

### Suggested Outline

Week	Topic	Special focus areas: Examples
1	Box models, reservoirs, fluxes	Box modeling introduction
2	Hydrologic cycle: rivers, lakes, wetlands, ocean, atmosphere	Global ice volume and sea level changes
3	Atmosphere and biogeochemistry	Acid rain and continental weathering
4	Carbon cycle: weathering reactions and tectonics; long, medium, and rapid responding C cycle; marine and terrestrial carbon cycles	Global warming
5		Records of paleo pCO <sub>2</sub> and O <sub>2</sub>
6		Weathering feedbacks Damming of rivers: water, sediment, and nutrient impacts
7	Nutrient cycles: Marine, terrestrial, and global views of N, P, Si, S	Biogeochemical methods, instrumentation resources in UCSC labs
8		
9	Case studies and proposals	
10	History of global change and biogeochemical cycles	Policy implications

### Suggested Readings

Schlesinger, W.H. (2005) Biogeochemistry, Treatise on Geochemistry, Vol. 8, Elsevier.

Berner, R.A. (2004) The Phanerozoic Carbon Cycle, Oxford University Press.

Jacobson, M.C., et al., (2000) Earth System Science: From Biogeochemical Cycles to Global Change, International Geophysics Series, Vol 72, Academic Press.

### Suggested Evaluation Metrics

Problem sets/exercises

Student presentations

Proposal or case study