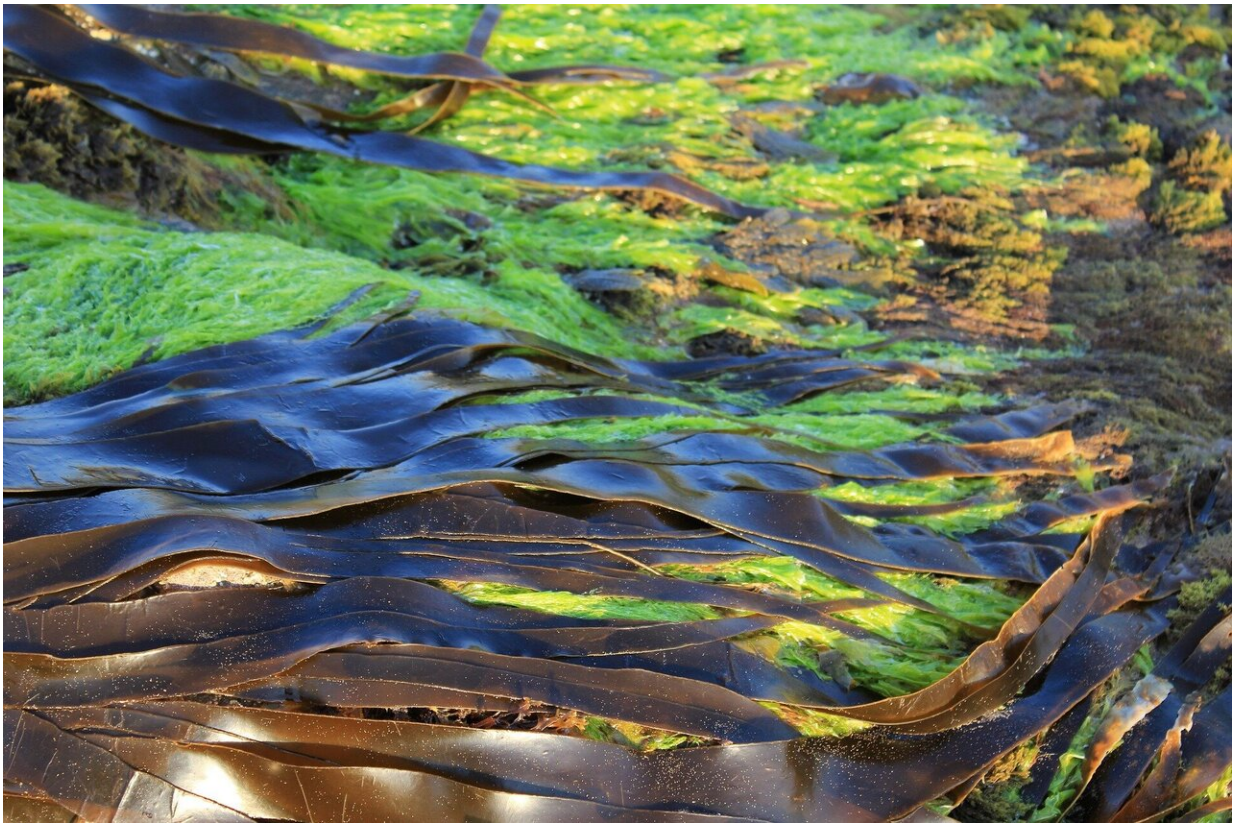


# There's too much nitrogen and phosphorus in U.S. waterways

April 1 2020, by Chrystian Tejedor

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Even minor amounts of human activity can increase nutrient concentrations in fresh waters that can damage the environment, according to a new study.

These findings suggest most U.S. streams and rivers have higher levels of nitrogen and phosphorus than is recommended. Although nutrients are a natural part of aquatic ecosystems like streams and rivers, too much of either nutrient can have lasting impacts on the environment and public health.

In Florida, toxic blue-green algal blooms have been triggered by releases of phosphorus-laden waters from Lake Okeechobee. Algal blooms produce a foul odor along waterways, decrease dissolved oxygen, threaten insect and fish communities and can even produce toxins that are harmful to mammals and humans.

"Ecosystems are being loaded with legacy and current nitrogen and phosphorus, and their capacity to hold these nutrients in many cases is decreasing," said FIU associate professor John Kominoski, an ecologist and co-author of the study. "Not only are they being overwhelmed by nutrients, but they also have and continue to undergo hydrological and land use alterations."

As [human populations](#) and demands increasingly grow, more land—including wetlands—is converted to agricultural and urban uses. This can introduce more nitrogen and phosphorus onto the land, which eventually makes its way into bodies of [water](#). To make matters worse, soil erosion and [climate change](#) are also impacting nutrient pollution, leading to nutrient export to coastal waters, Kominoski said.

Nitrogen is most likely to come from transportation, industry, agriculture and fertilizer application, while increased phosphorus is more commonly the result of sewage waste, amplified soil erosion and runoff from urban watersheds.

"High concentrations of nitrogen and phosphorus in our waterways are concerning because they threaten both human and ecosystem health,"

said David Manning, an assistant professor of biology at the University of Nebraska at Omaha and lead author on the paper. "Nutrients are essential for all life, but when they get too high in our waterways, they can fundamentally change the way a stream looks and operates."

In addition to causing [algal blooms](#), these elevated nutrient concentrations can lead to a lack of species diversity and oxygen depletion. High nutrient concentrations can also affect the purity of the water we drink.

Nutrient pollution is a complex problem. While there's still a lot of work to be done to develop management tools and set thresholds for nutrient concentrations in streams and rivers, better understanding of how nutrients are transported through the interconnected network of waterways can help lead to solutions. Kominoski emphasized the importance of management solutions at local-to-global scales required to effectively manage various sources of [nitrogen](#) and [phosphorus](#).

"Water is a shared resource that connects communities, landscapes, and continents across the globe," Kominoski said. "We must increase the protection and rehabilitation of ecosystems and water resources throughout the world, especially as human populations increase and climate changes."

The study was published in *Ecological Applications*.

**More information:** David W.P. Manning et al. Transport of N and P in U.S. streams and rivers differs with land use and between dissolved and particulate forms, *Ecological Applications* (2020). [DOI: 10.1002/eap.2130](https://doi.org/10.1002/eap.2130)

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