Food Web-Based Computational Tool to Estimate PFAS Risk to Human Health from Dredge Material

PROBLEM

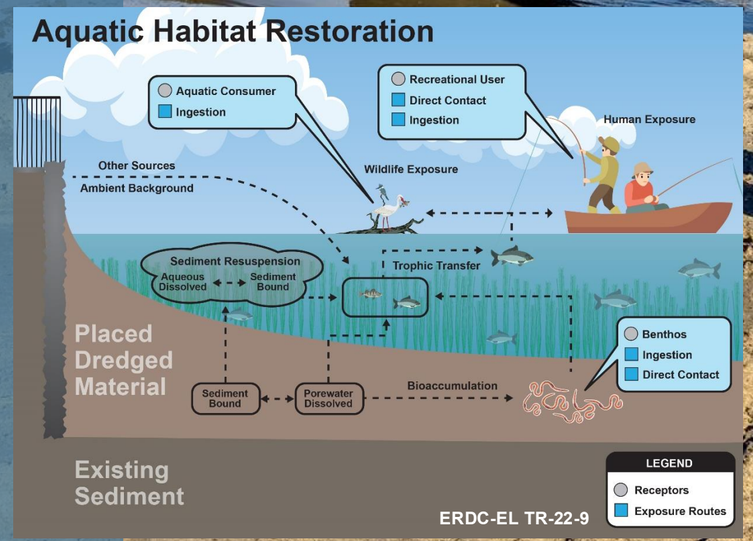
- As new water quality regulatory limits emerge for per- and polyfluoroalkyl substances (PFAS), science-based PFAS risk characterization protecting human health from sediment-associated PFAS is needed to inform management of dredging operations.

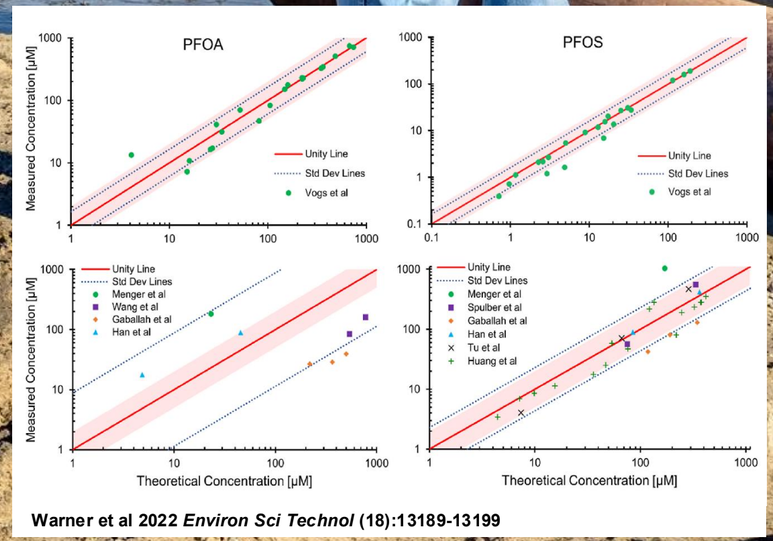
SOLUTION

- We will develop a food web-based computational tool to estimate PFAS risk to human health from dredge material.

IMPACT

- Science-based risk characterization for PFAS in dredged sediments will increase the frequency in which decision makers can confidently choose to use dredged materials as beneficial uses of dredged material (BUDM) when, otherwise, only a precautionary principle may be available, given existing uncertainties surrounding PFAS health risk.





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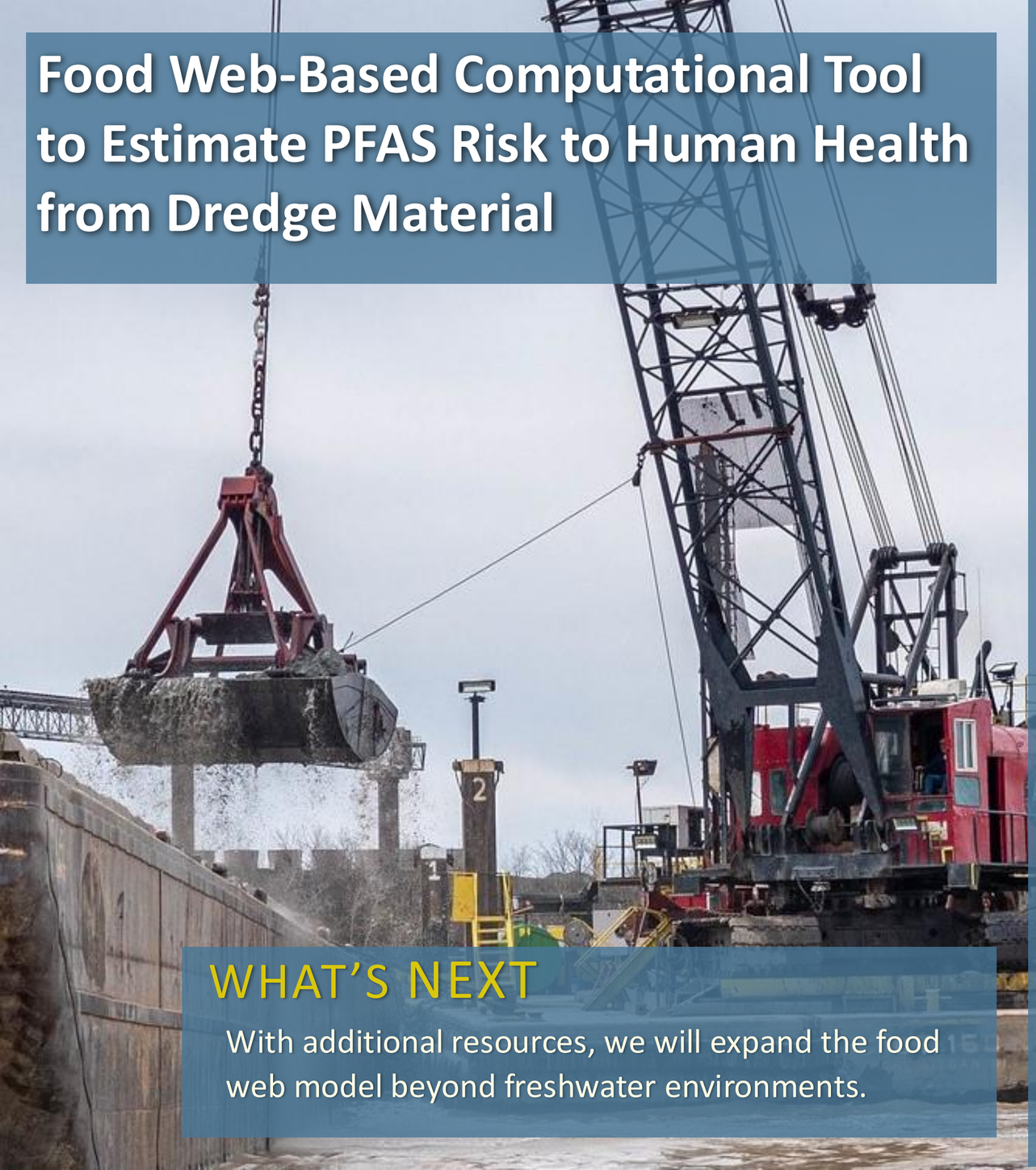

APPLICATIONS

- The principal product of this R&D effort is an integrative food-web model connecting PFAS concentrations in dredged sediments targeted for aquatic placement, including BUDM applications, to bioaccumulation and trophic transfer in biota with humans as apex consumers to understand if human health thresholds are exceeded in realistic dietary exposures.

STATUS

- Project is a FY25 New Start
- Comprehensive literature review is in progress
- Food web conceptual model is under development

BENEFITS

- The main benefit of this work is that the food-web model developed to estimate the human health risk associated with PFAS contamination in dredged sediments will directly support the Great Lakes and other fresh-water regions by providing a quantitative risk characterization tool to support risk-management decisions for dredged material placement in aquatic environments, including BUDM applications.

WHAT'S NEXT

With additional resources, we will expand the food web model beyond freshwater environments.