

# Breakout Group 4

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Q1. How can the community best facilitate -- through the development of geoscience cyberinfrastructure -- better collaboration in the areas of education, outreach, training, and workforce development?

**A1. Need to educate scientists and students on commonly available tools.**

**A2. The tools are in place (portals, web pages, data processing, visualization, etc.) - NSF needs to evaluate how to reward scientists who train and mentor.**

Q2. How can the **economy of scale** for a Geosciences high performance computing (HPC) and collaborative enterprise best be demonstrated?

**A1. General purpose tools, software, etc. -- templates -- developed now...and ready for scientists to use when the next class of machines are available.**

**A2. Frees up scientists and students to do science instead of system administration; must ensure management that meets the needs of the science.**

**Q. What are achievable science goals with PSC that can't be achieved with the computing we have today?**

**OR**

**Simulating something we have never been able simulate before due to limited computing power.**

**Plate tectonics, from "first principles"**

**Regional climate simulations**

**Sequestering CO<sub>2</sub>**

Q3. What is the best model for establishing a fair relationship between available resources, required science, and allocation of computing?

**A1. Make planned runs known to (and documented for) the larger community; investigators can plan for more extensive analyses before (and during?) the runs for broader community use.**

**i. Need to look at both small- and large-scale problems that may use these data.**

**ii. Open data policy - cost to be born by the data center.**

Q4. How can a Geosciences HPC and collaborative enterprise best be designed in order to provide the capability for addressing **emerging opportunities** and for supporting “hero” computing requirements?

**A1. Importance of openness! Allows for emerging opportunities.**

**A2. Scheduling such a (big) facility for specific runs, far in advance (a year or more); make allowances for such an exciting, but unscheduled, run.**

**i. How can such activities be fit into the procedures used to make these decisions?**