



Revisiting Six Heretical Notions in 2005

Six Heretical Notions About Weather Policy



Roger A. Pielke, Jr.
ESIG/NCAR
rogerp@ucar.edu

29 March 2000
USWRP Science Symposium



Roger A. Pielke, Jr.
Environmental and Societal Impacts Group
National Center for Atmospheric Research (NCAR) Boulder, Colorado, USA

25-Mar-00

Roger A. Pielke, Jr.
University of Colorado
Center for Science and Technology
Policy Research
26 July 2005



Roger A. Pielke, Jr.
Center for Science and Technology Policy Research
University of Colorado/CIRES, Boulder, Colorado, USA



26 Jul 2005

Perspective: Weather Prediction is an Unambiguous Success Story!!

floods
asteroid impacts
hydrocarbon reserves
acid rain
weather
environmental impacts of mining
earthquakes
beach processes
global climate change

PREDICTION

Science, Decision Making,



and the Future of Nature

Edited by

Daniel Sarewitz, Roger A. Pielke, Jr.,
and Radford Byerly, Jr.



POSTULATE

Improved forecasts will benefit society.

Roger A. Pielke, Jr.
Environmental and Societal Impacts Group
National Center for Atmospheric Research (NCAR) Boulder, Colorado, USA



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LOGICAL PROPOSITIONS

- To improve forecasts we must advance science.
- To advance science we need improved models.
- To test and use improved models we need better observations.
- To assimilate the better observations and run the improved models we need faster computers.
- More funding will enable faster computers, better observations, improved models, and advances in science.



QED

Therefore, more funding for advancements in science, models, observations, and computers are necessary and sufficient to benefit society. A corollary is that the greater the rate of these advancements, the greater the benefits to society.



Six Heretical Notions - 1999

- More data is collected than is ever used in research or operations
- Forecasts are already great -- How good do forecasts have to be?
- The weather community is flush with funding
- More research has been produced than has ever been incorporated into operations
- Improved value of weather forecasts is constrained by characteristics of use and users and not by forecast accuracy
- The atmospheric sciences community is so large and full of overlaps and redundancy that no one really knows what the universe looks like



SPECIAL EDITION

BILL MURRAY

GROUNDHOG DAY



"A romantic comedy fantasy
that is Bill Murray's best
screen performance."
— Gene Shalit, *NBC Today Show*

DVD
VIDEO



Roger A. Pielke, Jr.
Center for Science and Technology Policy Research
University of Colorado/CIRES, Boulder, Colorado, USA



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- MESOMEX
- SESAME
- National Mesoscale Initiative
- STORM
- STORM-CENTRAL
- STORM-FEST
- USWRP
- USWRP Reset
- THORpex
- What is next?



SESAME has been known in two or three previous incarnations under the name MESOMEX and it died for a variety of reasons. One thing that we are trying to do this time to prevent it from dying is to keep it fairly strongly focused, moving in one direction. That direction is severe storms. When you talk about mesoscale meteorology, if you have three people in a room you get six opinions. We had that earlier and we decided we simply couldn't tolerate it, so it is now a more strongly directed program. We hope that most of you will be interested enough so that you will join with us in this version of mesoscale meteorological work.

Open Sesame (Severe Environmental Storms and Mesoscale Experiment):
Proceedings of the opening meeting at Boulder, Colorado,
September 4-6, 1974.



Roger A. Pielke, Jr.
Center for Science and Technology Policy Research
University of Colorado/CIRES, Boulder, Colorado, USA



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The 1980's should be designated as the decade of mesometeorology research. Planning should be viewed as a joint, interagency effort over 5 to 10 years. Large mesoscale field programs should have multiple goals allowing a sharing of resources and expanded data with related studies in air pollution, air chemistry, weather modification, climate research, air-sea interaction, etc. Modelers and field observers should participate jointly in the planning of field programs...

There was an overall consensus that mesoscale field research needs better coordination and national planning...

We need a major national program - a mesoscale GARP - which addresses both the fundamental problems and observational needs common to all of mesoscale research and explicit sub-programs having special requirements.

26-27 March 1979

2nd Mesoscale Planning Conference. Norman, OK.



It is axiomatic that a major goal of the STORM project is to develop cost-effective national weather services on the mesoscale that will address 3 areas of application – severe weather warnings, water and air resource management, and national defense.... [we have] distressingly low levels of skill in warning of severe storms etc...This seems to reflect 2 obstinate failings of our science and profession. The most basic is that our physical understanding has not advanced as rapidly as has technology. The second is that a substantial schism has separated research and operational sectors of the profession. The STORM program outlined here is the most important since it will begin a solution to both of these problems.

January 1983. The National STORM Program: Scientific and Technological Bases and Major Objectives (UCAR, 1983)



Roger A. Pielke, Jr.
Center for Science and Technology Policy Research
University of Colorado/CIRES, Boulder, Colorado, USA



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... the USWRP has not succeeded because, with the possible exception of hurricane landfall, it failed to create a close, active, and mutually beneficial connection between the research and operational/user communities. The USWRP never took on the role of determining the ongoing priorities of the research and operational communities, and then coordinating the necessary research and development. Without such an active connection, researchers lacked valuable feedback from users and the encouragement of seeing their work transferred to practical application, while the user community did not develop an appreciation for the value of research efforts and thus was not motivated to support them. Today, the USWRP is without a chief scientist, its monthly conference calls and newsletter have been suspended, and its program office has been disbanded.

April 2005, Mass, C. The Uncoordinated Giant: Why U.S. Weather Research and Prediction Are Not Achieving Their Potential.



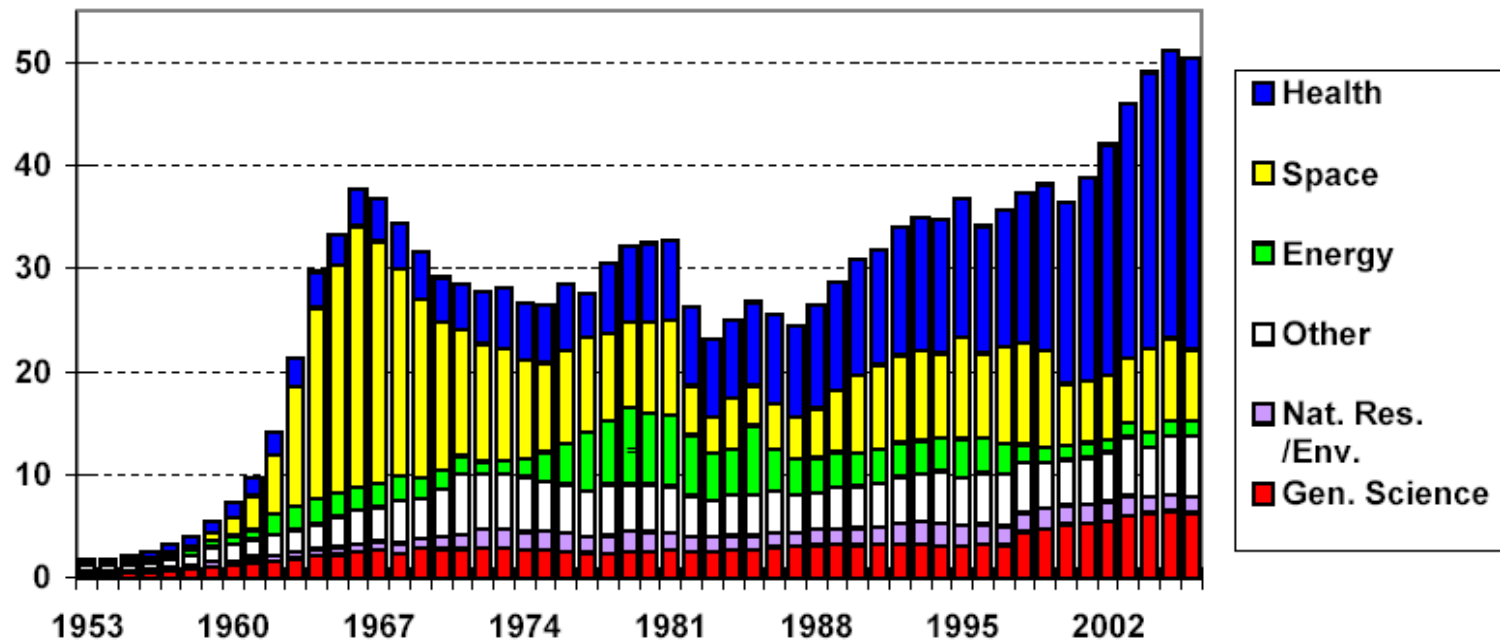
Roger A. Pielke, Jr.
Center for Science and Technology Policy Research
University of Colorado/CIRES, Boulder, Colorado, USA



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Trends in Nondefense R&D by Function, FY 1953-2006

outlays for the conduct of R&D, billions of constant FY 2005 dollars



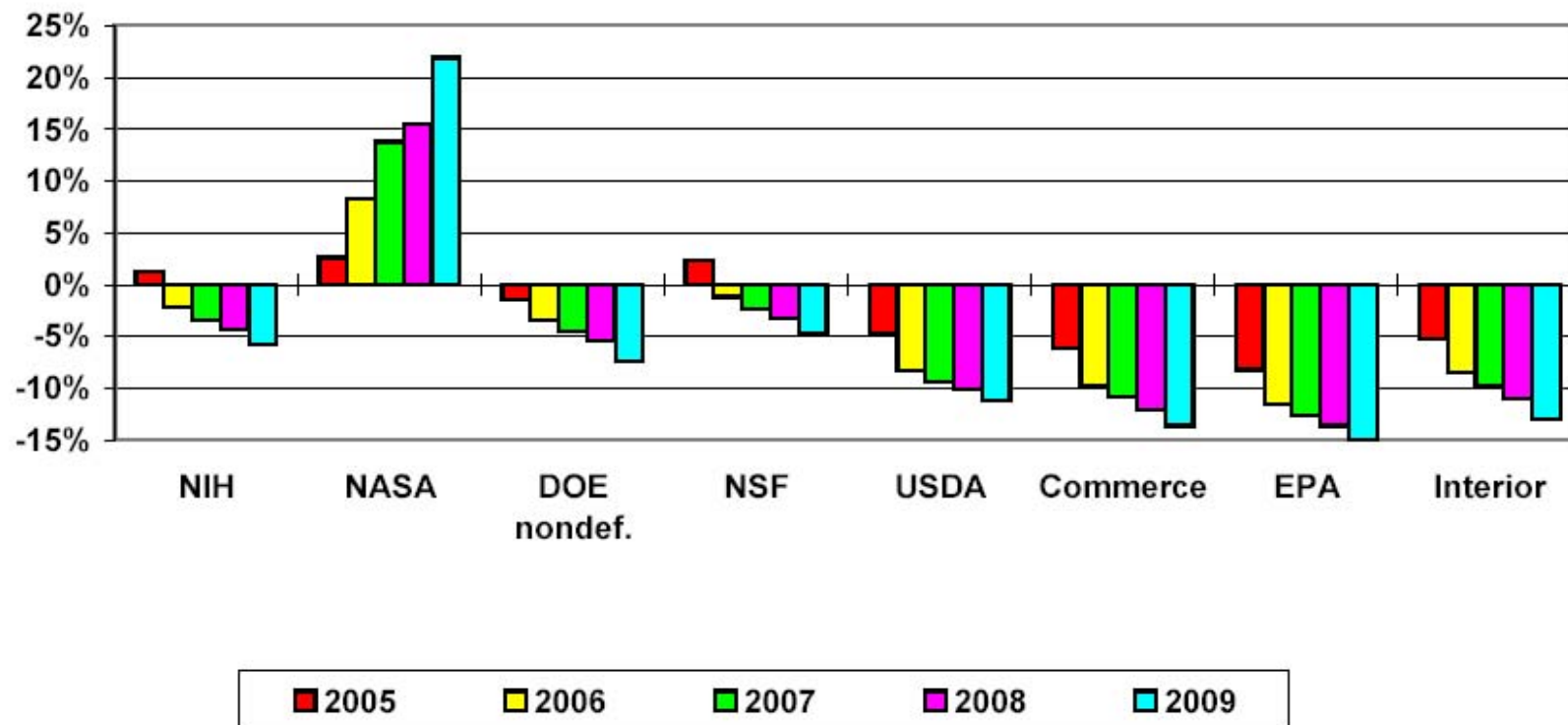
Source: AAAS, based on OMB Historical Tables in *Budget of the United States Government FY 2006*. Constant dollar conversions based on GDP deflators. FY 2006 is the President's request.

Note: Some Energy programs shifted to General Science beginning in FY 1998.
FEB. '05 © 2005 AAAS



Projected Nondefense R&D in the President's Budget, FY 2004-2009

% change from FY 2004 funding level in constant dollars



Source: AAAS analysis *Projected Effects of President's FY 2005 Budget on Nondefense R&D*
 APRIL '04 © 2004 AAAS



Six More Heretical Notions - 2005

- New funding – Forget about it!
- The frontiers of weather research lie in sciences other than meteorology
- In the developed world the future benefits to society of weather services are primarily in the private sector
- In the developing world the future benefits to society of weather services are primarily related to basic infrastructure of forecasting-warning-use
- Operations, not research, always has to be at the center of the weather enterprise
- Any effort focused only on the weather “research” or “prediction” enterprise is doomed to failure



pielke@colorado.edu

PROMETHEUS

<http://sciencepolicy.colorado.edu>

For further reading:

Pielke Jr., R. A., and M. H. Glantz, 1995: Serving Science and Society: Lessons from Large-Scale Atmospheric Science Programs. *Bulletin of the American Meteorological Society*, 76(12), 2445-2458.

Hooke, W. H., and R. A. Pielke, Jr., 2000: Short-Term Weather Prediction: An Orchestra in Search of a Conductor. Chapter 4 in D. Sarewitz, R. A. Pielke, Jr., and R. Byerly (eds.), *Prediction: Science Decision Making and the Future of Nature*. Island Press: Washington, DC. 61-84.

Pielke, Jr., R. A., and R. Carbone, 2002: Weather Impacts, Forecasts, and Policy: An Integrated Perspective, *Bulletin of the American Meteorological Society* 83:393-403.



Roger A. Pielke, Jr.
Center for Science and
University of Colorado

CIRES, Boulder, Colorado, USA



5 Jul 2005