

ONE PAGE SUMMARY OF CURRENT ACTIVITIES

Steven Emerson

School of Oceanography

University of Washington

Phone 206-543-0428

e-mail emerson@u.washington.edu

Research Interests

- Exchange of inert and metabolic gases and isotopes between the atmosphere and ocean
- Upper ocean oxygen mass balance and decadal-scale changes of the O₂ concentration
- Trace metal tracers of the REDOX state of marine sediments over geologic time
- Diagenesis and preservation of organic matter and calcium carbonate in sediments.

Teaching:

- Chemical Oceanography, a beginning graduate-level course
- Chemical Kinetics, an advanced graduate-level course
- The Global Carbon Cycle and Greenhouse Gases (with Ginger Armbrust, Bio Ocean and Lyatte Jaegle, Atm Sci.), This is a new course in the Program of Climate Change
- Topics in Chemical Oceanography, a senior level undergraduate Chemical Oceanography Course

Current Graduate Students:

Roberta Hamme (Ph.D. soon)

Erin Breckel (just completed her Masters degree)

Currently Funded Research Projects:

The study of the gases Ar, N₂, Ne and O₂ in the ocean. We use the distribution of these gases to determine the processes causing the net biological oxygen production and respiration in the upper ocean. This is the research project on which **Roberta Hamme** is working. *She will be leaving with her Ph.D. by the end of the spring and I will be looking for a student to take up where she left off.*

The study of oxygen mass balance in Puget Sound using a remote profiler (Ocean Remote Chemical Analyzer, ORCA). This project is a collaboration with Dr Allan Devol. We made this device and it determines a profile of T, S, O₂ and Chlorophyll every 4 hours and sends the data to our lab via cell phone.

The study of the oxyanion trace metals, U, V, Re and Mo in marine sediments. These metals accumulate in sediments that are anoxic. By studying their behavior in today's ocean we hope to use their concentrations in sediment cores to determine how the bottom water oxygen and carbon rain rate to the seafloor have changed in the past over glacial-scale time intervals. This is the project on which **Erin Breckel** recently completed her Masters Degree. A new proposal has been submitted to continue this research. We will know the results in summer.

Modeling the upper ocean in the North Pacific Ocean. This is a collaborative project among Luanne Thompson (Physical Oceanography), Paul Quay and I. Luanne has a basin-scale model of the North Pacific. We will be inserting chemical tracers and metabolic products in the

model to determine the mechanisms of anthropogenic CO₂ uptake and decadal-scale changes in ocean productivity. We hope to attract a new post doc. to continue this research.