

Paleoclimate Deliberations

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- ***Paleoclimate as a grand, unifying challenge?***
 - ***Is truly interdisciplinary***
- ***Understanding climate variability throughout earth history could unify the geocollaboratory***



Question 1: Structuring HPC for paleoclimate needs

- Unique needs:
 - Typically need longer runs (10^3 - 10^4 yrs)
 - Lower resolution, but sometimes need high resolution (e.g., K/T, Med Salinity Crisis, ocean gateways)
 - The climate signal: noise is large, but so are the signals
 - Linkages between land, oceans, atmosphere, biogeochemistry, biology are critical to investigations
- We need to learn how to use petascale capabilities: tradeoff between ensembles on Track 2-3 systems and focused studies on Track 1

Question 2: Effective Support for paleoclimate studies

- Challenges:
 - Porting to new systems
 - Parallelization issues (application support)
 - Need a fully functional (“broad brush”) paleoclimate model; model development currently driven by IPCC, current earth state (e.g. river routing)
 - Need better, wider, more integrated data collection, documentation, and archiving (NSF’s role(s)?)
- Paleoclimatology is rooted in geosciences, as much as in numerical weather prediction
- Can the models represent extreme climates?

Question 3:

Resource allocation models

- Whatever RA model is chosen, careful thought should be given to the downstream implications for new science and young scientists.
- The system should be open to admit people without funding.
- Grant allocations process - getting dedicated nodes for a long period of time, vs. short term intensive needs.
- Who will decide between communities for petascale use?
- NCAR/SCD allocation model - something to build on?

Question 4:

Types of services and support

- Access to data sets from model runs (e.g., PMIP, COHMAP)
- Underscores the need for data sharing and documentation technologies (e.g., metadata)
- Better support for applications, post processing assistance, visualization
- NetCDF and beyond; virtual machine models

