

NC Department of Health and Human Services

# Great Lakes Consortium for Fish Consumption Advisories: Best Practices for PFOS Guidelines

**August 5, 2026**

# Current NCDHHS fish consumption advisories

- NCDHHS educates on exposure to harmful substances in the environment when we have evidence to do so
- Fish from contaminated waters can be a source of exposure to toxins
- NCDHHS has issued fish advisories since ~2002
  - First advisory was for mercury, still in place statewide
  - Current NC Fish Consumption Advisory Story Map https://epi.dph.ncdhhs.gov/oee/fish/arcg.html



# What do fish consumption advisories do?

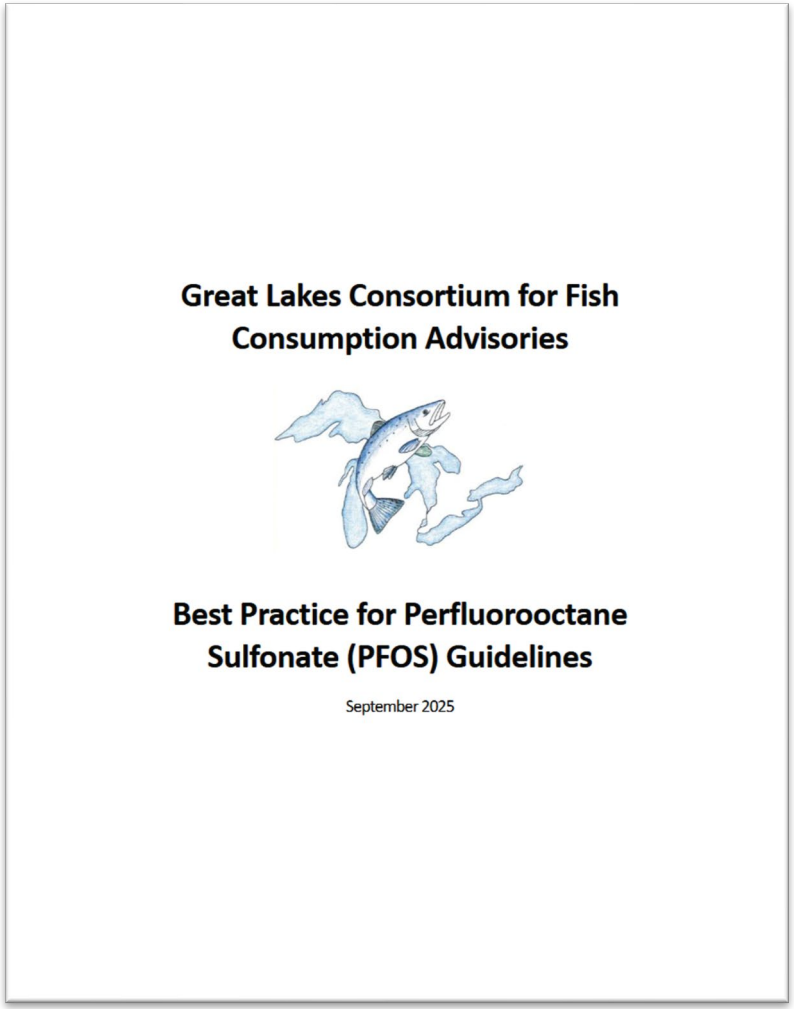
- **Fish consumption advisories are designed to protect recreational and subsistence fishers when we have evidence of contamination in fish**
  - Fish advisories **do not create any legal or regulatory restrictions** on fishing or fish consumption
  - DHHS does not regulate commercial fisheries nor fish sold in commerce
  - Advisories are developed with representative fish tissue samples typically collected at one point in time, **not monitored regularly**
  - Advisories have historically not accounted for potential benefits of fish consumption

# What guidance do we use for developing advisories?

- For most advisories, we follow US EPA guidance for developing fish consumption advisories
- In September 2025, the Great Lakes Consortium for Fish Consumption Advisories issued new Best Practice for Perfluorooctane Sulfonate (PFOS) Guidelines which modified the USEPA approach specific to PFOS
  - Perfluorooctane sulfonate (PFOS) is the PFAS compound typically occurring in the highest concentrations in fish across the US, including in NC

# Now Available: Great Lakes Consortium for Fish Consumption Advisories Best Practice for PFOS Guidelines, Sept 2025

- Best Practice Workgroup established to review new toxicity values and relevant information for PFOS fish consumption guidelines
  - 7 states (NY, IL, MI, OH, PA, WI, MN) plus Ontario participated in the workgroup
- 2025 Best Practice Guidelines reflect proposed updates and subsequent input from Consortium members
- Rationale considers both the risks of PFOS exposure and the health benefits of fish consumption




https://www.health.state.mn.us/communities/environment/fish/docs/consortium/bestpracticepfos.pdf

# Great Lakes Consortium for Fish Consumption Advisories Best Practice for PFOS Guidelines, Sept 2025

- Agreed that 2024 USEPA PFOS toxicity review, in support of 2024 maximum contaminant levels (MCLs) in drinking water, included the most up-to-date and comprehensive toxicity information available for PFOS. (p1)
- Questioned need to account for intra-human variability when the points of departure human equivalent doses were already based on sensitive populations, especially in consideration of the commensurate loss of numerous health benefits associated with fish consumption. (p1)
- Considered evidence that PFOS in fish tissue is not as bioavailable as in water (p1)

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# Intra-human variability considerations for the Health Protection Value (HPV) (p18-19)

- The effect levels (Point of Departure-Human Equivalent Doses) identified by USEPA for cardiovascular and developmental effects were 1.20 ng/kg-d and 1.13 ng/kg-d, respectively, both rounding to 1 ng/kg-d.
- A fish consumption Health Protection Value of 1 ng/kg-d PFOS would prevent doses above effect thresholds, pose acceptable risks for cardiovascular and developmental endpoints, and have reasonable margins of exposure when considering other toxicity effect levels.
- The Workgroup believes that the choice of this HPV would provide reasonable protection against toxic effects while avoiding unnecessary loss of fish consumption health benefits.

**https://www.health.state.mn.us/communities/environment/fish/docs/consortium/bestpracticepfos.pdf**

# Intra-human variability (p19)

- The Health Protection Value is based on a weight-of-evidence assessment and professional judgment that considers both risk and benefits. As such, it could be construed as incorporating risk management considerations.
- For all populations (general and sensitive), the Consortium is using 1.0 ng/kg-d Point of Departure-Human Equivalent Does (USEPA, 2024) as the PFOS Health Protection Value for fish consumption guidelines.
- This value does not include the intra-human variability factor of 10 used in the US EPA reference dose for calculation of drinking water MCL.

**https://www.health.state.mn.us/communities/environment/fish/docs/consortium/bestpracticepfos.pdf**

# Bioavailability of PFOS (p22-23)

According the report's authors, absorption of PFOS from fish is likely to be much less than that from drinking water. They estimate that exposure predictions for fish consumers based on 100% bioavailability, standard meal size, and USEPA 2024 TK parameter values overestimate serum levels by about 4-fold.

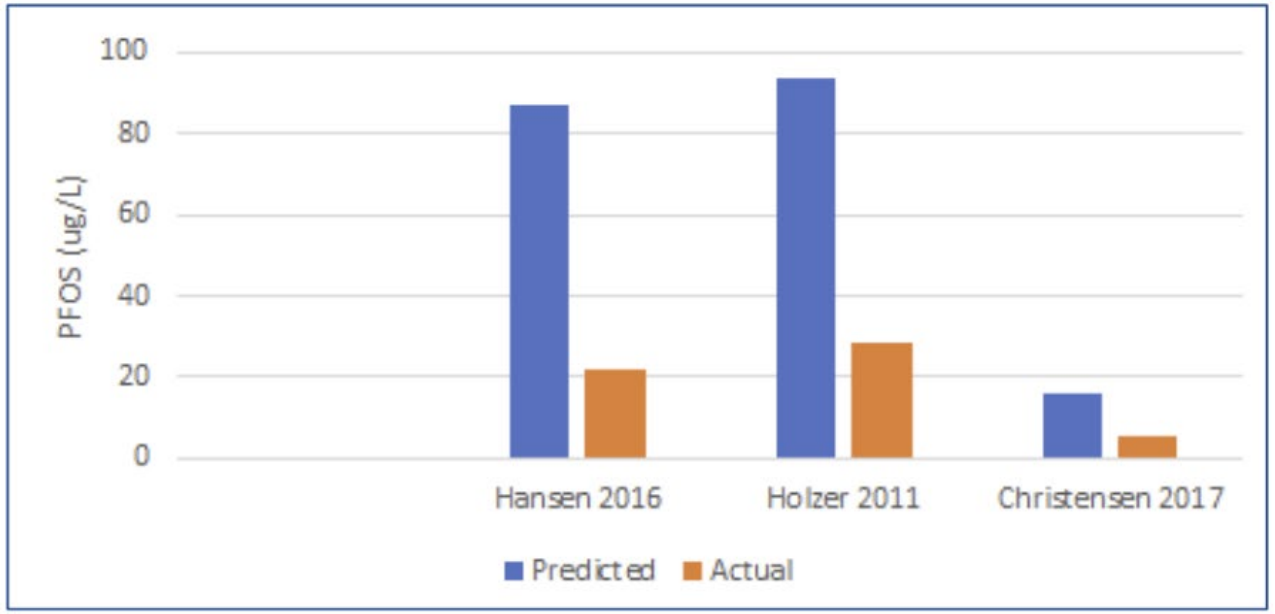



**Figure 1. Predicted vs. Actual PFOS Serum Concentrations Among Fish Consumers**

https://www.health.state.mn.us/communities/environment/fish/docs/consortium/bestpracticepfos.pdf

# Great Lakes Consortium for Fish Consumption Advisories Best Practice for PFOS Guidelines, Sept 2025

- Resulting modifications from EPA method
  - When assessing the Health Protective Value for calculations, does not include the intra-human variability factor of 10 previously used in the US EPA reference dose
  - Applies a 0.25 bioavailability factor for fish consumption guidelines (rather than 1.00 in US EPA guidance) based on current literature
  - This results in a 40x higher meal limit calculation compared to standard US EPA method using PFOS reference dose

https://www.health.state.mn.us/communities/environment/fish/docs/consortium/bestpracticepfos.pdf

# Great Lakes Consortium for Fish Consumption Advisories Best Practice for PFOS Guidelines, Sept 2025 - Modifications from EPA method

- “Eliminating local fish consumption due to implementation of guidelines directly based on the 2024 USEPA RfD would remove an important low-cost source of protein, vitamin D, omega-3 fatty acids, and other nutrients for many people, which could result in adverse impacts on public health, including cardiovascular and developmental endpoints.” (p19)
- “The rationale considers both the risks of PFOS exposure and the health benefits of fish consumption.” (p2)
- “The Consortium acknowledges that scientific understanding of the adverse health effects and risk assessment of PFAS is continually evolving… the Consortium will actively monitor emerging research and developments.” (p2)
- Acknowledges that “the human-based RfD is appropriate for many applications, although its appropriateness for fish consumption advice, for which health benefits should be considered, may be more limited.” (p13)

https://www.health.state.mn.us/communities/environment/fish/docs/consortium/bestpracticepfos.pdf

# Great Lakes Consortium for Fish Consumption Advisories Best Practice for PFOS Guidelines, Sept 2025

Table 1. 2025 PFOS Best Practice Fish Consumption Guidelines for All Populations

| PFOS in Fish Fillet (ng/g) | Meal Frequency |
|---|---|
| 0 – 2.5 | 4 or More Meals/Week |
| > 2.5 – 5 | 2 Meals/Week |
| > 5 - 10 | 1 Meal/Week |
| > 10 - 40 | 1 Meal/Month |
| > 40 | Do Not Eat |

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# Summary

- Setting fish advisories is a balance; lower meal recommendations would limit health benefits of eating fish while higher meal recommendations could allow for more PFOS ingestion than advisable to prevent health concerns.
- These guidelines use the most up-to-date toxicity information available (2024).
- The Great Lakes Consortium concluded that eating fish also provides vital nutrients that protect against some of the negative health effects of PFOS and other contaminants. These considerations were factored into the new guidelines.
- The Great Lakes Best Practice for PFOS Guidelines have been adopted wholly or in part by NY, WI, and MI.

**QUESTIONS?**