

# Pooling Observation Data Together to Serve Comprehensive Purposes

— Ms. Barbara Ryan on the Global Earth Observation System of Systems

“Regardless of the particular reason an observation system was put in place, we are expanding the use of the data from that system to help users in other areas,” Ms. Barbara Ryan answered when asked about the necessity and importance of connecting the existing observation and research networks of different disciplines and for different purposes together in an interview with *BCAS* reporter SONG Jianlan, at a brief break between meetings on April 23 during the session of the 35<sup>th</sup> International Symposium for Remote Sensing of Environment (ISRSE35). Now let’s follow her to have a glance at this “system of systems”.



**Ms. Barbara J. Ryan**

Secretariat Director of the intergovernmental Group on Earth Observations (GEO) located in Geneva, Switzerland, former Director of the World Meteorological Organization (WMO) Space Programme, former Associate Director for Geography at the U.S. Geological Survey (USGS) in Reston, Virginia and 2007 Chair of the international Committee on Earth Observation Satellites (CEOS). She holds a Bachelor’s degree in Geology from the State University of New York at Cortland, a Master’s degree in Geography from the University of Denver, and a Master’s degree in Civil Engineering from Stanford University.

**BCAS:** *For many people, GEO is still quite a new concept, though its Phase One Implementation has been running for seven years and will be completed in just two years. Would you give us some general ideas why it is so important to connect all the observing and research networks together to form a uniform system?*

**Ryan:** Yes, you are right, we have a ten-year implementation plan, 2005 to 2015, but right now we have a number of teams and China is quite active on most teams, to decide what GEO should look like AFTER 2015. Therefore we are now working on a 2015–2025 implementation plan. The first ten years we tested the international coordination mechanisms, and in the second ten years we would like to bring the same kind of policies and practices to regions in

either national implementation or regional implementation programs, like an Asia-Pacific implementation of GEO or a China implementation of GEO. Now why is that important? Many governments are making substantial investments in satellite observations, in *in-situ* or surface-based observations, in weather and climate, in water, energy, ecosystems, biology and agriculture; so what we are trying to do is, regardless of the particular reason an observation system was constructed, to use the data from that system to help users in other areas. Can we use the agriculture monitoring systems to help with research on forests? Can we use the meteorological and weather monitoring system to help with climate studies? What we are trying to do is to collect data once and use it many times (smile). We call



Ms. Barbara J. Ryan talking with Mr. WANG Qinmin, Vice Chairman of the National Committee of the Chinese People's Political Consultative Conference at the opening ceremony of the ISRSE35. (Photo by courtesy of RADl)

this process leveraging existing infrastructures. So we can take advantage of data that was collected for one purpose, and use it for many other purposes as well. Earth processes are not only multidimensional and cross-disciplinary, but generally transcend political boundaries. For example, the air quality in Beijing, China affects other parts of the world; the dust storms in Africa can affect coral reefs in the Caribbean; the air pollution in Los Angeles, California does not remain in Los Angeles alone. GEO's efforts are to increase the understanding of these processes, as well as the impacts that they are having globally. Studying how the

Earth behaves and the impact that humans are having on it is a complex discipline. As the Earth's climate changes, there are impacts on agriculture, biodiversity, ecosystems, and many other GEO Societal Benefit Areas (SBAs). GEO Members and Participating Organizations are contributing to GEOSS implementation by not only studying Earth processes, but ensuring the monitoring networks are sustained into the future.

**BCAS:** *Seems that China has been in the Group or in the program since the very beginning?*

**Ryan:** Yes, absolutely. China is one of the founding Members of GEO, so you have a very important role to play. Not only is China one of the 90 GEO Members, but also it sits on the GEO Executive Committee — Dr. CAO Jianlin from the Chinese Ministry of Science and Technology represents China on the GEO Executive Committee — as one of the thirteen Members. China is not only one of the 90 Member Countries of GEO, and one of the 13 countries on the Executive Committee, but also one of the four Co-Chairs of the Executive Committee — along with the European Commission, South Africa and the United States.

**BCAS:** *So what do you think China can contribute to this system?*

**Ryan:** Well, China has already contributed a lot of science to GEOSS implementation. For example, China

## About GEO

The Group on Earth Observations (GEO) is an intergovernmental organization aimed at coordinating efforts to build a Global Earth Observation System of Systems (GEOSS). The International Symposium on Remote Sensing for Environment (ISRSE) has become one of the major mechanisms for holding these discussions in the field of remote sensing.

GEO provides an international framework within which partners (Members and Participating Organizations) can develop new projects and coordinate their strategies and investments. So far GEO's Members include 89 national governments and the European Commission. In addition, 67 intergovernmental, international, and regional organizations, with a mandate in Earth observation or related issues, have been recognized as Participating Organizations.

Following the 2002 World Summit on Sustainable Development and endorsed by the G8 (Group of Eight) leading industrialized countries, GEO was established in 2005 to coordinate international efforts and observing networks to better understand the state of the Earth. These high-level meetings recognized that international collaboration is essential for exploiting the growing potential of Earth observations to support decision making in an increasingly complex and environmentally

stressed world.

In order to meet this call for action, GEO is constructing a Global Earth Observation System of Systems (GEOSS). It is largely based on a 10-Year Implementation Plan for the period from 2005 to 2015. Endorsed by the Third Earth Observation Summit, held in Brussels in February 2005, the Plan defines a vision statement for GEOSS, its purpose and scope, expected benefits, and the nine "Societal Benefit Areas" of agriculture, biodiversity, climate, disasters, ecosystems, energy, health, water and weather.

GEO is governed by a body consisting of all Members and Participating Organizations. It meets in Plenary at least once a year at the level of senior officials and every three years at the Ministerial level. Members take decisions at the Plenary by consensus. Additionally, an Executive Committee oversees GEO activities when the Plenary is not in session. The Executive Committee consists of 13 representatives elected from the five GEO regions, including three each from the Americas and Europe, four from Asia, two from Africa, and one from the Commonwealth of Independent States. The Committee is also responsible for guiding the Secretariat. The GEO Members elect four Co-Chairs who preside over both the Plenary and the Executive Committee.

(Based on information from the website of GEO)



Ms. Barbara Ryan, Secretariat Director of the Intergovernmental Group of Earth Observations gives an invited plenary speech in the title "GEO — Building a Global Earth Observation System of Systems" at the opening ceremony of the ISRSE35. (Photo by SONG J)

is participating in GEO's Global Agriculture Monitoring (GEOGLAM) initiative, and is similarly making a number of contributions in global land cover mapping, whereby several products have just been released globally. These products are important for studying landscape change over time. China is also making scientific contributions in areas including biodiversity, disasters, ecosystems, and also water with some of the Asia-Pacific water initiatives. Each of these is a strong contribution. What we would, however, like to see in this part of the world is a more robust endorsement of broad, open data sharing policies and practices. We believe very strongly in the principles of broad, open data sharing and we would like to see more data and products being released globally. You have some outstanding examples of how Earth observation data and information is being used, and broader exposure to these examples would advance activities globally.

**BCAS:** *So how helpful do you think this system would be in terms of understanding the global environment change?*

**Ryan:** It is absolutely essential. As one of the speakers said this morning, there is no other movement in the world like the Group of Earth Observations (GEO), and its efforts to build a Global Earth Observation System of Systems (GEOSS). Therefore it is VERY important, and in fact, I think it is one of the few mechanisms capable of creating the international partnerships among Member Countries, Participating Organizations, and the private sector to start integrating data from all the observing systems to better address the issue of global environment change.

**BCAS:** *I know the launching of this program is connected with the world's efforts to achieve sustainable development. Do you think its role very important for human beings to achieve sustainable development?*

**Ryan:** Yes, again, the data and information coming from the system of systems, and the science that goes into it, are all prerequisites — *i.e.* necessary steps, if one desires to address the millennium and sustainable development goals. It is absolutely essential.

**BCAS:** *Would you share with us your thoughts about the major challenges this program is now facing?*

**Ryan:** GEO objectives are to improve and coordinate observation systems, advance broad open data practices, foster increased use of Earth observation data and information, and build capacity. Uncertainty over continuity of observations, large spatial and temporal gaps in specific data sets, limited access to data and information in much of the world, inadequate data integration and interoperability, and lack of relevant processing systems are just a few of the major challenges we are facing globally. Each of these challenges calls for more involvement of national entities and efforts.



Ms. Barbara Ryan and ISRSE35 Chair Prof. GUO Huadong, CAS Member and head of the host of the ISRSE35, the CAS Institute of Remote Sensing and Digital Earth (RADI) at the panel discussion on "Remote Sensing and Global Environmental Change", a special session arranged in the scientific program of the ISRSE35 to provide representatives from different scientific organizations an opportunity to jointly deal with global environmental issues in the field of remote sensing. (Photo by Courtesy of RADI)

**BCAS:** *How do you think non-governmental international forums like this symposium could help coordinate the efforts to build GEOSS?*

**Ryan:** Definitely symposia like ISRSE help. International forums bring more attention to the value of Earth observations in various ways. This time the ISRSE-35 is being co-organized by GEO, and many of the technical sessions are directly aligned with GEO's Societal Benefit Areas. In addition to these formal sessions, several workshops and side meetings of technical experts were simultaneously held in Beijing. We very much appreciate the ISRSE/GEO partnership, and are looking forward to a bright and rewarding future together.