



Introduction to the NC PFAS Testing Network

JASON D. SURRATT, PhD
PROGRAM DIRECTOR (MANAGER)

UNCW-NCCF Public Forum, May 31, 2019





Jason D. Surratt, PhD

Program Director, PFAS Testing Network

Professor, Department of Environmental Sciences and Engineering, UNC Gillings School of Global Public Health

PhD, Chemistry, Caltech 2010

- *Dissertation: Analysis of the Chemical Composition of Atmospheric Organic Aerosols by Mass Spectrometry*

BA, Chemistry & BS, Meteorology, North Carolina State University 2003

North Carolina native, grew up in Charlotte, NC

Research foci: **resolving underlying atmospheric chemistry** (or sources) **that produces *harmful*** fine particulate matter (or aerosol particles) contained within **outdoor air pollution (“smog”)**

Smog in Los Angeles, CA



Smog in Charlotte, NC



Legislative Mandate: 2018 Appropriations Act (S99; SL 2018-5)

Section 13.1.(f) – NC General Assembly finds that academic expertise & instrumentation in public and private universities in NC should be “maximally utilized to address the occurrence of PFAS, including GenX, in drinking water resources.”

NC STATE
UNIVERSITY



Duke
UNIVERSITY



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL



NORTH CAROLINA
AGRICULTURAL AND TECHNICAL
STATE UNIVERSITY



Legislative Mandate: 2018 Appropriations Act (*S99; SL 2018-5*)

Section 13.1.(g) – Water sampling scope

- ALL public water supply surface water intakes (n=190)
- One well selected by each municipal water supply system operating groundwater wells for public water supply (688 total wells in 158 municipalities; n=158)

TOTAL SAMPLE UNIVERSE n=348

Legislative Mandate: 2018 Appropriations Act (*S99; SL 2018-5*)

Section 13.1.(I) – Other Research Directives

- Predictive modeling of private well contamination
- Performance testing of removal technologies
- Air emissions & atmospheric deposition
- Evaluate other research opportunities

Legislative Mandate: 2018 Appropriations Act (S99; SL 2018-5)

Section 13.1.(h) – Reporting requirements

Quarterly progress reports to NCGA Environmental Review Commission and regulatory agencies (NCDEQ, NCDHHS, EPA)

first report: Oct. 1, 2018 >>>> final report: Dec. 1, 2019

(provisional timeline extending 1 more year, pending final budget passage)

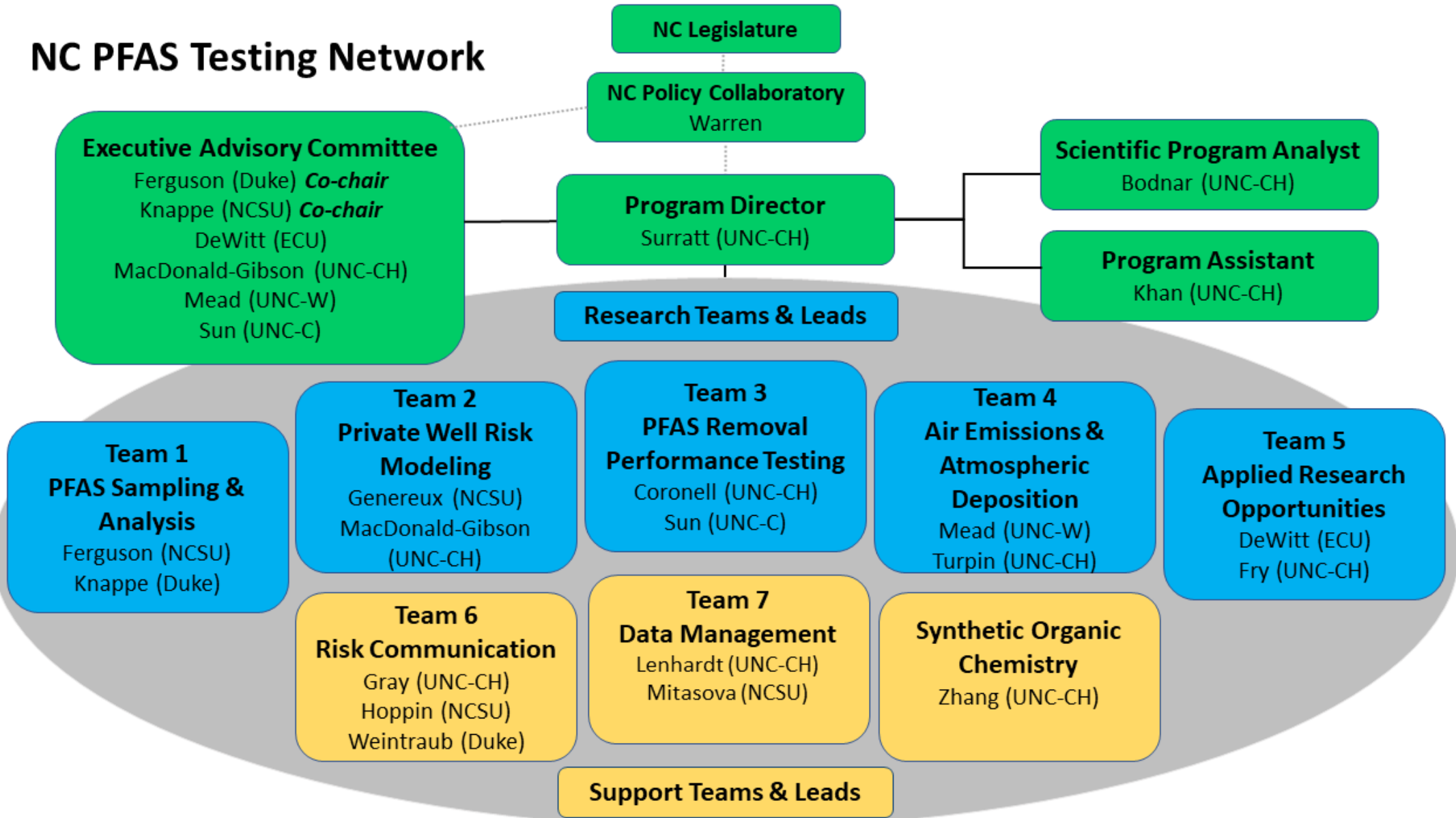
Section 13.1.(i) – Appropriation

\$5,015,000  Policy Collaboratory

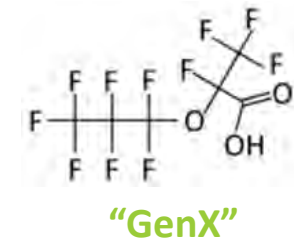
(FY 2018-19; non-recurring; non-reverting)

Additional \$1.7 M provided by NC Policy Collaboratory (through grant matching)

NC PFAS Testing Network



Research Questions for PFAS Water Sampling Team



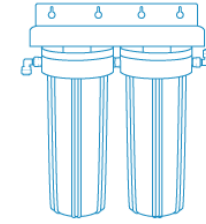
- **What are the concentrations of targeted legacy and emerging PFAS contaminants including “GenX” in North Carolina public drinking water sources?**
- **What unanticipated and untargeted PFAS compounds occur in North Carolina public drinking water sources?**
- **How much of the total organic fluorine in North Carolina public drinking water sources can be accounted for by targeted PFAS quantitation?**

Research Questions for Private Well Risk Modeling Team



- **For GenX and other PFASs, what are the current rates of input to the aquifer and output from the aquifer to tributaries of the Cape Fear River?**
- **Why are some wells contaminated and others are not?**
- **How can we help private well owners assess risks?**

Research Questions for PFAS Removal Testing Team



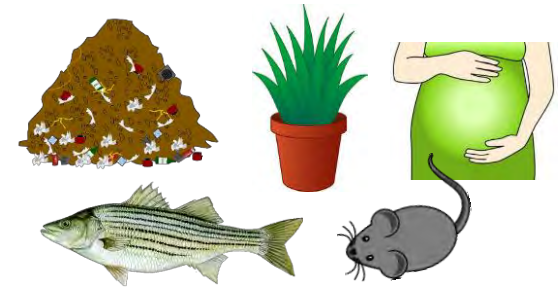
- **What is the best option to remove PFAS from drinking water?**
- **How successful are the household filters in removing PFAS from tap water?**
- **Are there promising novel PFAS removal methods we can develop?**
- **What do we do with waste streams enriched in PFAS?**

Research Questions for Air Sampling Team



- **What PFAS compounds are present in ambient NC air or in wet deposition?**
- **What is the geographic distribution and what does this tell us about sources?**
- **What is the contribution of wet deposition to the Cape Fear watershed?**
- **Does gas-to-particle conversion (multiphase atmospheric chemistry) alter the fate of small polar gaseous PFAS, as seen for similar non-fluorinated organics?**

Research Questions for the Applied Research Team(s)



- (A)** What are novel sources of PFAS to surface and groundwater (municipal solid waste landfills and unlined construction and demolition landfills)?
- (B)** How do PFASs bioaccumulate from the environment into ecologically important species?
- (C)** Do emerging PFASs impact the immune system to the same degree as legacy PFASs?
- (D)** Can PFASs be taken up by important food crops and do soil properties affect this uptake?
- (E)** Do PFASs in drinking water pose a risk to pregnant women and how do they affect cells of the placenta?
- (F)** Can we develop models to predict where PFASs go in organisms and in the environment?

Ongoing NC PFAST Network Research Activities

NC State & Duke Water Sampling



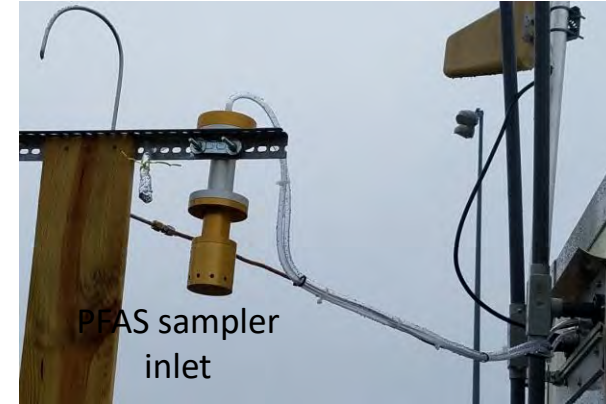
Location: Lillington, NC

NC State Fish Sampling



Location: Cape Fear River

UNC Air Sampling (Gas + Particles)



Location: Fayetteville, NC

UNCW Wet/Dry Deposition Collection



Location: Wilmington, NC

NC State Alligator Sampling



Location: Cape Fear River

ECU Toxicological Assessments



Location: ECU's campus

Program Management & Support Teams

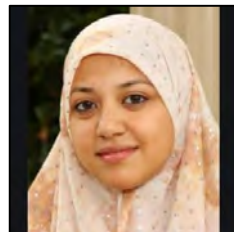
Program Management Team



Jason Surratt, PhD
Program Director
*Professor, Environmental
Sciences & Engineering,*
UNC Chapel Hill



Wanda Bodnar, PhD
Scientific Program Analyst
*Assistant Professor, Environ-
mental Sciences & Engineering,*
UNC Chapel Hill



Manal Khan, MPA
Program Assistant
Business Services Coordinator,
*Environmental Sciences &
Engineering,*
UNC Chapel Hill

Team 6: Risk Communications



Kathleen Gray, PhD
*Associate Director & Assistant
Professor, Institute for the
Environment,*
UNC Chapel Hill



Jane Hoppin, ScD
*Associate Professor, Biological
Sciences & Deputy Director,*
NCSU CHHE,
NC State University



Jory Weintraub, PhD
*Science Communication
Program Director, Initiative
for Science and Society &
Director, Broader Impacts
Resource Center,*
Duke University

Team 7: Data Science & Management

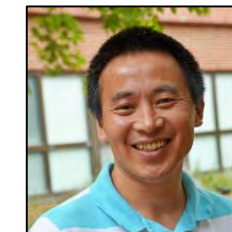


Christopher Lenhardt
Domain Scientist,
*Renaissance Computing
Institute (RENCI),*
UNC Chapel Hill



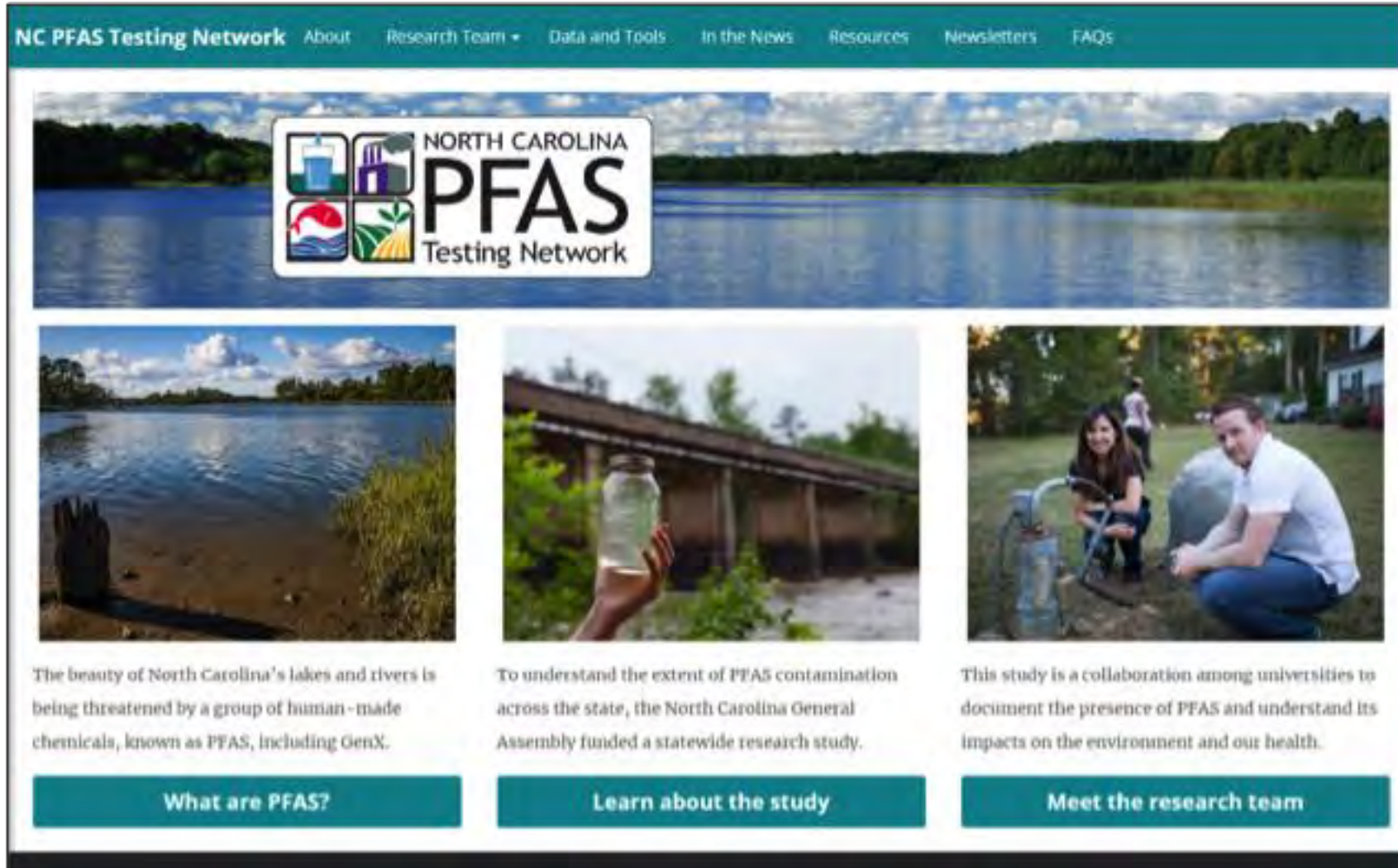
Helena Mitsova, PhD
*Professor, Marine, Earth &
Atmospheric Sciences & Associate
Director, Center for Geospatial
Analytics (CGA),*
NC State University

PFAST Network Synthetic Chemist



Zhenfa Zhang, PhD
Assistant Professor,
*Environmental Sciences &
Engineering,*
UNC Chapel Hill

Please Visit Our Website – <https://ncpfastnetwork.com/>



The screenshot shows the homepage of the NC PFAS Testing Network website. At the top is a teal navigation bar with the following links: **NC PFAS Testing Network**, About, Research Team, Data and Tools, In the News, Resources, Newsletters, and FAQs. Below the navigation bar is a large banner image of a lake with a logo in the center. The logo consists of four icons in a 2x2 grid: a water tap, a factory, a fish, and a plant, followed by the text "NORTH CAROLINA PFAS Testing Network".

Below the banner are three columns of content, each with an image, a text block, and a teal button:

- Column 1:** Image of a lake with a log. Text: "The beauty of North Carolina's lakes and rivers is being threatened by a group of human-made chemicals, known as PFAS, including GenX." Button: "What are PFAS?"
- Column 2:** Image of a hand holding a water bottle. Text: "To understand the extent of PFAS contamination across the state, the North Carolina General Assembly funded a statewide research study." Button: "Learn about the study"
- Column 3:** Image of two people crouching outdoors. Text: "This study is a collaboration among universities to document the presence of PFAS and understand its impacts on the environment and our health." Button: "Meet the research team"

Goals: increase awareness of study findings and create opportunities for dialogue about the study among diverse groups

Communications Team:

- Research symposia at Duke (fall 2018), UNC (fall 2019), NCSU (spring 2020)
- Research briefings in Wilmington, Fayetteville and RTP

ncpfastnetwork.com



Dr. Jory Weintraub leads science communication training

Goals: increase awareness of study findings and create opportunities for dialogue about the study among diverse groups

Communications Team:

- Science cafes
- Science communication training for researchers

ncpfastnetwork.com



Dr. Scott Belcher @ NC Museum of Natural Sciences

Data Management Team

- Has begun development of NC PFAST Data Hub
- This public portal will allow access to latest data from the Network through interactive visualizations that provide PFAS levels in air, groundwater, and water supply systems
- Once Data Hub is officially launched, data will be updated as soon as it becomes available from the research teams
- Will also provide a notification service so that the public can sign-up to be notified when any new data are released
- For more information, please visit our website and click the “Data and Tools” menu at top of homepage

ncpfastnetwork.com

Thank you!



e-mail: surratt@unc.edu
wanda_bodnar@unc.edu