



U.S. Geological Survey

New Tool Rates Stream Vulnerability to Unconventional Oil and Gas Development Study Looks at Natural and Man-Made Factors

Released: 11/3/2015 1:00:00 PM

Contact Information:

U.S. Department of the Interior, U.S. Geological Survey
Office of Communications and Publishing
12201 Sunrise Valley Dr, MS 119
Reston, VA 20192

Kelly Maloney

Phone: 570-724-3322x239

Sally Entrekin

Phone: 501-269-2108

Alex Demas

Phone: 703-648-4421

On average, streams in the Niobrara-Mowry Play of eastern Wyoming, Fayetteville Play of Arkansas, and Barnett Play of Texas ranked most vulnerable to unconventional oil and gas development, but for different reasons, according to recent U.S. Geological Survey coauthored research.

Streams in the Fayetteville and Barnett were vulnerable mostly from existing man-made stressors, whereas streams in the Niobrara-Mowry were vulnerable largely due to a stream's natural sensitivity to alterations. However, the study also shows that streams in all regions have the potential to be impacted by such development.

A team of academic, USGS, and private-sector researchers computed potential stream vulnerability to unconventional oil and gas development in six shale plays (<http://certmapper.cr.usgs.gov/data/energyvision/?config=config-ShaleGas.xml>), including the Bakken, Barnett, Fayetteville, Hilliard-Baxter-Mancos, Marcellus and Utica, and Niobrara-Mowry. The newly developed vulnerability index shows that streams with the highest sensitivity and exposure to stressors may be most vulnerable to unconventional oil and gas development.

^(#) "Stream ecosystems show variation in potential vulnerability to unconventional oil and gas development across the contiguous United States," said Kelly Maloney, USGS research ecologist and coauthor of the study. "The index we developed incorporated a stream ecosystem's natural sensitivity to alterations and its exposure to man-made stressors, such as well pads, urbanization and agriculture."

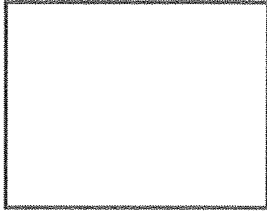
What made areas potentially vulnerable varied across plays due to climatic, geologic and human caused differences. Low annual precipitation in the drier regions of the western US (Niobrara-Mowry, Hilliard-Baxter-Mancos, and Bakken) affected stream vulnerability to unconventional oil and gas development. In contrast, the steeper slopes in the watersheds of Appalachia made streams in the Marcellus-Utica play naturally sensitive. The Barnett and Marcellus regions had areas with greater urbanization than other plays.

"The indices developed in this paper can be used to identify streams where aquatic life are particularly vulnerable, and then help prioritize stream protection and monitoring efforts," said Maloney. "These findings can also be used to guide local development activities to help reduce potential environmental effects."

Research partners in this study included the University of Central Arkansas, Waterborne Environmental Inc., University of Arkansas and Wilkes University.

The paper "Stream vulnerability to widespread and emergent stressors: a focus on unconventional oil and gas" is available in PLOS ONE, which is an open-access, peer-reviewed scientific journal and can be downloaded free of charge [online \(http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0137416\)](http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0137416).

NR2015_11_03 Tagged Images  



Total Results: 1

0

Like

1

USGS provides science for a changing world. Visit [USGS.gov \(http://usgs.gov\)](http://usgs.gov), and follow us on Twitter [@USGS \(http://twitter.com/usgs\)](http://twitter.com/usgs) and our other [social media channels \(http://usgs.gov/socialmedia\)](http://usgs.gov/socialmedia).
Subscribe to our news releases via [e-mail \(http://usgs.gov/newsroom/list_server.asp\)](http://usgs.gov/newsroom/list_server.asp), [RSS \(http://feeds.feedburner.com/UsgsNewsroom\)](http://feeds.feedburner.com/UsgsNewsroom) or [Twitter \(http://twitter.com/USGS\)](http://twitter.com/USGS).

Links and contacts within this release are valid at the time of publication.

(#)

###

[2 \(#\)](#)

[U.S. Department of the Interior | U.S. Geological Survey](#)

URL: http://www.usgs.gov/newsroom/article.asp?ID=4378&from=rss_home

Page Contact Information: [Ask USGS](#)

Page Last Modified: 11/3/2015 1:15:32 PM