#### **Thoughts on Funding Opportunities in Climate Change**

Jiaguo Qi Center for Global Change & Earth Observations Michigan State University

#### Earth System Visioning

- ICSU (International Council for Science)
- ISSC (International Social Science Council)
- IGFA (International Group of Funding Agencies)
- Needs Driven Research Era:

Find a new avenue for science to respond effectively to societal needs and accelerate the delivery of the environmental science-derived knowledge

#### Grand Challenges in Global Sustainability Research

- Challenge 1: Forecasting
- Challenge 2: Observations
  Challenge 3: Thresholds
  Challenge 4: Responses
  Challenge 5: Innovation

Over the next decade the global scientific community must take on the challenge of delivering to society the knowledge and information necessary to assess the risks humanity is facing from global change and to understand how society can effectively mitigate dangerous changes and cope with the change that we cannot manage

### **Grand Challenges**

- 1.1. What significant environmental changes are likely to result from human actions? How would those changes affect human well-being, and how are people likely to respond?
- 1.2 What threats do global environmental changes pose for vulnerable communities and groups and what responses could be most effective in reducing harm to those communities?
- 2.1 What do we need to observe in coupled socialenvironmental systems, and at what scales, in order to respond to, adapt to, and influence global change? 2.2 What are the characteristics of an adequate system for observing and communicating this information?

### **Grand Challenges**

- 3.1 Which aspects of the coupled social-environmental system pose significant risks of positive feedback with harmful consequences?
- 3.2 How can we identify, analyze and track our proximity to thresholds and discontinuities in coupled socialenvironmental systems? When can thresholds not be determined?
- 3.3 What strategies for avoidance, adaptation and transformation are effective for coping with abrupt changes, including massive cascading environmental shocks? 3.4 How can improved scientific knowledge of the risks of global change and options for response most effectively catalyze and support appropriate actions by citizens and decision-makers?

### **Grand Challenges**

- 4.1 What institutions and organizational structures are effective in balancing the trade-offs inherent in social-environmental systems at and across local, regional and global scales and how can they be achieved?
- 4.2 What changes in economic systems would contribute most to improving global sustainability and how could they be achieved?
  4.3 What changes in behaviour or lifestyle, if adopted by multiple societies, would contribute most to improving global sustainability and how could they be achieved?
- 4.4 How can institutional arrangements prioritize and mobilize resources to alleviate poverty and address social injustice under rapidly changing and diverse local environmental conditions and growing pressures on the global environment?
- environment? 4.5. How can the need to curb global environmental change be integrated with the demands of other inter-connected global policy challenges, particularly those related to poverty, conflict, justice and human security? 4.6 How can effective, legitimate, accountable and just, collective environmental solutions be mobilized at multiple scales? What is needed to catalyze the adoption of appropriate institutional, economic or behavioural changes?

### **Grand Challenges**

- 5.1 What incentives are needed to strengthen national systems for technology innovation to respond to global environmental change and what good models exist?
- 5.2 What incentives are needed to strengthen policy and institutional innovation to respond to global environmental change and what good models exist?

5.3 How can the pressing needs for innovation and evaluation in key sectors be met?

### Mitigation and Adaptation

- Who adapts? - Ecosystems? - Human?
- Social Science. Important and Complex!





# It calls for

- Research to Improve Understanding of Human-Environment Systems:
- 1. Climate *Forcings, Responses, Feedbacks,* and *Thresholds* in the Earth System;
- 2. Climate-Related Human Behaviors and Institutions

# It calls for

- Research to Support Effective Responses to Climate Change:
  - 3. Vulnerability and Adaptation Analyses of Coupled Human-Environment Systems
  - Research to Support Strategies for Limiting Climate Change
  - Effective Information and Decision-Support Systems

# ROSES

- Research Opportunities in Space and Earth Sciences (ROSES)
- http://nspires.nasaprs.com





#### Programs

- LCLUC ("CLUB")
- **Terrestrial Ecology** Carbon Cycle Science
- Biodiversity
- Modeling, Analysis, and Predictions
- Atm. Composition
- Terrestrial Hydrology
- NEWS
- Weather Focus Area

#### Programs

- · Earth Surface and Interior
- Remote Sensing
- NIP
- Impacts of Climate Variability and Change on NASA Center and Facility
- Earth Science Applications (Disasters, Water Resources, Fires and Wildfires
- Earth System Data Record for Environmental Use
- Uncertainty Analysis
- Computational Algorithms and Cyberinfrastructure

# 

 USAID responds to these challenges with innovative programming that emphasizes economic growth, poverty alleviation, education, health, disaster preparedness and democracy to create a more secure, democratic and prosperous region.

Saw an increase in "research" component

- USAID
- · GrantStation an interactive site for grant seekers to identify funding sources
- Funding on
- Capacity building Ocean Freight Reimbursement
- Title II Food for Peace Microenterprise Development
- Denton Program (Transportation)
- American Schools and Hospitals Abroad (ASHA) Limited Excess Property Program
- Foreign Disaster Assistance Child Survival and Health Grants Program



