

Calling on Scientists to Fight Budget Cuts

THE FUNDING LEVELS REQUESTED BY THE Bush Administration for 2006 (“Caught in the squeeze,” J. Mervis, *News Focus*, 11 Feb., p. 832) represent a decrease in science and technology funding across the board. This budget and its priorities do not bode well for American science and technology or for America’s scientists and science students. Underfunding science and technology research and education today is short-sighted. It puts our nation’s strong global standing in science and technology at risk now and in the future.

As ranking member of the U.S. House of Representative’s Committee on Science (which has jurisdiction over all nondefense science research and development including the National Science Foundation), I am familiar with the realities of our country’s current fiscal crisis and attempts to “remedy” that situation by cutting “lesser priorities.” I assure you that some Members of Congress, including myself, are fighting to push science and technology as a priority in this and future budgets.

However, Congress cannot achieve this alone; we must have your help. Adding your voices to ours is essential in presenting a unified front in support of additional science and technology funding. In a time of necessary fiscal restraint, advocates of science must be vocal in communicating science’s centrality to our nation’s future. It must be clear that science is not just an academic exercise.

The current downward trend in funding can be reversed. The federal budget is not irrevocably set and can be redrawn. Researchers, students, faculty, this affects you. Write, call, e-mail, and speak on the importance of what you do for this nation’s economy. Help us help you by being your own unrelenting advocates.

BART GORDON*

Letters to the Editor

Letters (~300 words) discuss material published in *Science* in the previous 6 months or issues of general interest. They can be submitted through the Web (www.submit2science.org) or by regular mail (1200 New York Ave., NW, Washington, DC 20005, USA). Letters are not acknowledged upon receipt, nor are authors generally consulted before publication. Whether published in full or in part, letters are subject to editing for clarity and space.

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Establishing Indicators for Biodiversity

IN THEIR POLICY FORUM “THE CONVENTION on Biological Diversity’s 2010 target” (14 Jan., p. 212), A. Balmford *et al.* argue that “conservation scientists have a lot to learn... from economists” in regard to the establishment of indicators that are “rigorous, repeatable, widely accepted, and easily understood.” By way of example, they refer to gross domestic product (GDP) and write that the “global imperative to protect biodiversity and ecosystem services must become as politically significant as economic growth...”

GDP may be a repeatable and widely accepted measure, but it is not rigorous and it is easily misunderstood. GDP measures a country’s dollar market value of legal, final (nonintermediate) goods and services produced during the course of an accounting period, such as one year. That can be a problem. Consider two examples: First, people become ill on account of pollution and have to seek medical treatment; more medical services are produced and counted in GDP at their market value. GDP rises. Economies grow. But we are not better off for having been polluted in the first place. Second, the more wars we fight, the more funds governments expend in the arms market, but we cannot argue that states are better off for fighting wars. Conversely, if we become healthier and fight fewer wars, GDP falls and economies shrink.

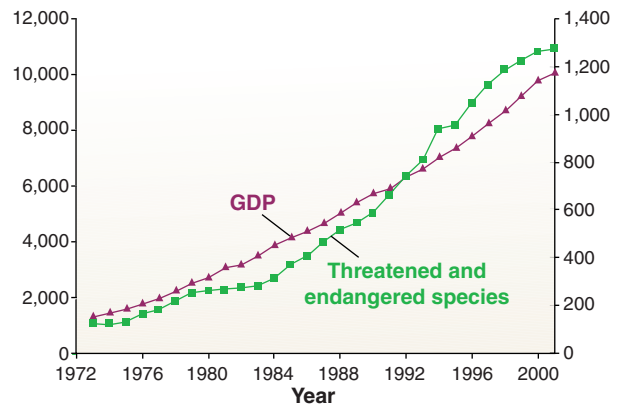
Economics can make tremendously valuable contributions to biology, but GDP and economic growth measures are not among them.

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IN THEIR POLICY FORUM “THE CONVENTION on Biological Diversity’s 2010 target” (14 Jan., p. 212), A. Balmford *et al.* describe the need for biodiversity indicators pursuant to the Convention on Biological Diversity. They identify gross domestic product (GDP), a measure of economic growth, as a precedent-setting indicator to be emulated by scientists. We propose that scientists already possess such an indicator, namely, inverse GDP.

As indicated by rising GDP, economic growth entails increasing population times per capita consumption (1). Technological progress broadens the human niche (2); economic growth is the process of filling the broadened niche (3). Economic growth



U.S. GDP correlates with the number of U.S. threatened and endangered species. GDP figures are in billions of dollars (www.bea.doc.gov/bea/dn1.htm). Threatened and endangered species are those listed by 31 December of the corresponding year (http://ecos.fws.gov/tess_public/).

entails the reallocation of natural resources from the “economy of nature” and its non-human species to the human economy (4).

The tight correlation ($R^2 = 0.99$; see figure) of U.S. GDP to the number of U.S. threatened and endangered species listed under the Endangered Species Act is unlikely to be a coincidence. The sectors comprising the economy are the same sectors endangering species (5).

Some may object, citing the “environmental Kuznets curve,” the hypothesis that the environment deteriorates during early phases of economic growth, then recovers after a threshold of growth is achieved (6). However, environmental Kuznets curves are thought to apply to only a limited set of pollutants (7), not to environmental issues stemming from macroeconomic activity (8). Biodiversity is threatened by economic sectors in the aggregate (5), and certainly a higher GDP cannot resurrect an extinct species.