

## The Ocean System

The physical characteristics of the ocean and its related systems have framed its origin, incredible diversification of life, and amazing ecosystems, like coral reefs and mangrove forests. This seminar explores how oceanographers investigate the role that symbiotic relationships and other biological adaptations have in the dynamics of oceans, a dynamic that is being threatened by human activities and consumption.



### Key Science Concepts:

- **The Oceans are a complex system.** They interact with the Earth's other systems -- the atmosphere, hydrosphere, geosphere, and biosphere -- to form a dynamic planet.
- **The oceans and atmosphere formed primarily from gasses** trapped deep in the Earth that were released by volcanic activity.
- **Evidence shows that life may have begun in the oceans.** Early photosynthetic bacteria played a key role in creating an oxygen-rich atmosphere.
- **Ocean basins are created by plate tectonic activity** (the movement of rigid plates across Earth's surface).
- **The unique properties of the water molecule** have remarkable implications for regulation of the Earth's temperature and climate and for supporting life.
- **The ocean is a layered and circulating system.** Surface currents are driven by winds, while deep-water circulation is driven by changes in water density. Both interact with the atmosphere to shape climate.
- **New technologies** - such as deep-ocean observatories, ocean-going robots, satellites, and rock cores from the sea floor - are giving oceanographers a first look at many ocean and atmospheric processes.
- The oceans and the solid Earth interact to support **life in extreme environments**.
- The Earth's growing population is putting a great strain on **ocean resources**.

### Authoring Scientists:

**Dr. Adriana Aquino** is Science Content Specialist in the Department of Education at the American Museum of Natural History. As such, her main task is to develop scientific content for professional development programs and publications for educators, consultations, conferences, exhibits, and K-12 students. She also teaches graduate courses for educators and is a Research Associate in the Museum's Department of Ichthyology.



**Dr. Rondi Davies** came to the American Museum of Natural History in 2002, where she is a postdoctoral research scientist in the Department of Earth and Planetary Sciences. Rondi also contributes to education outreach, an aspect of her job she loves because "the Museum is an amazing place, and I love to share my knowledge and passion for my work with others. I hope that it sparks people's curiosity and transforms their perspectives of the planet."

