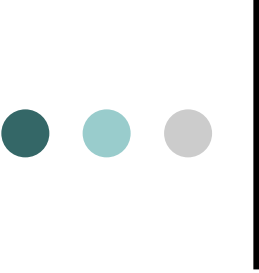




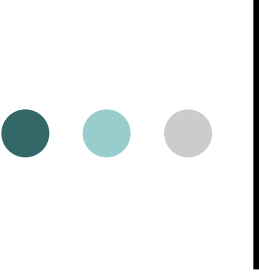
# Group 3 – Breakout Summary

HPC in the Geosciences Workshop  
Sep. 27<sup>th</sup> 2006



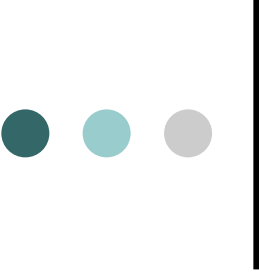
# How can the community best facilitate through the development of geosciences CI- better collaboration in the areas of education, outreach, training and workforce development?

- Education in general
  - can be a unique training ground, can teach many things not taught at universities, such as scientific visualization
  - accomplished by workshops
  - websites
- Opportunity for industry involvement
  - Data sets and simulation results expose the students and public to hurricanes, tsunamis, earthquakes;
  - challenge to visualization companies, such as Amira, data is too big for IDL and Matlab
- Significant social, economic implications in doing this outreach task well. much more so than Earth Simulator did, which did not do a good job in this outreach mission in Japan.
- Provide high visibility facility with lots of attractive high-tech access for high-school kids to encourage them to scientific and technical careers



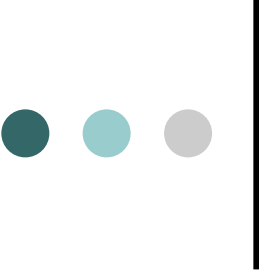
## How can the economy of scale of HPC enterprise be best demonstrated ?

- Collaboratory will help to spread the word and create opportunities not possible with just having hardware, more so than the National Centers today
- Visualization will flourish because of the demand, more than in cluster culture, in which visualization did not thrive
- investment by doing many interesting problems in the environmental sciences
- Allows geosciences to maintain leadership in computing
- Accessibility to state-of-the-art hardware, otherwise not possible with cluster technology



## What is the best model for establishing a fair relationship between available resources, required science and allocation?

- We must allay the fears of some colleagues ( e.g. solid-earth geophysics ) who worry about losing money for their PC clusters
- We must strive for a balance in the composition of the panels
  - science reviewers and code-readiness reviewers, the two may not overlap sometimes,
  - not enough qualified reviewers in some disciplines
- Allocations for user support as well as CPU time to bring some people up to speed
- Strong education component to teach people how to use these big iron. Without education, no progress will be made. in this regard, the Earth Simulator did not do well
  - summer school for this purpose.



How can geosciences HPC enterprise best be designed in order to provide the capability for addressing emerging opportunities and for supporting "hero" computing requirements ?

- How to divide up the machine- issue of half a hero. this is a difficult design problem , and requires leadership in promoting the frontier kind of question: scientifically driven- for example, largest turbulent model, oceanic circulation with high resolution, tsunami modeling with high resolution and coupling to earthquakes, plate-tectonics, formation of the core.
- Job allocation, in Pittsburgh center, many jobs take 1/2 processors and some jobs 100 %, possible to do interactive computing most hero-like NSF center, as compared to San Diego and Illinois.
- Try to increase scientific productivity by establishing reasonable tradeoffs
- Emerging opportunities, on-demand computing hurricanes, disease, explosions