

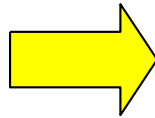
CURRENT PROBLEMS

SOCIAL SCIENCE

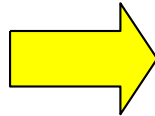
1. Climate Change



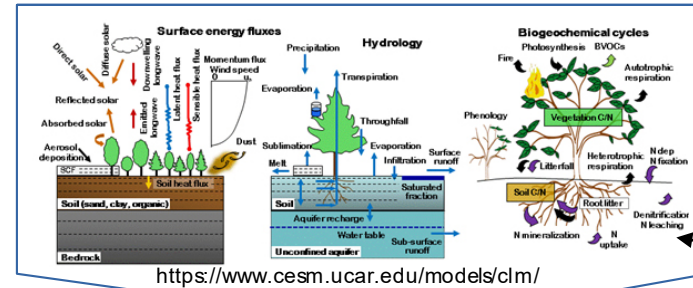
boundary conditions



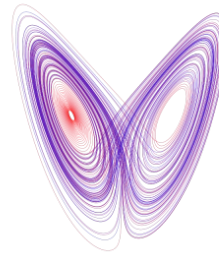
2. Land-Use/Cover Change



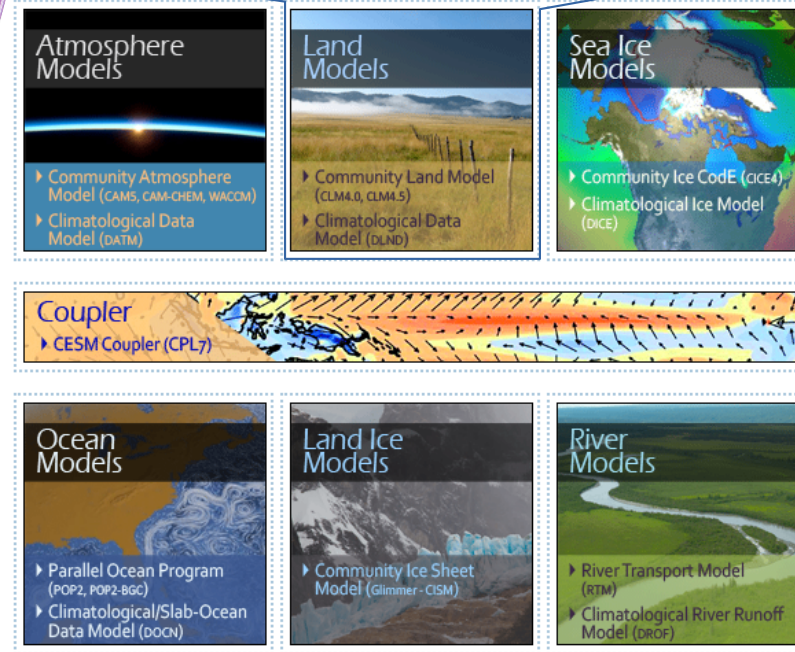
EARTH SYSTEM SCIENCE



Space/
Time
Scaling



Complex
dynamics
(nonlinearity,
feedbacks,
stochasticity)



Interfaces

EMERGING PROBLEMS

SOCIAL SCIENCE

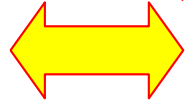
Climate Change



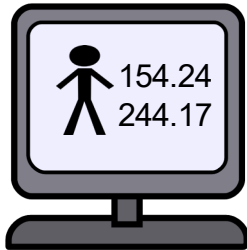
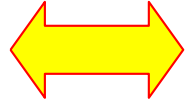
Land-Use/Cover Change



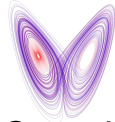
~~boundary conditions~~



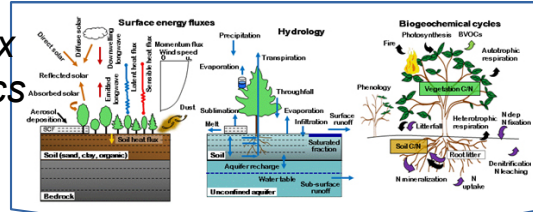
1. Human-Earth System



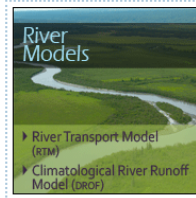
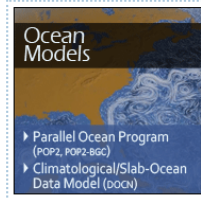
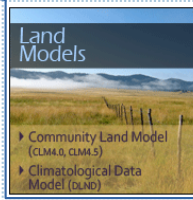
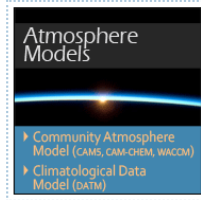
EARTH SYSTEM SCIENCE



Complex dynamics



Space/
Time
Scaling



Interfaces

EMERGING PROBLEMS

SOCIAL SCIENCE

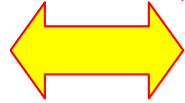
Climate Change



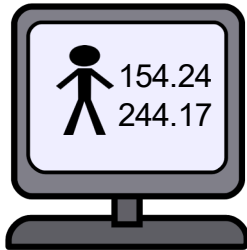
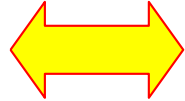
Land-Use/Cover Change



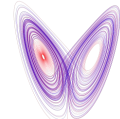
~~boundary conditions~~



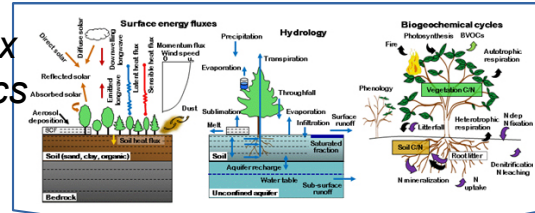
1. Human-Earth System



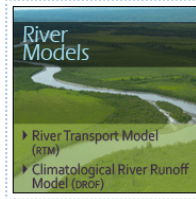
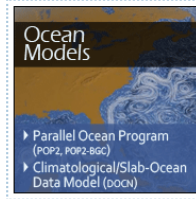
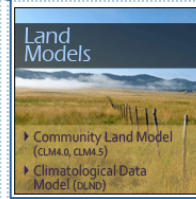
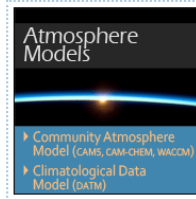
EARTH SYSTEM SCIENCE



Complex dynamics



Space/
Time
Scaling



Interfaces

2. Broader Impacts: Justice



Traditional harvesting of manoomin (wild rice)



(wild rice project website: <https://manoominpsin.umn.edu/>)

EMERGING PROBLEMS

SOCIAL SCIENCE

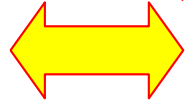
Climate Change



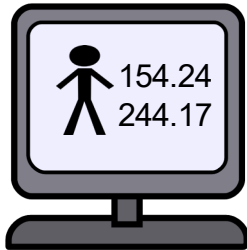
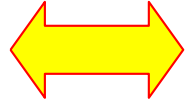
Land-Use/Cover Change



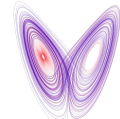
~~boundary conditions~~



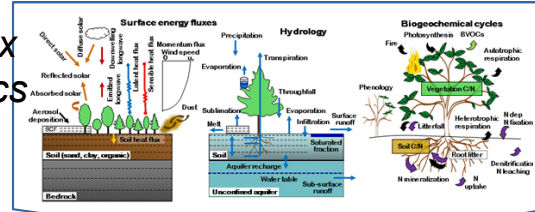
1. Human-Earth System



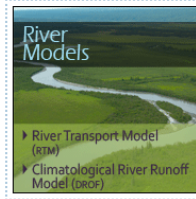
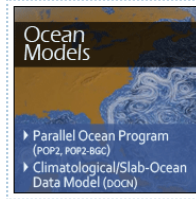
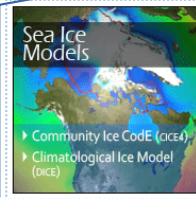
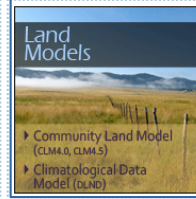
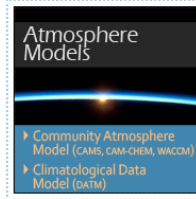
EARTH SYSTEM SCIENCE



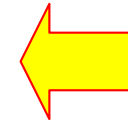
Complex dynamics



Space/Time Scaling



Interfaces



2. Broader Impacts: Justice



3. Community-Based Participatory Research



(wild rice project website: <https://manoominpsin.umn.edu/>)

EMERGING PROBLEMS

SOCIAL SCIENCE

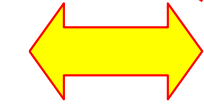
Climate Change



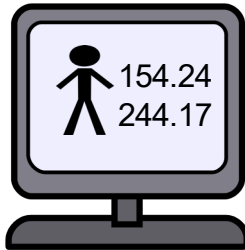
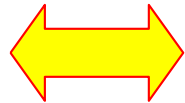
Land-Use/Cover Change



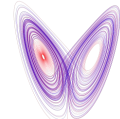
~~boundary conditions~~



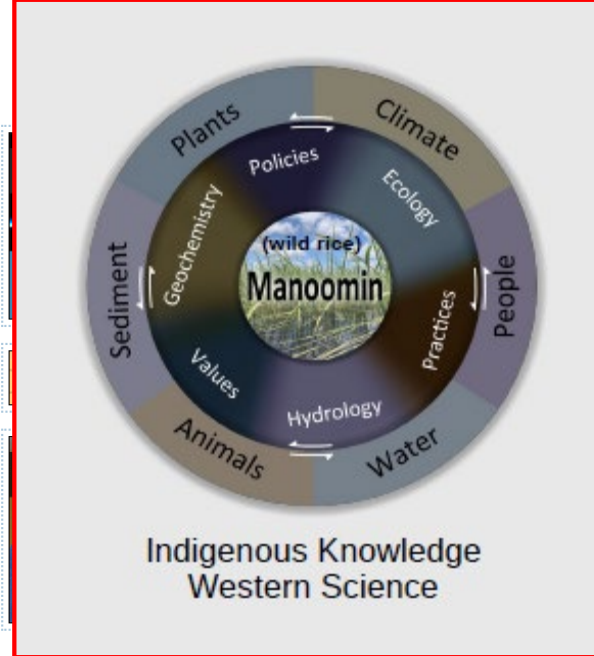
1. Human-Earth System



EARTH SYSTEM SCIENCE



Complex dynamics



Space/
Time
Scaling

Interfaces

**4. Integrating Ways of Knowing/
Epistemological Frameworks**

(Diversity makes our science better)

(wild rice project website: <https://manoominpsin.umn.edu/>)

SOCIAL SCIENCE

**2. Broader
Impacts:
Justice**



Traditional harvesting of
manoomin (wild rice)



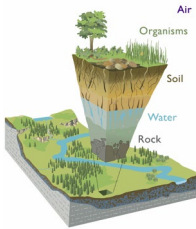
**3. Community-Based
Participatory
Research**



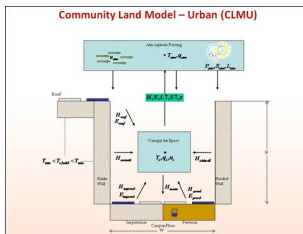
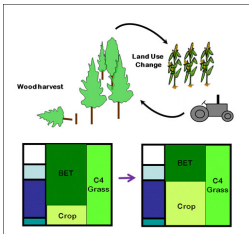
EXAMPLES

Noteworthy Starts:

NSF Critical Zone Observatories:
Intensively Managed Landscapes,
Calhoun



Human Dimensions in Earth System Modeling



Addressing Emerging Problems:



AGU FALL MEETING

Online Everywhere | 1-17 December 2020

**INV09 Convergence, Collaboration, Justice, and the
Future of the Sciences**

OPPORTUNITIES

- Support Justice, Equity, Diversity and Inclusion (JEDI) initiatives
- Create interdisciplinary opportunities for students & early career scientists (education and research)
- Intensive study sites / observatories including human dimensions
- Fund collaboration incubators (interdisciplinary scientists AND community partners)
- Sustain funding for JEDI / interdisciplinary efforts