A Response to

"The Global Change Research Program and the U.S. National Park Service: Six Essays"

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The U.S. National Park Service has a very important role to play in the Global Change Research Program (GCRP). Six authors in a recent issue of *The George Wright Forum* [Volume 7, Number 3, 1991] described various aspects of that role. Almost everything they said was right on target, but there is a bigger and more exciting opportunity for the USNPS to contribute to global change research, the hot scientific topic of the 1990s.

What the USNPS can uniquely offer the global change research community are baseline studies to answer the question, "change from what?" (S. Bishop 1989; W. Bishop 1989). The USNPS must join the global change research community and give its full commitment to answering this question of critical national concern. In assuming this role the USNPS goes beyond its stated mission of serving only the needs of the parks.

The Committee on Earth and Environmental Sciences (CEES) [formerly the Committee on Earth Sciences, or CES], the coordinating committee for the GCRP, has not adequately addressed the question, "change from what?" (CES 1990a). To approach an answer, there must be units of land that are managed to maintain their natural state. There must be a diverse set of units with forests, deserts, swamps, etc. to be

examined. The units must be large enough to be observed and monitored from space. What must be prepared in these units is a scientific baseline—a snapshot of what is there on the ground today.

Arguably, the USNPS is the only land management agency that has the charter as well as the diversity of sites not being managed for extractive resources, to provide this snapshot. And the USNPS has a number of units that might be large enough to be baseline sites or the cores of such sites. There are some 70 units in the National Park System larger than 50,000 acres. The GCRP was begun in the mid-1980s by the National Science Foundation (NSF), National Aeronautics and Space Administration (NASA), and the National Oceanic and Atmospheric Administration (NOAA) (McCauley 1989). It has grown from three agencies talking with each other to 21 departments and agencies with an FY1991 budget of $950 million to support studies, program development, major satellite systems—everything perceived to be necessary to manage a multifaceted research program.

Until 1991, the USNPS was not recognized by the CEES as an active player in the GCRP (CES 1989; 1990b). Plainly put, USNPS was not in line to receive any funds earmarked by the CEES for the GCRP. The only agency within the Department of the Interior to receive funding from the beginning was the U.S Geological Survey. Its administrator, Dallas Peck, heads the CEES. In 1991, USNPS was written into the CEES budget at $3.6 million—a very small pittance in comparison with the overall 1991 CEES budget (CEES 1991). USNPS is now on the GCRP playing field, but it has not assumed its proper role yet. It is time for the USNPS to go to the CEES with plans to establish baseline studies in at least 50 parks. The CEES, Office of Management and Budget, and the Congress will readily support such an ambitious program (Bradley et al.), but only if the USNPS will boldly promote its important role in the GCRP.

That said, let me comment on what some of the authors said in "The Global Change Research Program and the U.S. National Park Service." Stephen Nodvin (1991) points out that a monitoring program without analysis is not worth much. Granted, but we really are not at the analysis stage yet. What is in parks? What is its current condition? Those are the fundamental questions for USNPS managers. Prepare the laboratory; gather baseline information. Once that is done, invite others to set up and conduct the necessary long-term monitoring.

Maury Nyquist (1991) is right on target with his observation that parks are the perfect natural laboratories for answering the question, "change from what?" His suggestion to tie the Inventory and Monitoring (I&M) program more closely to the USNPS's GCRP is equally on target. Here the USNPS can produce the unified database to support the needs of other research agencies. It can analyze some of the information it gathers to support its priority needs. Let others analyze the rest (and share their findings with the USNPS for their purposes.

Robert Stottlemyer (1991) makes a persuasive case for the ecosystem approach to long term I&M. Such an approach should appear most desirable to the USNPS. Producing comprehensive inventories and funding them fully so that consistent monitor-

ing programs may be established should be the USNPS's highest GCRP priority.

Jill Baron (1991) asks the right questions; but, look at them in a different order. 1) How valuable are our resources to the rest of the world? The answer to this question points the direction of the agenda the USNPS should prepare as a response to question 2), What can we offer to the international global change research community? With a clear understanding of what the global change research community needs and will therefore "pay" the USNPS to produce, the USNPS can then focus its own funds on the answer to the third question, 3) What questions do we need to address regarding our resources *that no one else will address for us?* (emphasis hers).

David Parsons (1991) points out that USNPS now has some opportunities thrust upon it that could push it into the mainstream of science. Where we disagree is at his suggestion that the USNPS should develop the ability to answer all questions concerning parks, such as, for instance, the consequences of alternative climate scenarios on park ecosystems. Unless the USNPS is the only one interested in such matters, entice someone else to do that work by preparing and supporting an attractive laboratory for climatic research. I heartily agree with him that national parks have the opportunity to be an integral (I would say pivotal) part in carrying out baseline studies for the GCRP. He also encourages cooperative research programs with other land management agencies and with other scientists, which will be the payoff to the USNPS for its investment in the GCRP. In summary, the USNPS is not an agency chartered to do research. But it needs a strong research component (National Parks and Conservation Association 1989). In the near term the USNPS can join the mainstream of one major branch of American science by accepting a critical role in the U.S. GCRP—a role for which the USNPS is uniquely qualified and prepared. That role is to manage the laboratories that can answer the question "change from what?"

In accepting that role and the concomitant challenge, the USNPS commits to a role well beyond its tradition. It is a commitment to manage the laboratories, know what is there, and make them available to others for their research. In so doing, the USNPS will acquire for its own purposes a baseline inventory of a majority of its larger units (and some of the smaller ones), a richer understanding of the processes within those units, a means of attracting significant research of other agencies, and a major funded research program of its own. A good budget target might be 50 units with an average budget of $1 million per year per unit for inventory and monitoring, or $50 million per year for the USNPS program. Such an investment is certainly justified for answering the question "change from what?" as it represents only 2% of a program that will soon reach over $2 billion per year.

The USNPS will be richly rewarded for putting the GCRP needs ahead of its own. Not only will there be comprehensive inventory and monitoring programs established in a number of parks, the park-based research the agency has so little money to support and so great a need for will become highly attractive to agencies that do have funds for research. In short, by putting the needs of the GCRP ahead of its own,

the USNPS will not only enter the mainstream of science, it will advance its own research agenda manyfold as well.

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