Research Links Pesticide Harmful to Bees With Collapse of Fisheries

Researchers linked use of the chemicals on fields near a Japanese lake with major disruption to aquatic life. Monty Rakusen via Getty Images

By Andrea Germanos, Common Dreams
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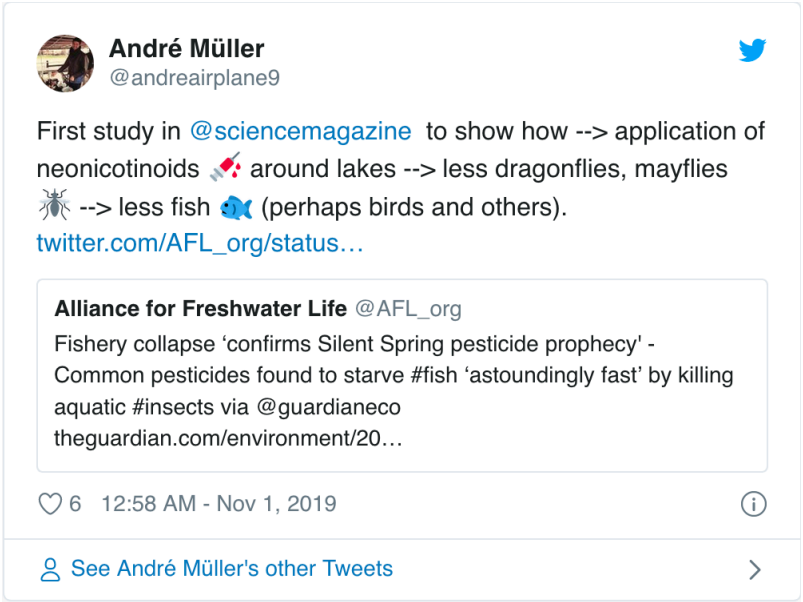
A new study out this week provides more evidence of harm caused by a class of pesticides known as neonicotinoids, with researchers linking use of the chemicals on a Japanese lake with impacts to an entire food web that resulted in the collapse of two fisheries.

"No surprise," tweeted former UK Green Party leader leader Natalie Bennett, "soaking our planet in pesticides has broad systemic effects on biodiversity and bioabundance."

For the study, published in the November 1 issue of the journal *Science*, the researchers looked at Lake Shinji and analyzed over two decades of data. They found cascading impacts that appeared to stem from the first use of neonicotinoids on nearby rice paddies.



"Since the application of neonicotinoids to agricultural fields began in the 1990s, zooplankton biomass has plummeted in a Japanese lake surrounded by these fields," the researchers wrote. "This decline has led to shifts in food web structure and a collapse of two commercially harvested freshwater fish species."

"Using data on zooplankton, water quality, and annual fishery yields of eel and smelt," the paper says, "we show that neonicotinoid application to watersheds since 1993 coincided with an 83% decrease in average zooplankton biomass in spring, causing the smelt harvest to collapse from 240 to 22 tons in Lake Shinji, Shimane Prefecture, Japan."

As for the strength of the link between the pesticides and the collapse, *Phys.org* added:

The researchers note that they also studied other factors that might have led to fishery collapse, such as nutrient depletion or changes in oxygen or salt concentrations. They report that they were not able to find any evidence showing that there might have been something other than pesticides killing the food fish ate leaving them to starve. They conclude that the evidence strongly suggests it was the introduction of neonicotinoid pesticides into the lake environment that led to the die-offs.

The Guardian, in its reporting on the study, noted that the researchers pointed to the haunting warning from Rachelel Carson's seminal work, *Silent Spring*:

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In their report, the Japanese researchers said: "She wrote: 'These sprays, dusts and aerosols are now applied almost universally to farms, gardens, forests and homes—nonselective chemicals that have the power to kill every insect, the 'good' and the 'bad,' to still the song of birds and the leaping of fish in the streams.' The ecological and economic impact of neonicotinoids on the inland waters of Japan confirms Carson's prophecy."

Similar impacts, the researchers added, are likely felt in other locations.

"Just awful, what gruesome harm we are inflicting on the environment," Matt Shardlow, CEO of the invertebrate conservation group Buglife, wrote on Twitter in response to the new study.

According to Nathan Donley, senior scientist at the Center for Biological Diversity and who was not involved in the study, the findings should spur action by the Environmental Protection Agency.

"This study highlights cascading harms to aquatic life from neonicotinoids that our EPA has known about but shrugged off," said Donley. "The evidence is now overwhelming that these pesticides are turning our rivers, lakes, and streams into inhospitable environments for fish, frogs, and other aquatic life."

"This landmark new research should make it impossible for even the Trump administration to ignore the immense damage caused by these dangerous chemicals," Donley added.

Neonicotinoids, or neonics as they're often called, have also been linked to harm to bees, other insects, birds, and other animals.