

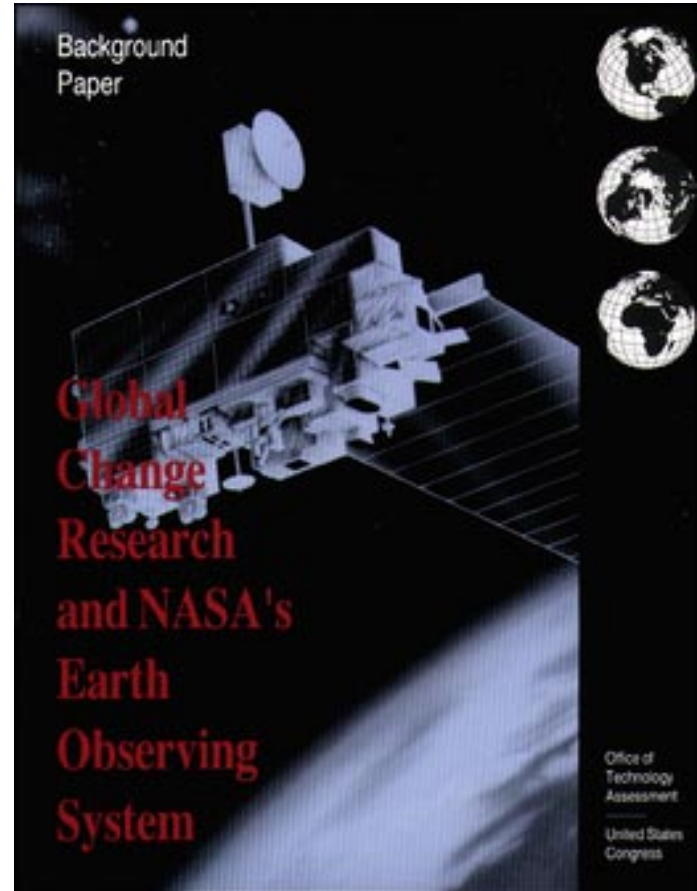
*Global Change Research and NASA's Earth
Observing System*

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Foreword

The United States is spending billions of dollars in a multiyear Global Change Research Program (the USGCRP) to monitor, understand, and ultimately predict the nature of global changes and the mechanisms that cause them. This background report examines the direction and scope of USGCRP and its most expensive component, NASA's Earth Observing System (EOS) of satellites. In particular, it examines how well USGCRP and EOS are fulfilling their scientific objectives, whether some program elements are missing or need to be strengthened, and whether the program is meeting the needs of policymakers.

The background paper responds to issues raised in two related OTA reports: *The Future of Remote Sensing From Space: Civilian Satellite Systems and Applications*, undertaken by OTA's International Security and Commerce Program, and *Preparing for an Uncertain Climate*, recently released by OTA's Oceans and Environment Program. Requesters for these assessments are the House Committee on Science, Space, and Technology; the Senate Committees on Commerce, Science, and Transportation; and on Environment and Public Works; the House and Senate Appropriations Subcommittees on Veterans Affairs, Housing and Urban Development, and Independent Agencies; and the House Permanent Select Committee on Intelligence.

This background paper describes a number of suggestions to improve the value of the USGCRP to both scientists and policymakers. For example, it observes that the USGCRP is focused narrowly on climate change. As a result, USGCRP may not be able to provide decisionmakers and natural resource managers with the information they will need to respond to other aspects of global change. The background paper also explicates the continuing debate over whether the sensors and satellites planned by USGCRP: 1) will be able to acquire data in sufficient detail to elucidate the mechanisms responsible for global change; 2) are appropriate for long-term monitoring of key indices of global change. Decades of continuous calibrated global observations from both space and strategically located sites on the Earth's land and oceans will be required to document climate and ecosystem changes and for differentiating natural variability from changes induced by human activities.

In undertaking this effort, OTA sought the contributions of a wide spectrum of individuals and organizations, and several Federal agencies. OTA also drew heavily on discussions at a 2-day workshop that assembled a small group of leading global change researchers and current and former officials of the USGCRP and EOS programs. OTA gratefully acknowledges their contributions; however, as with all OTA reports, the contents are the sole responsibility of the Office of Technology Assessment.

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NOTE: OTA appreciates and is grateful for the valuable assistance and thoughtful critiques provided by the workshop participants. The participants do not, however, necessarily approve, disapprove, or endorse this report. OTA assumes full responsibility for the report and the accuracy of its contents.