Working Group on Information Systems and Services

Terms of Reference

May 2015

1. **Purpose**

*This section includes a high-level vision and scope of work for WGISS and describes the contribution to the CEOS mission.*

The overall goal of WGISS is to facilitate the development of data and information systems and services for the benefit of both users and data providers in dealing with global, regional and local issues. To achieve this goal WGISS will address in particular the description, discovery, access, usability, archive and curation of space borne Earth observation data and supporting ancillary and auxiliary data and information. This should lead to improved operability and interconnectivity of data/information systems and services.

Specific objectives are to:

* Enable Earth observation data and information to be more accessible and usable to data providers and data users world-wide through international coordination;
* Enhance the complementarity, interoperability and standardization of Earth observation data and information management and services with other types of geospatial data such as in-situ data;
* Foster easier exchange of Earth observation and related data and information to meet the requirements of users and data providers; and
* Foster the development of best practices related to the exploitation space borne Earth observation data.

To achieve these objectives, WGISS will:

* Be responsive to the CEOS-endorsed GEO requirements and will maintain regular contact with the chair of CEOS SIT (Strategic Implementation Team) who has the overall responsibility for the day to day interaction with GEO and its subsidiary committees and secretariat as delegated by the CEOS chair.
* Foster global interconnectivity and interoperability of Earth observation and related data and information systems and services.
* Synthesize and respond to the needs of users and data providers internationally.
* Identify, influence and recommend best practices and standards for effective data management and the provision of interoperable systems and services.
* Support improvements in the quality, reliability and preservation of data, information and supporting systems and services.
* Monitor and investigate developments of new technologies and encourage their use as appropriate.
* Develop agreement on common terminology.
* Foster on-going effective communications among CEOS agencies, Working Groups and other related organizations to facilitate cooperation and avoid unnecessary duplication of effort.

The scope of WGISS are the systems that manage data and those areas that facilitate more effective use of the investments made by its member agencies in Earth Observation data. The value of those resources depends on the end user community, and how that community leverages these data systems to meet their needs. WGISS is interested in those approaches and technologies that further the alignment of Earth Observation systems and services with their usage.

There are a number of significant challenges in this effort. Those challenges are driven by two primary factors: The data and systems are evolving rapidly, with the volume and complexity of Earth Observation data, and the information technologies that are available to Earth Observation data systems, increasing. Secondly, the goals and applications of the user community are constantly transforming as there are increasing opportunities to explore potential societal benefits. There are synergistic relationships between these drivers. As the data and systems mature, there are a larger number of, and more useful, tools at the disposal of the user community. And, as the user community grows in its vision, there are more demands for efficiencies and interoperability placed on the Earth Observation data systems.

*WGISS works to provide a framework for addressing the needs of both data managers and service providers to better serve the users. As such, WGISS addresses all activities related to the capture, description, processing, access, discovery, retrieval, utilization, maintenance, archiving, preservation and exchange of space borne Earth Observation data and supporting ancillary data and information, enabling improved interoperability and interconnectivity of Earth observation information systems and services to its user communities, and combining space borne EO data with in-situ data.*

To maximize the impact and benefit of WGISS activities, WGISS coordinates with other CEOS groups and with non-CEOS agencies and organizations, including governmental and non-governmental organizations that have interests, resources and networks supporting EO data development and exchange. This broad scope is intended to foster the interdisciplinary coordination, the focus and the integration which are necessary for WGISS to act as a forum that is capable of implementing practical solutions.

*The interconnectivity and interoperability of services are key factors in achieving WGISS goals and objectives. WGISS activities emphasize international coordination in these areas to ensure the provision of accessible Earth observation services to data providers and data users worldwide. WGISS also provides a forum compatibility in the practical application of protocols and interfaces, in which technical and administrative issues can be addressed, and where critical interactions between technical implementers can take place.*

1. **Organization**

*This section specifies the duration of the WGISS’ existence, who leads it, the duration of leadership, how membership is determined, and how the activities are funded.*

The structure of WGISS has been designed to ensure that activities are efficiently coordinated in line with the directions and requirements of the CEOS Plenary. The structure facilitates "top-down" strategic planning and coordination as well as "bottom-up" dissemination of project results and discussion of future projects and requirements. The main technical work in WGISS is carried out in Interest Groups and Projects (IG/P), operating as self-managed activities.

All activities of WGISS are funded by its members and associates. Each participant is responsible for seeking and obtaining support and funding from his or her organization. Each participant undertakes activities on a “best effort” basis. WGISS aims to focus the contribution of each participant and to maximize the benefit of the activity to each member or associate involved. Similarly, the review procedures for each activity provide a record of the benefits to the contributing agencies, thus justifying funding and securing continued participation.

WGISS is coordinated under the direction of a chair supported by a secretariat provided by the chair’s organization. The chair is responsible for organizing the semi-annual meetings, producing minutes or notes of those meetings, monitoring actions and reporting to CEOS Plenary and to the SIT. It is the responsibility of the chair to take account of the direction and requirements of the Plenary and SIT, to introduce appropriate external partner agendas relevant to WGISS work, to hear from IG/P leaders concerning recommendations of technical strategic direction and progress of technical implementations and demonstrations, to plan and coordinate appropriately, and to provide "top-down" guidance of WGISS activities.

The WGISS chair will be responsible for preparing the annual report to Plenary and reporting to the chair of SIT as required. The annual report will be circulated to all WGISS members for comment prior to issue. The report will be based on the result of reports provided by the vice-chair, and IG/P leaders and the deliberative decisions taken at the previous WGISS meetings. The WGISS chair will also be responsible for briefing the members of WGISS regarding any inputs from Plenary or other outside bodies. Such inputs will be discussed at WGISS meetings and suitable responses developed. This will include the monitoring of and reporting upon relevant programs performed outside of CEOS (such as GEO, etc.) that may impact upon WGISS work.

The WGISS chair will be responsible for applying the agreed WGISS reporting procedures, ensuring that all minutes or notes, interest group and project templates and project plans, action lists, calls for information are posted as required on the relevant WGISS information systems in a timely fashion.

The role of the vice-chair is to assess the extent to which provider agency needs are being addressed by WGISS and the extent to which their requirements are being met.  The WGISS vice-chair will serve in an ad-hoc WGISS membership role, seeking to involve all CEOS members and associates in WGISS activities. The vice-chair will also coordinate the establishment of future WGISS meetings and serve as chair at functions that the WGISS chair is unable to attend. The WGISS vice-chair becomes the chair after two years. The WGISS vice-chair will report on the extent to which the output of WGISS is being used in the implementation of systems and services by the provider members and associates and the status of membership initiatives including future meeting opportunities. These reports will form inputs to the WGISS annual report.

Liaison Points of Contact are identified among WGISS members to provide an interface to external organisations and to report at WGISS meetings.

The technical work in WGISS is carried out through a mixture of Interest Groups and Projects. Interest groups aim to foster information exchange, discuss best practices and develop ideas for prototyping and demonstrations. Projects are targeted activities with specific goals and a schedule for delivery. The Interest Groups and Projects are organised and managed by leaders who volunteer for the role subject to approval by WGISS and the relevant IG/P members.

The IG/P leaders are responsible for reporting the progress of their activities at each WGISS meeting. Similarly, they are responsible for informing the members regarding the outcome of the WGISS or Plenary meetings. To ensure that the purpose of a WGISS interest group or project (IG/P) is clear, that the work being carried out is adequately monitored and the results widely disseminated, a series of simple procedures are used:

1. Proposal: The IG/P is initiated by completing a profile template that includes a description of how the IG/P aligns with the WGISS vision and will advance WGISS objectives as well as the strategy for success.
2. Adoption: Before an IG/P is undertaken, it will be presented to WGISS for adoption. When adopted, the identified IG/P lead will then take responsibility for the set-up and initiation of the activity. A profile template should be completed which outlines the IG/P objectives, a work plan schedule, goals, project champion for projects, details of participants and their roles, a list of deliverables, and a rough outline of the required resources. For projects, the template should include a statement of the delivery goals of the project and a target date for completion. The template will be submitted to the WGISS chair who will make the recommendation for creation to WGISS. If an IG/P is reviewed and is not immediately adopted it will be placed on a candidate list, subject to further development and refinement before subsequent review. All IG/P on the candidate list will be reviewed at each WGISS meeting and adopted for execution, removed or carried forward to the next meeting as appropriate.
3. Set-up: After adoption of an IG/P as current, the IG/P leader will initiate the various communication and information systems available in support of the IG/P (e.g. register the IG/P description with the home page, establish e-mail distribution lists, etc.). Each IG/P should make best use of the support available from the information services established by WGISS to assist IG/P management and communications. A project Plan is required to fully document the expected work of projects.
4. Reporting and on-going review: IG/P leaders will report on the progress of IG/P at each WGISS meeting, and the status and direction of each will be reviewed, and any adjustments that are necessary will be agreed upon. It is the responsibility of the WGISS Chair and Vice-Chair to ensure that templates of IG/Ps are updated on the basis of the status agreed at WGISS meetings, and that updated descriptions are incorporated into the IG/P Register as appropriate. IG/P Profiles will be reviewed at least annually.
5. Completion review:Upon completion of each IG/P or major milestone, the IG/P leader will produce a short written assessment summarizing the activity against the original plan, its success against the objective, and whether there are any lessons to be learned for the future. These reviews may be appended to the WGISS report to the Plenary and will be made available on the WGISS Web site.
6. Closure: Upon the termination of an IG/P due to completing its work, the profile will be updated to include achievements and the location of any material generated during the course of its work.

## General WGISS management issues are addressed by an executive committee (WGISS Exec) made up of the WGISS chair, vice-chair, secretariat, and the leaders of the IG/P teams. The WGISS Exec holds monthly teleconferences to facilitate the smooth operation of WGISS.

## WGISS meets twice per year. WGISS members are representatives from CEOS agencies and associates. Opportunities to meet jointly with other CEOS groups are organized when practical. IG/P leaders report on interest group recommendations and on the progression of projects against schedules and any other highlights. WGISS will receive reports from members and associates to maintain awareness of relevant developments within their organizations. Liaison PoCs will usually provide a short report prior to WGISS meetings, or provide a presentation at the meeting. The local host is also offered the opportunity to convene a half-day workshop on a topic of their choice.

The work of the Interest Groups and Projects will mainly be progressed through teleconferences and ad-hoc meetings convened as required. IG/P Leaders will report progress at WGISS meetings and more extended IG/P sessions may be held during the WGISS meetings to promote information exchange and more extended discussion on specific topics. An Interest Group or Project may also request to convene a more focussed half-day or one-day workshop during the WGISS meeting on a specific topic. These workshops are where the IG/P will facilitate broader discussions with goals of deeper collaboration with in-person meetings, or to request information from the WGISS and look for feedback on further activities.

The exchange of information among members and associates is invited and encouraged at all meetings and a reasonable amount of time will be allowed on the agenda to facilitate this. Each interest group and project will report directly to WGISS.

## The WGISS Document Approval Process is as follows:

1. Following review by the potential participants, the document will be sent to the WGISS chair with a covering note describing the context, which includes a request for a decision.

2. The WGISS chair will distribute the document and the covering note to WGISS members and associates approximately two months before the decision is expected.

3. If a WGISS member or associate does not support the document, he/she should provide the reason(s) in writing by the due date.

4. If there are no objections, the chair will inform WGISS that the document has been accepted and that it can be formally issued as a CEOS WGISS document and commended to CEOS members and associates and others for their respective decisions and actions.

5. If there are objections, those with objections will work with the interest group or project leader to resolve these objections; if not resolved, the issue will be discussed at the next WGISS meeting and a decision made then.

The following rules are applied to cover the nomination of a new WGISS Exec member in the event that they leave before the normal conclusion of their term. These rules cover the WGISS chair and vice-chair, and interest groups/project lead. The candidates for WGISS chair and vice-chair are handled at the CEOS level as there are budgetary implications to the acceptance of those positions. For other positions CEOS is informed, but formal support is not required. In the case of a departing WGISS chair or vice-chair: the agency of the member holding the post has the right to propose a replacement for the departing member. The reason for adopting this rule is that the agency has agreed to provide resources to support the WGISS chair/vice-chair. If there is no agency proposal then the rules used for the “*departing interest group or /project leader*” are applied. In the case of a departing interest group or project leader: An open discussion within the interest group or project seeks to determine a mutually agreeable candidate coming from within the interest group/project membership. If no candidate is identified within the interest group/project then the WGISS chair will work to identify a nominee.

1. **Objectives**

*This section lists the WGISS’ long-term objectives, intended outcomes or outputs, and measures of success. These items can be listed in bullet form.*

WGISS is a "best-efforts" organization with no central funding. The emphasis of the work plan is dependent upon defining strategic goals, as well as practical and realistic steps that can be achieved with the resources made available by its members and associates towards meeting those goals. WGISS receives strategic direction and specific requests for work from CEOS Plenary and CEOS SIT. Much of this input concerns providing support for the implementation of the CEOS Implementation Plan for GEOSS. WGISS provides reports on progress in achieving its objectives and also provides recommendations to the CEOS Plenary and CEOS SIT to help guide them in their strategic decision-making. WGISS also responds to requests for information and support from liaison and other organisations, including requests to support the implementation of GEO and CEOS Tasks.

WGISS activities consist of two main areas:

## Support for CEOS Plenary and GEOSS: WGISS takes strategic direction from the CEOS Plenary and from the CEOS Strategic Implementation Team (SIT). WGISS strives to help shape the work towards meeting CEOS Plenary, SIT and agency requirements.

This support can be further divided into two aspects:

a) Data and Information Management, which tends to be a more inwardly focussed activity of the space agencies and associates. WGISS members have experience in data and information management issues, and the technology that supports these issues. WGISS exploits this knowledge by producing recommendations, guidelines, and best practices concerned with all aspects of data and information management.

The continuing increase of sources of EO data and the need for interoperability for data from different sources and origins emphasizes the need for harmony in this aspect of EO. A major objective is to facilitate the use and interoperability of data without complications resulting from its form or origin. This interoperability of data can facilitate the generation of global composites of data from different sources.

The issues addressed within WGISS relate to the lifecycle management, stewardship of archives, data formats, auxiliary data requirements, and data packaging. WGISS has defined a common conceptual data model to provide a common language of the information entities with the Earth Observation System community. Defining the semantic content of data products is also a focus of consideration.

b) User Services and Applications Support, which tends to focus on external interactions. WGISS coordinates the provision of a range of global services and support for EO applications. WGISS pursues the development of global services for users of Earth observation and related non-satellite data through coordination of infrastructure development and encouraging the development of services based on international standards. The wider utilization of EO data is supported through:

* wider and easier access for users, assisting users to locate and utilize data and to collaborate with other users;
* coordination in the provision of distributed capabilities to users (e.g. for computing, data search, data caching and temporary storage, and cooperative tools);
* interoperability of user services such as guide, directory, inventory, order, browse;
* Support, as appropriate, for GEOSS.

Agencies continue to develop their own data and information systems, with particular features and functions determined by their needs and schedule. WGISS aims to facilitate the provision of coordinated access to all services available on all systems, providing the user with a seamless global view of all resources that are available for the application in question. This aspect of WGISS activity is primarily internet related. Specific issues include data discovery, inventory search, data retrieval, data processing and visualization. The scope includes information exchange protocols in addition to metadata standards and formatting. WGISS follows and evaluates new technologies that may prove applicable to EO endeavours.

Close contact is maintained with ISO TC211 (Geographic Information) and the Open Geospatial Consortium (OGC) who work on the test-bed prototype activities to help formulate the requirements for standards. WGISS is able to participate in the prototyping activities and influence the standards-making process.

## 2) Knowledge Exchange: An important aspect of the WGISS activities is to ensure that the information it generates is made easily available to interested parties, and to ensure that it receives relevant information from related organisations in a timely and efficient manner. WGISS will ensure that its activities are coordinated across CEOS Agencies and adequately promoted. To address these issues, WGISS has established information services, liaisons with related organisations and promotional activities.

WGISS populates a portion of the CEOS website, dedicated to information on past and current WGISS activities. It contains information on how WGISS is organised and provides access documents and presentations given at WGISS meetings. WGISS also provides infrastructure and information services to assist with CEOS internal organization.

The liaison activities include reporting on recent developments at WGISS meetings and attending meetings of the liaison organizations to report on WGISS activities and to gather information on the latest developments.

The objective of promotion is to provide an integrating function, allowing the achievements of the various objectives to be presented in context, providing a system view of WGISS recommendations and guidelines for Earth Observation. To increase the impact and benefit of WGISS activities, promotion extends to non-CEOS organizations, non-governmental organizations, commercial enterprises, and data users and providers in developing countries.

WGISS also recognises the need to promote the output of its work within its own agencies and organisations in order to ensure the adoption of results and recommendations; and to ensure continued funding WGISS activities. WGISS works to assist in facilitating information access for education, capacity building and data democracy activities. WGISS also seeks opportunities to work with other CEOS working groups.

WGISS meetings focus on responding to requests for support from CEOS, balancing this call on its resources with the need to co-ordinate the activities of its own member agencies and organisations. The WGISS meetings also carry out monitoring, tracking, documenting, reviewing and providing feedback to on-going technical activities. Information exchange on current and new technologies are also a fundamental part of WGISS meetings.

The scope of WGISS activities also includes convening workshops, authoring papers, developing information technology infrastructure that increases the interconnectivity and reuse of key information software and services in use across the broad spectrum of EO communities.