

OCN 760 Tracers: their diffusion, transport and reaction
Kelvin Richards
rkelvin@hawaii.edu
Spring Semester

Course Description

The course aims to introduce students to the various processes that affect the distribution of tracers in the ocean and atmosphere. The tracers considered range from the purely inert to biologically reactive. The structure of the course is a mix of lectures and directed reading with the content adapted to the needs and desires of the student. Course grades are assessed on (a) your participation in class discussions, (b) your own presentations to the class, and (c) a course journal submitted at the end of the class. The course journal is a statement of the salient points of each of the topics covered. Topics covered include:

Basics

3D and 2D turbulent flows
Energy Spectra

Diffusion

Random walks
Eddy diffusivity
Diffusion by continuous movements
Anomalous diffusion

Flow

Stretching
Coherent structures
Transport barriers

Transport

Ocean ventilation
Eddy transport
Transient tracers
Tracer age

Reaction

Phytoplankton/Zooplankton/Nutrient interactions
Impact of viruses
Effects of stirring