

William H. Hooke testimony
House Energy and Commerce Committee
March 9, 2005

Main points:

1. **IEOS and GEOSS are vital to the future of our Nation and the world's peoples.** Public health and safety, economic development, and protection of the environment and ecosystems all require the investments in IEOS and GEOSS under discussion today.
2. **The challenge cannot be met by government alone.** End users of Earth science and services must work with science and service providers to reconcile supply and demand, advance best practices, accelerate their widespread adoption, and anticipate future requirements. University researchers, government agencies, private enterprise, and NGO's such as the AMS all play a vital role. In our AMS policy study, we indicate some ways this might be achieved.
3. **The challenge is not solely domestic.** It is not enough for the United States to work in isolation to solve its own problems. By contrast, if we want to produce a weather forecast for more than the next few hours, we must rely on international cooperation. GEOSS is an important foreign policy opportunity for the United States – a major arena where we can be, and be seen as, a good neighbor. Again, the recent AMS policy study indicates some ways international data sharing might be strengthened and broadened.
4. **The problems are truly long-range.** To ensure the needed continuity of effort requires improving our characterization of the program's benefits, maintaining and enhancing funding levels, ongoing research to meet growing requirements, and sound programmatic oversight.
5. **The problems here are not purely technical.** Policies at national, state, and local levels can either increase the utility of Earth science and services or squelch the potential benefits.
6. **Congress can do much to foster progress.** Congress can commit to such programs through statutory language. Congress can work with the Administration to resist the admittedly natural attempts to accomplish these goals merely through the rearrangement of existing resources. Congress can stress the importance of ongoing research. This is true of all federal agencies, including NASA, where recent emphasis on interplanetary exploration threatens to siphon off funding needed for Earth system science and applications of that science to national priorities. Congress can also work with NGO's and the federal agencies to understand better the role of policy formulation in defining national benefits in this area. Finally, Congress can use regular hearings such as this one to check progress.

Testimony of William H. Hooke, Director,
American Meteorological Society Policy Program
before the Committee on Energy and Commerce,
U.S. House of Representatives
March 9, 2005.

Mr. Chairman, Committee members, ladies and gentlemen, my name is William Hooke, and I very much appreciate this opportunity to appear before you on behalf of the American Meteorological Society (AMS), where I direct our Policy Program. The AMS strongly supports the Global Earth Observation System of Systems (GEOSS) under discussion today, as well as the Integrated Earth Observing System (IEOS), which embodies the U.S. contribution to GEOSS. In fact, our members – some 12,000 earth system scientists and engineers from government, from private industry, and from the university sector – are helping to plan and implement these systems, and are putting them to work for the benefit of the Nation and mankind.

The AMS has just completed a policy study on GEOSS/IEOS implementation. We have supplied the Committee with this material and ask that it be included as part of the record of this hearing.

First, some background.

Better observations of the Earth system — its atmosphere, oceans, land masses, biosphere and natural and human resources and hazards—are vital to comprehensive understanding of its behavior and our hopes for a safer, more efficient society. An extraordinary

international effort is now underway to promote and plan “the development of a comprehensive, coordinated, and sustained Earth observation system of systems among governments and the international community to understand and address global environmental and economic challenges.” Recognizing the crucial role data from those systems could play in protecting human health and safety, alleviating human suffering and poverty, and achieving sustainable development, more than 50 nations have agreed to cooperatively implement a Global Earth Observation System of Systems (GEOSS) to collect those data for the purpose of providing information for decision makers. GEOSS has the potential to provide substantial benefits to all nations. An *ad hoc* interagency Group on Earth Observations (GEO) is developing a 10-year implementation plan for GEOSS.

In parallel with this coordinated international planning, the U.S. has established the Interagency Working Group on Earth Observations (IWGEO) to prepare a strategic plan for the development and implementation of the U.S. Integrated Earth Observation System (IEOS). The strategy will reinforce U.S. leadership in GEOSS. Currently, the international GEO and the U.S. IWGEO are developing the case for an integrated system of Earth observations; characterizing some of the societal benefits and requirements; and addressing a range of issues, such as the need for convergence of observations, the opportunities for synergy, requirements for interoperability and architecture, data access and use, capacity building, outreach, governance and funding, performance indicators, and schedule.

The level and nature of investments made in this area in the coming few years will either sustain or limit – perhaps for decades – our ability to meet growing national and international needs for effective earth observations, science and services. The ultimate international response to the proposed effort to implement and, in the future, strengthen GEOSS will depend on how effectively global thinking, dialogue, and planning address a range of challenges.

While much of the planning effort is directed at the scientific and technical aspects of the task, there are a host of policy issues that must be resolved if the implementation of an integrated Earth observing system is to be successful. The IEOS and GEOSS planners must come to grips with these issues that are largely if not wholly external in character. They reflect far broader national and international political and economic realities, and must be addressed by a range of individuals, institutions, and nations. Of course, the effort to fully realize IEOS/GEOSS will extend over a decade, at least, and will require a commensurate evolutionary approach to resolving the associated policy issues.

With that preamble, here is our message, which has six points.

1. IEOS and GEOSS are vital to the future of our Nation and the world's peoples.

As members of Congress you deal every day with major challenges facing our nation: public health and safety, economic growth, major federal budget deficits and international trade imbalances, national security, the aging of the population and corresponding drains on Social Security and Medicare, educational challenges

(especially in the sciences) and many more. Superficially, none of these problems would seem to have anything to do with a Global Earth Observation System of Systems, or an Integrated Earth Observing System. In fact, however, the need for IEOS and GEOSS is woven through each and all of these issues. For example, U.S. agriculture is increasingly energy-intensive. The effectiveness of energy use in agriculture (embodied in the use of irrigation, fertilizers, herbicides, and pesticides) is highly sensitive to the accuracy of weather and climate forecasts. Similarly, energy deregulation and reliance on regional power grids has increased efficiency, but at the same time increased the vulnerability of electrical utilities to errors in forecasts of peak demand. Formerly such errors could be readily accommodated by excess generating capacity in the system. Today such errors can lead to spikes in spot prices for energy, or in some cases to brownouts and rolling blackouts. Today, all modes of transportation clog the existing infrastructure – highways, airports, and harbors – even under fair weather conditions. As a result, unforecast weather delays contribute to spiraling costs. Finally, estimating National requirements for future public health infrastructure will depend critically upon the long-term outlook for climate change, for aerosol concentrations, for changes in patterns of moisture and heat and their associated changes in the impact of vector-borne diseases, and for changes in the nature and patterns of extreme events. These are just a few of many examples. To address these and other national priorities will require the investments in IEOS and GEOSS under discussion today. Perhaps the best analogy in the national experience is the Manhattan Project. In World War II, development of atomic weapons was so urgent, the scientific and technical challenges so great, and the stakes for mankind so

high, that no expense was spared in that effort. Today, similar statements can be made about the importance and urgency of earth observations to future human prospects.

- 2. The challenge cannot be met by government alone.** To provide for public health and safety in the face of earth's extremes, to ensure the growth of commerce in weather-and climate-sensitive sectors, to protect the environment and ecosystems, and to meet the requirements of national security for Earth system science and services, government, private enterprise, universities, and NGO's such as the AMS must work together, in a structured way. End users of Earth system science and services must work with science and service providers to reconcile supply and demand such information, advance best practices, accelerate their widespread adoption, and anticipate future requirements. University researchers, government agencies, private enterprise, and NGO's such as the AMS all play a vital role. This will not be accomplished trivially. In our AMS policy study, we indicate some ways this might be achieved, by involving IEOS/GEOSS stakeholders: through ongoing, comprehensive stakeholder evaluations of IEOS value (by means of periodic stakeholder conferences, and coordinated multi-year studies), by establishing a clearinghouse or referral service for IEOS user applications and services, and by constituting an IEOS stakeholder advisory group.
- 3. The problems are truly long-range.** Perhaps the greatest threat to GEOSS, IEOS, and realizing their full benefits lies in the clamor of other problems competing for national attention, and the natural tendency to lose track of the vital in the face of the

merely urgent. To ensure the needed continuity of effort amid such distractions requires improving our characterization of the program's benefits, maintaining and enhancing funding levels, ongoing research to meet growing requirements, and sound programmatic oversight. The latter should be achieved by establishing a secretariat within the United States to oversee administration and management of IEOS, and a counterpart GEOSS secretariat and funding mechanism at the international level.

- 4. The challenge is not solely domestic.** It is not enough for the United States to work in isolation to solve its own problems. Suppose we want to map the human genome, or develop nanotechnology, or a new cure for cancer. Suppose that other nations of the world do not wish to join with us. In these cases and many more, if we have to, we can go it alone. By contrast, if we want to produce a climate outlook, or assess the effect of climate change on the world's ecosystems, we must rely on international cooperation. This is even true of a weather forecast for more than the next few hours. To illustrate: the air that will be over Washington, DC in five days is currently over Asia and Siberia. Unless we know whether that air is moist or dry, hot or cold, we will not be able to predict its condition, and its consequences (will it produce rain or snow?), upon arrival here. Furthermore, to the extent that other countries fall prey to natural hazards, such as tsunamis, hurricanes, cycles of flood and drought, the effects are destabilizing and spill over into this country. Following Hurricane Mitch in 1998, which reduced Central American GDP by 50%, there was an uptick of illegal immigration into this country by Central Americans looking for work. Similarly, the aftermath of December's tsunami will continue to constrain the hopes and aspirations

of peoples bordering on the Indian Ocean for years to come. Countries have shared meteorological data for decades, but the increasing value of such information and country-to-country differences in public and private roles in the provision of that information have led to some fraying of the international agreements in recent years. It is important for all nations to maintain commitments to full and open exchange of meteorological data. Countries can then extend that foundation into more problematic areas such as ecological data sharing. GEOSS is an important foreign policy opportunity for the United States – a major arena where we can be, and be seen as, a good neighbor. Again, the recent AMS policy study indicates some ways international data sharing might be strengthened and broadened, by developing a negotiating process to progressively remove data restrictions on a case by case basis.

- 5. The problems here are not purely technical.** Policies at national, state, and local levels can either increase the utility of Earth science and services or squelch the potential benefits. For example, as mentioned earlier, electricity deregulation has had the hidden consequence of increasing vulnerability to forecast errors of peak demand. By contrast, the complex web of protocols governing management of this country's watersheds (through the operation of dams and reservoirs) has greatly constrained any ability to use seasonal outlooks to optimize decisions.

- 6. Congress can do much to foster progress.** Congress can commit to such programs through statutory language. Congress can work with the Administration to resist the admittedly natural attempts to accomplish these goals merely through the

rearrangement of existing resources. Congress can stress the importance of ongoing research. This is true of all federal agencies, especially those represented on previous panels and under your direct purview, but also including NASA, where recent emphasis on interplanetary exploration threatens to siphon off funding needed for Earth system science and applications of that science to national priorities. Congress can also work with NGO's and the federal agencies to understand better the role of policy formulation in defining national benefits in this area. Finally, Congress can use regular hearings such as this one to check progress.

In summary, I thank the Committee again for this opportunity to speak, and look forward to the discussion to follow. The AMS will be happy to continue a structured dialog with the Congress on these issues in the days and weeks following this hearing.