

Project Funding: NSF/SES Human Social Dynamics, Agents of Change
Project Period: (2004-2007; no cost extension to 2010)
Project Title: Interoperability Strategies for Scientific Cyberinfrastructure
History subProject Begin: May 2007
History Paper Submitted: July 2009
Journal: Historical Studies in the Natural Sciences

**From the International Geophysical Year to the International Biological Program:
Big Science and Big Data in Biology, 1957-present**

Elena Aronova,* Karen Baker,** Naomi Oreskes***

ABSTRACT

This paper discusses the historical connections between two large-scale undertakings that became exemplars for world-wide data-driven scientific initiatives after World War II: the International Geophysical Year (1957-1958) and the International Biological Program (1964-1974). The International Biological Program was seen by its planners as a means to promote a Big Science in ecology. As the term Big Science gained currency in the 1960s, the Manhattan Project and the national space program became paradigmatic examples, but the International Geophysical Year provided scientists with an alternative model: synoptic collection of observational data on a global scale. This new, potentially complementary, model of Big Science encompassed the field practices of ecologists, and suggested a model for the natural historical sciences to achieve the stature and reach of the experimental physical sciences. However, the program encountered difficulties when the institutional structures, research methodologies, and data management implied by the Big Science mode of research collided with the epistemic goals, practices, and assumptions of many ecologists. By 1974, when the program ended, many participants viewed it as a failure. However, this “failed” program was transformed into the Long-Term Ecological Research program, which continues today. Historical analysis suggests that many of the original goals of the program were in fact achieved by the program’s visionaries and its immediate investigators, and while it failed to follow the exact model of the IGY, it ultimately succeeded in providing a renewed legitimacy for synoptic data collection in biology. It also helped to create a new mode of contemporary research, the “network science” of LTER, in use by ecologists today.

KEY WORDS: Big Science, International Geophysical Year, International Biological Program, Roger Revelle, systems ecology, data management

SHORT TITLE: “From the IGY to the IBP”

* Department of History, University of California at San Diego, 9500 Gilman Drive, La Jolla, CA, 92093-0104, earonova@ucsd.edu

**Scripps Institution of Oceanography, University of California at San Diego, La Jolla, CA, 92093-0218, kbaker@ucsd.edu

***Provost-Sixth College, University of California at San Diego, 9500 Gilman Drive # 0054, La Jolla, CA 92093-0054, naoreskes@ucsd.edu