Panel V
Objective: A community conversation on the optimal high-level construction of EPIC.

Questions:

• If you were in charge, how would you partition the expected $15M of EPIC funding between administration, permanent scientific and technical staff, sponsored R&D, HPC, and other expenditures? Why?

• How and who should run EPIC?

• What performance metrics should be used to measure the short and long-term success of EPIC?

• How can EPIC ensure that young investigators and a more diverse community are engaged, represented, and included?

• What best practices can be applied and invoked to ensure community collaboration rather than community competition?

• How do you envision balanced governance among the weather, water, and climate enterprise?
Uncoordinated Enterprise

Enterprise towards a common goal

Recommendations

1. Launch a National Academies’ study on the Future of the U.S. Weather Enterprise

2. Develop a national unified modeling and forecasting system: a consolidated national center with participation from the entire Weather Enterprise and multiD agency support

3. Establish mechanisms for
   - sustained resources to support research, observations, computation, modeling, forecasting, and workforce
   - uncompromised accountability

(https://science.house.gov/imo/media/doc/Chen%20Testimony1.pdf)
Uncoordinated community
Can this be “integrated” into a world leader?

EPIC core model/forecast system
Who and what processes to decide?

EPIC towards a common goal

New, innovative, community-based EPIC:
• What are science drivers?
• What are requirements?
• What are metrics to measure success?
**Science drivers** (for the core model/forecast system):

- High impact weather (e.g., hurricanes, heat waves, flooding, etc.)
- Increase forecast lead time beyond 7 to 10 days (focusing on source of predictability on weeks to seasons time scales: the MJO, jet streams, tropics to high latitude teleconnection, etc.)
- Coastal prediction in a changing climate & rising seas (sea, land, urban, rivers and water shields, storm surge, etc.)

It’s the best way to attract young scientists and diverse community to participate!

**Requirements**

- Earth system (coupled atmosphere-wave-ocean-ice-land) model
- Model physics developed and tested in the coupled system
- Both operational and research needs
- Observations for both model verification and data assimilation

*Shuyi S. Chen*
**Metrics to evaluate forecast skills:**
- For coupled Earth system modeling and forecast (local and global energetics, e.g., global rainfall/air<sea fluxes/water transport, etc.)
- Evolving (non-static) as models improving and societal needs change

**Metrics to measure short-term and long-term success:**
- Short-term: tangible/concrete steps toward building a dream system and demonstrate its new capability?
- Long-term: “reclaiming and retaining international leadership in the area of numerical weather forecasting” (EPIC Legislation, Public Law 115<423)

How should the EPIC organization, management, and governance be structured to support and provide leadership on a long-term vision and a systematic and transparent process to achieve the EPIC goals?

Shuyi S. Chen