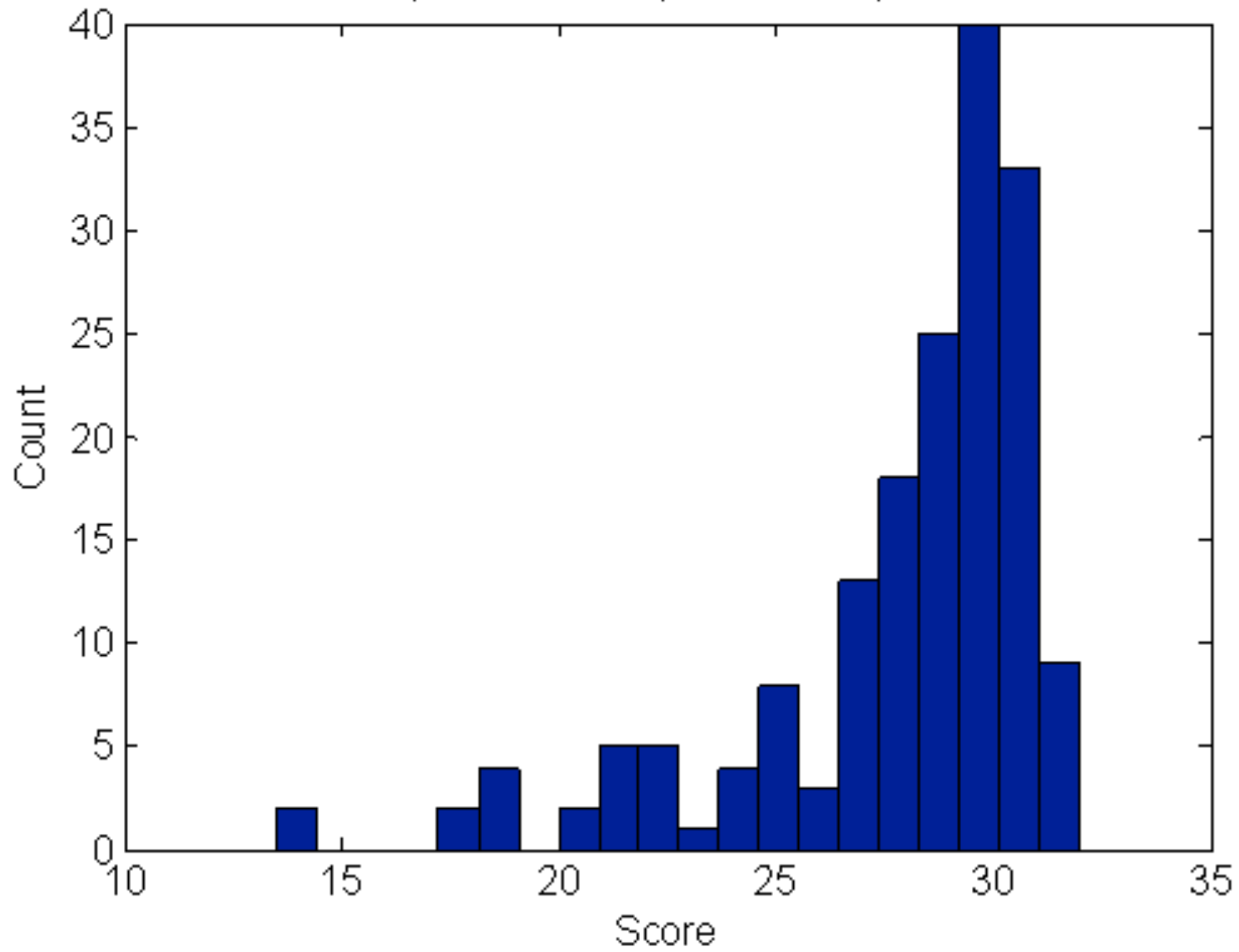


HW #4

Mean: 27.9, Median: 29.0, Mode: 30.0, Std Dev: 3.5



Ocean Growing More Acidic Faster Than Once Thought; Increasing Acidity Threatens Sea Life

ScienceDaily (Nov. 26, 2008) — University of Chicago scientists have documented that the ocean is growing more acidic faster than previously thought. In addition, they have found that the increasing acidity correlates with increasing levels of atmospheric carbon dioxide, according to a paper published online by the Proceedings of the National Academy of Sciences on Nov. 24.

See also:

Plants & Animals

- Nature
- Marine Biology
- Fish

Earth & Climate

- Oceanography
- Global Warming
- Ecology

Reference

- Ocean acidification
- Carbon cycle
- Acid rain
- Soil pH

"Of the variables the study examined that are linked to changes in ocean acidity, only atmospheric carbon dioxide exhibited a corresponding steady change," said J. Timothy Wootton, the lead author of the study and Professor of Ecology and Evolution at the University of Chicago.

The increasingly acidic water harms certain sea animals and could reduce the ocean's ability to absorb carbon dioxide, the authors said. Scientists have long predicted that higher levels of atmospheric carbon dioxide would make the ocean more acidic. Nevertheless, empirical

evidence of growing acidity has been limited.

The new study is based on 24,519 measurements of ocean pH spanning eight years, which represents the first detailed dataset on variations of coastal pH at a temperate latitude —where the world's most productive fisheries live.

"The acidity increased more than 10 times faster than had been predicted by climate change models and other studies," Wootton said. "This increase will have a severe impact on marine food webs and suggests that ocean acidification may be a more urgent issue than previously thought, at least in some areas of the ocean."

The ocean plays a significant role in global carbon cycles. When atmospheric carbon dioxide dissolves in water it forms carbonic acid, increasing the acidity of the ocean. During the day, carbon dioxide levels in the ocean fall because photosynthesis takes it out of the water, but at night, levels increase again. The study documented this daily pattern, as well as a steady increase in acidity over time.

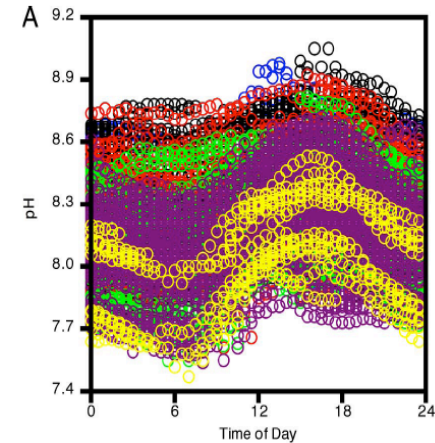
"Many sea creatures have shells or skeletons made of calcium carbonate, which the acid can dissolve," said Catherine Pfister, Associate Professor of Ecology and Evolution at the University of Chicago and a co-author of the study. "Therefore, the increased acidity of the ocean could interfere with many critical ocean processes such as coral reef building or shellfish harvesting."

Conducted at Tatoosh Island in the Pacific Ocean off the coast of Washington, the study documented that the number of mussels and stalked barnacles fell as acidity increased. At the same time, populations of smaller, shelled species and noncalcareous algae increased.

"Models revealed strong links between the dynamics of species living on the shore and variation in ocean pH," Wootton said. "The models project substantial shifts in the species dominating the habitat as a consequence of both the direct effects of reduced calcification and indirect effects arising from the web of species interactions."



Dead mussels as well as live mussels with open, eroded shells are possible symptoms of stress from declining ocean pH and increasing acidity. (Credit: C.A. Pfister, University of Chicago)



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Report warns against Coral Triangle collapse

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- WWF-commissioned
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(CNN) – Experts have warned that the richly diverse coral reefs of the Coral Triangle around southeast Asia will disappear by the end of the century if action is not taken against climate change.



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The rich fishing waters around the Philippines face coral decline, a new report warns.

1 of 2

As well as the loss of one of the world's most diverse underwater ecosystems, the knock on effect would be the collapse of coastal economies that supports around 100 million people, according to the WWF- commissioned study outlined at the World Ocean Conference this week.

The Coral Triangle includes 30 percent of the world's reefs, 76 percent of global reef building coral species and more than 35 percent of coral reef fish.

However the authors of the study believe that effective global action on climate change and regional attention to problems of over-fishing and pollution would prevent catastrophe.

The report presents two different possible futures for the world's richest marine environment – the coasts, reefs and seas of the six countries of Indonesia, the Philippines, Malaysia, Papua New

Guinea, the Solomon Islands and Timor Leste.

"In one world scenario, we continue along our current climate trajectory and do little to protect coastal environments from the onslaught of local threats," said Professor Ove Hoegh-Guldberg of the University of Queensland in a press statement.

"In this world, people see the biological treasures of the Coral Triangle destroyed over the course of the century by rapid increases in ocean temperature, acidity and sea level, while the resilience of coastal environments also deteriorates under faltering coastal management. Poverty increases, food security plummets, economies suffer, and coastal people migrate increasingly to urban areas."

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"Tens of millions of people are forced to move from rural and coastal settings due to loss of homes, food resources and income, putting pressure on regional cities and surrounding developed nations such as Australian and New Zealand."

Even under the best-case scenario, communities will face loss of coral, sea level rises, increased storm activity, severe droughts and reduced food availability from coastal fisheries, the report's authors say.

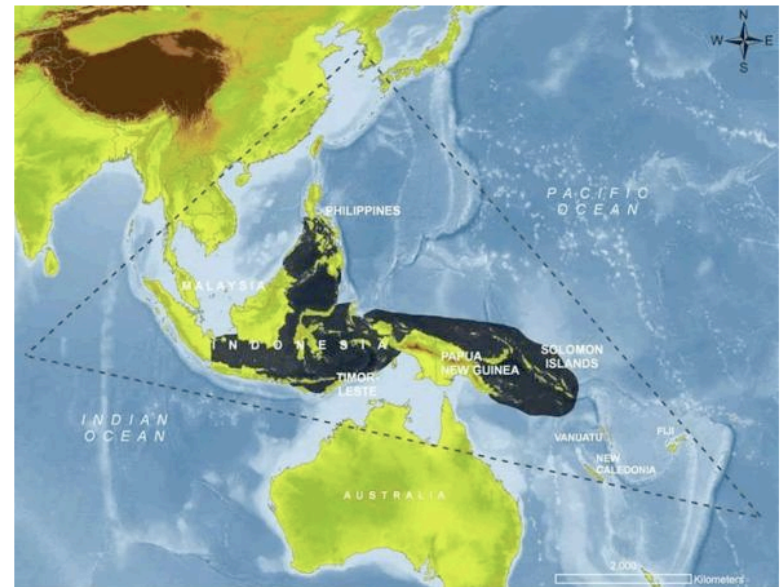
A key difference, they note, is that communities remain reasonably intact and more resilient in the face of these hardships.

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"Effective management of coastal resources through a range of options including marine protected areas, protection of mangroves and seagrass beds and effective management of fisheries would result in a slower decline in these resources," the summary report said.

"World leaders must support Coral Triangle countries in their efforts to protect their most vulnerable communities from rising sea levels and loss of food and livelihoods by helping them to strengthen management of their marine resources and by forging a strong agreement on greenhouse gas reductions at the UN Climate Conference at Copenhagen in December this year," said WWF International Director General James Leape. [E-mail to a friend](#) [Mix it](#) [Share](#)

The area is known as [the Coral Triangle](#), and stretching across six nations between the Indian and Pacific oceans - Indonesia, Malaysia, [the Philippines](#), East Timor, [Papua New Guinea](#) and the [Solomon Islands](#) - it is impressive in scale.



About half the size of the continental United States, the triangle is home to more than half the world's coral reefs, three-quarters of its coral species and key stocks of fish that help feed [the world](#).

<http://www.impactlab.com/2009/05/12/the-coral-triangle-most-diverse-ecosystem-or>



http://www.nytimes.com/slideshow/2008/02/25/science/earth/0226-REEF_index.html

Coral Polyps



http://www.johneasley.com/gallery2/main.php?g2_view=core.DownloadItem&g2_itemId=2546