

Note to media covering COP-15, “The Ocean: The critical and overlooked player in climate change.” takes place 1:30 p.m., Dec. 14, in the Asger Jorn Room, Hall H, Bella Center, Copenhagen. Contact:

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Researchers To Detail Climate Change Threats to Ocean Ecosystems and Coastal Communities

Stanford and Scripps Oceanography scientists discuss the latest research on how greenhouse gas emissions are changing the oceans and posing risks to human communities.

From coral reefs to polar regions, marine ecosystems are exhibiting signs of stress from the effects of climate change, according to four ocean researchers from Scripps Institution of Oceanography, San Diego and Stanford University.

The researchers will discuss recent observations of trends in phenomena such as ocean acidification as a consequence of the global ocean’s uptake of carbon dioxide emitted into the atmosphere, and polar ice melt.

“Unlike global warming, which can manifest itself in nuanced, complex ways, the science of ocean acidification is unambiguous,” said Scripps professor of marine chemistry Andrew Dickson, who will provide an overview of ocean chemistry trends. “The chemical reactions that take place as increasing amounts of carbon dioxide are introduced to seawater have been established for nearly a century.”

Biological oceanographer Victoria Fabry, a professor at California State University, San Marcos and visiting research associate at Scripps, said that it may take only 20 to 30 years before a dramatic restructuring of marine and coastal ecosystems takes place, which would in turn impact their ability to provide food security through fisheries, coastal protection, and tourism dollars.

Ocean acidification is only one phenomenon affecting marine ecosystems the health of which has direct bearing on society. Ove Hoegh-Guldberg, Director of the Global Change Institute at the University of Queensland and Director of Stanford in Australia, notes that coral reefs, though a proportionately small portion of Earth’s surface support 500 million people in tropical coastal zones by providing food, income and coastal protection.

If global temperatures increase to 2 degrees Celsius (3.6 degrees Fahrenheit) above pre-industrial global temperatures, coral reefs will be largely eliminated by bleaching and disease. The resulting loss of protection from ocean storms and economic damage would most affect people who had the least role in causing the destructive trends.

Ocean warming also means rise in sea level. Robert Dunbar, a professor of earth sciences at Stanford University will discuss new results from scientific drilling, which shows that West Antarctica is highly prone to melting. This work indicates that melting of Antarctica's ice is expected to contribute to a total projected sea level rise of up to 1.4 meters (about 4.5 feet) by 2100. The potential for sea level rise this century is far larger than estimates issued by the Intergovernmental Panel on Climate Change in 2007, which did not address the melting of Greenland and Antarctic ice.

"Melting of the West Antarctic Ice Sheet occurred when temperatures were as little as 2 degrees Celsius (3.6 degrees Fahrenheit) warmer than today and when atmospheric CO2 levels were 450 parts per million or less," said Dunbar. These values are lower than the values scientists now project for 2100. Approximately one hundred-sixty million people live below one meter elevation.

"A very rapid movement to renewables must occur within the next five years," stated Hoegh-Guldberg. "If not, we will see circumstances on this planet which will threaten the lives of hundreds of millions of people."