



# The Murder Mystery of Narragansett Bay's Winter Flounder



Rhode Island Sea Grant

**F**or decades, winter flounder have been disappearing from Narragansett Bay, but the question remains: What, or who, is killing them off, or preventing them from spawning in the first place?

“We have a classic ‘Who did it?’ This is a murder mystery if there ever was one,” said **Joe Langan**, a Ph.D. student at the University of Rhode Island Graduate School of Oceanography, talking about the dramatic decline of winter flounder in Narragansett Bay. “As I continue to work on my dissertation, I’ve come to realize that I’m basically playing Clue,” Langan added, referencing the popular “whodunit” board game.

Langan’s research has been focused on determining why winter flounder have all but disappeared from Narragansett Bay since the 1980s, and what, or who, is to blame. Some theories to explain such a drastic decline - about 99 percent - point to overfishing, while others point to pollutants or new predators entering the bay as a result of warming waters.

Langan discussed his findings to date during the Coastal State Discussion in March, and suggested that it isn’t just one cause, or suspect, but rather an interplay of many that are responsible for this species’ downturn. This is because different factors have different levels of impact on winter flounder depending on their life stage.

When winter flounder populations crashed in the 1990s, resource managers scaled back on how many fish could be harvested. In the early 2000s, when stock assessments rose, resource managers thought the population was making a comeback and allowed increased harvesting. This happened in 2002, 2005, and again in 2008. But the stock never rebounded, regardless of the favorable forecast that stock assessments were providing.

“We constantly overestimated biomass,” said Langan. “Even though we had these positive projections, the stocks stayed very low. So, there seems to be a hidden mortality – something we don’t understand about this species’ biology that is causing them to not rebound, to not recover.”

One potential suspect is **climate change** and associated changes in water temperatures in Narragansett Bay. Winter flounder are so named because they prefer temperatures below 70° F and spawn in the winter when water temperatures are below 42° F. Over the last several decades, Narragansett Bay has warmed by about 4°. This means fewer days at preferred temperatures for spawning.

“That window for appropriate spawning conditions has been getting smaller and smaller where, to this point, they’ve lost about a month of suitable spawning conditions over the last 50 to 60 years,” said Langan.

Warmer waters may also be restricting winter flounder’s overall habitat in the bay – where they can live and feed. Rising temperature could also be restricting food availability by redistributing species found throughout the bay, or creating favorable conditions for new competitors of the same food source or more predators, such as summer flounder and sea robin.

“Summer and winter flounder use a lot of the same habitat. But summer flounder spawn in the fall, so they have a head start and they’re bigger, faster, and more aggressive,”

said Langan. “So, there could be some sort of habitat bullying. There could also be competition for food. They eat a lot of the same things, but summer flounder have expanded tremendously, same as scup. Winter flounder are trying to adapt to this changing ecosystem, but all of their food is getting picked off by huge schools of scup.”

Although there has been a total ban on harvesting winter flounder in the bay in the last decade, Langan said, **fishing in Rhode Island Sound could still impact populations.**

“If you’re dragging for summer flounder, scup, or black sea bass, you’re going to catch winter flounder because they use a

lot of the same habitat,” said Langan, explaining that even if they’re released, the damage may already be done. “They don’t do well after being released from a trawl net. It’s possible that bycatch and release of fish that then dies is also a contributing factor [to this overall decline.]” **(to page 13)**

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