

WORK PLAN FOR THE TECHNICAL SUB-COMMITTEE ON STATUS ASSESSMENT OF WATER RESOURCES

PROJECT ELEMENT TWO

A WATER RESOURCES MANAGEMENT DECISION SUPPORT SYSTEM FOR THE GREAT LAKES

Work in Program Year 2001-2002

This document outlines a proposed work plan for the Technical Sub-committee (TSC) on Status Assessment of Water Resources (Project Element 2) for the project “A Water Resources Management Decision Support System for the Great Lakes.” Staff support for the implementation of this work plan will be provided by the U.S. Geological Survey (USGS), National Oceanic and Atmospheric Administration (NOAA), U.S. Army Corps of Engineers (USACE), Environment Canada (EC), and Great Lakes Commission (GLC) and will cover the program period from September 1, 2000 to September 30, 2002. Additional participation in the TSC will come from the member states and provinces. Initially Ohio, Illinois, Michigan, Ontario, and Quebec have voiced interest in participation in the TSC. The work plan consists of four primary components or tasks: assembling available data and information; the characterization and interpretation of the data and information; the development of communications tools; and the display and delivery of project results. A detailed description of the individual work plan elements follows.

Assemble available data and information

This activity includes compiling the data necessary to compute water balances by current methods and compiling and listing sources of all water-resources data in the Great Lakes watershed and the St. Lawrence River. Data is currently gathered by NOAA for the seven bodies of water that constitute the Great Lakes: Lakes Superior, Michigan, Huron, St. Clair, Erie, and Ontario and Georgian Bay. Because it is understood that the ecological impacts of water withdrawal decisions in the Great Lakes have the potential to be felt most acutely downstream, a portion of the St. Lawrence River will need to be included in the data collection and reporting effort to correlate findings with Project Elements 3 and 4. The TSC, augmented by specific St. Lawrence expertise, will make the determination in consultation with the Project Management Team (PMT) of the end point for data collection efforts on the St. Lawrence River.

- Compilation of all data currently used by NOAA to compute water balances. Accurate hydrologic data (over-land precipitation, over-lake precipitation, runoff, lake evaporation, net basin supplies, connecting channel flows, diversion flows, beginning-of-month lake levels, and changes in storage) are required for simulation, forecasting, and water resource studies on the Laurentian Great Lakes and their basins.

Timeline and Responsibilities: NOAA will have the lead on this activity, and it will be completed by September 2001.

- Compilation and listing of all sources and locations of water-resources data relevant to the Great Lakes, even if those data are not currently used to compute water balances. For instance, this compilation will include a listing of all USGS stream gages in the watershed with a period of record exceeding 5 years and information on how to access data from these gages.

Timeline and Responsibilities: USGS will have the lead on this activity, however, in accordance with the Project Work Plan (December 2000), each member organization of the PMT will be responsible for assembling and providing existing data that it collects and houses. This work will be completed by September 2001.

Characterize and interpret data and information

This activity includes updating water-balance computations for the Great Lakes, identifying errors associated with water-balance components, and recommending steps to reduce errors. After available data and information have been compiled, the TSC will characterize the availability of data spatially, temporally, and with respect to data needs for quantifying the Great Lakes water balance. Characterizing the data in terms of spatial and temporal availability will be relatively straightforward, given the aforementioned data assembly effort.

Characterizing and interpreting the data and information with respect to quantifying the Great Lakes water balance is more problematic and will be a substantial part of the TSC's effort. This effort requires identifying and quantifying errors associated with terms in the water balance equation, including lake outflows, tributary inflows, precipitation on the lake surface, evaporation from the lake surface, and direct groundwater discharge to the lake. A white paper will present findings related to errors. Final interpretation of data and information for a status assessment will include a description of the quantity and quality of all data and information relevant to the Great Lakes water balance.

- Computation of water balances. These will be computed for seven bodies of water, the five Great Lakes, Lake St. Clair, and Georgian Bay plus the St. Lawrence River to a downstream endpoint as determined by the TSC. The components of the water balance are precipitation, runoff, evaporation, connecting channel flows, diversions, and consumptive uses. Water balances will be computed for the period of available data, which will be at least 1948-1998.

Timeline and Responsibilities: NOAA will have the lead on this activity, and it will be completed by September 2001.

- Identification of errors associated with water-balance components. Types and sources of errors will be identified, for instance, measurement errors, missing data, estimation errors, and model errors. Error magnitudes will be evaluated qualitatively and ranked, if possible. Some error magnitudes may be quantified. Approaches to quantifying each type of error will be presented.

Timeline and Responsibilities: USGS will have the lead on this activity, and it will be completed by February 2002.

- Identification of steps to reduce errors. Errors in components of the water balance may be reduced by collection of new data, using data that are currently available but not part of the computational process, application of new technologies and analytical tools, and use of alternative models. Appropriate approaches to reducing errors will be presented with emphasis on the largest errors. Findings from this task and the task above will be presented in a peer-reviewed white paper.

Timeline and Responsibilities: USGS will have the lead on this activity with additional and substantial support from the other member groups of the TSC. This peer-reviewed white paper will be completed in final form by July 2002.

Develop Communications Tools

One of the primary goals in this project is to establish a viable and integrated communications system that will make available the data, reports, and information to researchers, policy makers, and decision-makers and provide the necessary level of education, outreach, and detail to the general public on water supply and use issues. Using the existing Great Lakes Information Network (www.glin.net) and Great Lakes Commission (www.glc.org) web sites, data will be accessed, interim and final project products will be posted, and administrative details of the project will be shared with the PMT, Stakeholders Advisory Committee (SAC), TSCs, and interested parties.

The generalized structures of each anticipated web site are as follows:

- Great Lakes Information Network - The Water Quantity and Use page already in place on GLIN (<http://www.great-lakes.net/envt/water/uses.html>) will serve as the initial point of entry for the interim and final products produced during the project as well as all associated data and information. The initial structure of the this page, to be posted in the 3rd project quarter, will consist of linking existing resources primarily from the sources identified by the PMT, SAC and TSC members. Between this time and the release of the final web site in the 7th project quarter the site will undergo almost continual revamping to accommodate project reports, newly identified data, and interactive mapping to help the user access the available data and information. The final web site will be primarily directed to the needs of the states and provinces but will be readily accessible and understandable to all levels of government, citizen organizations, business/industry groups, and other interested parties.
- Great Lakes Commission - This site (<http://www.glc.org/waterquantity/wrmdss/>) will serve as the main page for dissemination of administrative, information, and products generated during project execution. Typical documents and information that will be available for download on this page include PMT and SAC Meeting Minutes, agendas, and members lists; Project and TSC Work Plans; and Project Element Status Sheets. This site will be established in the 2nd quarter and

maintained throughout the entire project and will serve interested individuals and groups as an open and transparent source of the documented processes developed to ensure full and focused participation.

Standard communications, inquiries, and distribution will be enhanced through the establishment of at least two intra-project list servers: one to serve the Project Management Team (pmt-water@great-lakes.net) and one to jointly serve the Project Management Team and Stakeholders Advisory Committee (sac-water@great-lakes.net). These list serves will be utilized for distribution of meeting agendas, meeting minutes, reports, and general project and project-related announcements. In addition, the Commission's bi-monthly newsletter, The ADVISOR, will serve as another means for general project progress and updates through its distribution to over 3,000 interested parties in the basin.

To streamline the flow of project and project element progress, a suite of "Status Sheets" will be developed and maintained on at least a quarterly basis for each project element. These sheets will outline the associated tasks with each project element, the timeline when work will occur, the status of the work, and commentary on progress. These status sheets will be updated by the Project Secretariat for Project Elements 1 and 5; and by the TSC leads for Project Elements 2, 3, and 4. These status sheets will be shared, as updated, with the PMT and SAC through the list serves and posted on the Commission project web site.

Project documentation will be posted and shared in portable document format (.pdf) to ensure ease of accessibility and compatibility with all computer platforms.

Timeline and Responsibilities: The activities for this task will commence in the 2nd quarter and continue throughout this project. Staff support for this task will be provided mainly by the GLC. Thomas Rayburn, Project Manager, will provide overall coordination and administrative support; and Christine Manninen, Project Manager, and Karl Geil, Program Associate, will provide support for web site design and maintenance.

Display and Deliver Project Results

Project Element 2's focus on the status assessment of water resources in the Great Lakes-St. Lawrence System will support and be supported by the other two TSCs. To integrate this web of information focused on ecological impacts, water withdrawals and use, and the overall status of the system a highly detailed, logically structured, and readily accessible web site will be developed and maintained that provides useful and applicable information to all levels of researchers, decision makers, and interested parties. This web site will contain information in narrative formats, databases, maps, and related links. It will be housed within the structure of GLIN at <http://www.great-lakes.net/envt/water/uses.html>. The regional nature and focus on the Great Lakes-St. Lawrence System of GLIN and the wide audience (GLIN's web pages receive on average over 2.5 million hits per month) will help to ensure that information and results are targeted to appropriate groups and individuals.

The Water Quantity and Use web site on GLIN will contain the following general categories:

- What's New
- Overview (including a link to the GLC project page)
- General Resources (including educational and outreach materials)
- Databases
- Applicable Models (flow, consumptive use, levels, etc.)
- Reports (project reports, relevant research, etc.)
- Status Assessment of the System
- State and Provincial Resources
- Federal Resources
- Great Lakes Laws and Policies
- Related Links

Initial reliance will be upon the identification of existing web-accessible data and establishing a site utilizing web pointers to provide the user with information. Efforts will also be targeted throughout the project on identifying data and information not currently accessible through the Internet and working with the appropriate groups and individuals get their information online. This site will also serve as the primary point of publication for the project's interim and final products and reports. Integrated throughout will be clickable maps. These maps will ultimately serve as the main navigability function for the web site. Data and information will be able to be accessed on a multitude of levels (*e.g.* system, lake, river, or watershed) and the subsets of this data and information will be extrapolated and customized by the user. In sum this web site will provide the inventories and will integrate and display status assessment, use, and ecological impacts data and information. It will also support the characterization and assessment of source data and information and help to convey inventory gaps, needs, and associated actions to address them.

Timeline and Responsibilities: These activities for this task will commence in the 2nd quarter and continue throughout this project. Staff support for this task will be provided mainly by the GLC. Thomas Rayburn will provide overall coordination and administrative support; Christine Manninen will provide support for web site design and maintenance; and Stuart Eddy, Program Associate, and Derek Moy, Program Associate, will develop and integrate the interactive online mapping functions related to this work.