It’s a tough period for science

• Science - What are we hiding?

• http://www.thedailyshow.com/watch/wed-october-26-2011/weathering-fights--science---what-s-it-up-to-
Things to Think About

1) What is important to you?

2) What will the world look like when you are 60?

3) What did the person who cut down the last tree on Easter Island think?

4) What would Bono do?
Global Change

• Ecologists now recognize the pervasive influence that human activities have in all ecosystems – even those not directly managed – and that these impacts, collective referred to as Global Change, will only become more pressing in the future.

• Thus, a research programs and in particular platforms that does not explicitly include the study of global change drivers will not be successful in providing the understanding of key ecological interactions necessary to forecast the future of ecosystems and the services provided.
The past can provide insight, but history provides few analogs for the climate change in the near future...

**IPCC predictions**

- 1600-1700's - bitter winters, famine in Europe
- Younger Dryas - 1300 yr cold period (11,000 BP), then rapid warming

Overpeck et al. 2003
Climate change is only one aspect of Global Change.

Reid & Miller (1989) the Scientific Basis for Conserving Biodiversity, World Resources Institute; Vitousek (1994) Ecology 75:1861-1876; National Oceanic and Atmospheric Administration (NOAA), USA. (Slide courtesy of Berrien Moore, USA)
Global Change Factors are strongly interactive

Independent vs. Combined Effects?

Ecological Systems

Species Extinctions

Reid & Miller (1989)

Nitrogen

Vitousek (1994)

CO₂

NOAA

Land Cover

Goldewijk and Batter (1997)

J.A. Klein
Gradual change does not mean gradual response

Thresholds and alternative states...
Climate Change: Basic Issues

- Earth’s climate varies naturally - because of a variety of cosmological and geological processes.
- “Climate change” refers to an additional, and relatively rapid, change induced by human actions.
- The additional change - several degrees C within a century - will disrupt the foundations of life on Earth.
- Ecosystems and life in general have evolved within a narrow band of climatic-environmental conditions.
Climate Change: the “debate”

Skepticism is now receding. We know that:

- Greenhouse gas (GHG) concentrations are increasing
- GHGs affect the climate system (thankfully!)
- World average temperature has risen relatively fast over the past 30 years
- Sea-level rise is gradually accelerating
- Many temperature-sensitive systems/processes have changed over the past two decades
Kilimanjaro 2000

Decreased ice on Kilimanjaro
1) What is important to you?
   The "environment" isn’t an abstract concept; it begins with your home, community, and family. These are all at the mercy of the larger global forces at work. If we make the connection between local vs. global, the importance of what is at stake emerges.

2) What will the world look like when you are 60?
   Our environmental future will be a world of 9-10 billion people, with drastically different energy and climate conditions. To change the future, we must first envision it.

3) What did the person who cut down the last tree on Easter Island think?
   Supposedly, Easter Islanders’ rapid deforestation deprived residents of even the ability to build canoes and exploit their fisheries. From our vantage point it’s easy to say, “What were they thinking?” In the future, someone may ask that about our use of oil.

4) What would Bono do?
   There is a chasm between what we know and gaining public and political acceptance. Bono, U2 lead vocalist and humanitarian activist, has an intuitive grasp of effective discussion: 1) make your point, 2) confirm the values of those with whom you speak, and 3) allow participants from different value systems to engage with you.