The Group on Earth Observations, GEO, is leading a worldwide effort to build a Global Earth Observation System of Systems, GEOSS, over the next 10 years.

GEOSS will support sound, rational management of our planet, environment and resources. It is organised to inform decisions and actions in the following areas:

- disaster reduction,
- human health improvement,
- energy resource management,
- water resource management,
- understanding and adapting to climate variability and change,
- improved weather forecasting,
- management and protection of ecosystems,
- sustainable agriculture,
- understanding and conserving biodiversity.

GEOSS will provide comprehensive and sustained observations and information to a wide spectrum of users, from ecosystem scientists to emergency responders, commercial land-use planners, government decision makers, educators, and the general public.

GEOSS will be a “system of systems”, building on existing and future, national, regional, and international Earth observation systems.

GEO includes over 65 member countries, the European Commission, and more than 40 participating organizations.
The Group on Earth Observations (GEO) is leading a worldwide effort to build a Global Earth Observation System of Systems (GEOSS) over the next 10 years. The GEOSS vision, articulated in a 10-Year Implementation Plan, represents the consolidation of a global scientific and political consensus: the assessment of the state of the Earth requires continuous and coordinated observation of our planet at all scales. The programmatic approach of considering the Earth as an integrated system facing major common challenges represents a significant breakthrough, an intentional departure from earlier approaches looking at individual components of the Earth’s system.

GEOSS will provide comprehensive, coordinated Earth observations from thousands of instruments worldwide, transforming the data they collect into vital information for society. GEOSS will yield a broad range of basic societal benefits, including the reduction of loss of life and property from tsunamis, hurricanes, and other natural disasters, improved water resource, energy, agricultural and ecosystem management, and improved understanding of environmental factors significant to public health, from biodiversity to climate change.

What is Earth observation?:
Sound, rational management of the Earth system, in both its natural and human aspects, requires relevant and timely information about our ever-changing planet. Such information is obtained through observations of the Earth, collected through satellites, buoys, seismometers, and other devices, which are transformed through computers and models into forecasts, maps, and other decision support tools. These tools provide valuable, often life-saving information.

The need is acute:
- Between 1990-1999, disasters killed 500,000 people and caused $750 billion in damage. Although damage cannot be completely avoided, better coordination of observation systems and data will improve preparedness and thus reduce these losses and help protect other resources. Improved monitoring of hazards and delivery of information about them are critical to prevent hazards from becoming disasters.
- In 1995, the World Bank reported that 80 countries, with 40 percent of the world’s population, faced water scarcity, a percentage expected to increase with population growth. This problem persists, particularly in developing countries where water shortages make a major contribution to human misery. Food security and economic well-being depend on reliable supplies of clean water. Yet current water cycle monitoring capability is inadequate for anticipating short- and long-term changes in the global water system.
- Many critical issues facing society involve plants and animals, i.e. biodiversity, which are under increasing pressure from human activity: invasive species, threatened species and animal-borne diseases. Addressing these issues, as well as sustainable agriculture and effective management of biological resources depends on increasing observations and analyses to support decision-making.
The changing pattern of the global climate has important consequences in many areas, including human health, water availability, food security, and energy management. Better short-term and seasonal forecasting, in the range of 1 day to 6 months, will provide essential information for predicting the outbreak of environment-related diseases, improving preparedness for hurricanes and other extreme weather hazards, and optimizing the management of energy resources.

**User Focus:**
The ultimate objective of GEOSS is to develop the use of Earth observations by a broad range of user communities from both developed and developing countries. These communities range from decision- and policy-makers to scientists, industry, emergency responders, international organisations and non-governmental organisations, the media and the general public. Engagement of these communities to identify their needs for new or improved data is essential to enhancing the adequacy of provided services and products for a wide diversity of applications.

**“System of Systems”:**
GEOSS aspires to involve all countries of the world, and to cover in situ observations as well as airborne and space-based observations. It will develop as a “system of systems,” with components consisting of existing and future, national, regional and international Earth observation systems, from primary observation to information production. Earth observing systems participating in GEOSS retain their existing mandates and governance arrangements, supplemented by their involvement in GEOSS. Through GEOSS, they will share observations and products with the system as a whole and take such steps as are necessary to ensure that shared observations and products are accessible, comparable and understandable, by supporting common standards and adaptation to user needs.

**Societal Benefit Areas:**
Clear societal benefits will be derived from GEOSS. It is anticipated that the following areas will evolve over time, and that new societal benefit areas may be added:

- Reducing loss of life and property from natural and human-induced disasters.
- Understanding environmental factors affecting human health and well-being.
- Improving management of energy resources.
- Understanding, assessing, predicting, mitigating, and adapting to climate variability and change.
- Improving water resource management through better understanding of the water cycle.
- Improving weather information, forecasting and warning.
- Improving the management and protection of terrestrial, coastal and marine ecosystems.
- Supporting sustainable agriculture and combating desertification.
- Understanding, monitoring and conserving biodiversity.
Governance:
The Group on Earth Observations (GEO), established in February 2005, is comprised of over 65 member countries, the European Commission and 43 participating international organizations. The GEO leadership includes a regionally elected 12-member Executive Committee (Brazil; Honduras; United States; European Commission; Germany; Italy; Morocco; South Africa; China; Japan; Thailand; Russian Federation.)

The GEO Secretariat was established in Geneva in May 2005, and the first Director, José Achache, assumed leadership in September 2005. The Secretariat is the centre of international coordination for the GEOSS effort.

Summits Leading to the Creation of GEO and GEOSS
- The World Summit on Sustainable Development, Johannesburg 2002 (WSSD), highlighted the urgent need for coordinated observations relating to the state of the Earth.
- A meeting of the Heads of State of the Group of 8 Industrialized Countries Summit in June 2003 in Evian, France, affirmed the importance of Earth Observation as a priority activity.
- The First Earth Observation Summit was convened in Washington, DC in July 2003, and adopted a Declaration establishing the ad hoc intergovernmental Group on Earth Observations (ad hoc GEO) to draft a 10-Year Implementation Plan.
- The Third Earth Observation Summit, held in Brussels in February of 2005, endorsed the GEOSS 10-Year Implementation Plan and established the intergovernmental Group on Earth Observations (GEO) to carry it out.

Learn more about GEO, GEOSS, and Earth observations by visiting www.earthobservations.org

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