

A global revolution in Earth management

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Climate change, the depletion of natural resources, the emergence of new diseases, and the loss of biological diversity are amongst some of the most serious and complex challenges facing the human race today.

Addressing these threats to our common home will require effective national policies plus international collaboration on a grand scale. Global action must always be based on political agreements supported by the best scientific information available, including comprehensive and timely data about the Earth's physical, chemical and biological systems.

For this reason, over 70 governments and administrations, together with more than 40 participating organizations, have joined forces through the Group on Earth Observations (GEO) to build a Global Earth Observation System of Systems that will generate the information we need to understand our rapidly changing planet.

This enhanced understanding will enable us to manage environmental stresses and natural and man-made hazards more effectively than ever before. And it will give us the insights and tools we will need to promote social and economic progress over the next few decades.

The complexity and dynamism of our modern civilization is placing ever greater demands on political and economic decision-makers. Their need for data and forecasts has evolved beyond the capabilities of today's single-purpose, stand-alone information systems. We are entering a new era of shared risks and opportunities where policy and management decisions must be based on the comprehensive and near-real-time environmental monitoring of the entire planet.

To make this possible, governments are collaborating through GEO to link together the many thousands of scientific observation instruments that have until now been operating in isolation. They include floating buoys for monitoring ocean currents, temperature and salinity; land stations that record air quality and rainwater trends; sonar and radar systems for estimating fish and bird populations; and over 60 high-tech environmental satellites that scan the Earth from space.

Based on an internationally agreed 10-year plan for constructing the Global Earth Observation System of Systems, we are defining common technical standards so that outputs from different observation systems can be combined into comprehensive and interoperable data sets. We are identifying gaps and eliminating unnecessary overlaps in coverage. And we are helping individuals and institutions gain the skills and capacities they need to use Earth observations more effectively for decision making.

With these fundamentals in place, we can proceed to transform humanity's relationship with the planet. Databases and decision-support tools that integrate atmospheric, oceanic, geologic and biologic information from around the world will transform our ability to issue more reliable seasonal weather forecasts to farmers, warn people in advance of tsunamis and typhoons, track and protect endangered species, anticipate and manage changing freshwater supplies, combat deforestation and desertification, evaluate long-term investments in infrastructure under changing climate conditions, and much, much more.

In addition to connecting people to the planet, this global public infrastructure will connect people to people. Many of the challenges and opportunities facing us today are cross-cutting, or interdisciplinary. To solve them, climate analysts and health workers, water managers and foresters, energy suppliers and policy makers, need to share information and ideas. Such collaborative decision making will soon be easier and more productive than ever before.

Professionals at the local and regional level and experts addressing global benefits must also be better connected. For example, the regional benefits of strengthening climate observation networks in Africa will include better management of water resources, crops, rangelands, energy resources and climate-related health risks such as malaria. The global benefits will include better data for modelling global climate change and weather patterns.

Like the Internet, the flexible and distributed network of content providers, or "system of systems", that we are assembling is emerging quietly and steadily. Soon it will gain a more public profile, and then one day it will become universally recognized as an essential tool that we couldn't imagine living without. Given our shared commitment to a healthier planet, the community of nations needs to ensure that this day arrives as soon as possible.

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