# Interdisciplinary Oceanography

Peter Franks
Professor, Scripps Institution of Oceanography

## CURRENT RESEARCH

### Combining physics and biology to understand planktonic ecosystems

Statistically, about half the oxygen we breathe is supplied by the phytoplankton in the ocean, yet we know surprisingly little about these organisms, their interactions, or their environment. Dr. Peter Franks is studying the physical-biological interactions that occur in our world's oceans. Drawing on his training in both the biology and physics of the oceans, he is exploring how physical dynamics such as turbulence, internal waves, fronts and eddies - much like the weather in the terrestrial atmosphere - affect the growth and distribution patterns of plankton in the ocean. The sunlight that drives photosynthesis is only available near the surface of the ocean, while the nutrients that regulate the biomass of the phytoplankton are found mostly in the ocean's depths. The phytoplankton must rely on the physical processes of the ocean to bring critical nutrients from the deep, dark waters up to the surface waters where they can be used for primary production and oxygen production. This intimate coupling between physics and biology controls the spatial and temporal patterns of phytoplankton biomass, primary production, and even fisheries in the ocean. Dr. Franks is researching both the physical mechanisms that control the ocean as well as the phytoplankton ecosystem in order to gain a better understanding of how plankton behave in their natural environment. This, in turn, will provide clues into how planktonic ecosystems will respond to environmental changes.

In terrestrial ecology, primary production is performed by stationary plants. In the ocean, however, fluid motions influence plankton position and the temperature, light, and nutrients of their environment. Studying these forces is critical to understanding...

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## AFFILIATION

University of California, San Diego

## EDUCATION

- Postdoc in Physical Oceanography 1993 ,Oregon State University
- Ph.D. in Biological Oceanography 1990 ,MIT/Woods Hole Oceanographic Institution Joint Program
- M.Sc. in Oceanography 1984, Dalhousie University
- B.Sc. in Biology 1981, Queen's University

## AWARDS

- Gordon A. Riley Lecturer, Dalhousie University, 2012
- Limnology and Oceanography Outstanding Reviewer, 2008
- David Chapman Lecturer, WHOI, 2008
- SIO Outstanding Graduate Teaching Award, 2005
- WHOI H. Burr Steinbach Visiting Scholar, 2002

## RESEARCH AREAS

Environment, Oceanic, Oceanic

## FUNDING REQUEST

Your contributions will continue to allow Dr. Franks to recruit the top minds in the field of oceanography. Dr. Franks is extremely proud of his student researchers, and is training this next generation to prepare them to tackle the problems involving the physics and biology of the world's oceans. Funding will allow new instruments to be designed and developed, and will allow for these new tools to be deployed into the ocean, testing models and hypotheses that were previously not testable.