



Mining can damage fish habitats far downstream, study shows



Nov. 25, 2014

Anglers across the nation wondering why luck at their favorite fishing spot seems to have dried up may have a surprising culprit: a mine miles away, even in a different state.

Scientists at Michigan State University (MSU) have taken a first broad look at the impacts of mines across the country— and found that mining can damage fish habitats miles downstream, and even in streams not directly connected to the mines.

The work is published in this week's issue of the journal *Ecological Indicators*.

"We've been surprised that even a single mine in headwaters might influence larger rivers miles downstream," said Wesley Daniel, a research associate at Michigan State University. "Mines have a much stronger influence on fishes than has been assumed. It's important, when considering the location of a new mine, to not just look local – but look way downstream."

Mining occurs in every state for a variety of natural resources – such as coal, precious metals, pebbles, sand and salt. Mining disrupts the environment

around it, Daniel said. It can add sediments and chemicals to rivers, alter the flow of streams, lead to fewer forests in headwaters, and compact soil – all of which can change fish habitats.

And what happens to the river or stream near the mine flows downstream and can wreak havoc on populations of trout or bass and the smaller fishes that they prefer, far from the mine's location. The study looked at areas throughout the eastern United States typically known for mining, such as Appalachia, but also included areas where little mining research has been done, such as Iowa and Illinois.

Daniel works in the lab of Dana Infante, associate professor of fisheries and wildlife who studies the way landscape and land use affect water. Colleagues in her lab recently developed an algorithm capable of crunching the mountains of data that tell the connected stories of the nation's streams and rivers.

That algorithm has allowed Daniel to take a long look at how extensive the effects of mines on rivers can be. His conclusion calls mines a "regional stress" and cites the example of pollutants from a mine in a headwater stream in Kentucky disrupting the breeding grounds of bass in Tennessee rivers.

While large rivers can dilute the damage a mine may do, the small streams that feed into a watershed may be much more fragile.

"The quality of headwater streams will determine quality of rivers," Daniel said. "The condition of small streams that flow into larger rivers will affect downstream fish communities. Everything is cumulative -- again and again we can see that the effects of one mine can be associated with altered fish communities."

Along with Daniel and Infante, "Characterizing coal and mineral mines as a regional source of stress to stream fish assemblages" was written by Robert Hughes at Amnis Opes Institute; Yin-Phan Tsang, Daniel Wieferich, Kyle Herreman, Arthur Cooper and William Taylor at MSU; Peter Esselman at the U.S. Geological Survey Great Lakes Science Center in Ann Arbor, Mich.; and Lizhu Wang of the International Joint Commission Great Lakes Regional Office in Detroit.

Infante, Tsang, Esselman and Taylor are affiliated with the MSU Center for Systems Integration and Sustainability, an interdisciplinary research center that works in the innovative new field of coupled human and natural systems to find sustainable solutions that both benefit the environment and enable people to thrive.

The research was funded by the U.S. Fish and Wildlife Service and the U.S. Geological Survey.

Contact:



Characterizing coal and mineral mines as a regional source of stress to stream fish assemblages

In the media

- » Mississippi River Basin Policy Analysis - Water pollution...
- » Louisville Courier-Journal - Mine pollution dries up fishing holes far downstream
- » AZO Cleantech - Mining in Headwaters Can Affect Fish Habitats Downstream
- » Science Newline - Mining Can Damage Fish Habitats Far Downstream
- » Science Daily - Mining can damage fish habitats far downstream
- » Iowa Environmental Focus - Mining can affect fish habitats miles downstream
- » Phys.org - Mining can damage fish habitats far downstream



Search

Enter terms:

Search for:

- ☒ Any-
- ☐ Event
- ☐ Press Release
- ☐ Profile
- ☐ Project
- ☐ Publication

Search

News archives

- » February 2018 (4)
- » January 2018 (1)
- » December 2017 (3)
- » November 2017 (4)
- » October 2017 (3)
- » September 2017 (2)
- » August 2017 (6)
- » July 2017 (3)
- » June 2017 (2)
- » May 2017 (3)



Human+Nature BLOG

Read the Blog »

Amazon art Asian carp australia bamboo Blog Book Boone and Crockett Brazil carbon emissions Carnivores CHANS China climate change Collective action conservation conservation policy coupled human and natural systems CSIS Divorce ecosystem services energy energy policy environment Fish fisheries fisheries conservation fish habitat Fishing forest recovery habitat human-wildlife conflict hyenas inland fisheries invasive species Kirtland's warbler Nepal Panda pandas pandas and people plant diversity policy pollution Rachel Carson remote sensing research scholarship species diversity student student awards students sustainability Telecoupling Tigers Tourism Water wildlife wildlife conservation Wolong Wolong Nature Reserve

Sue Nichols, nichols@msu.edu, 517-432-0206

[Share / Save](#) [f](#) [t](#) [g+](#) [d](#)

About the Center

The Center for Systems Integration and Sustainability at Michigan State University integrates ecology with socioeconomics, demography and other disciplines for ecological sustainability from local, national to global scales.

Coupled Human and Natural Systems (CHANS) are integrated systems in which humans and natural components interact. CHANS research has recently emerged as an exciting and integrative field of cross-disciplinary scientific inquiry to find sustainable solutions that both benefit the environment and enable people to thrive. Visit CHANS-Net, the international network of research on coupled human and natural systems, for information and ways to engage.

Contact Us

Center for Systems Integration and
Sustainability
Michigan State University
115 Manly Miles Building
1405 S. Harrison Rd.
East Lansing, MI 48823, USA

(517) 432-5025