

Questions at the Earth System Level and Modeling Tools to Address Them

Jeffrey Kiehl
Climate Change Research
Section

Outline

- Process to date on formulating questions
- Examples of overarching questions
- Tools Required to Address Problems
- Future Steps

Process to Date

- Initial small group formed to begin process
- List of over 30 questions/problems identified
- Use this meeting to solicit more input
- Reshape & Expand working group

Groupings of Questions

Chemistry-Climate &
Air Quality

Climate Thresholds in
Earth System

Climate Impacts on Policy

Climate Change &
Urbanization

Shifts in Extreme Events

Land Use Issues

Climate change &
Energy Use

Assessment of
Uncertainty

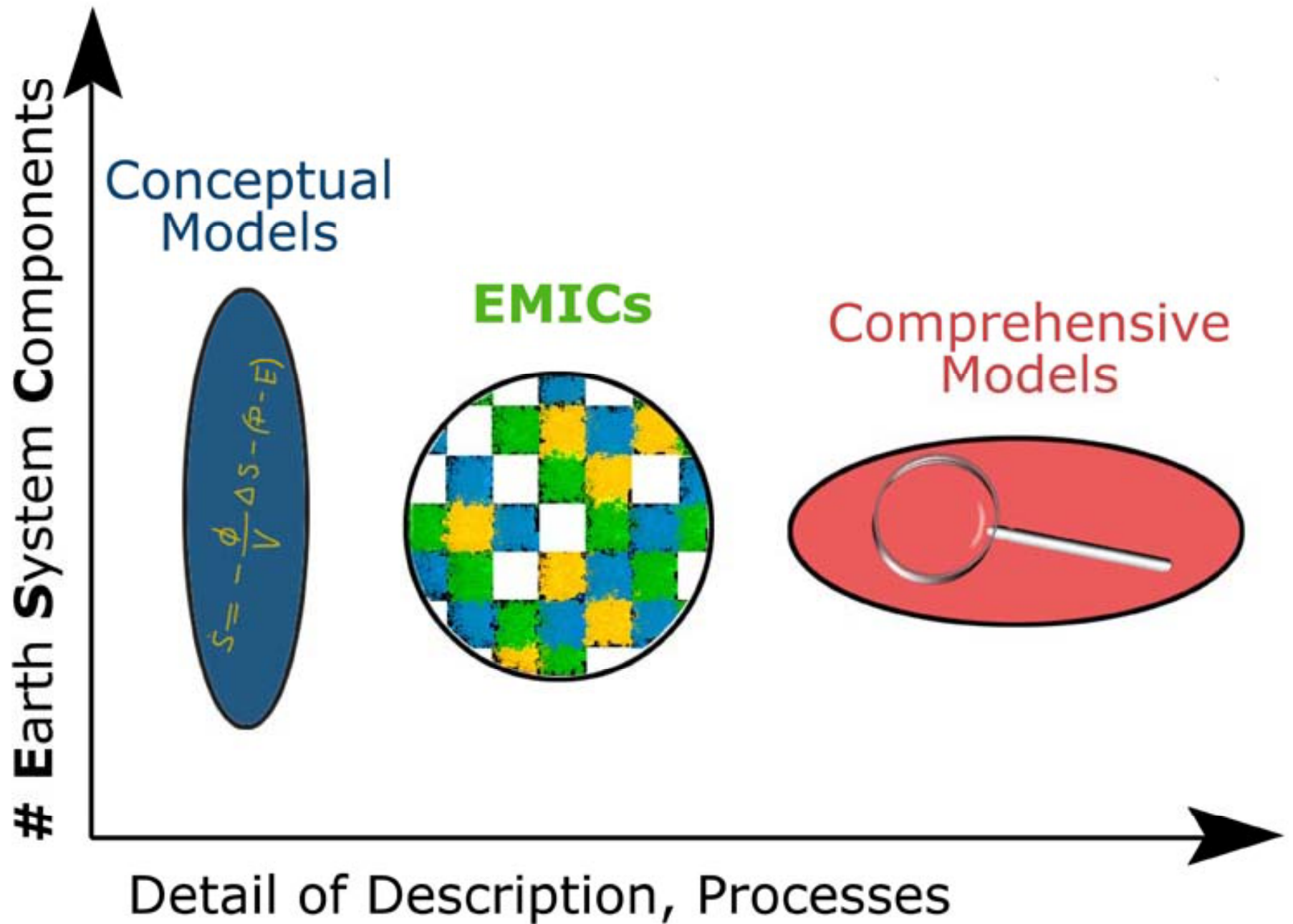
Earth System Sensitivity &
Policy Strategies

Examples of Two Issues

- Sea Level Rise & Coastal Processes
 - Stability of Ice Sheets
 - Storm surges
 - Coastal sustainability
- Uncertainty Analysis & the Earth System
 - Socio-economic factors
 - *Earth System Sensitivity*
 - Mid course changes to emissions strategies

Tools Required to Address Questions

- Fully coupled Earth System Model
- Sub-components of the ESM
- Earth System Models of Intermediate Complexity (EMICs)
- Integrated Assessment Models (IAMs)
- Conceptual Models



Future Steps

- Renaming of Working Group:
 - Working Group on “Human Dimensions as a Part of the Earth System Model”
- Plan to hold another local meeting in May
- Plan to hold a workshop in the Fall with participants from around the country
- Encourage equal partner collaborations
- Write a white paper on using an ESM hierarchy to address key questions