

Locally caught freshwater fish across the United States are likely a significant source of PFAS exposure

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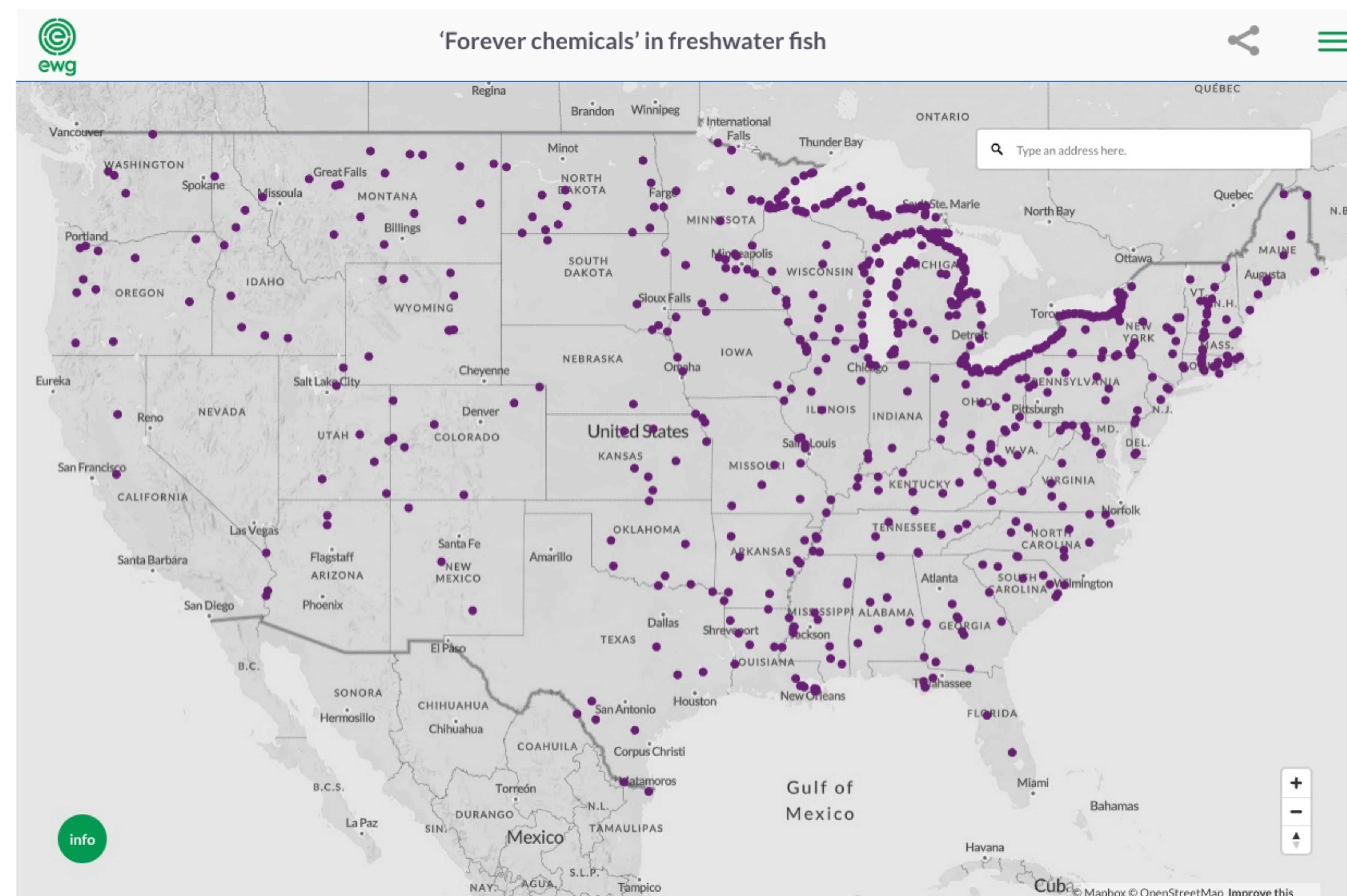
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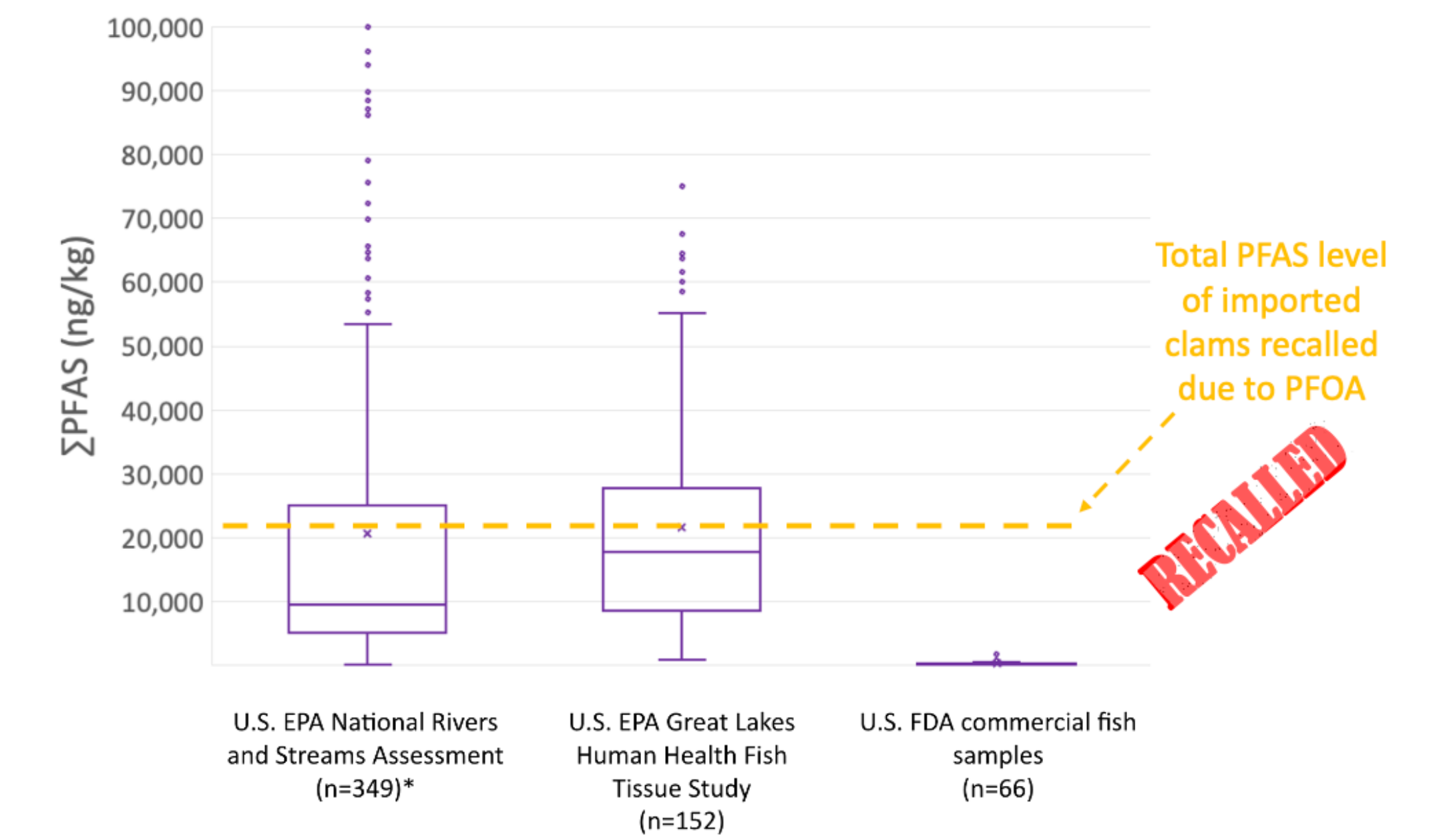


[Interactive map:](https://www.ewg.org/interactive-maps/pfas-in-us-fish/map/)

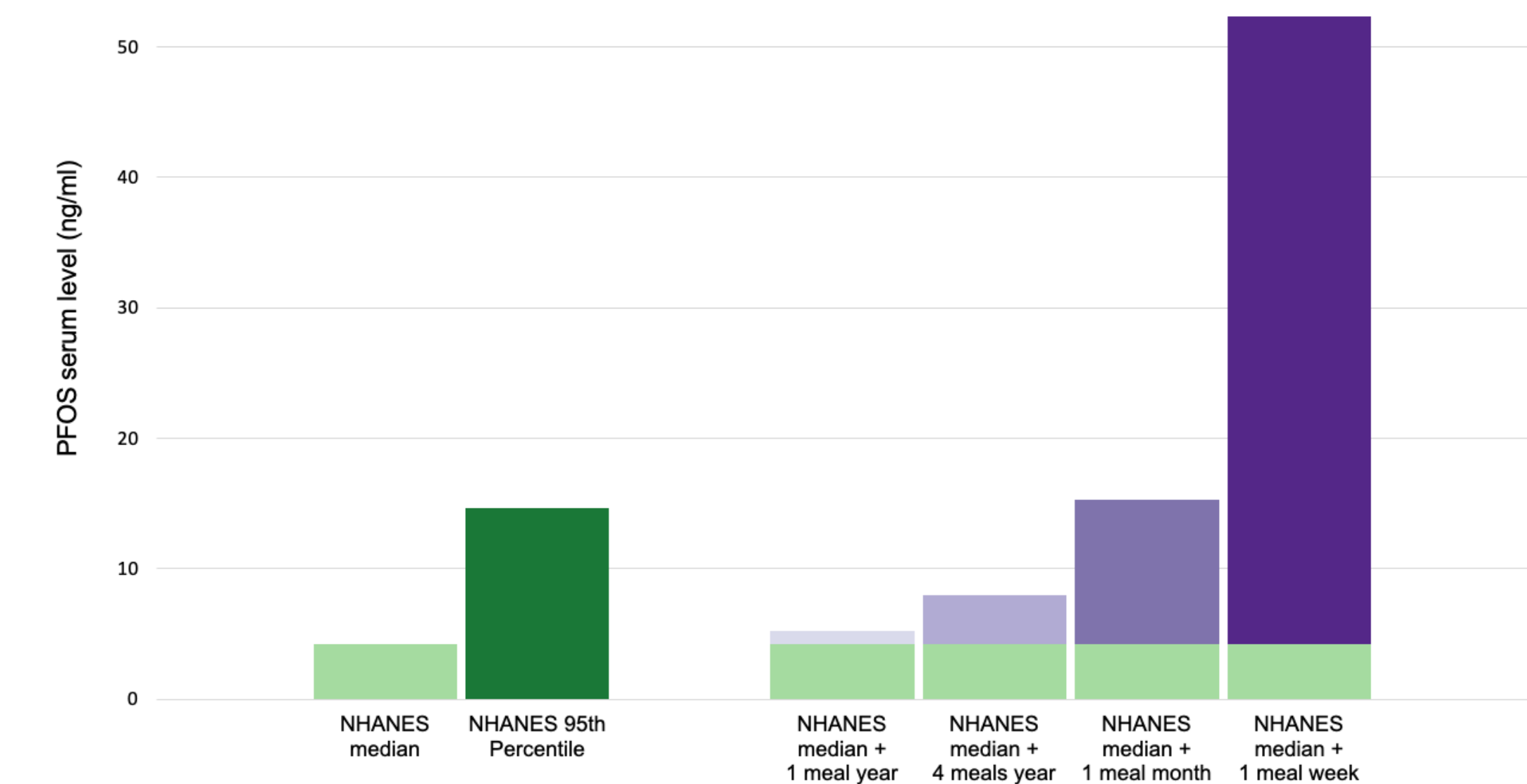
www.ewg.org/interactive-maps/pfas-in-us-fish/map/



Results



Median total PFAS levels in freshwater fish sampled by U.S. EPA were 278 times higher than commercial fish tested by U.S. FDA.



Infrequent consumption of freshwater fish modeled to significantly increase serum PFOS levels.

Eating one 8 ounce serving of fish at	20 ng/kg PFOS (average PFOS level in fish from FDA testing)	is equivalent to consuming one month of drinking water at	0.1 ppt. (5.7 times the interim U.S. EPA health advisory)
	8,415 ng/kg PFOS (Median PFOS level in freshwater fish in U.S. EPA testing from 2013-2015)		48 ppt. (2,400 times the interim U.S. EPA health advisory)
	49,976 ng/kg PFOS (90th percentile PFOS level in freshwater fish from U.S. EPA testing from 2013-2015)		286 ppt. (4,700 times the interim U.S. EPA health advisory)

One fish serving can be equivalent to drinking water for a month with 48 ppt PFOS.

Essential data needs

- Publicly available and timely fish testing results
- Comprehensive national testing
- Community-based participatory research on the best practice methods for **educating** anglers and communities that fish for sustenance about the risks of PFAS to health and ways to avoid PFAS
- Testing methods for total PFAS levels in fish and analysis of consumption impacts on total PFAS levels in human serum

Actions needed

- Address social injustice issues for those catching and eating fish for economic or cultural reasons.
- End PFAS releases to the environment.
- Eliminate non-essential uses of PFAS.
- Provide consistent health protective guidance to anglers.

Abstract

Identifying and reducing exposure to per- and polyfluoroalkyl substances, or PFAS, is an urgent public health priority due to health harms associated with exposure.

Here we calculate the potential contribution of PFAS from consumption of locally caught freshwater fish to blood serum levels in the United States. The basis for our analysis is over 500 composite samples of fish fillet collected across the United States from 2013-2015 under the U.S. EPA's monitoring programs, the National Rivers and Streams Assessment and the Great Lakes Human Health Fish Fillet Tissue Study. The PFAS levels in sampled freshwater fish were compared with recent FDA seafood sampling and the impacts on serum levels are calculated.

The median levels of PFAS in freshwater fish across the United States were 278 times higher than levels in commercially relevant fish tested by the U.S. Food and Drug Administration in 2019-2022. Our analysis finds that a single serving of freshwater fish per year with the median level of PFAS as detected in the U.S. EPA monitoring programs would have a significant impact on levels in blood serum.

Methods

Fish testing results were compiled from the U.S. EPA National Rivers and Streams Assessment, the U.S. EPA Great Lakes Human Health Fish Fillet Tissue Study and testing by the U.S. FDA.

PFOS Impacts on serum were modeled using a first order, one-compartment pharmacokinetic model dependent on dose, clearance factor, and volume of distribution assuming: (1) steady-state fish consumption; (2) consumption of any freshwater fish results in additional exposure above the U.S. median; (3) no PFOS is removed through cooking; and (4) 100% of PFOS in fish tissue is absorbed.

2015 Great Lakes Human Health Fish Fillet Tissue Study

National Rivers and Streams Assessment (2013-2014)

www.epa.gov/fish-tech/2015-great-lakes-human-health-fish-fillet-tissue-study

www.epa.gov/national-aquatic-resource-surveys/nrsa