Communicating about Climate Change — 50 Years Later

Commemorating the 50th Anniversary of the First Official Climate-Change Warning to a U.S. President
So What Are The Challenges?

- Everyone Has a Bully Pulpit Now…..
- Too Many Graphs, Not Enough Common Ground
- “I have 20 inches of Global Warming in my yard”… Cute Tweet But Oh So Scientifically Wrong
- Overcoming Perceptions
- The Causation Problem
- Zombie Theories
Challenge #1:
Everyone Has A Bully Pulpit
Now
### Opinion Differences Between Public and Scientists

<table>
<thead>
<tr>
<th>Biomedical sciences</th>
<th>U.S. adults</th>
<th>AAAS scientists</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safe to eat genetically modified foods</td>
<td>37%</td>
<td>88%</td>
</tr>
<tr>
<td>Favor use of animals in research</td>
<td>47%</td>
<td>89%</td>
</tr>
<tr>
<td>Safe to eat foods grown with pesticides</td>
<td>28%</td>
<td>68%</td>
</tr>
<tr>
<td>Humans have evolved over time</td>
<td>65%</td>
<td>98%</td>
</tr>
<tr>
<td>Childhood vaccines such as MMR should be required</td>
<td>68%</td>
<td>86%</td>
</tr>
</tbody>
</table>

### Climate, energy, space sciences

<table>
<thead>
<tr>
<th></th>
<th>U.S. adults</th>
<th>AAAS scientists</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climate change is mostly due to human activity</td>
<td>50%</td>
<td>87%</td>
</tr>
<tr>
<td>Growing world population will be a major problem</td>
<td>59%</td>
<td>82%</td>
</tr>
<tr>
<td>Favor building more nuclear power plants</td>
<td>45%</td>
<td>65%</td>
</tr>
<tr>
<td>Favor more offshore drilling</td>
<td>42%</td>
<td>52%</td>
</tr>
<tr>
<td>Astronauts essential for future of U.S. space program</td>
<td>47%</td>
<td>59%</td>
</tr>
<tr>
<td>Favor increased use of bioengineered fuel</td>
<td>68%</td>
<td>78%</td>
</tr>
<tr>
<td>Favor increased use of fracking</td>
<td>31%</td>
<td>39%</td>
</tr>
<tr>
<td>Space station has been a good investment for U.S.</td>
<td>64%</td>
<td>68%</td>
</tr>
</tbody>
</table>

Who’s the Expert on Weather and Climate?
Challenge #2:
Too Many Graphs, Not Enough Common Ground
Graphs and Jargon

A table from the article: "Communicating the Science of Climate Change," by Richard C. J. Somerville and Susan Joy Hassol, from the October 2011 issue of Physics Today, page 48:
Different styles of communication

RESEARCHER
- Background
- Supporting Details
- Results/Conclusions

PUBLIC
- Bottom-Line
- So What?
- Supporting Details
Use E.L.F.L.A.N.D (via USFS Steve McNulty)

E Establish Contact
L Listen
F Find Common Ground
L Lessen Mistrust
A Assess Needs
N Nurture
D Deliver

Farmers skeptical about validity of climate change
May 9, 2014 by Mick Kulkowski

The recently released National Climate Assessment, reported by a team of 300 experts, including a panel from the National Academy of Sciences, asserts that climate change is already impacting the United States, and that the warming of the past 50 years is "primarily due to human-induced emissions of heat-trapping gases."
Challenge #3:

“I have 20 inches of Global Warming in my yard”…Cute Tweet But Oh So Scientifically Wrong.........
Weather is your Mood, 
Climate is your personality
“I find now that in the era of ‘arm-chair’ science – many people just don’t understand the scientific process, the peer-review process, etc. They see things more like a legal system and reasonable doubt. If there is reasonable doubt or slight uncertainty, they think the basic scientific premise is flawed. Science doesn’t work that way. There is uncertainty in an 80% chance of rain, but you will probably grab an umbrella. There is uncertainty in many medical doctors’ diagnoses, but we consume the information”---Dr. J. Marshall Shepherd
The Mystery of Peer Review

• Outside of Academia, Peer-Review is Relatively Meaningless Concept

• People **DO** understand concept of FDA Approval of Food and Drugs.

• Criticism of Peer Review Process (some warranted) shapes certain confirmation biases

• **An Aside:** I still find it amusing that some will invalidate peer review until they find “one” paper that supports their viewpoint
Challenge #4: Overcoming Perceptions
Weather Myths

• Heat Lightning
• It Doesn’t Get Cold In Deserts…..
• How are Hurricanes and Typhoons Different?
• Weather Forecasts are Wrong 50% of the Time
• Clouds coming out of airplanes are a government conspiracy
• Polar Vortex
• How are Weather Forecasts Made?
• Weather Apps are always right.
• Beware of “Wishcasting and Watch the Evolving Forecast
Why Do I Care About California’s Drought...?
WASHINGTON — Coca-Cola has always been more focused on its economic bottom line than on global warming, but when the company lost a lucrative operating license in India because of a serious water shortage there in 2004, things began to change.

Today, after a decade of increasing damage to Coke’s balance sheet as global droughts dried up the water needed to produce its soda, the company has embraced the idea of climate change as an economically disruptive force.

“Increased droughts, more unpredictable variability, 100-year floods every two years,” said Jeffrey Seabright, Coke’s vice president for environment and water resources, listing the problems that had earlier struck Coke.

A Coke bottling plant in Winona, Minn. The company has been affected by global droughts.
Andrew Link/Winona Daily News, via Associated Press
“Climate change is the challenge of our time. Each of us must recognize that the risks are personal. We’ve seen and felt the costs of underestimating the financial bubble. Let’s not ignore the climate bubble---Henry Paulson, President George W. Bush’s Treasury Secretary

“I have come to conclude that greenhouse gases and carbon pollution is not a good thing.” Lindsey Graham (SC-R)
Challenge #5:
The Causation Problem
We are going to be asked?
New National Academy Study on Attribution

An ad hoc NRC committee will examine the science of attribution of specific extreme weather events to human-caused climate change and natural variability.

- Provide an assessment of current scientific understanding and capabilities for attribution of specific extreme weather events to climate change.

- Provide guidance about the robustness of extreme event attribution science. The guidance should discriminate among different attribution approaches and different classes of extreme events, and it should consider various characteristics of the analysis (e.g., data coverage and quality, model performance, etc.).

- Identify research priorities for further development of the approaches.

Challenge #6: Zombie Theories
Zombies abound...

Most skeptics focus on very short-term or long-term climate changes without looking at the rate at which the changes are occurring. They also tend to look at one place rather than consider the entire globe.

Changing climate will cause some areas to improve, particularly in the short to medium term, while other suffer most of the consequences.

And “No, It’s not about Grant Money 😊
For my kids’ sake, I hope those that say changes are a hoax are right...I have far more to lose than gain by being right.............