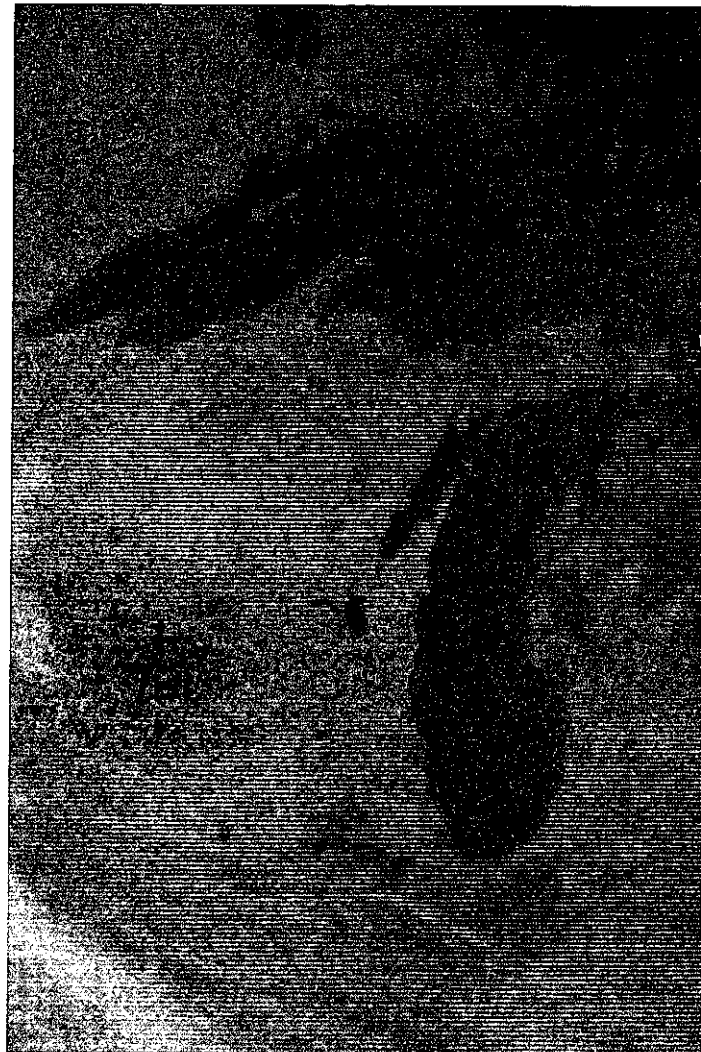




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Annex G
Public Information Program

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A satellite view
of the Great Lakes
Photo courtesy of
the Atmospheric
Environment Service,
Environment Canada

LIVING WITH THE LAKES:

CHALLENGES

AND

OPPORTUNITIES

ANNEX G

PUBLIC INFORMATION PROGRAM

PREPARED BY FUNCTIONAL GROUP 4
FOR THE PROJECT MANAGEMENT TEAM

International Joint Commission
Water Levels Reference Study

MAY, 1989

Executive Summary of Annex G Public Information Program

The Public Participation and Communications Group (Functional Group 4, FG4) is charged with, among other things, developing a public information program for responsible government agencies which has the prime objective of helping people avoid, or at least be aware of, some of the problems associated with fluctuating water levels. For purposes of this task, FG4 has interpreted the Reference's use of the word "information" in a broad sense. Accordingly, FG4 will be considering information, communications, participation, and involvement, as well as educational and learning activities.

The Reference Request

Through the 1986 Reference from the U.S. and Canadian Governments, the Commission was asked to "examine and report upon methods to alleviate the adverse consequences of fluctuating water levels." Improved information is one such "method." In addition to this overall directive, the Commission was specifically requested to "develop an information program which could be carried out by responsible governmental agencies to better inform the public on lake level fluctuations." Therefore, one of the most important tasks of Functional Group 4 is to "devise a plan" to assist the Commission in meeting this Reference obligation. A public information program on lake level fluctuations might cover initiatives that range from providing practical information to people directly affected by water level conditions to raising public awareness about how the Great Lakes system works.

Work Plan

Functional Group 4 developed a work plan listing tasks to be completed throughout both Phases I and II of the Study. Preliminary work on an inventory/analysis of information, communications, and educational activities from a variety of governmental and nongovernmental sources has been completed in Phase I. Updating, expansion, and analysis of the inventories will continue during Phase II of the Study.

Communications Task Group

A thorough analysis of past communication efforts will require additional time and a greater degree of input, both from those who initiate communications activities and, equally important, from those to whom they are directed. Interaction between consumers and providers of information is a critical component for the successful development and implementation of information programs.

To ensure this interaction, Functional Group 4 is convening a Communications Task Group (Group), consisting of government agency personnel and community members with a stake in information related to water levels. The Group is being asked to define communication

needs, and develop initiatives to meet those needs. This project will be completed in Phase II.

Communications Improvements

Significant communications improvements were made during the recent high water level period of 1985-87 by international, federal, state/provincial and non-governmental agencies and organizations in both Canada and the United States. The effort during this period was the most extensive to date: responses to an informal survey and other sources confirm that the water level forecast information proved valuable, particularly, to shoreline residents and property owners threatened by flooding and erosion.

Although much of the governmental communication efforts have been dictated by policy and jurisdiction, more concerted efforts should be made to respond to the concerns of the public. Several additional activities could be undertaken to prevent the level of dissatisfaction with governments that seemed to exist during the recent high water emergency, particularly among riparians. These could included: (1) more public information sessions with practical advice on minimizing flooding and erosion risks earlier on in a crisis period, (2) periodic updates—identified as such—about actions that governments were taking, such as various stages of involvement in the Reference Study, and (3) communication of genuine concern and sensitivity in everyday dealings with the public—from the highest levels of government through the bureaucracy—beginning at the very early stages of extreme water level periods (ideally before the damage begin to occur).

The Public Participation and Communications Group makes the following interim recommendations.

1. That Governments not diminish their communications efforts despite the fact the Great Lakes have receded from crisis high levels.
2. That agencies take advantage of the decrease in recent high water levels to strengthen their communications efforts.
3. That Governments take action on the Commission's recommendation of November 14, 1986, that a federal lead agency be designated in each country to "facilitate coordination between and among the large number of affected agencies within the provinces of Ontario and Quebec and the eight Great Lakes States."
4. That governments, in cooperation with Great Lakes states and provinces, and with other organizations as appropriate, design and distribute information to increase awareness and the potential consequences of the changeable nature of Great Lakes water levels.

5. That Governments, in cooperation with the Great Lakes states and provinces, and with other organizations as appropriate, design and distribute information that updates and explains water level situations on an ongoing basis.
6. That a positive first step toward coordinating the flow of information from both federal governments should be the further coordination of the monthly Water Level Bulletins and their 6-month forecasts.
7. That Governments, in cooperation with state and provincial governments, and with other organizations as appropriate, design and distribute water level information that is specifically designed for recreational boaters and marina operators.
8. That Governments, in cooperation with other organizations as appropriate, design and distribute information that explains, in layman's terms, how hydroelectric structures in the Niagara River are operated, and the number, description and functions of existing water diversions.
9. That Environment Canada and the U.S. National Weather Service maintain and enhance their capabilities for timely issuance of high water level/flood and erosion watches and warnings.
10. That Governments, in cooperation with other organizations as appropriate, take steps now to develop and/or coordinate distribution of how-to manuals for shoreline residents to help them prepare themselves and their property for impending storms.
11. That federal, state and provincial governments improve two-way communications with the public by establishing and publicizing central contact points to which citizens may address their concerns for follow-up action.

Other Functional Group 4 Activities

In addition to the activities related to the Reference request "to develop an information program," Functional Group 4 (FG4) was directed to "develop strategies for involving the public in the various studies." FG4 undertook a number of public information and communications activities during the first Phase of the Levels Reference Study. Several participation activities involved representatives from all functional groups.

Among these were the Toledo Workshop (1987 Biennial Meeting), three Public Comment Periods (on the Plan of Study - 1987, Task Force Report - 1988, and the Interim Report - 1988), the Public Forum (October 1988), and water levels-related articles in Focus.

Public communications and involvement activities proposed for Phase II include the meaningful involvement of Great Lakes community members in the work of the study team, increasing the output of study-related information through various means (newsletters, executive summaries of all reports, production of fact sheets).

Internal communications activities have centered around the development of a study personnel directory, an electronic mail system for Reference personnel, and a master contacts list.

FOREWORD

This Annex presents the results of the Public Participation and Communication Group's (Functional Group 4 or FG4) work during Phase I of the Study. This group, which is integrated with the Public Information Committee of the Commission, was given three main responsibilities in the Study Directive of April 1987:

- a. develop an information program which could be carried out by responsible government agencies;
- b. develop strategies for involving the public in the various studies, and
- c. create and maintain an effective internal communications system to manage and coordinate the Public Participation/Communication aspects of Reference-related activities.

This Annex describes the work that has been carried out with respect to all three of the Group's responsibilities and, where it has been deemed appropriate, draws conclusions and makes recommendations based upon this work.

DEFINITIONS

To ensure clarity, the following definitions are presented at the beginning of the Annex. They are also contained in the Glossary appended to each Annex.

Early in the work under the Reference, and to assist the PMT and other functional groups, the first four definitions were developed for use under Phase I of the Study:

Public Information - activities where the purpose, design, and plan intends to deliver information to the public or various publics. Examples: press releases and articles in the IJC's newsletter, Focus.

Public Communications - activities where the purpose, design, and plan intends for two-way communication for a defined period of time between Study personnel and the public or various publics. Examples: the Public Information Meeting held during the IJC's biennial meeting in Toledo, Ohio, the Public Comment Process on the Study's Task Force Report and on the Background Paper.

Public Participation - activities where the purpose, design, and plan intends that members of the public have an opportunity to participate for a defined period of time in a Study activity. Example: input into a portion of the work activities of a functional group through a workshop.

Public Involvement - activities where the purpose, design, and plan is such that members of the public or various publics are engaged in the Study on a continuing basis with other "expert" resources. Example: a member of an interest group serving as a functional group member.

The discussion that follows in this Annex requires definition of some additional terms:

Educational and Learning Activities - activities undertaken through the formal education system, in post-secondary settings, for the media, and in informal, public meetings. Example: supplemental curricular lessons and activities for secondary school students and learning programs presented through community-based service organizations.

Stakeholders - Individuals with a direct interest in helping to develop government-sponsored information activities with regard to lake levels. These stakeholders include personnel from the government agencies responsible for conducting these activities as well as members of their intended audiences.

The membership of Functional Group 4 is diverse. It includes public affairs personnel from both Canadian and U.S. federal agencies, IJC public affairs staff, a telecommunications expert, and a leader of an international riparian organization. In combination, these individuals bring substantial public information and communications experience to the work of FG4. In addition, representatives of each of the other functional groups were appointed to serve as liaisons to FG4 and were invited to report regularly on activities of their functional groups.

Readers wishing to pursue in greater detail the matters discussed in this Annex are directed to the bibliography and appendices.

PHASE 1 REPORT OUTLINE
IJC FLUCTUATING WATER LEVELS STUDY

MAIN REPORT

- ANNEX A - PAST AND FUTURE WATER LEVEL FLUCTUATIONS
- ANNEX B - ENVIRONMENTAL FEATURES, PROCESSES AND IMPACTS: AN ECOSYSTEM PERSPECTIVE ON THE GREAT LAKES - ST. LAWRENCE RIVER SYSTEM
- ANNEX C - INTERESTS, POLICIES AND DECISION MAKING: PROSPECTS FOR MANAGING THE WATER LEVELS ISSUE IN THE GREAT LAKES - ST. LAWRENCE RIVER BASIN
- ANNEX D - THE GREAT LAKES ECOSYSTEM PERSPECTIVE: IMPLICATIONS FOR WATER LEVELS MANAGEMENT
- ANNEX E - POTENTIAL ACTIONS TO DEAL WITH THE ADVERSE CONSEQUENCES OF FLUCTUATING WATER LEVELS
- ANNEX F - EVALUATION INSTRUMENT
- ANNEX G - PUBLIC INFORMATION PROGRAM

IJC REFERENCE STUDY
ON
FLUCTUATING WATER LEVELS IN THE
GREAT LAKES - ST. LAWRENCE RIVER BASIN

ANNEX G: PUBLIC INFORMATION PROGRAM

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SECTION 1

INFORMATION PROGRAM FOR RESPONSIBLE GOVERNMENT AGENCIES

Introduction

The need for improved communication among governments and the public has been indicated in the Phase I report of the Project Management Team. In all human activities, we tend to base our decisions upon the information at hand; if the information, or the means of transmitting the information, is inaccurate or incomplete, our decisions may be flawed.

For example, an individual may purchase lakefront property, but be unaware of the susceptibility of this property to flooding or erosion. Although the individual has purchased the property in good faith, a government worker who is aware of historical flood and erosion data for that stretch of shoreline may appear unsympathetic several months later toward the property owner who, in the opinion of the government worker, may have exercised poor judgement in purchasing the property. Add to this situation the possibility that the government's information has been, theoretically, available to the public for some time and that the property owner might gladly have used the data but was unaware of its existence.

Incomplete information and faulty communication, as illustrated in the hypothetical example above, can lead to bad decisions and often antagonism between parties not necessarily at odds but who fail to understand each other due to incomplete or inaccurate communication.

The Public Participation and Communications group (Functional Group 4) is charged, among other things, with developing a public information program for responsible government agencies aimed at preventing situations such as the one described above. The assumption behind this charge is that improved public information and communications will, over time, help people avoid some of the problems associated with fluctuating water levels. The requested information initiatives are under development and will be completed during Phase II of the Reference Study.

The Reference Request

In issuing the August 1986 Reference, the governments of Canada and the United States requested that, as part of their charge to the Commission to "examine and report upon methods of alleviating the adverse consequences of fluctuating water levels," the Commission would "develop an information program which could be carried out

by responsible governmental agencies to better inform the public on lake level fluctuations." One of the most important tasks of Functional Group 4 is to "devise a plan" to assist the Commission in meeting this Reference obligation.

The request for a program to "better inform" the public suggests that government communications prior to this Study may not have been as complete or integrated as they might have been. The Commission was asked to "examine and report upon methods to alleviate the adverse consequences of fluctuating water levels." Improved information is one "method" that may be used. However, it should be noted at the onset that the extent to which improved information practices actually help alleviate adverse consequences is often a matter of individual discretion and perception. Because of this, and because it will be almost impossible to draw causal connections between information activities and reductions in adverse consequences of fluctuating water levels, the effectiveness of these information efforts have been and will continue to be difficult to measure.

For purposes of this task, Group 4 has interpreted the Reference's use of the word "information" in a broad sense. Accordingly, the group will be considering information, communications, participation, and involvement, as well as educational and learning activities under this task. (These terms are defined in the Foreword.)

A public information program "on lake level fluctuations" might cover initiatives that range from providing practical information to people directly affected by localized water level conditions to raising public awareness about how the Great Lakes system works.

Anticipated Products

The request by governments that the Commission "develop an information program" [emphasis added] must be approached with caution. Numerous government and nongovernmental organizations within the basin offer varying types of level-related public information. This diversity is discussed in the subsections that follow. Because of the diverse number of jurisdictions, agencies, and NGOs with legitimate interests in communicating about water levels, FG4 concludes it is not possible for a single information program to be effective in all instances. Accordingly, the thrust of the work of FG4 has been to consider approaches to develop:

- a. means of improved coordination among diverse information activities;
- b. suggested principles upon which these activities may be based;

- c. specific suggestions for changes in particular areas; and
- d. outlines of specific information, communications, and education programs that could be useful in different jurisdictions.

Work Plan

As this involves such a wide-ranging inquiry, Functional Group 4 has developed a work plan (Appendix G-3) that sets out specific subtasks to be completed throughout both Phases I and II of the Study. The subtasks of the plan call for:

- a. the compilation of an inventory and analysis of information, communications, and education activities to date;
- b. a description of the communications challenge and objectives; and
- c. various program designs, which together with recommendations for other actions, could achieve these objectives.

Summary of Work to Date

Preliminary work on the first two components of this task has been completed in Phase I. Inventories (Appendix G-4) have been compiled of educational, information, and communications activities with regard to Great Lakes water levels by federal, provincial and state governments and others in the Great Lakes-St. Lawrence River basin. Updating and expansion of these inventories will continue during Phase II of the Study.

A preliminary analysis of the inventories has also been completed in order to identify major strengths and weaknesses in communication efforts to date and to define potential communications objectives. This analysis and the conclusions and recommendations arising from it are presented in the following subsections of this annex.

Concurrent with the development of the initial inventories, a second inventory to identify jurisdictional approaches to the water level issue which affect information and communications efforts is underway. This inventory should be refined in Phase II of the Study.

In executing this analysis, observations on the success of numerous activities and suggestions for possible improvements have been obtained by informally surveying people inside and outside of

governments. Functional Group 4 members have also begun examining relevant literature, together with past public opinion and communications analyses. In making assessments of communications activities, reliance has also been placed upon the collective and diverse experience of Functional Group 4 members, Study and government personnel. Further, the Study must involve others from outside of governments in the assessment process during Phase II.

Communications Task Group

The preliminary nature of the communications analysis has already been emphasized. A complete analysis will require additional time and a greater degree of input, both from those who initiate communications activities and from those to whom they are directed. Interaction between consumers and providers of information is an essential component for the development and implementation of information programs to be carried out by responsible government agencies. Without this interaction, the credibility necessary for successful implementation for recommendations will likely be absent.

To ensure this input is received, Functional Group 4 is convening a Communications Task Group (Group), consisting of government agency personnel and community members with a stake in information related to water levels in the Great Lakes - St. Lawrence River basin. The Group is being asked to define the needs which communication activities should address, and to develop initiatives to meet those needs. Additional views will be sought through a formalized Review Network that will provide written comments on products developed by the Group. This project is essentially a Phase II exercise.

The Communications Task Group is convened with the following principles in mind.

- a. Government information programs will be more likely to further the goal of reducing the problems associated with fluctuating levels if program design is broadly-based.
- b. A greater degree of partnership between the agencies which provide the information, and the communities and interests who are the intended audience for the information, should lead to more effective programs.
- c. Group members are brought together in the spirit of partnership in working toward a common goal of improved communications about water levels.

The task group process should serve to clarify the legitimate communications objective of the agencies and communities. It is hoped that those participating in the Group will develop a

sense of partnership—an ability to work together in defining common interests and in developing a mutually beneficial product.

The Group will be given the assignments of:

- a. reviewing and assessing information activities during the 1985-87 high water crisis and subsequent period (see Appendix G-4);
- b. defining the information needs of system users;
- c. identifying objectives which system users and agencies share; and
- d. developing specific communications initiatives that agencies could take to further common objectives.

The Communications Task Group consists of individuals, representing federal agencies from both countries, state/provincial agencies, municipal governments, riparians, recreational boaters, and recreational business owners.

Products of the Group will be circulated to participants of a formal Review Network, comprised of members of the same interests as those of the Group members, but in greater numbers. In this way, a larger portion of the providers and audience for levels-related information will be involved in developing the programs benefiting them both.

INVENTORY OF INFORMATION, COMMUNICATIONS AND EDUCATION ACTIVITIES

FG4 has begun to inventory all communications, information and education activities with regard to Great Lakes water levels that have been undertaken to date by government and nongovernmental organizations. This is the first step in assessing the basinwide communications situation in preparation for developing future communications initiatives for governments. This section describes the results of this process to date. An inventory of these activities may be found in Appendix G-4. For a listing of levels-related publications and materials, see Appendix G-5.

Crisis Communication

Canada/United States

During the most recent period of high Great Lakes water levels in 1985-87, both the United States and Canadian governments supplied information about water levels and how specific areas of shoreline might be affected during high water level events. Both governments publish and distribute monthly water level

bulletins which use graphs to illustrate the progress of water levels to date, together with 6-month forecasts. This service has existed in Canada since 1966 as a joint project of the Canadian Hydrographic Service which is responsible for, among other things, charting the navigable waters of the Great Lakes - St. Lawrence Seaway, and Environment Canada, which has among its responsibilities the monitoring of water levels and supplies of the Great Lakes. The U.S. Army Corps of Engineers (Corps) has distributed a similar bulletin since 1952. Although primarily a design and construction agency, the Corps has been involved in the charting of the Great Lakes and monitoring of their levels since the mid-1800s. The forecasts shown on both bulletins are coordinated by the International Coordinating Committee on Great Lakes Basic Hydraulic and Hydrologic Data. Both bulletins are distributed free of charge to extensive mailing lists.

In the United States, the publication of the Corps of Engineers Great Lakes Water Levels Monthly Bulletin coincides with a news release that summarizes the water level situation for the previous month and compares current levels to those of one year ago. A similar news release is issued with the Water Level Bulletins, published by Environment Canada, which provide interpretive summaries to the news media and interested government agencies. In the U.S., all recipients of the bulletin have been receiving the "Levels Update" since July 1985. In addition the Corps issues a separate news release for each lake each month. The news releases deal with the level and forecast for the lakes while the update attempts to provide current information about all relevant ongoing activities.

During the high water level period, both federal governments supplied information on high water level events to help shoreline dwellers and property owners prepare as best they could for upcoming storms that had potential for causing flood and erosion damage.

Environment Canada established the Great Lakes Water Level Communications Centre and the Great Lakes Water Level Forecast Centre in March of 1986 for this purpose. The Communications Centre would be advised of high water level "watches" or "warnings" by the Forecast Centre (as would regional and district offices of the Ontario Ministry of Natural Resources, its Conservation Authorities and news media organizations on the Forecast Centre's information network) and would monitor the course of each event around the clock. With information collected from the Forecast Centre, water level gauges, weather stations, wave rider buoys and local contacts around the lakes, the Communications Centre was able to track the progress of high water level events, as well as to provide the public and the media with current information. The service provided by Environment Canada's Forecast Centre was supplemented by a toll-free telephone number which gave regularly-updated water level forecasts.

In the United States, the National Weather Service provided similar forecasts and issued flood and erosion warnings. These warnings were localized for specific reaches of the lakeshore and were disseminated through local radio and television stations.

The Great Lakes Water Level Communications Centre also undertook activities aimed at improving the general public's level of knowledge about how the Great Lakes system works. The Centre distributed two publications, "Great Lakes Water Levels" and "Living with the Great Lakes," that explained in layperson's terms the factors which influence changes in Great Lakes water levels. They were distributed by mail in response to inquiries, at public displays and meetings, and in quantity to groups and agencies who requested them. The latter publication was produced in tabloid form and inserted in several Great Lakes community newspapers in the fall and winter of 1986. In addition, Environment Canada reprinted a brochure entitled, "The Role of Vegetation in Shoreline Management," which had been an earlier project of the Corps of Engineers, Environment Canada and the Great Lakes Basin Commission. In conjunction with these efforts, a 14-minute film called, "Lake Views: Perspectives on Great Lakes Water Levels," was produced to illustrate the diversity of opinion among Great Lakes basin leaders and experts on the water levels issue.

In the spring of 1987, the Water Level Communications Centre offered a series of Community Information Sessions around the lakes in cooperation with the International Joint Commission and the Ontario Ministry of Natural Resources (Edgett, 1987). These sessions were designed to provide two-way communication between those affected by water level fluctuations and the agencies responsible for dealing with the public on issue. In addition, Communication Centre staff responded to media inquiries, made themselves available for radio and television interviews, and responded to speaking invitations from professional, municipal and interest groups. In most of these cases the discussion focused upon explanation of the water level phenomenon and Environment Canada's responses to it.

In the United States, the U.S. Corps of Engineers (the Corps) provided fact sheets about the Great Lakes and distributed a brochure, "Help Yourself," which discusses techniques for minimizing erosion. The Corps also responded to media inquiries and requests for speakers, sponsored public meetings and provided technical assistance to municipalities regarding shoreline construction. It also publicized the availability of its limited erosion control program, its "Advance Measures" flood control program and, in the fall of 1986, its "Self-Help" program that enabled local communities to construct their own sandbag dikes. The Corps worked with many U.S. lakeshore counties, using a videotape and literature to demonstrate proper procedure for construction of sandbag dikes.

The National Oceanic and Atmospheric Administration's (NOAA) Great Lakes Environmental Research Laboratory also played a key role in communicating with the public in the United States during the high water period. Representatives of the lab frequently spoke at conferences and public meetings. Numerous interviews with news media resulted in newspaper and broadcast accounts which explained the factors causing high water levels. Representatives of the Corps and NOAA were the primary spokespersons with regard to water levels in the United States portions of the Great Lakes-St. Lawrence River basin.

The Federal Emergency Management Agency (FEMA) had some involvement with the public through its administration of flood (and erosion) insurance which is available to shore property owners. The agency delineates hazard areas along the shoreline and makes available to the public maps that show the areas. Legislation in early 1987 broadened the agency's authority to provide insurance against erosion, which necessitated direct mailings to insurance adjusters and policy holders.

International

The International Joint Commission took early action to initiate communications among the agencies with a mandate to respond to the high water crisis and inform the public of the assistance which was available. In the summer of 1985, the Commission convened representatives from federal agencies and the American Red Cross to brief Congress on emergency preparedness and relief programs. A summary of the programs listing contact persons was compiled for public distribution. A similar meeting of state and provincial representatives was convened in the Commission's Windsor office to coordinate information about the jurisdictional response efforts.

Both sections of the Commission voluntarily participated in other Congressional and Parliamentary briefings and cooperated with Environment Canada and the Ontario Ministry of Natural Resources in providing the Community Information Sessions in the Spring of 1987. The Commission sent representatives to numerous community meetings as well. The Commission issued news releases and public announcements each time the regulation of Lake Superior and Lake Ontario outflows was adjusted in response to emergency conditions. Articles on lake levels were published in the Commission's newsletter, Focus, and a special section devoted to progress under the study reference was initiated in the summer 1988 issue. From 1985 through 1988, the Commission made available to the public, organizations, government officials, a document titled, "Great Lakes Levels: A Commission Overview." This document, which was updated quarterly, described factors affecting lake levels and described Commission responsibilities, exercised through its Orders of Approval and Regulation Plans for Lakes Superior and Ontario.

States/Provinces

In the United States, most land-use regulation is a state responsibility. Since the passage of the Coastal Zone Management Act in 1972, most of the Great Lakes states have established communications programs regarding shoreline use.

During the 1985-87 high water level period, the Michigan government made substantial efforts to inform the public about its programs that provided support to riparians. Brochures regarding water levels, shore protection and a home relocation loan program were distributed. In addition, workshops were held to discuss shore protection alternatives, permit requirements, home relocation and to alert property owners and local officials to the potential for severe erosion and flooding damages. Department of Natural Resources (DNR) staff also responded to requests for information, and updates on the water level situation were published regularly in the DNR journal, the "Natural Resources Register." The Office of the Great Lakes was established in 1985 as part of DNR and, among its other duties, distributed information to Michigan residents.

At the local level, for example, efforts were made by officials in Monroe County, Michigan, to coordinate information efforts with townships and utility companies. Representatives of the Corps of Engineers, the DNR and officials involved in emergency preparedness made presentations to shoreline residents and gave practical advice at county-sponsored information meetings. Townships also provided information about government programs, and utility companies published tips about home safety in the event of flooding.

Information efforts similar to those made by the Michigan Department of Natural Resources were made by agencies in other Great Lakes states. Two such agencies were the Indiana Department of Natural Resources and the New York Coastal Management Program.

Although the Canadian Federal government is responsible for monitoring Great Lakes water levels, the provincial agencies and municipalities administer regulations and programs related to the use of land along the shores of the Great Lakes.

In a cooperative effort to increase the availability of information about Great Lakes flooding and erosion hazards, the Canadian and Ontario governments in 1987 included the Great Lakes in a Flood Damage Reduction Program that endeavors to raise public awareness about the hazards of riverine flooding. As with the riverine program, the Great Lakes project will produce information maps of hazard areas and sponsor public meetings to explain the maps when they are completed. Previously, Environment Canada and the Ontario Ministry of Natural Resources cooperated during the high water levels of the 1970s to develop a Great Lakes coastal zone atlas

and flood and erosion prone area maps.

In addition, the Ontario Ministry of Natural Resources worked through its Conservation Authorities during the most recent high water level period to disseminate information about the concept of shoreline management and about programs which could assist shoreline property owners who were vulnerable to flood and erosion damage. The Authorities initiated individual information activities as the need arose. Some were more active than others, depending upon the impacts of the high water level situation in their particular areas.

A significant portion of the Ontario government's communications effort during the high water level period grew from the appointment in April 1986, of a Shoreline Management Review Committee which held public meetings for input into the establishment of an overall framework for addressing shoreline management issues (Ontario Shoreline Management Review Committee, 1986). As a result of one of the Committee's recommendations, a Shoreline Management Advisory Council was established in April of 1987 to solicit public opinion on shoreline management through public meetings and to act in an advisory capacity to the Minister of Natural Resources. An important component of the Council's function was to inform and educate the public with regard to shoreline management (Ontario Shoreline Management Advisory Council, 1988).

As well, a booklet entitled, "How to Protect Your Shore Property," was produced to provide information on minimizing flood and erosion risks. Brochures produced under the Canada-Ontario "Coping with the Great Lakes" program of the 1970s ("Shore Property Hazards" and "A New Approach to an Old Problem") were redistributed. In addition, the Ministry of Natural Resources worked with its Great Lakes Conservation Authorities to provide free technical advice to shoreline property owners planning to construct shore protection. In the United States, a similar service was provided by Sea Grant organizations and government departments in Wisconsin, Indiana and New York.

During the most recent high water level period, the Quebec government disseminated water level and flow forecasts in special circumstances and sponsored workshops and seminars for municipal inspectors with regard to regulations and standards for lakeshores and river banks. In addition, initial steps were made toward an interdepartmental coordination of an information strategy with regard to water levels.

Nongovernmental Organizations

In addition to government-sponsored communications, interest groups and other nongovernmental organizations undertook their own communications activities. Groups such as the Centre for the Great Lakes, Great Lakes United and the Great Lakes Commission offered

various types of information, including newsletters, speakers, conferences and seminars.

The International Great Lakes Coalition, an organization composed largely of American and Canadian shoreline property owners, also provided information to its members, elected and appointed government officials, and the general public through public meetings. Media interviews and a quarterly newsletter which carried Great Lakes data and historical information concerning past IJC water level studies were also provided by the Coalition.

Noncrisis Communications

The marked difference between crisis and non-crisis communications activities is that during non-crisis periods, less emphasis was placed upon the dissemination of information about Great Lakes water levels. The degree of difference, however, varies between countries. In the United States, the difference between crisis and noncrisis communications exist mainly in the level of activity within established systems of communication. For example, the high water levels crisis caused the Corps and the Great Lakes Environmental Research Laboratory (GLERL) to respond to greater numbers of public and news media inquiries, but their methods of dissemination were unchanged from noncrisis years.

Three significant programs were brought about by the crisis conditions of the high water level period. First, the Corps began inserting lake level updates in its monthly water level bulletin. Second, the Upton-Jones amendment to the National Flood Insurance Act expanded erosion coverage in 1988 and resulted in major information efforts aimed at policy-holders. Finally, the efforts of the International Great Lakes Coalition (mentioned in the previous section) became a strong and somewhat mediatory influence in the United States during the high water crisis of the mid-1980s.

In Canada, some communications initiatives, such as the Great Lakes Water Level Communications Centre, the Great Lakes Water Level Forecast Centre and the Shoreline Management Advisory Council, were established only after water levels had reached record high levels for the century. As in the United States, the International Great Lakes Coalition, which advocates further regulation of the Great Lakes, grew from the most recent high water period.

Most of the government publications mentioned under "Crisis Communications" were available for distribution between high water level periods as well, although the demand for them was less and the impetus to distribute them was not as great. Much of the information material made available in Canada during the recent high water level crisis had been created during the last high water level period in the 1970s.

However, in response to dramatically lower lake levels in late 1987 and 1988, Environment Canada's Great Lakes-St. Lawrence Study Office began in the summer of 1988 to distribute a bi-weekly news release advising boaters of forecast changes in water level conditions in Lake Ontario and on the St. Lawrence River. This service is expected to continue during the 1989 boating season.

In both countries, there was less media interest in water levels between crisis periods, because the same level of public concern about them did not exist. As the issue became more prominent with the media and the public, communications efforts increased.

PRELIMINARY ANALYSIS OF COMMUNICATIONS ACTIVITIES

An analysis of the information and communications activities described in the previous section follows. The preliminary nature of this analysis must be emphasized. Conclusions from this analysis will be tested in Phase II of the Study during the Communications Task Group discussions in which government agencies and citizens alike are participants.

Communications Improvements

Significant communications improvements were made during the recent high water level period.

The activities previously described reflect in part the collective communications response by U.S. and Canadian governments to fluctuating water levels in the Great Lakes-St. Lawrence River basin. The effort during the high water level period of 1985-87 was the most extensive to date. Responses to the informal surveys and the personal experiences of those involved confirm that the water level forecast information proved valuable, particularly, to shoreline residents and property owners threatened by flooding and erosion.

The water level bulletins gave some sense of what to expect of the water level situation in the coming months. The news releases and lake level updates issued by the Corps of Engineers and Environment Canada to accompany their water level bulletins provided useful interpretative information, particularly for the news media, who in turn disseminated them throughout the Great Lakes basin. The availability of the Commission, the Corps of Engineers, Environment Canada staff and others to respond to follow-up questions from the media facilitated this process.

The high water level/flood and erosion watches and warnings issued by Environment Canada and the U.S. National Weather Service allowed riparians, to some extent, to prepare themselves and their property for impending storms. The toll-free forecast number maintained by Environment Canada, together with the service provided by the

Great Lakes Water Level Communications Centre proved particularly useful in this respect. The around-the-clock accessibility of Centre staff during water level watches and warnings also proved to be a valuable source of information and to some shoreline dwellers.

In addition, radio stations in many areas announced high water level watches and warnings as they received notification from the Water Level Forecast Centre and the National Weather Service. Water Level Communications Centre staff were also available to answer media inquiries at these times. This combination of services kept shoreline property owners and residents informed about upcoming storm events. Responses to the informal survey of basin residents indicated some support for continuing these services.

The communications climate appeared to improve during the most recent high water level period over that of previous water level crises in the 1960s and 1970s. This improvement can, in part, be attributed to the formation of the International Great Lakes Coalition, an organization of Canadian and American shoreline property owners. The Coalition contributed to an improved dialogue and mutual understanding between citizens and governments on a basinwide scale. In addition, the group was able to communicate its views to politicians, and to provide useful and well-researched information to its membership through its newsletter.

Although Coalition and government agency views often conflicted, the group was, nevertheless, instrumental in dispelling some commonly-held myths about the causes of changing lake levels. This improved dialogue was enhanced by government initiatives to make first-hand contact with citizens and to hear their concerns. Some of these initiatives included public talks and participation in community-sponsored sessions by federal agencies, such as the Corps of Engineers, NOAA, Environment Canada; and state/provincial departments/ministries of natural resources and other agencies. The Ontario Shoreline Management Advisory Council and the Great Lakes Water Level Communications Centre signaled continuing and conscious efforts by governments to maintain communication with the public on the water level issue.

Communications Problems

If one were to look for shortcomings in the provision of long and short-term water level forecasting during the high water level period of the 1980s, one should note that, in Canada, the Water Level Forecast Centre and Communications Centre came into existence only after the perceived crisis was well underway. Both Centres were established in March of 1986, but shoreline property owners and residents had been witnessing flood and erosion damage since the spring of 1985. However, once the decision was taken to make

the services available, they were partially in place within two weeks and fully operational within three months.

With this in mind, it might be useful for Environment Canada and the Corps of Engineers to ensure that its capability in these areas is maintained even through noncrisis periods to prevent any delay in responding to future crises. As well, consideration should be given to firmly establishing the contact networks of both Centres to ensure the widest possible dissemination of forecast information and the most nearly complete data on individual high water level events. Given the success of these services on both sides of the border, it might be useful for Canada and the United States to consider offering a centralized service, using the best parts from the programs of each country. This will be considered in Phase II.

The monthly water level bulletins have been distributed on both sides of the border for a number of years and have proven useful to a variety of people and agencies with interests in past and future levels of the Great Lakes. However, some improvements in their distribution may be possible. Currently, names and addresses are added to or deleted from the mailing lists upon request; there is currently no method of ensuring that as many people as possible who could make use of the bulletins receive them or know of their existence.

Some confusion may have arisen from the distribution of both the Canadian and the U.S. water level bulletins in some Great Lakes communities. Although attempts are made to have the 6-month levels forecasts agree, they are not identical. Each agency uses different water level gauges which produce similar, but not identical, measurements. While the starting level for the 6-month forecasts are agreed upon by both agencies, their methods of forecasting future levels differ. These differing measurements, coupled with the differing forecasting methods, produce forecasts that are somewhat similar, but rarely identical. These complications are compounded by the different units used to measure and express water level changes in the two countries: feet in the United States and meters in Canada.

The United States bulletin is distributed one to two weeks earlier than in Canada, where it is released to coincide with a news release. The news release is delayed due to a requirement for translation into French, which takes at least five working days.

Any or all of the facts mentioned could contribute to a feeling that the two governments are issuing conflicting information. The informal surveys by FG4, together with responses to the Group Depth Interviews (GDIs) conducted by Functional Group 3 (Synergy Consultation Services, 1988), supported this conclusion. Many of those interviewed indicated a need for more coordinated information dissemination effort by Great Lakes basin agencies during water level crises.

The GDIs found that people were distrustful of water level forecast information. Mention was made of boaters becoming frustrated with so-called expert opinions that the high water levels of the Great Lakes would take years to recede if precipitation levels returned to normal. Some bought boats with deep draughts with the expectation that high levels would continue for some time. But, in 1987 and 1988 the lakes dropped back to nearly average levels due to low amounts of precipitation. This made some areas hazardous for larger boats. Some docks, built to allow for high water levels, were inaccessible. Those most seriously affected by the dramatic drop were not likely to be impressed with government explanations that the prediction was based on average amounts of precipitation, while the dramatic drop was caused by very low precipitation.

The number of agencies and organizations involved in communicating with the general public about the water level issue may also have contributed to a sense of confusion in the minds of some people. Because these efforts were, for the most part uncoordinated, one expert's interpretation to the public of a certain event or set of data may not have been identical to that of another. While such variation of opinion is not uncommon in scientific circles, it is not usually exhibited to the general public without explanation - especially when the public is looking to experts to provide reliable information.

Another source of confusion may have been the outright conflict that existed in some cases between the opinions of government spokespersons and the International Great Lakes Coalition. While some government agencies were insisting that further regulation of the Great Lakes is not a viable option and that existing human engineered structures could have little effect upon levels, the Coalition was asserting the opposite view. For those who subscribed to neither view but who were looking for information to allow them to make informed choices, these strong but conflicting messages may have been confusing.

Although increased coordination among agencies and (to a lesser extent) organizations may help solve the confusion due to the lack of coordination, the conflicts between parties is a more difficult problem to dispel. Organizations will communicate their subjective views to the public and government agencies, and will use this communication in an attempt to influence actions taken by governments. This, of course is proper, but can lead to conflicting, albeit, honestly held views about what is happening, why it is happening, and what actions governments can take to mitigate the effects of fluctuating Great Lakes water levels.

There was also an apparent failure by governments to respond directly to many of the concerns expressed and questions asked by the general public during the high water level period. Riparians looking for practical information on preparing their properties for

impending storms and minimizing water damage to household articles were often confronted with nothing more helpful than literature on the risks associated with living in the shore zone.

In addition to this, there was a perceived failure by governments to answer questions or respond to requests posed by riparians; such as why certain emergency actions were not taken in an attempt to lower lake levels. From a communications perspective, what is relevant is the question of whether the public perceived these questions to have been answered. At least a segment of the public believed that governments were sidestepping the issue by advocating shoreline management and advising people of shoreline hazards, rather than taking direct steps to lower lake levels.

Despite extensive efforts in both countries to inform people about Great Lakes hydraulics and hydrology, government responses to the levels crisis, and damage minimization options for erosion and flooding, some were apparently not satisfied with the information received during the high water level period. Responses to the informal surveys and the experiences of those involved in dealing with the public during the 1985-87 period suggest that the public was less interested in repeated explanations of Great Lakes processes and the responsibilities of the respective governments than it was in learning what action was being taken to minimize the damages associated with high water levels (see Edgett, 1987).

Although much of the governmental communications efforts have been dictated by policy and jurisdiction, more concerted efforts should be made to respond to the concerns of the public. Several additional activities could be undertaken to prevent the level of dissatisfaction with governments that seem to exist during the recent high water emergency among riparians in particular. These could included: (1) more public information sessions with practical advice on minimizing flooding and erosion risks earlier on in a crisis period, (2) periodic updates—identified as such—about actions that governments were taking, such as various stages of involvement in the Reference Study, and (3) communication of genuine concern and sensitivity in everyday dealings with the public—from the highest levels of government through the bureaucracy—beginning at the very early stages of extreme water level periods (ideally before the damage begin to occur).

The survey responses and experiences of some government personnel indicate that a certain degree of the dissatisfaction with governments' responses was the result of an incomplete understanding of the complexity of factors which influence changes in Great Lakes water levels. From a government perspective, there is a general need for greater on-going effort to make the general public aware of the complexities of the Great Lakes system and of the risks that go with living, working and playing beside them. Although a good deal of literature exists on the subject of changing water levels in a form that the general public can use, a more concerted effort

is required, not only to ensure this information gets to the people who would benefit from it, but that these people remain conscious of the potential for change in Great Lakes water levels through periods of average levels as well as through periods of exceptional lows or highs.

If we are to learn to deal more effectively with fluctuating water levels in the Great Lakes, there must be a greater understanding of the hydrology of the lakes and the effect of the activities of nature and humans on lake levels. Adequate educational materials are essential to this development, and could be considered an integral part of governments' information program to help the public achieve a greater awareness of the causes and effects of lake level fluctuations. Owing to the lack of supplementary curriculum materials, FG4 has identified the need for the development of such materials, suitable for use in the elementary/secondary school classroom and the community. Educational materials will be further developed in Phase II.

There may also be a need for more and clearer on-going information about the human-caused changes in lake levels that do occur (i.e. regular advisories and clear explanations, in laypersons's terms, of why certain decisions are taken with regard to regulation structures and diversions and what their implications are). As well, from this point of view, those responsible for communicating about water levels on behalf of government agencies should understand the history of the Great Lakes water level issue, past studies, and the principles upon which interest groups such as the International Great Lakes Coalition operate.

The Communications Process

It is a truism that before communications objectives can be set, it is necessary to identify both the senders of potential messages and their audiences.

Usually, when organizations set communications objectives, the identity of the sender is a given. In the Great Lakes water level issue, even this essential ingredient in communications planning is not clear. From discussion of the inventory of communications/information activity in the Great Lakes basin, it is clear that there are many agencies and organizations involved in communicating about Great Lakes water levels. They include all levels of government, a host of organizations and special interest groups, many of which will have dual functions as both senders and receivers of messages. A further complication to this situation is the diversity of jurisdictions and policies which affect the manner in which each message is communicated and the content of the message itself.

Audiences for the levels-related messages must also be identified. In the case of Great Lakes water levels, there are almost as many audiences as there are classes and subclasses of interests. Although

owners of shoreline property and others who use the Great Lakes for recreational and economic pursuits may be the prominent audiences, others, such as municipal governments and the public at large, should not be ignored.

Each audience presents not only a need for a specially focused communications effort, but a variance in the level of understanding with regard to the issue. The public may be best served by information that allows for a low level of knowledge about Great Lakes hydraulics and hydrology. Riparians who have been involved in shoreline owner organizations may require more advanced information that assumes a basic understanding of the lake system and of the responsibilities of various levels of government.

Although there may be common threads running through communications efforts aimed at all of these people, each audience requires specific types of information. For example, water level forecasts may be useful to all audiences, but a shoreline property owner may require complementary information about flooding and erosion, while a recreational boater may prefer to have a forecast interpreted to give the location of safe sailing channels and areas with marinas with adequate draught depths. Meanwhile, a municipal government may require an interpretation of how, or whether, changes in water levels can affect planned and existing development in the shore zone. Added to the need to inform each of these groups in accordance with its special requirements is the obligation to inform the public at large about Great Lakes levels in general and to account for the spending of the taxpayer's monies regarding fluctuating water levels.

Levels of audience sophistication will affect the means of communicating. The task of providing basic, primer level information to the public may be best served through the publication and distribution of information material and through educational programs in schools. But the task of communicating with riparians, recreationists and other interest groups about water level issues which directly affect them may be more complicated.

Meeting the information requirements of the public may be possible through efforts in which the flow of information goes in one direction - from the provider to the receiver. However, the task of meeting the needs of diverse audiences will require two-way communication. Groups, such as shoreline property owners and boaters, should not only be informed by governments, but also invited to participate in the decision-making process as well. For this reason, communications efforts with groups such as these will require more innovative methods which allow for an exchange of information and opinion. This exchange will affect government policies as well as their communications efforts. Consequently, communications/information programs will need to be supported by policy decisions.

PRELIMINARY CONCLUSIONS

The foregoing preliminary communications analysis leads Functional Group 4 to the following conclusions:

- a. Communications with regard to Great Lakes-St. Lawrence River water levels have improved since previous water level crises.
- b. This improvement is due, in part, to:
 1. the formation of the International Great Lakes Coalition and the subsequent increase in dialogue between the organization and governments and
 2. increased efforts by some government agencies to deal with the public firsthand and hear their concerns.
- c. Long and short-term water level forecasts provided by both federal governments have proven valuable to users of the Great Lakes - shoreline residents and property owners in particular - and they should be continued.
- d. Although communications efforts during the high water level period may be described as extensive, governments will need to correct several communications deficiencies if they are to earn and maintain credibility with the public.
- e. The identified deficiencies are:
 1. a need for increased, publicly available information on the workings of the Great Lakes system and the factors which influence water level changes;
 2. an inability on the part of governments to communicate effectively in a short timeframe the reasons for high lake levels and the reasons why immediate action to lower the lakes was not taken;
 3. a failure to coordinate communications efforts among diverse agencies at state, provincial and federal levels;
 4. real or perceived inconsistencies in the disseminated information;
 5. the possibility that information disseminated to the public may be perceived as unreliable; and
 6. the failure of agencies to respond directly when many citizens were asking for direct and immediate actions.

- f. A seeming lack of responsiveness may have helped give the appearance during the 1985-87 high water period that governments were generally unwilling to take into account suggestions from some that direct actions to decrease water levels were possible and necessary. Because of this lack of responsiveness, many riparians concluded, rightly or wrongly, that governments were unwilling to consider taking direct and immediate action to lower water levels.

This bias was perceived in government communications efforts, such as attempts to explain why governments would not proceed immediately to further regulate the Great Lakes.

- g. The content and design of existing information and communications activities should be corrected by addressing these needs:
1. information should be produced to meet the specific requirements of the user; for example, marina operators, recreational boaters and shoreline property owners;
 2. information should provide and explain current water level conditions and the reasons for them;
 3. information should give details about extremely low water levels and their potential effects upon Great Lakes users;
 4. educational activities or lessons about Great Lakes hydraulics and hydrology should be designed for school curricula; and
 5. communications activities should maintain public awareness (between water level extremes) of the changeable nature of Great Lakes water levels and the associated risks to users.
- h. The diversity of government jurisdictions, government agencies and NGOs with legitimate interests in communicating with the public about Great Lakes water levels makes it impossible, even if it were desirable, to develop a single information program (as requested in the reference) that will be effective in all instances.
- i. Rather, the thrust of the public information/communications development activities in Phase II should be to develop:
1. suggested principles upon which diverse information activities may be based;

2. means of improved coordination of activities;
3. specific suggestions for changes in particular areas; and
4. outlines of specific information, communications and education programs that could be useful in different jurisdictions.

INTERIM RECOMMENDATIONS FOR IMPROVED COMMUNICATIONS ACTIVITIES

The foregoing presents a preliminary analysis of the communications situation and communications challenge with regard to fluctuating levels in the Great Lakes - St. Lawrence River basin. It is based on public comment that has been provided and the collective experience of FG4 members during Phase I of the Study. This research included a series of informal interviews with 42 members of various segments of the basin community.

This preliminary analysis does not represent a comprehensive assessment of the communications situation and communications challenge; nor does it indicate specific methods for communicating more effectively with specific audiences. More comprehensive and detailed investigations will be undertaken by the Communications Task Group, Education Task Group, and Review Network in Phase II of the Study.

Nonetheless, the Phase I effort has clearly identified areas in which improvements are needed and provides the basis for recommendations which responsible government agencies should consider at the present time.

Therefore, the Public Participation and Communications Group recommends:

1. That Governments not diminish their communications efforts despite the fact the Great Lakes have receded from crisis high levels.

While communications efforts may have a different focus during noncrisis periods, providing information is an essential and ongoing governmental function. Therefore, during noncrisis situations, agencies should not diminish their capability to develop information tools, respond to inquiries, make site visits or rapidly respond to crisis situations.

2. That agencies take advantage of the decrease in recent high water levels to strengthen their communications efforts.

This might include an assessment of actions which were most effective during the high water crisis, together with an increased focus on recreational development and new residential development.

3. That Governments take action on the Commission's recommendation of November 14, 1986, that a federal lead agency be designated in each country to "facilitate coordination between and among the large number of affected agencies within the provinces of Ontario and Quebec and the eight Great Lakes States."

This recommendation, contained in the Commission's initial report to governments following the August 1, 1986 reference, dealt with program development as well as information dissemination. However, the importance such a measure could have for information and communications activities must be emphasized.

The establishment of federal lead agencies working in conjunction with governmental agencies and other organizations would, it is hoped, make possible the communication of consistent messages to the public.

4. That governments, in cooperation with Great Lakes states and provinces, and with other organizations as appropriate, design and distribute information to increase awareness and the potential consequences of the changeable nature of Great Lakes water levels.

All media should be used in designing information programs for community groups, school curricula and the public in general. Such packages should be promoted as valuable educational/learning material about one aspect of the Great Lakes Basin ecosystem: the hydraulics and hydrology of the Great Lakes.

To ensure their effectiveness, these educational and learning packages should be prepared in consultation with educators. Once prepared, they should be actively promoted, and follow-up contacts should be made to ensure that the programs are being used and understood.

5. That Governments, in cooperation with the Great Lakes states and provinces, and with other organizations as appropriate, design and distribute information that updates and explains water level situations on an ongoing basis.

All media should be used to explain why water levels have changed so drastically since the highs of 1985-87, and how specific interests can expect to be affected as water level changes continue.

News releases, lake levels updates and Water Level Bulletins issued by the Corps of Engineers and Environment Canada are examples of how this type of information process is already partially underway. However, a more concerted and comprehensive effort is required to ensure that, to as great an extent possible, those most directly interested in water levels of the Great Lakes receive the information they need in a form which they can use.

To ensure the success of such information efforts, and to prevent misunderstandings due to possible conflicts or inconsistencies in information emanating from both federal governments, co-ordination between the two would be essential, as a failure to co-ordinate can lead to confusion. State and provincial governments could assist this information exercise by using their own agency networks to help disseminate the information.

6. That a positive first step toward coordinating the flow of information from both federal governments should be the further coordination of the monthly Water Level Bulletins and their 6-month forecasts.

Through the International Coordinating Committee on Great Lakes Basic Hydraulic and Hydrologic Data, both governments should begin immediately to ensure the forecasts and figures presented in both bulletins are consistent. Such consistency will be an important step in increasing public trust in the data issued by each government.

If it is not possible to make the information completely consistent, a similarly worded note should be included on each bulletin explaining why the U.S. and Canadian figures appear to vary.

7. That Governments, in cooperation with state and provincial governments, and with other organizations as appropriate, design and distribute water level information that is specifically designed for recreational boaters and marina operators.

Recreational boaters and marina operators are a fast-growing user group of the Great Lakes. They require information about water levels in specific locations - especially during the current near and below-average levels - since in recent years the Great Lakes have been characterized by above average water levels.

Marinas and boaters on Lake Ontario require information about forecast levels for the lake and the St. Lawrence River, where changes in flows through the Cornwall regulation structure often affect draughts. These users also need easy and constant access to level forecasts for all the Great Lakes.

The biweekly news release issued in the summer and fall of 1988 by Environment Canada's Great Lakes-St. Lawrence Study Office represented a positive beginning in responding to the information needs of boaters. However, to maximize its effectiveness, this news release should be issued jointly in Canada and the United States.

In addition, consideration should be given to ways of having such information broadcast on radio channels and commercial stations frequently used by boaters. Marinas, resorts, yacht clubs, sailing associations and power and sail squadrons - as well as local media

- should be targeted to receive information material on water level forecasts, lake regulation and Great Lakes hydraulics and hydrology.

8. That Governments, in cooperation with other organizations as appropriate, design and distribute information that explains, in layman's terms, how hydroelectric structures in the Niagara River are operated, and the number, description and functions of existing water diversions.

Understandable explanations of how and why the regulation plans, hydroelectric structures and water diversions work would help dispel much of the mystery that seems to surround these operations. Consideration should also be given to including in these publications addresses and telephone numbers for contacts on each side of the border who are capable of explaining, to the public and the media, regulation procedures and the reasoning behind them.

9. That Environment Canada and the U.S. National Weather Service maintain and enhance their capabilities for timely issuance of high water level/flood and erosion watches and warnings.

These services proved valuable in the past high water level crisis and, coupled with firmly established and effective distribution networks - particularly to shoreline media outlets, can continue to be valuable. By retaining and enhancing these capabilities, both governments will avoid unnecessary delay in starting up the services should high water level crises arise in the future.

To ensure the watch and warning capabilities are put to their best possible use, both agencies should also ensure that their networks of contacts for disseminating the watches and warnings are complete and firmly in place. Procedures for initiating this information service should be laid out in manuals for future use. In the case of Environment Canada's Great Lakes Water Level Communications Centre, attention should also be paid to firmly establishing its network of storm information contacts, so that the office may continue to provide as much information as possible to citizens and the media during high water level events.

In addition to having the information transmitted on radio, provision should also be made for having watches and warnings typed on-screen at local television stations. These same dissemination networks should be used to ensure that mariners are aware of low water levels in specific areas, and of accompanying hazards.

10. That Governments, in cooperation with other organizations as appropriate, take steps now to develop and/or coordinate distribution of how-to manuals for shoreline residents to help them prepare themselves and their property for impending storms.

Although literature and technical assistance is available to help minimize flooding and erosion, no comparable information exists on how to prepare homes and cottages for flooding by doing such things as elevating household goods above flood level and ensuring gas and electrical connections are secure. Booklets containing this type of practical information should be ready for quick distribution during the next high water level period.

These materials should be made available to local government agencies, local arms of state and provincial governments, and community organizations with interest in assisting shoreline property owners during periods of high water levels.

This effort could be initiated by any level of government, or even any community organization with adequate resources. However, it is important that the information be coordinated with similar materials that already exist, and that it be coordinated among agencies if more than one undertakes the task. Accuracy and reliability of these booklets will be of paramount importance. Booklets distributed by more than one agency which give conflicting or confusing information could do more harm than good in matters in which personal safety is concerned.

During periods of high water levels, these manuals could be complemented with information sessions for shoreline residents. However, planning for these information sessions should be undertaken now so they could be implemented immediately during a crisis.

11. That federal, state and provincial governments improve two-way communications with the public by establishing and publicizing central contact points to which citizens may address their concerns for follow-up action.

Each of these levels of government already has agencies which have been contact points for the public on the water level issue. For example, in the United States, the U.S. Army Corps of Engineers and the National Oceanic and Atmospheric Administration (NOAA) have been highly visible to the public during the high water level period of 1985-87. In Canada, Environment Canada's Great Lakes Water Level Communications Centre has served as a contact point for the public; in Michigan, the Department of Natural Resources has worked to keep people informed during the high water level period; and in Ontario, several Conservation Authorities have mounted information efforts.

Any of these agencies - or offices within them - could be designated as points to which citizens could address their concerns for follow-up action. Such designations would allow the general public to become involved in the decision-making process with regard to government policies on water level issues. If well-executed, these contact points would be a major step toward increasing the public's faith in governments' willingness to take the concerns of ordinary citizens into account in making decisions, and in their ability to respond effectively to water level issues.

However, for such contact points to be successful, adequate and timely follow-up to all concerns would be essential. Without such follow-up, governments would appear to be unwilling to respond meaningfully to concerns. Therefore, governments are advised to establish these contact points only if they were fully prepared beforehand to support these initiatives through all the necessary steps: from acknowledging and providing responses in writing to all concerns, to following up the concerns in the formulation of policy.

Again, it must be emphasized that the above recommendations are based purely upon Functional Group 4's preliminary examination of the communications situation with regard to Great Lakes water levels. In Phase II of the Study, there will be an examination in greater detail of the communications situation, followed by recommendations in the final Study report for broader, more fully integrated information/communications/education initiatives.

SECTION 2

PUBLIC COMMUNICATIONS AND INVOLVEMENT IN THE STUDY

In addition to the activities related to the Reference request "to develop an information program," Functional Group 4 (FG4) was directed to "develop strategies for involving the public in the various studies" (see Foreword.) FG4 undertook a number of public information and communications activities during the first Phase of the Levels Reference Study. Several participation activities involved representatives from all functional groups. This section contains descriptions of the public information, communication, involvement, and participation activities with which FG4 was involved.

PHASE I ACTIVITIES

The Toledo Workshop and Public Comment Process

During the November 1987 IJC Biennial Meeting in Toledo, Ohio, FG4 held a 3-hour workshop for those interested in the Study. Approximately 175 individuals attended. Representatives of the U.S. Corps of Engineers, Environment Canada, Ontario Conservation Authorities, and the Michigan Department of Natural Resources discussed emergency measures. Past or ongoing activities under the Reference were discussed by Study team members. Also discussed were the Interim Reports by the Levels Task Force and the Plan of Study. The audience questioned and discussed the information they had received with the presenters.

The Levels Workshop in Toledo also kicked-off a two-stage Public Comment Process with the public being encouraged to comment on the Plan of Study. Newspaper advertisements, press releases, articles in Focus (the Commission newsletter), public service announcements, as well as other media activities all contributed to generating interest in the Study. Other documents distributed for public comment were the Task Force and Interim Reports (January and November 1988, respectively). Recipients of these reports included approximately 3,000 individuals, citizen groups, media, elected officials and businesses.

Inventory of Materials

An inventory of levels-related materials has been compiled, in part by contacting other Great Lakes-oriented agencies and organizations. This had the additional result of increasing the awareness of the basin community about the Levels Reference Study. (See Appendix G-5.)

October 1988 Public Forum

A major public participation activity organized by FG4 was the "Public Forum on the Great Lakes - St. Lawrence River Levels Reference Study," held on October 22, 1988. Members of the many interested publics met in ten communities around the basin - from Duluth, Minnesota, to Montreal, Quebec - to participate in a day-long interactive videoconference. Interchanges between and among members of the PMT and thirteen invited guests were transmitted by satellite from a television studio in Detroit, Michigan, to each of the ten community sites. Invited guests were selected to represent the interests and regions of the Great Lakes - St. Lawrence basin.

Invitations were sent to some 15,000 households, businesses, organizations, and agencies throughout the basin. Over 500 radio and television stations, and daily and weekly newspapers in the basin received press kits prior to the Forum, containing background documents on the Study, and/or press releases/public service announcements. Advertisements in several basin newspapers and announcements in the U.S. Army Corps of Engineers and Environment Canada monthly levels bulletins helped to publicize the event. An announcement in the International Great Lakes Coalition newsletter reached approximately 25,000 households.

Printed background materials on the Study were available to the more than 400 attendees and to an additional 400 who requested the materials by mail. (See Appendix G-6 for an assessment of the Public Forum and Appendix G-7 for commitments and statements made by the PMT during the broadcasts.) A summary of the discussion from each of the ten community sites was also distributed to those who attended and those who were interested in the Forum.

Three hours of videotape, the actual broadcast portions of the Forum, are available from IJC offices in Washington, Ottawa, and Windsor. Two additional programs on videotape are presently in production; one, a shortened version of the Public Forum discussions, and the second, a primer on levels and the Great Lakes and St. Lawrence River.

Levels Articles in Focus

Beginning with the July/August issue, the Commission's Focus newsletter has featured a four-page pull-out section, "Lake Levels Update," on the progress of the Levels Reference Study. Functional group updates, descriptions of papers and meetings, and a lake level report are included in the section.

Before the "Update" section, articles related to the Reference appeared in each issue since August 1986 and, on water levels in general, since mid-1985. Focus is distributed three times each year to approximately 13,000 households and organizations per issue.

Through workshops, surveys, and a focus group process, other functional groups involved the public in their ongoing work. FG4 assisted by defining different approaches, encouraging, and, where requested, supporting this process. In a number of instances individual members of the public were invited to participate in workshops or meetings, to otherwise assist Study groups and also to serve as full functional group members.

PUBLIC INVOLVEMENT ACTIVITIES IN PHASE II

A major emphasis on the next phase should be to encourage the widest possible public consideration of "methods of alleviating the adverse consequences of fluctuating water levels in the Great Lakes - St. Lawrence basin."

From our correspondence and other contacts with the public, we have found that many people see Study "experts" as those who work in isolation - from the public and from each other. And, as with the Levels Reference Study, the "isolated" decisions made by the experts affect the lives of basin residents. In this Study, we have begun to develop ways that the public in general, as well as representatives of the public, are actively engaged in the concept, design and implementation of strategies and actions related to fluctuating water levels. While we are not satisfied with the extent of our progress we are convinced that Phase II provides opportunities for further development of this approach. This lack of satisfaction is supported by what we have heard and read of the activities and experience of other functional groups during Phase I.

The experience of FG4, and the Study as a whole, in Phase I suggests a quite different orientation toward various sectors of the public and their institutions in Phase II. Earlier in this chapter, we outlined the approach already in place for Phase II that would develop the "public information program" for government agencies requested in the Reference. Our experience to date also underscores the importance of a more comprehensive engagement of members of the public, nongovernmental organizations, the media and educational institutions, as well as government agencies during the balance of the Study.

All activities in Phase II of the Study should be designed to ensure appropriate engagement of all sectors of the Great Lakes - St. Lawrence basin community and also those from outside the basin.

This should include a comprehensive program on the Great Lakes-St. Lawrence basin utilizing educational strategies appropriate to schools, colleges, and universities, the media, and the communities. To this end, we have formed the Communications Group (discussed in detail above) in order to utilize the expertise and experiences of individuals both in and out of government agencies in developing information/participation approaches that will more adequately serve the needs of the basin community.

Having the "invited guests" from the Public Forum on October 22 meet on a regular and continuing basis as a kind of advisory group would be another means for incorporating the views of basin interests into the Study, as was suggested following the Public Forum.

Essential to Phase II of the Study is the realization by all those involved that information, communications, participation and involvement, in fact any means by which various sectors of the public are engaged in the Study, must permeate the overall structure. Without this recognition and commitment to engaging various sectors of the community in the Study process, an essential requirement of the Reference, will not be achieved. Our combined experience in Phase I, some positive and some perhaps negative, should encourage us to shun proposals for superficial or perfunctory programs to engage various sectors of the community in Phase II.

RECOMMENDATIONS FOR PHASE II

Specific recommendations for public information and participation activities during Phase II by Study team personnel are as follows.

- a. Study team members should more aggressively seek the meaningful engagement of various sectors of the Great Lakes basin community for involvement and participation in all subject areas of the Study by:
 1. having representatives of the various interests serve on Study-related working groups,
 2. seeking public comment on the proceedings of workshops, draft interim reports, and the Phase II report draft, and
 3. developing a timetable for the production of the Phase II report which would include a public review and comment period.
- b. The public communication and information program of the Study should be improved through one or more of the options of:
 1. providing periodic updates for the water levels-related newsletter of basin agencies and organizations (those listed in Appendix G-5);
 2. producing a bimonthly Study newsletter to be distributed to individuals on the master contacts list;

3. releasing periodic news releases regarding workshops, preliminary findings, public comment periods, and released reports;
4. producing informational fact sheets or brochures for general use and to include with responses to inquiries (topics should include an overview of the Study process, Study mission, an organizational chart, a flow chart on the 'path' the Reference and subsequent reports take, and the definition of terms, such as Reference, Project Management Team, riparian, and functional group);
5. using the PMT members from the October 1988 Public Forum as continuing spokespersons for the Study in news releases, newsletter articles, and media interviews;
6. producing executive summaries for any reports issued under the Reference which could be released to the public; and/or
7. conducting a basinwide videoconference in 1990 to update the public on the progress of Phase II.

SECTION 3

INTERNAL STUDY COMMUNICATIONS

Functional Group 4 (FG4) was given the responsibility to maintain the internal communications network of the Study. The activities of FG4 in doing so are reported as follows.

STUDY PERSONNEL DIRECTORY

A directory of Levels Study personnel was developed to enable Study members to communicate with one another more easily. The directory lists the name, affiliation, address, telephone number, FAX number, and electronic mail system designation for each functional group member.

ELECTRONIC MAIL SYSTEM

After surveying the communications needs and recommendations of the PMT and functional groups, FG4 established and encouraged the use of an electronic mail system to enhance internal communications. The directory of Study personnel and a calendar of combined IJC/Levels Reference Study meetings for both Canadian and U.S. sections are maintained on a 'bulletin board' within the system and are accessible to all Study members. More than sixty Study users are now linked by this system.

MASTER CONTACT LIST

The preparation of a Levels mailing list has allowed FG4 and other functional groups to contact members of the various interest groups, organizations, and agencies regarding upcoming Study-related events.

Functional Group 4 personnel have developed a master contacts list for organizing communications between the Study team and the public. It consists of a database, program for managing the database, utilities for working with different sets of data, and documentation for the whole package. The primary purpose of the master contacts list is to serve as an automated mailing list and telephone directory for the Study. It also provides a format which all functional groups can use to build compatible databases.

The stand-alone program to run the database is currently operational. The database contains the IJC Great Lakes levels mailing lists, the Group Depth Interview attendees (see glossary and ANNEXES C and E), as well as addresses collected prior to and during the Public Forum. This master list will be maintained and updated throughout the life of the Study.

The program, database, and documentation for the database have been distributed to all functional groups. Updated versions will be circulated as they are developed.

OTHER INTERNAL COMMUNICATIONS

Representatives of each of the five functional groups serve as liaisons to FG4. At each FG4 meeting, the liaisons report on the activities of their respective groups and so keep FG4 abreast of Study activities. Minutes from these meetings are then circulated to the liaisons to be shared with the other members of their functional groups. Liaisons report on the findings, workshops, and other events of their particular group. This serves not only FG4, but all the groups.

All Study members receive issues of Focus which, by way of the "Levels Update Section," provides members with a summary of Study activities and information made available to the Levels publics.

SECTION 4

CREDITS

Annex G is the progress report of the Public Participation and Communications Group - Functional Group 4 - which, with other components, was formed by the International Joint Commission under the 1986 Reference Study of fluctuating water levels in the Great Lakes and St. Lawrence River. Public affairs, videocommunications, and riparian interests expertise have been present in the membership of FG4. In addition, a representative of each of the other four functional groups has participated in the work of FG4.

Primary contributors to this Annex and its appendices were:

Frank Bevacqua	IJC, Washington
Alan Clarke	IJC, Ottawa
Ruth Edgett	Great Lakes Water Levels Communication Centre
Ross Fredenberg	U.S. Army Corps of Engineers, Chicago
David LaRoche	IJC, Washington
Clifford Sasfy	International Great Lakes Coalition
Kimberly Tassier	IJC, Windsor

Other contributors, FG4 members, and functional group representatives were:

Sally Cole-Misch	IJC, Windsor
Jim Houston	IJC, Ottawa
Peter Mallett	Sheridan College
Jody Rooney	U.S. Army Corps of Engineers, Duluth; FG2
Sally Spiers	IJC, Washington
Anne Sudar	Environment Canada, Burlington; FG3, FG5
Geoffrey Thornburn	IJC, Ottawa
Malcolm Todd	U.S. Army Corps of Engineers, Chicago; FG1

FG4 also acknowledges others who have contributed to its public outreach program: Sally Leppard and David Dilks of the LURA Group, Mariette Malone of Sheridan College, the staff of the IJC Great Lakes Regional Office, and the many Great Lakes and St. Lawrence River basin residents who assisted with the October 1988 Public Forum.

APPENDIX G-1

-Glossary-

GLOSSARY OF TERMS

Adverse Consequences: Negative implication of fluctuating water levels for social, economic, environmental or political investments.

Agreements: Joint statements among two or more governmental units on (i) goals and purposes which should guide basin decision-making, (ii) processes of decision-making and (iii) authorities of governments to act. Agreements are an attempt to remedy a shared problem, and they serve to define the boundaries and constraints on choice of measures.

Alternative Dispute Resolution (ADR): A process aimed at reaching a consensus agreement in order to end a dispute or reduce conflict among interest groups that have some stake in and can influence the outcome of decisions or actions related to the water level issue. The distinguishing characteristics of ADR are that 1) interest groups are actively included in developing and assessing alternatives and making tradeoffs between alternatives, and 2) issues are decided on their merits rather than on the interests access to the decision-making process. Policy dialogues and negotiation are types of ADR processes.

Aquifer: Any subsurface material that holds a relatively large quantity of groundwater and is able to transmit that water readily.

Authority: The right to enforce laws and regulations or to create policy.

Average Water Level: see Monthly Mean Level

Bathymetry: The measurement of depths of water in oceans, seas and lakes; also information derived from such measurements.

Basin (Great Lakes - St. Lawrence River): The surface area contributing runoff to all of the Great Lakes and the St Lawrence River downstream to Trois Riviere, Quebec.

Basin: The rounded depression of a lake bed.

Beach: The zone of unconsolidated material that extends landward from the average annual low water level to either the place where there is marked change in material or physiographic form, the line of permanent vegetation, or the high water mark.

Beneficial Consequence: Positive implication of fluctuating water levels for social, economic, environmental or political investments.

Bluff: A steep bank or cliff of variable heights, composed of glacial tills and lacustrine deposits consisting of clay, silt, gravel and boulders.

Breakwater: An offshore barrier to break the force of waves, which affords shelter to shore structures.

Climate: The sum total of meteorological phenomena over a period of time which combine to characterize the average and extreme condition of the atmosphere at any place on the earth's surface.

Coastal Zone Data Base: Information of the various attributes of the key components of the Great Lakes ecosystem, gathered and stored in the GIS.

Connecting Channels: A natural or artificial waterway of perceptible extent, which either periodically or continuously contains moving water, or which forms a connecting link between two bodies of water. The Detroit River, Lake St. Clair and the St. Clair River comprise the connecting channel between Lake Huron and Lake Erie. Between Lake Superior and Lake Huron, the connecting channel is the St. Marys River.

Consumptive Use: The quantity of water withdrawn or withheld from the Great Lakes and assumed to be lost or otherwise not returned to them, due to evaporation during use, leakage, incorporation into manufactured products or otherwise consumed in various processes.

Control Works: Hydraulic structures (channel improvements, locks, powerhouses, or dams) built to control outflows and levels of a lake or lake system.

Criteria: A principle or standard by which a judgement or decision is made. Criteria are conceptual but must have operational (measurable in principle) components. Any single criterion can be used to compare the merit of measures or policies along the dimensions encompassed by the criterion. Criteria are used to assess measures and criteria are used to assess the decision making process (for example, group access to the decision making bodies).

Criteria, Core: The broad principles upon which the overall value of any measure can be assessed relative to other measures. They include economic sustainability, environmental integrity, social desirability, uncertainty and risk, political acceptability and implementability, and equitability.

Criteria, Operational: These criteria are sub-sets of the core criteria. These sub-criteria are quantified on the basis of the application of specific group rules to data or estimates of impacts of the measure. Impact assessments used to score sub-criteria are ultimately used to compare the profiles of measures.

Current: The flowing of water in the lakes caused by the earth's rotation, inflow and outflows, and wind.

Design Range: The range of factors (including expected water levels) taken into consideration when making an investment decision.

Diversions: A transfer of water either into the Great Lakes watershed from an adjacent watershed, or vice versa, or from the watershed of one of the Great Lakes into that of another.

Dike: A wall or earth mound built around a low lying area to prevent flooding.

Drainage Basin: The area that contributes runoff to a stream, river, or lake.

Ecology: The science which relates living forms to their environment.

Ecosystem: A subdivision of the Biosphere with boundaries arbitrarily defined according to particular purposes. An ecosystem is a dynamic totality comprised of interacting living and non-living components. The Great Lakes-St. Lawrence River Basin Ecosystem is an example which encompasses the interacting components of sunlight, air, water, soil, plants, and animals (including humans), within the Basin.

Ecosystem Integrity: "Ecosystem integrity" refers to a state of health, or wholeness of an ecosystem. It encompasses integrated, balanced and self-organizing interactions among its components, with no single component or group of components breaking the bounds of interdependency to singularly dominate the whole.

Environment: Air, land or water; plant and animal life including man; and the social, economic, cultural, physical, biological and other conditions that may act on an organism or community to influence its development or existence.

Environmental Integrity: The sustenance of important biophysical processes which support plant and animal life and which must be allowed to continue without significant change. The objective is to assure the continued health of essential life support systems of nature, including air, water, and soil, by protecting the resilience, diversity, and purity of natural communities (ecosystems) within the environment.

Equitability: The assessment of the fairness of a measure in its distribution of favorable or unfavorable impacts across the economic, environmental, social, and political interests that are affected.

Erosion: The wearing away of the shoreline and lake or river bed by the action of waves and currents, and other natural processes.

Eutrophic: Waters high in nutrient content and productivity arising either naturally or from agricultural, municipal, or industrial sources; often accompanied by undesirable changes in aquatic species composition.

Evaluation: The application of data, analytical procedures and assessment related to criteria to establish a judgment on the relative merit of a measure, policy or institution. Evaluation is a process which can be conducted both within formal studies and by separate interests, although different data, procedures and criteria may be employed in the evaluation by different interests.

Evaluation Framework: A systematic accounting of the criteria considered and methodologies applied in determining the impact of measures on lake levels, stakeholders, and stakeholder interests.

Evapotranspiration: Evaporation from water bodies and soil and transpiration from plant surface.

Feed Back Loop: Feed back loops are circular cause and effect relationships dominating some interaction of particular sets of system's key variables. Feed back loops belong generally to one of two types: "negative feed back loops" which act to maintain the value of a particular variable around a given level, and "positive feed back loops" which act to cause the value of a particular variable to increase or decrease in a self-amplifying manner, and, usually at a geometric rate.

Flooding: The inundation of low lying areas by water.

Fluctuation: A period of rise and succeeding period of decline of water level. Fluctuations occur seasonally with higher levels in late spring to mid-summer and lower levels in winter. Fluctuations occur over the years due to precipitation and climatic variability. As well, fluctuations can occur on a short-term basis due to the effects periodic events such as storms, surges, ice jams, etc.

Geographical Information System (GIS): A computer-based "tool" which captures, displays and manipulates geographically referenced data.

Geomorphology: The field of earth science that studies the origin and distribution of landforms, with special emphasis on the nature of erosional processes.

Governance System: The complex, dynamic mosaic of governmental and non-governmental entities having some authority to manage, or the ability to influence the management of Basin resources.

Greenhouse Effect: The warming of the earth's atmosphere and associated meteorological effects due to increased carbon dioxide and other trace gases in the atmosphere. This is expected to have implications for long-term climate change.

Groundwater: Subsurface water occupying the zone of saturation. In a strict sense, the term is applied only to water below the water table.

Group Depth Interviews (GDI's): A tool borrowed from marketing to gather perceptual data from a small group of representatives of local interests and governments on the following: the problems caused by different lake levels; the opportunities presented by different Measures; the factors involved in decision making about adopting Measures; and the consequences of Measures. It should be noted the GDI's reflect accurately the perceptions of the attendees but do not necessarily reflect the perceptions of all individuals within an interest.

Gullies: Deep, V-shapes trenches carved by newly formed streams, or groundwater action, in rapid headward/forward growth during advanced staged of accelerated soil erosion.

Hazard Land: An area of land that is susceptible to flooding, erosion, or wave impact.

Hydraulics: That branch of engineering science dealing primarily with the flow of water or other liquids.

Hydrology: The applied science concerned with the water of the earth in all its states.

Ice Jam: An accumulation of river ice, in any form which obstructs the normal river flow.

Implementability: The ability to put into effect a measure considering factors of engineering, economic, environmental, social, political and institutional feasibility.

Implementing Authority: Any governmental agency at any level having appropriate authority to authorize and execute the implementation of any particular action and the jurisdiction to enforce an action.

Infiltration: Movement of water through the soil surface and into the soil.

Institution: An organization of governmental units which have the authority and ability to facilitate and/or make decisions affecting the water levels issue.

Interests: Any identifiable group, including specialized mission agencies of governments which (1) perceive that their constituents/members welfare is influenced by lake level fluctuation or policies and measures to address lake level fluctuation, and which (2) are willing and able to enter the decision making process to protect the welfare of their constituents/members.

Interest, Agriculture: This interest benefits from the services of shore location (fertility and climate), water supply, and indirectly from the transport of grains. This interest class includes all types of farming and production agriculture.

Interest, Commercial Fishing: This interest uses the Great Lakes habitat and shore access services to earn income and sustain a lifestyle from sale of fish and fish products.

Interest, Commercial/Industrial: A commercial and industrial interest includes firms whose activities are tied into having a fixed point location along the shoreline and whose net income position is potentially affected by fluctuating lake levels. The interest is made up of a number of diverse businesses that are often represented by specialized trade associations and because of diversity of activities and geographic dispersion may not be uniformly affected by lake level fluctuations.

Interest, Electric Power: Power interests are composed of all forms of electrical generation that depend on water as an integral part of power production process. The interest uses the Great Lakes and the St. Lawrence River for shore access service and water supply for hydro power head, cooling water and steam power and therefore includes hydro power, nuclear power, and fossil fuel-fired electric power.

Interest, Environment: This class of interest receives a service from the knowledge that particular Great Lake ecosystems exist. The class is represented primarily by naturalist and conservation groups, as well as government agencies with a mandate for preserving the environment.

Interest, Government: This interest includes all levels of government, local, regional, state/provincial and federal with some vested interest in the Great Lakes - St. Lawrence River water levels issue.

Interest, Native Peoples: This interest includes Native populations whose reservations are located on the shores of the Great Lakes - St. Lawrence River. The benefits derived from shoreline location of Natives include subsistence, residential location, aesthetics and cultural heritage.

Interest, Recreational: Non-riparian recreation interests include individuals, some of which are represented by specialized associations, which are located both inside and outside the Great Lakes Basin. This interest does not include those who own shoreline property. This interest seeks access to the lakeshore and to some extent depends upon the habitat services of the lakes for serving its interests. Recreation interests benefit from angling, hunting, non-consumptive recreation, boating, swimming and camping.

Interest, Residential Shoreline Property Owner: This interest group, also referred to as riparians, is comprised of many individuals who have seasonal or permanent shoreline residences along the Great Lakes - St. Lawrence River. A number of riparians are represented by various coalitions and associations with a wide range of organization and political strength.

Interest, Transportation: Transportation includes movement of goods in Great Lakes-St. Lawrence shipping channels and into and out of Great Lakes-St. Lawrence ports. Transportation interests are comprised of two major sub-classes: (1) ocean going and lake carrier shipping companies, often represented by shipping associations, and (2) ports, often represented by port associations. Associated with the lake transportation interests are other interests within the regional transportation infrastructure, including truck and rail interests.

International Joint Commission (IJC): A binational Commission created under authority of the 1909 Boundary Water Treaty. The IJC has three primary functions: 1) quasi-judicial, with responsibility for approving applications to affect natural flows or levels of boundary waters; 2) investigation of matters at the request of the two governments, with the limitation that resulting recommendations are not binding on the governments, and can be modified or ignored; 3) surveillance/coordination, through monitoring or coordinating the implementation of recommendations, at the request of the governments.

Investment: Expenditure made by an interest to capture benefits. The investment decision reflects available information and understanding about the system, government responsibilities and risks.

Jurisdiction: The extent or territory over which authority may be legally exercised.

Lake Outflow: Controlling the amount of water flowing out of a lake.

Littoral: Pertaining to or along the shore, particularly to describe currents, deposits and drift.

Littoral Cell: An area under the continuous influence of specific longshore currents.

Littoral Zone: The area extending from the outermost breaker or where wave characteristics significantly alter due to decreased depth of water to: either the place where there is marked change in material or physiographic form; the line of permanent vegetation (usually the effective limit of storm waves); or the limit of wave uprush at average annual high water level.

Location Benefit: Positive effect on the welfare of an interest derived from shore location and water level situation.

Location Cost: Negative effect on the welfare of an interest derived from shore location and water level situation.

Marsh: An area of soft, wet or periodically inundated land, generally treeless and usually characterized by grasses and other low growth.

Measures: Any action, initiated by a level(s) of government to address the issue of lake level fluctuations, including the decision to do nothing.

Measures, Non-Structural: Any measure that does not require physical construction.

Measures, Structural: Any measures that requires some form of construction. Commonly includes control works and shore protection devices.

Monthly Mean Water Level: The arithmetic average of all past observations (of water levels or flows) for that month. The period of record used in this Study commences January 1900. This term is used interchangeably with average.

Meteorological: Pertaining to the atmosphere or atmospheric phenomena; of weather or climate.

Model: A model may be a mental conceptualization; a physical device; or a structured collection of mathematical, statistical, and/or empirical statements. Models used in this Study include:

Model, Computer: A series of equations and mathematical terms based on physical laws and statistical theories that simulate natural processes.

Model, Hydraulic: A small-scale reproduction of the prototype used in studies of spillways, stilling basins, control structures, river beds, etc.

Model, Visual Situation: A pictorial display linked to an automated information/geographic information system(s) which connects the problems associated with fluctuating water levels with the stakeholders and their interests that are impacted by the problems, with an emphasis on overlapping or interacting relationships.

Negotiation: The process of seeking accommodation and agreement on measures and policies among two or more interests or agencies having initially conflicting positions by a "voluntary" or "non-legal" approach. This is often considered a part of an ADR process.

Net Basin Supply: Represents the supply of water a lake receives from its own basin less the losses by evaporation from the lake surface and loss or gain due to seepage.

No Net Loss: A working principle by which the department strives to balance unavoidable habitat losses with habitat replacement on a project-by-project basis so that further reductions to Canada's fisheries resources due to habitat loss or damage may be prevented.

Operating Plan: A list of procedures to be followed in making changes to the lake levels or their outflows for the specific purpose or to achieve certain objectives. Operation of regulatory facilities on the Great Lakes are carried out by their owners and operators under the supervision of the IJC and in accordance with Plan 1977 (Lake Superior) and Plan 1958D (Lake Ontario).

Oxic: To expose to oxygen.

Physiography: A descriptive study of the earth and its natural phenomena, such as climate, surface, etc.

Planimetric Capabilities: The capability of a system to measure areas.

Policy: The position adopted by a government on an issue which is expected to structure and guide the decision making process.

Position of Interests: The perceptions, beliefs and preferences of interests regarding fluctuating water levels, implications of those levels, and acceptability of a measure or policy to an interest. Positions may be directly stated or may be inferred from supporting or opposing activities taken by the interest in the decision making process.

Public Communications: Activities where the purpose, design, and plan intends for two-way communication for a defined period of time between Study personnel and the public or various publics. Examples: the Toledo Public Information Meeting and the Public Comment Process on the Task Force Report and Background Paper.

Public Information: Activities where the purpose, design, and plan intends to deliver information to the public or various publics. Examples: press releases and articles in the IJC's Focus Newsletter.

Public Involvement: Activities where the purpose, design, and plan is such that members of the public or various publics are engaged in the Study on a continuing basis with other "expert" resources. Example: a member of an interest group serving as a functional group member.

Public Participation: Activities where purpose, design, and plan intends that members of the public have an opportunity to participate for a defined period of time in a Study activity. Example: input into a portion of the work activities of a functional group through a workshop.

Reach: A length of shore with fairly-uniform onshore and offshore physiographic features and subject to the same wave dynamics.

Rebound (Crustal Movement): The uplift or recovery of the earth's crust in areas where a past continental glaciation had depressed the earth's crust by the weight of the ice.

Recession: A landward retreat of the shoreline by removal of shore materials in a direction perpendicular or parallel to the shore.

Regulation: Control of land and water use in accordance with rules designed to accomplish certain goals.

Regulation: Artificial changes to the lake levels or their outflows for specific purpose or to achieve certain objectives.

Resiliency: The ability to readily recover from an unexpected event, either because costs were not significantly affected by changing levels, another source of income provided a cushion to levels induced costs, and/or a conscious effort was made on the part of the interest.

Riparians: Persons residing on the banks of a body of water. (see Interests, Residential Property Owner).

Runoff: The portion of precipitation on the land that ultimately reaches streams and lakes.

Shoreline: Intersection of a specified plane of water with the shore.

Sills: Underwater obstructions placed to reduce a channel's flow capacity.

Social Desirability: The continued health and well-being of individuals and their organizations, businesses, and communities to be able to provide for the material, recreational, aesthetic, cultural, and other individual and collective needs that comprise a valued quality of life. The satisfaction of this objective includes a consideration of individual rights, community responsibilities and requirements, the distributional impacts of meeting these needs, and the determination of how these need should be achieved (paid for) along with other competing requirements of society.

Spatial Evaluation Framework: The classification and delineation of terrestrial, wetland and aquatic environments in spatial units meaningful to an assessment of fluctuating levels and measures.

Stakeholder: An individual, group, or institution with an interest or concern, either economic, societal or environmental, that is affected by fluctuating water levels or by measures proposed to respond to fluctuating water levels within the Great Lakes-St. Lawrence River Basin.

Strategy: A general conceptual framework for guiding action based upon a particular purpose and selected means for achieving agreed upon ends.

Steady-state: No change over time.

System Dynamics: A simulation modelling methodology developed at Massachusetts Institute of Technology (M.I.T.) for the study of the behaviour of complex systems. System Dynamics is based upon the identification of key system variables, the interactions between them and the study of the effects of these interactions over time.

Systems Approach: A method of inquiry which complements the classical analytical method of science by emphasizing the concept of "whole systems" and the irreducible properties of whole systems that result from the interactions among individual components.

Uncertainty and Risk: The evaluation of a proposed measure in terms of the unpredictability and magnitude of the consequence which may follow, the detectability of anticipated or unanticipated consequences, and the ability to reverse, adapt, or redirect the measure, depending on its effects.

Urbanization: The change of character of land, due to development, from rural or agricultural to urban.

Water Supply: Water reaching the Great Lakes as a direct result of precipitation, less evaporation from land and lake surfaces.

Watershed: The area drained by a river or lake system.

Wave: An oscillatory movement in a body of water which results in an alternate rise and fall of the surface.

Wave Crest: The highest part of a wave

Wave Direction: The direction from which a wave approaches.

Wave Period: The time for two successive wave crests to pass a fixed point.

Weather: The meteorological condition of the atmosphere defined by the measurement of the six meteorological elements: air temperature; barometric pressure; wind velocity; humidity; clouds; and precipitation.

Wetlands: Relatively flat lands, either covered by water or water-logged, that are wet during all or part of the year. These lands are generally characterized by grasses, shrubs, cattails, bulrushes and other low growing plants. Along the Great Lakes shoreline they include marshes, swamps and other lands generally considered to be potential havens for fish and wildlife areas.

Vulnerability: Vulnerability is a concept pertaining to a relative susceptibility of interests to the adverse consequences of water level fluctuations. Depending on the choice of level of resolution, the concept of vulnerability could pertain to a spectrum of identifications of interests ranging from an individual, to a group of interests (industry) or to some notion of "society as a whole." Vulnerability would thus be dependent on the concentration of interests in the Basin, the type of activity they are engaged in, the assets they employ, including such factors as location and setting, design range of the building or equipment, the ability of the interest to adapt, and the like.

APPENDIX G-2

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APPENDIX G-3

-Work Plan for Task 442-

DEVISE AN INFORMATION PROGRAM FOR GOVERNMENTS

(TASK 442)

WORK PLAN

BACKGROUND

By letter of reference dated August 1, 1986, the Governments of Canada and the United States requested that the International Joint Commission "examine and report on methods of alleviating the adverse consequences of fluctuating water levels in the Great Lakes - St. Lawrence River Basin." One item in the terms of reference directs the Commission to:

develop an information program which could be carried out by responsible government agencies to better inform the public on lake level fluctuations(.)

Task 442 of the Plan of Study, adopted by the Commission on March 15, 1988, requires that Public Participation and Communications Group (Functional Group 4) "devise a plan" to meet this reference obligation.

SCOPE

The request of the two Governments for a program to "better inform" the public assumes that prior government communications could be improved upon. In the context of the reference, the purpose of improved communications is to reduce the occurrence or severity of problems associated with fluctuating levels. Thus, if the information process is improved, more people will be better able to make informed decisions with regard to their use of the Great Lakes system, and avoid or minimize some of the adverse consequences they might suffer as a result of changes in water levels.

The charge to develop an information program on "lake level fluctuations" is interpreted to include a broad range of initiatives, from ones that provide practical information to parties directly affected by localized water level conditions, to raising public awareness about how the Great Lakes system works and its value as a natural resource. Also included are communications activities which would improve the implementation of other actions, such as publicizing government assistance or regulatory programs.

For this task, the reference's use of the word "information" is also interpreted broadly. Accordingly, the task may be considering "public information", "communications", "participation", "involvement" and "education" activities. Each of these has been given specific definitions as listed below. For ease of discussion, the word "communications" is sometimes used to refer to all of these activities. Communications "activities" are defined as discrete communications efforts which may or may not be part of larger, strategically planned communications "programs".

The Great Lakes Basin contains a number of jurisdictions, each having a different segment of the shoreline and differing policies with regard to the use of the shoreline. It is recognized that the task is unlikely to result in a single information program which can be implemented by all "responsible government agencies".

This task will result in three main products:

- the compilation of an inventory and analysis of existing communications activities related to fluctuating levels in the Great Lakes - St. Lawrence River Basin,

- a description of the communications challenge and objectives, and

- various program designs and recommendations for achieving these objectives.

APPROACH

The assignments outlined in this workplan will be accomplished by a combination of working groups and a review network. Members of Functional Group 4 will take primary responsibility for completing the inventories (subtask 442-1), recommending public involvement activities related to the conduct of the task (subtask 442-3), coordinating Task 442 with the work of other study groups, and producing a final report (subtask 442-4g).

Functional Group 4 is of the view that the development of successful information programs will require input from both those who initiate communications activities and those to whom they are directed. To ensure that this type of input is received, a Communications Task Group will be convened consisting of members from government agencies and from segments of the Great Lakes community with a direct interest in the programs. The Communications Task Group will assume primary responsibility for defining the problems and objectives which information programs should address (subtask 442-2) and developing initiatives to achieve those objectives (subtasks 442-4b,c, and f).

The Communications Task Group will be convened with the following principles in mind.

Government information programs will be more likely to further the goal of reducing the problems associated with fluctuating levels if the program design is broadly based.

A greater degree of partnership between government agencies, who provide the information, and the communities and interests who are the users of the information, would lead to more effective programs.

Members of the Communications Task Group are brought together, not as representatives of adversarial interests, but in the spirit of partnership in working toward a common goal of improved communications about water levels.

In order to receive input from a wider range of agency and community members, written materials produced by the Communications Task Group will be circulated to the Review Network for comment. Comments will be catalogued and made available to all members of the Communications Task Group.

In order to give special emphasis to educational activities, an Education Task Group will also be convened. This Group will assume responsibility for developing agency program initiatives which might be undertaken in cooperation with the formal educational system, post-secondary education programs, public broadcasting, youth programs or citizen-based education programs (Subtask 442-4d).

Task 442 will be conducted in full coordination with other study groups under the reference where this would provide for mutual benefit and eliminate unnecessary duplication of effort. In order to develop useful recommendations, the general level of human and financial resources necessary for the implementation of any initiatives proposed under this task will be identified.

DEFINITIONS

Public Information - activities where the purpose, design, and plan intends to deliver information to the public or various publics. Examples: press releases and newsletter articles.

Public Communications - activities where the purpose, design, and plan intends to provide two-way communication for a defined period of time between agencies and the public or various publics. Examples: the public information meetings and circulating documents for a public comment period. For ease of discussion, the word "communications" is sometimes used to refer to all of the activities defined here.

Public Participation - activities where the purpose, design, and plan intends that members of the public have an opportunity to participate for a defined period of time in an agency activity. Example: input into an agency planning process through a workshop.

Public Involvement - activities where the purpose, design, and plan is such that members of the public or various publics are engaged in the an agency process on a continuing basis with other "expert" resources. Example: a member of an interest group serving as a study team member.

Educational Activities - activities undertaken by agencies in cooperation with the formal educational system, post-secondary education programs, public broadcasting, youth programs or citizen-based education programs. Examples: development of curricular lessons and activities for secondary school students and materials for use by community-based service organizations.

SUBTASK 442-1 -- INVENTORIES

442-1a: Existing Programs: Prepare an inventory of government and nongovernment public information, communications, participation and involvement activities related to water levels in the Great Lakes Basin. This will include activities conducted during the recent high water crisis, their present status and any initiated subsequent to the crisis.

FOR PHASE I REPORT

TARGET DATE: First draft - Dec. 2, 1988
Final draft - Mar. 30, 1989
LEAD: RE/RF
PERSONNEL: FG4
APPROACH: Review of relevant literature, including IJC Great Lakes Water Levels Task Force Report; survey of program administrators;
PRODUCT: Inventory of Programs

FOR PHASE II REPORT

TARGET DATE: Final draft - Sept. 30, 1989
LEAD: RE/RF
PERSONNEL: FG4, Communications Task Group
APPROACH: Update and expand as necessary
PRODUCT: Updated Inventory of Programs

442-1b: Policies and Approaches: Review and inventory any jurisdictional approaches, policies or other informational efforts relevant to communications activities in the Great Lakes Basin.

FOR PHASE I REPORT

TARGET DATE: First draft - Mar. 10, 1989
Final draft - Mar. 30, 1989
LEAD: RE/RF
PERSONNEL: FG4
APPROACH: Review of relevant literature, personal research.
PRODUCT: Inventory of Policies, Approaches and related informational efforts.

FOR PHASE II REPORT

TARGET DATE: Revisions as needed.
Final draft - Sept. 30, 1989
LEAD: RE/RF
PERSONNEL: FG4, Communications Task Group
APPROACH: Update and expand as necessary
PRODUCT: Updated Inventory of Policies, Approaches and related informational efforts.

442-1c: Model Activities: Prepare an inventory of other selected communications activities inside and outside the G.L. Basin which may serve as models for the activities considered under the study.

TARGET DATE: First draft - April 28, 1989
Final draft - Sept. 30, 1989
LEAD: RE/RF
PERSONNEL: FG4, Communications Task Group
APPROACH: Review of relevant literature, personal research.
PRODUCT: Inventory of model activities.

442-1d: Educational activities: Prepare an inventory of educational activities undertaken and educational materials produced by government agencies with regard to fluctuating lake levels in the Great Lakes Basin.

FOR PHASE I REPORT

TARGET DATE: First draft - Feb. 6, 1989
Final draft - Mar. 30, 1989
LEAD: SCM
PERSONNEL: KT
APPROACH: Review of relevant literature, personal research.
PRODUCT: Inventory of educational activities and materials.

FOR PHASE II REPORT

TARGET DATE: Final draft - Sept. 30, 1989
LEAD: SCM
PERSONNEL: FG4, Education Task Group
APPROACH: Update and expand as necessary
PRODUCT: Updated Inventory of Educational activities and materials.

SUBTASK 442-2 -- IDENTIFY GOALS

442-2: Statement of problems to be addressed in Task 442, identification of objectives for possible communications activities and definition of desired outcome.

TARGET DATE: First draft by May 31, 1989
Review comments by June 30, 1989
Refine at mid-course May 1990
LEAD: RE/FB
PERSONNEL: Communications Task Group Review Network
APPROACH: Review input from interests to date;
review results of preplanning interviews, coordinate research with other relevant study groups.

Goals identification will be the focus of the first Communications Task Group meeting with the intent of reaching agreement on substance of first draft.

First draft to be circulated to review network and relevant study personnel.

PRODUCT: Summary paper on problems and goals.

SUBTASK 442-3 -- PUBLIC INVOLVEMENT IN TASK 442

442-3 Recommend public information, communications, participation and involvement activities relating to the conduct of Task 442 for implementation during the study.

LEAD: RE/FB
PERSONNEL: FG4
APPROACH: The primary mechanisms for involving interested parties in the development of communications programs will be the Communications Task Group and Review Network. Work on Task 442 would also be included as a subject for comment during any opportunities for input provided to the

general public on the study in general. Proposals for additional activities can be brought before FG4 at any time prior to the completion of the study.

PRODUCT: Possible recommended activities.

SUBTASK 442-4 -- ANALYSIS, FINDINGS AND RECOMMENDATIONS FOR PHASE I REPORT

442-4a: Assess efforts to date: Based on the inventories (Subtask 442-1), assess the existing communications activities in the Great Lakes Basin. Effective activities should be highlighted. The problems which received the greatest attention, the differences between activities during crisis and noncrisis periods, and overall coordination of program planning and delivery should also be noted.

FOR PHASE I REPORT

TARGET DATE: First draft - Feb. 16, 1989
Final draft - Mar. 30, 1989
LEAD: RE/RF
APPROACH: Review of inventories (Subtask 442-1), review of results of preplanning interviews.
PRODUCT: Draft material for Phase I report.

FOR PHASE II REPORT

TARGET DATE: First draft by: Sept. 30, 1989
Review comments by: Nov. 15, 1989
LEAD: RE/RF
PERSONNEL: FG4

Communications Task Group Review Network

APPROACH: Refine Phase I product and provide greater detail. General discussion of efforts to date will take place at first Communications Task Group Meeting. Consensus on substance of first draft to be reached at second meeting.

442-4b: Propose criteria for communications initiatives: Review the inventories (Subtask 442-1) and assess why certain communications activities appear to be especially effective. Assessment should incorporate the goals

identified in Subtask 442-2 and include the programs that have been identified as possible models (Subtask 442-1c).

TARGET DATE: First draft by: Sept. 30, 1989

Review comments by: Nov. 15, 1989

Refine at mid-course: May 1990

LEAD: RF/RE

PERSONNEL: Communications Task Group Review Network

APPROACH: Review of inventories (Subtask 442-1), goals (Subtask 442-2), personal research and analysis by Communications Task Group. General discussion will take place at first Communications Task Group Meeting in conjunction with discussion of efforts to date. Consensus on substance of first draft to be reached at second meeting.

PRODUCT: Criteria for effective communications programs.

442-4c: Identify communications initiatives: Consistent with the goals (Subtask 442-2) and criteria (Subtask 442-4b), identify specific communications initiatives which should be considered to meet the reference request for an information program.

TARGET DATE: First draft by: May 31, 1990

Review comments by: July 18, 1990

Refinement by: Oct. 31, 1990

Review comments by: Nov. 30, 1990

LEAD: RE/FB

PERSONNEL: Communications Task Group Review Network

APPROACH: Review inventories (Subtask 442-1) and identify any communications activities which appear especially well-suited to achieve the objectives (Subtask 442-2). Examine all measures under consideration in the study and identify any communications activities which would be required for successful implementation of such measures. Circulate comprehensive list of initiatives for comment to Review Network. Refine and prioritize initiatives. Identify the general levels of human and financial resources necessary for implementation of each. Coordinate work with Measures Work Group and Subgroup on Measures.

PRODUCT: List of communications initiatives along with resources which would be required for their implementation.

442-4d: Identify educational initiatives which should be undertaken by responsible government agencies with regard to fluctuating lake levels in the Great Lakes Basin.

TARGET DATE: First draft by: May 31, 1990
Refinement by: Oct. 31, 1990
LEAD: SCM
PERSONNEL: Education Task Group
APPROACH: The focus of this subtask is on activities pertaining to the formal educational system, post-secondary education programs, public broadcasting, youth programs or citizen-based education programs. The general level of human and financial resources necessary for implementation of any initiatives should also be identified.
PRODUCT: List of proposed educational initiatives along with resources which would be required for their implementation.

442-4e Propose evaluation techniques: Propose techniques for tracking the effectiveness in achieving the goals (Subtask 442-2) of initiatives identified above (Subtasks 442-4c and 442-4d). Discuss the accuracy and usefulness of the evaluation techniques, as well as the general level of resources required.

TARGET DATE: First draft by: May 31, 1990
Refinement by: Oct. 31, 1990
LEAD: FG4
PRODUCT: Paper proposing evaluation techniques along with discussion of their accuracy, usefulness and general level of resources required for their implementation.

442-4f: Recommend communications initiatives and a strategy for their implementation consistent with all of the subtasks above.

TARGET DATE: First draft by: Jan. 31, 1991
Review comments by: Mar. 15, 1991
Final Recommendations: Apr. 30, 1991
LEAD: FB/RE
PERSONNEL: Communications Task Group, Education Task Group, Review Network

APPROACH: Communications Task Group and Education Task Group will be responsible for making recommendations to Governments for possible inclusion in FG4 final report.

PRODUCT: Recommended initiatives and strategy for their implementation.

442-4g: Produce final report for Task 442.

TARGET DATE: First draft by: May 31, 1991
LEAD: FG4

ABBREVIATIONS

FG4 Functional Group Four
FB Frank Bevacqua
SCM Sally Cole-Misch
RE Ruth Edgett
RF Ross Fredenburg
KT Kimberly Tassier

APPENDIX G-4

Inventory of Educational, Information, and Communications Activities of Government Agencies and Nongovernmental Organizations

This inventory contains descriptions of governmental and nongovernmental public information, communications, participation and involvement activities related to water levels in the Great Lakes basin. Activities are divided into two main categories, governmental and nongovernmental, and then further subdivided into international, national, and state/provincial listings.

ACTIVITIES OF GOVERNMENTS

International

International Joint Commission

U.S. Section
Sally Spiers, Public Affairs
2001 S Street, NW
Washington, DC 20440
202-673-6222

Canadian Section
Alan Clarke, Public Affairs
100 Metcalfe Street, 18th Floor
Ottawa, ON K1P 5M1
613-993-2984

The International Joint Commission is authorized by the Boundary Waters Treaty of 1909 to examine and report on issues concerned with the Canadian-United States boundary waters. The Commission oversees the regulation of Lakes Superior and Ontario.

- Issues news releases, answers public and news media inquiries
- Holds conferences, public hearings
- Produces Focus newsletter (3 issues per year)
- Distributes copies of reports

United States

U.S. Army Corps of Engineers
Ross Fredenburg, Public Affairs
536 S. Clark St.
Chicago, IL 60605
312-353-6319

The U.S. Army Corps of Engineers has been involved with development of the nation's water resources since the early 1800s. Today, the Corps is authorized to study, design and construct projects in support of navigation and flood control. It has limited authority to construct erosion control works, but only for public

lands. The Corps provides considerable technical support to the International Joint Commission and monitors the levels of the Great Lakes. Certain emergency authorities exist for assisting with flooding problems caused by high levels.

- Issues lake level bulletins
 - Monthly bulletin (graphs with one page narrative update)
 - Forecast as well as current, historic levels
- Monthly newsletters (one for each lake)
 - Channel depth forecast (every 2 weeks)
- Weekly levels updates
- Produces, distributes brochures
 - "Help Yourself" (erosion control techniques)
 - "Great Lakes Facts"
 - "Lake Ontario Fact Sheet"
 - "Lake Erie Fact Sheet"
- Slide presentations
 - "Water, Water Everywhere" (possibly obsolete)
- Produced and distributes film
 - "Great, Great Lakes" (obsolete)
- Provides speakers
- Answers public and news media inquiries
- Issues news releases (as needed)
- Congressional liaison
- Sponsors public meetings
- Meets with local officials and provides technical assistance for shoreline construction

National Oceanic and Atmospheric Administration (NOAA)
Great Lakes Environmental Research Laboratory (GLERL)
Frank Quinn, Chief, Lake Hydrology Group
2205 Commonwealth Blvd.
Ann Arbor, MI 48105-1593
313-668-2254

The Great Lakes Environmental Research Laboratory (GLERL) has been conducting research on significant environmental processes and problems in the Great Lakes region for fourteen years. The Lake Hydrology Group, one of the five GLERL research groups, is directing its efforts toward improving knowledge of hydrologic and hydraulic processes, improving methods of forecasting and simulating water supplies and lake levels, and improving large river dynamic flow models.

- Answers news media, public inquiries
- Publishes in scientific journals
- Distributes NOAA reports
- Sponsors open-houses
- Uses portable displays
- Provides speakers
- Works through established program with local schools

- Uses, explains computer models
- Uses slide shows tailored to audience

National Oceanic and Atmospheric Administration (NOAA)
 National Ocean Service
 Great Lakes Water Levels Section
 Office of Oceanography and Marine Services
 6001 Executive Boulevard
 Rockville, MD 20852
 301-443-8443

The National Ocean Service compiles and publishes nautical and aeronautical charts of U.S. coastal waters; collects and evaluates oceanographic and marine navigational data, and performs analyses of physical phenomena pertaining to the sea and the Great Lakes. The Great Lakes Water Levels Section manages a network of water level stations on the Great Lakes and outflow rivers, and records and disseminates basic lake level measurements.

National Oceanic and Atmospheric Administration (NOAA)
 U.S. National Weather Service

Central Reg. (L. Sup. & Mich.)
 601 E. 12th St., Room 1835
 Kansas City, KS 64106
 816-374-5922

Eastern Reg. (L. Hur., Erie & Ont.)
 585 Stewart Avenue
 Garden City, NY 11530
 516-228-5400

The National Weather Service provides weather, hydrologic and oceanographic warnings and forecasts to the public. On the Great Lakes, the Service provides marine weather warnings and forecasts, including ice and flood conditions.

- Issues lakeshore flood and erosion warnings and forecasts
- Forecast offices located in Chicago, IL; Milwaukee, WI; Ann Arbor, MI; Cleveland, OH; and Buffalo, NY. Smaller offices in Duluth, MN; Marquette, MI; Sault Ste. Marie, MI; Green Bay, WI; Grand Rapids, MI; Muskegon, MI; Alpena, MI; Toledo, OH; and Erie, PA.

National Oceanic and Atmospheric Administration (NOAA)
 Sea Grant Program
 National Sea College Program
 6010 Executive Boulevard
 Rockville, MD 20852
 301-443-8923

The Sea Grant College Program is a matching fund program which provides grants supporting marine resources to universities and consortia of universities in states that have developed a management structure and demonstrated a commitment to Sea Grant

Program goals. The grants support research, education, and marine advisory services.

-See States for Sea Grant information activities

National Oceanic and Atmospheric Administration (NOAA)
Office of Ocean and Coastal Resource Management
3300 Whitehaven Street, NW
Washington, DC 20235
202-634-4124

Through its regions of the Coastal Programs Division, the office administers the Federal Coastal Zone Management Act of 1972. It assists coastal states in the development of coastal resource management programs and the reviewing and approving of these programs. (Center for the Great Lakes Directory)

-See individual states for Coastal Zone Management information activities

Federal Emergency Management Agency (FEMA)
Pat Buckley, Public Affairs Specialist
175 West Jackson
Chicago, IL 60604
312-408-5515

The Federal Emergency Management Agency is the agency responsible in the United States for responding to Presidential Disaster Declarations. FEMA is also concerned with plans for civil defense. Of particular concern to the Great Lake levels issue is the agency's administration of the National Flood Insurance Program (NFIP), a program of government subsidized insurance rates for homes within flood plains.

ONGOING ACTIVITIES:

- Provides speakers for lake level conferences
- Grants to the states for implementation of the Insurance Act may be used for communications programs designed to make individuals aware of flood hazards
- Delineates flood hazard areas
- Flood hazard area maps are made available

CRISIS ACTIVITIES:

- Direct mailings
- To Flood Insurance policy-holders in Spring of 1988, explaining Upton-Jones amendment to the National Flood Insurance Act (expanded erosion coverage)
- To insurance adjusters, explaining recent changes in the implementation of the National Flood Insurance Act

- Sponsored workshop for adjusters, explaining Upton-Jones amendment
- Revised its "Open Coast Lake Level Report" and distributed it to NFIP communities

U.S. Coast Guard
 LCDR E.L. Del Bueno, Public Affairs Officer
 Ninth Coast Guard District
 1240 East Ninth Street
 Cleveland, OH 44199
 216-522-3900

The Coast Guard on the Great Lakes is concerned with safe navigation, both commercial and recreational. They perform search and rescue operations as needed. They also provide ice-breaking services.

- Issues occasional "notices to mariners" regarding levels

Small Business Administration
 Disaster Assistance Division
 1441 L Street, NW
 Washington, DC 20416
 202-653-6879

The Small Business Administration issues low-interest loans to businesses and individuals who are recovering from declared natural disasters. (Declared natural disasters are those designated as such by this agency and/or the President; state administrations can only recommend that an area be designated as such.)

States

Illinois

Illinois Department of Transportation
 Division of Water Resources
 Lake Michigan Management Section
 Daniel Injerd, Chief
 310 S. Michigan Avenue, Room 1606
 Chicago, IL 60604
 312-793-5948

- Serves as the trustee of the submerged lands and waters of Illinois' portion of Lake Michigan
- Oversees a Lake Michigan construction permit program for any work within Illinois waters

- Produces and distributes publications such as: bluff stabilization brochure, Lake Michigan permit guide, lake level updates
- Aerial photography of entire Illinois shore at least every two years
- Update coastal geologic status with Illinois Geological Survey coastal atlas of Illinois shoreline nearshore bathymetry sediment transport, beach nourishment 1985-1989 shore damage survey
- Included shoreline in state Geographic Information System

Indiana

Indiana Department of Natural Resources
 Division of Water
 John Simpson, Director
 2475 Directors Row
 Indianapolis, IN 46241
 317-232-4160

- Publishes newsletter, "Water Bulletin" (distribution 300)
- Publishes "Outdoor Indiana" magazine
- Issues news releases (i.e. spring flooding, availability of flood insurance)
- Produces brochure on what is covered by flood insurance
- Distributes certain publications to mailing list of shoreline residents and organizations
- Technical assistance
- Occasional site visits, also by phone
- Provides speakers/representation
- Sends staff to local meetings to explain programs
- Shoreline mapping
- Aerial photography of Indiana coast through contract with Purdue Great Lakes Coastal Research Lab and with own facilities

Michigan

Michigan Department of Natural Resources
 Chris Shafer
 P.O. Box 30028
 Lansing, MI 48909
 517-373-1950

- Publishes newsletter: "Natural Resources Register" Office of the Great Lakes (DNR)
- Issues news releases on state's flood and erosion relief program
- Publishes Annual Report on state of the Great Lakes Land and Water Management Division (DNR)
- Sponsored workshops to explain assistance programs and shoreline protection options (1986)
- Shoreline maps made available

- Maps of high risk erosion areas (maps indicate 30-year setback for new construction)
- Provides technical assistance to property owners
- Offering loan and set-back programs
- Cosponsored with Sea Grant two brochures: "Vegetation: Its Role in Shoreline Erosion" and "Shoreline Erosion Questions and Answers"

Michigan State Police
Emergency Management Division
300 S. Washington, Suite 300
Lansing, MI 48913
517-373-6271

- Disaster preparedness
- Reviews emergency response plans of local governments and provides assistance
- Storm warning
- Disseminates National Weather Service storm information to local governments

Minnesota

Minnesota Department of Natural Resources
Division of Waters
Ogbazghi Sium, Supervisor, Land Use Management Division
500 Lafayette Road
St. Paul, MN 55155
612-296-0444

- Issues news releases
- "DNR News," a weekly news release which includes shoreland and floodplain management issues
- publishes newsletter
- "Water Talk", partially funded by FEMA, is devoted mainly to flood plain, shoreland, and other water-related issues
- Produces publications, slide presentations
- Series of 22 publications and slide presentations produced in cooperation with FEMA on flood plain management rules, issues and related subjects
- Ten publications and slide presentations on shoreland management rules, issues and related subjects

University of Minnesota
Carol Johnston
Natural Resources Research Institute
3151 Miller Trunk Hwy.
Duluth, MN 55811
218-720-4294

- Shoreline mapping
- Conducting analysis of aerial photographs of Minnesota shoreline to determine the annual rate of shore erosion

New York

New York State Department of State
Division of Coastal Resources and Waterfront Revitalization
George R. Stafford, Director
162 Washington Avenue
Albany, NY 12231
518-474-3643

- Administers New York State Coastal Management Program
- Publishes newsletters on various coastal issues of concern
- Sponsors workshops on management of lakeside land use
- Provides technical assistance to municipalities preparing Local Waterfront Revitalization to address flooding and erosion concerns

New York State Department of Environmental Conservation
Bureau of Flood Protection
William Daley
50 Wolf Road
Albany, NY 12233
518-457-3157

- Distributes Corps of Engineers and IJC information regarding lake levels
- Maintains National Flood Insurance Program data and maps
- Administers Coastal Erosion Hazard Area Act and maintains erosion area maps
- Regional offices are available for local assistance

New York State Emergency Management Office
Donald A. DeVito, Director
Public Services Bldg.
State Office Campus
Albany, NY 12226-5000
518-457-2222

- Disseminates National Weather Service severe weather information

- Coordinates Governor's Flood Awareness Campaign
- Sponsors workshops
- Cooperates with Corps of Engineers on Advance Measures Program
- Conduit for Corps of Engineers and other data on floodproofing
- Technical assistance to municipalities for hazard mitigation and emergency response planning

State University of NY College at Brockport
 Sea Grant Program
 Charles O'Neill, chief spokesperson
 Brockport, NY 14420
 716-395-2638

- Published newsletter devoted to the high Great Lakes levels "New York's Great Lakes Water Levels Update" (circulation 900)
- Sponsored erosion control workshops
- Issued news releases
- Answered news media, public inquiries (including radio and television interviews)
- Provided technical assistance
- Site inspections to give advice to property owners on property protection methods

Ohio

Ohio Department of Natural Resources
 Division of Water
 1939 Fountain Square Court, Bldg. E-3
 Columbus, OH 43224
 614-265-6730

- Cooperated with Great Lakes Commission in production of brochures, "Water Levels Changes" and "Great Lakes Shore Erosion and Flooding Assistance Programs"
- Provides public information and advice on flooding and flood mitigation and general information on shore erosion
- Coordinates eligibility for National Flood Insurance
- Directs communities and homeowners to other available assistance

Ohio Department of Natural Resources
 Office of Chief Engineer
 Fountain Square, Bldg. D-2
 Columbus, OH 43224
 614-265-6947

- Provides structural, engineering and general engineering information on shore erosion protection

Ohio Department of Natural Resources
Division of Geological Survey
P.O. Box 650
Sandusky, Ohio 44870
419-626-4296

- Provides information on geological setting, geologic processes and shore recession rates
- Produces and distributes publications

Ohio Adjutant General
Disaster Services Agency
2825 W. Grandville Road
Columbus, OH 43235-2712
614-889-7150

The agency is responsible for disaster preparedness, operations and recovery. The agency provides local governments with assistance in designing emergency management plans and training programs and coordinating response to disasters with the Federal Emergency Management Agency and other state agencies. In 1986, the agency established a temporary field office in Port Clinton to assist in pre-disaster planning and preparedness

Ohio State University Cooperative Extension Service
Frank Lichtkoppler
Ohio Sea Grant Program
99 E. Erie Street
Painesville, OH 44077
216-357-2582

- Provides occasional workshops
- Issues news releases
- Produces fact sheets
- Answers news media, public inquiries

Ohio Coastal Resource Management Project
Edna Chase
P.O. Box 360
Kent, OH 44240
216-673-1193

- Produced report: "Lake Erie, Who's Minding the Shore" (February 1989)
- Sponsors occasional public meetings
- Issues news releases
- Publishes a newsletter, "Lake Erie Shore Lines"

Pennsylvania

Department of Environmental Resources
Division of Coastal Zone Management
William Johnson
P.O. Box 1467
Harrisburg, PA 17120
717-783-9500

- Provides technical assistance to property owners experiencing shore erosion. Coastal zone management staff perform site visits and recommendations
- Produce Coastal Tidings newsletter (quarterly)
- Distributes brochure on levels fluctuation and booklet on shore erosion
- Flier on flood insurance
- Distributes videotape of Pennsylvania shoreline
- With FEMA, implementing provisions of Upton-Jones Amendment to the National Flood Insurance Act

David A. Skellie, Director
Erie County Department of Planning
Erie County Courthouse, Room 13
Erie, PA 16501
814-451-6336

- Direct mailings
- Sent announcement to mailing list of 600 riparian homeowners and businesses regarding Upton-Jones, placed advertisements in local newspapers

Pennsylvania Department of Community Affairs
Bureau of Community Planning
551 Forum Bldg.
717-787-7403

- Provides technical assistance to communities to help them comply with the Pennsylvania Flood Plain Management Act.

Wisconsin

Wisconsin Department of Administration
Coastal Zone Management Program
David Jones
101 S. Webster, 8th floor
Madison, WI 53707-7868
608-267-3369

- Published and distributes:
- Shore Erosion Technical Report: Reach-by-reach geotechnical information on bluff stability and shoreline recession

- Produced with Sea Grant: Coastal Processes Workbook, Evaluating the Risks of Flooding and Erosion for Great Lakes Coastal Property (1987) videotapes

Also available:

- Regulations to Reduce Coastal Erosion Losses: Model zoning ordinance to control further development in coastal hazard areas
- Great Lakes Shore Protection: Structural Design Examples
- Great Lakes Shore Erosion--A general review with Case Studies: Guidance on shore protection

Wisconsin Department of Administration
Division of Emergency Government
4802 Sheboygan Ave.
P.O. Box 7921
Madison, WI 53707
608-266-8631

- Distributes flood advisory bulletins and action reports to state and local officials

Wisconsin Department of Natural Resources
Bureau of Water Regulation and Zoning
P.O. 7921
Madison, WI 53707
608-226-8030

- Serves as state hazard mitigation coordinator for flood disasters
- Provides public information and technical advice on flood mitigation and protection against shoreline erosion
- Conducts educational efforts associated with its role as administrator of the Wisconsin Floodplain Management Program and coordinator for FEMA for the National Flood Insurance Program
- Maintains a computerized publications inventory of all department information items in print; can be searched by keywords
- Regulates shore protection structures

University of Wisconsin
Sea Grant Institute
1800 University Avenue
Madison, WI 53705
608-263-3259

- Distributes lake levels updates
- Field agents provide advice to businesses and homeowners on site conditions
- Conducts workshops for professionals, businesses, and property owners on coastal hazards

Canada

In Canada, the federal government and the governments of the two provinces bordering on the Great Lakes and St. Lawrence River have undertaken information activities relative to their respective jurisdictions with regard to Great Lakes water levels.

At the federal level, Environment Canada is responsible for monitoring water levels, while in the provinces various agencies and local governments are responsible for land use.

In addition, several nongovernmental organizations sponsor information activities related to Great Lakes water levels. These include coalitions of shoreline property owners, environmental and academic groups.

Following is an inventory of information activities related to Great Lakes water levels by governments and nongovernmental organizations in Canada.

Canada

Water Planning & Management Branch
Inland Waters Directorate
Environment Canada
867 Lakeshore Road
Burlington, Ontario
L7R 4A6
416-637-4531

Great Lakes Water Level Communications Centre
Ralph Moulton, Manager
867 Lakeshore Road
Burlington, Ontario L7R 4A6
416-336-4581

Great Lakes Water Level Forecast Centre
Ontario Weather Centre
P.O. Box 159 (AMS)
Toronto, ON L5P 1B1
416-676-3477

Environment Canada's information activities cover the two broad areas of: (1) providing detailed forecast and water level measurement information and (2) increasing public awareness of the factors which cause changing water levels and explaining how governments have responded to them.

Although extreme fluctuations in water levels have given rise in the past to limited information activities aimed primarily

at raising awareness, the recent record high levels prompted the establishment in 1986 of the Great Lakes Water Level Communications Centre and the Great Lakes Water Level Forecast Centre.

The subsequent dramatic decline in water levels has reduced the intensity of information activity, but the Water Level Communications Centre continues to act as an information clearing house and, to date, retains the capability to respond to extreme situations.

News Releases

- Monthly news release on Great Lakes Water Levels

Media Interviews

- Upon request

News Letters/Bulletins

- Monthly Great Lakes Water Level Bulletin in cooperation with the Canadian Hydrographic Service of Fisheries and Oceans

Produces and Distributes Publications

- Explaining Great Lakes hydraulics and hydrology, and government actions in response to 1985-87 record high water levels
- Great Lakes Water Levels (revised, 1989)
- Living with the Great Lakes (1986 - outdated)
- See also Canada - Ontario

Produces Films, Videos, Slide Shows, Visual Displays

- Discussing high water level issue, Great Lakes hydraulics and hydrology
- Lake Views: Perspectives on Great Lakes Water Levels (1986 - set in the context of high water levels) Available in VHS, beta and 16mm
- Great Lakes Water Levels (1989) Slide/tape show
- Great Lakes Water Levels (1989) Visual display

Shoreline Mapping

- See also Canada - Ontario

Speakers/Representation

- Staff available as guest speakers for meetings and conferences
- Staff available to explain programs to other groups/agencies as required
- 1987: community information sessions in Great Lakes shoreline communities, in cooperation with Ontario Ministry of Natural Resources and the International Joint Commission

Workshops/Seminars

-1986-87: Great Lakes Water Levels, Shore Processes and Shore Protection in cooperation with National Water Research Institute and Department of Fisheries and Oceans - general public invited

Public Involvement

-Responds to inquiries and concerns in person, by telephone and letter

Crisis Response

-Great Lakes Water Level Communications Centre has capability to track and provide information to the media and general public on specific high water level events

Other

-A Survey of Public Perceptions of Great Lakes Water Levels, completed by Anne Sudar in early 1987
-Toll-free telephone number linking callers with recorded water level forecasts issued by the Great Lakes Water Level Forecast Centre (1986-1988)

Canada-Ontario

Environment Canada
Water Planning and Management Branch
James Lloyd, Water Resource Technician
867 Lakeshore Road
Burlington, ON L7R 4A6
416-336-4956

Ontario Ministry of Natural Resources
Conservation Authorities and Water Management Branch
Maurice G. Lewis, Director
Whitney Block
99 Wellesley Street
Toronto, ON M7A 1W3
416-965-6287

The two governments have been cooperating since 1987 under the Canada-Ontario Flood Damage Reduction Program (FDRP) to identify and map hazard areas along the Canadian Great Lakes Shoreline.

This project is an extension of a cooperative program entered into in 1978 to raise public awareness and understanding of the potential for riverine flooding by producing public information maps of hazard areas and explaining them at public meetings. Similar information activities will follow completion of the lakeshore mapping.

Other previous cooperative efforts included a "Coping with the

Great Lakes" information program in response to the high water levels of the 1970s.

Produce Publications

- Under "Coping with the Great Lakes" public awareness program between 1976 and 1981

Distribute Publications

- By mail, personal contact, public displays and meetings
- Most "Coping with the Great Lakes" publications now out of print
- Information maps on shoreline hazard areas with completion of Flood Damage Reduction Plan (FDRP) -see "Shoreline Mapping"

Shoreline Mapping

- Great Lakes Shore Damage Survey Coastal Zone Atlas (1976)
- Great Lakes Flood and Erosion Prone Area Maps (under "Coping With the Great Lakes" program)
- Flood Damage Reduction Program (FDRP) identifying hazard areas of Great Lakes shoreline

Public Involvement

- Information meetings following completion of FDRP public information mapping

Provinces

Ontario

Ontario Ministry of Natural Resources (OMNR)
Shoreline Management Advisory Council
Maurice G. Lewis, Director
Conservation Authorities and Water Management Branch
Whitney Block
99 Wellesley Street
Toronto, ON M7A 1W3
416-965-6287

The Ontario government's information activities also intensified with the record high lake levels of 1985-86.

The Shoreline Management Advisory Council is charged to hold public meetings, advise the Minister of Natural Resources and inform the public on shoreline management matters. The Council submitted its first annual report in March of 1988 and made, among others, some broad recommendations for cooperation between the province and the federal government on information activities related to Great Lakes water levels.

The 27 Ontario Conservation Authorities (CAs) which border the

Great Lakes (there are 38 CAs in all) are semi-autonomous implementing agencies for the province's Shoreline Management Program. The lakeshore CAs mount individual water level information activities to suit the needs of their particular areas.

These activities provide information on types of assistance available to property owners and on the risks of locating on Great Lakes shorelines. Currently, their largest information effort is concentrated upon the local governments within their jurisdictions.

Recently, the Ontario government has devoted new resources to shoreline management studies, both by the Ministry of Natural Resources and the Conservation Authorities. Thirty people have been added to CA staffs.

Media Interviews

- Upon request

Newsletters/Bulletins

- CAs identify activities and issues of interest to residents within shoreline areas and discuss these in their newsletters

Produces and Distributes Publications

- On risks of building on Great Lakes shorelines, and on available programs within jurisdictions of various Conservation Authorities
- See Canada - Ontario

Produces Films, Videos, Slide Shows and Visual Displays

- On risks and programs

Shoreline Mapping

- See Canada - Ontario

Speakers/Representation

- Public meetings
- 1987: community information sessions in cooperation with Environment Canada and the IJC

Crisis Response

- MNR Technical Advisory Assistance Program gives professional advice on shore protection
- Disseminates high water level event forecasts to Conservation Authorities and municipalities

Public Involvement

- Shoreline Management Advisory Council solicits public opinion and advises the Minister of Natural Resources on shoreline management issues
- See also Canada - Ontario

Quebec

Environnement Quebec
 Andre Carpentier
 3900, rue Marly, 5 etage
 St-Foy, PQ G1X 4E4
 418-644-3430

Bureau de la Protection civile du Quebec
 Urgence environnement
 Interdepartmental coordination

In Quebec, the government's information efforts have focused mainly on crisis response to high water levels and flows. However, an interdepartmental committee chaired by Environnement Quebec and consisting of representation from several other departments has been charged to develop an information strategy to address problems associated with high water levels.

With the most recent water level crisis now past, this committee may shift its focus to providing various types of information for the IJC Reference Study.

In addition, Environnement Quebec holds information sessions for municipal inspectors regarding standards and regulations that apply to lake shores and river banks.

Information/Communication Strategy

- Under the leadership of Environnement Quebec, Interdepartmental coordination of an information strategy to address high water levels has begun

Crisis Response

- Disseminate water level and flow forecasts in special circumstances

Workshops/Seminars

- For municipal inspectors on regulations and standards for lakeshores and river banks

ACTIVITIES ON NONGOVERNMENTAL ORGANIZATIONS

International

Centre for the Great Lakes
39 Spadina Road
Toronto, ON M5R 2S9
416-921-7662

Center for the Great Lakes
435 N. Michigan Ave., Suite 1408
Chicago, IL 60611
312-645-0901

The Center for the Great Lakes is a binational, non-profit organization devoted to providing a basinwide focus to management, conservation and development issues in the region. It is concerned with water quality, water quantity, shoreline development and general economic issues. The Center works with businesses, environmental leaders and governments to find solutions to Great Lakes issues.

- Publishes books: The Law and the Lakes; The Great Lakes Directory; A Look at the Land Side
- Great Lakes Shoreline Management; Water Works!; The St. Lawrence River - Its Economy and Environment; The Lake Effect - The Great Lakes' Impact on the Region's Economy
- Sponsors conferences, seminars, workshops
- Responds to public and news media inquiries; maintains an information and referral center
- Provides speakers
- Produces and distributes Fact Sheets on Great Lakes issues and events -publishes bimonthly newsletter: "Great Lakes Reporter"

Great Lakes United

(no contact person in Windsor)
P.O. Box 548, Station A
Windsor, ON N9A 6M6
(no telephone)

Kirk Peters, Administrative Asst.
State University College at Buffalo
Cassety Hall, 1300 Elmwood Ave.
Buffalo, NY 14222
716-886-0142

Great Lakes United is a coalition of groups and citizens, including almost 200 conservation groups, trade unions, businesses and municipal governments. Its objectives include education concerning Great Lakes environmental issues, promotion of citizen action, implementation of the U.S.-Canada Great Lakes Water Quality Agreement, encouragement of economic strategies compatible with the natural resource, and information exchange for interested organizations.

- Plays leadership role in Remedial Action Plan process for numerous Great Lakes Areas of Concern
- Issues annual set of resolutions
- Publishes periodic newsletter: "The Great Lakes United"

- Organization representatives attend public meetings
- Served on re-negotiating team for U.S.-Canada Great Lakes Water Quality Agreement

International Great Lakes Coalition

Sharon Hazen, President
60 Front Street
Port Rowan, ON NOE 1M0
519-586-3805

Thomas B. Curtis, Chairman
P.O. Box 429
Saugatuck, MI 49453
616-857-8945

"The International Great Lakes Coalition is a non-profit organization consisting of individuals, property-owners, local governments, businesses and related organizations concerned about and affected by fluctuating high and low water levels of the Great Lakes. Its overall long term objective is to obtain responsible management and full regulation of Great Lake water levels which are compatible with human, environmental and property values" (organization newsletter, spring 1988). Its concerns also include pollution abatement.

- Publishes quarterly newsletter, "Coalition News"
- Issues periodic news releases
- Answers news media inquiries
- Twelve U.S. chapters and six Canadian chapters have periodic meetings which are open to the public
- U.S. national organization has quarterly meetings, also open to the public
- Annual meetings have outside speaker on lake levels issue
- Organization representatives attend conferences
- Display booths are set up at conferences

U.S. Organizations

Great Lakes Commission
Catherine Chown, Communications Specialist
400 S. 4th Street
Ann Arbor, MI 48103
313-665-9135

The Great Lakes Commission was established in 1955 by the Great Lakes Basin Compact. It was federally authorized in 1968 and has members from all eight Great Lake states. The Commission deals with resource and economic issues by developing and sharing information, assisting in coordination of state positions on regional matters, and advocating those positions on which there is agreement.

- Drought Management/Lake Levels Task Force formed in 1989
- Great Lakes Information Task Force formed in 1989
- Publications include "Water Level Changes - Factors Influencing the Great Lakes" (1986) and "Great Lakes Shore Erosion and Flooding Assistance Programs" (1987)
- Publishes periodic newsletter, "The ADVISOR"
- Planning Great Lakes lake level forecasting symposium
- Great Lakes Education Speaker Bureau and other projects aimed at increasing Great Lakes education opportunities in the region's classrooms
- Compiles a checklist twice a year summarizing Great Lakes research

Canadian Organizations

Great Lakes Institute
 Paul Hebert, Director
 University of Windsor
 Windsor, ON N9B 3P4
 519-253-4232

Produces Publications

- Emphasis on research, but publications are available to the public
- Most recently, a report on the effects of climate change upon navigation and power generation in the Great Lakes was completed for release to the public by Environment Canada's Atmospheric Environment Service

Speakers/Representation

- Upon request

Media Interviews

- Upon request

The Water Network
 Dr. Marie Sanderson
 University of Waterloo
 Waterloo, ON N2L 3G1
 519-885-1211, ext. 6962

- Still in the developmental stages and focusing upon exchange of a broad range of water information for academics and the public

APPENDIX G-5

Listing of Levels-related Publications and Materials

(Arranged alphabetically by title within groups).

This inventory of informational materials was compiled by Functional Group 4 members during Phase I. Materials are grouped according to type: audiovisual, brochures and booklets, educational/supplementary curricular, International Joint Commission documents (relating to the ongoing levels Study), newsletters and periodicals, reports, self-help, and other informational materials.

Levels-related documents available from the IJC library in Windsor, Ontario, are also listed.

A more extensive description of the information activities of Great Lakes - St. Lawrence River basin agencies and organizations may be obtained from the International Joint Commission. See Appendix G-4 for details.

AUDIOVISUAL MATERIALS

1. **Barge 45 - A Salvage Mission**
Videotape produced by the U.S. Corps of Engineers, Buffalo District in 1987. 19 minutes. Available from the International Joint Commission, 201 S Street, Washington, DC 20440. 202-673-6222.
2. **Build a Beach -- Erode a Shore**
Slide program which illustrates the processes of sedimentation, erosion and deposition in the Great Lakes. Produced for audiences of grades seven through adult/general audiences. Available from Michigan Earth Science Teachers Association, c/o Department of Geology, Michigan State University, East Lansing, MI 48824. 517-355-4626.
3. **Cutting Our Flood Losses.**
An 80-image slide/tape program or a 170-image videotape (VHS) program explain riverine and Great Lakes flood hazards. Available from the Ontario Ministry of Natural Resources, Whitney Block, 99 Wellesley Street, Toronto, ON M7A 1W3, 416-965-6285; or Water Planning and Management Branch, Environment Canada, 867 Lakeshore Road, Burlington, ON L7R 4A6, 416-336-4956.
4. **Great Lakes Water Levels.**
An 80-image slide/tape program developed in 1989 explains reasons for lake level changes. Suitable for audiences of ages 12 and up. Available from the Great Lakes Water Levels Centre, Environment Canada, 867 Lakeshore Road, Burlington, ON L7R 4A6, 416-336-4956.

5. **IJC Videotapes.**
Three videotapes will soon be available: (1) a one-hour program introducing the issues related to fluctuating water levels and to the Levels Reference Study, (2) a 25-minute program featuring a condensed version of the Public Forum broadcasts from October 22, 1989, and (3) the full three hours of the Public Forum broadcasts (October 22, 1988). Contact Levels Reference Study, International Joint Commission, Great Lakes Regional Office. In Canada: 100 Ouellette Avenue, 8th Floor, Windsor, ON N9A 6T3, 519-256-7821, OR in the U.S.: P.O. Box 32869, Detroit, MI 48232-2869, 313-226-2170.
6. **Lake Views: Perspectives on Great Lakes Water Levels.**
A 14-minute videotape (VHS or beta) or 16mm film from 1986 which discusses fluctuations in terms of high water levels. Available from Great Lakes Water Levels Communications Centre, Environment Canada, P.O. Box 5050, 867 Lakeshore Road, Burlington, ON L7R 4A6. 416-336-4580.
7. **The Needless Hazard: Floods.**
A 16mm film developed by the Ontario Ministry of Natural Resources and Environment Canada under the Canada-Ontario Flood Damage Reduction Program. Explains how flood devastation can be avoided and discourages development on flood plains (deals primarily with rivers). Available from the National Film Board of Canada: 1251 Avenue of the Americas, New York, NY 10200; P.O. Box 6100, Montreal, PQ H3C 3H5; 150 Kent Street, Ottawa, ON K1A 0M9 (613-996-4861); or at local libraries (in Canada).
8. **New Shoreline Dilemma**
Videotape (VHS or 3/4") produced in 1986. Includes proceedings of a lake levels fluctuation conference held by the Lake Michigan Federation. 20 minutes. Available on loan from the same organization, 59 E. Van Buren, Suite 2215, Chicago, IL 60605. 312-939-0838.
9. **Not Man's to Command**
A 1978 film which focuses on Great Lakes water levels and influences of weather on levels. Examines why levels fluctuate, whether they can be controlled and other questions relative to levels and weather. Developed primarily for adult/general audiences. 14 minutes. Available from the National Film Board of Canada: 1251 Avenue of the Americas, New York, NY 10200; P.O. Box 6100, Montreal, PQ H3C 3H5; 150 Kent Street, Ottawa, ON K1A 0M9 (613-996-4861); or at local libraries (in Canada).

10. **The Rise and Fall of the Great Lakes**
Provides a humorous lesson in geography and geology as a lone canoeist travels through the changing geological histories of the lakes, focusing on water quantity and quality issues. Suitable for all ages. Produced in 1969 by the National Film Board of Canada, 17-minute color film. Available from the National Film Board of Canada: 1251 Avenue of the Americas, New York, NY 10200; P.O. Box 6100, Montreal, PQ H3C 3H5; 150 Kent Street, Ottawa, ON K1A 0M9 (613-996-4861); Michigan Media, 400 Fourth Street, Ann Arbor, MI 48103 (313-764-5360); or at local libraries (in Canada).
11. **Shoreland Development: A New Approach (No. 9077)**
A 1973 film on shoreline development. Suitable for adult/general audiences. Rental fee: \$7. Contact the University of Wisconsin Extension Program, Bureau of Audio/Visual Instruction, 1327 University Avenue, Madison, WI 53715. 608-262-1644.
12. **Storm Water Pollution Control**
Film on precipitation, waves, water levels, pollution. For adult/general audiences. Available from U.S. EPA, Region V, 230 S. Dearborn, Chicago, IL 60604. 312-353-3503.
13. **Understanding Lakes and Lake Problems**
Slide set (for purchase only - \$60) on erosion control, water levels, property owners, inland lakes. For adult/general audiences. Available from the University of Wisconsin Extension Program, Bureau of Audio/Visual Instruction, 1327 University Avenue, Madison, WI 53715. 608-262-1644.
14. **Water, Water Everywhere Slides**
Possibly obsolete. Available from U.S. Army Corps of Engineers, Ross Fredenberg, Public Affairs Officer, 536 S. Clark Street, Chicago, IL 60605. 312-353-6319.
15. **What's Happening to Our Lakeshore? (No. 6127)**
This 1967 film outlines effective shoreline management practices, and the effects of pollution on the Great Lakes. Suitable for grades seven through adult/general audiences. Rental fee: \$6. Contact the University of Wisconsin Extension Program, Bureau of Audio/Visual Instruction, 1327 University Avenue, Madison, WI 53715. 608-262-1644.
16. **Workshop on Fluctuating Great Lakes Water Levels**
Videotaped proceedings from the public workshop at the IJC's Biennial Meeting, November 1987, in Toledo, Ohio. Entire workshop - 90 minutes; first rough cut - 60 minutes; second rough cut - 40 minutes. Available from the International Joint Commission, 201 S Street, Washington, DC 20440. 202-673-6222.

BROCHURES AND BOOKLETS

17. **The Great Lakes: An Environmental Atlas and Resource Book.** A 44-page booklet on all aspects of the Great Lakes region, including climate, the hydrologic cycle, runoff, groundwater, lake levels and lake processes. Produced jointly in 1987 by Environment Canada, U.S. EPA, Brock University (ON), and Northwestern University (IL). Available from either: Great Lakes National Program Office, U.S. EPA, 230 S. Dearborn Street, Chicago, IL 60604, 312-353-3503 (No. EPA-905/9-87-002); OR Conservation and Protection, Ontario Program, Great Lakes Environmental Program, Environment Canada, 25 St. Clair Avenue East, Toronto, Ontario M4T 1M2, 416-973-6406 (Cat. No. EN40-349/1987E).
18. **Great Lakes Water Level Facts.** 1985. 15 pages. Physical features of the Great Lakes and factors affecting lake levels. Available from the Department of the Army, Detroit District, Corps of Engineers, ATTN: CENCE-ED-L, P.O. Box 1027, Detroit, MI 48231. 313-226-6440.
19. **Great Lakes Water Levels - An Overview.** August 1985. 10 pages. A brief overview of the types of environmental influences affecting lake levels, the human-made regulation of and regulatory actions taken to affect them, the consequences of high levels and to whom Great Lakes citizens can turn for assistance in the face of adversity caused by high water. Available from The Center of the Great Lakes, 435 North Michigan Avenue, Suite 1408, Chicago, IL 60611. 312-645-0901.
20. **Great Lakes Water Levels.** Revised 1989. 20 pages. A four-color booklet that provides an explanation to the causes and effects of Great Lakes water level fluctuations. Available from the Great Lakes Water Levels Communication Centre, Environment Canada, P.O. Box 5050, Burlington, ON L7R 4A6. 416-336-4580.
21. **Lake Erie Fact Sheet.** Available from the North Central Division, U.S. Army Corps of Engineers, 536 South Clark Street, Chicago, IL 60605. 312-353-6319.
22. **Lake Ontario Fact Sheet.** Available from the North Central Division, U.S. Army Corps of Engineers, 536 South Clark Street, Chicago, IL 60605. 312-353-6319.
23. **Water Level Changes: Factors Influencing the Great Lakes.** 1986. Describes natural and other factors affecting water levels and potential modifications to the system. Federal and state agencies with erosion and flood assistance programs are also listed. 13 pages. Available from the Great Lakes Commission, 400 S. 4th Street, Ann Arbor, MI 48103. (313)665-9135. (Also available from the Pennsylvania Department of Environmental Resources, Division of Coastal Zone Management, P.O. Box 1467, Harrisburg, PA 17120. 717-783-9500.)

EDUCATIONAL / SUPPLEMENTARY CURRICULUM MATERIALS

24. **Oceanic Education Activities for Great Lakes Schools (OEAGLS)**
For grades four through nine, teacher's guides are available with each lesson. Three OEAGLS activities cover levels-related topics (see a. - c. below). Focus is on the Great Lakes and especially Lake Erie; ocean processes are also covered in some lessons. Available for \$1.00 each from Ohio Sea Grant Education Program, The Ohio State University, 059 Ramseyer Hall, 29 West Woodruff, Columbus, OH 43210. 614-292-1078.
- a. **Lake Erie and Changing Lake Levels (EP-5)**
Printed in March 1979 and reprinted in September 1982. 9 pp. Possible causes of changing lake levels are identified; the effect of increased lake levels; some effects on Lake Erie (and others) from lake level regulation. Activities for students include reading graphs; modeling changing lake levels; a worksheet and review questions.
- b. **Erosion along Lake Erie (EP-6)**
Printed in April 1979 and reprinted in March 1982. 8 pp. Discusses shoreline and bluff erosion. Activities include mapping with before/after photographs of Lake Erie shoreline; worksheets and review questions.
- c. **Coastal Processes and Erosion (EP-7)**
Printed in February 1979; revised in July 1982. 11 pp. Deals with erosion forces (wind, waves), longshore currents, drift. Activities focus on erosion processes, especially on Lake Erie; worksheet on methods of shoreline protection; discussion on runoff; and question/answer sheets.
25. **Coastal Awareness: A Resource Guide for Teachers**
Developed in September 1978. Three versions are available, for elementary, junior high and senior high science classes. Approximately 70 pp. Covers ocean coasts, ocean in motion, currents and tides, sandy beaches, rocky shores, estuaries, marshes. Resources lists and glossary sections are included. Available at no cost from: Coastal Zone Information Center, National Oceanic and Atmospheric Administration, N/ORM4 Room 729, 1825 Connecticut Avenue NW, Washington, DC 20235. 202-673-5115.
26. **Chemical Literacy Series -- Water Component**
A textbook series being produced by Society, Environment and Energy Development Studies (SEEDS). Expected for release in November 1991. Covers levels as they affect the environment, industry and commerce, and how the raising and lowering of levels effects the ecosystem. For grades one through thirteen. For more information, contact Bob Killam, SEEDS, General Delivery, Midhurst, ON L0L 1X0. 705-726-2276.

27. **"High Water," Lacustrine Lessons.**
September/October 1985. Developed by Karen Plass, University of Wisconsin Sea Grant Advisory Services. Background information is provided on the fluctuation and regulation of Lake Superior waters during the 1985 high water period, and also on structure protection measures home/shoreline property owners can take to alleviate erosion or flooding damage. Two classroom activities are provided: (1) for students who can read graphs and (2) for students 10 years of age and older. In the first activity, students use a 24-hour graph and a monthly graph of water levels to investigate how levels change. Students design a shoreline city in the second activity. Available from Lacustrine Lessons, 208 Washburn Hall, University of Minnesota, 2400 Oakland Avenue, Duluth, MN 55812. 218-726-8106.

INTERNATIONAL JOINT COMMISSION DOCUMENTS

28. The following reports regarding the Great Lakes - St. Lawrence River Levels Reference Study are available from many public libraries or from:

International Joint Commission

Canadian Section
100 Metcalfe St.
18th Floor
Ottawa, ON
K1P 5M1
613-995-2984

Great Lakes Reg'l Off.
100 Ouellette Avenue
8th Floor
Windsor, ON
N9A 6T3
519-256-7821

U.S. Section
2001 S St., NW
2nd Floor
Washington, DC
20440
202-673-6222

OR

P.O. Box 32869
Detroit, MI
48232-2869
313-226-2170

•Reference from the U.S. and Canadian Governments to the IJC:
August 1, 1986

•Letters to Governments from the IJC: December 10, 1986 and
November 14, 1986 with responses from Governments

•Directive: April 10, 1987

•Task Force Report to the IJC: October 1987

•Plan of Study: March 1988

•Great Lakes Levels - A Commission Overview: April 1, 1988

•Study Personnel Directory: as of September 1988

•Interim Report on 1985-86 High Water Levels in the Great Lakes -
St. Lawrence River Basin: October 1988

NEWSLETTERS AND PERIODIC PUBLICATIONS

29. **The Advisor.** Periodic newsletter of the Great Lakes Commission. The GLC deals with resource and economic issues by developing and sharing information, assisting in coordination of state positions on regional matters, and advocating those positions on which there is agreement. The newsletter is available from Great Lakes Commission, Communications Specialist, 400 S. 4th Street, Ann Arbor, MI 48103. 313-665-9135.
30. **Coalition News.** Quarterly newsletter of the International Great Lakes Coalition, whose objective is to obtain responsible management and full regulation of Great Lakes water levels compatible with human, environmental, and property values. Available from International Great Lakes Coalition, 6 Main Street, Port Rowan, ON NOE 1M0. 519-586-7371.
31. **Coastal Tidings.** Quarterly newsletter. Available from the Pennsylvania Department of Environmental Resources, Division of Coastal Zone Management, P.O. Box 1467, Harrisburg, PA 17120. 717-783-9500.
32. **DNR News.** A weekly news release which includes shoreland and floodplain management issues in Minnesota. Available from the Minnesota Department of Natural Resources, Division of Waters, 500 Lafayette Road, St. Paul, MN 44155. 612-296-0444.
33. **Great Lakes Reporter.** A bimonthly newsletter of the Center for the Great Lakes. Management, conservation, and development issues concerning the Great Lakes region are covered. Available from the Center for the Great Lakes, Public Information Officer, 435 N. Michigan Avenue, Suite 1408, Chicago, IL 60611. 312-645-0901.
34. **Great Lakes United.** Periodic newsletter from this coalition of Great Lakes organizations. Environmental issues, promotion of citizen actions, encouragement of economic strategies compatible with the natural resource, and information exchange for interested organizations are the aims of GLU. Available from Great Lakes United, 24 Agassiz Circle, Buffalo, NY 14214. 716-886-0142.
35. **Great Lakes and Connecting Channels Water Levels and Depths.** A twice-monthly publication that provides the depths of the Great Lakes connecting channels and St. Lawrence River, for navigation purposes. Available from: Department of the Army, Detroit District, Corps of Engineers, ATTN: CENCE-ED-L, P.O. Box 1027, Detroit, MI 48231. 313-226-6440
36. **Lake Erie Shore Lines.** Available from the Ohio Coastal Resource Management Project, P.O. Box 360, Kent, OH 44240. 216-673-1193.

37. **Lake Levels Update.** Newsletter (service letter) focusing on Lakes Ontario and Erie. Published twice yearly, in late winter and late summer. Geared toward the needs of riparians and boaters. No cost. Available from the New York Sea Grant Extension, 405 Administration Bldg., State University College, Brockport, NY 14420. 716-395-2638.
38. **Monthly Water Levels Bulletins.** Monthly publication providing a graphical representation of historical water levels for the previous year and current year to date, and probable levels for the next six months, for all of the Great Lakes. In Canada, contact the Department of Fisheries and Oceans, Canadian Hydrographic Service, P.O. Box 5050, Burlington, ON L7R 4A6, 416-336-4581. In the U.S., contact the Department of the Army, Detroit District, Corps of Engineers, ATTN: CENCE-ED-L, PO Box 1027, Detroit, MI 48231. 313-226-6440.
39. **Natural Resources Register.** Available from the Office of the Great Lakes, which is responsible for, among other things, providing information on the state's flood and erosion relief program for Michigan. Available from Office of the Great Lakes, Department of Natural Resources, P.O. Box 30028, Lansing, MI 48909. 517-373-1950.
40. **New York's Great Lakes Water Levels Update.** Available from the SUNY College at Brockport, Sea Grant Program, Brockport, NY 14420. 716-395-2638.
41. **Outdoor Indiana.** Magazine produced by the Indiana DNR. Available from the Indiana Department of Natural Resources, Division of Water, 2475 Directors Row, Indianapolis, IN 46241. 317-232-4160.
42. **Water Bulletin.** Newsletter published by the Indiana DNR. Available from the Indiana Department of Natural Resources, Division of Water, 2475 Directors Row, Indianapolis, IN 46241. 317-232-4160.
43. **Water Talk.** Newsletter from Minnesota DNR devoted to shoreland, floodplain and other water-related issues. Available from the Minnesota Department of Natural Resources, Division of Waters, 500 Lafayette Road, St. Paul, MN 55155. 612-296-0444.
44. **Weekly Great Lakes Water Level Record.** A weekly summary of present water levels and a forecast one month into the future. Available from the Department of the Army, Detroit District, Corps of Engineers, ATTN: CENCE-ED-L, P.O. Box 1027, Detroit, MI 48231. 313-226-6440.

REPORTS

45. **Causes and Consequences of the Record High 1985 Great Lakes Water Levels.** Available from the Great Lakes Environmental Research Laboratory (GLERL), 2205 Commonwealth Blvd., Ann Arbor, MI 48105. 313-668-2235.
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53. **Great Lakes Water Levels - Report to Congress.** August 1986. 89 pages. Report prepared pursuant to the Urgent Supplemental Appropriations Act of 1986, which authorized expenditures of available funds up to one million dollars for the Secretary of the Army to develop emergency contingency plans to prevent or control near-term flooding along the Great Lakes. Report provides Congress with all pertinent information relative to lake levels, their regulation, effects of their extremes, and efforts to combat the extremes. Available from the U.S. Army Corps of Engineers, North Central Division, 536 South Clark Street, Chicago, IL 60605-1592. 312-353-6319.
54. **Implications of Interbasin Diversions, Consumptive Use, and the Greenhouse Effect on Future Great Lakes Management.** Available from the Great Lakes Environmental Research Laboratory (GLERL), 2205 Commonwealth Blvd., Ann Arbor, MI 48105. 313-668-3544.
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56. **Potential Variation of Great Lakes Shore Erosion and Flooding Assistance Programs.** 1988. Written by H.C. Hartmann. Available from NOAA TM ERL GLERL-68, Great Lakes Environmental Research Laboratory (GLERL), 2205 Commonwealth Blvd., Ann Arbor, MI 48105. 313-668-3544.
57. **Shoreline Management Review Committee Report to the Minister of Natural Resources and Minister of Municipal Affairs.** October 1986. 95 pages. Recommends a long-term program for the management of shorelines along the Great Lakes, in four categories: jurisdiction, prevention, protection and emergency response. Available from Ontario Ministry of Natural Resources, 99 Wellesley Street West, Toronto, ON M7A 1W3. 416-965-9751.
58. **Unified National Program for Floodplain Management.** March 1986. 130 pages. Report sets forth a conceptual framework and identifies strategies fundamental to implementing a balanced approach to floodplain management. It appraises the implementation of current programs and recommends federal, state and local actions needed to achieve a unified program of planning and action at all levels of government to reduce flood losses and losses of floodplain natural values. Available from the Interagency Task Force on Floodplain Management, 500 C Street NW, Washington, DC 20472.

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61. **Coastal Hazard Management -- Shore Erosion.** 1982. Provides a model ordinance for an erosion hazard area setback that local municipalities can adopt. Available from the Ohio Department of Natural Resources, Division of Water, 1939 Fountain Square Court, Bldg. E-3, Columbus, OH 43224. 614-265-6730.
62. **Coastal Processes Manual: A Training Manual for Evaluating Coastal Property.** 1987. By J.P. Keillor and A.H. Miller. Ask for WIS-SG-87-430 from the University of Wisconsin Sea Grant Institute, Communications Office, 1800 University Avenue, Madison, WI 53705. 608-263-3259.
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65. **A Guide to Coastal Erosion Processes.** (Publication #199) Cost: \$2.25. Available from the New York Sea Grant Extension, 405 Administration Bldg., State University College, Brockport, NY 14420. 716-395-2638.

66. **Help Yourself.** September 1978. 24 pages. A discussion of erosion problems on the Great Lakes and alternative methods of shore protection. Available from the North Central Division, U.S. Army Corps of Engineers, 536 South Clark Street, Chicago, IL 60605-1592. 312-353-6319.
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69. **Low Cost Shore Protection: A guide for local government officials.** 1981. A self-help guide to low-cost ways to control or slow shoreline erosion. 108 pp. Available from the Department of the Army, Detroit District, Corps of Engineers, ATTN: CENCE-ED-L, P.O. Box 1027, Detroit, MI 48231. 313-226-6440.
70. **Low Cost Shore Protection: A property owner's guide.** 1981. A self-help guide to low-cost ways for the shoreline property owner to control or slow shoreline erosion. 159 pp. Available from the Department of the Army, Detroit District, Corps of Engineers, ATTN: CENCE-ED-L, P.O. Box 1027, Detroit, MI 48231. 313-226-6440.
71. **New Approach to an Old Problem: The Canada/Ontario Flood Damage Reduction Program.** 1986. A brochure produced by Environment Canada. Available from the Ontario Ministry of Natural Resources, 5th Floor, 99 Wellesley Street W, Whitney Block, Toronto, ON M7A 1W3. 416-965-2756.
72. **Potential Variation of Great Lakes Shore Erosion and Flooding Assistance Programs.** 1988. Written by H.C. Hartmann. Available from NOAA TM ERL GLERL-68, Great Lakes Environmental Research Laboratory (GLERL), 2205 Commonwealth Blvd., Ann Arbor, MI 48105. 313-668-3544.
73. **Report on 1986 Water Levels of the Great Lakes.** December 1986. 20 pages. A summary of events that took place in 1986 in connection with water levels on the Great Lakes. Available from the Great Lakes Water Levels Communication Centre, Environment Canada, P.O. Box 5050, Burlington, ON L7R 4A6. 416-336-4580.

74. **Report on 1987 Water Levels of the Great Lakes.** February 1988. 15 pages. A summary of events that occurred in 1987 in connection with water levels on the Great Lakes. Available from the Great Lakes Water Levels Communication Centre, Environment Canada, P.O. Box 5050, Burlington, ON L7R 4A6. 416-336-4580.
75. **Shore Erosion Technical Report.** A reach-by-reach geotechnical account of bluff stability and shoreline recession. Available from Wisconsin Department of Administration, Coastal Zone Management Program, 101 S. Webster, 8th Floor, Madison, WI 53707-7868. 608-267-3369.
78. **Shoreline Management Guidebook.** 1988. Available from the Center for the Great Lakes, 435 N. Michigan Ave., Suite 1408, Chicago, IL 60611. 312-645-0901.
79. **Slip Sliding Away: Erosion on Lake Superior's North Shore.** May 1987. 4-page flyer. Report of 1986 survey of shoreline property owners along Minnesota's North Shore. Available by writing for "Superior Advisory Note No. 25, from University of Minnesota Sea Grant Extension Program, 208 Washburn Hall, University of Minnesota, Duluth, MN 55812. 218-726-8106.
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81. **Structural Methods for Controlling Coastal Erosion.** (Publication #200) Cost: \$3.70. Available from the New York Sea Grant Extension, 405 Administration Bldg., State University College, Brockport, NY 14420. 716-395-2638.
82. **Vegetation and its Role in Reducing Great Lakes Shoreline Erosion: A Guide for Property Owners.** 1988. Lists grasses, trees, and shrubs that can reduce erosion on some coastal properties. Cost: \$.50 (U.S.) Available from University of Minnesota Sea Grant Extension Program, 208 Washburn Hall, University of Minnesota, Duluth, MN 55812. 218-726-8106.
83. **Vegetative Uses in Coastal Ecosystems.** (Publication #198) Cost: \$3.85. Available from the New York Sea Grant Extension, 405 Administration Bldg., State University College, Brockport, NY 14420. 716-395-2638.

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85. **Coastal Hazards -- Erosion and Flooding.** 1977. Gives county by county shoreline descriptions. Available from the Ohio Department of Natural Resources, Division of Water, 1939 Fountain Square Court, Bldg. E-3, Columbus, OH 43224. 614-265-6730.
86. **Great Lakes Flood and Erosion Prone Area Maps.** Available from the Ontario Ministry of Natural Resources, Whitney Block, 99 Wellesley Street, Toronto, ON M7A 1W3, 416-965-6287; or Water Planning and Management Branch, Environment Canada, 867 Lakeshore Road, Burlington, ON L7R 4A6, 416-336-4956.
87. **Great Lakes Shore Damage Survey Coastal Zone Atlas.** 1976. Available from the Ontario Ministry of Natural Resources, Whitney Block, 99 Wellesley Street, Toronto, ON M7A 1W3, 416-965-6285; or Water Planning and Management Branch, Environment Canada, 867 Lakeshore Road, Burlington, ON L7R 4A6, 416-336-4956.
88. **Great Lakes Water Levels and Erosion.** 1987. Annotated Bibliography. Includes a list of engineering firms involved in coastal erosion control. Available from Minnesota Sea Grant Extension, 208 Washburn Hall, University of Minnesota, Duluth, MN 55812. 218-726-8106.
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APPENDIX G-6

The Public Forum on the Great Lakes - St. Lawrence River Levels Reference Study: An Assessment

On October 22, 1988, the Project Management Team for the International Great Lakes - St. Lawrence River Levels Reference Study under the International Joint Commission (IJC), held a Public Forum to provide members of the public with information on the progress of the study and to receive comments and suggestions for incorporating their concerns into the study. This Forum was unique in that the Project Management Team (PMT) was linked, via satellite, to 10 community meetings around the Great Lakes and St. Lawrence River basin. As this was "a first" for the PMT and the IJC, an evaluation of the physical facilities, the telecommunications network, the community meeting proceedings, and the format for the day was seen as vital in determining whether this type of forum should be used in the future and, if so, what improvements could be made. Information contained herein should be considered in making those decisions.

The following report is divided into six sections: background, adequacy of the physical facilities at the 10 sites, adequacy of the telecommunications network, nature of participation in the 10 sites, adequacy of the format used, and specific advice for improving future forums.

Background

Several groups of people were involved with the Public Forum in addition to the Public Participation and Communications Functional Group (FG-4) of the PMT. Those groups were the site coordinators, community coordinators, facilitators (moderators), and resource people.

Site coordinators were employed by the university or other facility where the community meetings were held and made the necessary building and technical arrangements. Community coordinators were engaged by the FG-4 to make all logistical arrangements (not including technical arrangements made by site coordinator), to contact local media, and to coordinate local awareness of the Forum. Facilitators were contacted by the FG-4 to moderate the discussions in the 10 community forums. Most resource people were members of FG-4 or were IJC staff, and served as sources of information in the 10 meetings and as liaisons for the PMT. Thirteen invited guests, representing a variety of interests and locations in the basin, posed questions to the PMT during the broadcast portion of the Forum.

Procedure

During the week following the Forum, evaluation questionnaires were developed to investigate the effectiveness of the Forum. Members of each of the four groups were contacted during that week to allow them to respond to the questionnaire and to give other observations about the Forum. Questionnaires for each of the four groups varied somewhat according to the tasks associated with their roles. Several identical questions appeared on all questionnaires to allow for collective analysis. (See Appendix A.) In addition, the facilitators and resource people were asked to submit their notes or a summary of their observations from the discussions at the site they attended.

As many members of each of the four groups as was possible were contacted by telephone or in person during the week after the forum. Those contacted by telephone responded to the questions as they were read, and were encouraged to elaborate on their answers. Their responses were recorded on a questionnaire

form, and later, all responses for each group were recorded on one questionnaire form. Those individuals contacted in person were asked to complete the questionnaire in writing. Collective responses to similar questions on the questionnaires from different groups or respondents were compared.

Responses to the questions follow in the first sections as described above. At least one person from each site was contacted. The greatest effort was made to contact the community coordinators as their tasks and contacts were the more diverse than those of the other responding groups. The names of the respondents are not shown and site names are used only when necessary. Suggestions for improving future Forums are shown in the fifth section and are based on the recommendations of the respondents and the observations of the Forum coordinator.

Adequacy of the Physical Facilities at Each of the Ten Sites

In all cases, the facilities were rated from "fine" to "excellent." Large video screens were present in all sites, and seating, room size, and the assistance of the technicians/site staff were highly rated.

A few location problems were noted. Several people had difficulty finding the room at Duluth. This was due in part to the layout of the campus and to the lack of preregistration materials sent (which would have included a map). Also the room number given by the site for the receive site was the office of the site coordinator. In Buffalo, parking was inadequate. The suggestion was made by one respondent from Chicago that Triton College is quite far from the center of the city and the mass transit system, and that greater participation may have been encouraged by a more centrally location.

Most of the problems regarding the facilities were concerned with lunch and break refreshments. Each of the sites handled lunch in a different way due to site restrictions or cafeteria availability. In all sites except Montreal where lunch was "catered," the participants paid for their own. In Montreal, the community coordinator paid for all lunches. In Toledo, the lunches were brought in 15 minutes later than was scheduled, but this posed no major problem. Participants moved to a cafeteria in both Buffalo and Duluth. This took too much time from the discussion for the Buffalo gathering, but the Duluth participants continued their discussion while in the cafeteria. The Duluth community coordinator also mentioned the walk across campus to lunch gave the participants a good break.

Lunches in Windsor were said to be of poor quality by one of the respondents and another said they were satisfactory. A few participants at Windsor commented that \$5.00 was too expensive for a bag lunch.

Three respondents, from Montreal, Owen Sound, and Oakville, advised that lunch should be provided for the participants at no cost. This was viewed as especially important by a Montreal respondent.

Miscellaneous problems arose in connection with the telephones. Some were outside of the rooms and callers had difficulty hearing the person at the studio during the on-air call. The telephone was not properly "hooked up" at Toledo upon the arrival of the community coordinator on the day of the Forum, but the appropriate adjustments were made quickly and without much difficulty.

In summary, all sites were reported to have had adequate to superior facilities for the community forums.

Adequacy of the Telecommunications Network

As one respondent commented, "The technology really worked!" According to those contacted, the technology used for the Forum was "interesting" to the participants. The technology not only functioned properly (in most cases), but also enhanced the intent of this communications effort. "The people felt they were part

of something big." The immediacy of both the questioning and responses were viewed as a definite advantage to proceedings. Another respondent commented that this was a good way to reach many people without causing them great expense. From the participant's point of view as observed by those contacted, the telecommunications worked very well and was very successful in the two-way communications between the PMT and the participants.

A few problems arose at the beginning of the first broadcast. Potsdam did not receive the broadcast for the first twenty minutes. The French translation was delayed at the beginning of the first broadcast in Montreal, and the switching between French and English during the second broadcast was difficult. The Montreal site coordinator felt that these problems would not have arisen had they had more contact with the FG-4 technical people.

Suggestions made with regard to changing the telecommunications format included linking all 10 sites with the PMT simultaneously to allow for more discussion. Another suggestion was to break the Forum into five segments -- one devoted to the work of each functional group. During each of those hour-long segments, each functional group would report on their work and findings to date during the first half, and during the second half, respond to questions and comments from the sites. Two respondents encouraged the airing of the next forum on PBS- and CBC-affiliated television stations.

Overall, respondents were positive in their reactions to the question, "Was this effective as a communications tool?" In addition to the comments listed above, other responses were "excellent," "worked well," "people liked it," "didn't see the need for Montreal or Chicago video segments," "well received," "absolutely [worthwhile]." All of those contacted said additional forums of the same nature should be held on the Levels Reference Study.

The Nature of Participation at the Community Meetings

The following descriptions were taken from the call-ins during the Forum, from the telephone survey during the week after the Forum, and from the discussion notes of the resource people and facilitators.

Buffalo

Between 25 to 30 people were in attendance at the Buffalo community forum and because of snow, the meeting started late. Most participants were shoreline property owners. Others were concerned with navigation problems due to low levels. Overall the group was oriented toward shoreline issues; the group felt their concerns were of the lowest priority with regard to levels-related studies. Power interests were also represented.

Both the facilitator/community coordinator and a resource person at Buffalo observed that the group there was confrontational and would have preferred more one-on-one time with each other. They did, however, see this as a valuable tool in gaining a perspective on other's concerns there at Buffalo (though not basinwide interests -- the facilitator mentioned that they were not ready to look away from local issues to the concerns of those around the Great Lakes). People were generally satisfied with the day's process, but did not like the broadcasts. The participants wanted the PMT there to question, face to face.

Questions raised during the discussion times were:

- 1 - Does sufficient knowledge exist to develop adequate regulation schemes?
- 2 - Past mistakes have resulted in too many human-made structures, which impede natural flows.
- 3 - There does not appear to be sufficient authority for proper regulation.

Buffalo chose to take a presentation approach to their call-in time:

STATEMENT: The group feels that the study should strive to identify an ability to regulate the entire basin.

Engineering information and technology is there to do this, but improper regulations seem to be a matter of course.

More integration is needed.

AN UMBRELLA ORGANIZATION IS NEEDED TO SET PRIORITIES FOR ACTION AND TO HAVE THE AUTHORITY TO TAKE ACTION AND TO BE ACCOUNTABLE (to be achieved through the expansion of the authority of the IJC or through a new agency).

QUESTION: Is there any interest group who believes they would not ultimately benefit from better regulated lake levels?

RECOMMENDATIONS:

- 1) More interaction among interest groups is needed.
- 2) Cost/benefit analysis for a completely regulated system should be compared with the cost/benefit analysis for a non-regulated system.

Chicago

One-third of the 25 people in attendance at the Chicago community forum were members of the Great Lakes Coalition (Wisconsin). Others attending represented municipal governments and the Lake Michigan Federation. As a group, their primary concern was the management/regulation of levels.

The facilitator observed that the discussion was dominated by the Coalition attendees, and would like to have seen a more diversified group.

The discussion at Chicago included the following excerpts.

- 1 - A large number of people were in favor of regulating the middle lakes (Erie, Huron, and Michigan) in the way that Superior and Ontario are presently regulated. They did not want to see this left to chance. One person stated that not one group would suffer if the system were totally regulated.
- 2 - Concern was expressed that the study would falter or grind to a halt due to the present normal lake levels.
- 3 - Some Wisconsin participants stated that their state/residents had not had the opportunity to give input into the study. No GDIs were held in Wisconsin; the only interviews were in Chicago.
- 4 - One participant wanted to know why Lake Superior is maintained within a few inches when the other lakes are allowed to vary over a wide range.
- 5 - Concerning the regulation of the whole system, one person suggested building in a plan where excess waters would be diverted to the Mississippi River. If this were built into the regulation plan, the otherwise slow decisionmaking process to implement this could be avoided.
- 6 - Because of the predictions that high water levels would be with us for years to come, shoreline owners spent millions of dollars to protect their property. Now the lakes are down - only 1½ years later. What explanations are there for this miscalculation? Is this due to the increased flow of the Niagara River by 30 percent?

7 - Even though the beaches are back now, the wetlands will take years to come back. The backup of the Milwaukee sewer system into the lake was another environmental concern expressed.

During the working lunch session, the facilitator asked the participants to cover a few main topics. These are listed below along with the points made during the discussion.

- 1 - What problems were experienced as a result of the extreme high or low water levels in your area?
 - Extreme cost were incurred to protect existing structures along the shore. This included water and sewer systems, storm water disposal, and the loss of wetlands.
 - Property, including sand dunes, were permanently lost. Recreational areas suffered great damage.
 - What impact do the low levels AND the high levels have on sewage systems, and further, on the water quality of the lakes? This could affect not only the shoreline, but two to four miles into the lake.
 - Marinas do not know whether to raise or lower their docks or storage facilities. Both come at great expense.
- 2 - What measures should be taken and what would be the implications of those measures for other areas?
 - Additional structures on the St. Clair and Detroit Rivers should be installed to control all the lakes.
 - Dredge the rivers.
 - More structural measures would be fought by the environmental community. Political entities talking to one another would have more positive effects than structures.
 - Is total regulation of the lakes possible?
 - If canals are used to drain off excess lake waters, then people along the canal will be concerned with preventing floods there. This could also bring about sewage system problems.
 - Limited regulations would be more advisable; use in conjunction with coastal zone setback zoning (to the 50 year mark).
 - Marinas should use floating docks.
 - One governing body is needed to deal with lake level issues.
 - Better utilization of existing structures is needed.
 - Lake Superior is now kept at ± 1 foot and therefore cannot effectively store storm water when it comes.
 - Build more breakwaters.
 - Regulation and other means of alleviating the damage caused by extreme water levels are performed by engineers, who do not seem to take the effects of those measures on the environment into account.

• Use of the Chicago Diversion could be used in times of extreme high water only. It could be turned on and off.

The presentation made from Chicago centered around the following topics:

- 1 - Use engineering solutions to alter the water fluctuations.
- 2 - Concern was raised as to the impacts on the environment due to altering the system, but no objections were made to the use of engineering solutions.
- 3 - Cynicism was expressed in relation to the willingness of the governments to respond.
- 4 - "Kudos" were give to the IJC for their efforts in this study.

Duluth

Approximately 25 people from Minnesota, Wisconsin, Michigan, and Thunder Bay, Ontario, were in attendance at Duluth. Property owners, recreationalists/sailing, and several government agencies were represented. Agencies represented were the Seaway, Minnesota Department of Natural Resources, the City of Duluth, the Port of Thunder Bay, and native North Americans.

According to the community coordinator, a variety of interests were expressed during the day. Only one "drum beater" was there, but was not allowed to dominate the conversation. The participants learned much and came away feeling "they had been listened to --that this was not just *pro forma*." The group agreed they would like to see a local meeting with all area interests represented; there was a willingness to hear and consider the concerns of all parties.

One of the resource people in Duluth observed that the participants had confidence in getting answers to their questions. The people there were "energetic" and had diverse interests. Part of their discussion went back and forth between "don't tinker" and "controls are needed for lakes Huron and Michigan." They felt there were no clear channels for what was to happen next with the information dissemination process and wanted follow up.

Both the community coordinator and the resource person noted that the Duluth group expressed a very strong interest in having a meeting with the other interest groups to (1) understand each of the varying positions on lake levels and (2) to negotiate a joint position. (The resource person later suggested to the writer that this sort of meeting might be coordinated by Functional Group 3.)

Concerns and questions raised at the Duluth discussions were as follows.

- 1 - The greatest concern regarded compensation for property owners and others for damages incurred if the level of Lake Superior were raised above the "disaster" level of 602 feet. Many expressed concern for major damage and even the abandonment of property and dwellings. The City of Duluth presently experiences water and sewer problems when the lake level reaches 602 feet and has the potential for structural damage to 500 structures.

- 2 - A few attendees at the meeting felt that if the "middle lakes" -- Michigan, Huron, and Erie - could be better controlled, Lake Superior could have better control. The logic was that Lake Superior would have an outlet to drain into in the event of high water.

- 3 - Out-of-basin diversions were discussed during the working lunch session. The extension of diversions out of Superior to aquifers in the Midwest and Southwest when "flood gates" were needed to lower levels was proposed. Several individuals supported this idea, but others believed it to be an undesirable solution as it would depend upon political processes. The people at Duluth felt that in political matters their voices are not heard due to the sparse population of the area.

- 4 - Some discussion centered on the role of the states and provinces in the study. The people wanted to know what expectations the IJC has for the role of municipalities in the study, and what their level of responsibility would be in implementing the measures recommended by the study and adopted by governments. The question was raised as the actions by the U.S. and Canada regarding broad-based Great Lakes issues were unclear to the participants.

- 5 - Participants in Duluth proposed that all "tinkering" (in-place regulation measures) be stopped and steps be taken in the future to reverse the human-caused alterations to the Great Lakes basin. This should include the restoration of natural wetlands and the development of new wetlands to absorb the fluctuations of the lakes.

- 6 - The last issue discussed at the Duluth meeting was the length of the forecasting horizon in the study. Uncertainty about the extent of future concerns seemed to make the group skeptical about drawing a conclusion of what should be done with the lakes without knowing if the study looks far into the needs of the future.

Questions for the PMT from Duluth were:

- 1 - Will full regulation be considered?
- 2 - Will "untinkering" the lakes be considered?
- 3 - Will out-of-basin diversions be considered?
- 4 - What is the role of Lake Superior?

Montreal

Twenty-eight people participated during the Montreal community forum and they also had snow. Those in attendance represented or included university students, the Port of Montreal, municipal government, the Quebec Environmental Foundation, provincial and federal environmental agencies, and recreational business owners. Topics for conversation included a lack of understanding of what the IJC was or did, water quality, boating problems due to low levels, port and shipping problems due to low levels, regulation practices for Lake Ontario and their negative impacts on the St. Lawrence, hydro power, group concerns influence on the Study, negative environmental impacts due to regulation, and waterfront development.

According to the community coordinator, there was a great deal of discussion at Montreal, though more time was needed during the lunch break. Although people were pleased with the proceedings overall, they were disappointed with the token mention of the St. Lawrence during the first broadcast. This reaffirmed their fears that neither their concerns nor the problems of the St. Lawrence would be taken seriously in the Levels Reference Study. The Montreal attendees would have liked more time for the reports from the other nine sites and were pleased with their video report. The participants were happy to have attended and were very eager for future public information efforts. Overall there was much interest in Montreal in the Levels Study with regard to the St. Lawrence.

Main points of discussion from Montreal:

- 1 - Why was Montreal informed at such a late date about the Public Forum? Why was documentation not provided ahead of time? Why weren't all those with a vital interest in the St. Lawrence River represented at the Public Forum in Montreal?
- 2 - Has the IJC undertaken detailed study of the St. Lawrence as they have done for the Great Lakes?
- 3 - Water quality and water quantity are interconnected and must be considered together. This is evidenced by the re-suspension of toxic pollutants from sediments when water levels decrease.
- 4 - Does the Commission have a mandate to consider water quality with water quantity?
- 5 - The measures studied and proposed by the Commission must take account of the St. Lawrence River. Quebec should not be neglected in a "system approach" to Great Lakes water quantity issues.

The comments and questions from Montreal were as follows.

- 1 - A huge concern about the regulation of water exists because the effects are multiplied and intensified in the St. Lawrence.
- 2 - Montreal needs more information. The invitation list did not include all the people who have interests in the issues. Many felt left out.
- 3 - The St. Lawrence was not mentioned this morning (the first broadcast). They feel the St. Lawrence is not being considered in terms of the whole system.
- 4 - Water quality is interconnected with water levels. Shipping is very affected. The Port of Montreal has trouble being competitive if water levels keep changing.

5 - When water levels drop and when big ships come through, the sediments come to the surface. The problems from this pollution are still unknown. Chemicals make new bonds and we don't understand the effects.

6 - Does the IJC have a mandate to deal with water quality? Water quality and levels are interconnected.

Oakville

The approximately 75 people at the Oakville forum represented interests on lakes Erie and Ontario, and for all the lakes. The distribution between individuals and organizations was about half and half, and included recreational boaters, but mostly riparians. The discussions focused on the need to improve predicative capabilities and communications to the public about the levels. The many interests represented fueled much discussion over whether to regulate more, diversions, perceptions of regulation, the need for a lead agency to oversee regulations, the liability of governments regarding levels, hydro power, and the reactive (rather than proactive) nature of the study.

The facilitator for Oakville noted the participants were satisfied with the day's events. The participants were already very knowledgeable on the levels issues and were interested in details and schedules for action from the PMT. At the end of the day, people felt they had had their say, but needed to feel their information had made a difference -- that their contributions would be taken seriously.

One resource person noted the response of the group to the first broadcast was that it was good, but incomplete. They were observed to have learned more in one hour than with all previous efforts. Several comments were made with respect to obtaining more information about the study, and with staying informed.

Another resource person made the following observations of the issues under discussion.

Structural measures were supported by some people, but they were opposed by a large segment of the audience, as was any sort of assistance to shore property owners. Shoreline management received strong support from a large portion of the audience.

There was concern that the public would only be involved in this study as observers and commenters on a final report. This was considered to be unsatisfactory by more than one speaker. There was a strong desire for the public to have input to and be involved in the study process and in the development of conclusions/recommendations.

The issues and questions from Oakville were:

- 1 - Can a case be made in the World Court regarding diversions?
- 2 - What is the impact of the greenhouse effect on Great Lakes levels?
- 3 - Do we really have the ability to control the outflow?
- 4 - What is the legal responsibility and liability of governments if the lakes are mismanaged?
- 5 - How is Ontario Hydro's usage controlled?
- 6 - What is the feasibility of total regulation? There are 117 human-made structures already in the system. No lead agency; about 60 different bodies are involved.
- 7 - We must consider the seriousness of low levels as well as high levels.

8 - Can we improve communications, -ie, regarding the decision to go to criterion k or other operational decision?

9 - Can the IJC [pmt] take into consideration all the variables and manage the system and be able to predict lake levels?

10 - Is a computer model the sole basis for decision-making by the PMT? If not, what other "tools" will be used?

Owen Sound

Forty-eight people attended the Owen Sound forum; half were resort or home/cottage owners, the other half were from outdoor groups. Specific interests represented were riparian, environmental, recreation, commercial, industrial, hydro power, and governments. Topics of conversation included the Free Trade agreement, shoreline erosion (especially in the Collingwood/Midland area), water quality, accessibility of water for household use (due to low water levels), pressures for developing the shoreline (condominiums), commercial fisheries, the effect of fluctuating levels on fish spawning beds, and the control of fluctuations.

The community coordinator felt the interests of the participants were whetted with regard to the Levels Study. They wanted to be assured they could monitor the actions eventually taken by both governments once the study had been completed. They also felt not enough information was given by the PMT regarding the study content during the first broadcast.

Their questions, asked or to be asked, during the second broadcast were:

1 - What affect will the Free Trade Agreement have on the control of the Great Lakes and Great Lakes basin including rivers? Will there be a statement by the IJC regarding diversions into or out of the Great Lakes and tributary waters without the consent of all federal, provincial, state, and municipal governments?

2 - How do fluctuations in water levels affect (a) wetlands, (b) access of fish to spawning beds, (3) wildlife and habitats, (4) sport and commercial fishing?

3 - Should we be learning to live with the fluctuations in levels, having become informed of their extremes, rather than attempting regulation? Can we be informed of the extent of the fluctuation?

Additional questions were raised through a process of consensus.

1 - Will the impact of low levels, and lessening rates of flow, on the concentration of toxins and other pollutants be part of the research in this reference?

2 - The headwaters appear to be ignored. Why, when the solution may well be stabilized in flow are meetings held at the bottom of the funnels as it were? (By headwaters the questioner explained he meant all tributary and inflowing waters not just the Lake Superior source.)

3 - Is there a study by the IJC to assess the effect of waste disposal on the aquifer. Many inland communities draw water for human consumption from this source.

4 - Reference was made to the 85/86 response to high water levels. What was that response?

5 - Could the experts clarify the extension of the area of authority of the Conservation Authorities? Is it 5 km into the lakes by a provincial order in council?

6 - Are we actually experiencing a climatic change or is this being used as a smoke screen to cover up human error in water level control?

7 - Mr. LaRoche indicated that steps were taken in response to the 85/86 high water: (a) what steps were taken that affected Georgian Bay/Lake Superior and (b) to what extent have these measures contributed to our present low levels?

8 - Is there a reliable forecast for future long term lake levels?

9 - We live unfortunately in a throw away society, with its grave environmental consequences. Are today's participants to be 'throw aways'? Will we get specific feedback from governments, facilitated by the IJC in order that our interest groups will be made aware of exactly what recommendations of the reference group the present governments chose to act on, and how exactly that they will respond?

Issues raised during the Owen Sound Forum:

- 1 - Water levels on the Great Lakes
 - long term fluctuations and impacts of greenhouse effects
 - present measures to hold water levels constant
 - reasons for recent high/low water levels
 - human-made controls on water levels
 - present/future commitments to water diversion schemes
 - physical processes; set-up, seiche
- 2 - Problems associated with shoreline erosion
 - increased construction costs (protection) associated with water level fluctuations and shoreline erosion
 - needs for additional shoreline erosion monitoring of the Georgian Bay and Lake Huron shoreline
- 3 - High and low water
 - access to water by household wells
 - access to harbors during low water levels
 - water quality during low water levels
 - access to spawning beds by commercial fishing during low water levels
 - loss of fish and wildlife habitat during low water levels
 - impacts on shipping
- 4 - Controls on water withdrawal/consumption from the Great Lakes
- 5 - Commercial pressure along the lakefront and the associated political pressure
- 6 - The impact of the Free Trade agreement will have on the Great Lakes

Potsdam

Fifteen people and eight inches of snow were at the Potsdam meeting on 22nd of October. Hydropower, the Power Squadron (boating safety instructor), recreational boating, The Nature Conservancy, marina operators, and Environment Canada were represented at the Potsdam community forum. The major themes were the St. Lawrence River, greater research on shorelines affected by fluctuating levels, more efforts made at forecasting changes in levels, more consistency in the actual levels of water (for boating safety), strong frustration that it takes too long for bureaucracy to act.

The facilitator observed that people felt a part of the process and that they listened to the concerns of others around the basin. There was a high level of interest among the attendees and the discussion was one of

the highlights of that meeting. However, people felt they were not getting straight answers from the PMT and that little information was delivered during the first broadcast.

Questions and comments from Potsdam for the PMT were:

1 - Everyone had a basic, fundamental concern that the St. Lawrence River is regarded as a drain or a plug for the rest of the system, and that St. Lawrence interests are not taken into account. How is the Study addressing this and will changes be made?

2 - There was great concern in Potsdam regarding what "they" are doing with the system. The bureaucracy is not responding to the needs of the various interests. How is the study looking at how we can get better communication and two-way interaction between regulating agencies and various publics?

3 - Ask the invited studio guests what they expect to achieve out of lake level regulation?

The main issues raised were as follows:

1 - The St. Lawrence interests have been ignored, with the river treated as a drain or plug, not as a region with distinct interests, and that the regulation plan should be adjusted to reflect those interests.

2 - Regulation brings potentially major changes to the ecosystem that we don't really understand - more study is needed before taking drastic, perhaps irreversible action.

3 - High water levels have caused erosion, the effect of which has been to remobilize pollutants in lagoons, embayments, and shoreline landfills.

4 - Better information, forecasting, and planning techniques are needed so that users and managers of the river can better predict changes, both in the short term and long term.

5 - There is a mismatch between the perceptions of the "bureaucrats" and the public as to how well the former is responding to problems and to the needs of the users -- again, better information is needed.

Sault Ste. Marie

Approximately 60 U.S. and Canadian residents participated in the Sault community forum. Drinking water, regulation, diversions, the enforcement powers of the IJC, public education and warning, the effect of fluctuations on fish stock and spawning, transportation, erosion, riparian, recreational activities on the St. Mary's River, and Lake Superior as a storage basin were discussed.

The community coordinator commented that people received the day's outcome very well. Public education was seen as the most important effort we can undertake with respect to actually accomplishing something about fluctuating levels. People from diverse backgrounds and from both sides of the border had a chance to voice their concerns. The attendees wanted to receive future PMT reports and to be called together at that time to discuss their contents.

A resource person at the Sault commented that the participants were encouraged by first PMT broadcast that the process was proceeding. They seemed skeptical on the idea of regulating the entire system.

The major issues discussed and suggestions made during the noon sessions were:

1 - The problem for this Study should be clearly defined.

2 - Better public information and education is needed and, perhaps, an information/interpretive center.

- 3 - People need to know what they are up against for the future. Better forecasting, followed by the dissemination of that information to the public, is needed.
- 4 - Improved shoreline management and planning
- 5 - A lead agency with binational authority is needed to oversee regulations.
- 6 - The PMT should have an 800 telephone number for public inquiries.
- 7 - The Great Lakes basin should be divided into regions with an ombudsman in each.
- 8 - Lake Superior does not get as much attention as the other lakes due to its sparsely populated shores.
- 9 - More interaction among the levels interest groups is needed.

The concerns and questions from the Sault Ste. Marie forum were as follows.

- 1 - What are the impacts of dredging on fishing?
- 2 - The introduction of unwanted species by foreign vessels, i.e., alewives.
- 3 - Who is responsible?
- 4 - Erosion due to high water levels.
- 5 - What are the alternatives to dredging?
- 6 - The delay in reacting to the water levels situation by the IJC.
- 7 - The impact of the level fluctuations on the individual.
- 8 - Does dredging contribute to pollution?

Toledo

Thirty-seven people attended the Toledo meeting. Most were riparians, along with representatives of yacht clubs and the Ohio commercial fishermen. The issues discussed were the damage caused by extreme high and low water levels, great concern for the effect of fluctuations on water quality, Toledo Edison water intakes during low water levels, and the effect of fluctuations on the ecosystem.

The community coordinator for Toledo observed that there was no great variety of opinions expressed -- most were riparian points of view. Participants wanted immediate answers and actions. They saw the live interviews by the invited guests as the most exciting part of the day. The participants were positive and were enthusiastic about the opportunity to participate in another forum.

No other information was available on the Toledo discussion.

The questions and comment topics from Toledo to the PMT were:

- 1 - With 15 months into the study, we would like a more detailed progress report.
- 2 - Full management of the system with the three existing diversions.
- 3 - How will the greenhouse effect influence the long-term picture for the Great Lakes?
- 4 - Wetlands preservation.
- 5 - Flooding, erosion, costs, commerce, tourism.
- 6 - Pollution.
- 7 - To what conclusions is the IJC coming?

Windsor

About 60 people attended in Windsor; most of them were property owners. Property damage, wetlands filling along the Detroit River, ice damage to private property, low water effects on boating, difficulty in getting navigation charts on the U.S. side, and the apparent lack of commitment from the IJC to educate the public, were issues raised at Windsor.

The community coordinator viewed the lunch-hour discussion time as the highlight of the day. Three people expressed the opinion that they had "heard this all before" and did not have confidence in new actions being taken. But one of the resource people at Windsor stated that the attendees were positive overall and came away with the hope that "something" would be done to ease the fluctuations.

The Windsor group developed fifteen questions, was to have asked the first five on the air. However there was only time for one or two questions during the call-in time. The questions from Windsor were:

- 1 - Why can't mechanical devices control the water level in the St. Clair River, Lake St. Clair, the Detroit River, and also Lake Erie (all inner lakes)? Why is this taking so long? Why do we not start on protective measures NOW to prepare for the next time?
- 2 - If the lake levels are going to be controlled, what will the average levels be and what will the range of levels be?
- 3 - How will the socio-economic measures be estimated (e.g., sewer collapse and costs, house prices)?
- 4 - Why are the wetlands being filled in?
- 5 - Precipitation and evaporation are uncontrollable by human. Why does the IJC not concentrate on protection and regulation of shoreline structures rather than try to control water flows and levels?
- 6 - What is being done to reduce runoff from the land? What are the future plans for this? (surface storage?)
- 7 - Can the IJC do more to educate the public? What about an information hotline (an 800-number) with an up-to-date levels/study information recording?
- 8 - What happened to the planning studies undertaken by DOXIADIS - Megalopolis?
- 9 - Have the fluctuations of the water levels and their controls affected water quality?
- 10 - Why does the agreed water level on Lake Superior (602 feet) determine whether the lower lakes become flooded?
- 11 - Are there studies to use existing water control structures to regulate the levels of the lakes (trigger mechanism)? (e.g., L. Superior, Chicago, NY Barge Canal, Long Lac, Black Rock SL, Niagara River, Welland Canal)
- 12 - What assurance have we that the IJC recommendations will be implemented?
- 13 - Why is the IJC asking questions on how to control high lake levels when all the Great Lakes levels are controlled by controlling the outflows from all the Great Lakes?
- 14 - Will the IJC make a commitment that if they don't know what is best to do, they will do something?
- 15 - Will the IJC get experts from the Netherlands to conduct studies of existing IJC reports and make recommendations to the IJC?

From All Ten Sites

Several issues, questions, and suggestions were common to the discussions of many of the sites. The following is a list of some of these.

- 1 - More interaction among the interest groups is needed.
- 2 - A better delivery system for information about changing water levels is needed.
- 3 - The majority of participants from three sites (Buffalo, Chicago, Toledo) were in favor of the regulation of all the lakes.
- 4 - We should be learning to live with fluctuating levels rather than trying to regulate them.
- 5 - A lead, authoritative agency is needed to oversee the regulation of lake levels and related programs.
- 6 - How will global climate change effect the Great Lakes?
- 7 - Environmental considerations are important.
- 8 - Each of the lakes and the St. Lawrence River should be considered with equal weighting in this Study.

Adequacy of the Forum Format

The format for the Forum ran as follows.

9:00-9:30 AM	Registration
9:30	Meeting Convenes
9:30-9:40	Welcome, Introductions, and Opening Remarks
9:40-10:15	Outline of the Day What do we perceive some of the issues to be? Group discussion
10:15-10:30	Break
10:30-12:00 Noon	PMT Broadcast from Detroit
12:00-1:45 PM	Working Lunch -Discussion of response to the 1st Broadcast -Preparation of input to 2nd Broadcast
1:45-2:00	Break
2:00-3:30	PMT Broadcast from Detroit
3:30-4:00	Closing Remarks -Future opportunities for public involvement in the Levels Reference Study -Evaluation of the Forum

Responses to the questions, "Was this an effective communications tool?," "What were the highlights/best points?," "With what were you disappointed?," and "What changes would you make with the format, agenda, questions, etc.?" along with additional appropriate comments, were used to assess the format.

Overall

Several respondents commented that the overall, interactive format for the day was excellent. One respondent suggested altering the format altogether: have five 1-hour segments where (1) each functional group would discuss the progress of their study area thus far and (2) the sites could discuss that information and phone in their comments.

First Discussion Period/Warm-up

The first discussion period before the morning broadcast was seen as needing more direction by one facilitator. Another suggested eliminating that session altogether due to the lethargy of the participants in the morning.

First PMT Broadcast

Eight of the 14 respondents stated the morning PMT broadcast needed more "meat;" little information was said to have been presented. Some suggested having brief presentations or an overview from each of the functional group co-chairs on the progress in their area. Another suggested shortening the PMT broadcast time. Giving more time for the panelists to question the PMT was suggested by two respondents, while two others were not satisfied with the "bureaucratic" answers given by the PMT to those questions that were asked.

Working Lunch

Three respondents requested that more specific questions be given to the 10 communities by the PMT to discuss during their working lunch. Two others cited the need for a longer lunch-time discussion period.

Second PMT Broadcast

Six respondents noted that a longer time for each call-in was needed. One stated there was not enough time to comment on the answers given by the PMT, nor was enough time given to ask all questions.

Two people suggested altering the technological arrangements so that (1) all 10 sites could communicate with each other, or (2) have more video two-way communication time between a site and the PMT.

Only Montreal and Chicago were satisfied with their video report session: all other sites had negative comments with regard to those two sessions. Too long, have all or none of the sites report visually, the video reports were unnecessary, and the colleges (Triton and Montreal) received a free advertisement were the comments from the other eight sites regarding the video report sessions.

Suggestions for Future Forums

The people involved with the preparations and presentation of the Public Forum should be commended for a job well done. In any event such as this, improvements are always possible. Several of these are listed

below and are based on the comments of the respondents. Lists of additional suggestions, from the Forum coordinator, are found in Appendix B.

1. Allow for more preparation time. This was noted by most respondents. One professional event organizer stated a minimum of two months for the community coordinators would be needed to successfully complete all the tasks of that position. Site coordinators requested final confirmation of their sites three weeks before the event. Facilitators should be brought "on board" one month ahead of time; one facilitator requested to be involved from the beginning of the planning process.
2. Provide coordinators and facilitators with more concise information on the Levels Study and on their roles.
3. Engage a separate coordinator for Quebec.
4. The PMT should provide more specific information about the progress of the study in their portion of the Forum.
5. Contact PBS/CBC/cable television stations about airing the Forum live.
6. Provide pre-Forum information to participants.
7. Eliminate the visual reporting sessions; lengthen the call-in report time to at least 10 minutes each.
8. Select a more diversified group of invited guests -- fewer media and politicians.

Summary

All respondents stated they would be willing to participate in like capacities if another Forum were held. All thought there should be other teleconferencing Forums on the Levels Study, although they urged that other forms of public meetings and information dissemination take place as well. Follow-up on this Forum was seen as crucial to its ultimate success.

When asked if, considering all their work and pluses and minuses of the Forum, "was this worth all the effort?," all gave affirmative replies. The following elaborations to this question will serve as a closing statement to this report.

- People felt they were part of something bigger.
- People felt they were listened to.
- People went home with information.
- The various interest groups were brought together.
- People were eager for more public information opportunities.
- It brought the IJC into the public eye.
- This was an ideal means of information dissemination.
- This was good for getting people to think about other interests around the lakes.
- A great trial run.
- Good for government to do an innovative technological media event.

- More glitz is needed for future forums.
- This was worth it, but only if we follow up.

Suggestions for Regarding Community Forum Sites

The arrangements made by Sheridan College with the 10 sites were very good. Some further actions could be taken by the Forum coordinator for future events.

1-Sites should receive final confirmation no later than six weeks before the Forum.

2-Some rotation of the location of the community sites should be made for future forums. Some locations should be used again, but other reaches/communities should be represented. A few suggestions for future locations are: Green Bay, Wisconsin; Erie, Pennsylvania; Cleveland, Ohio; Thunder Bay, Ontario; Ashland, Wisconsin; Rochester, New York; Kingston, Ontario; Port Huron, Michigan/Sarnia, Ontario; Cornwall, Ontario; Muskegeon, Michigan; Traverse City, Michigan; Oshawa, Ontario; Niagara Falls, Ontario; Benton Harbor, Michigan.

3-Include the accessibility of a FAX machine in the preliminary screening of the sites. Include the FAX telephone number on the specs sheet for each site.

4-Sites should be provided with a written description of billing requirements at the time of their final confirmation.

Suggested Changes for Future Levels Study Forums

Time was in short supply during the preparation for the October 22, 1988 Forum. A minimum of six months is recommended for preparing for future Forums. The following are more specific suggested changes for the various phases of preparation.

Media Coverage

1-Press releases, public service announcements, and advertisements should be approved AT LEAST ONE MONTH AHEAD.

2-Press releases should be very prominently displayed in the media kits--with a "PRESS RELEASE ENCLOSED" sticker on the envelope.

3-Contacts with as many media contacts should be made by phone during the early part of the week of the Forum, by the community coordinators and the Forum coordinator.

4-Mail media kit no later than three weeks before the Forum.

5-Include a 1-page "bullet" fact sheet in the media kit. Include information on the satellite down-link details for television stations.

6-Contact public broadcasting and cable channels for details on airing the Forum to home viewers.

7-Send advertisements to newspapers at least two weeks before the Forum; call the ad departments at those papers to reserve space.

Suggestions Regarding Community Coordinators for the Forum

1-BEGIN THE SELECTION/IDENTIFICATION PROCESS AT LEAST SIX MONTHS BEFORE THE FORUM.

2-Have community coordinators in place at least two months before the Forum.

3-Revise community coordinator's guide to a checklist format. Specific tasks and completion dates should be listed.

4-Have a community coordinator's informational meeting near the beginning of their 2-month working period. At that time, provide them with the guide and describe the various tasks they will need to accomplish. Brief them on the Reference Study and the information to be presented during the Forum. Provide time for them to brainstorm together in the areas of media involvement, increasing attendance, and issues to be covered.

5-The Forum coordinator should contact each of the coordinator on a weekly basis for encouragement and to ensure they are on-line with their tasks. (And for encouragement to the Forum coordinator!)

"To Do" List for Forum Coordinator/FG4 Public Information Specialist

The list of suggestions below is meant to prepare the IJC and assisting parties in the preparing for future Levels Reference Forums.

1-Revise Community Coordinator's Guide. Use a checklist format with specific tasks and completion dates.

2-Develop a Facilitator's Guide. Use a checklist format with specific tasks.

3-Develop a Site Coordinator's Fact Sheet and information kit.

4-Develop a Resource Person's information kit.

5-Revise the media kit and the method of approaching the media.

6-Develop a mailing list using the registrants and information-seekers from the October 22, 1988 Forum.

7-Revise the invitations.

8-Develop a "how-to" booklet for present and future Forum coordinators.

9-Develop/hone evaluation procedures for all parties involved.

10-Prepare in-depth report on October 22, 1988 Forum.

APPENDIX G-7

**"Promises to Keep:"
Statements made by the Levels Reference Project Management Team**

PROMISES TO KEEP

**Statements made by the
Levels Reference
Project Management Team**

**Public Forum
October 22, 1988**

On October 22, 1988, the Project Management Team for the International Great Lakes - St. Lawrence River Levels Reference Study under the International Joint Commission (IJC), held a Public Forum to provide members of the public with information on the progress of the study and to receive comments and suggestions for incorporating their concerns into the study. This Forum was unique in that the Project Management Team (PMT) was linked via satellite to 10 community meetings around the Great Lakes and St. Lawrence River basin. In addition to the participants in the meetings around the basin, twelve invited guests were with the PMT at the broadcast site in Detroit. The concerns of these individuals were representative of the geographic and/or topical interests of the people of the Great Lakes region regarding fluctuating water levels.

In responding to the questions and comments of the invited guests in the studio and the participants in the 10 meetings, the PMT spokespersons made several statements about what the Levels Reference Study could include or accomplish. Those statements are recorded here as a reminder.

Morning Broadcast

1. "There will be no limits, no constraints on ways to look at the questions of the study." (Elizabeth Dowdeswell)
2. "People can get information about the Levels Reference Study from us (IJC) via Kim Tassier." (David LaRoche)
3. "The greenhouse effect will be taken into consideration in this study, as will environmental and social concerns. The effect of climate change on levels will be an integral part of this study." (Doug Cuthbert)
4. "The study will seek to find a balance between the extent to which humans tinker and don't tinker with the natural scenario." (David LaRoche)
5. "The PMT will make a sincere effort to hear all [interest] groups." (Robert Roden)
6. "We must not limit ourselves to technical fixes. We [PMT] must take into account solutions that reflect how people feel." (Elizabeth Dowdeswell)
7. "FG3 will be developing a procedure for taking into account the balancing of interests." (Barry Smit)
8. "The study is not limiting itself to the actions of governments that try to influence the flows and levels. That is only one of the actions the Study is addressing. But there are many others including actions relating to shoreline development, compensation for moving away, actions other than regulation. We are looking at the cost sharing arrangements. Who would pay? Obviously, a measure, the cost of which is borne by the people who use it, is different than one where the cost is borne by the general public. So, one of the interest groups is governments." (Barry Smit)
9. "The removal of in-place "tinkering" will be included as a possible measure in the Study." (Barry Smit)

Afternoon Broadcast

10. "The regulatory plan [1958 - Lake Ontario] is deficient in many respects and one is . . . what happens to the St. Lawrence when we regulate Lake Ontario. That is a very specific subject that we are going to address in this study." (General Vander Els)
11. "Specific concerns we do want to feed into the study process. Those questions will be passed along so that the various functional groups can take them into due consideration." (A "quick turnaround time" was promised.) (Elizabeth Dowdeswell)
12. "Bureaucracy did not respond well to the people during the high water levels crisis period. The IJC had asked governments to establish lead agencies. That did not happen as well as we had hoped. We will try again." (David LaRoche)
13. "The ramifications of the Free Trade agreement will be addressed in the Study along with other political policy issues." (Elizabeth Dowdeswell)
14. "We are developing plans for the regulation of lakes Erie, Michigan, and Huron." (Doug Cuthbert)
15. "The purpose of the Study is to establish groundrules -- broad principles for government actions." (Barry Smit)
16. (Regarding a lead government agency with clout to deal with levels:) "We are looking at processes by which decisions are made and by which resources are allocated: what impediments are there and who would do it (lead agencies)." (General Vander Els)
17. "We will provide a draft report [to the public] before the final report. Suggestions for receiving commentary for more effective public participation are welcome." (David LaRoche)
18. "Sufficient money is available from the two governments to complete Phase I." (General Vander Els)
19. "We are very concerned with equity [of the lakes]. It is one of the criteria by which we are measuring and evaluating the potential measures and activities governments may take." (General Vander Els)

APPENDIX G-8

LISTING OF OTHER MATERIALS AVAILABLE FROM FUNCTIONAL GROUP 4

Materials listed below may be obtained from the:

International Joint Commission

2001 S St., Second floor
Washington, DC 20440
202-673-6222

or

100 Metcalfe St., 18th floor
Ottawa, ON K1P 5M1
613-995-2984

1. A detailed update on the TASKS assigned to Functional Group 4.
2. A SUMMARY OF PUBLIC FORUM DISCUSSIONS from the ten community meetings during the October 22, 1988 Public Forum.
3. MASTER CONTACTS LIST (Levels Reference mailing list).
4. PREPLANNING CONTACTS: a list of those individuals interviewed by FG4 on their perceptions of the communications efforts of government agencies during the 1985-87 high water levels crisis.

SB 1627 .SB 164 1989 Annex G
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Commission.
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