

Climate Change Alters Base of Tahoe Food Web

September 29 2008



(PhysOrg.com) -- UC Davis researchers at Lake Tahoe this week published the first evidence that climate change alters the makeup of tiny plant communities called algae, which are the very foundation of the web of life in freshwater lakes.

Other scientists had predicted that climate change would reduce the overall amount, or biovolume, of an important algae group called diatoms. However, the UC Davis researchers found that the warming of the lake changed not the overall biovolume but rather the relative populations of various diatom species.

"There are greater numbers of small-sized diatom species in recent years than there were 20 years ago," said postdoctoral researcher Monika Winder, the study's lead author.

"Changing climate conditions, such as warmer air temperatures, have changed the mixing patterns of the lake," explained study co-author Geoffrey Schladow, director of the UC Davis Tahoe Environmental Research Center. "With less mixing, it is difficult for larger algae to stay suspended at the surface of the lake, where there is light to facilitate their growth. This allowed the smaller diatoms, which sink more slowly, to proliferate."

Diatoms form the base of the food chain in large bodies of water, both freshwater and saltwater, around the world. The hugely abundant, single-celled plants are eaten by tiny animals (zooplankton), which are eaten by small fish, which are eaten by bigger fish and birds, and so on to the highest predators in the system.

"It is inconceivable that you could alter the base of the food web and not have other things start changing," Winder said. "What those changes will be, we don't know yet."

Some zooplankton species may decline, which would lead to declines in fish numbers. Clarity may also be reduced because smaller algae stay at the surface longer, scattering light and making the water appear greener.

Schladow noted that this particular finding was possible because of the uncommonly long and detailed record of physical and biological measurements made by UC Davis at Lake Tahoe for the past 50 years.

The new study, titled "Lake warming favours small-sized planktonic diatom species," was published online on Sept. 24 by the journal *Proceedings of the Royal Society B*. The research was funded by UC Davis and the agencies that have supported the Lake Tahoe Interagency Monitoring Program (LTIMP).

Also a co-author of the study: John Reuter, associate director of the UC

Davis Tahoe Environmental Research Center.

Provided by UC Davis

Citation: Climate Change Alters Base of Tahoe Food Web (2008, September 29) retrieved 9 April 2024 from <https://phys.org/news/2008-09-climate-base-tahoe-food-web.html>

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