

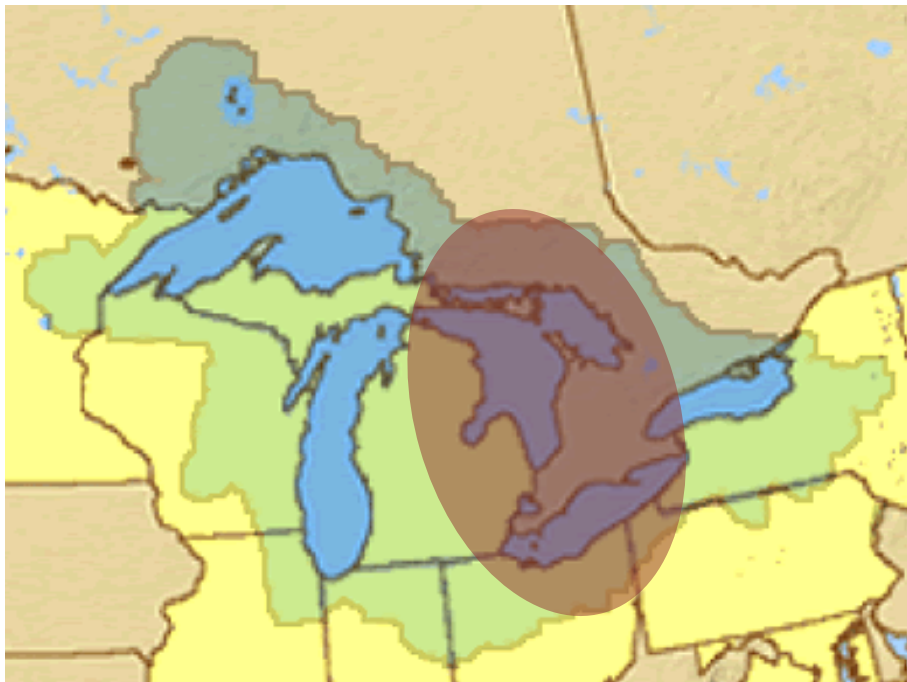
## Great Lakes Regional Integrated Sciences and Assessments Center (GLISA)

University of Michigan, Michigan State University, The Ohio State University

The economy of the Great Lakes Region and the wellbeing of its residents depend heavily on the seasonal rhythms of weather and the interaction of water and land. As such, life in and around the Great Lakes will be greatly affected by regional and local changes to the climate.

The two overarching goals of the GLISA core program are to contribute to the long-term sustainability of the region in the face of multiple and simultaneous social and climate changes and to improve the utility of scientific knowledge to decision making. Specific objectives of the center are 1) to develop a database and integrated network of stakeholders from interrelated sectors who will contribute to the co-production of policy and usable science, 2) to conduct high-quality scientific research to address substantial gaps in current knowledge, 3) to compile, synthesize, and compare existing climate knowledge in the region and, through interaction with stakeholders, develop new approaches to enhance their usability; and 4) to develop best practices for the use of climate projections in impact analysis and decision making.

GLISA research centers on the watersheds of Lake Huron and Lake Erie located in the states of Michigan and Ohio and the province of Ontario. The GLISA leadership, however, recognizes that its work is relevant to, and must sometimes encompass, the larger Great Lakes basin.



**Figure 1:** Great Lakes basin (image from NOAA-GLERL). GLISA target area approximated by shading.

GLISA spotlights three important sectors that are critical to the economy and quality of life in the region and are interconnected through issues of water quality and quantity: agriculture, watershed management, and natural resources-based recreation and tourism.

## **GLISA Core Management Team**

### **Primary Investigators**

Donald Scavia, University of Michigan  
Thomas Dietz, Michigan State University

### **Co-Investigators**

Jeffery Andresen, Michigan State University  
Maria Carmen Lemos, University of Michigan  
Richard Rood, University of Michigan  
Julie Winkler, Michigan State University  
Melinda Huntley, Ohio Sea Grant  
Charles Pistis, Michigan Sea Grant  
Michael Staton, Michigan State University Extension Program

### **Program Manager**

David Bidwell

## **GLISA Structure**

GLISA is organized around three program areas—an annual funding program and two long-term projects.

### **Annual Funding Program**

The core management team, in consultation with the Science and Stakeholder Advisory Committees, will manage a flexible research program by soliciting, reviewing, and selecting research projects through an annual evaluative process. This structure will not only allow for adaptive evolution of projects to meet stakeholders' changing needs but also provide an opportunity for researchers beyond the Core Management Team to contribute to GLISA. Researchers expressing an interest in participating will be invited as *Affiliates* and will be eligible for funding through this mechanism.

### **Integrated Stakeholder Networks (ISNs) Program**

A core philosophy of GLISA is that scientific analysis must be linked to deliberative processes involving stakeholder networks (we define stakeholders as all those interested in and affected by climate-related decisions). To meet the goals associated with our approach, we will build a database of stakeholders and identify their existing networks in the region. One of the subjects of our research will be the structure of stakeholder networks and in particular which groups are well-connected in those networks and which groups are absent. Another will be to understand the character and evolution of climate information needs in the region. GLISA and its projects will be informed by an analytic deliberative process whose goal is to “get the science right” by supplementing conventional scientific understanding with insights from those who have deep local knowledge of the systems we will study. It is also designed to “get the right science” by insuring that the scientific questions asked make sense both in terms of the scientific goal of advancing fundamental knowledge but also the practical goal of conducting analyses that will be of value in decision making in the public and private sectors.

### **Downscaled Climate Projections Program**

Current state-of-the-art information on climate change is provided by coupled atmosphere-ocean general circulation models. An intrinsic constraint of these simulations is their relatively coarse

resolution, which limits their direct use in many impact-oriented applications. Because of the urgent need to make decisions about resource management and infrastructure expenditures at a local and regional level, other means to provide climate change information at the temporal and spatial resolution required by stakeholders have been developed. For example, “downscaling” coarse-scale projections results in estimates at far finer resolutions than the resolution of the original climate model. To outline best practices, GLISA will build an archive of already available climate projections for the Great Lakes region, supplement these projections with additional temporal or spatial detail as appropriate, and extend potential applications of the datasets by expanding them to include variables beyond temperature and precipitation (e.g., snow, snowpack, and snowmelt).

## **Stakeholder Input**

### **Standing Advisory Committees**

Stakeholder and Scientific Advisory Committees will support core management and ensure overall project quality and relevance. The stakeholder committee membership will include interested and affected parties in the public, private, and NGO communities from around the region. The science committee will be composed of social and natural scientists with national climate impact assessment and adaptation experience and reputations.

### ***Ad hoc* Advisory Committees**

Each project that received annual funding from the GLISA will have its own advisory committee, with a membership and scope relevant to the project. Members of these *ad hoc* committees will be selected based on input from the standing advisory committees and the GLISA Core Management Team.

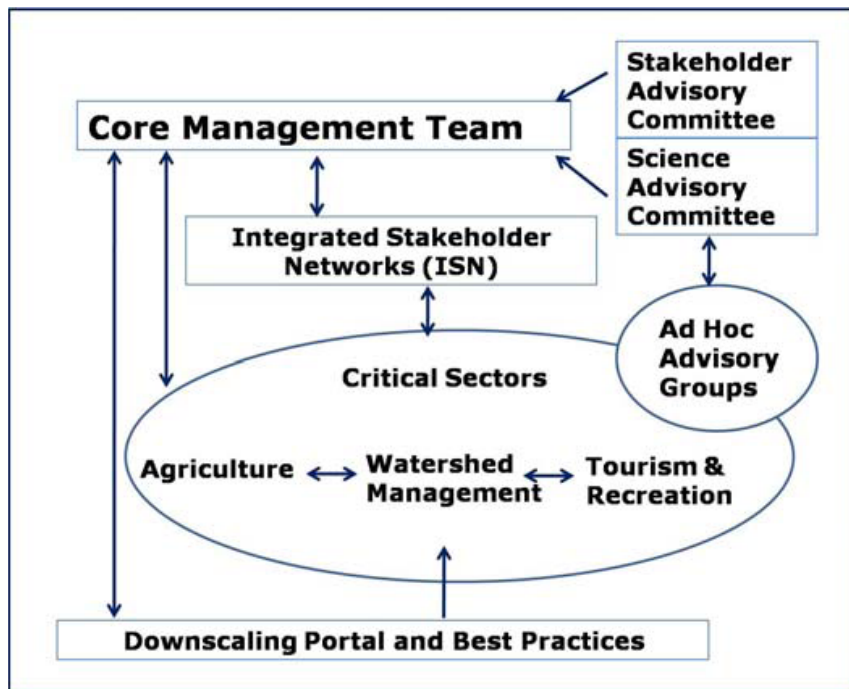


Figure 2: GLISA organizational structure.

### **FY2011 Key Activities**

In its first year of operation (Fiscal Year 2011), GLISA will focus on six key activities:

1. Organize the GLISA management structure and establish the Stakeholder and Science Advisory Committees
2. Compile and analyze existing stakeholder data to better understand research needs and opportunities and constraints for knowledge use
3. Hold two or more integrated stakeholder workshops to present the project, present findings from stakeholder data analysis, and spearhead creation of ISNs to work closely with the research teams
4. Identify a snowball sample of regional networks and collect the stakeholder data that will be the basis of network research
5. Construct the archive of climate projections, with the goal of having at least one set of fine resolution climate projections available to project researchers
6. With input of the advisory committees and ISNs, set priorities for the first “competition” for internal projects and solicit, review, and fund those efforts

### **Anticipated Areas of Decision Support**

Stakeholder engagement is a core principle of the GLISA. As such, decision-support and research-funding priorities will be shaped through ongoing interactions with stakeholders and the standing advisory committees. The Core Team, however, has identified several issues and types of decisions that are likely to benefit from GLISA activities.

GLISA focuses its support on three sectors that are critical to the economy and well-being of the region. Climate change poses serious issues for each of these sectors:

#### **Agriculture**

The Great Lakes Region encompasses some of the most productive farmland in the world, with large areas devoted to row crops, fruit orchards and other specialty crops, and livestock grazing. Climate-sensitive decisions include:

- Selection of crops and varieties
- Management of and insurance against extreme weather events
- Pest management

#### **Watershed Management**

Water is a unifying theme in the Great Lakes Region, and water quality and quantity are two major climate-related issues. There are particular concerns about fluctuating levels of the Great Lakes themselves. Specific decisions include:

- Storm-water management
- Lakeshore development
- Conservation of aquatic species and habitat

- Invasive species
- Prevention of water-borne illness

### **Natural Resource-Based Recreation and Tourism**

Local economies in the region depend heavily on natural resource-based recreation and tourism, particularly boating, hunting and fishing, and snow sports. Moreover, these activities play a critical role in the culture and identity of the region. Climate change could affect a number of key decisions:

- Capital investments in facilities and equipment
- Marina development and management
- Fisheries and wildlife management
- Land-use planning

The Core Team and its individual members are also lending expertise and coordinating with relevant initiatives in the Great Lakes Region and at the national level. These include:

- Linking formal and informal educators with the most recent science in the region
- Understanding the implications of extreme events on water quality and decision-making in the region
- Working with representatives of cities in the region to assess climate-related vulnerabilities of urban communities
- Creating national guidelines for downscaling of climate models