

Global Lake Ecological Observatory Network (GLEON)

9 May 2007

Objectives

Mission Statement:

The mission of GLEON is to facilitate interaction and build collaborations among an international, multidisciplinary community of researchers focused on understanding, predicting, and communicating the impact of natural and anthropogenic influences on lake ecosystems by developing, deploying, and using networks of emerging observational system technologies and associated cyberinfrastructure.

Vision Statement:

The advent of new sensing devices and the advancement in networking and cyberinfrastructure allow for improved and expanded observations of the environment; sharing of data, expertise, experience, and models; replication of experiments in different ecosystems, and discovery of patterns in local, regional, global scales not detected heretofore. It is of paramount importance to use these tools to understand, predict, and mitigate the effects of human-accelerated global change as well as natural disturbances. Lakes, in particular, are a key ecosystem under stress in this changing world. Lakes provide human communities with freshwater for drinking and irrigation, food resources, and also opportunities for recreation and aesthetic appreciation.

GLEON aims to use international collaboration between aquatic scientists and information and other technology specialists as a means to examine and monitor lakes during this pivotal time. Great potential exists to use recently developed technology to conduct aquatic science on a scale never before attempted. By integrating the expertise of multidisciplinary researchers, GLEON will provide insight, scientific understanding, education, and outreach while determining the role and response of lakes in a changing global environment.

Activities:

To fulfill our mission, the Members will conduct the following activities to facilitate interactions and build collaborations:

- 1) Design and build a persistent global lake observatory network of instruments, software, and people to transmit and make data available instantly throughout the network
- 2) Promote and develop tools to share, analyze, and model data; manage the network of lakes; and expand the number of GLEON sites

- 3) Catalyze collaborations between lake scientists, researchers and cyberinfrastructure specialists
- 4) Share resources and information including sensor information, calibration protocols, designs (e.g, buoy blueprints), data and software to ensure the success of projects
- 5) Conduct multi-site training in the use of appropriate technologies and methodologies
- 6) Encourage and conduct joint projects that take advantage of the emerging physical and human network and shared data
- 7) Create opportunities for students, postdocs, and researchers to conduct research and training, collaborate, and exchange personnel
- 8) Meet and communicate regularly
- 9) Disseminate the results of research and experiences through meetings, publications, and the web
- 10) Make data accessible, usable and understandable beyond the network (i.e., laypeople, students, teachers, policy makers, managers)
- 11) Collaborate with and participate in major regional and international activities and in other regional or international environmental observing systems (e.g., the United States National Ecological Observatory Network (NEON), Coral Reef Ecological Observatory Network (CREON)), as well as in standards bodies
- 12) Raise the level of awareness of GLEON activities in the research community and beyond to promote and raise resources for its members

Outcomes:

Through GLEON activities, the Members expect to achieve the following outcomes.

- 1) A persistent, international observatory system of sensors that transmit data easily and instantaneously throughout the GLEON network
- 2) Cyberinfrastructure technology and tools that collect, analyze, model, share and synthesize data from ecological observatories; manage networks of sensors; and interact with other networks, as well as an increased number of GLEON sites

- 3) Enhanced international collaborations among limnologists, information technology experts and engineers
- 4) An established framework with plans for financing, building and deploying high-resolution lake sensors that can be connected to GLEON and other observatory networks
- 5) A greater practical understanding of the cyberinfrastructure and technology involved in collecting and processing data from sensor arrays
- 6) Hypotheses and collaborative approaches to guide the science behind global, high-resolution ecological sensor networks
- 7) Increased opportunities for students of all levels, postdocs and researchers to conduct research internationally and train across diverse disciplines
- 8) A synthesized network of readily accessible scientific, engineering, cyberinfrastructure, and technological expertise for all GLEON members (to be defined)
- 9) Increased communication in the scientific community of the mechanics and importance of global, high-resolution sensor networks in interpreting ecological patterns and processes through joint publications and presentations
- 10) Enhanced interactions with the public to educate, motivate and empower with tools for observing natural systems
- 11) Increased understanding of the influence of climate and land-use change on lake structure and metabolism on wide-ranging spatial and temporal scales, and greater recognition of the role of lakes as barometers of local, regional and global trends in environmental change
- 12) Increased recognition of the power of sensor networks to interpret and predict changes in ecological systems, and increased financial support for the GLEON mission resulting from enhanced collaborations, data acquisition and interpretation, outreach and education

Involvement of the Members

Each Member should seek to:

- (a) Promote the mission and expected outcomes of GLEON
- (b) Participate actively in the formulation and implementation of activities
- (c) As appropriate, make other contributions to support GLEON activities and mission

Cooperation and Coordination

The Members intend to encourage cooperation amongst themselves in the implementation of GLEON and in developing joint activities in areas of mutual interest with other appropriate bodies to avoid duplication and to benefit from existing resources and expertise.