Learning goals:
- Facts about oceanography
  - ocean basins and plate tectonics
  - atmosphere and climate
  - waves and beaches
  - life in the ocean, global fisheries
- Science process
- Implications for the future

The Guided Writing Assignment:
- The model was developed at UCLA (http://cpr.mosbci.ucla.edu/)

Elements of a CPR assignment:
1) assignment description
2) scoring rubric to be used by peer graders
3) 3 "calibration" papers, scored by the instructor
4) other instructional resources
5) data resources that can create images of data plots or other representations

To do the assignment, the student:
1) carefully reads the assignment description
2) writes the paper using EarthEd Online
3) Hands in paper before edue date/time (click the "hand-in" button)
4) Reviews 3 "calibration" papers, beginning 24 hrs after the hand-in due date. Students are prompted if their average item grade for a particular heading is greater than a preset value.
5) Reviews 3 peer papers, randomly assigned and anonymous
6) Reviews her/his own paper.

The paper grade is computed from:
1) the 3 peer grades weighted by each reviewer's rms variation
2) Prof or TA grade if student requests it. This grade over-rides the peer grade.

The reviews grade is computed from:
1) difference between grade given peers and final grade each peer received
2) difference between final grade for own paper and self-score for own paper
3) RMS deviation of calibration paper scores relative to "correct" scores
4) other instructional resources

Student feedback example question:
"Compared to a normal writing assignment where the paper is handed in on paper, graded by a teacher or TA, then returned, do you think the calibrated peer review system helps you learn the subject matter better? (comments welcome)"

Example positive comments:
- "More classes need to be software supported such as this one."
- "It's nice to have immediate content with peer reviews, as well as being able to compare the paper to the rubric on hand."
- "It's a great format."

Online writing in EarthEd:

Peer grading (Calibrated Peer Review):
- The model was developed at UCLA (http://cpr.mosbci.ucla.edu/)

Advantages of assigning writing:
- improves student learning by going beyond fact memorization
- active participation in the science process
- teaches how to argue from data, rather than opinion

Challenges:
- faculty/TA workload
- posing an effective assignment
- managing TA skills, feedback, and grading
- paper shuffling logistics
- avoiding grading "burnout"

Approach:
- Learning the facts:
  - lectures
  - reading
  - online, auto-graded homeworks
- Science process
  - investigations using real Earth data
  - writing in science format
- Logistics and motivation
  - on demand grade computation
  - auto-grading homework, for immediate feedback
  - online writing, "hand-in," grading, and return

EarthEd Online is:
- Authored with Macromedia Director
- A stand-alone browser, delivered on CDROM
- connected to a web server through the internet
- automatically upgraded from server
- cross platform: Macintosh and PC
- modular: new modules can be added easily
easily configured for the needs of a variety of courses. Assignments are stored on the class web server.

Online writing in EarthEd: