

Signs of fires, hurricanes, other disruptions linger in the Florida Everglades for years

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Credit: Florida International University

The chemical signature left behind by hurricanes, fires, cold snaps and droughts can linger in the slow-moving water of the Florida Everglades for up to a decade.

No one expected evidence of these disturbances to be detectable in the [water](#) for so long and spread across different areas of the Everglades. Increased levels of phosphorus, nitrogen, bacterial production and dissolved carbon were found in long-term water data collected from 2000 to 2017 through the Florida Coastal Everglades Long Term

Ecological Research program supported by the National Science Foundation. The discovery could influence water management of the Everglades.

"That we can use long-term data to sense that a disturbance happened means it must be having a functionally important role in the system," said FIU ecologist John Kominoski, the study's lead author. "Otherwise, it would be overwhelmed by noise instead of these clear signals."

Hurricane Wilma in 2005. Fire in 2008. A Cold snap and a drought in 2010. Another cold snap in 2011. Both a drought and excessive flooding in 2015. Hurricane Irma in 2017. Each one of these disturbances left unmistakable, traceable signals in the chemistry of the water winding through the Everglades.

Researchers were equally surprised to see these [chemical signatures](#) in different parts of the Everglades—from freshwater marshes to coastal mangroves—because they expected that local environmental conditions would predominate, Kominoski explains. Sea-level rise and the introduction of more freshwater from restoration means more water is moving and interconnected through the Everglades system, spreading these chemical markers farther away from the points of origin.

"It tells us the Everglades is a highly sensitive and connected ecosystem," Kominoski said. "It has memory of disturbance events that we can still detect years later in the chemistry of the water. Because the Everglades has such a large volume of water, it is remarkable that [chemical](#) signals in the water from past disturbances are not diluted. This means we must protect this sensitive and vital resource—upon which one out of every three Floridians rely for their water supply—from overexploitation and pollution."

The study was published in the journal *Ecology*.

More information: John S. Kominoski et al. Disturbance legacies increase and synchronize nutrient concentrations and bacterial productivity in coastal ecosystems, *Ecology* (2020). [DOI: 10.1002/ecy.2988](https://doi.org/10.1002/ecy.2988)

Provided by Florida International University

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