



GROUP ON  
EARTH OBSERVATIONS

## GEO-VIII

16-17 November 2011

Report of the Data Sharing Task Force  
and Status of Data-CORE

Document 8 (Rev1)

As accepted at GEO-VIII



## Report of the Data Sharing Task Force and Status of Data-CORE

The draft report of the GEO-VII Plenary shows that the GEOSS Data Sharing Action Plan was accepted by the Plenary. In addition, the Plenary decided to extend the mandate of the existing Data Sharing Task Force (DSTF) for one year (through to the GEO-VIII Plenary).

The Action Plan established the GEOSS Data Collection of Open Resources for Everyone, or GEOSS Data-CORE, a distributed pool of documented datasets contributed on the basis of full and open exchange and unrestricted access. It called for maintaining the GEOSS Common Infrastructure (GCI) as the architectural framework essential to implementing the Data Sharing Principles, encouraged GEO Members to take leadership in establishing national coordinating mechanisms for promoting and monitoring engagement with the implementation of the Principles, and advocated for flexible policy frameworks that could ensure the implementation of a more open data environment. GEO Members and Participating Organizations were encouraged to maximize the number of documented datasets made available on the basis of full and open access and promote with data providers within their territories the benefits of full and open access to data.

The Action Plan also explored the issue of how to categorize the datasets in GEOSS based on such issues as custom licenses and cost recovery over and above that of reproduction and distribution, without coming to any conclusions. It was recognised by the GEO-VII Plenary that the discussions on these issues would continue over the course of the coming year.

The commitment of GEO to the GEOSS Data Sharing Action Plan was reinforced in the GEO-VII Ministerial Declaration, where it was stated that: *We, the participants assembled at the Group on Earth Observations (GEO) Ministerial Summit in Beijing, China, on 5 November 2010, ... Commit to* (i) maximize the number of documented datasets made available on the basis of full and open access; (ii) create the GEOSS Data Collection of Open Resources for Everyone (GEOSS Data CORE), a distributed pool of documented datasets with full, open and unrestricted access at no more than the cost of reproduction and distribution; and (iii) develop flexible national and international policy frameworks to ensure that a more open data environment is implemented, thus putting into practice actions for the implementation of the GEOSS Data Sharing Principles;

Based upon the outcomes of the GEO-VII Plenary and the 2010 GEO Ministerial Summit, the 21<sup>st</sup> meeting of the GEO Executive Committee in March 2011 updated the DSTF Terms of Reference in order to guide the work of the DSTF through to the GEO-VIII Plenary:

### **Terms of Reference for the Data Sharing Task Force in 2011**

(as agreed by GEO Executive Committee on 23 March 2011)

The scope the DSTF for 2011 is to focus primarily on the GEOSS Data-CORE to enhance the value of GEOSS for the users, especially by developing nations. *The DSTF shall identify the maximum possible data sets that qualify for the Data-CORE and whose providers agree to make it available through GEOSS.* The DSTF will make a proposal for the implementation of the Data-CORE as a recommendation for the next Executive Committee meeting.

To establish the GEOSS Data-CORE, the DSTF will consider the different intellectual property rights rules and regulations that apply to data providers. The DSTF will identify a set of licenses and copyright provisions that are compliant with the definition of the Data-CORE. The task force will also approach data providers to identify their IP regulations and to assess whether their proposed licenses are compliant with the Data-CORE. Then, the DSTF will make such list of admissible licenses available in the broadest possible way.

After the process of identifying licenses and IP rules compliant with the GEOSS Data-CORE is completed, the DSTF will identify the possible data providers and prepare an initial list of all those data providers that: (a) are willing to have their data as part of GEOSS Data-CORE; and (b) whose licenses are compliant with the GEOSS Data-CORE rules. The DSTF shall present this to the GEO Secretariat for presentation to the Plenary.

The DSTF will also focus secondarily on the other issues set out in the GEOSS Data Sharing Action Plan in order to make recommendations to the GEO Plenary.

The DSTF is pleased to provide this report on the progress made towards addressing the actions set out in the GEOSS Data Sharing Action Plan and the Beijing Declaration at the Ministerial Summit.

This report will focus in particular in addressing the actions set out by Executive Committee in the updated DSTF Terms of Reference. To achieve demonstrable progress by GEO-VIII Plenary, the March 2011 Executive Committee directed the DSTF to promote and collate contributions to the Data-CORE. This has been accomplished and is included in an updated and expanded list of agreed Data-CORE contributions to be reported to Plenary-VIII (Appendix A), and discussed in Section 1, *Maintaining a list of the GEOSS Data-Core*, of this document.

Executive Committee also directed the DSTF to identify existing licensing options that are consistent with the GEOSS Data-CORE requirements. Following this direction, the DSTF organized two subgroups of experts to produce two White Papers: “Legal Options for the Exchange of Data through the GEOSS Data-CORE,” which covers legal interoperability issues and whose summary is provided in Appendix B, and “Liability Issues in the Global Earth Observation System of Systems,” which covers legal liability issues and whose entirety is provided in Appendix C. The full “Legal Options...” white paper will be provided in the near future. The recommendations to GEO from these white papers are provided in Section 2, *Promoting Intellectual Property arrangements that support GEOSS Data Sharing Principles*, of this document.

Sections 2, 3 and 4 provide recommendations for addressing and promoting data sharing in the GCI, “Sprint to Plenary,” and the 2012-2015 GEO Work Plan.

## **1 MAINTAINING A LIST OF THE GEOSS DATA-CORE**

The DSTF has been tasked by Executive Committee to identify the maximum possible data sets that qualify for the Data-CORE and whose providers agree to make it available through GEOSS. The DSTF prepared correspondence to be sent by the GEO Secretariat to GEO Principals to invite them to update and extend entries in the list of GEOSS Data-CORE datasets that were pledged at the GEO Ministerial in Beijing. They are also requested to identify a technical point of contact for each dataset or data service that we can work directly with to ensure that the resources can be integrated into the GEOSS Data-CORE as expeditiously as possible. These tasks were accomplished.

In order to minimize possible confusion among GEO members, organizations, and those involved in the various GCI and Sprint to Plenary activities, the DSTF has worked to strengthen coordination with these various activities. In addition, in order to promote and encourage contributions to the Data-CORE, the DSTF worked to have national contributions to the Data-CORE highlighted in multiple GEO arenas.

The DSTF has been particularly interested in identifying ways to ensure that the GEOSS Data-CORE datasets and data services are consistent with those identified in the Components and Services Registry (CSR) and 4<sup>th</sup> Architecture Implementation Pilot (AIP-4). It is hoped that through improved coordination between GEO groups that the various reports to Plenary in November will fully complement each other and demonstrate notable progress in the areas of data sharing and accessibility.

It should be noted that while the DSTF has prepared an updated list of GEOSS Data-CORE contributions, it is anticipated that in the future such a separate list will not be necessary. Ideally, it

should be possible obtain such information from a direct query of the CSR, with the understanding that some of the entries will be for external data services.

## **2 PROMOTING INTELLECTUAL PROPERTY ARRANGEMENTS THAT SUPPORT THE GEOSS DATA SHARING PRINCIPLES**

The DSTF conducted a review of legal options for the exchange of data and developed two White Papers that address legal options for the exchange of data, metadata, and products through the GEOSS Data-CORE: “Legal Options for the Exchange of Data through the GEOSS Data-CORE,” which covers legal interoperability issues, and “Liability Issues in the Global Earth Observation System of Systems,” which covers legal liability issues. A summary of the former is provided in Appendix B and the full text of the latter is provided in Appendix C.

**The recommendations to the GEO Plenary that arise from these documents are as follows.**

**GEOSS legal interoperability issues.** Recommendations from White Paper “Legal Options for the Exchange of Data through the GEOSS Data-CORE” are as follows:

1. The GEOSS Data-CORE’s terms and conditions can best be achieved through any of the following mechanisms: statutory public domain, private-law waiver of rights, or a common-use license.
2. If the database is not in the public domain as a result of a statutory or private-law waiver of rights, or by the expiration of the term of protection of any rights, the GEO Members and Affiliated Organizations should use data licenses with the following characteristics:
  - a. The license must be compatible with the GEOSS Data-CORE principles as established in the 2010 GEOSS Action Plan; specifically:
    - i. The data are free of restrictions on re-use;
    - ii. User registration or login to access or use the data is permitted;
    - iii. Attribution of the data provider is permitted as a condition of use; and
    - iv. Marginal cost recovery charges (i.e., free online or not greater than the cost of reproduction and distribution on physical media) are permitted.
  - b. The license should be valid under the laws of as many different jurisdictions as possible;
  - c. The license should be clear and simple enough to not be confusing to the data provider or user;
  - d. The license should be easy to recognize and find;
  - e. The license should be embeddable in the data as machine readable metadata whenever possible;
  - f. The license should be available in different languages, at a minimum in the language(s) of the country making the data available, as well as in English;
  - g. The license may have any other terms and conditions, such as a disclaimer of warranty and liability, that do not restrict the user or conflict with any of the terms and conditions summarized in a-f above;
  - h. Finally, and perhaps most importantly, the data and the applicable license must be kept under the legal control of the data providers, and not GEO or GEOSS.
3. Based on these characteristics, the GEO Members and Participating Organizations should consider adopting one of the following existing private-law waivers or standard common-use

licenses, which are presented below from pure public domain to the adoption of the legal attribution requirement by license:

- a. Creative Commons Public Domain Mark. The CC Public Domain Mark is used to mark and identify data sets already in the public domain, enabling their more ready identification in global web searches;
  - b. Creative Commons Public Domain Dedication (CC0). To the extent possible under law across the world, the person or authority who associates CC0 with the work waives all copyright and related or neighboring rights to this work;
  - c. Open Data Commons Public Domain Dedication and License (PDDL). The PDDL allows the database user to “copy, distribute and use the database,” “produce works from the database,” and “modify, transfer and build upon the database”;
  - d. Creative Commons Attribution License (CC BY 3.0). The CC BY 3.0 license allows the database user “to Share – to copy, distribute and transmit the work,” and “to Remix – to adapt the work,” as long as the user “attribute[s] the work in the manner specified by the author or licensor”;
  - e. Open Data Commons Attribution License (ODC BY 1.0). The ODC BY 1.0 license allows the database user “To Share: To copy, distribute and use the work,” “To Create: To produce works from the database,” and “To Adapt: To modify, transform and build upon the database,” as long as the user “attribute[s] any public use of the database, or works produced from the database, in the manner specified in the license.”
4. Custom licenses that have the same terms and conditions as the characteristics listed in recommendation 2 above can also be used to provide data through the GEOSS Data-CORE, although such custom licenses will not be vetted and approved by the GEO Members in advance.<sup>1</sup>

Please refer to Appendix B for a fuller discussion of the legal interoperability issues.

**GEOSS legal liability issues.** Recommendations from White Paper “Liability Issues in the Global Earth Observation System of Systems” are as follows:

1. **Conditions of Use.** GEO should:

- a. consider posting explicit and comprehensive conditions of use on its GEOSS Common Infrastructure websites incorporating such issues as an explanation of the purpose of the website and deployed capabilities, the privacy policy, registration requirements and expectations, expected user conduct, conditions for use of the site content, conditions for contributing content, conditions for use of communications forums, procedure for reporting alleged unauthorized use of copyrighted material, conditions for use of trademarks and logos found on the site, disclaimers of warranties, liability and endorsements, and controlling law in the event of a conflict;
- b. engage competent legal counsel to construct and advise it on the explicit language to use.

2. **Online Agreements.** GEO should:

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<sup>1</sup> Examples of standard, common-use licenses that meet the GEOSS Data-CORE terms and conditions, but that are geographically limited or constrained to a particular type of data and information (e.g., information generated by a government agency), include the U.K. Open Government Licence for Public Sector Information (OGL) and the Norwegian Open Data License for Public Sector Information (NLOD).

- a. consider requiring the clicking of one of more online agreements by those contributing information and comments to its websites with such agreements incorporating all or most of the issues stated in the previous paragraph above;
  - b. engage competent legal counsel to construct and advise it on the explicit language to use.
3. **Business Practices.** GEO should strive to ensure that:
- a. appropriate and comprehensive quality control checks, including beta testing, are being made and documented prior to the technical deployment of infrastructure components;
  - b. accurate records are being kept in logging code changes to the GEOSS Common Infrastructure;
  - c. accurate records are being kept in logging contributions to the GEOSS Common Infrastructure.

Please refer to Appendix C for a fuller discussion of legal liability issues.

### 3 ROLE OF THE GCI

The GEOSS Common Infrastructure (GCI) is GEO's primary tool for supporting the implementation of the GEOSS Data Sharing Principles. The GCI includes the GEO Portal, the Clearinghouse, the Components and Services Registry (CSR), and the Standards and Interoperability Registry (SIR). It currently meets the requirements to support the registration and identification of GEOSS Data-CORE datasets.

The Data Sharing Action Plan approved at the 2010 Plenary states that the procedures for registering and maintaining metadata in the GCI should be simple, or partially automated, in order to promote the discovery of resources and to encourage timely updates. In addition, users should be able to easily discover GEOSS Data-CORE resources and any details on restrictions applicable to the use of the associated data, products and information via the GEO Web Portal, enabling them to make informed choices about using data. The discovery of details on restrictions has not been implemented yet. Therefore, the user should check access to any non-GEOSS-Data-CORE resource with the resource provider to ensure that any existing restrictions are being acknowledged and handled properly.

In particular, users of the GEOSS should also be able to search the GCI to find data or services that:

- are useful for a particular application, theme, or societal benefit area[s];
- align with the Data Sharing Principles of “full and open exchange” that match one or more of the categories of data access conditions; and/or
- are contributions to the GEOSS Data-CORE.

In addition, to make these categorizations and usage boundaries clear, it would be helpful for the GCI to provide information to enable users to understand usage requirements such as attribution or minimum costs for distribution. The DSTF has addressed the legal implications for GEOSS of such actions (Appendices B and C). For datasets falling outside of the GEOSS Data-CORE, the GCI should refer the user to the data source or owner to obtain any necessary permission directly.

### 4 ADDRESSING THE GEOSS DATA-CORE IN THE “SPRINT TO PLENARY”

Another initiative that provided an opportunity to positively impact the Data-CORE effort was the “Sprint to Plenary” effort (or, more specifically, the “Showcasing Access to High Priority EO Data Sets” initiative). This project, begun by the Architecture and Data Committee (ADC), focused on making it easier for a user to not only find but also actually download or view data. It also set a goal of

achieving immediate results by GEO-VIII Plenary. Therefore, those working on the Sprint to Plenary demonstrations have initially established a limited number of collaborations to demonstrate the proof-of-concept in the expectation that this work will continue in the future and provide the momentum for a system-wide implementation.

From the start, GEOSS architecture implementation required that resources contributed to the GEOSS be registered in the CSR. This registration process should be extended to allow GEO to identify all contributions to the GEOSS, in particular those that qualify for the GEOSS Data-CORE. Based on guidance from the March 2011 Executive Committee, any extension to the registration process should be made as simple and “light” as possible, with the initial aim of any extension to this process being to identify potential contributions to the GEOSS Data-CORE. The changes currently made to the CSR registration process to support the GEOSS Data-CORE have met these guidance objectives.

In support of the “Sprint to Plenary,” GCI component providers added many of the identified GEOSS Data-CORE entries to the CSR in order to make the Data-CORE contributions visible and accessible via the GCI by the GEO-VIII Plenary. The provider of the GEO Web Portal (the webpage that users visit when accessing the GCI) is expected to add functionality to allow searches for contributions identified as Data-CORE and highlight Data-CORE contributions within the results of any other searches. To date, Members and Participating Organizations including Brazil, European Commission, France, Germany, Italy, Japan, Netherlands, Spain, United Kingdom, United States, ECMWF, EEA, EUMETSAT and GBIF have identified specific data resources to contribute to the GEOSS Data-CORE, and more than 8,000 datasets are currently searchable through the CSR, many more to be added in the future.

## 5 GEOSS DATA SHARING ACTIVITIES IN THE 2012-2015 WORK PLAN

For the longer term, the GEO Data Sharing Task Force recommends that there be a dedicated task in the "Institutions and Development" section of the 2012-2015 GEO Work Plan on *Advancing GEOSS Data Sharing Principles*. A Working Group, which would formally bring together the current Data Sharing Task Force and the Data Sharing Task Team, would be established to lead this task and carry out the specific actions foreseen for this task, with a focus on advocacy for broad support of the GEOSS Data Sharing Principles and the Data Sharing Action Plan. This Working Group would report to Plenary to address this fundamental challenge for GEOSS.

However, the current DSTF also believes that the task of implementing the GEOSS Data Sharing Action Plan is very broad and will in fact require the assistance of all GEO Members, Participating Organizations, and governance mechanisms to ensure success.

In addition to an overarching task, specific reference should therefore be made in other sections of the Work Plan to transverse Data Sharing actions. For example, in the proposed section on "Infrastructure," it will be important for that section of the Work Plan to explicitly reference the GCI and related responsibilities to support the Data Sharing Action Plan. This should include an action to maintain the GCI as the architectural framework essential to implementing the Data Sharing Principles.

Appendix A: “List of Data-CORE Contributions”

Appendix B: “Legal Options for the Exchange of Data through the GEOSS Data-CORE”  
Summary White Paper.

Appendix C: “Liability Issues in the Global Earth Observation System of Systems”  
White Paper.



## **Appendix A**

### **DATA-CORE MASTER LIST**

## List of Datasets for the GEOSS Data-CORE

Updated 25/10/2011

  = pledged at Summit as contribution to Data-CORE  
  = announced at Summit generally as "open" ; need confirmation as Data-CORE  
  = announced at Summit as "open" and confirmed as Data-CORE  
  = identified after Summit  
 no fill =

Resource Name	Description	GEO Member/PO	Responsible Organization	Contact Name	Contact Email	Contact Tel.	URL to Resource	Registration Status	GEOSS SBA(s)
Datasets registered in the Global Change Master Directory (GCMD)	The GCMD/CEOS IDN, already registered in the GCI, contains US agency datasets that are contributions to the GEOSS Data-CORE. These have been "tagged" by the GCMD according to USGEO member agency contributions. The total number of unique entries in the GCMD contributed by USGEO to the GEOSS Data-CORE is 8,026. (See attached spreadsheet)	US	USGEO	Martha Maiden	<a href="mailto:martha.e.maiden@nasa.gov">martha.e.maiden@nasa.gov</a>	+1 (202) 358-1078+G20	<a href="http://gcmd.nasa.gov/">http://gcmd.nasa.gov/</a>	registered	
Carbon Dioxide Information Analysis Center (CDIAC)	Included in GCMD above	US	Department of Energy					searchable through GCMD	
AIRNow	Included in GCMD above	US	EPA					searchable through GCMD	
Standard Earth science products	Included in GCMD above	US	NASA	Martha Maiden	<a href="mailto:martha.e.maiden@nasa.gov">martha.e.maiden@nasa.gov</a>	+1 (202) 358-1078		searchable through GCMD	
NOAA datasets	e.g. Integrated Ocean Observing System and the Argo global ocean array of free-drifting profiling floats (included in GCMD above)	US	NOAA	Martha Maiden	<a href="mailto:martha.e.maiden@nasa.gov">martha.e.maiden@nasa.gov</a>	+1 (202) 358-1078		searchable through GCMD	
Foreign Agriculture Service Crop Explorer interface	Included in GCMD above	US	DoA					searchable through GCMD	
Global Seismographic Network (GSN)	The IRIS Data Management System is comprised of eight nodes of data collection centers and a Data Management Center (DMC) that provides open and easy access to all IRIS data holdings and data products along with even larger quantities of other seismological data and virtual pathways to international data archives at no cost. (included in GCMD above)	US	Incorporated Research Institutions for Seismology (IRIS)	Tim Ahern	<a href="mailto:tim@iris.edu">tim@iris.edu</a>	206-547-0393 ext. 118	<a href="http://www.iris.edu/hq/programs/dms">http://www.iris.edu/hq/programs/dms</a>	searchable through GCMD	
Data from the Smithsonian GEO's network of tropical forest institutes	CTFS/SIGEO is a global network of forest research plots and scientists dedicated to the study of tropical and temperate forest function and diversity. The multi-institutional network comprises more than forty large forest research plots across the Americas, Africa, Asia, and Europe, with a strong focus on the tropics. The data from the first tree plot established at Barro Colorado Island in Panama is publicly available after filling out a form. The data from the other plots other plots is available following consultation with their principal investigators. (included in GCMD above)	US	STRI	Stuart Davies; Richard Condit	<a href="mailto:sdavies@oeb.harvard.edu">sdavies@oeb.harvard.edu</a> ; <a href="mailto:conditr@gmail.com">conditr@gmail.com</a>		<a href="http://ctfs.arnarb.harvard.edu/webatlas/datasets/bci/">http://ctfs.arnarb.harvard.edu/webatlas/datasets/bci/</a>	searchable through GCMD	
Landsat Global Land Survey	Included in GCMD above	US	USGS					searchable through GCMD	
WaveNET	The Defra strategic wave monitoring network for England and Wales will provide a single source of real time wave data from a network of wave buoys located in areas at risk from flooding. Data from this network will be used to improve the management of flood events.	UK	Centre for Environment, Fisheries & Aquaculture Science	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Disasters, Energy
The elevation of the Antarctic and Greenland ice sheets	By repeated satellite altimeter observations	UK	Centre for Polar Observation & Modelling	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Climate

AURN (Automatic Urban & Rural Monitoring Network)	Automatic analysers NO/NO2 - Chemiluminescence CO - IR absorption SO2 - UV fluorescence O3 - UV absorption PM10 - Tapered Element Oscillating microbalance (TEOM) - Beta Attenuation Mass Monitor (BAM), and Filter Dynamic Measurement System (FDMS), Partisol	UK	Department for Environment, Food and Rural Affairs	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Health
Baseline Measurement of Stratospheric Ozone and UV	Daily (or more frequent) measurement of column ozone at two sites - Reading and Lerwick. The Lerwick site makes column ozone measurements with a Dobson Spectrophotometer providing one of the longest continuous time series in the world. Ozone measurements are also made at Manchester and Reading using Brewer spectrophotometers but the data records are much shorter. At both sites, spectrally resolved UV measurements are also made	UK	Department for Environment, Food and Rural Affairs	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Health
National Atmospheric Emissions Inventory (UK)	UK wide, mapped on 1X1km grid. Consistent datasets covering annual emissions of 35 pollutants. Essential for regulatory compliance checking and understanding processes leading to observed pollutant distribution and levels.	UK	Department for Environment, Food and Rural Affairs	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Health
Historic Flood Events Outlines	Historic Flood Events Outlines shows known areas that have been inundated by flood water in the past. The outlines have been derived from archived field data and aerial photographs that were captured by Rivers Agency at the time of the actual flood event. Coverage limited to Northern Ireland. [26/07: Record added by Wendy McKinley, DOENI.]	UK	Department of Agriculture and Rural Development (DARD) Rivers Agency	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Disasters
LiDAR DTM & DSM	Light Detection and Ranging (LIDAR) supplied as a Digital Terrain Model and Digital Surface Model produced from the signal returned to the LIDAR. Coverage limited to specific areas in Northern Ireland where detailed flood modelling is being undertaken. [26/07: Record added by Wendy McKinley, DOENI.]	UK	Department of Agriculture and Rural Development (DARD) Rivers Agency	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Disasters, Energy
Real and Near Real Time River Flow Data	Measurements of the flow (m/s) of water in a river taken using automatic field devices, usually every 15 mins, and transferred via telemetry to internal and external systems in, or close to real time. Coverage limited to Northern Ireland. [26/07: Record added by Wendy McKinley, DOENI.]	UK	Department of Agriculture and Rural Development (DARD) Rivers Agency	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Disasters, Water, Energy
River Centreline	The River Centreline is based OSNI large-scale and Rivers Agency's culvert network. It is not attributed. Coverage extends to boundary of Northern Ireland. It is used along with DTM datasets as the basis for generation of river catchment boundaries. [26/07: Record added by Wendy McKinley, DOENI.]	UK	Department of Agriculture and Rural Development (DARD) Rivers Agency	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Disasters, Health, Water, Ecosystems, Agriculture, Biodiversity

Strategic Flood Map	The map shows the flood extents associated with flooding from Rivers and the Sea, based on strategic level modelling. The river maps indicate extents for a 100 to 1 chance of flooding; the coastal maps indicate extents for a 200 to 1 chance of flooding. Climate change versions of the above maps are also available. Coverage is limited to Northern Ireland [26/07: Record added by Wendy McKinley, DOENI.]	UK	Department of Agriculture and Rural Development (DARD) Rivers Agency	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Disasters
Air Quality Database for Northern Ireland	On-line database of automatic and non-automatic daily (or more frequently) monitoring data for O3; NOx; SO2; CO; PM10; PM2.5. [26/07: Response from Wendy McKinley " I can confirm DOENI is content that the NI Air Quality Monitoring database is included."	UK	Department of the Environment Northern Ireland	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Health
Detailed River Network	The Detailed River Network (DRN) is a large-scale, accurate and fully attributed digital river centreline covering England and Wales. The dataset has full-feature network geometry cross-referenced with OS MasterMap following Digital National Framework principles. England and Wales © Environment Agency 2009.	UK	Environment Agency	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Disasters, Health, Water, Ecosystems, Agriculture, Biodiversity
Flood Zones 2 & 3	Flood Zone 2 & 3 are the Environment Agency's best estimate of the extent of flooding from rivers or the sea with a 1000 to 1, and a 100 to 1 (or greater) chance of flooding each year from rivers, or with a 200 to 1 chance (or greater) of flooding each year from the sea. England and Wales © Environment Agency 2009.	UK	Environment Agency	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Disasters
Commercial and Non-commercial Fish and Shellfish Discards (Observer Programme) Scotland	The observer programme (previously referred to as discard programme) commenced in 1975 as a result of an ICES resolution (ICES Council Resolution 1975/4:22) which stressed the importance of the collection of discard data as an aid to improving the assessment of fish stocks. Data on fish discarded at sea are collected aboard commercial fishing vessels. The original aim of the sampling scheme was to sample each of the main sea areas (as per ICES regions) once per quarterly period for the five main gears - heavy trawl, seine net, light trawl, pair trawl and Nephrops trawl. However, this is continually being revised in light of changes to fishing patterns and also changes in effort by gear types. During an observer trip the following data are collected from EACH haul: 1.An estimate of the quantity discarded. 2.Length frequency distribution of discarded fish. 3.Otoliths for age determination. 4.Landings statistics and landings measurements. 5.Miscellaneous information. Monitoring includes: - Commercial and non-commercial fish and shellfish (bycatch) - biological data. Observer sampling by spe	UK	Marine Scotland	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Agriculture

International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests) Plants	ICP Forests monitors the forest condition in Europe, in cooperation with the European Union. The first grid (called Level I) is based on around 6000 observation plots on a systematic transnational grid of 16 x 16 km throughout Europe. The intensive monitoring level comprises around 800 Level II plots in selected forest ecosystems in Europe. Currently 41 countries participate in the ICP Forests. The programme aims are (i) to provide a periodic overview on the spatial and temporal variation of forest condition in relation to anthropogenic and natural stress factors (in particular air pollution) by means of European-wide and national large-scale representative monitoring on a systematic network; (ii) to gain a better understanding of the cause-effect relationships between the condition of forest ecosystems and anthropogenic as well as natural stress factors (in particular air pollution) by means of intensive monitoring on a number of selected permanent observation plots spread over Europe and to study the development of important forest ecosystems in Europe.	UK	Forestry Commission	Beth Greenaway	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Ecosystems
National Inventory of Woodland and Trees	Woodland boundaries at 31 March 2002	UK	Forestry Commission	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Ecosystems
NBN Gateway	The NBN Gateway was developed to allow people to view and download biodiversity data that is being shared by participants within the NBN. Datasets are sent by data providers and these are collated to a single database. More than 50 million individual records, covering plants, mammals, birds and invertebrates, are stored having been supplied from numerous sources including volunteers, conservation and environmental agencies, local government and non-government wildlife-related organisations, local records centres and the national Biological Records Centre. [26/07: Response from Lawrence Way, Programme Leader Surveillance and Monitoring, Joint Nature Conservation Committee: The NBN provides data to GBIF and will later this year do a major overhaul of its provision, substantially increasing what is available so that it will provide 25million of the around 200 million data points so far available. It will make the UK second largest contributor after the USA but probably with the greatest taxonomic range. A contribution to GBIF is a contribution to GEO, it is linked in in terms of protocols and the data	UK	National Biodiversity Network	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Ecosystems, Biodiversity
Atmospheric and Oceanographic Monitoring	Surface meteorology at Halley, Rothera, and 6 automatic weather system sites; Upper air meteorology at Halley; Ozone observations at Halley and Rothera; Air and Snow sampling at Halley; VLF measurements at Halley; Upper air measurements at Rothera; Mesospheric temperatures at Halley and Rothera; Moorings on the Filchner Sill and NW of South Georgia CTD station in Marguerite Trough; Weddell Sea transect at 10 degrees W; Sea Ice observations at Signy	UK	NERC British Antarctic Survey	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Climate

British Antarctic Survey Long Term Monitoring and Survey	To make long term measurements of the Antarctic Environment; To map biologically, geologically and topographically on land and in the sea region south of the polar front and within the British Antarctic Territory; To determine both natural variance and long term change.	UK	NERC British Antarctic Survey	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Climate
National Well Record Archive	All water boreholes drilled to more than 15 metres below ground level are notified to BGS. Records are kept of the geology, well construction and on hydrogeological observations, including water levels, water strikes and water quality. Data are available for over 110,000 wells, with more than 1,000,000 water level measurements made on 50,000 of the boreholes. Although only a small percentage of the wells have repeated observations, the dataset (available digitally as the WellMaster database) provides an important environmental baseline.	UK	NERC British Geological Survey	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Health, Water
Seismic Monitoring and Information	The BGS operates a network of seismometers throughout the UK in order to acquire seismic data on a long term basis. While large earthquakes do not occur frequently in the UK, a catalogue that covers a long period of time is essential in seismic hazard assessment.	UK	NERC British Geological Survey	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	DisastersAdult Salmon Counter
Adult Salmon Counter	Hourly records since 1973 make this the longest & best resolution data on salmon movement in England and probably UK	UK	NERC Centre for Ecology and Hydrology	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Biodiversity
ALTER-Net	ALTER-Net is a focus of efforts to create a network of sites for European long-term terrestrial and freshwater biodiversity and ecosystem research (Long-Term Ecosystem Research sites, LTER). It is also developing a related network of Long-Term Socio-Ecological Research (LTSER) sites, which could be used to determine the socio-economic implications of, and public attitudes to, biodiversity loss. ALTER-Net is integrating capacity across Europe to assess and forecast changes in biodiversity, structure, functions and dynamics of ecosystems and their services	UK	NERC Centre for Ecology and Hydrology	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Ecosystems, Biodiversity
Appearance of ice on lake Windermere	Observations are made on Lake Windermere. Number of days in the year when ice is present on Lake Windermere (in a sheltered bay on the west side of the lake). A climate change impact indicator for the UK has been proposed using these data (Cannell et al., 1999, 2003).	UK	NERC Centre for Ecology and Hydrology	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Climate
UK Land Cover Map 2000	Land Cover Map 2000 (LCM2000) is a vector database, for use within a GIS system that shows areas of land as 'parcels' or polygons. Each parcel has attached to it a list of values or attributes, covering such topics as land cover class, parcel area, length of boundary, processing history, knowledge-based correction and identification of the original satellite scene. It can be used for a wide range of applications including environmental character assessments, environmental protection, transport planning, animal disease distribution, bird and habitat relationships and forestry research.	UK	NERC Centre for Ecology and Hydrology	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Ecosystems, Agriculture

Atlantic Meridional Transect	<p>The AMT programme undertakes biological, chemical and physical oceanographic research during the annual return passage of the RRS James Clark Ross between the UK and the Falkland Islands or the RRS Discovery between the UK and Cape Town, a distance of up to 13,500 km. This transect crosses a range of ecosystems from sub-polar to tropical and from euphotic shelf seas and upwelling systems to oligotrophic mid-ocean gyres. The measurements of hydrographic and bi-optical properties, plankton community structure and primary production completed on the first 12 transects (1995-2000) represent the most coherent set of repeated biogeochemical observations over ocean basin scales.</p> <p>In 2002, the programme restarted (2002-2006) and broadened, to address a suite of cross-disciplinary questions concerning ocean plankton ecology and biogeochemistry and their links to atmospheric processes. This unique spatially extensive decadal dataset continues to be deposited and made available to the wider community through the British Oceanographic Data Centre. Measurements include</p>	UK	Plymouth Marine Laboratory	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Climate, Ecosystems, Biodiversity
Global Sea Level Observing System Tide Gauges	UK contribution to the construction of the global sea level network. The Global Sea Level Observing System (GLOSS) is an international programme conducted under the auspices of the Joint Technical Commission for Oceanography and Marine Meteorology (JCOMM). GLOSS measures temperature of the water column; air pressure; sea level expressed as pressure.	UK	Proudman Oceanographic Laboratory	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Disasters, Energy, Climate
National Tide and Sea Level Facility	The National Tide and Sea Level Facility, records tidal elevations at 44 locations around the UK coast. The UK national network of sea level gauges was established after violent storms in the North Sea in 1953 resulted in serious flooding in the Thames	UK	Proudman Oceanographic Laboratory	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Disasters, Energy, Climate
The NERC Mesosphere-Stratosphere-Troposphere Radar Facility at Aberystwyth	The Natural Environment Research Council (NERC) Mesosphere-Stratosphere-Troposphere (MST) Radar at Aberystwyth is the UK's most powerful and versatile wind-profiling instrument provides measurements of the vertical as well as the horizontal components of the wind. It can, under suitable circumstances, provide information about atmospheric stability, turbulence, humidity fields, and precipitation. The data products are freely available to academic researchers through the British Atmospheric Data Centre. The Facility additionally operates and hosts a number of instruments whose observations complement those made by the MST radar. Other data products available through this website include boundary layer (below 2 km) wind-profiles, (column) integrated water vapour measurements, and surface measurements of wind-speed and direction, temperature, pressure, humidity, solar radiation and rain rate.	UK	Rutherford Appleton Laboratory	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Climate, Weather
SEPA Air Quality Monitoring	At various temporary sites around sources. Limited periods of continuous monitoring of Sulphur oxides, nitrogen oxides, particulates, hydrocarbons, solvents.	UK	Scottish Environment Protection Agency	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Health

Continuous Plankton Recorder Survey	This monitoring programme has been collecting data from the North Atlantic and the North Sea on the ecology and biogeography of plankton since 1931. The unique dataset provides a wide range of env. and climatic data such as temperature and electrical conductivity of the water column; phytoplankton and zooplankton taxonomy-related abundance per unit volume of the water column.	UK	Sir Alistair Hardy Foundation for Ocean Science	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Climate, Agriculture, Ecosystems
Adult and juvenile salmon counts	The population dynamics of the Atlantic salmon stock in the River Bush (N. Ireland) have been monitored since 1973. Datasets on adult returns and juvenile recruitment are recorded and reported annually. [Contact: Matt Service, Matt.Service@afbini.gov.uk]	UK	Agri-Food and Biosciences Institute	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Biodiversity
Lake Freshwater fish population	Erne system fish stocks have been monitored for 20 years. Data is presented in terms of number and biomass split between species. [Contact: Matt Service, Matt.Service@afbini.gov.uk]	UK	Agri-Food and Biosciences Institute	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Biodiversity
Coastal Monitoring Network	AFBI has established a comprehensive network of Marine Observation Systems throughout the estuarine, sea-lough and coastal waters of Northern Ireland. These include automated in-situ instruments deployed on moorings for remotely monitoring a range of physicochemical and environmental variables. The network is well established and provides high frequency temporal data (such as concentration of suspended particulate material, dissolved oxygen, fluorometer outputs, salinity, temperature and nutrients) to websites using automated data telemetry. This network is quality assured with additional certified measurements providing a robust mechanism for delivering environmental data. Additional survey work is performed to contextualise fixed point monitoring, with transects at fine sea-lough scale through to the shelf edge. The network is developing to allow the integration of other parallel monitoring programmes (such as the CEFAS Smartbuoy programme) - data is used both for reactive assessment and management, in addition to ecosystem modelling and baseline assessment. [Contact: . Matt.Service@afbini.gov.uk]	UK	Agri-Food and Biosciences Institute	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Ecosystems Climate Weather Agriculture
Bathing Water Quality at Designated Beaches	beaches as identified under EC Directive 76/160/EEC in England and Wales. It sets out specified quality standards relating to chemical, microbiological and physical parameters to protect the environment at bathing waters throughout the bathing season that runs from mid-May to September. Bathing Water Quality is monitored for 415 designated beaches in England and 80 in Wales. England and Wales © Environment Agency 2009.	UK	Environment Agency	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Water Ecosystems Health
Scottish Inshore Coastal Monitoring Programme	The Marine Scotland (MS) Coastal Long Term Monitoring project was set up in 1999 to monitor water quality parameters at sampling sites in Scottish coastal waters. The measurements taken as part of this monitoring are used to create a continuous time series of the variation in key properties of the sea. This time series data set will enable us to study the impact of climate change on	UK	Marine Scotland	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Climate Ecosystems



Faroe-Shetland Channel Atlantic-Nordic Seas Flux Observations	In collaboration with Faroese Fisheries Laboratory , Marine Scotland have, since 1994 maintained an array of Acoustic Current meters across the Faroe Shetland Channel. These data are currently a contribution to ASOF (Arctic sub-Arctic Ocean	UK	Marine Scotland	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Climate Ecosystems
Offshore Standard Oceanographic Sections	Marine Scotland monitors 3 standard oceanographic sections: In the northern North Sea (since 1970), along a section from Start Point on Orkney to the centre of the North Sea (the JONSIS line). Since 1903, along sections crossing the deep water channel separating Scotland from the Faroe Islands (the Nolso-Flugga and Fair Isle-Munken Sections). [03/08: Response from Sarah Hughes, Physical Oceanographer, Ocean Processes Theme, Marine Scotland – Science "I have proposed 4 additional datasets to be added to your table (as attached)."]	UK	Marine Scotland	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Climate Ecosystems
Oceanographic Monitoring	Moorings on the Filchner Sill and NW of South Georgia; CTD station in Marguerite Trough; Weddell Sea transect at 10 degrees W; Sea Ice observations at Signy; The Rothera Oceanographic and Biological Time Series (RaTS). [13/09: Alex Tate, Polar Data Centre "I am aware that the BAS entries are actually a collection of datasets and that the abstracts consist of bullet points but I wanted to make sure we got something on the table."]	UK	NERC British Antarctic Survey	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Biodiveristy Ecosystems
Biological Monitoring	Climate measurements of the terrestrial ecosystem; Biodiversity of West Antarctica; Bacterial biodiversity at the molecular level. [13/09: Alex Tate, Polar Data Centre "I am aware that the BAS entries are actually a collection of datasets and that the abstracts consist of bullet points but I wanted to make sure we got something on the table."]	UK	NERC British Antarctic Survey	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Ecosystems Biodiversity
NERC Earth Observation Data Acquisition and Analysis Service (NEODAAS)	NEODAAS has the capability to automatically receive, archive, process and map global data from multiple polar-orbiting sensors in near-real time, including MERIS, MODIS, SeaWiFS and AVHRR, allowing the support of global studies. NEODAAS maintains archives dating back to the 1990's. Data is browsable through the NEODAAS Web Portal (Multiview). [06/09: Entry provided by Pete Walker, PML Remote Sensing Group.]	UK	Plymouth Marine Laboratory	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Climate Ecosystems Biodiversity
Western Channel Observatory	The Western Channel Observatory (WCO) is situated in the Western English Channel and comprises of long-term sustained observations at a number of stations. The WCO is an ideal location as: (i) it has a long history (>100 years) of in situ sampling at several stations; (ii) it represents both ocean influenced and coastal waters within 30 km of PML. Parameters include temperature, salinity, nutrients, zooplankton, phytoplankton, chlorophyll. [06/09: Entry provided by Pete Walker, PML Remote Sensing Group.]	UK	Plymouth Marine Laboratory	UKGEO	<a href="mailto:ukgeo@nerc.ac.uk">ukgeo@nerc.ac.uk</a>	+44 1793 411799		new	Climate Ecosystems Biodiversity
ALOS/PALSAR	K&C, IPY datasets	Japan	JAXA	Chiyoshi Kawamoto	<a href="mailto:kawamoto.chiyoshi@jaxa.jp">kawamoto.chiyoshi@jaxa.jp</a>			new	
DIAS		Japan	Univ. of Toyko	Toshio Koike	<a href="mailto:tkoike@hydra.t.u-tokyo.ac.jp">tkoike@hydra.t.u-tokyo.ac.jp</a>				

ICARE	ICARE provides various services to support the research community in fields related to atmospheric research, such as aerosols, clouds, radiation, water cycle, and their interactions. ICARE's initial emphasis is the production and distribution of remote sensing data derived from Earth observation missions from CNES (Polder/Parasol), NASA (Calipso) and EUMETSAT (MSG). One of ICARE's	France	ICARE (CNES, INSU, Univ Lille, Region Nord-Pas-de-Calais)	Jacques Descloitres (CNRS), Therese Barroso (CNES)	<a href="mailto:Jacques.Descloitres@univ-lille1.fr">Jacques.Descloitres@univ-lille1.fr</a> , <a href="mailto:therese.barroso@cnes.fr">therese.barroso@cnes.fr</a>	<a href="http://www.icare.univ-lille1.fr/">http://www.icare.univ-lille1.fr/</a>		climate, weather
ETHER	The ETHER thematic centre aims to facilitate access to and encourage exploitation of all data and expert knowledge in the field of atmospheric chemistry. This is done through the Products and Services Centre, developed around a knowledge base and database accessible via the Internet.	France	ETHER (CNES, INSU)	Mireille Paulin (CNES), Cathy Boone (IPSL), Laurence Fleury (OMP)	<a href="mailto:mireille.paulin@cnes.fr">mireille.paulin@cnes.fr</a> , <a href="mailto:cbipsi@ipsl.jussieu.fr">cbipsi@ipsl.jussieu.fr</a> , <a href="mailto:Laurence.Fleury@obs-mip.fr">Laurence.Fleury@obs-mip.fr</a>	<a href="http://ether.ipsl.jussieu.fr/">http://ether.ipsl.jussieu.fr/</a>		climate
SPIRIT	Distribution of DTMs generate from SPOT 5 HRS acquisitions carried out during the International Polar Year. This dataset is not yet accessible online (end 2011)	France	CNES, SPOT Image	Steven Hosford	<a href="mailto:steven.hosford@cnes.fr">steven.hosford@cnes.fr</a>			climate
Kalideos	Distribution of diverse satellite imagery acquired since 1990 over 3 geographical sites.	France	CNES, SPOT image	Steven Hosford	<a href="mailto:steven.hosford@cnes.fr">steven.hosford@cnes.fr</a>	<a href="http://kalideos.cnes.fr">http://kalideos.cnes.fr</a>		agriculture, disasters, climate
Aviso	Acces to satellite altimetry data and products (mono and multimission) from various satellites (Jason series, ERS, Envisat, GFO)	France	CNES, CLS	Thierry Guinle	<a href="mailto:thierry.guinle@cnes.fr">thierry.guinle@cnes.fr</a>	<a href="http://www.aviso.oceanobs.com/">http://www.aviso.oceanobs.com/</a>		climate, water
Coriolis	French contribution to the ARGO programme. Coriolis coordinates in situ data collection, with the objective of developing continuous, automatic, and permanent observation networks. The data collected enables the mapping of water properties such as temperature, and ocean circulation.	France	IFREMER, CNES	Sylvie Pouliquen	<a href="mailto:sylvie.pouliquen@ifremer.fr">sylvie.pouliquen@ifremer.fr</a>	<a href="http://www.coriolis.eu.org/">http://www.coriolis.eu.org/</a>		Climate, Water
SMOS - CATDS	Distribution of high level (Level 3 and 4) ocean salinity and soil moisture products derived from data acquired by the SMOS mission	France	IFREMER, CNES	Nicolas Ruel, Carole Larigauderie	<a href="mailto:carole.larigauderie@cnes.fr">carole.larigauderie@cnes.fr</a> , <a href="mailto:nicolas.ruel@ifremer.fr">nicolas.ruel@ifremer.fr</a>			Climate, Water
International Gravimetric Bureau	The objective of BGI is to collect, on a world-wide basis, all measurements and pertinent information about the Earth gravity field, to compile them and store them in a computerized data base in order to redistribute them on request to a large variety of users for scientific purposes.	France, IAG	IRD, CNES, OMP	Sylvain Bonvalot	<a href="mailto:bonvalot@ird.fr">bonvalot@ird.fr</a>	<a href="http://bgi.omp.obs-mip.fr/">http://bgi.omp.obs-mip.fr/</a>		Disasters, Water
CTOH	French Observation Service dedicated to satellite altimetry studies. The CTOH aims to help scientific users develop new altimetric products and applications.	France	LEGOS	Rosemary Marrow	<a href="mailto:rosemary.marrow@legos.obs-mip.fr">rosemary.marrow@legos.obs-mip.fr</a>	<a href="http://ctoh.legos.obs-mip.fr/">http://ctoh.legos.obs-mip.fr/</a>		Climate, Water
Globwave	Distribution of satellite wave data products. Satellite - in situ intercalibration data.	France / Europe	ESA, IFREMER, CNES			<a href="http://www.globwave.org">www.globwave.org</a>		Climate, Water
Cersat	The Center for Satellite Exploitation and Research (CERSAT) is one of the major world data centers for oceanography. It processes, archives and distributes a large amount of data products obtained from satellite remote-sensing, mostly intended to support research activity in various fields (oceanography, meteorology, climatology,...) and operational applications based on space data (weather prediction, ocean circulation, environment monitoring,...).	France / Europe	IFREMER	Bertrand Chapron	<a href="mailto:bertrand.chapron@ifremer.fr">bertrand.chapron@ifremer.fr</a>	<a href="http://cersat.ifremer.fr">http://cersat.ifremer.fr</a>		Climate, Water

Hermes	Ocean Colour data. The GlobColour Archive data consists of daily, weekly and monthly Level-3 ocean colour products generated at day+15. Also called Full Product Set (FPS), the archive data is based on the merging of MERIS, SeaWiFS and MODIS level-2 data over the whole globe.	France / Europe	ACRI, ESA	Odile Fanton D'Andon	<a href="mailto:oha@acri.fr">oha@acri.fr</a>		<a href="http://hermes.acri.fr/">http://hermes.acri.fr/</a>		Climate, Water
Global Biodiversity Information Facility Network	GBIF is an international government-initiated and funded organisation focused on making biodiversity data available to all and anyone, for scientific research, conservation and sustainable development. One of the core services it provides is an information infrastructure - an Internet-based index of a globally distributed network of interoperable databases that contain primary biodiversity data – information on museum specimens, field observations of plants and animals in nature, and results from experiments, and supported by community-developed tools, standards and protocols for formatting and sharing the data. As of July 2011, there are some 300,000,000 records from over 9000 data sources from over 330 data publishers.	GBIF	GBIF	Andrea Hahn	<a href="mailto:ahahn@gbif.org">ahahn@gbif.org</a>	+45 35 32 14 91	<a href="http://data.gbif.org">http://data.gbif.org</a>	constituent web services are registered	Biodiversity
AEMET Meteorological data (Spain)	Graphical and tabled hourly observations from the surface network plus daily resumes and extreme values.	Spain	Spanish State Meteorological Agency (AEMET)	Fernando Belda	<a href="mailto:fbeldae@aemet.es">fbeldae@aemet.es</a>	+ 34 3968 83 44 04	<a href="http://www.aemet.es/es/eltiempo/observacion/ultimosdatos">http://www.aemet.es/es/eltiempo/observacion/ultimosdatos</a>		Climate, Weather
AEMET Meteorological data (Spain)	Downloadable observational data from the AEMET surface network.	Spain	Spanish State Meteorological Agency (AEMET)	Fernando Belda	<a href="mailto:fbeldae@aemet.es">fbeldae@aemet.es</a>	+ 34 3968 83 44 04	<a href="ftp://ftpdatos.aemet.es/datos_observacion/">ftp://ftpdatos.aemet.es/datos_observacion/</a>		Climate, Weather
AEMET Meteorological data (Spain)	Solar radiation. Data from the network of global radiation measurement (direct, diffuse infrared and ultraviolet).	Spain	Spanish State Meteorological Agency (AEMET)	Fernando Belda	<a href="mailto:fbeldae@aemet.es">fbeldae@aemet.es</a>	+ 34 3968 83 44 04	<a href="ftp://ftpdatos.aemet.es/radiacion_solar/">ftp://ftpdatos.aemet.es/radiacion_solar/</a>		Climate, Weather
AEMET Meteorological data (Spain)	Ozone. Data from ozone soundings and ozone total content in column.	Spain	Spanish State Meteorological Agency (AEMET)	Fernando Belda	<a href="mailto:fbeldae@aemet.es">fbeldae@aemet.es</a>	+ 34 3968 83 44 04	<a href="ftp://ftpdatos.aemet.es/ozono/">ftp://ftpdatos.aemet.es/ozono/</a>		Climate, Weather
AEMET Meteorological data (Spain)	Background pollution.	Spain	Spanish State Meteorological Agency (AEMET)	Fernando Belda	<a href="mailto:fbeldae@aemet.es">fbeldae@aemet.es</a>	+ 34 3968 83 44 04	<a href="ftp://ftpdatos.aemet.es/contaminacion/">ftp://ftpdatos.aemet.es/contaminacion/</a>		Air quality
AEMET Meteorological data (Spain)	Radar. Data from single radars and from the national network.	Spain	Spanish State Meteorological Agency (AEMET)	Fernando Belda	<a href="mailto:fbeldae@aemet.es">fbeldae@aemet.es</a>	+ 34 3968 83 44 04	<a href="ftp://ftpdatos.aemet.es/radart/">ftp://ftpdatos.aemet.es/radart/</a>		Climate, Weather
AEMET Meteorological data (Spain)	Lightnings. Data from the lightning detection network.	Spain	Spanish State Meteorological Agency (AEMET)	Fernando Belda	<a href="mailto:fbeldae@aemet.es">fbeldae@aemet.es</a>	+ 34 3968 83 44 04	<a href="ftp://ftpdatos.aemet.es/rayos/">ftp://ftpdatos.aemet.es/rayos/</a>		Climate, Weather
AEMET Meteorological data (Spain)	Numerical Weather Models. Output fields generated	Spain	Spanish State Meteorological Agency (AEMET)	Fernando Belda	<a href="mailto:fbeldae@aemet.es">fbeldae@aemet.es</a>	+ 34 3968 83 44 04	<a href="ftp://ftpdatos.aemet.es/modelos_numericos/">ftp://ftpdatos.aemet.es/modelos_numericos/</a>		Climate, Weather
AEMET Meteorological data (Spain)	Climatological Series. Historical series of daily and monthly data.	Spain	Spanish State Meteorological Agency (AEMET)	Fernando Belda	<a href="mailto:fbeldae@aemet.es">fbeldae@aemet.es</a>	+ 34 3968 83 44 04	<a href="ftp://ftpdatos.aemet.es/series_climatologicas/">ftp://ftpdatos.aemet.es/series_climatologicas/</a>		Climate, Weather
GMES Sentinel Missions		ESA	ESA						
Envisat		ESA	ESA						
ERS		ESA	ESA						
Earth Explorers Missions		ESA	ESA						
Geological map data		OneGeology-Europe	OneGeology-Europe						
World Data System		ICSU	ICSU						

		EC	ECJRC	Massimo Craglia	<a href="mailto:massimo.craglia@irc.ec.europa.eu">massimo.craglia@irc.ec.europa.eu</a>	+390332786269			
Corine Land Cover of Italy	CLC 2000&2006 with 4° thematic Level for Forest and Seminatural areas	Italy	ISPRA	Nico Bonora	<a href="mailto:nico.bonora@isprambiente.it">nico.bonora@isprambiente.it</a>	+390650072465	<a href="http://www.sinanet.isprambiente.it/Members/mais/Corine/">http://www.sinanet.isprambiente.it/Members/mais/Corine/</a>	new	
Corine Land Cover Changes in Italy	CLC changes between 1990-2000-2006	Italy	ISPRA	Nico Bonora	<a href="mailto:nico.bonora@isprambiente.it">nico.bonora@isprambiente.it</a>	+390650072465	<a href="http://www.sinanet.isprambiente.it/Members/mais/Corine/">http://www.sinanet.isprambiente.it/Members/mais/Corine/</a>	new	
DEM	20m DEM of Italy	Italy	ISPRA	Nico Bonora	<a href="mailto:nico.bonora@isprambiente.it">nico.bonora@isprambiente.it</a>	+390650072465	<a href="http://www.sinanet.isprambiente.it/Members/mais/elevazione/">http://www.sinanet.isprambiente.it/Members/mais/elevazione/</a>	new	
DEM	75m DEM of Italy	Italy	ISPRA	Nico Bonora	<a href="mailto:nico.bonora@isprambiente.it">nico.bonora@isprambiente.it</a>	+390650072465	<a href="http://www.sinanet.isprambiente.it/Members/mais/elevazione/">http://www.sinanet.isprambiente.it/Members/mais/elevazione/</a>	new	
DEM	250m DEM of Italy	Italy	ISPRA	Nico Bonora	<a href="mailto:nico.bonora@isprambiente.it">nico.bonora@isprambiente.it</a>	+390650072465	<a href="http://www.sinanet.isprambiente.it/Members/mais/elevazione/">http://www.sinanet.isprambiente.it/Members/mais/elevazione/</a>	new	
Hydrographic network	Hydrographic Network of Italy. 1:250.000 (y. 2007)	Italy	ISPRA	Nico Bonora	<a href="mailto:nico.bonora@isprambiente.it">nico.bonora@isprambiente.it</a>	+390650072465	<a href="http://www.sinanet.isprambiente.it/Members/mais/">http://www.sinanet.isprambiente.it/Members/mais/</a>	new	
Digital Gravimetric map of Italy	Different datasets related to gravimetry, from local to national scale.	Italy	ISPRA	Nico Bonora	<a href="mailto:nico.bonora@isprambiente.it">nico.bonora@isprambiente.it</a>	+390650072465	<a href="http://www.sinanet.isprambiente.it/Members/mais/cgd/">http://www.sinanet.isprambiente.it/Members/mais/cgd/</a>	new	
Primary and secondary catchment basins.	Italian primary and secondary catchment basins at 1:250.000 scale.	Italy	ISPRA	Nico Bonora	<a href="mailto:nico.bonora@isprambiente.it">nico.bonora@isprambiente.it</a>	+390650072465	<a href="http://www.sinanet.isprambiente.it/Members/mais/">http://www.sinanet.isprambiente.it/Members/mais/</a>	new	
Coastal Datasets.	Historical series of coastline and its trends. Coastal typology. Bathymetry. Defences structures and ports. 1:25.000 scale.	Italy	ISPRA	Nico Bonora	<a href="mailto:nico.bonora@isprambiente.it">nico.bonora@isprambiente.it</a>	+390650072465	<a href="http://www.sinanet.isprambiente.it/Members/mais/elevazione/">http://www.sinanet.isprambiente.it/Members/mais/elevazione/</a>	new	
Soil sealing layer	1:100.000 (y. 2008)	Italy	ISPRA	Nico Bonora	<a href="mailto:nico.bonora@isprambiente.it">nico.bonora@isprambiente.it</a>	+390650072465	<a href="http://www.sinanet.isprambiente.it/Members/mais/impianeti_di_monitoraggio/">http://www.sinanet.isprambiente.it/Members/mais/impianeti_di_monitoraggio/</a>	new	
Air monitoring station	Points (y. 2010)	Italy	ISPRA	Nico Bonora	<a href="mailto:nico.bonora@isprambiente.it">nico.bonora@isprambiente.it</a>	+390650072465	<a href="http://www.sinanet.isprambiente.it/Members/mais/impianeti_di_monitoraggio/">http://www.sinanet.isprambiente.it/Members/mais/impianeti_di_monitoraggio/</a>	new	
Water monitoring network	Drinkable waters, bathing waters.	Italy	ISPRA	Nico Bonora	<a href="mailto:nico.bonora@isprambiente.it">nico.bonora@isprambiente.it</a>	+390650072465	<a href="http://www.sinanet.isprambiente.it/Members/mais/impianeti_di_monitoraggio/">http://www.sinanet.isprambiente.it/Members/mais/impianeti_di_monitoraggio/</a>	new	
Marine transport network	Passengers and goods traffic, Port structures, port boundaries, port typology.	Italy	ISPRA	Nico Bonora	<a href="mailto:nico.bonora@isprambiente.it">nico.bonora@isprambiente.it</a>	+390650072465	<a href="http://www.sinanet.isprambiente.it/Members/mais/reti_di_trasporto/">http://www.sinanet.isprambiente.it/Members/mais/reti_di_trasporto/</a>	new	
Atmospheric NO2	Atmospheric Nitrogen Dioxide concentrations (tropospheric and total) from GOME, SCIAMACHY, GOME-2 and OMI satellite observations	The Netherlands	KNMI/BIRA-IASB	Ronald van der A	<a href="mailto:Ronald.van.der.A@knmi.nl">Ronald.van.der.A@knmi.nl</a>	+31302206412	<a href="http://www.temis.nl/airpollution/no2.html">http://www.temis.nl/airpollution/no2.html</a>	new	
MSR	Multi Sensor Reanalysis (MSR) of ozone from 30 year of satellite observations	The Netherlands	KNMI	Ronald van der A	<a href="mailto:Ronald.van.der.A@knmi.nl">Ronald.van.der.A@knmi.nl</a>	+31302206412	<a href="http://www.temis.nl/protocols/O3global.html">http://www.temis.nl/protocols/O3global.html</a>	new	
UV index and dose	Global UV index and UV dose archive	The Netherlands	KNMI	Ronald van der A	<a href="mailto:Ronald.van.der.A@knmi.nl">Ronald.van.der.A@knmi.nl</a>	+31302206412	<a href="http://www.temis.nl/uvradiation/UVindex.html">http://www.temis.nl/uvradiation/UVindex.html</a>	new	
AAI	Aerosol Absorption Index (AAI) from GOME, SCIAMACHY, GOME-2 and OMI satellite observations	The Netherlands	KNMI	Piet Stammes	<a href="mailto:Stammes@knmi.nl">Stammes@knmi.nl</a>	+31302206459	<a href="http://www.temis.nl/airpollution/absaa/">http://www.temis.nl/airpollution/absaa/</a>	new	
FRESCO	Global cloud information (fraction and height) from UV-VIS satellites (GOME, SCIAMACHY and GOME-2)	The Netherlands	KNMI	Piet Stammes	<a href="mailto:Stammes@knmi.nl">Stammes@knmi.nl</a>	+31302206459	<a href="http://www.temis.nl/fresco/">http://www.temis.nl/fresco/</a>	new	
WACMOS	Global Evapotranspiration at 1km resolution. The dataset processing level is L2. Year 2008.	The Netherlands	University of Twente - Faculty of GeoInformation Science and Earth Observation (ITC)	Murat Ucer	<a href="mailto:ucer@itc.nl">ucer@itc.nl</a>	+31534874428	<a href="http://www.WACMOS.org">www.WACMOS.org</a>	new	

Twente Soil Moisture Observatory	A soil moisture/temperature networks located in East of The Netherlands. The network includes about 20 stations with the sensors installed at 5 different depths. From 2008 until now.	The Netherlands	University of Twente - Faculty of GeoInformation Science and Earth Observation (ITC)	Murat Ucer	<a href="mailto:ucer@itc.nl">ucer@itc.nl</a>	+31534874428			new	
Tibetan Plateau Soil Moisture Observatory	Three soil moisture/temperature networks across the Tibetan Plateau. Each network includes about 20 stations with the sensors installed at 5 different depths. From 2010 until now. Details in HESS, 2011, vol 15, pp 2303-2316.	The Netherlands	University of Twente - Faculty of GeoInformation Science and Earth Observation (ITC)	Murat Ucer	<a href="mailto:ucer@itc.nl">ucer@itc.nl</a>	+31534874428			new	
Meteorological and Turbulent flux data, open water area	Ethiopia, synoptic weather station data, campaign data: Tana lake (3-D Sonic and 4-component radiometric data). Year 2008.	The Netherlands	University of Twente - Faculty of GeoInformation Science and Earth Observation (ITC)	Murat Ucer	<a href="mailto:ucer@itc.nl">ucer@itc.nl</a>	+31534874428			new	
Meteorological and Turbulent flux data (energy balance), semi-arid area	Sardon (North-Central Spain), synoptic weather station data, 3-D Sonic, Licor and 4-component radiometric data, soil heat flux. From 2009 until now.	The Netherlands	University of Twente - Faculty of GeoInformation Science and Earth Observation (ITC)	Murat Ucer	<a href="mailto:ucer@itc.nl">ucer@itc.nl</a>	+31534874428			new	
Meteorological and Turbulent flux data (energy balance), humid forest area	Speulderbos (Central The Netherlands), synoptic weather station data, 3-D Sonic, Licor and 4-component radiometric data, soil heat flux. From 2008 until now.	The Netherlands	University of Twente - Faculty of GeoInformation Science and Earth Observation (ITC). Please note that for use of this data also RIVM needs be acknowledged!	Murat Ucer	<a href="mailto:ucer@itc.nl">ucer@itc.nl</a>	+31534874428			new	
ESA - SPARC 2004 Campaign	Hyperspectral airborne remote sensing data. In-situ; Meteorological, Turbulent flux data (energy balance), soil heat flux and soil temperature profiles. Details in IJRS 2008, vol 29, no 17-18, pp 5215-5235	The Netherlands	University of Twente - Faculty of GeoInformation Science and Earth Observation	Murat Ucer	<a href="mailto:ucer@itc.nl">ucer@itc.nl</a>	+31534874428				
ESA - Sen2Flex 2005 Campaign	Hyperspectral airborne remote sensing data. In-situ; Meteorological, Turbulent flux data (energy balance), soil heat flux, soil and canopy component temperatures, soil moisture, directional radiometric data. Details in IJRS 2008, vol 29, no 17-18, pp 5215-5235	The Netherlands	University of Twente - Faculty of GeoInformation Science and Earth Observation (ITC)	Murat Ucer	<a href="mailto:ucer@itc.nl">ucer@itc.nl</a>	+31534874428				
ESA - AgriSAR 2006 Campaign	Hyperspectral and Microwave airborne remote sensing data. In-situ; Meteorological, Turbulent flux data (energy balance), soil heat flux, soil and canopy component temperatures, soil moisture, directional radiometric data. Details in JoH, 2008, vol 349, pp 425-440	The Netherlands	University of Twente - Faculty of GeoInformation Science and Earth Observation (ITC)	Murat Ucer	<a href="mailto:ucer@itc.nl">ucer@itc.nl</a>	+31534874428				

ESA - EAGLE 2006 Campaign	Hyperspectral, Turbulent flux and Microwave airborne remote sensing data. In-situ; Meteorological, Turbulent flux data (energy balance), soil heat flux, soil and canopy component temperatures, soil moisture, directional radiometric data. Details in HESS, 2009, vol 13, pp 833-845	The Netherlands	University of Twente - Faculty of GeoInformation Science and Earth Observation (ITC)	Murat Ucer	<a href="mailto:ucer@itc.nl">ucer@itc.nl</a>	+31534874428			
SeaDataNet	Concerning Ocean & Marine data from Dutch institutions, there is large amount of data available which is already being integrated in a larger European data-infrastructure portal called SeaDataNet. This Pan-European portal in turn is currently being linked to GEOSS, and via the INSPIRE compliant CSW service. They hope to realise this before the coming Istanbul GEO meeting in November 2011.	The Netherlands	MARIS, INSPIRE	Dick Schaap and Stefano Nativi			<a href="http://www.seadatanet.org/">http://www.seadatanet.org/</a>		
Global Map of Congo, Sudan, Mauritius, Mozambique, South Africa, Swaziland, Guinea Bissau, Azerbaijan, Hong Kong China, Georgia, Indonesia, Lebanon, Pakistan, Saudi Arabia, Honduras, Nicaragua, St Vincent and the Grenadines, United States, Chile, New Zealand, Papua New Guinea,	Global Map V.1/ V.2 National&Regional version Trans, Boundary, Drainage, Population, Elevation, Vegetation, Land Cover, Land Use,	PO/Japan	ISCGM	Secretariat of ISCGM	<a href="mailto:sec@iscgm.org">sec@iscgm.org</a>	+81298646910	<a href="http://www.iscgm.org">http://www.iscgm.org</a>	new	
The Global Map V.1 (Global version)	Land Cover (GLCNMO), Vegetation (Percent Tree Cover) ,	PO/Japan	ISCGM	Secretariat of ISCGM	<a href="mailto:sec@iscgm.org">sec@iscgm.org</a>	+81298646910	<a href="http://www.iscgm.org">http://www.iscgm.org</a>	new	
GPCC - Climatology	gridded long term means of precipitation, based on gauge measured data (ca. 65,000 stations); reference period 1951-2000 if available, else other 30 year period, at least 10 years of data; extensive quality control; grid resolution 0.25, 0.5, 1.0 and 2.5 deg lat/lon (created for climatic mean and analysis background)	Germany	Deutscher Wetterdienst (DWD) (= Nat. Met. Service of Germany)	Andreas Becker	<a href="mailto:gpcc@dwd.de">gpcc@dwd.de</a> ; <a href="mailto:Andreas.Becker@dwd.de">Andreas.Becker@dwd.de</a>	+49 - 69 - 8062 - 2900	<a href="http://kunden.dwd.de/GPCC/Visualizer">http://kunden.dwd.de/GPCC/Visualizer</a> and <a href="ftp://ftp-anon.dwd.de/pub/data/gpcc/html/download_gate.html">ftp://ftp-anon.dwd.de/pub/data/gpcc/html/download_gate.html</a>		Climate, Hydrology
GPCC - Full Data Reanalysis	gridded monthly precipitation amounts and anomalies, timeseries 1901 to near present; based on all stations with long term means available at GPCC (based on gauge measured data, up to 65,000 stations); extensive quality control applied to the data; grid resolution 0.5, 1.0 and 2.5 deg lat/lon (created for best spatial data coverage)	Germany	Deutscher Wetterdienst (DWD) (= Nat. Met. Service of Germany)	Andreas Becker	<a href="mailto:gpcc@dwd.de">gpcc@dwd.de</a> ; <a href="mailto:Andreas.Becker@dwd.de">Andreas.Becker@dwd.de</a>	+49 - 69 - 8062 - 2900	<a href="http://kunden.dwd.de/GPCC/Visualizer">http://kunden.dwd.de/GPCC/Visualizer</a> and <a href="ftp://ftp-anon.dwd.de/pub/data/gpcc/html/download_gate.html">ftp://ftp-anon.dwd.de/pub/data/gpcc/html/download_gate.html</a>		Climate, Hydrology
GPCC - Monitoring Product	gridded monthly precipitation amounts and anomalies; based on monthly CLIMAT and SYNOP reports; automatic and human quality control, grid resolution 1.0 and 2.5 deg lat/lon (created on WCRP request and for merging to satellite data, available ca. 2 months after obs.)	Germany	Deutscher Wetterdienst (DWD) (= Nat. Met. Service of Germany)	Andreas Becker	<a href="mailto:gpcc@dwd.de">gpcc@dwd.de</a> ; <a href="mailto:Andreas.Becker@dwd.de">Andreas.Becker@dwd.de</a>	+49 - 69 - 8062 - 2900	<a href="http://kunden.dwd.de/GPCC/Visualizer">http://kunden.dwd.de/GPCC/Visualizer</a> and <a href="ftp://ftp-anon.dwd.de/pub/data/gpcc/html/download_gate.html">ftp://ftp-anon.dwd.de/pub/data/gpcc/html/download_gate.html</a>		Climate, Hydrology
GPCC - First Guess	gridded monthly precipitation amounts and anomalies, based on SYNOP reports; automatic quality control, grid resolution 1.0 deg lat/lon (created for early detection, e.g. drought monitoring, available ca. 5 days after obs.)	Germany	Deutscher Wetterdienst (DWD) (= Nat. Met. Service of Germany)	Andreas Becker	<a href="mailto:gpcc@dwd.de">gpcc@dwd.de</a> ; <a href="mailto:Andreas.Becker@dwd.de">Andreas.Becker@dwd.de</a>	+49 - 69 - 8062 - 2900	<a href="http://kunden.dwd.de/GPCC/Visualizer">http://kunden.dwd.de/GPCC/Visualizer</a>		Climate, Hydrology
GPCC - HOMPRA	homogenized gridded monthly precipitation amounts; period 1951-2005; only stations with at least 90% temporal coverage; extensive quality control and homogenisation of the time-series; grid resolution 0.5, 1.0 and 2.5 deg lat/lon; release scheduled for first half of 2012	Germany	Deutscher Wetterdienst (DWD) (= Nat. Met. Service of Germany)	Andreas Becker	<a href="mailto:gpcc@dwd.de">gpcc@dwd.de</a> ; <a href="mailto:Andreas.Becker@dwd.de">Andreas.Becker@dwd.de</a>	+49 - 69 - 8062 - 2900	<a href="http://kunden.dwd.de/GPCC/Visualizer">http://kunden.dwd.de/GPCC/Visualizer</a> and <a href="ftp://ftp-anon.dwd.de/pub/data/gpcc/html/download_gate.html">ftp://ftp-anon.dwd.de/pub/data/gpcc/html/download_gate.html</a>		Climate, Hydrology

Long-Term Mean Monthly Discharges and Annual Characteristics of GRDC Stations	The Long-Term Mean Monthly Discharges and Annual Characteristics offer basic statistics of 3,843 stations draining basins larger than 2.500 square kilometres [km <sup>2</sup> ], and being represented in the Global Runoff Database by a time series longer than ten years. On the basis of daily discharge values from years of at least ten months and months with less than ten days missing, the following was calculated: annual means, lowest, and highest monthly discharges for individual years, long-term mean, lowest, and highest monthly discharges of time series with at least five years of observation each with at least ten monthly values, long-term inner-annual mean, lowest and highest monthly discharges of time series with at least five values of a specific month, and their standard deviations. These monthly primary values are provided station by station as ASCII-text files (see example on the right margin), named with pvm-prefix and station numbers. For download, all files are grouped by WMO Regions.	Germany	Global Runoff Data Centre (GRDC) at the Federal Institute of Hydrology (BfG)	Ulrich Looser	<a href="mailto:grdc@bafg.de">grdc@bafg.de</a>	+49-261-1306-5224	<a href="http://www.bafg.de/clin_031/nn_294540/GRDC/EN/02_Services/02_DataProducts/LongTermMonthlyMeans/longtermmonthly_node.html?_nnn=true">http://www.bafg.de/clin_031/nn_294540/GRDC/EN/02_Services/02_DataProducts/LongTermMonthlyMeans/longtermmonthly_node.html?_nnn=true</a>	new	Water
Polyphemus	Air Quality Analysis und Forecast (NO2, O3)	Germany	DLR/WDC-RSAT	Christoph Bergemann	<a href="mailto:christoph.bergemann@dlr.de">christoph.bergemann@dlr.de</a>		<a href="http://wdc.dlr.de/data_products/projects/promote/BY-forecast/index.php">http://wdc.dlr.de/data_products/projects/promote/BY-forecast/index.php</a>		Health
MetOpA-GOME2 L3 O3	O3 vertical column density	Germany	DLR/WDC-RSAT	Julian Meyer-Arneke	<a href="mailto:Julian.Meyer-Arneke@dlr.de">Julian.Meyer-Arneke@dlr.de</a>		<a href="http://wdc.dlr.de/data_products/SERVICES/GOME2NR/T/o3.php">http://wdc.dlr.de/data_products/SERVICES/GOME2NR/T/o3.php</a>		Health, Climate
MetOpA-GOME2 L3 NO2	NO2 vertical column density	Germany	DLR/WDC-RSAT	Julian Meyer-Arneke	<a href="mailto:Julian.Meyer-Arneke@dlr.de">Julian.Meyer-Arneke@dlr.de</a>		<a href="http://wdc.dlr.de/data_products/SERVICES/GOME2NR/T/no2.php">http://wdc.dlr.de/data_products/SERVICES/GOME2NR/T/no2.php</a>		Health, Climate
MetOpA-GOME2 L3 NO2 tropospheric	NO2 tropospheric vertical column density	Germany	DLR/WDC-RSAT	Julian Meyer-Arneke	<a href="mailto:Julian.Meyer-Arneke@dlr.de">Julian.Meyer-Arneke@dlr.de</a>		<a href="http://wdc.dlr.de/data_products/SERVICES/GOME2NR/T/no2tropo.php">http://wdc.dlr.de/data_products/SERVICES/GOME2NR/T/no2tropo.php</a>		Health, Climate
MetOpA-GOME2 VCD L4 ROSE	O3 vertical column density (global model analysis)	Germany	DLR/WDC-RSAT	Julian Meyer-Arneke	<a href="mailto:Julian.Meyer-Arneke@dlr.de">Julian.Meyer-Arneke@dlr.de</a>		<a href="http://wdc.dlr.de/data_products/SERVICES/GOME2NR/T/o3assim.php">http://wdc.dlr.de/data_products/SERVICES/GOME2NR/T/o3assim.php</a>		Health, Climate
MetOpA-GOME2 VCD L4 ROSE	Chemical O3 loss at 56 hPa (derived from ozone assimilation)	Germany	DLR/WDC-RSAT	Julian Meyer-Arneke	<a href="mailto:Julian.Meyer-Arneke@dlr.de">Julian.Meyer-Arneke@dlr.de</a>		<a href="http://wdc.dlr.de/data_products/SERVICES/GOME2NR/T/o3loss.php">http://wdc.dlr.de/data_products/SERVICES/GOME2NR/T/o3loss.php</a>		Health, Climate
SCIAMACHY VCD L4 SACADA	Stratospheric trace gases (global analysis)	Germany	DLR/WDC-RSAT	Frank Baier	<a href="mailto:Frank.Baier@dlr.de">Frank.Baier@dlr.de</a>		<a href="http://wdc.dlr.de/data_products/SERVICES/O3_GL/">http://wdc.dlr.de/data_products/SERVICES/O3_GL/</a>		Health, Climate
MetOpA-GOME2 VCD L4 SACADA	Stratospheric trace gases (global analysis)	Germany	DLR/WDC-RSAT	Frank Baier	<a href="mailto:Frank.Baier@dlr.de">Frank.Baier@dlr.de</a>		<a href="http://wdc.dlr.de/data_products/SERVICES/O3_GL/">http://wdc.dlr.de/data_products/SERVICES/O3_GL/</a>		Health, Climate
Satellite Aerosol Products	Parameter AOD	Germany	DLR/WDC-RSAT	Thomas Holzer-Popp	<a href="mailto:thomas.holzer-popp@dlr.de">thomas.holzer-popp@dlr.de</a>		<a href="http://wdc.dlr.de/data_products/AEROSOLS/">http://wdc.dlr.de/data_products/AEROSOLS/</a>		Health, Climate
SYNAER	Parameter: AOD, PM	Germany	DLR/WDC-RSAT	Thomas Holzer-Popp	<a href="mailto:thomas.holzer-popp@dlr.de">thomas.holzer-popp@dlr.de</a>		<a href="http://wdc.dlr.de/data_products/AEROSOLS/daily_AOT_envisat.html">http://wdc.dlr.de/data_products/AEROSOLS/daily_AOT_envisat.html</a> <a href="http://wdc.dlr.de/data_products/AEROSOLS/one_stop_shop/SYNAER_aerosol.php">http://wdc.dlr.de/data_products/AEROSOLS/one_stop_shop/SYNAER_aerosol.php</a>		Health, Climate
EEA Contributions	See attached spreadsheet	EEA	EEA	Paul Hasenohr	<a href="mailto:Paul.Hasenohr@eea.europa.eu">Paul.Hasenohr@eea.europa.eu</a>		Available through EEA website		
INPE's Earth Observation Images Catalog	INPE's catalog comprises images from the China-Brazil Earth Observation satellites CBERS-2 and CBERS-2B, as well as from Landsat-1, Landsat-2, Landsat-3, Landsat-5, Landsat-7, Terra 1 and Aqua 1. Search for images can be done using criteria like satellite/sensor, data, municipality, path/row, region. Access to the catalog is entirely free and only requires a quick registration.	Brazil	INPE	Ivan Barbosa	<a href="mailto:ivan@dqi.inpe.br">ivan@dqi.inpe.br</a>	+55 12 3186 9201	<a href="http://www.dqi.inpe.br/CDS/R/">http://www.dqi.inpe.br/CDS/R/</a>	new	Ecosystems, Agriculture and Disasters

INPE/DevCoCast Products	This resource includes the DevCoCast products distributed by INPE. It comprises the following data sets: Fire Detection ASCII - GOES - South America (FAG), Fire Detection - GOES - South America (FDG), Fire Detection ASCII - NOAA - South America (FAN), Fire Detection - Multimission - South America (FDN), ForTraCC Images - GOES - South America (FTC), Lightning Discharge Image - GOES - South America (LDI), Ultraviolet Index - Multimission - South America (UVI), Normalized Difference Vegetation Index (15 day) - Multimission South America (NDV), Colour Composite CCD-HRC - CBERS - Africa, South America (CHC), Composites - GOES-MSG - Africa, South America (GMC).	Brazil	INPE	Cesar Mello	cesar.mello@cptec.inpe.br	+55 12 3186 9467	<a href="http://satellite.cptec.inpe.br/home/?i=en">http://satellite.cptec.inpe.br/home/?i=en</a>	new	Disasters, Health, Energy, Climate, Water, Weather, Ecosystems Agriculture, Biodiversity
INPE Products to GeonetCast-Americas (GNC-A)	This resource includes the Geonetcast Americas products sent by INPE to NOAA for GNC-A dissemination. It comprises the following data sets: Accumulated Precipitation 120hrs (WGR), Accumulated Precipitation 48hrs (RR2), Accumulated Rainfall 24hrs (RR1), Channel Composite – GOES (SAC), Cloud Temperature – GOES (SAE), Colour Composite CCD-HRC - CBERS - Africa, South America (CHC), Composites - GOES-MSG (GMC), Fire Detection – GOES (FDG), Fire Detection – NOAA (FDN), ForTraCC Images – GOES (FTC), Infrared Channel over Central America – GOES (CAI), Infrared Channel over Central and South America – Goes (SCI), Infrared Channel over South America – GOES (SAI), Land Surface Temperature – NOAA (LST), Lightning Discharge Image – GOES (LDI), Normalized Difference Vegetation Index 15 day (NDV), Normalized Difference Vegetation Index (Monthly) – NOAA (NVI), Number of Days Without Rain / Dry Season Monitoring (NDR), Rainfall Satellite Image (RFS), Regional Temperature at 1000 hPa - 24hrs (RT1), Regional Temperature at 1000 hPa - 48hrs (RT2), Streamlines at 200 hPa (m/	Brazil	INPE	Cesar Mello	cesar.mello@cptec.inpe.br	+55 12 3186 9467	<a href="http://satellite.cptec.inpe.br/home/?i=en">http://satellite.cptec.inpe.br/home/?i=en</a>	new	Disasters, Health, Energy, Climate, Water, Weather, Ecosystems Agriculture, Biodiversity
Key information by satellites - Eumetsat "Essential" Data	Three-hourly and Six-hourly Meteosat Data, all Meteosat Derived Products and the data offered through the Meteosat Internet Service; EUMETSAT SAF products (near-real-time level 2 products); A set of Metop Level-I products and all Metop Level-2 products.	Eumetsat	Eumetsat	Sally Wannop	<a href="mailto:sally.wannop@eumetsat.int">sally.wannop@eumetsat.int</a>				
Datasets on atmospheric composition developed by pilot projects for the GMES Atmosphere Service		ECMWF	ECMWF	Manfred Klöppel	<a href="mailto:M.Kloeppe@ecmwf.int">M.Kloeppe@ecmwf.int</a>	+44-118-949 9101			
Datasets from atmospheric reanalyses		ECMWF	ECMWF	Manfred Klöppel	<a href="mailto:M.Kloeppe@ecmwf.int">M.Kloeppe@ecmwf.int</a>	+44-118-949 9101			
RESIF (Réseau sismologique et géodésique français)	French seismic and geodetic network	France	RESIF Consortium	Helle Pedersen	<a href="mailto:Helle.Pedersen@obs.ujf-grenoble.fr">Helle.Pedersen@obs.ujf-grenoble.fr</a>	+33 (0)4 76 63 52 59	<a href="http://www.resif.fr">www.resif.fr</a>	new	Disasters



## EEA Contributions to GEOSS Data-CORE

Effective Date	Title	Themes	Description
04/11/2010	Natura 2000 data - the European network of protected sites	biodiversity, landuse	Natura 2000 is the key instrument to protect biodiversity in the European Union. It is an ecological network of protected areas, set up to ensure the survival o...
24/05/2011	Member States reporting (Art 7) under the European Pollutant Release and Transfer Register (E-PRTR) Regulation	air, waste, water, climate, industry, chemicals, soil	The European Pollutant Release and Transfer Register (E-PRTR) is a web-based register established by Regulation (EC) No 166/2006 which implements the UNECE PRT...
15/09/2010	Zones in relation to EU air quality thresholds, 2008	air	Member States provide an annual assessment of air quality in comparison to EU air quality thresholds
15/06/2011	Bathing Water Directive - Status of bathing water	water	The EU Bathing Waters Directive requires Member States to identify popular bathing places in fresh and coastal waters and monitor them for indicators of microbi...
25/06/2010	Waterbase - Transitional, coastal and marine waters	water	Waterbase is the generic name given to the EEA databases on the status and quality of Europe's rivers, lakes, groundwater bodies and transitional, coastal and ma...
30/03/2011	Waterbase - Water Quantity	water	Waterbase is the generic name given to the EEA's databases on the status and quality of Europe's rivers, lakes, groundwater bodies and transitional, coastal and...
01/06/2010	Corine Land Cover version 13 (02/2010)	landuse, natural	Various raster and vector datasets on land cover for the CLC1990, CLC2000 and CLC2006 inventories
30/05/2011	Waterbase - Lakes	water	Waterbase is the generic name given to the EEA's databases on the status and quality of Europe's rivers, lakes, groundwater bodies and transitional, coastal and...
28/05/2010	GMES Urban Atlas	urban, landuse	The Urban Atlas is providing pan-European comparable land use and land cover data for Large Urban Zones with more than 100.000 inhabitants as defined by the Urb...
11/05/2011	Waterbase - Rivers	water	Waterbase is the generic name given to the EEA's databases on the status and quality of Europe's rivers, lakes, groundwater bodies and transitional, coastal and...
13/05/2011	Waterbase - Groundwater	water	Waterbase is the generic name given to the EEA's databases on the status and quality of Europe's rivers, lakes, groundwater bodies and transitional, coastal and...
04/03/2011	AirBase - The European air quality database	air	AirBase is the air quality information system maintained by the EEA through the European topic centre on Air and Climate Change. It contains air quality data de...
26/01/2010	EEA Fast Track Service Precursor on Land Monitoring - Degree of soil sealing 100m	soil, landuse	Raster data set of built-up and non built-up areas including continuous degree of soil sealing ranging from 0 - 100% in aggregated spatial resolution (100 x 100...
03/12/2009	CORILIS - CORINE Lissage	natural, landuse	CORILIS, from CORIne and LISsage (smoothing in French), is a methodology developed for land cover data generalization and analysis
30/11/2009	NATURILIS - Smoothed values of designated areas	landuse, biodiversity	The NATURILIS dataset is an application of the CORILIS methodology on available geospatial data about designated areas
30/10/2009	Nationally designated areas (National - CDDA)	biodiversity, landuse	The European inventory of nationally designated areas holds information about protected sites and about the national legislative instruments, which directly or ...
24/09/2009	Population density disaggregated with Corine land cover 2000	population	Raster data on population density using Corine Land Cover 2000 inventory
13/07/2009	Conservation status of habitat types and species (Article 17, Habitats Directive 92/43/EEC)	biodiversity	All Member States are requested by the Habitats Directive (1992) to monitor habitat types and species considered to be of Community interest.
29/04/2009	Desertification in the Mediterranean region	water, soil	The European Topic Centre on Terrestrial Environment (ETC-TE) has been asked by the European Environment Agency (EEA) to support the development of a sensitivit...
23/02/2009	WISE Large rivers and large lakes	water	Large rivers are rivers that have a catchment area large than 50,000 km2 or other rivers and tributaries that have a catchment area larger than 5,000 km2
20/10/2008	Global land cover - 250m	natural, landuse	Global land cover 2000 dataset is a main input dataset to define the boundaries between ecosystems
26/08/2008	Interpolated air quality data	air	Interpolated maps showing air quality in Europe
20/08/2008	Biogeographical regions, Europe 2008	biodiversity	The bio-geographic regions dataset contains the official delineations used in the Habitats Directive (92/43/EEC) and for the EMERALD Network set up under the Co...
19/08/2008	European river catchments	water	The purpose of the European river catchments (ERC) is to provide a homogeneous European catchments dataset at scale 1:1 million that can be used together with t...
18/07/2008	Green potential background	landuse, natural	CORILIS layers can be grouped by simple addition
16/07/2008	Land cover flows based on Corine land cover changes database (1990-2000)	natural, landuse	Corine land cover changes are classified into land cover flows based on Land cover accounts (LEAC) methodology and generalised using the 1 Km reference grid siz...
11/07/2008	Dominant land cover types 2000	natural, landuse	Dominant land cover types are defined by classification of the CORILIS layers into dominant classes
01/07/2011	WISE River basin districts (RBDs)	water	River Basin Districts (RBDs) are the main units for the management of river basins and have been delineated by Member States under Article 3 of the Water Framew...

## US Contributions to GEOSS Data-CORE

### through tagging in NASA's Global Change Master Directory (GCMD) (Summary)

5	DHS (Department of Homeland Security)
1	DOC/BEA (Department of Commerce/Bureau of Economic Analysis)
2	DOC/NIST (National Institute of Standards and Technology)
2522	DOC/NOAA (National Oceanic and Atmospheric Administration)
8	DOC/NTIS(National Technical Information Service)
1	DOC/NTIS/GRC (Government Research Center)
99	DOD (Department of Defense)
283	DOE (Department of Energy)
1551	DOI (Department of the Interior)
15	DOS (Department of State)
22	DOT (Department of Transportation)
121	EPA (Environmental Protection Agency)
3900	NASA (National Aeronautics and Space Administration)
2342	NSF (National Science Foundation) and NSF-funded entities
35	SI (Smithsonian Institution)
630	USDA (United States Department of Agriculture)

Some of these datasets overlap as there are multiple agencies involved in many projects. Please note that the datasets listed above are shown as they are tagged in the GCMD. In some cases, such as with the U.S. Geological Survey and other component agencies of the Department of Interior (DOI), datasets are tagged by their parent department. In other cases, such as with the Department of Commerce (DOC), datasets are tagged by the component agency. The total number of unique entries in the GCMD contributed by USGEO to the GEOSS Data-CORE is 8,026.

These datasets represent geophysical parameters and related data and products in the Earth observations fields of agriculture, atmosphere, biological classification, biosphere, climate, cryosphere, human dimensions, land surface, oceans, paleoclimate, solid Earth, spectral and engineering parameters, Sun-Earth interactions, and terrestrial hydrosphere. They also include the contributions of the specific datasets pledged at the Beijing Summit, i.e., Carbon Dioxide Information Analysis Center, NASA Standard Earth science products, NOAA datasets, the Global Seismographic Network data, Smithsonian GEO's network of tropical forest institute data, EPA AirNOW and GEO Data Gateway, and the Landsat Global Land Survey. US contributions will change over time and will be updated dynamically through the GCMD.

## Appendix B

### LEGAL OPTIONS FOR THE EXCHANGE OF DATA THROUGH THE GEOSS DATA-CORE

#### *SUMMARY WHITE PAPER*

#### **DATA SHARING TASK FORCE<sup>1</sup>**

### **1 PURPOSE**

1.1 This summary document<sup>2</sup> addresses the legal options for the exchange of data, metadata, and products [referred to as “data” or “databases” below] through the GEOSS Data Collection of Open Resources for Everyone (Data-CORE). The GEOSS Data-CORE is a distributed pool of documented data contributed by the Group on Earth Observations (GEO) community through databases under the following principles, as set forth in the 2010 GEOSS Action Plan:

- a. The data are free of restrictions on re-use;
- b. User registration or login to access or use the data is permitted;
- c. Attribution of the data provider is permitted as a condition of use; and
- d. Marginal cost recovery charges (i.e., not greater than the cost of reproduction and distribution) are permitted.

1.2 It is important to note that user registration, attribution of provider, and marginal cost recovery charges<sup>3</sup> for access to the data are permitted, but not required, and are not considered restrictions by GEO in the context of the GEOSS Data-CORE.

### **2 FINDINGS AND CONCLUSIONS**

2.1 “Legal interoperability” of data made available through the GEOSS Data-CORE is essential for the effective sharing of data in GEOSS, which is a priority of the GEO Members. Legal interoperability for data means that the legal rights, terms, and conditions of databases from two or more sources are compatible and the data may be combined by any user without compromising the legal rights of any of the data sources used.

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<sup>1</sup> The information contained in this document does not constitute legal representation by the GEO Data Sharing Task Force (DSTF) or its Legal Liability Subgroup. Before using any information in this publication, it is recommended that an attorney licensed in the jurisdiction of interest be consulted for specific legal advice. The DSTF is grateful to its Legal Interoperability Sub-Group members for providing the draft of this summary and the background white paper. The Sub-Group members are: Paul F. Uhlir, Miles Gabriel, Joanne Irene Gabrynowicz, Jeff Heninger, Puneet Kishor, Harlan Onsrud, Kevin Pomfret, Daniel Quintart, and Glenn E. Tallia. We also wish to express our gratitude to Sarah Pearson, Senior Counsel at Creative Commons, for her comments on drafts of this paper. The views expressed here are those of the authors and not necessarily those of their employing institutions.

<sup>2</sup> A draft of the full background white paper is available upon request.

<sup>3</sup> For a definition and discussion of marginal cost pricing, see the Implementation Guidelines for the GEOSS Data Sharing Principles (2009).

2.2 When substantial amounts of statutorily protected data are combined from two or more data sources, the new resulting database often will acquire the most restrictive rights from any of the sources used.

2.3 Public domain status is the best legal option for promoting the various social benefits and goals intended by GEO through the GEOSS Data-CORE by enabling the unrestricted re-use, re-dissemination, and legal interoperability of data. The public domain may be defined as encompassing content that is (1) not subject to copyright or related rights (including database protection rights), and (2) not subject to conditions on reuse imposed by other means.<sup>4</sup> The public domain may be created formally by public laws through national legislation or regulation that expressly excludes certain categories of data and information from copyright or from other exclusive property protection, or by private-law waivers of rights. Public domain status may also be attained when the protection of the databases has exceeded the statutory term of protection (which is unlikely for almost all data made available through GEOSS), or by exclusions of certain subject matter from protection, such as facts. Rights under copyright or database protection laws arise automatically (i.e., they do not have to be claimed by a copyright filing or statement), unless expressly excluded or waived. Hence, express legislative or regulatory action is needed, or a waiver of all rights through a private law alternative (see, e.g., the CC0 or PDDL waivers in section 3.2, below) to make the data excluded or waived from protection, or to make the re-use and re-dissemination of data unrestricted.

2.4 Ideally, databases already having public domain status should include a notice in their metadata or on the database owner's server informing potential users of their public domain status. The Creative Commons Public Domain Mark, listed in section 3.2, serves this purpose. Such a notice could help to overcome the incorrect assumption by some potential users that the data are subject to protection and have attendant restrictions on reuse. Such a notice would thereby promote the further use of the data and legal interoperability through the GEOSS Data-CORE.

2.5 Most databases, however, do not have public domain status and are protected in whole or in part under statutory intellectual property laws. In those cases, a legally valid waiver of rights can achieve a private-law equivalent of public domain status, or a common-use license can incorporate the attribution conditions allowed by the GEOSS Data-CORE (see the CC BY 3.0 and ODC BY 1.0 licenses in section 3.2).

2.6 The endorsement by the GEO Plenary of either standard, accepted waivers or licenses, or other customized common-use licenses that meet all of the GEOSS Data-CORE conditions of access and unrestricted re-use of data, would help ensure certainty and legal interoperability of the data, and thus support the important GEO societal benefit goals. Common-use licenses and waivers also would help promote the contribution of databases through the GEOSS Data-CORE, because most jurisdictions do not have public domain status created by statute for the data compilations relevant to GEOSS.

2.7 It is important to note that the attribution term may not be legally enforceable for all data used in all jurisdictions. In those cases that it is not, attribution may be seen as a standard community practice or norm, or a moral or ethical imperative, which is not exactly the same as the legally enforceable attribution condition.

2.8 Data policies that promote full and open data exchange, but that are not formally codified through public laws, or through licenses and agreements, do not have the force of law.

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<sup>4</sup> Private communication from Sarah Pearson to Paul Uhlir, 1 September 2011.

### 3 RECOMMENDATIONS FOR THE 2011 GEO PLENARY

1. The GEOSS Data-CORE's terms and conditions can best be achieved through any of the following mechanisms: statutory public domain, a private-law waiver of rights, or a common-use license.

2. If the database is not in the public domain as a result of a statutory or private-law waiver of rights, or by the expiration of the term of protection of any rights, the GEO Members and Affiliated Organizations should consider adopting a common-use data license with the following characteristics:

- a. *The license must be compatible with the GEOSS Data-CORE principles as established in the 2010 GEOSS Action Plan; specifically:*
  - *The data are free of restrictions on re-use;*
  - *User registration or login to access or use the data is permitted;*
  - *Attribution of the data provider is permitted as a condition of use; and*
  - *Marginal cost recovery charges (i.e., not greater than the cost of reproduction and distribution) are permitted.*
- b. *The license should be valid under the laws of as many different jurisdictions as possible;*
- c. *The license should be clear and simple enough not be confusing to the data provider or user;*
- d. *The license should be easy to recognize and find;*
- e. *The license should be embeddable in the data as machine readable metadata whenever possible;*
- f. *The license should be available in different languages, at a minimum in the language(s) of the country making the data available, as well as in English;*
- g. *The license may have any other terms and conditions, such as a disclaimer of warranty and liability, that do not restrict the user or conflict with any of the terms and conditions summarized in a-f above;*
- h. *Finally, and perhaps most important, the data and the applicable license must be kept under the legal control of the data providers, and not GEO or GEOS..*

3. Based on these characteristics, the GEO Members and Participating Organizations should consider adopting one of the following existing private-law waivers or standard common-use licenses, which are presented below from pure public domain to the adoption of the legal attribution condition by license<sup>5</sup>:

**a. Creative Commons Public Domain Mark.** The CC Public Domain Mark is used to mark and identify data sets already in the public domain, enabling their more ready identification in global web searches. For a full description, see <http://creativecommons.org/choose/mark/>.

**b. Creative Commons Public Domain Dedication (CC0).** To the extent possible under law across the world, the person or authority who associates CC0 with the work waives all copyright and related or neighboring rights to this work. For the text of this waiver, see: <http://creativecommons.org/choose/zero/>.

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<sup>5</sup> Examples of standard, common-use licenses that meet the GEOSS Data-CORE terms and conditions, but that are geographically limited or constrained to a particular type of data and information (e.g., information generated by a government agency) include: the U.K. Open Government Licence for Public Sector Information (OGL), available at <http://www.nationalarchives.gov.uk/doc/open-government-licence/>, and the Norwegian Open Data License for Public Sector Information (NLOD), available at <http://data.norge.no/nlod>.

**c. Open Data Commons Public Domain Dedication and License (PDDL).** The PDDL allows the database user to “copy, distribute and use the database”; “produce works from the database”; and “modify, transfer and build upon the database.” See: <http://www.opendatacommons.org/licenses/pddl/1-0/> for the full text of the license and waiver.

**d. Creative Commons Attribution License (CC BY 3.0).** The CC BY 3.0 license allows the database user “to Share – to copy, distribute and transmit the work”, and “to Remix – to adapt the work”, as long as the user “attribute[s] the work in the manner specified by the author or licensor” (plus some other conditions described in the license). See: <http://creativecommons.org/licenses/by/3.0/legalcode> for the full text.

**e. Open Data Commons Attribution License (ODC BY 1.0).** The ODC BY 1.0 license allows the database user “To Share: To copy, distribute and use the work”, “To Create: To produce works from the database”; and “To Adapt: To modify, transform and build upon the database”, as long as the user “attribute[s] any public use of the database, or works produced from the database, in the manner specified in the license.” See <http://www.opendatacommons.org/licenses/by/> for the full text.

4. Custom licenses that have the same terms and conditions as the characteristics listed in recommendation 2 above can also be used to provide data through the GEOSS Data-CORE, although such custom licenses will not be vetted and approved by the GEO Members in advance.

## **Appendix C**

**GEOSS LIABILITY 20 AUGUST 2011**

## Liability Issues in the Global Earth Observation System of Systems

Legal Liability Sub-Group  
Data Sharing Task Force  
Group on Earth Observation

### EXECUTIVE SUMMARY

The Group on Earth Observations (GEO) is a voluntary consortium of Member countries and non-governmental Participating Organizations (mostly not-for-profit and some for-profit) that seeks to promote human welfare in nine “societal benefit areas” through the Global Earth Observation System of Systems (GEOSS). The group is creating the *GEOSS Common Infrastructure*. Member countries and non-governmental Participating Organizations, along with others, produce and make available through GEOSS both geospatial data sets and services. The *GEOSS Common Infrastructure* is itself a service.

Liability is a creation of the law to support a range of important social goals such as avoidance of injurious behavior, encouraging the fulfillment of obligations established by contracts and licenses, and the distribution of losses to those responsible for them. If decisions are made based on use of an exchange or communication system such as the *GEOSS Common Infrastructure* which is developed and maintained for use by others, there will always be liability exposure. Reducing liability exposure for creators and contributors to such a system and minimizing losses for users of such an information system or infrastructure is achieved primarily through performing competent work and keeping all parties informed of their obligations.

The Legal Liability Sub-Group of the Data Sharing Task Force of GEO recommends the following actions:

1. Conditions of Use: GEO should (a) consider posting explicit and comprehensive conditions of use on its GEOSS Common Infrastructure websites incorporating such issues as an explanation of the purpose of the website and deployed capabilities, the privacy policy, registration requirements and expectations, expected user conduct, conditions for use of the site content, conditions for contributing content, conditions for use of communications forums, procedure for reporting alleged unauthorized use of copyrighted material, conditions for use of trademarks and logos found on the site, disclaimers of warranties, liability and endorsements, and controlling law in the event of a conflict and (b) engage competent legal counsel to construct and advise it on the explicit language to use.
2. Online Agreements: GEO should (a) consider requiring the clicking of one of more online agreements by those contributing information and comments to its websites with such agreements incorporating all or most of the issues stated in the previous paragraph above and (b) engage competent legal counsel to construct and advise it on the explicit language to use.
3. Business Practices: The Group on Earth Observations (GEO) should strive to ensure that (a) appropriate and comprehensive quality control checks including beta testing are being made and documented prior to technical deployment of infrastructure components, (b) accurate records are being kept in logging *code changes* to the GEOSS Common Infrastructure and (c) accurate records are being kept in logging *contributions* to the GEOSS Common Infrastructure.



# Liability Issues in the Global Earth Observation System of Systems<sup>1</sup>

Legal Liability Sub-Group  
Data Sharing Task Force  
Group on Earth Observation

## A. INTRODUCTION

The Group on Earth Observations (GEO) is a voluntary consortium of Member countries and non-governmental Participating Organizations (mostly not-for-profit and some for-profit) that seeks to promote human welfare in nine “societal benefit areas”<sup>2</sup> through the Global Earth Observation System of Systems (GEOSS). Member countries and non-governmental Participating Organizations are creating the *GEOSS Common Infrastructure*.<sup>3</sup> This facility consists primarily of the *GEO Portal* which “provides an entry point to access remote sensing, geospatial static and in-situ data, information and services,”<sup>4</sup> the *Components and Services Registry* which “provides a formal listing and description of all the Earth observation systems, data sets, models and other services and tools that together constitute the Global Earth Observation System of Systems,”<sup>5</sup> as well as a *Standards and Interoperability Registry*<sup>6</sup> and a *Best Practices Wiki*.<sup>7</sup>

No geospatial data, services or other components are uploaded to or implemented through the registries or *GEO Portal*. That is, all data and services registered in the *GEOSS Common Infrastructure* are maintained under the control of the contributing agencies or parties. The intent of the *GEOSS Common Infrastructure* is to provide to potential users an efficient and effective method to find geospatial data, services and other components that are globally distributed.

Numerous questions have arisen concerning the liability exposure of parties involved in the design, implementation, and maintenance of the *GEOSS Common Infrastructure*. These parties include government agencies, non-governmental participating organizations and individuals representing these organizations. Other parties concerned with liability exposure include those individuals and organizations contributing information to the *Components and Services Registry* and the *Standards and Interoperability Registry* as well as those parties using information in the *GEO Portal* and using data sets and services accessed through the *GEO Portal*.

The goal of this article is to raise liability issues but not to address them except in the context of providing general recommendations by which GEO and members of GEO might choose to address them. The audience for this article is the GEO community to help them assess whether they desire to engage legal counsel to address any of the concerns raised or pursue any of the recommendations listed

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<sup>1</sup> The information contained in this document does not constitute legal representation by the GEO Data Sharing Task Force (DSTF) or its Legal Liability Subgroup. Before using any information in this publication, it is recommended that an attorney licensed in the jurisdiction of interest be consulted for specific legal advice.

<sup>2</sup> According to the GEO document, “The Global Earth Observation System of Systems (GEOSS): 10-Year Implementation Plan” (as adopted 16 February 2005), the nine agreed societal benefit areas are: Reduction and Prevention of Disasters, Human Health and Epidemiology, Energy Management, Climate Change, Water Management, Weather Forecasting, Ecosystems, Agriculture and Biodiversity.

<sup>3</sup> [http://www.earthobservations.org/gci\\_gci.shtml](http://www.earthobservations.org/gci_gci.shtml)

<sup>4</sup> [http://www.geoportal.org/web/guest/geo\\_home](http://www.geoportal.org/web/guest/geo_home)

<sup>5</sup> [http://www.earthobservations.org/gci\\_cr.shtml](http://www.earthobservations.org/gci_cr.shtml)

<sup>6</sup> [http://www.earthobservations.org/gci\\_sr.shtml](http://www.earthobservations.org/gci_sr.shtml)

<sup>7</sup> <http://wiki.ieee-earth.org/>

for the GEOSS Common Infrastructure. A further audience is government agency staff attorneys that may have similar goals.

Although not all are raised again in this article, common liability-related questions being asked about GEOSS include:

- Assume that a government agency or a private party registers a data set in and makes it available through the GEOSS Portal when in fact the proprietary rights in all or substantial portions of the data set are held by others. Do GEOSS members such as those government agencies and non-governmental participating organizations helping to develop and maintain the *GEOSS Common Infrastructure* acquire substantial liability for any damages to the rights holders?
- Are the parties supporting the development and maintenance of GEOSS in a position similar to defendants in court cases where, even though the registry systems held no files and only aided potential users in finding files, the system developers were held liable regardless under contributory liability for copyright infringement principles?<sup>8</sup>
- Can the parties behind the development of GEOSS take advantage of “safe harbor” rules such as are available for Internet Service Providers in removing from the registry challenged data after notification and then restoring the registration if an intellectual property claim eventually fails?
- What if a government agency or a private party registers a data set in and makes it available through the GEOSS Portal under circumstances where some spatially-referenced data is tied to and identifies living individuals? Do GEOSS members such as those government agencies and non-governmental participating organizations helping to develop and maintain the *GEOSS Common Infrastructure* acquire liability for any damages to the persons whose privacy has been breached? Does it make a difference if the inappropriately registered data set is registered maliciously, carelessly or by mistake?
- Do the parties developing and supporting the *GEOSS Common Infrastructure* have a duty to do so competently? What is the standard of care that must be achieved? What is the legal obligation of developers to guard against the use of GEOSS for propagation of viruses and malware by others?
- If users rely on a classification of data found in the GEOSS registry such as the legal or technical status of the data and the classification proves later to be wrong and causes harm, what is the liability exposure for the parties responsible for building and maintaining GEOSS? To what degree are the parties behind the development of GEOSS responsible for ensuring accuracy and making corrections?
- Does it make a difference if the defendant is a government agency versus a non-governmental participating organization? Under what circumstances can individuals be held personally liable in addition to their organizations?
- To what extent can waiver or disclaimer language posted on the GEOSS web sites minimize liability exposure for the GEOSS developers? Is it good practice to use such language to inform contributors and users of the *GEOSS Common Infrastructure* (i.e. GEO Portal and registries) about their responsibilities regardless of the effect on liability exposure?
- To what extent can “click” licenses or contracts imposed on those registering data sets and services through the *GEOSS Common Infrastructure* help in minimizing liability exposure? To what extent will such agreements be valid if they are “clicked” by low level agency technical staff rather than by administrators authorized to act for the contributing agency?
- To what extent can “click” licenses or contracts imposed against portal users protect against damage claims by users of GEOSS? Does the sophistication of the user make a difference?

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<sup>8</sup> [https://secure.wikimedia.org/wikipedia/en/wiki/Secondary\\_liability](https://secure.wikimedia.org/wikipedia/en/wiki/Secondary_liability)

- Is it good business practice to use such “click” agreements to inform information contributors and users of their responsibilities regardless of the effect on liability exposure?
- What about third parties that rely on a mistaken statement of fact in the GEO Portal yet acquire the data elsewhere without ever clicking on a GEO Portal user agreement?
- What are the potential liability ramifications if a statement or metadata listed in the GEO Portal concerning accuracy, precision, or fitness of use for a particular purpose is false and use of the geospatial data or service causes substantial physical or economic harm for a user? If liability exposure is significant, are there actions that GEO can take to lessen exposure for its members and participating organizations that are supporting the development and maintenance of the infrastructure?
- What actions may GEO members and participating organizations take on their own server download and service sites to minimize liability exposure?

## **B. OVERVIEW OF BASIC LIABILITY PRINCIPLES AND CONCEPTS**

Organizations must consider a number of legal risks when collecting, using or transferring geospatial data. These risks include (i) complying with any third party intellectual property rights in the data, (ii) issues associated with data quality or injuries that arise due to use or unforeseeable misuse of the data, (iii) violating an individual’s right to privacy (as that term is defined and protected around the world; and (iv) disclosing national secrets and/or violating national security legislation. Failure to adequately address these risks through internal processes or allocate these risks through contract or other agreements can result in substantial monetary damages as well as in some cases criminal liability. In some cases GEOSS and GEO members may be within the potential liability chain for data accessed through the GEOSS Common Infrastructure.

“Liability in data, products, and services related to geographic information systems, spatial data infrastructure, location based services and web mapping services, is complicated by the complexities and uncertainties in liability for information system products and services generally. Each application of geospatial technologies to a specific use may require integration of different types of data from multiple sources, assessment of attributes, adherence to accuracy and fitness-for-use requirements, and selection from among different analytical processing methods. All of these actions may be fraught with possible misjudgments and errors and subject to various national laws. A variety of software programs may be run against a single geographic database, while a wide range of users may have very different use objectives. The complexity of the legal questions surrounding liability for geospatial data, combined with the diversity of problems to which geospatial data and technologies may be applied and the continually changing technological environment, have created unsettling and often unclear concerns over liability for geospatial technology development and use.”<sup>9</sup>

The challenge for GEO and all member organizations is to meet GEOSS objectives within a framework that permits acceptable risk. This requires identifying the potential risks and then mitigating unacceptable risk through such measures as agreements (e.g. licensing regimes), internal processes, training and education.

## **C. LEGAL STATUS OF CONTRIBUTIONS TO GEOSS**

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<sup>9</sup> H.J. Onsrud, “Liability in the Use of GIS and Geographical Datasets” in: P. Longley, M. Goodchild, D. Maguire, and D. Rhind (eds.), *Geographical Information Systems: Vol.2 Management Issues and Applications*, John Wiley and Sons, Inc., 1999, pp. 643-652.

As mentioned in the introduction, no geospatial data, services or other components are uploaded to or controlled by the *Components and Services Registry* or the *GEO Portal*. All data and services registered in the *GEOSS Common Infrastructure* are maintained under the control of the contributing agencies or parties. They retain any proprietary rights they may have in their contributions. However, questions have arisen as to whether an agency or other organization by registering a data set or other resource within the *GEOSS Common Infrastructure* either implicitly or explicitly agrees to conditions set forth for use of the registry.

It has been argued by some GEO members that by registering a resource in GEOSS the agency providing the registry information for a resource is legally binding the contributing agency to the conditions as established by the GEO membership for any listed resources. That is, the conditions agreed upon and established by the GEO membership should trump any conflicting provisions imposed on users when users access data or services at a specific GEO member's server site. This is an issue that should be explicitly clarified by and for the GEO membership.

Under the current language used in the *GEOSS Common Infrastructure* it would appear that registration of a resource within the GEOSS registry is equivalent to listing data in a public catalog with no intent to change the legal status of the data contributed. The controlling rights in the resource are determined by the provider and are likely to be found through listed terms of use on the data download site, a click agreement on the download site, or through the controlling national law. If the intent of the GEO members is to change this outcome it should be done so explicitly.

## **D. KINDS OF RISKS AND LIABILITY EXPOSURE**

### **1. Parties at Risk**

The Group on Earth Observations (GEO) is open to all member States of the United Nations and to the European Commission. Membership in GEO is contingent upon formal endorsement of the GEOSS 10-Year Implementation Plan.<sup>10</sup> GEO Members are nations and not individual government agencies. As such, the formal letter of commitment to the GEOSS 10-Year Implementation plan is typically signed at the ministerial level. GEO Participating Organizations are required to be intergovernmental, international, or regional organizations with a mandate in Earth observation or related activities and their acceptance is subject to approval at a plenary meeting of the GEO members.

GEO has not been formed as a legal entity under the laws of any jurisdiction and the organization does not have a published convention as is often established for other international organizations.<sup>11</sup> GEO itself has never hired any consultants or personnel nor signed any contracts. Contracts for staff are made and signed by the World Meteorological Association (WMO), through a Standing Arrangement between GEO and WMO adopted by the ad hoc GEO at its Sixth Plenary Meeting in Brussels on 15 February 2005. Moreover, member nations are not bound by a written treaty with respect to GEOSS. With no legal document establishing its creation nor any evidence as a contracting body, GEO appears to not exist as a juridical entity.

In addition to likely lack of existence as a juridical body, GEO itself does not have significant assets. Thus as discussed in further detail below, if a party is seeking compensation for damages that arise from

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<sup>10</sup> See [http://www.earthobservations.org/documents/GEO\\_Rules\\_of\\_Procedure.pdf](http://www.earthobservations.org/documents/GEO_Rules_of_Procedure.pdf)

<sup>11</sup> See for example the Convention of the World Meteorological Organization which includes provisions addressing its legal status, privileges and immunities. [ftp://ftp.wmo.int/Documents/MediaPublic/Publications/Policy\\_docs/wmo\\_convention.pdf](ftp://ftp.wmo.int/Documents/MediaPublic/Publications/Policy_docs/wmo_convention.pdf)

use of the GEOSS Common Infrastructure, the parties they would most likely look to for recovery would include GEO Members, GEO Participating Organizations (non-governmental organizations that are mostly not-for-profits but also may include some for-profit organizations), contributors to GEOSS (these may or may not be GEO Members or GEO Participating Organizations) and other users of GEOSS (these may include any human or organizational entity on Earth).

## **2. Kinds of Risk**

Data providers are subject to a variety of legal risks when allowing third parties access to use of their data. Data providers must often ensure that the data sets comply with national and international legal and legislative responsibilities prior to supplying the data externally, including making them accessible online. Failure to do so may result in damages, fines or criminal sanctions being levied on the data provider. GEO members and participating organizations are taking on additional risk through their active support of development of an infrastructure (i.e. GEOSS) that may unreasonably facilitate widespread infringements of the rights of others.

Notable areas of risk include:

### **a. Duty to Prevent Harm as Established through Tort, Contract and Legislation**

Although the Group on Earth Observations (GEO) does not itself produce geospatial datasets, it does provide a service to access such data. Further, GEO Members and GEO Participating Organizations produce and make available through GEOSS both geospatial data sets and services. Data providers need to ensure that their offerings do not unreasonably cause harm to others. People using geospatial data sets, products, and services are often disappointed in their expectations. Representations that a data set, service or product is complete or sufficient to accomplish specified tasks may be false or misleading. Further data sets may contain errors or blunders. In many instances the disappointed user or purchaser may have a contract relation with the technology product or service provider upon which to assert their claim. Courts across the globe often strive to support freedom of the parties to contract and thus will often strongly support the provisions as set forth in contracts and licenses. In disputes based on contract principles, the issue of warranty, either express or implied, will typically be raised as a basis of claim. Tort theories come to the forefront when the goal of the law is to prevent harms to the public generally. Thus, tort concepts such as negligence and strict liability may often be invoked by third party users outside of and independent of contractual considerations. Certain geographic information services and products if found defective may be held by public policy to be unreasonably harmful to persons or property if offered to the public. In these instances, the tort theory of strict liability will be important. Whether standards of performance are established by contract, legislation or judge-made common law, providers of geospatial data sets and services may be held liable for those harms and resulting damages they had a duty to prevent.

### **b. Violation of Intellectual Property and Other Proprietary Rights**

Perhaps the most significant risk for contributors, users and developers of GEOSS is the violation of third parties' intellectual property or other proprietary rights in data sets registered in GEOSS. Data providers should make reasonable efforts to ensure they hold sufficient ownership rights in the data they propose to register in GEOSS, i.e. they can only share what they are legally entitled to share. If the data set proposed to be shared has been derived from third party sources protected by intellectual property rights or other statutory restrictions (see below), checks are required to determine whether the necessary rights are held and whether any express or implied restrictions apply. For example are any third party intellectual property or other proprietary rights present in the data (as "foreground" intellectual property) and, if so, will the third party's rights be infringed by sharing? Is the information held under license

terms that would be infringed by sharing? For example the license may restrict the sharing of: "copy derived"<sup>12</sup> information, or reverse engineered information (i.e. where the original 3rd party intellectual property can easily be recreated), or even non-copy derived information (i.e. the license restricts any derivation).

Checks to determine that the necessary rights are held can involve extensive work evaluating the provenance of a data set, how it was created and the licenses that apply to each input source. The conclusion of these investigations is often not definitive. As a result, there is often legal risk assessment required. This is true even when the data provider has paid a third party data collector for ownership rights, as the default in copyright law in many jurisdictions is that the data collector owns the rights to the data so providers must ensure they claim the rights (via contract) in any data collected for them, i.e. by contractors on their behalf.

### **c. Violation of Privacy Rights**

Data providers also face a risk that their data does not contravene national or international personal confidentiality. The confidentiality of individuals are protected by law in many jurisdictions, most notably within the European Union<sup>13</sup> under the European Convention on Human Rights (ECHR) and the Data Protection Directive (Directive 95/46/EC on the protection of individuals with regard to the processing of personal data and on the free movement of such data) as transposed within Member States. In certain jurisdictions common law also protects from disclosure information (whether personal or not) that is given in circumstances giving rise to an obligation of confidence.

Failure to comply with personal data legislation can result in the prevention of further processing of personal information by that organization, civil remedies (including damages) and criminal sanctions for both organizations and individuals (e.g. directors, managers and even employees). As a result, they may take steps to remove or aggregate confidential data, e.g. by anonymizing or summarizing information so that persons are not identifiable. However, privacy issues are very fluid, and it will be difficult for data providers to prepare for all contingencies.

### **d. Violation of National Security**

Many jurisdictions control the disclosure of classified or sensitive information that should it be released may damage national security, defense or public safety if released to the public or to individuals who are not authorized to receive it. The degree of sensitivity required is generally based upon some classification scheme of the information based on administrative regulations, for example as: restricted, confidential, secret, or top secret. Data providers to the GEOSS Data-CORE need to ensure that their data sets are checked in accordance with national legislation and classification systems to ensure information is suitable for disclosure. Failure to comply with national security restrictions can result in criminal liability and imprisonment.

### **e. Violation of Commercial Confidentiality or Trade Secrets**

Although many GEO Members (Governments) are subject to freedom of information and other legislation that establish a "right to know" or require the proactive dissemination of information, they often acquire and hold commercially sensitive information or trade secrets about businesses and organizations within their jurisdiction. This information is often acquired on the condition that they are held in confidence. Sensitive information can include information that indicates how a business

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<sup>12</sup> Copy derived means that the derived information includes a copy of the third party's information as a whole or a substantial part of it.

<sup>13</sup> Other jurisdictions such as the US have different approaches to data protection that tend to be less integrated.

operates, who its customers are or any other information of commercially sensitive nature that could have major financial repercussions for a company if disclosed to a competitor. Unless there is a legislative requirement to do so, disclosure of commercially confidential information could result in legal action either to prevent disclosures or recover damages.

#### **f. Reputational Risks**

Although not as significant or serious as the risks outlined above, data providers also face reputational risks if they choose to provide poor quality data into the GEOSS Data-CORE. Quality issues could relate to the scale or fitness for purpose of data (which may largely be countered by appropriate metadata) but may also relate to the technical quality of data, in particular GIS (Geographic Information Systems) data, which may contain topological errors that affect its usability. When providing data into systems such as GEOSS, data providers also need to accept the risk that their data will be misunderstood, and misused.

### **E. SOVEREIGN IMMUNITY PROTECTIONS AND LIMITS**

#### **1. Sovereign Immunity of the United States Federal Government**

The U.S. Government enjoys sovereign immunity but it is not explicit in either the U.S. Constitution or any statute. Instead, it rests on the common law principle that subjecting the Federal government to private litigation could constitute a serious interference with the performance of its functions and control over its instrumentalities, funds, and property.

The Federal Tort Claims Act (FTCA) is the statute by which the United States has authorized certain tort suits to be brought against itself. As a result of the common law doctrine of sovereign immunity, the United States cannot be sued without its consent. By enacting the FTCA, Congress waived sovereign immunity of the U.S. Government for some tort suits. With exceptions, it made the United States liable for injury or loss of property caused by the negligent or wrongful act or omission of any employee of the government while acting within the scope of office or employment.<sup>14</sup> Thus U.S. government employees involved in designing and developing the GEOSS Common Infrastructure may make their agencies liable for their negligent performance or wrongful acts or omissions in their performance. Among other exceptions, such as the discretionary function exception, the United States may not be held liable for claims arising in a foreign country. The U.S. Supreme Court has interpreted this exception to bar all claims based on any injury suffered in a foreign country, regardless of where the tortious act or omission occurred.<sup>15</sup>

The discretionary function exception is the most significant exception to U.S. Government liability that is explicitly provided for in the FTCA. This exception immunizes the United States from claims “based upon the exercise or performance or the failure to exercise or perform a discretionary function.”<sup>16</sup> It precludes liability even if a federal employee acted negligently in the performance or nonperformance of a discretionary duty. The decision of the U.S. Government to participate in GEOSS was the result of the deliberate exercise of policy discretion by U.S. Government officials. Further, the method and manner of implementation of GEOSS can be characterized as involving a high degree of discretion and judgment.<sup>17</sup> Therefore, it is likely that the U.S. Government’s participation in GEOSS would fall under the

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<sup>14</sup> 28 U.S.C. §§ 2671 *et seq.*

<sup>15</sup> *See Sosa v. Alvarez-Machain*, 542 U.S. 692, 712 (2009).

<sup>16</sup> 28 U.S.C. § 2680(a).

<sup>17</sup> *Berkovitz v. U.S.* 531 (1988), *U.S. v. Gaubert*, 499 U.S. 315 (1991)

discretionary function exception to the FTCA. This would make it difficult for the U.S. Government to be successfully sued in Federal court for any damage allegedly caused by the negligent or wrongful act or omission of any employee assigned to implement or manage GEOSS related activities.

As to copyright infringement, the United States has waived its sovereign immunity in three instances: 1) when the United States government itself infringes a copyright, 2) when a corporation owned or controlled by the United States infringes, and 3) when a contractor or person or entity acting for the United States with its authorization or consent infringes.<sup>18</sup> The U.S. Court of Appeals, Federal Circuit, has affirmed that the U.S. Government is not liable for contributory copyright infringement as a matter of law since the U.S. has not waived its sovereign immunity.<sup>19</sup> In addition, the U.S. copyright statute specifically precludes claims arising in a foreign country.<sup>20</sup> Absent facts establishing one of the three instances where the U.S. Government has consented to be sued for copyright infringement, it would be difficult for the U.S. Government to be successfully sued in Federal court for damage allegedly caused by copyright infringement arising from its participation in GEOSS.

## **2. State Sovereign Immunity in the United States**

State Governments also enjoy sovereign immunity deriving from public law. The doctrine of sovereign immunity was in effect in all states that were in existence at the time of the drafting of the U.S. Constitution and still exists today by extension in all States. The concept is based on early English law, which provided that the Crown could not be sued in English courts without its consent. Therefore, whether a state government may be sued in its own court system will depend on whether it has consented to be sued for the harm alleged. Many states have consented to be sued pursuant to statute or by express authorization within their state constitution.

In addition, the Eleventh Amendment to the U.S. Constitution provides that “[t]he Judicial power of the United States shall not be construed to extend to any suit in law or equity, commenced or prosecuted against one of the United States by Citizens of another State.” Although this text appears to be limited to preventing citizens from bringing “diversity” cases against states in federal courts, the Supreme Court has expanded the concept of state sovereign immunity further to prohibit citizens generally from bringing suits against states under federal law. Specifically, the Amendment provides that a non-consenting state is immune from suits brought in federal courts by its own citizens as well as citizens of another state, and foreigners. This immunity extends to state agencies as well. In determining whether an entity is an arm of the state and, therefore, entitled to Eleventh Amendment immunity, the courts consider various factors, including whether payment of a judgment would come from the state treasury, the status of the entity under state law, and the entity’s degree of autonomy. State courts’ decisions can vary by district, region and state. The U.S. District Court, S.D. New York, has recently agreed with other courts in its district that senior colleges of the CUNY system are arms of the State of New York for Eleventh Amendment purposes.<sup>21</sup> Although it extends to entities that are arms of a state, the Eleventh Amendment does not extend its immunity to units of local government.

Eleventh Amendment immunity is subject to three exceptions: 1) Congressional abrogation; 2) state waiver; and 3) suits against individual state officers for prospective relief to end an ongoing violation of Federal law.

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<sup>18</sup> 28 U.S.C. § 1498.

<sup>19</sup> *Boyle v. U.S.*, 200 F.3d 1369 (Fed. Cir., 2000).

<sup>20</sup> 28 U.S.C. § 1498c.

<sup>21</sup> *Hamilton v. City College of the City University of New York*, 173 F. Supp. 2d 181 (U.S.D.C. S.D.N.Y., 2001.)



The Copyright Remedy Clarification Act (CRCA) was passed in 1990 with the intent of subjecting states to liability for copyright infringement. However, the CRCA has been subsequently found by two U.S. Circuit Court of Appeals to be unconstitutional, as an improper exercise of Congressional legislative power under the Fourteenth Amendment, and therefore not a valid abrogation of state sovereign immunity.

### **3. Sovereign Immunity in Europe**

Sovereign immunity is the doctrine that the state is immune from civil or criminal liability unless it agrees otherwise. Agreement to be subject to liability may often be found in the constitutions or laws of individual nations<sup>22</sup> and in international agreements and treaties.<sup>23</sup> These typically specify the circumstances and conditions under which citizens and foreign entities may bring suit. Consideration of sovereign immunity principles within and among national jurisdictions in Europe is complex and beyond the scope of this paper. As a general principle, while sovereign immunity may offer significant protections, government agencies in Europe should not assume that the doctrine is as expansive as the protections provided to federal agents in the U.S. and should thoroughly investigate the limits of protection by the doctrine in their own jurisdictions.

With regard to the European regional supranational organization, the European Union accepts the principle of its non-contractual liability for damage caused by itself or by its servants in the performance of their duties. The Court of Justice of the European Union has exclusive jurisdiction on such claims and will judge them in accordance with the general principles of non-contractual liability common to the laws of the European Union Member States<sup>24</sup>. An analysis of the Court of Justice's case law and of the general principles common to the laws of the Member States should therefore be performed to assess the extent of the accepted liability. This analysis is beyond the scope of this paper.

### **4. Other Jurisdictions**

Sovereign immunity is a legal principle enforced by governments across the globe. The sovereign immunity principles discussed for the United States and for Europe within the previous paragraphs are merely illustrative. The form and application of the principles vary from nation to nation. Agencies in each nation should thoroughly investigate the limits of protection by the doctrine in their own jurisdictions. As a general rule, however, governments and their agents are often in a lesser liability exposure position than private parties and organizations within the same jurisdictions.

## **F. LIABILITY RISKS FOR PARTICIPATING NON-GOVERNMENT ORGANIZATIONS**

Parties expressing the greatest concern over liability exposure for their participation in GEOSS development are those individuals, non-profit organizations and private organizations engaged in the development of the GEOSS Common Infrastructure that do not have deep government legal resources to defend themselves in the event of a major lawsuit for damages nor the potential protections of sovereign

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<sup>22</sup> Illustrative constitutional and/or legislative authorizations may be found at [https://secure.wikimedia.org/wikipedia/en/wiki/Sovereign\\_immunity](https://secure.wikimedia.org/wikipedia/en/wiki/Sovereign_immunity)

<sup>23</sup> Illustrative examples of agreements among nations include the European Convention on State Immunity (<http://conventions.coe.int/Treaty/en/Treaties/Html/074.htm>) signed by eight European States and the United Nations Convention on Jurisdictional Immunities of States and Their Property ([http://untreaty.un.org/ilc/texts/instruments/english/conventions/4\\_1\\_2004.pdf](http://untreaty.un.org/ilc/texts/instruments/english/conventions/4_1_2004.pdf)) that is not yet in force.

<sup>24</sup> Articles 268 and 340 of the Treaty of the Functioning of the European Union.

immunity. By example, the U.S. Government is not liable for contributory copyright infringement as a matter of law (i.e. one of the greatest liability risks for contributors and developers of GEOSS) yet GEO Participating Organizations and private companies contributing to the building and maintenance of the GEOSS Common Infrastructure may be vicariously liable for damages through the actions of their engaged employees, officers and executives. Private companies, universities and non-profit organizations (e.g. NGOs) may have the deepest pockets to look to for recovery in the event that major damages accrue and government agencies and agents are found immune from recovery. While GEO Participating Agencies can do much to protect themselves such as through the use of their own good business practices and utilization of liability insurance, GEO needs to be concerned with aiding in the reduction of liability for all parties if it intends to keep others than government agents involved in the development, maintenance, expansion and growing use of the GEOSS Common Infrastructure over time.

## **G. METHODS FOR REDUCING LIABILITY EXPOSURE**

### **1. Good Business Practices by GEO**

Liability exposure often can be reduced through appropriate communications, use of contracts or licenses, and following good business practices. Communications may be enhanced in the context of Internet deployed information infrastructure by posting conditions of use on appropriate web sites. Broadly applicable licenses with no practical ability for users to alter the language are typically imposed in Internet use and interaction environments rather than one-on-one negotiated contracts. Good business practices typically include such things as reasonably checking the validity and accuracy of an information system prior to making it publicly available and ensuring that the infrastructure accomplishes what it purports to do as it is maintained and altered over time. Good business practices typically also include maintaining accurate and secure records or transaction logs that divulge when specific infrastructure alterations were made and by whom, who registered and when, who agreed to click agreement provisions and when, and when and by whom information contributions were made.

### **2. Potential Conditions of Use to Post on GEOSS Common Infrastructure Websites**

Typical conditions of use that might be posted on GEOSS Common Infrastructure websites might include such items as explanation of the purpose of the website and deployed capabilities, registration requirements and expectations, expected user conduct, conditions for use of the site content, conditions for contributing content, conditions for use of communications forums, procedure for reporting alleged unauthorized use of copyrighted material, conditions for use of trademarks and logos found on the site, disclaimers of warranties, liability and endorsements, and controlling law in the event of a conflict. The site should also clearly state its privacy policy.<sup>25</sup>

### **3. Potential Click Agreements for Contributors to the GEOSS Common Infrastructure**

In addition to posting conditions of use to apply to all users of GEOSS Common Infrastructure websites, GEO should consider imposing explicit licenses for those contributing information or comments to some

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<sup>25</sup> Example language used for *Terms and Conditions* and *Protection of Privacy* in the sharing of knowledge and data in international contexts may be found on the Zunia web site at <http://zunia.org/terms-and-conditions/> and <http://zunia.org/privacy/>. Additional example language is provided by the U.S. National Oceanic and Atmospheric Administration at <http://www.weather.gov/disclaimer.php>, <http://www.esrl.noaa.gov/psd/disclaimer/>, and <http://www.ngdc.noaa.gov/ngdcinfo/privacy.html> and by the Canada Council on Geomatics Geobase Unrestricted Use License Agreement at <http://www.geobase.ca/geobase/en/licence.jsp>

or all of the websites.<sup>26</sup> By requiring contributors to agree to license terms through volitional clicking of their affirmation, defendants in a lawsuit over damages have much better evidence that the contributor knew or should have known the conditions under which they were allowed to contribute information to the site. A click agreement may address many of the same topics addressed in the Conditions of Use language and should be careful to comport with that language if both devices are used. However, additional conditions may be imposed as well. By example, if by the act of registering a service or component within the GEOSS Common Infrastructure there is an intent that the status of intellectual property or other ownership rights in datasets registered in the infrastructure should or should not change this intent should be made perfectly clear. While a click agreement is likely enforceable only against parties that click the agreement, use conditions posted on the web can and should be designed to be enforceable against all users of the websites.

## H. RECOMMENDATIONS TO GEO FOR ACTION

The Legal Liability Sub-Group of the Data Sharing Task Force of GEO recommends the following actions:

1. Conditions of Use: GEO should (a) consider posting explicit and comprehensive conditions of use on its GEOSS Common Infrastructure websites incorporating such issues as an explanation of the purpose of the website and deployed capabilities, the privacy policy, registration requirements and expectations, expected user conduct, conditions for use of the site content, conditions for contributing content, conditions for use of communications forums, procedure for reporting alleged unauthorized use of copyrighted material, conditions for use of trademarks and logos found on the site, disclaimers of warranties, liability and endorsements, and controlling law in the event of a conflict and (b) engage competent legal counsel to construct and advise it on the explicit language to use.
2. Online Agreements: GEO should (a) consider requiring the clicking of one of more online agreements by those contributing information and comments to its websites with such agreements incorporating all or most of the issues stated in the previous paragraph above and (b) engage competent legal counsel to construct and advise it on the explicit language to use.
3. Business Practices: The Group on Earth Observations (GEO) should strive to ensure that (a) appropriate and comprehensive quality control checks including beta testing are being made and documented prior to technical deployment of infrastructure components, (b) accurate records are being kept in logging *code changes* to the GEOSS Common Infrastructure and (c) accurate records are being kept in logging *contributions* to the GEOSS Common Infrastructure.

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<sup>26</sup> Clickwrap Agreements are more thoroughly discussed at <https://secure.wikimedia.org/wikipedia/en/wiki/Clickwrap>. Sample web sites that might be consulted in looking at a range of language used in Click Agreements in the use or sharing of knowledge and data include:

DATA: Forum Agreement to discuss Research Data, Strategic Highway Research Program (SHRP2), Transportation Research Board <http://forums.preprod.shrp2nds.us/index.php?app=core&module=global&section=register> (this is a pre-production test site prior to beta testing, a data download agreement is forthcoming), Helcom Map and Data Service, <http://maps.helcom.fi/website/mapservice/index.html>, Cancer Data Use Agreement, <http://statecancerprofiles.cancer.gov/datause.html>

SERVICE: E-Mail Service Signup Clickwrap Agreement, <https://accountservices.passport.net/reg.srf?id=2&sl=1&lc=1033>

SOFTWARE: Example Software Clickwrap Agreement;

[https://www.compassanchor.com/CIRB\\_docs/AnchorLicenseAgreement.pdf](https://www.compassanchor.com/CIRB_docs/AnchorLicenseAgreement.pdf)

## I. SUMMARY

Liability is a creation of the law to support a range of important social goals such as avoidance of injurious behavior, encouraging the fulfillment of obligations established by contracts and licenses, and the distribution of losses to those responsible for them. If decisions are made based on use of an exchange or communication system produced by other than the user of the system, there will always be liability exposure. Minimizing losses for users of an information system or infrastructure and reducing liability exposure for creators and contributors to such a system is achieved primarily through performing competent work and keeping all parties informed of their obligations. Liability in data, products and services made available through the GEOSS Common Infrastructure is likely to be determined in many instances by resort to contract law and warranty issues. Tort theories, such as negligence and strict liability, come to the forefront when preventing harms to the public generally arises as an issue. Assessing liability exposure arising under statutory law requires consideration of the specific language of the legislation in each nation or other jurisdiction. The availability of immunity for government agencies from damages varies among nations. Finally, international agreements on liability for injuries resulting within world trade contexts may be determinative or have an effect on the outcome of damage claims. All of these issues should be considered by GEO in reviewing its own operations and by a law firm in constructing language to better reduce the liability exposure of those agencies and organizations involved in developing and maintaining the GEOSS Common Infrastructure.

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