GLOBAL INITIATIVE FOR INTEGRATIVE MODELING OF HUMAN AND EARTH SYSTEMS

MICHAEL BARTON (ARIZONA STATE UNIVERSITY), BRIAN O'NEIL (NCAR), JOHAN FEDDEMA (UNIVERSITY OF VICTORIA), LAWRENCE BUJA (NCAR)
Building Capacity for 21st Century Social Sciences

- Goals
  - Mapping future directions for large-scale societal research
  - Infrastructure to catalyze advanced science of human systems
  - Identifying resources for building research capacity
Building Capacity for 21st Century Social Sciences

- Recommendations (white paper)
- National Center for Human Systems Science
  - Next generation science on the dynamics of human systems and coupled human-natural systems
  - High-performance computation for data synthesis, modeling, and advanced visualization
  - Meta-portal to synthesize data streams from multiple off-site sources and sensors

https://www.academia.edu/27189352/A_National_Center_for_Human_Systems_Science_Advancing_Next_Generation_Social_Informatics_and_Analytics
Building Capacity for 21st Century Social Sciences

- Examples of potential research
  - Risks of abrupt transitions in social and associated ecological systems, and decision-making under risk and uncertainty
  - Global human systems models that can be coupled with current earth systems models
  - Massive agent based modeling of firms and workers in the US economy
  - Analysis of social and security consequences of globally interconnected information networks
Followup Meetings

- Social Observatories Coordinating Network
- US Global Change Research Program
- Second workshop at Institute for Social Research
  - Comments to Congressional Commission on Evidence Based Policymaking
  - Clearinghouse for Integrative Human Analytics and Data Synthesis
  - Tracking #1k0-8t5u-nvqk
Workshop: Linking Earth System Dynamics and Social System Modeling

- CSDMS/CoMSES Net Social Dimensions FRG workshop
- Goal: create a multi-year science plan for next generation integrative modeling
- Major topics
  - Initial domains to tackle
  - Issues for coupling human and Earth systems models
  - Modeling extreme events and migration
  - Modeling human decisions and behavior
  - Impact assessment
- CHESS community
Workshop: Modeling Challenges for Sustainability

- Future Earth/AIMES workshop on integrative modeling of human and Earth systems (Kyoto)
- Emphasis on community building
- Focus on
  - Modeling significant transitions/regime shifts
  - Multi-scalar modeling
Where do we go from here?
CSDMS Annual Meeting: Modeling Coupled Earth and Human Systems

- Jointly sponsored by CoMSES Net
- 23-25 May, 2017
- CSDMS integration facility (Colorado and Foothills Parkway)
- Information and registration at: http://csdms.colorado.edu
Workshop: Integrated Modeling of Socio-Environmental Systems

- Sponsored by Future Earth/AIMES
- 13-15 March, 2017
- Institute for Advanced Sustainability Studies, Potsdam, Germany
- Modeling regime shifts in SES and international FOSS initiative for integrative modeling
human system as static input

human system as dynamic input

bi-directional feedbacks between human & biophysical systems
a) human system as static input

b) human system as dynamic input

c) bi-directional feedbacks between human & biophysical systems