

Appendix A: OTA's Workshop Premise and Questions to Participants

The U.S. Global Change Research Program (USGCRP) was formally announced as a Presidential Initiative in January 1989. Several new developments occasion OTA's workshop, which will review the organization and scientific priorities of USGCRP and its largest single element, the Earth Observing System Program (EOS). These developments include:

- The start of a new Congress with an unprecedented number of new members.
- The beginning of a new administration that includes a Vice-President who has a particular interest in the consequences of climate change.
- Executive-branch and congressional reductions that have
 - a. forced NASA's EOS program to be restructured; and
 - b. cut complementary components/new initiatives to EOS from agencies outside NASA, for example, the Department of Energy Atmospheric Radiation Measurement program and advanced technology demonstrations proposed by the Department of Defense (DOD).

OTA recognizes that USGCRP and EOS programs are the result of lengthy reviews and difficult compromises, Workshop participants will not be asked to pass judgment on the wisdom of individual instrument selections. Instead, OTA is seeking a broad look at USGCRP and EOS to determine whether it is possible

to strengthen the existing program. Most of the workshop will focus broadly on USGCRP; however, particular attention will be given to EOS and its role in USGCRP,

■ Questions Related to USGCRP:

- **Are the** science priorities of USGCRP the "right" (type, order) ones? How well has the process that established./revised these priorities worked?
- How well is USGCRP addressing the needs of policymakers? Are new elements needed to support the assessment roles of the program?
- Are there missing elements from USGCRP (e.g., ecological research, systems appropriate for very long-term monitoring)? If so, could they be added without causing disruption to a program that already has undergone substantial revision.
- Does USGCRP have sufficient balance among ground-, ocean-, air-, and satellite-based measurements to address the most pressing scientific questions?
- Does USGCRP have a "strategic plan" that is geared to the multidecadal time frame of societal concerns (e.g., economics and ecosystem loss). Is there an appropriate balance between near-term and long-term problems and goals? How will the end of the USGCRP as a Presidential Initiative affect plans?
- NASA's Mission to Planet Earth is the largest single element of USGCRP, making NASA the lead

¹ This appendix is the text of a memorandum submitted to workshop participants prior to their attendance at the Feb. 25-26, 1993 meeting.

agency for global change research. The contributions of other agencies in the USGCRP have fallen short of initial expectations. Can requirements for ground-, ocean-, or airborne-collected data be met without additional support from these agencies? Are there particular high-leverage initiatives that Congress should restore/initiate?

- Was USGCRP organized to insure that the broad and diverse interests of the Earth science and global change research community were addressed? What is the best way to ensure balance in the execution of the goals of the USGCRP?
- Management and utilization of natural resources under a potentially changing climate will fall to terrestrial management and research agencies such as the Department of Interior and the U.S. Department of Agriculture. Do panelists foresee greater involvement in USGCRP by these agencies?
- Certain long-lived systems, such as forests and water supply systems, will be planned with considerable uncertainty as to future climate.
 - a. Will our climate research provide information with sufficient promptness to improve decision making in these areas?
 - b. Are we in any way *ranking our* research efforts to provide timely information to those systems for which decisions must be made relatively promptly?

■ Questions Related to the EOS Program

The present \$8 billion EOS program (fiscal years 1990 to 2000) evolved from what was planned to be a \$17 billion program as recently as 2 years ago. Questions related to EOS and its role in the USGCRP include:

- What parts of the EOS program should now be considered “frozen; are there parts that might still be modified without substantial delays or cost penalties?
- Did a broad spectrum of the Earth science community have appropriate input into the formulation and revision of the EOS program? If not, what new relationships might be considered?
- Should NASA allocate greater resources towards nonsatellite means of data collection?
- What actions might Congress take to facilitate the development of ‘smaller, faster, cheaper’ missions

for EOS? Does the increased risk associated with this approach (versus the traditional Phase A-D methodical approach) restrict these missions to process-oriented missions? Is smaller and lighter weight necessarily equivalent to cheaper? Are there specific actions NASA could take to facilitate technical innovation that do not require substantial increases in budget authorization?

- Are systems being developed for EOS appropriate (scientifically sound, acceptable risk affordable) for a long-term (decadal time-scale) monitoring program? Is the program structured to carry out long-term monitoring missions?
- Are the systems being developed for EOS appropriate for future operational missions, such as National Oceanic Atmospheric Administration’s (NOAA) environmental satellites? Are panelists satisfied with the current arrangements between NASA and NOAA for development of NOAA satellite systems? Are NOAA interests for future operational systems being addressed in the planning of EOS?
- Is the EOS acquisition strategy flexible enough to:
 - a. Withstand additional budget cuts?
 - b. Withstand unexpected cost growth?
 - c. Respond to science priorities that may change as early data is processed?

(Historically, budget cuts and cost growth have resulted in program delays—among the issues to be explored here is how to minimize the risk that these unexpected developments will result in gaps in the acquisition of time-series data.)

- Have budget reductions compromised EOS plans to process the expected “avalanche” of data? Are panel members satisfied that global change researchers will have adequate access to EOS data? to appropriate hardware and software? Are panelists satisfied with NASA efforts to solicit their views on questions of data policy, data analysis, data computability?
- How much of EOS will be directly relevant to assessment of ecosystem vulnerability and response to a changing climate? What parts of EOS might give us near-term guidance on policy responses? Are EOS systems a cost-effective way to acquire the required data?