

A Look Back, A Look Ahead

Jane Lubchenco, Ph.D.

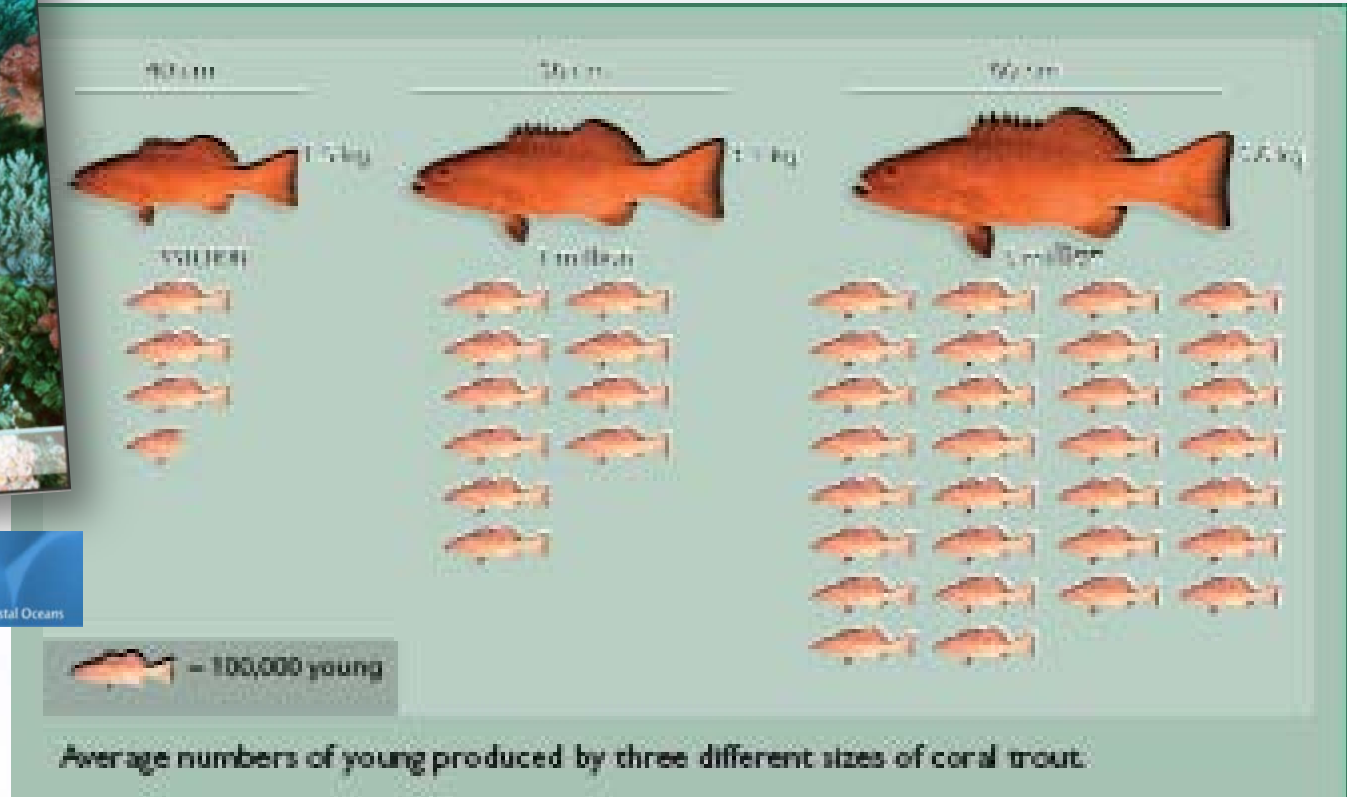
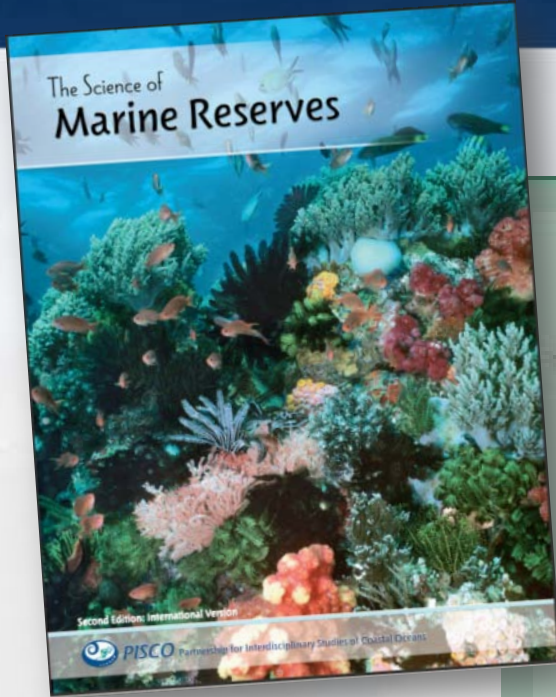
Under Secretary of Commerce for Oceans and Atmosphere

National Oceanic & Atmospheric Administration | NOAA

21 March 2012



NCEAS Legacy



Transformative



Blue-sky bias should be brought down to Earth

High-prestige research hogs the money, while the needs — and value — of the US science agencies closest to the public are ignored, says **Daniel Sarewitz**.

The Republican majority swept into Congress promising to reduce government spending. One of the first targets was the US Geological Survey (USGS), an agency within the Department of the Interior. The survey had long prided itself on the excellence of its science, but its relatively small budget and low profile made it a good candidate for political sacrifice. The year was 1995.

As 2012 begins, we are entering the most important and decisive period for US science and technology policy since the late 1940s. After 60 years dominated by growing federal expenditure, US science now faces a long period of budgetary stasis, or even contraction. From today's vantage point, we can see the 1995 assault on the USGS as a harbinger of this new era.

The USGS did survive. An important factor in this was the 1,400 state and local organizations that collaborated with the agency to monitor and manage water resources. When these groups let their elected representatives know about the survey's importance for the well-being of the nation, Congress took the USGS off the chopping block. But over the past 15 years, mission agencies such as the USGS that seek principally to serve public goals rather than to advance science have experienced minimal budgetary growth, in some cases not even keeping up with inflation. Since 1996, research funds at the USGS have risen by a mere 16%; at the National Oceanic and Atmospheric Administration (NOAA), 11%; the Environmental Protection Agency, 33%; the National Institute of Standards and Technology (NIST), 38%; and the Centers for Disease Control and Prevention, 45%. Even Department of Defence research has

diseases, and developing the standards and measures that facilitate technological innovation. Indeed, just over a year ago, NOAA director Jane Lubchenco earned a place on the cover of *Nature* for guiding her agency's response to the Deepwater Horizon oil spill.

But as the current budget crisis unfolds, the erosion of mission-oriented research is likely to accelerate. For example, the spending bill passed in late November increased the NSF's budget by 2.5%, flat-funded NIST and cut NOAA's by 4.3%.

It wasn't supposed to be this way. America's pragmatic culture has long been assumed to favour applied investigation over fundamental science, a notion that goes back at least to Alexis de Tocqueville's nineteenth-century classic *Democracy in America*. And the foundational text of modern US science policy, Vannevar Bush's 1945 report *Science the Endless Frontier*, builds its case on the claim that the government will naturally support applied research, but must be compelled to support basic work.

Why, then, the neglect of the mission agencies? One important reason may be that the leading public voices speaking on behalf of research funding come mostly from the high-prestige frontiers of science, and from the institutions associated with such research — universities, the National Academies, the professional scientific societies, and so on.

Last November, for example, the head of the American Association for the Advancement of Science called for "rethinking the way we make the funding of universities more efficient" (A. I. Leshner *Science* 324, 758; 2011). This is a worthy goal, but nowhere in his

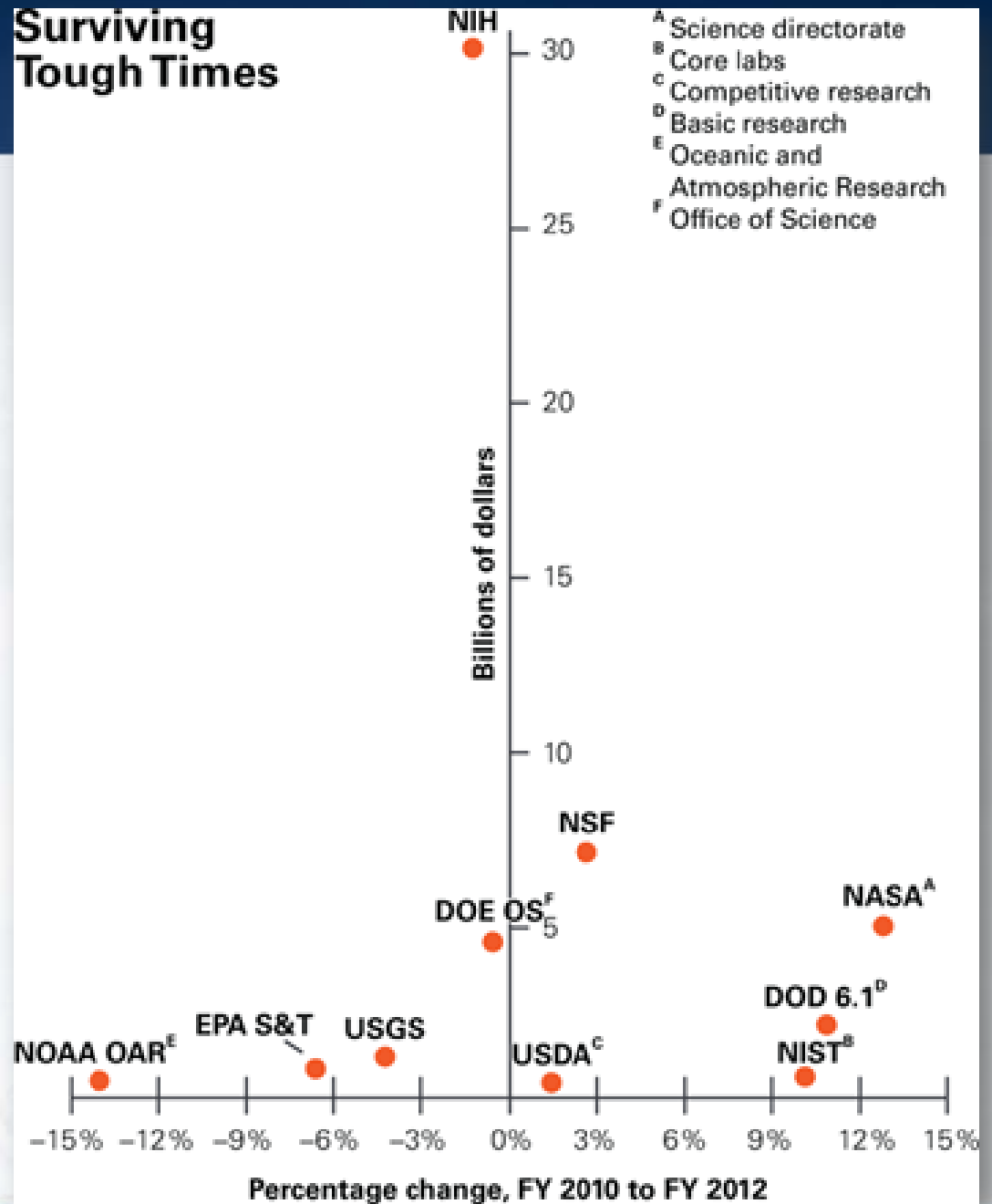
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January 4, 2011



2012 Research Budgets

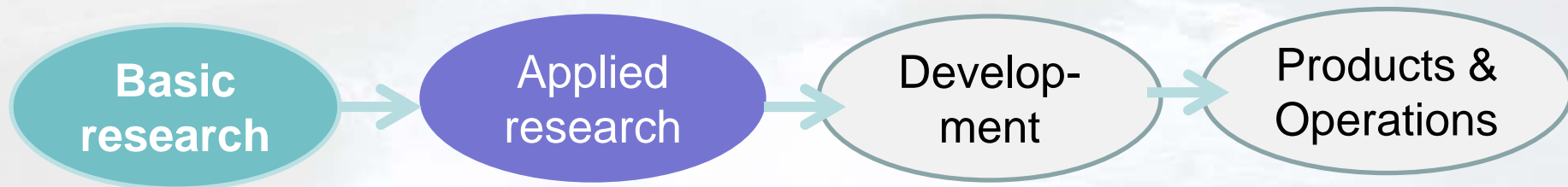
Science
January 6, 2012



Linear Model

BASIC RESEARCH:

performed without thought of practical ends
to yield fundamental understanding

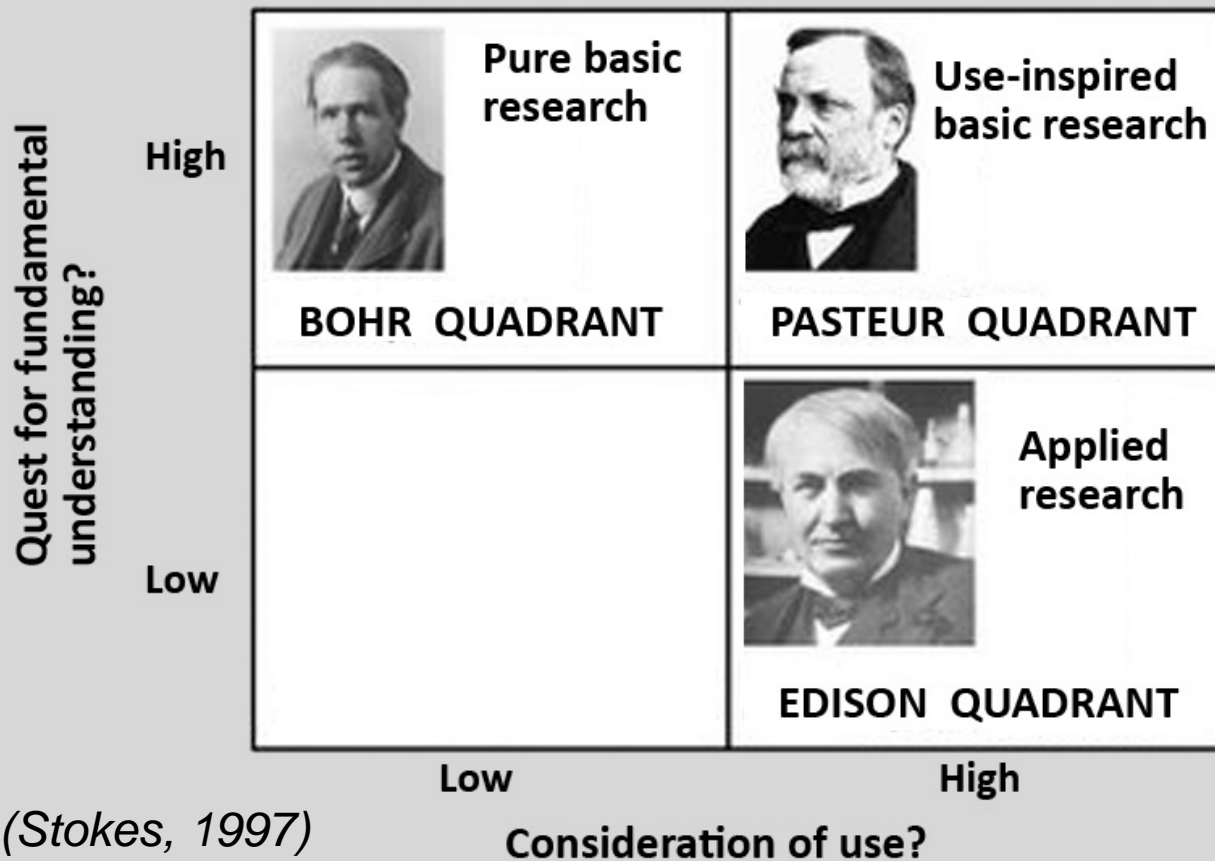


APPLIED RESEARCH: motivated by
use but does not seek fundamental
understanding

Vannevar Bush (1945) *Science – The Endless Frontier*
as described in *Rising Above the Gathering Storm* (NAS, 2007)



Pasteur's quadrant



There is not **pure science** and **applied science**, but only **science** and the **applications of science**.

Louis Pasteur, 1863

