

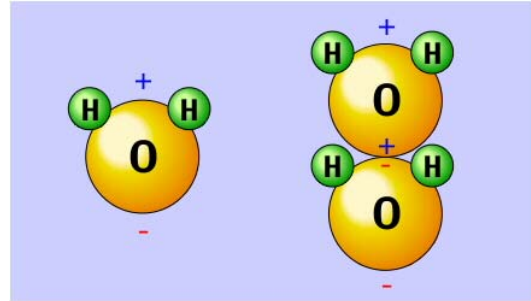
H A&S 222d

Introduction to Energy and Environment

Spring 2009 (5 credits)

Instructor: P.B. Rhines, Prof. of Oceanography and Atmospheric Sciences

<http://www.ocean.washington.edu/courses/as222d/> or contact rhines@ocean.washington.edu



This course explores the global environment and energy resources. It has a ‘science core’ yet is designed so that non-scientists can compete equally with science majors. The core will teach some of the essential ideas that underlie our environment: first from the solar origin of energy, to the ‘heat engine’ that is circulating atmosphere and ocean, and then following the track of living energy in the biosphere. Energy use by humans, and our need for ‘green’ energy, will be the final focus. In parallel with the science core we will study the impact of humans on the environment, and do this by studying the lives of natives of the far North. At the rim of the Arctic, the most challenging environment on Earth, energy is central to survival. We consider changes in our global environment brought about by humans in the 20th Century, debate the ‘end of oil’, and present some ‘can-do’ strategies for the new century.

Students will write essays and work out quantitative problems for each of three units, with quizzes and exam. The course has no science prerequisites (essays and projects will have options with varying amounts of science in them). The natives of Greenland, Canada and Asia have lived, since the dawn of intelligent life, successfully with the cold, turning the harsh Arctic environment to their advantage. Yet now Arctic climate, oceans and atmosphere are changing faster than anywhere else on the planet. Both humans and their surrounding ecosystems are under stress. Readings from numerous sources will give us an understanding of their predicament, in contrast with the more familiar environments of warmer latitudes.

We have numerous resources to supplement lectures. Our laboratories in the School of Oceanography will be available for demonstrations and hands-on work to explore some basic physical properties of energy: its generation, transmission and conversion in Nature and by humans (from the sun to the fuel cell, for example). We will do experiments that show how the atmosphere and ocean define our climate. Biological systems can be analyzed using ideas about energy, and looked at with experiments. We have field programs in the Arctic which also provide resources for this course.

