NCDHHS Middle and Lower Cape Fear River PFOS Fish Consumption Advisories

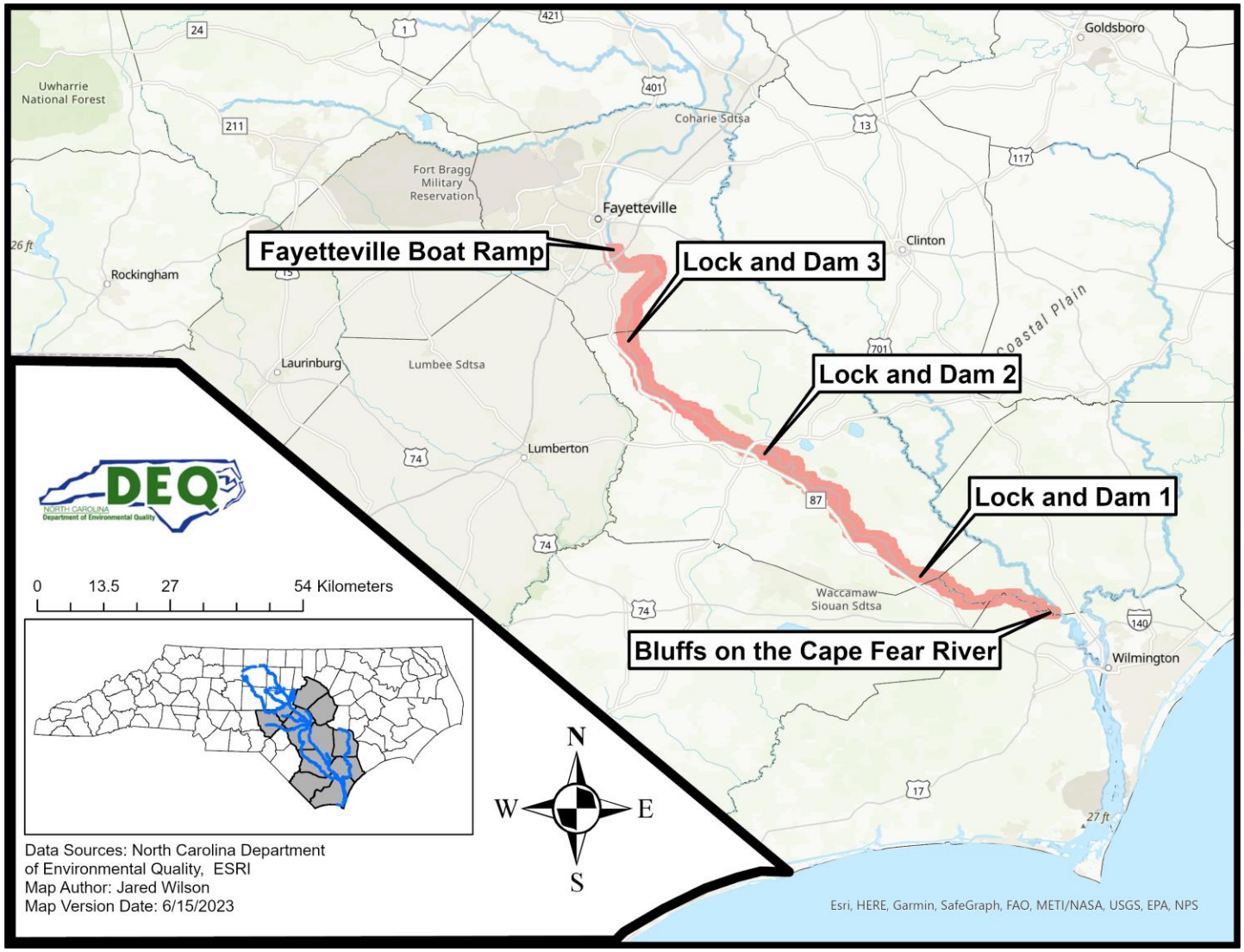
Secretaries' Scientific Advisory Board Meeting

August 2, 2023

Background

- **Communities in the middle and lower Cape Fear Region have been requesting information regarding PFAS in fish since 2017**
- **June–August 2022**
  - **250+ fish from 14 species collected from the middle and lower Cape Fear River, starting near the Chemours facility and ending at the Atlantic**
  - **Species collected were identified as the most frequently caught and consumed, according the North Carolina Wildlife Resources Commission**

Cape Fear River Sections



Background, continued

- **Fish were analyzed for 56 different PFAS**
  - **Includes PFOA, PFOS, GenX, PFBS, PFHxS, PFNA**
- **Data collected to support multiple efforts**
  - **DEQ**
    - **Development of bioaccumulation factors**
    - **Development of surface water quality standards**
  - **DHHS**
    - **Development of PFAS-specific fish consumption advisories (FCAs)**
- **Current results are for freshwater fish only**

Background

- **Fish advisories help people weigh the value of eating fish with the risks of pollutants fish absorb from their environment**
- **These advisories do not account for the health benefits of eating fish, which include supporting brain development in children and improved heart health**
- **Fish advisories do not create any legal or regulatory restrictions on fishing or fish consumption**

Other states have site specific advisories based on local concentrations, but it is difficult to compare them directly due to different source data, calculations, etc.

State	Advisories in Place
Alabama	Yes
Connecticut	Yes
Illinois	Yes
Indiana	Yes
Maine	Yes
Massachusetts	Yes
Michigan	Yes
Minnesota	Yes
New Jersey	Yes
New York	Yes
Ohio	Yes
Oregon	Yes
Pennsylvania	Yes
Wisconsin	Yes
North Carolina	**Yes**

- PFAS fish consumption advisories from various states range from “do not eat” to 1 meal a week.
- No current PFAS fish advisories: South Carolina, Virginia, Tennessee, Georgia

North Carolina PFAS Data and Fish Consumption Advisories

How can PFAS affect my health?

In adults, children, and pregnant women

- Increased cholesterol levels
- Decreased vaccine response in children
- Changes in liver enzymes
- Increased risk of high blood pressure or pre-eclampsia in pregnant women
- Small decreases in infant birth weights
- Increased risk of kidney or testicular cancer

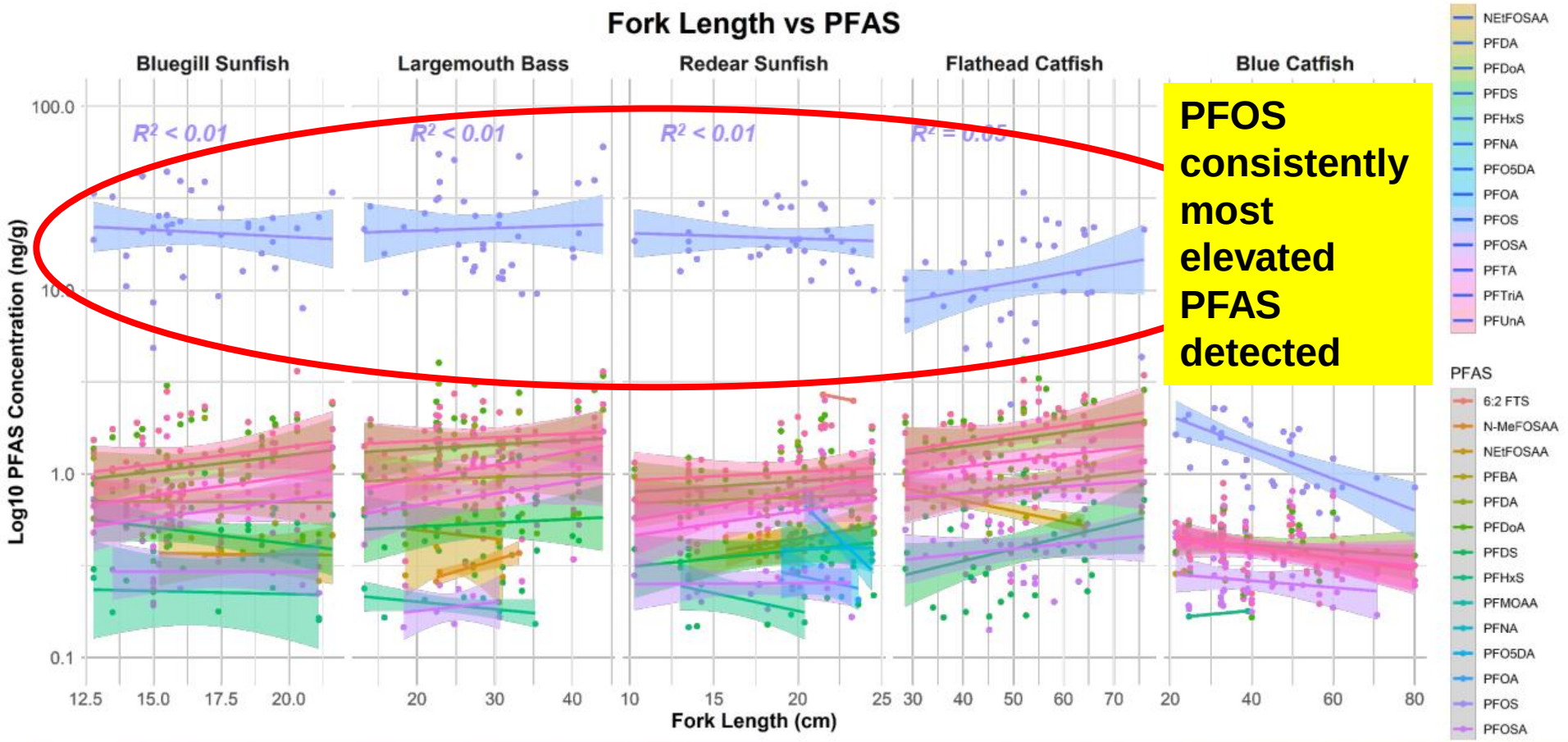
More research is needed to better understand the health effects associated with PFAS exposure.

Development of Fish Consumption Advisories (FCAs)

- **Current FCAs are driven by PFOS**
  - **PFOS concentrations higher than other PFAS chemicals**
  - **Consistent with FCAs issued by other states**
- **As of March 2023, EPA classifies PFOS as a likely carcinogen**
- **Using the non-cancer reference dose as a starting point for the calculation of the fish advisories is more protective than basing the calculations on cancer risk**

Log Concentrations of measured PFAS

Preliminary Analysis



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Slide courtesy of NCDEQ, presented at a previous SSAB meeting

Toxicology of PFOS

- **NC advisories developed using most recent USEPA reference dose (2023)**
  - **Based on most current scientific data**
  - **Most health protective**
  - **Uses same science as proposed maximum contaminant levels (MCLs) for drinking water supplies**
- **Reference dose based on the most sensitive endpoints – low birth weight and increased cholesterol**
  - **Fish consumption advisories for susceptible populations warranted to protect against multiple adverse health impacts that can affect children.**

Middle and Lower Cape Fear River Freshwater FCAs – PFOS

Combined across all species in each category

Women of childbearing age (15 to 44 years), pregnant women, nursing mothers and children

Species	Fish Consumption Advisory
American Shad, Blue Catfish, Channel Catfish	No more than 1 meal per year
Bluegill, Flathead Catfish, Largemouth Bass, Redear, Striped Bass	Do Not Eat

All Other Individuals

Species	Fish Consumption Advisory
American Shad, Blue Catfish, Channel Catfish	No more than 7 meals per year
Bluegill, Flathead Catfish, Largemouth Bass, Redear, Striped Bass	No more than 1 meals per year

Key Messages

- **DHHS is recommending limits on consumption of certain freshwater fish species from the middle and lower Cape Fear River.**
- **Fish advisories help people to balance health benefits of catching and eating fish with concerns about PFAS exposure.**
- **Different PFAS chemicals were measured in fish, but the new advisories are driven by the presence of one chemical (PFOS).**
- **This action is similar to PFAS fish advisories in other states, like Michigan and Pennsylvania, as well as existing fish advisories in North Carolina related to mercury and other contaminants.**
- **Concentrations of PFOS found in NC were similar to levels found nationally but our advisory is more restrictive based on use of the new EPA reference dose.**

Additional Messages

- **While these advisories are important for helping people reduce their exposure to PFAS, it is important to note fish remain an important source of nutrition for many North Carolina residents.**
- **Fish from our local waterways, including the Cape Fear River, have significant cultural value for our Native American populations and other residents.**
- **Most PFAS exposures occur through drinking contaminated water or eating food that contains PFAS. Other exposures include indoor dust, some consumer products, and workplaces.**
- **NCDHHS and NCDEQ will continue working with local health departments, academic researchers, community partners, and others to respond to community concerns about PFAS.**

Draft Signage

PFOS FISH CONSUMPTION ADVISORIES FOR WOMEN OF CHILDBEARING AGE (15 TO 44 YEARS), PREGNANT WOMEN, NURSING MOTHERS AND CHILDREN

for the Cape Fear River at the Fayetteville Boat ramp, near the I-95 overpass, to the Bluffs on the Cape Fear

DO NOT EAT

COMBINED ACROSS ALL SPECIES

Bluegill Sunfish

Flathead Catfish

Largemouth Bass

Redear Sunfish

Striped Bass

1

NO MORE THAN 1 SERVING PER YEAR

COMBINED ACROSS ALL SPECIES

American Shad

Blue Catfish

Channel Catfish

Fish illustrations by Duane Raver

Benefits of Eating Fish

Fish are good source of lean protein that can promote bone health, decrease the chance of becoming overweight or obese, and decrease the risk of colon and rectal cancers.

Avoiding Bad Fish

The fish above have been found to have high levels of PFOS and/or PFAS. Eating fish with higher levels of chemicals like PFAS or PFOS may cause health problems. These health concerns can be and not limited to; increase in risk of cancer, liver damage, and higher cholesterol.

Serving Size

A serving of fish is:

6 oz cooked fillet **-OR-** **8 oz** raw fillet

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SCAN TO LEARN MORE

Or visit: https://bit.ly/44ocXZk

Draft Signage

PFOS FISH CONSUMPTION ADVISORIES*

for the Cape Fear River at the Fayetteville Boat ramp, near the I-95 overpass, to the Bluffs on the Cape Fear

1
NO MORE THAN 1 SERVING PER YEAR
COMBINED ACROSS ALL SPECIES

Bluegill Sunfish | Flathead Catfish | Largemouth Bass | Redear Sunfish | Striped Bass

7
NO MORE THAN 7 SERVINGS PER YEAR
COMBINED ACROSS ALL SPECIES

American Shad | Blue Catfish | Channel Catfish

*See separate advisory for women of childbearing age, pregnant women, nursing mothers and children.

Fish illustrations by Duane Raver

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Draft Signage (Spanish)

ADVERTENCIA SOBRE EL CONSUMO DE PESCADO PARA MUJERES DE EDAD FÉRTIL (15 A 44 AÑOS), MUJERES EMBARAZADAS, MADRES LACTANTES T NINOS

para el rio Cape Fear en la región de rampa de bote de Fayetteville, cerca al paso elevado de la ruta I-95, hasta el Farallón en el Cape Fear

NO COMA

COMBINADO EN TODAS LAS ESPECIES

Mojarra azul
(Bluegill Sunfish)

Siluro chato
(Flathead Catfish)

Perca americana
(Largemouth Bass)

Redear Sunfish
(Redear Sunfish)

Perca rayada
(Striped Bass)

1

NO MÁS DE 1 PORCIÓN POR AÑO

COMBINADO EN TODAS LAS ESPECIES

Sábalo americano
(American Shad)

Siluro azul
(Blue Catfish)

Siluro de canal
(Channel Catfish)

Ilustraciones de peces por Duane Raver

Beneficios de comer pescado

El pescado es una buena fuente de proteínas magras que pueden promover la salud ósea, disminuir la posibilidad de tener sobrepeso u obesidad, y disminuir el riesgo de cáncer de colon y cáncer del ano.

Evitar el pescado malo

Se ha descubierto que los pescados mencionados tienen niveles elevados de PFOS y/o PFAS. Comer pescado con niveles elevados de sustancias químicas como PFAS o PFOS puede causar problemas de salud. Estos problemas de salud pueden ser, entre otros aumento del riesgo de cáncer, daños hepáticos y aumento del colesterol.

Porción

Una ración de pescado es:

6 onzas de filete cocido **-O-** **8 onzas** de filete crudo

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ESCANEAR PARA OBTENER MÁS INFORMACIÓN

O visite el sito web:
https://bit.ly/44ocXZk

Draft Signage (Spanish)

ADVERTENCIA SOBRE EL CONSUMO DE PESCADO CON PFOS*

para el rio Cape Fear en la región de rampa de bote de Fayetteville, cerca al paso elevado de la ruta I-95, hasta el Farallón en el Cape Fear

1
NO MÁS DE 1 PORCIÓN POR AÑO
COMBINADO EN TODAS LAS ESPECIES

Mojarra azul
(Bluegill Sunfish)

Siluro chato
(Flathead Catfish)

Perca americana
(Largemouth Bass)

Redear Sunfish
(Redear Sunfish)

Perca rayada
(Striped Bass)

7
NO MÁS DE 7 PORCIÓN POR AÑO
COMBINADO EN TODAS LAS ESPECIES

Sábalo americano
(American Shad)

Siluro azul
(Blue Catfish)

Siluro de canal
(Channel Catfish)

**Consulte la advertencia separada para mujeres de edad fértil, mujeres embarazadas, madres lactantes y niños*

Ilustraciones de peces por Duane Raver

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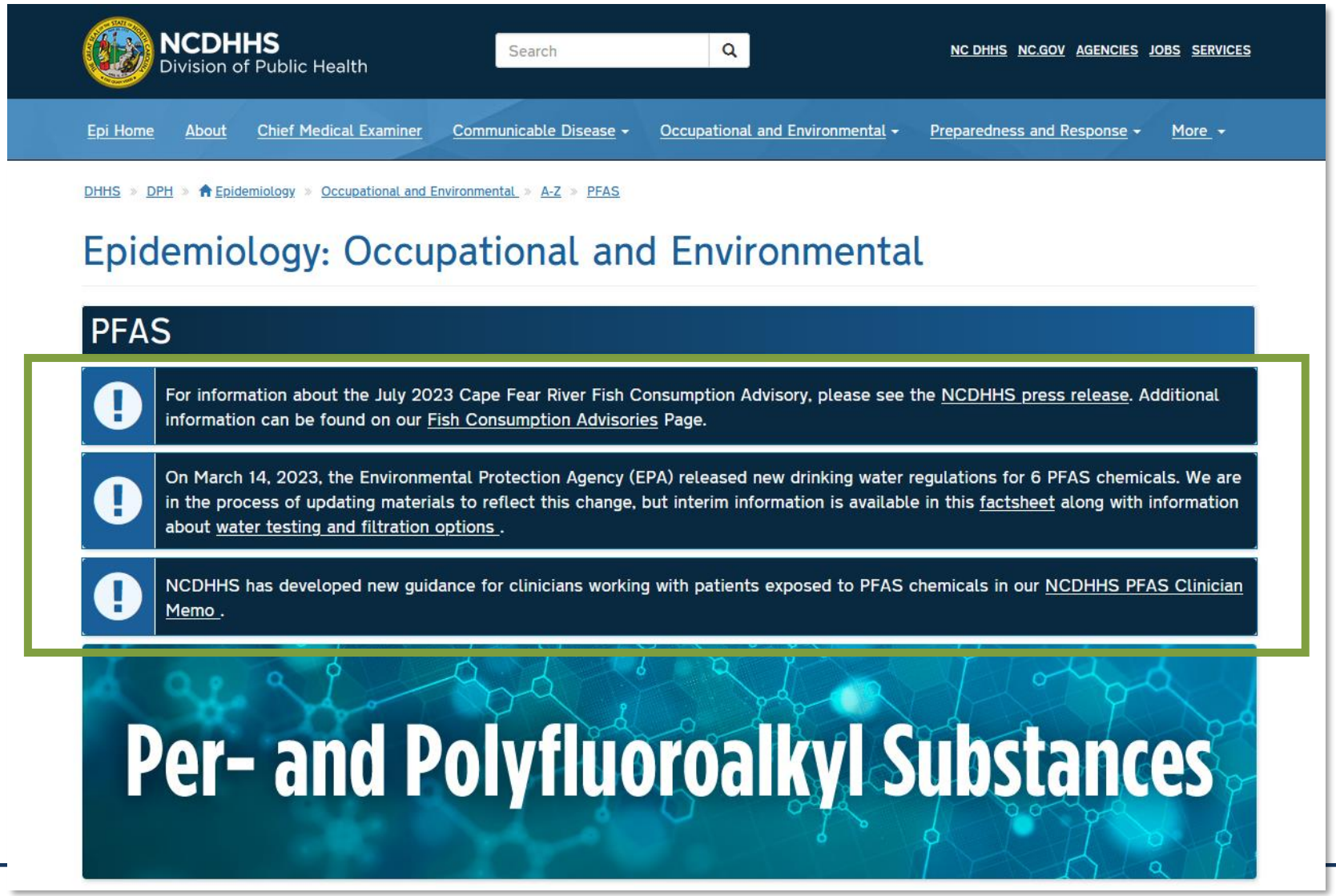
Dissemination

- **July 12, 2023 (Under embargo)**
  - **Media interviews**
  - **Briefing with local health directors and community-based organizations**
- **July 13, 2023**
  - **Legislative Briefing**
  - **Press Release, Social Media, Webpage Updates**
  - **Media interviews**
  - **Outreach via email to**
    - **NCDEQ, NCWRC, NCA&CS, Commission of Indian Affairs**
    - **Local health directors, community-based organizations, and academic partners**

Dissemination

- **Webpage Updates: https://bit.ly/44ocXZk**



Dissemination

- **Webpage Updates: https://bit.ly/44ocXZk**

  - **Cape Fear River**

    Affected Counties: Bladen, Brunswick, Cumberland, Columbus, New Hanover, Pender

    Date Issued: July 13, 2023

    Site: Fayetteville Boat Ramp, near the I-95 overpass, to the Bluffs on the Cape Fear, near the I-140 overpass

    Pollutant: PFOS, one type of PFAS chemical

    Fish Species: Blue Gill, Flathead Catfish, Largemouth Bass, Redear, Blue Catfish, American Shad, and Striped Bass

    Advisory: Elevated levels of PFOS and other PFAS chemicals have been found in Blue Gill, Flathead Catfish, Largemouth Bass, Redear, Blue Catfish, American Shad, and Stripped Bass. For women of childbearing age (15 to 44 years) pregnant women, nursing mothers, and children, do not eat Blue Gill, Flathead Catfish, Largemouth bass, Redear fish, and Stripped bass. For Blue Catfish and American Shad, do not eat more than 1 serving per year combined across all species. For adults, Blue Gill, Flathead Catfish, Largemouth bass, Redear fish, and Stripped bass should not be eaten more than 1 serving per year combined across all species. Blue Catfish and American Shad should not be eaten more than 7 servings per year combined across all species.

    For more information, please see the July 2023 NCDHHS press release

    For information about the project, please visit appendix A and appendix B.

    For frequently asked questions(FAQs), please go English FAQs and Spanish FAQs.

    Fish Advisory Sign Templates

    Fish Advisory Sign Templates Spanish

Dissemination

- **Community Meetings**
  - **Thursday 8/17 6-8pm, Bladen Community College**
  - **Tuesday 8/22 6-8pm, Navassa Community Center**
  - **Thursday 8/24 6-8pm, Virtual meeting**
- **More info soon on https://bit.ly/44ocXZk**
- **Also looking into additional ways to reach anglers through newsletters, etc.**

Questions?

DHHS Occupational and Environmental Epidemiology Branch

Phone: (919) 707-5900

E-mail: oeeb@dhhs.nc.gov

Appendix

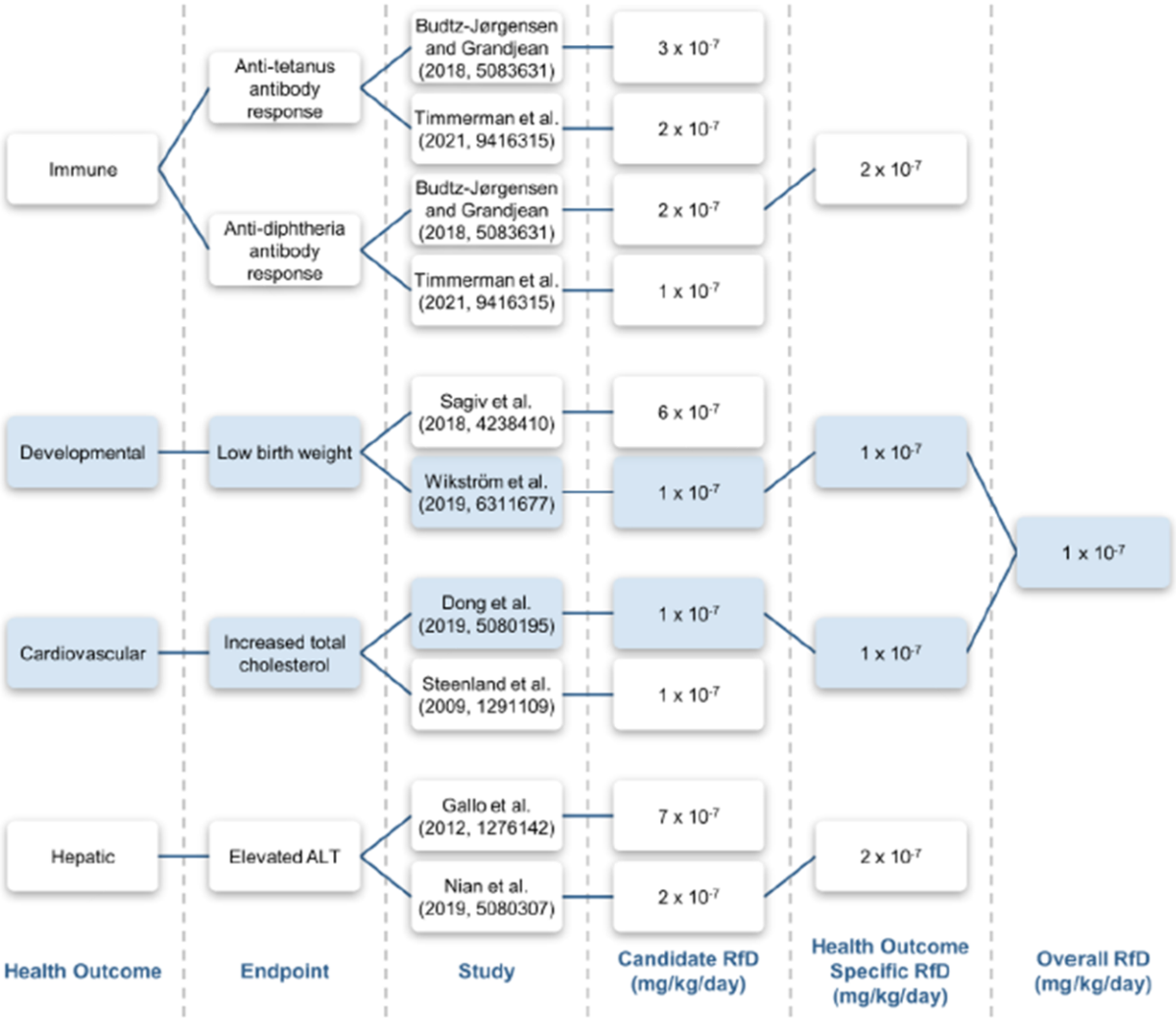


Figure 4-4. Schematic depicting selection of the overall RfD for PFOS

From "PUBLIC COMMENT DRAFT: Toxicity Assessment and Proposed Maximum Contaminant Level Goal for Perfluorooctane Sulfonic Acid (PFOS) in Drinking Water" (USEPA, March 2023)

Meal Limit Calculation – Non-Cancer

$$\boldsymbol{ML_{nc}} = \frac{RfD \times BW \times Tap}{C \times MS \times LF \times week/month}$$

- ML_{nc} = non-cancer fish consumption meal limit (meals/week)
- RfD = reference dose (mg/kg/day)
- BW = body weight (kg)
- T_{ap} = time averaging period (days/month)
- C = average contaminant concentration (mg/kg)
- MS = size of one fish meal (kg/meal)
- LF = loss factor due to trimming and cooking

Example PFOS Blue Catfish - ML_{nc}

$$.44\ \boldsymbol{meals/week} = \frac{.0000001 \times 80 \times 30.44}{0.0007472 \times .17 \times 1 \times 4.33}$$

- MLnc = (meals/week) (rounded to one significant digit)
- RfD = .0000001 (mg/kg/day)
- BW = 80 (kg)
- Tap = 30.44 (days/month)
- C = 0.0007472 (mg/kg)
- MS = .17 (kg/meal)
- LF = 1
- Week/month = 4.33