Climate sciences: a return to relative obscurity or a rising relevance?

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18 October 2012
We have two hypotheses on the future of climate research

1. **INERTIA & DESPERATION**

“It is about the battle between inertia (skeptics, people who don't care, don't understand, or put a low priority on such issues) and the need for action, where ‘now or never’ pleas are being made and ignored because they sound too desperate.”

2. **QUESTIONS ANSWERED**

“On the other end, climate sciences may be on the way down because it has accomplished the mission that has stimulated its growth in the past 20 years; we have provided society an answer; but... unless we choose to work on impacts, we are not part of the solution.”

**IMPLICATIONS**

- Societal interest
- Funding for climate science
Inertia – really? In spite of the noise, public views are now more accepting of the influence of climate on our lives

• A large and growing majority of Americans say “global warming is affecting weather in the United States.” (74%, up 5 points since the last national survey in March 2012)

• Asked about six recent extreme weather events in the United States, majorities say global warming made each event “worse.”

• 87 percent of Democrats say climate change is taking place compared with 53 percent of Republicans. (In March 45 percent of Republican respondents said climate change is happening.)

Sources: Yale Project on Climate Change Communication; U. Texas
The key questions are answered? Not so fast

- The science IS settled in terms of knowing that we are changing Earth's climate, AND YET
- There are still significant questions and impacts that merit continued and deepening work – examples include:

  **REGIONAL CLIMATE**
  Describing and making real how large-scale warming will translate into decadal-scale and regional-scale changes

  **ADAPTATION PLANNING**
  Understanding and preparing for extremes – to include critical adaptation and response decision support

  **UNDERSTANDING ANOMALIES**
  There will always be surprises – witness the unprecedented melt in the Arctic this year and we must understand its implications
Rather than declining relevance, our time is now if we adapt to a changed environment and playing field

FACE FISCAL REALITIES – Recognize government funding will likely be flat to down for the foreseeable future under most scenarios
   – We must augment our traditional sources of funding for our work from those who will be affected by the changes across sectors

STOP FIGHTING THE LAST WAR – Spend less energy battling skeptics
   – With the science established, we must move to more direct solutions in service to society, directly supporting those on the front lines who can make the most of our insights

PLAY TO OUR STRENGTHS – We are among the most successful predictors the world has ever seen*
   – We have to double-down on the life-saving and economy-enhancing work our community does at the heart of weather-climate nexus over longer timeframes.

*See Nate Silver ‘Why Weather Forecasters are Role Models, NYT 9 September 2012
We have a national imperative from which to work

Billion Dollar Weather/Climate Disasters
1980 - 2011
NOAA/NESDIS/NCDC

- Actual # events exceeding $1 billion in damages at the time of event
- Actual damage amounts at the time of the event
- Adjusted # events exceeding $1 billion adjusted to present using the Consumer Price Index (CPI)
- Adjusted damage amounts at the time of the event adjusted to present using CPI

Years (1980 - 2011)

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The systems that sustain human health and our prosperity are heavily weather and climate dependent.

Routine weather events such as rain and cooler-than-average days add up to an average annual economic impact of as much as $485 billion in the United States.

In 2011, the U.S. experienced $52 billion in weather disaster costs – 14 disasters that amounted to more than $1 billion each.

The U.S. has been facing its worst drought in 50 years and in 2010 – globally, 44 million people were driven into poverty by rising food prices related to similar conditions.

Governments around the world spend $1.1 trillion annually on resource subsidies – food, energy, water, basic materials.
Business leaders, infrastructure managers, policy-makers face changing extremes and require new information

How does changing precipitation trends affect freshwater collection and reservoir system investments?

How should building codes be shaped to build a more resilient nation?

What crops will thrive, and which ones will struggle in the face of changing extremes?

In what ways can we weather-proof the commodity and supply chains life relies upon?
Addressing these opportunities and challenges plays to our community’s truly distinctive capabilities

- **Making Climate Science More Responsive**: Assessing the climate science needs of decision-makers in critical end-use domains (e.g., urban planning, water resources, natural resources, and ecological sustainability)

- **Embed Science in Decision Support**: Deploying a new generation of regional climate models and associated outputs for local decision-making

- **Benchmark and Assure Model Accuracy**: Applying tools and metrics to measure, quantify, and benchmark the effectiveness and drawbacks of various models

- **Expand Model Applications**: Addressing high impact geographies (urban, coastal, and high alpine systems), pairing these integrated effects on human, land, and other critical systems
The future is bright with a focus on amplifying and securing the impact of climate and weather science by doing the following

- **Secure** the federal foundation of baseline observations and forecast services by working across the entire climate-weather enterprise in a coordinated fashion

- **Support** the research & development necessary for the infusion of science & technology to improve weather and climate forecast accuracy and reduce uncertainty in the near, medium and long-term for users

- **Enable** and work with the private sector to rapidly develop specialized products and services needed to accommodate evolving climate-weather questions and impacts

- **Ensure** our nation’s economic engine is weatherproofed for the natural extremes which lie ahead
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