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OPERATING PRINCIPLES AND PROCEDURES

FOR THE

GLOBAL LAKE ECOLOGICAL OBSERVATORY NETWORK

(GLEON)

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Preamble

OPERATING PRINCIPLES AND PROCEDURES FOR THE GLOBAL LAKE ECOLOGICAL OBSERVATORY NETWORK

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 the 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. A number of researchers throughout the world have decided that a coordinated international scientific effort is needed to harness the new technology to address the challenges facing lakes and their ecosystems. As a result, these researchers established the Global Lake Ecological Observatory Network (designated hereafter as GLEON). 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.

GLEON aims to use international collaboration among limnologist, environmental 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.

Four workshops were held to take initial steps to establish the GLEON forum. The first took place in San Diego, California, United States of America on 7-9 March 2005, the second was held on 28-31 March 2006 in Townsville, Australia, the third was held on 2 - 4 October 2006 in Hsinchu, Taiwan, and the fourth was held on 2–5 March 2007 in Lammi, Finland. As an outcome of these workshops, these Operating Principles and Procedures express the rules of operation of GLEON as a form of technical and scientific international cooperation.

Paragraph 1: DEFINITIONS

1. Cyberinfrastructure

Cyberinfrastructure is the aggregation of data storage, computers, communication networks, and people, tied together with the software (i.e. middleware) between application programs and hardware that links these distributed resources together. The goal of using cyberinfrastructure is to enable the derivation of novel scientific theories and knowledge.

2. Sensor Networks and Observing Systems

Sensor networks are spatially-extended, intelligent networks of multi-variable intelligent sensor arrays that capture data across time and spatial scales. Observing systems tie together sensor networks with other remote sensing devices via cyberinfrastructure to gain understanding of basic environmental processes at local, regional, and global scales.

3. Lakes

By lakes we mean lakes, reservoirs and other free-standing bodies of water.

4. Participants and Members

Any one of several means of participation: Individual Member, Site Member, Observer, or Affiliate. A member can be either an Individual or a Site.

5. Individual Member

A *Member* is an individual who has expressed his/her intention to observe the provisions of this Operating Principles and Procedures document.

6. Site Member

A GLEON (Observing) *Site* is a location of intense GLEON activity and infrastructure where:

- GLEON Members conduct research at the site using its infrastructure, or GLEON “projects” are conducted using the site infrastructure (e.g., sensors); or instruments are located at this site that gather information for GLEON researchers;
- There is an agreed-upon practice as to how metadata and the automatically collected, transmitted, and stored sensor data are contributed and shared; and

- There is the history of and/or prospect for long-term observations or research.

Note: Key examples are lakes or lake systems with the associated observing infrastructure. A *Site Member* is a site with staff who have expressed support for and have intentions to observe the provisions of these Operating Principles and Procedures and acknowledged that some of its staff may become members. It is expected that these sites are either free standing, university-affiliated, publicly funded, or not-for-profit institutions.

7. Other Types of Participation

There are two other types of association with GLEON.

(a) Observer: An *observer* is a site, institution, organization, consortium of institutions or research group with some staff that has expressed support for GLEON but is unable to fulfil the requirements for membership. Involvement as an observer is set for a fixed period of time, with the anticipation that the observer will eventually become a Member. An observer should be sponsored by three Members.

(b) Affiliate: An *affiliate* (institution) is an institution, organization, consortium of institutions, research group, or project with some staff that has expressed support for GLEON that does not meet the eligibility for or does not wish for site membership. An affiliate should be sponsored by three Members.

8. Related Organizations and Projects

(a) The issues motivating GLEON are extremely urgent with significant ramification on society. In order to enhance effectiveness and avoid duplication of efforts, we will work with other groups and projects with related interests to GLEON's mission, where mutual benefit can be found

Paragraph 2: UNDERSTANDINGS

1. GLEON is an international forum founded with the overall aim 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.
2. GLEON is open to all individuals, sites, and institutions that align with the goals of GLEON.
3. The involvement of a Member in GLEON is subject to the goodwill and the applicable laws and regulations of that site, institution, organization, consortium of institutions, or research group.
4. This document is not legally binding and will have no effect as a legal or political precedent.
5. The Steering Committee of GLEON will strive to reach decisions by consensus.
6. This document will be made public via dissemination resources such as the GLEON website, www.gleon.org.

Paragraph 3: OBJECTIVES

1. Mission

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. GLEON will work closely with established activities that support GLEON's mission and objectives.

2. Activities

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

- (a) Design and build a persistent global lake observatory network of instruments, software, and people to transmit and make data available instantly throughout the network.
- (b) Promote and develop tools to share, analyze, and model data; manage the network of lakes; and expand the number of GLEON sites.
- (c) Catalyze collaborations between limnologists, environmental scientists, researchers and cyberinfrastructure specialists.
- (d) Share resources and information including sensor information, calibration protocols, buoy designs data and software to ensure the success of projects.
- (e) Conduct multi-site training in the use of appropriate technologies and methodologies.
- (f) Encourage and conduct joint projects that take advantage of the emerging physical and human network and shared data.
- (g) Create opportunities for students, postdocs, and researchers to conduct research and training, collaborate, and exchange personnel.
- (h) Meet and communicate regularly.
- (i) Disseminate the results of research and experiences through meetings, publications, and the web.
- (j) Make data accessible, usable and understandable beyond the network (i.e., laypeople, students, teachers, policy makers, managers).

(k) 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.

(l) Raise the level of awareness of GLEON activities in the research community and beyond to promote and raise resources for its members.

3. Outcomes

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

(a) A persistent, international observatory system of sensors that transmit data easily and instantaneously throughout the GLEON network.

(b) 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.

(c) Enhanced international collaborations among limnologists, environmental scientists, information technology experts and engineers.

(d) An established framework with plans for financing, building and deploying high resolution lake sensors that can be connected to GLEON and other observatory networks.

(e) A greater practical understanding of the cyberinfrastructure and technology involved in collecting and processing data from sensor arrays.

(f) Hypotheses and collaborative approaches to guide the science behind global, high-resolution ecological sensor networks.

(g) Increased opportunities for students of all levels, postdocs and researchers to conduct research internationally and train across diverse disciplines

(h) A synthesized network of readily accessible scientific, engineering, cyberinfrastructure, and technological expertise for all GLEON members (to be defined).

(i) 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.

(j) Enhanced interactions with the public to educate, motivate and empower with tools for observing natural systems

(k) 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.

(l) 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.

4. Involvement of the Members

Each Member should seek to:

- (a) Promote the mission and expected outcomes of GLEON (paragraph 3.1 and 3.3),
- (b) Participate actively in the formulation and implementation of activities (paragraph 3.2),
- (c) As appropriate, make other contributions in the development or use of sensor network or observatory technology to support GLEON's activities and mission.

5. 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.

Paragraph 4: SHARED VALUES AND PRINCIPLES

Shared values and principles are critical to GLEON's future growth. The values are important to foster collaboration and trust among members [Member Values] and to help define how the GLEON organization interacts with its members [Organizational Values] and the broader community.

Member Values

PARTICIPATION: GLEON members value collegiality, mutual respect, collaboration and involvement among different groups of researchers, including limnologists, environmental scientists, cyberinfrastructure experts, computer and information scientists, and others who will support GLEON's mission, as well as educators and community and association leaders. Therefore, members share responsibility for upholding the GLEON mission, engaging in collaborative interactions with other members and actively participating in GLEON activities.

OPENNESS: GLEON members will provide guidance, and will share experiences and expertise openly, freely, and willingly.

INTEGRITY OF DATA: GLEON seeks to integrate data from different sites in order to enhance the scientific understanding of high-frequency mechanisms important for understanding lake ecosystems. GLEON members endorse the following values:

- **ACKNOWLEDGMENT OF USE OF DATA AND ATTRIBUTION:** GLEON members value collaboration and attribution; therefore, members agree to acknowledge the use of members' data, resources, and expertise, in publication and presentation or other dissemination media, and, where appropriate, agree to engage the contributors of the data in other professional activities (e.g. co-authorship of papers). [See Annex V for details.]
- **OPEN ACCESS TO DATA:** GLEON members endorse the principle that data should be openly available to the maximum extent possible. This will foster scientific research and educational development internationally, and will establish and maintain research and educational collaborations while also supporting the public use of these data. [See Annex IV.1 for implementation]

Organizational Values

MEMBER DRIVEN: GLEON is a grassroots organization; therefore, it values the resources and contributions of its members and is driven by the members' needs.

PROMOTION AND DISSEMINATION: GLEON provides value to its members through its unique focus and mission: to facilitate research and education and to promote individual, collaborative, and community activities.

INFORMALITY: GLEON membership will maintain informality in conducting business.

TRANSPARENCY OF DECISION-MAKING: GLEON will operate in an open manner, and its membership acknowledges that the Steering Committee is the decision-making group for the organization. It will follow the operating principles and practices agreed to by members.

DIVERSITY, INNOVATION, AND PROFESSIONAL DEVELOPMENT OF MEMBERS: GLEON values the diversity of its membership, promotes training and exchange of members, and encourages pioneering and innovative initiatives that develop new science resulting in the professional development of its membership.

EDUCATION/OUTREACH FOR THE ACADEMIC AND LAY COMMUNITIES: GLEON values education; therefore, it will provide a forum for training the next generation of scientists, researchers, and educators, and an outlet for sharing its science with the public.

INTEGRATION: GLEON recognizes that progress in achieving its mission will be made by drawing upon knowledge and expertise from several disciplines; therefore, it will integrate all relevant disciplines in order to better answer questions about lakes and reservoirs.

Paragraph 5: GLEON MEMBERSHIP

GLEON's mission 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. As GLEON's mission indicates, GLEON is composed of two networks; a network of scientists, engineers and computer specialists, and a sensor (observing) network.

Individual membership is the route to the human side of the network. This includes the science, generation of hypotheses, sharing of ideas, experiences and expertise (this includes, but is not limited to, the limnology and the broader environmental science, the computing aspects, and sensing technology). No membership distinction is made in benefits or commitments among the different individual backgrounds. The sensor (observatory) network is the integrated infrastructure of hardware, software, and people that produce the data that supports the science network and evolves from the science.

Site membership reflects the commitment by sites to support GLEON research and provide access to various types of data and infrastructure. It is possible to access the sensor network without the human network but the benefits are considerably reduced and as such, membership is actively encouraged.

Benefits of Membership

Membership in GLEON provides access to a network of individuals with a strong interest in limnology or environmental science and the role of technology in answering fundamental and applied research questions, as well as a network of sites with sensor infrastructure and access to shared data.

Benefits will include:

- **Exchange** of knowledge and data on the ecological phenomena that occur in lakes around the globe
- **Opportunities** to seek solutions or validation of limnological or environmental hypotheses in different lakes through data sharing and/or collaboration with other GLEON members
- **Support** from other GLEON members in the development and improvement of observatory technologies and data management.

- **Access** to an on-going discussion about global lake ecological issues and access to data and collaborative partners to address these
- **Affiliation** with a more formalized research network that can be used to enhance competitive power for funds
- **Opportunities** to provide leadership for and gain experience in a global community of researchers.

Commitment of Members:

A key concept of commitment is the desire to participate in GLEON, collaborate with other members, and to contribute to advancing GLEON's mission. Furthermore, all members must endorse and express a willingness to adhere to GLEON's "Operating Principles and Procedures" and the shared values and means of conducting GLEON's operations.

Term of Membership

The term of membership is three years, renewal upon mutual agreement.

NOTE:

- Both Benefits and Commitments of Membership are outlined in more detail in Annex IV:

Participation Propositions.

- Two other types of participation are defined (Paragraph 1): Observers and Affiliates, and these may be individuals or sites and could include projects and programs. For example, government agencies, water utilities and environmental managers may wish to join GLEON as either observers or affiliates or as individual or site members for access to the network of individuals, in addition to access to the data.

Paragraph 6: THE STEERING COMMITTEE

1. Role and Purpose

The Steering Committee will be the means by which representatives of the Members will make collective decisions on matters relating to GLEON.

2. Initialization of Expanded Steering Committee

An initial set of Expanded Steering Committee members was proposed by the Founding Steering Committee and discussed with potential members for approval. This Expanded Steering Committee began to function when the proposed individuals agreed to serve and agreed to the Operating Principles and Procedures. This Expanded Steering Committee is hereafter known as the Steering Committee, and oversees the implementation of these Operating Principles and Procedures.

3. Composition of the Steering Committee

(a) The key principle for Steering Committee membership is the extent of the contributions that an individual has made and can make to the Steering Committee and to GLEON mission.

(b) Other principles that guide the evolution of the Steering Committee membership are:

- i. Continued success of GLEON and of the operation of the Steering Committee.
- ii. Representation of members and member sites.
- iii. Preserve or enhance diversity, with particular note to region, discipline, and gender.
- iv. Limited size for both effectiveness and efficiency. A size of 10 to 15 members is considered reasonable for representation as well as frank discussions. The larger this group, the harder it is to find time for a meeting. In addition, given the global nature of this organization, it will be difficult for some members to participate in a virtual conference.
- v. Retain GLEON 'memory' while engaging new energy and talent from members.
- vi. Ensure direct link between Steering Committee and working groups or strategic projects (e.g., GLEON RCN), by having a steering committee member either as co-lead of a working group or as a key member of the working group, or as having a key member of the strategic project on the Steering Committee.

(c) Appointment Term

- i. Each Steering Committee member will serve for three years.

(d). Renewal or Rotation Process

- i. Six months prior to the end of their three year appointment, a Steering Committee member may express his/her interest in continuing on or in rotating off the Steering Committee.
- ii. If a Steering Committee member wishes to remain, he/she should state his/her intention and provide the other members of the Steering Committee with a list of previous, current, and future activities and contributions to GLEON.
- iii. A member of the Steering Committee will be appointed to be in charge of the election and charged with setting up an ad hoc sub-committee to solicit, receive and vet nominations. This person may not be one of the steering committee members seeking re-election.
- iv. Nominations for new Steering Committee members will be collected from GLEON Members by the ad hoc committee.
- v. The member in charge of the election will contact nominees to ensure they are willing to serve and, following their approval, send a summary of nominees to the Steering Committee at least two weeks prior to election.
- vi. The Steering Committee will renew current members or elect new members based on the principles stated above.

4. Committee Members

Steering Committee members are required to be present at Steering Committee meetings in person. A member can be present in one of the following ways: face-to-face, by telephone, videoconference, or other practical means determined in advance by the Steering Committee.

5. Voting

- (a) The Steering Committee should strive to work by consensus. Except where mandated that a decision must be made by consensus the following rules (b, c, d) apply. If consensus cannot be reached after reasonable attempts have been made, then approval by a super-majority of those members present and voting is required.
- (b) Each Member of the Steering Committee will have one vote.
- (c) A super-majority vote is the affirmative vote of a two-thirds majority of the members present and eligible to vote.
- (d) If a decision requires choosing between multiple alternatives, the voting process that will consist of a series of votes, such that during any round the alternative with the smallest

number of votes will be removed from further consideration. The process will terminate when any alternative gets the super-majority vote.

- i. For clarification, in the case of selecting a site to host a meeting, there could be several proposals; in the case of deciding membership for new sites, the alternatives might be admit, do not admit, defer.

6. Responsibilities

The Steering Committee may:

- (a) Review at each meeting any nominated applications [please see Paragraph 9 and Annex IV pertaining to “Nominations”] by any individual to be an Individual Member or any organization seeking to become Site Member, Observer or Affiliate, (see Paragraph 9.1 and 9.2 on process).
- (b) Refine processes and definition of membership and participation in the Steering Committee.
- (c) Determine and maintain relationships to other related activities (e.g. NEON, CREON, GLEON RCN and key application projects).
- (d) Review and select at each meeting any application to host a future GLEON Workshop (see Annex VI)
- (e) Review and approve plans (topics, agenda, participants (number, non-GLEON participants)) for preparation for the workshops. It will also be updated on any registration fees for the workshops.
- (f) Review progress on activities between GLEON workshops.
- (g) Review all activities of GLEON and recommend directions for the advancement of GLEON mission and goals.
- (h) Set concrete milestones for GLEON.
- (i) Consider rules for removal of Members, Observers and Affiliate and Steering Committee Members (e.g. lack of participation, misrepresentation).
- (j) Consider plans for publicity of GLEON, including logos, common flyers and press releases.
- (k) Carry out the other functions conferred upon it by this Operating Principles and Procedures document, including any Annexes or modifications hereto.
- (l) Set policies pertaining to the operation of the entire GLEON.
- (m) Review and approve requests for letters of support for proposals.

- (n) Review and approve requests to “support” meetings related to GLEON.
- (o) Designate a project to be a strategic project of GLEON (e.g. GLEON RCN).

7. Procedures

The Steering Committee may establish such subsidiary bodies and rules for procedure as are required for its proper functioning. The Steering Committee will elect two Co-chairs who will serve a (renewable) term of up to three years (to be decided and minute by the Steering Committee prior to the time of appointment). The term length will ideally be offset by a reasonable period of time to ensure continuity between Co-chair terms. The election procedure will follow Annex IX of the operating principles and procedures. The Co-chairs will be responsible for the following Steering Committee functions:

- (a) Conducting the meetings
- (b) Setting the agenda (with input from members of the committee)
- (c) Calling meetings on a regular (as needed) basis
- (d) Producing reports of the committee activities
- (e) Supplying the GLEON membership with regular updates
- (f) Supporting the administrative activities of the committee (but excluding travel and associated costs of members)
- (g) Documenting successes
- (h) Publishing an annual report

8. Meetings

Meetings of the Steering Committee will be held in conjunction with GLEON workshops and at other times as needed. The agenda for the meeting will be circulated by the Chair, no later than two weeks prior to the meeting, after soliciting topics for discussion. From time to time the agenda of the meeting will be enhanced by the involvement of others outside of the Steering Committee, who will be invited to attend the Steering Committee meeting by the Chair after discussions with the Steering Committee.

9. Designation as an Official GLEON Steering Committee Meeting

A meeting of Steering Committee members shall be designated as an official GLEON Steering Committee Meeting if the number of the committee members present is more than

two thirds of the total number of the Steering Committee Members. A member can be present at such meetings in one of the following ways: face-to-face, by telephone, videoconference, or other practical means determined in advance by the Steering Committee. Any decisions taken at an official Steering Committee Meeting should be transmitted to any Steering Committee member not present at the meeting.

10. Ex-officio Steering Committee members

The Steering Committee or Co-chairs may appoint an ex-officio member of the Steering Committee, to undertake a specific task. Examples of such tasks may be representing GLEON at a high level meeting, or attending a Steering Committee meeting to provide mentoring and advice to the Steering Committee and Co-Chairs. The task will be for a time period designated by the Steering Committee or Co-Chairs. Ex-officio appointees must be GLEON members. Ex-officio members may attend Steering Committee meetings for designated durations without voting rights.

Paragraph 7: INTELLECTUAL PROPERTY

1. Applicable Law

Nothing in this document should be read to alter the scope and application of Intellectual Property Rights and benefit sharing agreements as determined under relevant laws, regulations and international agreements of the Participants.

2. Attribution

GLEON will seek to ensure that individual and resource contributions to GLEON activities are acknowledged in publications and presentations. [See Annex V]

3. Jointly Developed Software and Data Products

GLEON will seek to promote open access to software and data produced by joint efforts of the Members, subject to international, site, and institutional restrictions and due attribution.

4. Technology Transfer

GLEON will seek to promote the public dissemination of GLEON activities and results.

Paragraph 8: FINANCE AND HOSTING

1. Costs Borne by Members

Members bear the costs of their own participation in GLEON, including the costs of formulating or transmitting reports, travel costs, and other expenses related to attendance at Workshops and other GLEON functions, events, and activities.

2. Hosting GLEON Meetings

(a) The Host Site is responsible for all local arrangements including: meeting rooms, setting up blocks of hotel rooms, arranging for food, arranging for local transportation from airport to hotel (i.e., letting participants know how to get from airport to hotel, not necessarily paying for transportation), and at least one cultural or distinctly unique local event.

(b) Should funding for some participation be available, priority would be given to members to attend. The host site may but is not required to support non-members or non-participants. The Workshop Chair from the host site will be assisted by a workshop co-chair (who will Chair the subsequent workshop) and a workshop program committee, who collectively will set the Workshop agenda. The Workshop Chair will inform the Steering Committee of progress at appropriate meetings.

Paragraph 9: ADDING, WITHDRAWAL, OR REMOVING PARTICIPANTS

The Steering Committee will be responsible for the growth of GLEON, and in particular the addition of Members, Observers, and Affiliates. The Steering Committee will add members who can contribute to the mission and activities of GLEON, thus balancing growth with demonstrated contribution to and success of GLEON.

1. Process for Adding Site Members

New Site Members are added by invitation from the Steering Committee. This process includes:

(a) Identification of potential participants by Steering Committee Members.

Nomination of potential participants should come from at least three existing members of the steering committee. Nominations will enhance the likelihood of a bona fide application and ultimate acceptance at the end of the application process.

(b) Endorsement by a majority of the Steering Committee to extend an invitation to attend a GLEON workshop to the potential participants.

(c) Notification to the entire Steering Committee of the intent to invite, with a reasonable period of time to hear from all members (e.g., two weeks). This notification should include the name of the invited site members, observers or affiliates, initial staff to be involved, and existing or potential collaborations with GLEON members.

(d) Invitation to attend the Workshop by the Steering Committee Chair or designee. The invitation would request that the invitee to make a presentation about potential involvement at a GLEON workshop and to submit an application to the Steering Committee as a potential Member to join GLEON.

(e) Review of the application by the Steering Committee at a subsequent Steering Committee Meeting (possibly via VTC). A representative of the institute or organization applying to join as a member may be required to appear in front of the Steering Committee to present and justify its applications.

(f) Vote of the Steering Committee to convey membership or observer status.

Note:

- Prior to a membership request, it is recommended and encouraged to attend a GLEON workshop, or discuss membership in general with a member of the GLEON Steering Committee.
- Acceptance as a Site Member does not imply involvement in or representation on the Steering Committee.
- Identification and invitation to participate in GLEON can be done via e-mail, VTC or other means of distributed communication. The final decision on the acceptance of a new participant ideally would be made face-to-face.
- Each case will be distinct, and the final decision on specifics can be discussed by the Steering Committee.
- The Operating Principles and Procedures will be sent as part of the invitation package.
- Individual members of a new Site Member can be approved at the time of Site Membership.
- Observers are accepted as participants for a fixed period of time.

Application Content for Site Membership:

Name of Site, including name of point of contact with e-mail address, list of other staff and their e-mail addresses at the site who would be participating and a description of their intended involvement, site url, logo of site, and permission to use logo in GLEON publications. For each staff member to be proposed for Individual Membership, the material on the individuals must be included (see Paragraph 9.2).

Statement of Interest to join GLEON, including statement as to how the mission of GLEON will be advanced by this new membership as well as how the site would benefit from involvement in GLEON.

Prior Experience with Sensor Networks, Limnological or Environmental Research/Activism, relevant information technology, or other relevant background, including (as appropriate): prior and current involvement with GLEON activities or members; other experience in multi-institutional activities; education or experience conducting limnological or environmental research or developing environmental sensor networks; or experience with volunteer groups working on restoration or preservation.

Brief Statement of Rationale for Joining GLEON, including resources that would be contributed to GLEON (e.g. specifying form and extent of data, information about existing

sensor network infrastructure); statement of how applicant would want to be involved with GLEON (e.g., data contribution, expertise available for consultation by other members, sensor network development).

Statement of Data Sharing and Attribution Policy: The site will submit its data sharing policy, indicating which metadata and data are to be made available, whether data have been verified or any QA/QC tests have been performed, and the length of the lag between data acquisition and data accessibility to others.

Indication of Intentions to observe the provisions of this Operating Principle and Procedures document.

Special Circumstances: Articulation of any special factors to be considered by the Steering Committee.

2. Process for Adding Individual Members

The process of adding an Individual Member is similar to that of adding a Site Member. In particular, the process for adding interested individuals as members includes:

(a) Identification of potential participants by Steering Committee Members or other GLEON members. Nomination of potential participants should come from at least two existing members of the Steering Committee.

(b) Endorsement by a majority of the Steering Committee (or a subcommittee) to extend an invitation to invite the individual to apply.

(c) Notification to the entire Steering Committee of the intent to invite, with a reasonable period of time to hear from all Steering Committee members (e.g., two weeks). This notification should include name of the invited individual and a short rationale for the engaging the invitee in GLEON.

(d) Invitation by the Steering Committee Chair or designee to apply. The invitation would invite the individual to make a presentation at the workshop about potential involvement at a GLEON workshop and to submit an application as an Individual Member or Observer to join GLEON to the Steering Committee.

(e) Review of the application by the Steering Committee or a subcommittee.

(f) Vote of the Steering Committee to convey membership or observer status.

NOTE:

- This process applies to graduate students as well, with the exception that they only need one GLEON member to recommend them.
- Interested individuals are encouraged to contact the Steering Committee about membership.

Application Content for Individual Membership: A potential member should provide the following information (ideally on the web)

Name of Applicant

Title, Position, Professional Level (e.g. Graduate student, postdoc)

Institution of Applicant

E-mail Address

Phone Number

Expertise and Area of Interest: e.g. theoretical or applied research of lake ecology, lake ecological observatory techniques, ecological data analysis, catchments environmental managements, tool and software developers, sensor designers, social or economic scientists, educators, etc.

Interest in GLEON: Why is the applicant interested in joining GLEON?

Proposed Contribution: e.g. data, models, technology development, manuscripts, curriculum development, community outreach, ...

Indication of Intention to observe the provisions of this Operating Principle and Procedures document.

Names of two GLEON Members who endorse the application

Agreement to Allow Membership Information to be placed on the web.

3. Process for Adding Affiliates and Observers.

This process will be based on the process for Site Membership. Interested Sites, Institutions or Organizations should notify the chair of the Steering Committee about their interest.

4. Process for Removing Participants

There are two ways in which Participants will be removed: Self-initiated or Steering Committee initiated:

Self-initiated Removal: Members or Observers may remove themselves from GLEON by stating their intention in writing to the Steering Committee with an effective date.

Steering Committee Initiated Removal: The Steering Committee will review participation of Participants on an annual basis. If there has been no participation for a year or more, if there has been misrepresentation on the part of the Participant or a violation of the principles of this document, or if the Participant is no longer contributing in any way to the mission and activities of GLEON, the Steering Committee may decide to remove a Member or Observers and will notify that entity in writing, with an effective date. The Steering Committee has to vote and obtain a supermajority in order to remove an existing member.

Paragraph 10: OTHER MATTERS

1. Establishment of GLEON

The Operating Principles and Procedures outlined in this document come into effect when two-thirds of the initial proposed members of the Steering Committee (see Annex 1) have agreed in writing to this Operating Principles and Procedures document.

2. Duration

Except as provided below, GLEON will be set up for an initial 5-year period from the Montreal GLEON 5 Workshops, 11 August 2007. Extension is allowed as long as a super-majority of the Steering Committee votes for the proposed extension.

3. Termination

The Committee members may terminate this Operating Principles and Procedures document at any time by a unanimous decision.

4. Modifications

Except where otherwise specified, this Operating Principles and Procedures document and any Annexes thereof may be modified at any time by the Steering Committee (subject to applicable laws of Members).

Annex I: LIST OF FOUNDING STEERING COMMITTEE MEMBERS

Participants (as of 1 January 2006) consist of

- Tim Kratz, University of Wisconsin, Trout Lake Station, United States
- David Hamilton, Waikato University, Hamilton, New Zealand
- Fang-Pang Lin, National Center for High-performance Computing, Hsinchu Taiwan
- Peter Arzberger, University of California San Diego, United States

Annex II: LIST OF INITIAL MEMBERS OF THE EXPANDED STEERING COMMITTEE

- Tim Kratz, University of Wisconsin, Trout Lake Station, United States, Chair
- Lauri Arvola, University of Helsinki, Lammi Biological Station, Finland
- Peter Arzberger, University of California San Diego, United States
- Thorsten Blenckner, Uppsala University, Sweden
- Justin Brookes, University of Adelaide, Research Institute for Climate Change and Sustainability, Australia
- David Hamilton, Waikato University, Hamilton, New Zealand
- Paul Hanson, University of Wisconsin, Center for Limnology, US
- Fang-Pang Lin, National Center for High-performance Computing, Hsinchu
Taiwan
- Ami Nishri, Israel Oceanographic and Limnological Research, Israel
- Boqiang Qin, Nanjing Institute of Geography & Limnology, China
- Kathie Weathers, Institute for Ecosystems Studies, New York, US

Annex III: LIST OF CURRENT MEMBERS, SITES, AND AFFILIATES

Individual Members: See Web

Site Members: See web

Observers and Affiliates: See Web

Annex IV: PARTICIPATION PROPOSITIONS

1. Membership Propositions for Site Members

Site Members

- Institutions, Organizations, Consortium, Research groups

Structure:

- Steering Committee is representative of its Members
- An initial committee is identified from Founding Steering Committee

Commitments (agreed to by Site Members):

- Endorsement of the principles, operating procedures and activities of GLEON (as per the Operating Principles and Procedures document).
 - Acknowledge that some staff will attend workshops, etc.
 - Agree to the use of its name and logo by GLEON for publicity purposes.
 - Acknowledge that VTC or similar facilities may be used by GLEON activities.
 - Agree to host or co-host GLEON workshop or semi-annual meeting.
 - Encourage and assist GLEON members associated with the site to participate in GLEON activities to the extent possible.
 - Develop and adhere to Data Sharing and Attribution Policies
 - Agree to contributing metadata about the site and sharing its automatically generated, transmitted (and stored) sensor data
 - Publish site *policy statement about the use and attribution of the data shared from their site data*. This policy should be attached to the Lakes information page and at the web portal, and will be part of the application for Site Membership
- [Paragraph 9.1] .The information may include whether data have been verified or any QA/QC tests have been performed, and the length of a lag between data acquisition and data accessibility to others.

Benefits:

- Increased profile of the organization, through GLEON website and brochures
- Increased publicity of its research efforts

- Strengthened collaboration for its researchers
- Hosting meetings, to connect local researchers with international efforts
- Support from other members to raise awareness about the importance of limnological and environmental research and sensor networks, as well as help in leveraging and raise funds
- Guaranteed minimum number of slots at GLEON workshops/meetings
- Can add members at site through simple request
- Priority to have GLEON assistance for installation of software or site systems
- Can be written in proposals for deployment of sensors and infrastructure
- Have early access to software developed by or “distributed” via GLEON.
- GLEON Logo for site

Obligations:

The obligations of a Site Member will be limited to the commitments listed above. In particular there will be:

- No financial obligation or commitment up-front for becoming a Site Member (this does not preclude discretionary financial support for the Workshop).
- No legal obligation or commitment for becoming a Site Member.
- No Intellectual Property obligation or commitments raised by becoming a Site Member.
- No obligation to provide its resources to GLEON activities by being a Site Member.

Premise:

- Site Membership in GLEON will be under the terms and conditions of the home organization and the terms and conditions of employment of its staff.

Joining and Leaving:

- An organization becomes a Site Member via a nomination by three Steering Committee Members, an invitation to join from the Steering Committee, a pledge of support for GLEON’s mission and activities, and by acknowledging that some of its staff will participate in network activities.
- A Site Member can withdraw from membership by notifying GLEON of its withdrawal, by having none of its staff registered as Members, or by having none of its staff participate in meetings over an extended period (usually three meetings). The withdrawal of an organization as a Site Member will be done in writing and requires an effective date.

2. Membership Proposition for Individuals:

Members:

- Individuals

Structure:

- Steering Committee is representative of its Members
- An initial committee is identified from Founding Steering Committee

Commitments (agreed to by individuals):

- Endorsement and adherence to principles, operating procedures and activities of GLEON (as per Operating Principles and Procedures document).
- Participate in working groups aligned with GLEON activities, to the extent possible
- Interact with other GLEON members
- Attend meetings to the extent possible
- Contribute to larger goals of GLEON by sharing expertise, providing leadership, and enhancing educational opportunities (e.g. interactions among students)
- Consider co-authorship where appropriate (see Annex V)
- Where appropriate, offer attribution to contributors and to GLEON

Benefits:

- Access to shared resources for GLEON activities
- Access to expertise, tools, and training
- Visible links to other members, including participation in a network email list
- Involvement in workshops
- Priority for selection to attend GLEON activities when attendance is limited due to space constraints, over non-members
- Priority for selection to receive fellowships, over non-members
- Support from other members to raise awareness about the importance of limnological or environmental research and sensor networks, as well as help in leveraging and raising funds
- Increased collaboration with other researchers
- Opportunity to serve in a leadership role as a member of the Steering Committee
- More opportunities for research and individual (team) goals
- Connectivity with potential future employers, supervisors, or institutional colleagues
- Recommend other individuals as Members and recommend additions to the Steering Committee when there are openings

Obligations:

The obligations shall be limited to the commitments above.

Premise:

- To recruit the best individuals to help develop sensor networks and approaches to using data from sensor networks to advance both fundamental and applied limnological research.

Joining and Leaving:

- An individual applicant will provide a minimum amount of information (outlined below) for review by the steering committee.
- An individual becomes a member via endorsement by two Steering Committee Members [exception are students who need one recommendation] and an invitation to join from the Steering Committee.
- An individual withdraws from being a member by notifying GLEON of its withdrawal. The withdrawal of an individual as a member will be done in writing and requires an effective date.

3. Observer Proposition for Sites, Institutions, Organizations, and Research Groups

Observers

- Sites, Institutions, Organizations, Research groups

Structure:

- No requirement on the Observers

Commitments (agreed to by Observers):

- Endorsement of the principles, operating procedures and activities of GLEON (as per the Operating Principles and Procedures document)
- Acknowledge that some staff will attend workshops, etc.
- Agree to the use of its name and logo by GLEON for publicity purposes
- During time as Observer, work towards building resources and preparing an application for Site Membership

Benefits:

- Increased profile of the organization
- Increased publicity of its research efforts
- Strengthened collaboration for its researchers
- Support from other members to raise awareness about the importance of limnological or environmental research and sensor networks, as well as help in leveraging and raise funds
- Guaranteed minimum number of slots at GLEON workshops/meetings

Obligations:

- Pay for all fees and activities and costs related to GLEON, unless waived.
- Follow the commitments listed above. (See Site Member's Responsibility).

Premise:

- Observer Sites, Institutions, and Organizations in GLEON will be under the terms and conditions of the organization and the terms and conditions of employment of its staff.
- Observer status allows GLEON to build capacity in sites, institutions, and organizations that wish to become part of the larger lake sensor network community.

Joining and Leaving:

- An organization becomes an Observer via a nomination by three Steering Committee Members and an invitation to join from the Steering Committee, by expressing its support for GLEON, and by acknowledging that some of its staff will participate in GLEON workshops/meetings.
- An Observer withdraws by notifying GLEON of its withdrawal, or by having none of its staff participate in meetings over an extended period (usually three meetings). The withdrawal of an organization as an Observer will be done in writing and requires an effective date.
- Note: Observer status is conveyed for a fixed period of time with the understanding that the Observer will be seeking to become a Site Member (the status can be extended upon mutual agreement). However, if the status is not extended and if no application for membership is made, the Site, Institution, or Organization will lose its Observer status along with the benefits.

4. Affiliate Proposition for Institutions, Organizations, and Research Groups

Affiliates

- Institutions, Organizations, Research Groups

Structure:

- No requirement of the Affiliates

Commitments (agreed to by Affiliates):

- Endorsement of the principles, operating procedures and activities of GLEON (as per Operating Principles and Procedures document)
- Acknowledge that some staff will attend workshops, etc.
- Agree to the use of its name and logo by GLEON for publicity purposes

Benefits:

- Increased profile of the organization
- Increased publicity of its research efforts
- Strengthened collaboration for its researchers
- Support from other members to raise awareness and potential of limnological or environmental research and sensor networks, as well as help in leveraging and raising funds
- Guaranteed minimum number of slots at GLEON workshop.

Obligations:

- Pay for all fees and activities and costs related to GLEON, unless waived or non-applicable, follow the commitments of Site Members listed above.

Premise:

- Affiliate status in GLEON will be under the terms and conditions of the organization and the terms and conditions of employment of its staff.
- Affiliate status allows GLEON to engage sectors of the economy that would not otherwise be able to contribute to GLEON.

Joining and Leaving:

- An Affiliate participates in GLEON via a nomination by three Steering Committee Members and an invitation to join from the Steering Committee, by expressing its support for GLEON, and by acknowledging that some of its staff will participate in GLEON activities.
- An Affiliate withdraws from GLEON by notifying GLEON of its withdrawal, or by having none of its staff participant in meetings over an extended period (usually three meetings). The withdrawal of an Affiliate will be done in writing and requires an effective date.

ANNEX V: GUIDANCE ON ACKNOWLEDGEMENT AND CO-AUTHORSHIP

GLEON's success depends on collaborations among its members. Sharing of data can lead to collaborations, which can result in additional scholarship and publications. GLEON members are encouraged to be broadly inclusive and cognizant that data sharing present opportunities for collaboration and co-authorship. Co-authorship, or an offer of co-authorship, may be appropriate in instances where GLEON data are used, or intellectual contribution is derived from the activities of GLEON. Discussing authorship with data originators or others who have contributed is necessary to ensure transparency of process, equity of acknowledgment, and goodwill within the network. Authorship discussions should happen at the onset of data sharing/exploring and should be revisited frequently. Authorship and co-authorship are often the end result of an interactive and invitational process. Data themselves, and especially data that either require interpretation or can be enhanced by interacting with the generators of those data, are often an entry into the synthesis and publication process. While guidelines exist that outline the specific contributions that warrant co-authorship, the opportunities to make many of these contributions often arise as a result of such activities as sharing data, entering into casual or structured conversations about the data or interpretation of them, or being asked to comment on and contribute to manuscript drafts. Thus, members are encouraged to consider that several of the standard criteria² for co-authorship require active inclusion, or such invitations to participate. The activities of GLEON and its community are designed to facilitate these interactions.

2 The International Committee of Medical Journal Editors, having identified common and persistent problems with authorship, developed criteria in the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" in 1985, most recently revised in 1997. Several hundred journals worldwide have adopted the following criteria:

- All persons designated as authors should qualify for authorship*.
- Each author should have participated sufficiently in the work to take public responsibility for the content.
- Authorship credit should be based only on substantial contributions to: (1) either the conception and design or the

- analysis and interpretation of data; (2) drafting the article or revising it critically for important intellectual content; and (3) final approval of the version to be published. Conditions 1, 2, and 3 must all be met.
- Other contributors should be listed in an appendix or footnote.
- Editors may ask authors to describe their contribution(s).

* From “*The Roles and Activities of Scientific Societies in Promoting Research Integrity*, 2000. <http://www.aaas.org/spp/sfrrl/projects/report.pdf>, page 9.

Annex VI: PROCEDURE FOR SELECTION OF GLEON MEETING HOST SITE

Summary of Proposal and Selection Procedure

Purpose of this document: To outline a procedure and criteria for proposing and selecting the host site of a future GLEON workshop that will give maximum benefit to the GLEON effort. The anticipated timeframe for the consideration of a future workshop is no more than eighteen months in the future of the next scheduled GLEON workshop.

Eligible Institutions: Institutions or Member Sites of Individual Members who have participated in previous GLEON activities are eligible to host a future workshop.

Application Schedule: Letters of intent and proposals to host a workshop should be sent to Chair of the Steering Committee (see gleon.org) at least four weeks prior to next scheduled GLEON workshop.

Contents of Proposal: Proposals should contain the following information: proposed agenda, location, date and duration, indications of costs covered by host site, and other circumstances surrounding the desire to host the workshop at the proposed time. Note, in order to maximize impact of workshop and minimize travel, co-locating the GLEON workshop with related activities will be seen as a major benefit. A maximum of five pages is recommended for the proposal.

Review of Proposal: The proposals will be reviewed by the Steering Committee of GLEON. The selection will follow the rules adopted by the Steering Committee. The ultimate criteria for site selection will be advancement of the GLEON mission and goals. Other criteria will include the ability to host a successful workshop, the proposed timing and relation to other activities, and the proposing institution's or site's commitment to the workshop. Finally, preference will be given to institutions or sites who have not yet hosted a GLEON workshop.

Final decision: The final decision will be reached on the second day of a GLEON workshop at which the application is reviewed. Short presentations from each applying institution or site will be made on the first day of the workshop, with a decision made by the second day.

The final decision will be reached by vote of the Steering Committee, following the rules adopted by that committee.

For further information: Please contact the chair of the Steering Committee or any of its members.

Note: Ideally at the end of one workshop the community would know the location of the next two workshops.

Content of the Proposal

The proposal should include the following information with a recommended five-page limit.

Statement of intent to host the workshop together with statement as to how the goals of GLEON will be advanced by this workshop.

Content of workshop (agenda), including (but not limited to):

- What applications to be highlighted?
- Will tutorials be offered, and if so, on what topics?
- Will there be special groups involved in the workshop?

Logistics: Proposal needs to address

- Who will be the local Chair?
- What is the structure of the planning committee, if any?
- Where will the meeting will be held?
- When will the meeting be held?
- How long (duration) will the workshop last?
- What is the tentative agenda? This should include
 - What arrangements are anticipated for housing people?
 - What arrangements are there for informal discussions, i.e., via meals, receptions?
 - What the host site will cover in terms of expenses for meeting
 - Will other funds be sought? If so, is hosting of meeting contingent upon receiving other funds?
 - What if any extramural activities (visits to local cultural sites) are planned?
 - Is the proposed location near a large or easily accessible international airport?
 - What are the meeting room availability and capacities, eg. Is there the ability to have breakout rooms? What is the size of the plenary rooms?
 - Will there be wireless access for participants?

- Is there the opportunity for “reduced cost housing” or “guest house” housing?

Budget:

- What is your approximate budget for workshop?
- What funds are available now?
- What are sources of funding?
- Are you seeking additional funding sources
- Do you plan to levy a fee for some attendees?

Collocation Issues:

- Will the workshop be collocated with other meeting?

Special Circumstances: Articulation of any factors to be considered by the group.

Annex VII: GUIDELINES TO SUPPORT WORKSHOPS OR CONFERENCES

The following are criteria for GLEON to apply in considering “supporting” an event (e.g., conference, workshop).

The event should:

- Be aligned with the mission of GLEON and focus on limnological and environmental research and sensor network applications;
- Foster cooperation between GLEON members;
- Obtain support from GLEON only through in-kind contributions (and have no financial cost to GLEON or its members for the support provided by GLEON);
- Have benefits for GLEON members (for example, activities such as the listing of GLEON as a “supporter” of the meeting on the web site and in printed material, providing reduced rates of attendance for GLEON members, allowing space for a GLEON booth or materials);
- Involve GLEON members.

It is envisaged that GLEON would not support an event by providing funds. In other words, it would not be a sponsor for an event. The decision to support an event will be made by the Steering Committee (or a designated subgroup). It is expected that the organizers of the event would submit a brief description of the event addressing the five points listed above. This would be circulated (electronically) for approval by the Steering Committee. If support for an event is approved by the Steering Committee, GLEON would list the event on its website and circulate a message to GLEON members about the event.

Annex VIII: GUIDELINES TO SUPPORT PROPOSALS

The following are criteria for GLEON to apply in considering supplying a “letter of support” for a proposal for funding.

The proposed work should:

- Be aligned with the mission of GLEON and focus on grid technologies and applications;
- Foster cooperation between the GLEON members;
- Obtain support from GLEON only through in-kind contributions (and have no financial cost to GLEON or its members for the letter of support provided by GLEON);
- Have benefits for GLEON members (for example, activities that would enhance the functioning of GLEON members site resources);
- Involve interested GLEON members in a collaborative activity

It is envisaged that GLEON would not support a proposal by providing funds. The decision to support a proposal will be made by the Steering Committee. It is expected that the requester of the letter would submit an executive summary of the proposed activity, address the five points listed above, and state any expectations on specific GLEON members for access to resources or use of staff. This would be circulated (electronically) for approval by the Steering Committee. It is expected that the request would be made at least a week before it was needed. If support for the proposal is approved by the Steering Committee, a letter will be drafted for signature by either of the Co-chairs, and whenever possible circulated to the Steering Committee prior to sending to the requester

ANNEX IX: PROCEDURE FOR ROTATION AND SELECTION OF GLEON STEERING COMMITTEE CHAIR AND CO-CHAIR

The following procedure reflects our experience in the fall of 2011 in the selection of a Co-chair.

- At least six months prior to the end of co-chair appointments, the Steering Committee will discuss with the reappointment of the incumbent. Satisfactory service of the Co-chair is expected in order to receive the approval of the Steering Committee to be reappointed.
- At least three months prior to the end of chair/co-chair appointments, nominations will be collected for Co-chair position. Nominations must be of eligible Steering Committee Members¹ and will come from GLEON Members. Steering Committee Members may self-nominate. A member of the Steering Committee or other ex-officio member will be appointed in charge of the election and charged with collecting nominations.
- The member in charge of the election will contact nominees to ensure they are willing to serve and, following their approval, send a summary of nominees to the Steering Committee at least two weeks prior to election.
- Nominees are expected to send a brief summary of qualifications and goals for the chair position. These summaries will be collected by the member in charge of the election and forwarded to the steering committee.
- Election of the Co-chair will take place by super-majority, following guidelines laid out for voting in Section 6 sub-paragraph 5. Nominees are not permitted to vote in the election.

¹ With the exception of the graduate student representative, all members are eligible. If the Chair of the Collaborative Climate Committee (CCC) is elected, he / she will give up the chair of the CCC.