

Promoting Safer Fish Consumption

NIEHS-funded researchers aid development of new fish consumption advisories, launch educational campaign for subsistence fishers.

Supported in part by the National Institute of Environmental Health Sciences (NIEHS) Superfund Research Program (SRP), and with strong community partnerships, researchers helped improve fish consumption advisories and created awareness campaigns to educate subsistence fishers about contaminants in fish.

Fish consumption advisories are recommendations to limit or avoid the consumption of certain fish or shellfish caught in specific bodies of water.¹⁵ These advisories can be issued for the general public or for a specific vulnerable group, like children and pregnant women, to protect people from consuming environmental contaminants in the fish they eat.

Led by Elizabeth Shapiro-Garza, Ph.D., and staff from the Duke University SRP Center and in partnership with community-based organizations, a team of researchers conducted surveys to assess subsistence fish consumption and tested fish for levels of certain contaminants in various fish species near the Lower Cape Fear River in North Carolina. Their findings helped the state extend its resources to improve fish consumption advisories for the area, and informed campaigns about safe fish consumption.



An NC Coastal Federation Board member speaks with a community member about fishing consumption advisories. (Photo courtesy of Duke SRP Center)

Community direction was an important part of the fish consumption advisories project. For example, at the request of community advocates, the scientists produced educational materials describing the problem and potential solutions using plain language. By communicating with community partners at every step of the research process, the team could identify issues of high importance and address them accordingly.

"Everything that we've done has been responsive to our coalition of community partners and their expressed interests. They have a holistic understanding of what their communities need, and we work hard to follow their direction when addressing those needs," said Shapiro-Garza.

Impacts

Communicating risks: The Duke SRP Center Community Engagement Core (CEC) developed the Stop, Check, Enjoy! campaign to inform the public via a social media push about how to reduce their exposure to contaminants by limiting consumption to certain fish species and preparing fish in certain ways.

Identifying vulnerable groups: Studies suggested that low-income individuals and individuals experiencing food insecurity were more likely to eat fish from the river, and that subsistence fishing was important for both the livelihood and cultural identity of communities.³

Analyzing exposure sources: The team tested the most consumed fish species from popular fishing locations and found that bowfin, catfish, and bluegill had high levels of mercury, hexavalent chromium, and/or arsenic contaminants.³

Updating information: Data from the study was given to the North Carolina Department of Health and Human Services (NCDHHS). They used the information to develop new fish consumption advisories that inform the public of the risks of eating certain fish.³

Improving communication: Duke SRP and the North Carolina State University (NCSU) SRP Center released a communication manual that details best practices for developing and communicating fish consumption advisories.¹⁰

Encouraging collaboration: State agencies, like NCDHHS and the North Carolina Department of Environmental Quality (NCDEQ), have often lacked the resources to collect and test fish tissue samples, and communicate relevant advisories to the public. Duke SRP and Oakland University team members created a manual for health departments, non-governmental organizations, and community members on how to collect and test fish samples to continue helping NCDHHS develop fish consumption advisories.⁹

Then and Now

• **Then:** North Carolina fishing advisories are specific to each body of water and require samples from each location. Due to limited resources, fish tissue samples from the Lower Cape Fear River basin had not been collected by the NCDEQ between 2013 and 2020.

Now: Based on Duke's data, six new advisories were created in October 2021. Efforts to encourage fish tissue collection by non-governmental organizations, academic researchers, and community members are underway to further extend the state's resources.

• **Then:** Fish consumption advisories did not adequately reach target groups or communicate potential risks.

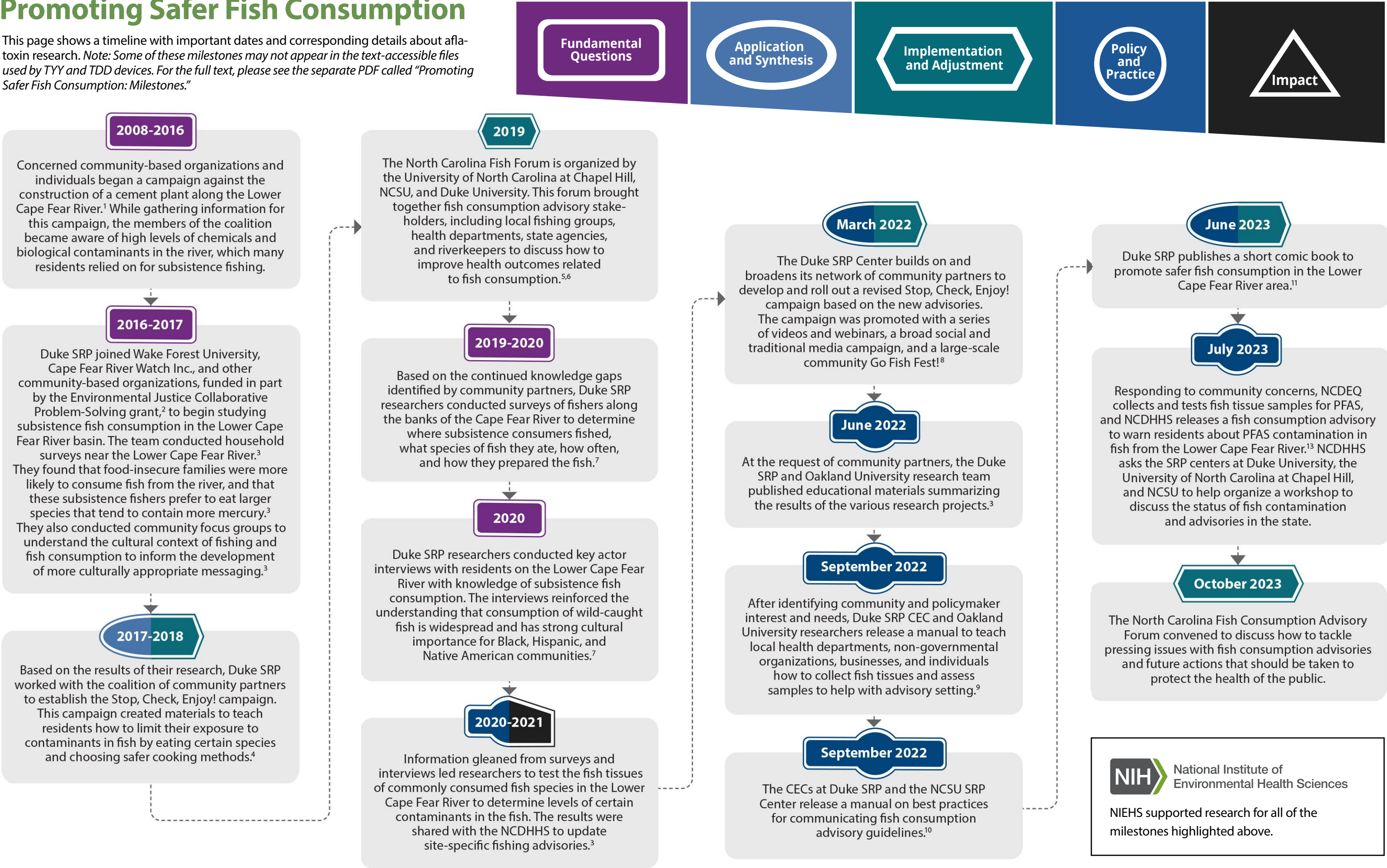
Now: Fish consumption guidelines are promoted through the Stop, Check, Enjoy! public outreach campaign. The campaign organizers disseminated recipes, videos, and webinars to encourage people to follow the new guidelines.

• **Then:** Fishing advisories used language that strongly discouraged the consumption of certain caught fish, with no alternative measures given.

Now: Guidance now addresses the reality of subsistence fishers and leaves room for residents to catch and eat certain fish by following specific safety measures, such as removing a fish's fatty skin to avoid contaminants stored in the fat.

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This page shows a timeline with important dates and corresponding details about aflatoxin research. *Note: Some of these milestones may not appear in the text-accessible files used by TYY and TDD devices. For the full text, please see the separate PDF called "Promoting Safer Fish Consumption: Milestones."*



PFAS Presents New Challenges

In July 2023, NCDHHS released new fish consumption advisories to address community members' concerns about PFAS levels in certain fish caught in the Cape Fear River.¹³ The new advisories present significant challenges for understanding and communicating about the risk of consuming wild-caught fish. Although they are not enforceable rules, the advisories provide fish consumption limits for seven different types of fish in the Lower Cape Fear River. Because PFAS chemicals build up in fish, there are no viable preparation or cooking methods that can remove or limit exposure to PFAS in fish. For subsistence and tribal fishers who may depend on caught fish for food or cultural activities, the addition of these new advisories left them with few options for safe fish consumption.¹⁴

"So far, PFAS seem to go against all the rules of thumb we've established for clearly communicating about contaminants in fish," said Katy May, director of the CEC for the NCSU SRP Center. "Eating smaller fish or avoiding fatty parts of the fish do not seem to be effective strategies for PFAS. It's creating a real challenge for how we talk about safer fish consumption."

Part of the challenge is widespread PFAS contamination throughout the Cape Fear River basin. Researchers at the NCSU SRP Center have been working to understand how PFAS are affecting humans and the environment in the Cape Fear region. Since 2017, the NIEHS-funded GenX Exposure Study has been working to understand potential health effects from PFAS exposure in the residents.

Duke SRP is currently bringing together new and existing community partners to review the effectiveness of their communication strategies. In the future, they hope to revise the Stop, Check, Enjoy! campaign and assess additional needs and opportunities for outreach.

"We're adjusting our strategy to align with the latest research," noted Shapiro-Garza. "It's a bit of a moving target, which isn't unique to PFAS, but it's a challenge that a strong coalition of community and academic partners, such as this, is uniquely positioned to address."



*An individual fishing from the Cape Fear River.
(Photo courtesy of Hendry Street Productions)*

Duke, NCSU, and the University of North Carolina at Chapel Hill organized the North Carolina Fish Forum in 2019⁶ with key fish consumption advisory stakeholders to review the advisory setting process and identify opportunities for improved communication. The organizers later released educational materials⁵ that summarized the challenges, opportunities, and potential action steps that participants identified for improving advisories to better protect people.

In October 2023, the North Carolina Fish Consumption Advisory Forum was held in Raleigh. Participants from the previous fish forum, as well as new stakeholders, came together to discuss previously identified challenges, progress, new issues, and solutions.

The Duke SRP CEC launched the Stop, Check, Enjoy! campaign in June 2018 to help inform the public about the risks of eating certain fish that are caught from contaminated waters, as well as methods to prepare fish to avoid or limit exposure to contaminants.⁴



The campaign hosted events with local organizations to spread awareness among community members about the benefits and dangers of eating specific kinds of fish, such as the 2022 Go Fish Fest!¹⁸ Additionally, the campaign established a strong social media presence,¹⁸ posting videos, recipe calendars, and more for their online audience. In 2023, Duke SRP released the comic "Cape Fear Kids Go Fishing,"¹¹ which aimed to make Stop, Check, Enjoy! easy for children to understand.

Challenges and Solutions

Challenge: It is difficult to collect data from subsistence fishers along the Cape Fear River because the population is spread out and tends to be wary of speaking to people who represent outside institutions.

Solution: Local data collectors were hired to conduct the initial household surveys. To help ensure adequate representation, a second survey was conducted at popular bankside fishing spots.

Challenge: Some subsistence fishing communities do not use English as their primary language. Surveys and outreach aimed at subsistence fishers were not accessible for these communities.

Solution: Duke SRP translated their surveys and educational materials into Spanish and used translators at community events to reach more people.

For references, supplementary information, and more on the impact of NIEHS research, please visit <https://www.niehs.nih.gov/research/programs/translational/examples>.