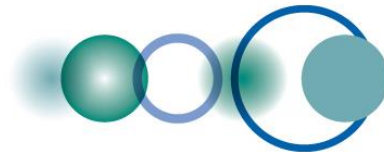


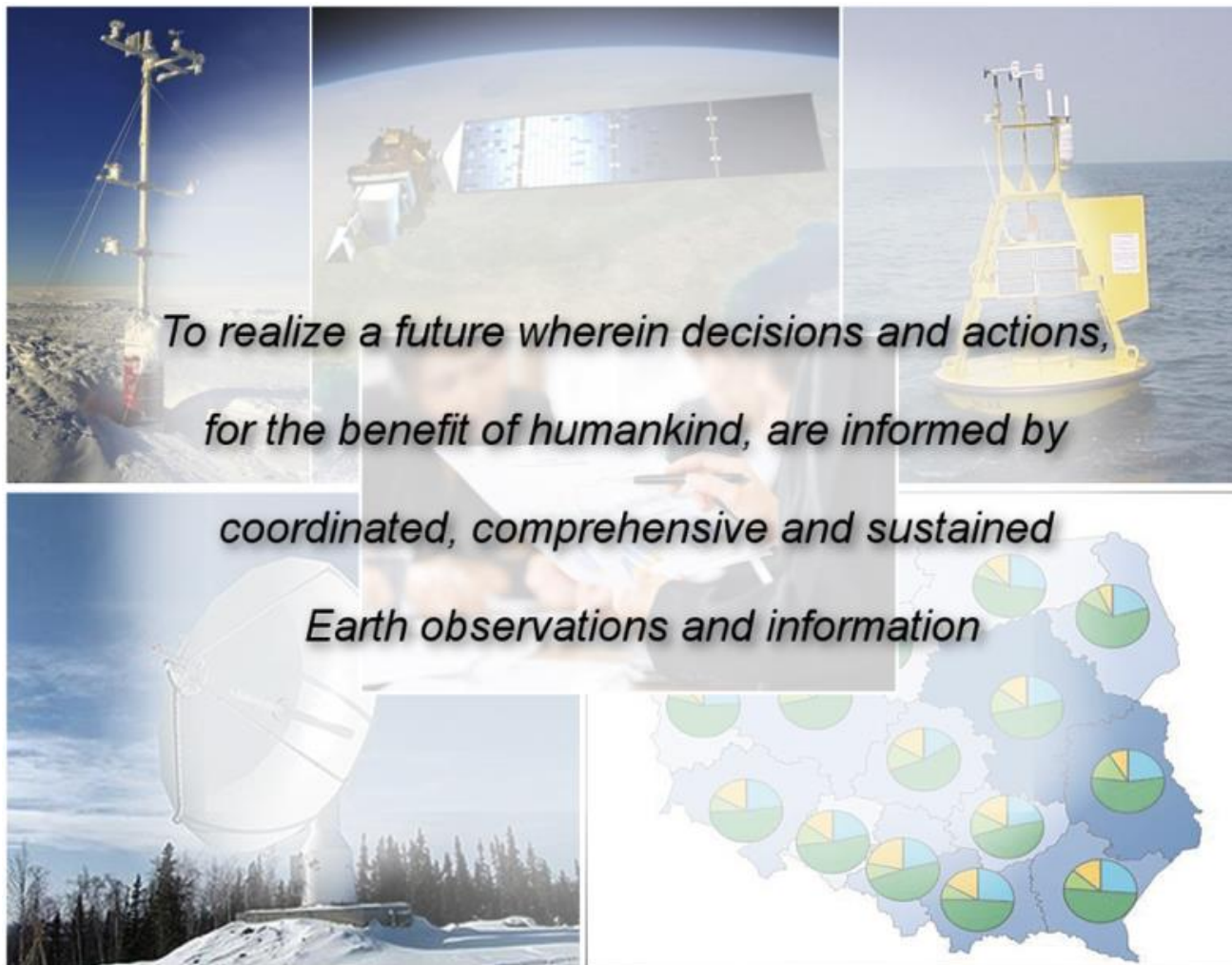


Introduction to the *GEOSS Common Infrastructure (GCI), Data Sharing Principles (DSPs) & Data Management Principles (DMPs)*

Siri Jodha S. Khalsa
23 October 2017



GEO Vision



Achieving the GEO Vision

Through Advocacy, Cooperation & Technology

Connect those who need sound and timely environmental information with resources supplying data and information about the Earth.

Broad, open data policies help ensure that the data collected through national, regional and global observing systems are both available and applied to decision-making for global priorities including:

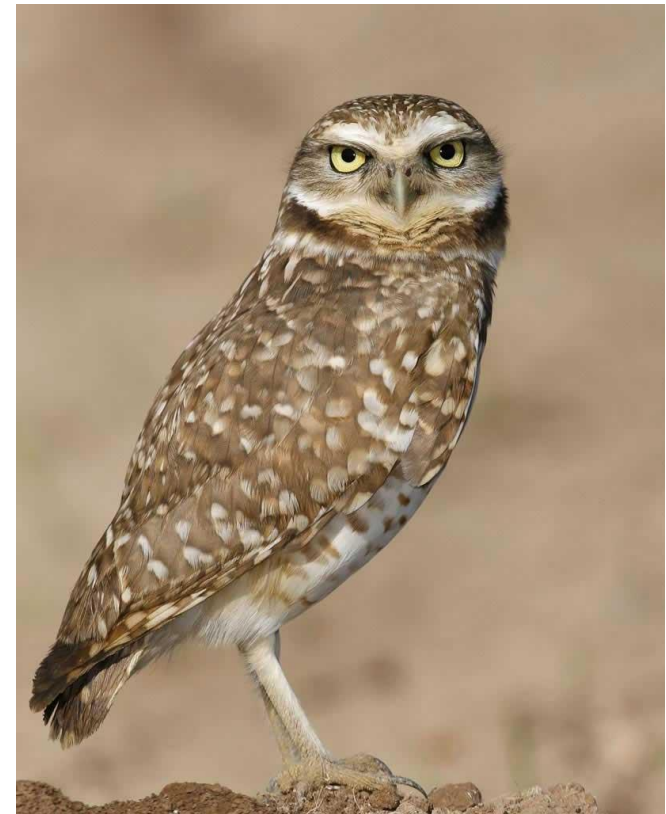
- The UN's Sustainable Development Goals,
- The Paris Agreement on Climate Change,
- The Sendai Framework for Disaster Risk Reduction and
- The Aichi Targets of The Convention on Biodiversity.

What is GEOSS?

The Global Earth Observation System of Systems

GEOSS is a core element of GEO's vision for a world in which decisions are informed by coordinated and sustained Earth Observations

With a goal of better integrating existing and future observing systems and promoting the sharing of data by connecting existing infrastructures using common standards and protocols.

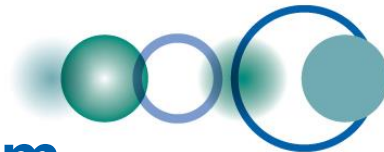




GEOSS the Global Earth Observation System of Systems

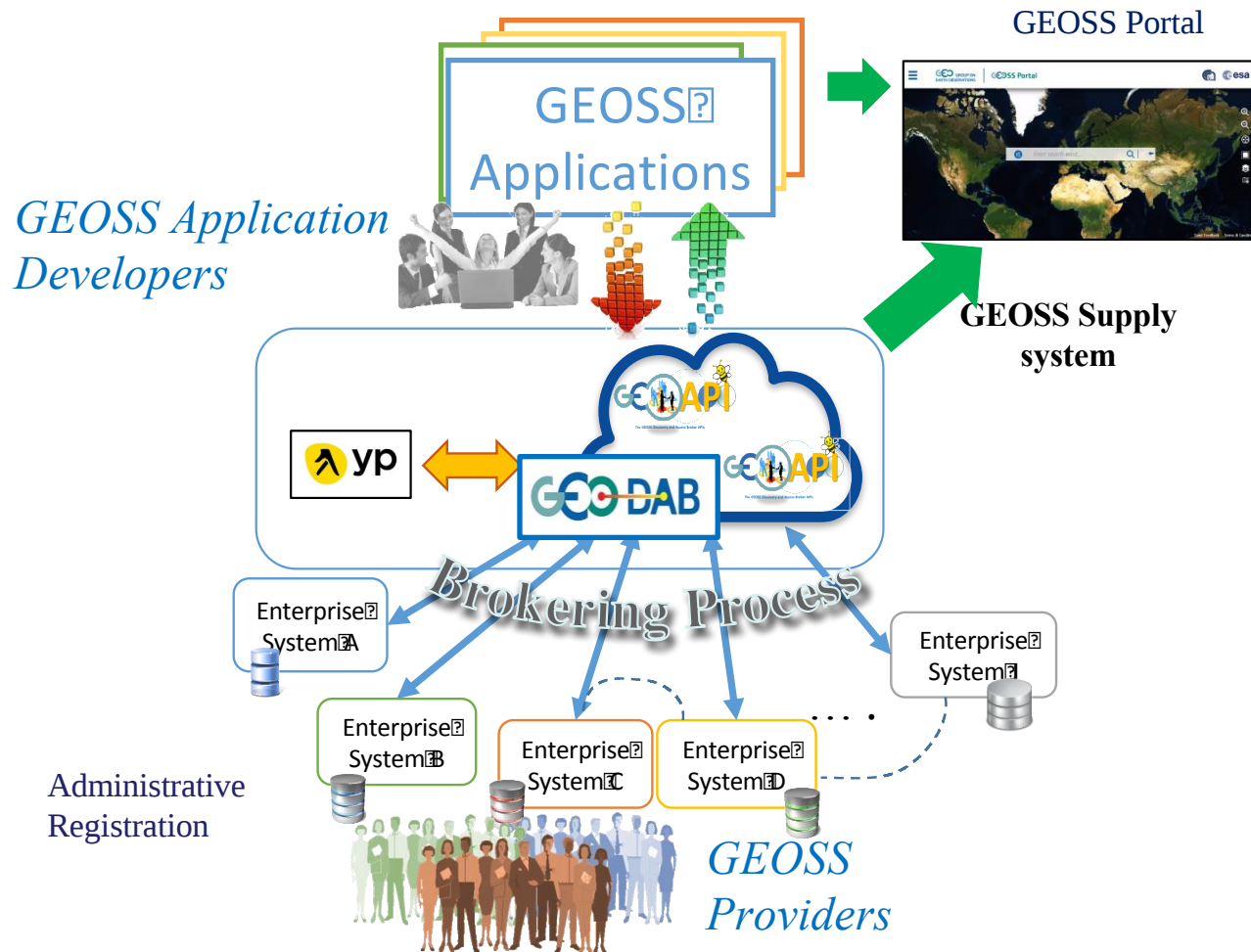


A set of coordinated, independent Earth observation, information and processing systems that interact and provide access to diverse information for a broad range of users in both public and private sectors.



GEOSS Information System

A little bit of complexity



Maximizing the Value of Earth Observations

Only possible if the data are open, accessible and free of cost

GEO works to ensure access to EO data and derived information and knowledge

Key elements of this effort are

- The GEOSS Data Sharing Principles (DSPs)
- Coordination among data providers
- The GEOSS Information System
 - aka the GEOSS Common Infrastructure (GCI)
- The GEO Data Management Principles (DMPs)

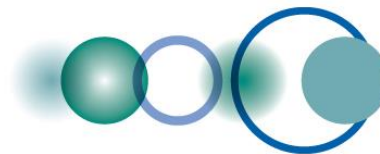


GEOSS Data Sharing Principles (2015)

“The societal benefits of Earth observations cannot be achieved without data sharing.”

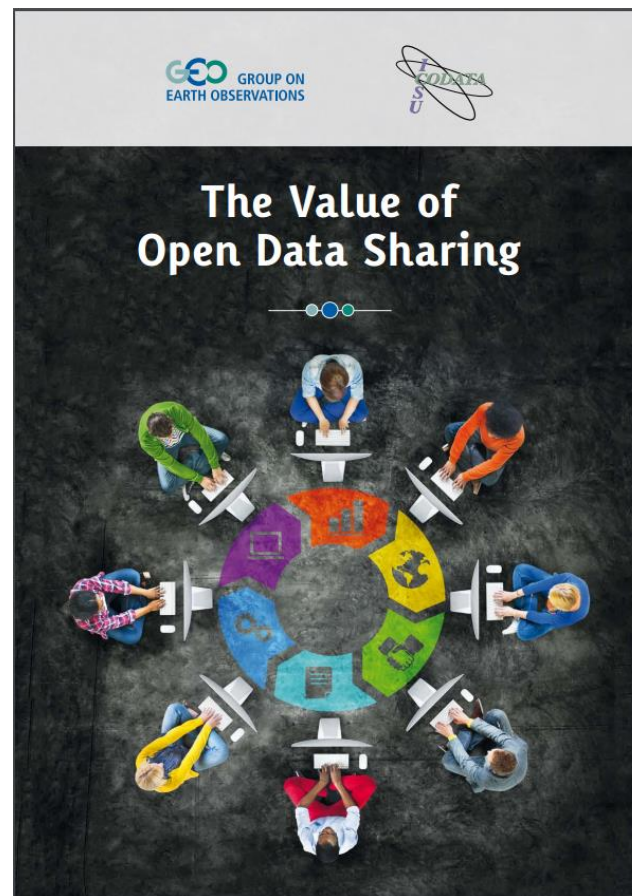
*GEOSS 10-Year Implementation Plan
The Third Earth Summit, Brussels, 2005*

- data, metadata and products will be shared as **Open Data by default**, by making them available as part of the GEOSS Data Collection of Open Resources for Everyone (Data-CORE) **without charge or restrictions on reuse**, subject to the conditions of registration and attribution when the data are reused;
- where international instruments, national policies or legislation preclude the sharing of data as Open Data, data should be made available with minimal restrictions on use and at no more than the cost of reproduction and distribution; and
- all shared data, products and metadata will be made available with minimum time delay.



The Value of Open Data Sharing

- **Economic Growth**
- **Social Welfare**
- **Research & Innovation**
- **Education**
- **Capacity Development**
- **Effective Governance & Policy Making**



[The Value of Open Data Sharing](#)

The GEOSS Portal

Exposure of conformance to DSPs



ice stream

Search Results Number of results: 18182

Filters

KEYWORD ▾	FORMAT ▾	SOURCE ▾
PROTOCOL ▾	ORGANISATION ▾	SERVICE HEALTH ▾

VELMAP: Institute Ice Stream 1986-1989
(Organization: Antarctic Cryosphere Access Portal (WMS))
Scambos, T., B. Raup, and J. Bohlander. 2001. VELMAP: Antarctic ice velocity data. Boulder, Colorado USA: National Snow and Ice Data Center. Digital Media. Available at <http://nsidc.org/data/velmap/>. Accessed 11 February 2009. Instrument: Landsat. Time Period: Feb. 16, 1986 to Jan. 15, 1989. Sample ...

VELMAP: Ice Stream C 1996-1997 (graded)

Visible 1-10 of 18182

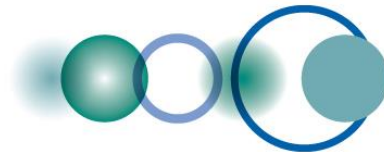


Why the DMPs are Important

*“Ensure that data and information of **different origin and type** are **comparable and compatible**, facilitating their **integration into models** and the development of applications to derive **decision support tools**.”*

GEO Strategic Plan 2016-2025

- Interoperability
- Quality (Fitness for use)
- Trustworthiness



Life-cycle Data Management

Data Management Principles (DMP)

	Discoverable	1	D
	Accessible	2	A
	Standard encoding using	3	Usability
	Well documented metadata	4	
	Traceable	5	
	Quality documented	6	
	Preserved	7	Preservation
	Periodically verified	8	
	Reviewed and refreshed	9	Curation
	Tagged with permanent ID	10	

DMP Implementation Guidelines

- Description / explanation of each principle and implementation
- Guidance on implementation with examples
- Resources for implementing each principle
- Metrics measuring adherence to implement each principle

[GEOSS Data Management Principles: A Brief Overview](#)
[Data Management Principles Implementation Guidelines](#)

DMPs Condensed Version

Earth observations will be **catalogued** or otherwise advertised on the internet so that they can be **discovered**, and will be **accessible** online using **open-standard encodings and services**. Data and services will be comprehensively **documented** using international or community-approved standards, and to the extent possible, peer-reviewed publications, so that users can understand and make use of the data. Metadata will include **access and use conditions**, the **results of quality control procedures**, and **provenance statements** indicating the origin and processing history of the dataset or product. Data and associated metadata will be **protected from loss** and periodically **verified to ensure integrity, authenticity and readability**. **Corrections and updates** to data and metadata records will be performed as required. Finally, **persistent identifiers** will be assigned to data so that they can be tracked and cited and data providers can be acknowledged.

From Principles to Implementation

DOI 10.5281/zenodo.34354



WDS Data Sharing Principles

Purpose

The International Council for Science – [World Data System](#) (ICSU-WDS) aims to provide equitable access to quality-assured scientific data, data services, products and information towards long term data stewardship. Furthermore, ICSU-WDS is committed to foster agreed-upon data standards and conventions, and providing mechanisms to facilitate access to data. As the leading international, multidisciplinary organization in the provision of ICSU-WDS has adopted Data Sharing Principles to advance its goals.

The Principles express core ethical commitments that are operationalized in [WDS Certification](#) and Network Members, it is anticipated that existing organizational policies align with them, but are encouraged to do so. The Principles embody the spirit of 'open science' and diverse communities of data producers and data users, and thus could be adopted for science for the public good.

e-INFRASTRUCTURE DATA MANAGEMENT PROJECT **BELMONT FORUM**

Home About Activities Documents Announcements

Activities » Data Principles

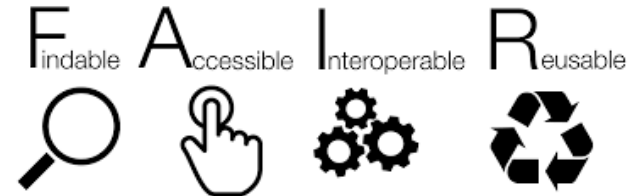
Data Principles

Share this page

The following data principles are recommended for adoption by the Belmont Forum e-Infrastructure and Data Management CRA.

Data should be:

- **Discoverable** through catalogues and search engines, with data access and use conditions, including licenses, clearly indicated. Data should have appropriate persistent, unique and resolvable identifiers.
- **Accessible** by default, and made available with minimum time delay, except where international and national policies or legislation preclude the sharing of data as Open Data. Data sources should always be cited.
- **Understandable and interoperable** in a way that allows researchers, including those outside the discipline of origin, to use them. Preference should be given to non-proprietary international and community standards via data e-infrastructures that facilitate access, use and interpretation of data. Data must also be reusable and thus require proper contextual information and metadata, including provenance, quality and uncertainty indicators. Provision should be made for multiple languages.
- **Manageable** and protected from loss for future use in sustainable, trustworthy repositories with data management policies and plans for all data at the project and institutional levels. Metrics should be exploited to facilitate the ability to measure return on investment, and can be used to implement incentive schemes for researchers, as well as provide measures of data quality.
- **Supported** by a highly skilled workforce and a broad-based training and education curriculum as an integral part of research programs.



DOI: 10.1038/sdata.2016.18

www.nature.com/scientificdata

SCIENTIFIC DATA

OPEN

SUBJECT CATEGORIES

- » Research data
- » Publication characteristics

Comment: The FAIR Guiding Principles for scientific data management and stewardship

Mark D. Wilkinson *et al.*[✉]

Received: 30 December 2015
Accepted: 12 February 2016
Published: 15 March 2016

There is an urgent need to improve the infrastructure supporting the reuse of scholarly data. A diverse set of stakeholders—representing academia, industry, funding agencies, and scholarly publishers—have come together to design and jointly endorse a concise and measurable set of principles that we refer to as the FAIR Data Principles. The intent is that these may act as a guideline for those wishing to enhance the reusability of their data holdings. Distinct from peer initiatives that focus on the human scholar, the FAIR Principles put specific emphasis on enhancing the ability of machines to automatically find and use the data, in addition to supporting its reuse by individuals. This Comment is the first formal publication of the FAIR Principles, and includes the rationale behind them, and some exemplar implementations in the community.

www.earthobservations.org

2009-15



2015



2016

Implementation of DMPs

*“A **priority** mission for GEO is to encourage the implementation of the Principles (DMPs) by organizations contributing to GEOSS”*

GEO Strategic Plan 2016-2025

The GEOSS Yellow Pages

Exposure of conformance to DMPs



Consortium of Universities for the Advancement of Hydrologic Science Inc.

Consortium of Universities for the Advancement of Hydrologic Science Inc.

Founded in 2001, the Consortium of Universities for the Advancement of Hydrologic Science, Inc. (CUAHSI) is a 501(c)3 research organization representing more than 130 U.S. universi...



 Registration date: 2017-10-18

 www.cuahsi.org



Read more



Data Integration and Analysis System

Data Integration and Analysis System

DIAS aims at collecting and storing earth observation data; analyzing such data in combination with socio-economic data, and converting data into information useful for crisis mana...



 Registration date: 2017-03-31

 <http://www.diasjp.net/>



Read more

Visible 6 - 10 of 40

 prev [next](#) 

Uptake of the Guidelines?

Monitoring DMPs implementation

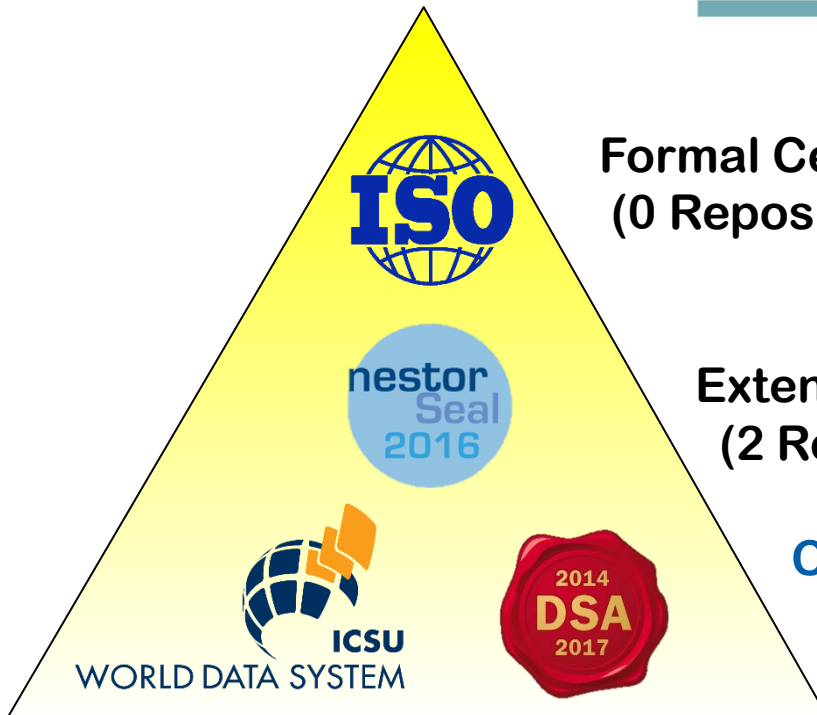
1. GEOSS Data Providers

- a) Data Repositories Certification
- b) Status checker...

2. Dataset/Collection

- a) Data fitness for use: Certification, DMP Labels...
- b) User feedback...

Practical Implementation



Formal Certification ISO 16363
(0 Repositories, 100+ requirements)

Extended Certification
(2 Repositories, 34 requirements)

Core Certification
(150+ Repositories, 16 requirements)

**Trustworthy Data
Repositories (TDRs)**



Apply Repository Certification to Data Sharing Principles and Data Management Principles

- **Data sharing** depends upon reliable repositories
 - Repository certification verifies potential for reliability
 - Renewal of certification affirms continuing reliability
- **Data management** depends on capabilities
 - Validated by repository certification
- Repository certification in DMP IG
 - DMP1: Metadata for Discovery;
 - DMP7: Data Preservation;
 - DMP8: Data and Metadata Verification;

Key Take Aways

In achieving the GEO Vision

To maximize the value of EO data we must:

- Make then free and open – the GEOSS Data Sharing Principles
- Ensure effective access – the GEOSS Information System
- Manage the data properly to ensure reliability – the GEOSS Data Management Principles
- Showcase the value of EO data in informing decision making
- Foster and support integration of EO data with socio-economic data through collaborative platforms



Thank You

Communicate and Collaborate with GEO:

