What are the Issues?
Six central issues were identified as of high importance to geoscience education.
1. What are the goals or desired learning outcomes of instruction in the geosciences?
2. What methods are effective in helping students understand time and spatial scales?
3. What strategies will help undergraduates become comfortable with the complex representations common in the geosciences?
4. How do scientists learn about and understand complex systems? How can this expertise be developed in students?
5. How do geoscientists combine knowledge from observations, experiments, and theory to create knowledge? How can this expertise be developed in students?
6. What types of instruction and learning environments work well for the geosciences?

A New Research Agenda
Research is needed in three broad areas:
1. What characterizes expert cognition in the geosciences?
2. How do we facilitate learning that leads to this expertise?
3. How do we effectively design learning environments to support geoscience learning?

Topics that are ripe for study include
- Visualization: how do people look at, interpret and describe geoscience images
- Representation: how do we understand and represent things abstract, unseen, and beyond everyday human experience
- Space: how do we effectively teach the spatial reasoning skills fundamental to studying the Earth (e.g. distance, shape)
- Learning in the field: how do people observe, interpret, and draw conclusions from natural systems
- Deep time: how do we effectively teach about deep time, rates, and the importance of history in the evolution of the earth
- Expert-novice relationships: what characterizes geoscience expertise; how do geoscientists learn things and draw conclusions
- Complex systems: How do we teach and learn about complex systems
- Models: How do we teach about models and use them to learn about the Earth (creation, use, analysis)
- Evaluation of learning, methods, teaching environment