

POTOMAC ENVIRONMENTAL RESEARCH AND EDUCATION CENTER



College of Science
George Mason University



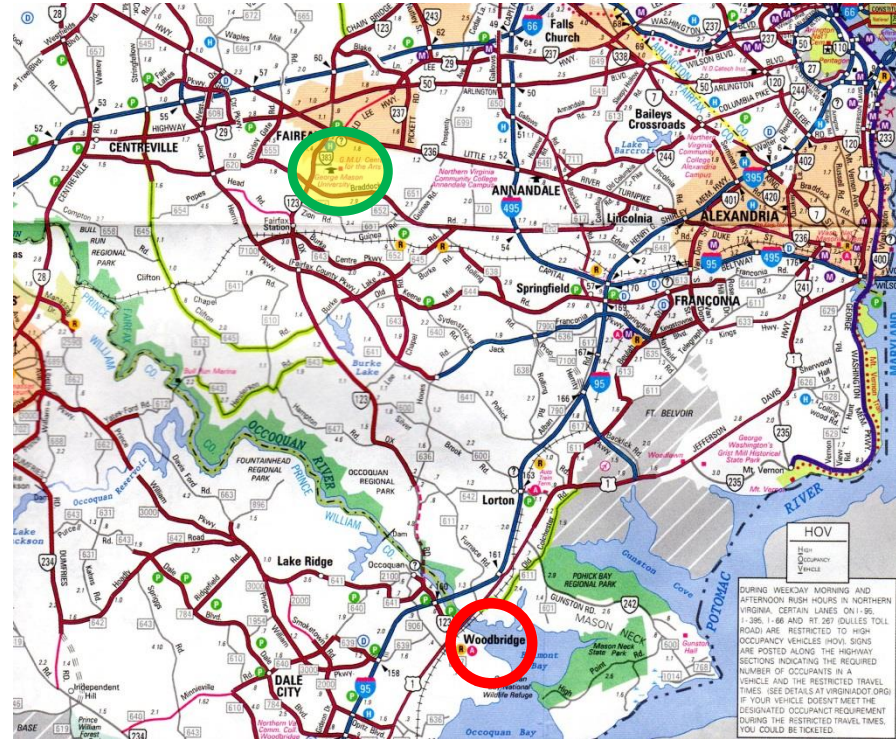
PEREC's MISSION

- To utilize the tools of scientific research, restoration, education, and policy analysis to help society understand and sustain natural processes in ecosystems, watersheds, and landscapes.
- Our goals will be achieved through:
 - Research and Scholarship
 - Instruction: Academic and Contract
 - Outreach and Events



POTOMAC ENVIRONMENTAL RESEARCH AND EDUCATION CENTER

- Our new building, Potomac Science Center, opened in September 2018
- Located on the tidal Occoquan River in Woodbridge, VA
- 15 miles from the Fairfax campus, about 25 minute drive down Rt. 123





FACILITIES AT POTOMAC SCIENCE CENTER

Laboratory Space

- 8 PI Research wet labs
- 2 Teaching wet labs
- 12 Tech. support rooms
 - autoclave
 - growth chambers
 - hoods, biosafety cabinets
- Large storage area for boats and vehicles in parking garage basement

Meeting, Learning, Work Space

- Multipurpose event room (100+)
- Lecture room (40+)
- K-12 Discovery Lab
- Exhibition hall with walkout onto river patio
- Faculty and grad student offices
 - ❖ NEEDED: a pier for on-site boat access
 - ❖ In the interim, using rented boat slip at the marina



FACILITIES AT POTOMAC SCIENCE CENTER



PEREC FACULTY

- R. Chris Jones – water quality, plankton, SAV (ESP)
- Kim De Mutsert – fish ecology (ESP)
- Greg Foster – aquatic organic chemistry (CHEM)
- Tom Huff – organic micropollutants
- Jennifer Salerno (ESP)- microbiology
- Amy Fowler – benthic ecology (ESP)



- Randy McBride – coastal geomorphology (AOES)
- Benoit Van Aken – environmental molecular biology (CHEM)
- Dann Sklarew – aquatic ecology & sustainability (ESP)
- Cindy Smith – K12 outreach and sustainability (ESP)

R. Christian Jones, PhD

Director, PEREC

Water Quality and Nutrients

Plankton and Benthos

Long Term Study of Gunston Cove



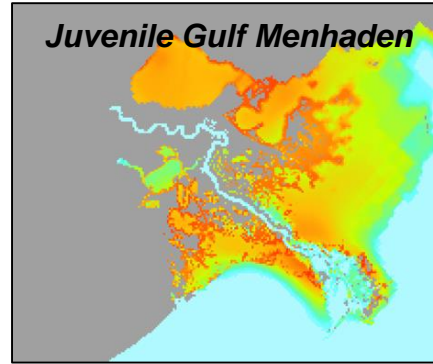
Kim DeMutsert

Associate Director

Fish Ecology

Ecosystem Modeling

Gulf of Mexico fish ecology



Amy Fowler

Faculty Fellow

Invertebrate Ecology

Invasive species



- Black gill disease in shrimp
- Individual-based model of blue crab fishery
- Developing a benthic IBI in the Potomac River



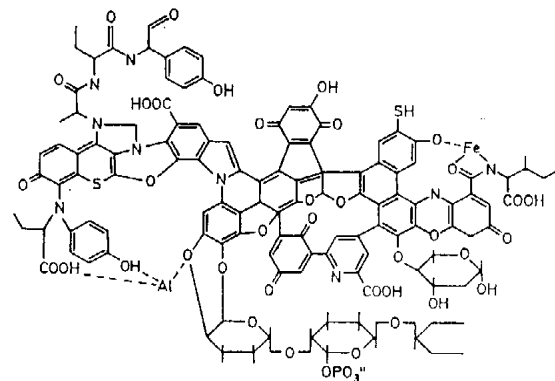
Greg Foster

Senior Faculty Fellow

Environmental Chemistry

Organic Micropollutants

- Organic matter flocculation at the ETM (estuarine turbidity maximum) examines sediment
- Fingerprinting and source apportionment of PAHs (where did pollutants come from)
- Wastewater Treatment Plant emissions of pharma chemicals
- Bioaccumulation of endocrine disrupting chemicals in fish – examines tissues



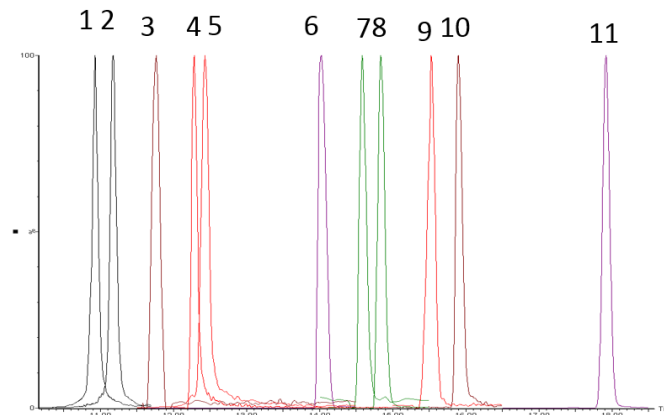
Tom Huff

Faculty Fellow

Instrumental Analysis

Organic and Inorganic Micropollutants

- Mass spectrometric analysis of endocrine disrupting chemicals, pharmaceuticals and personal care products
- Hunting Creek micropollutant study – Alexandria Renew Enterprises Grant
- Development of liquid chromatography – tandem mass spectrometry methods for analysis of micropollutants in environmental samples



Randy McBride

Faculty Fellow

Coastal Geology, Geomorphology, and Processes



Examines sediment cores
to understand deposition
over time

Looks at processes of sea
island inlet formation and
closure

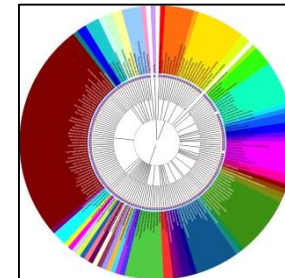
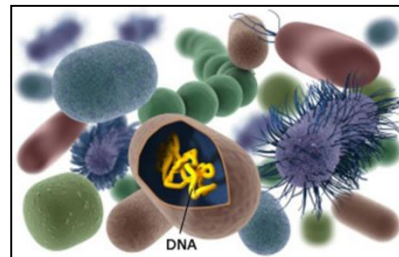
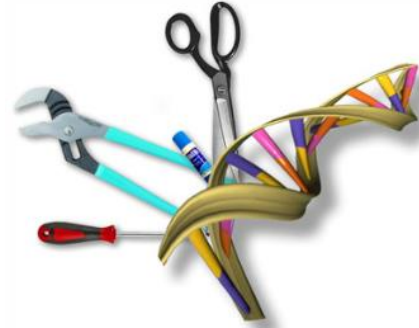


Benoit Van Aken

Faculty Fellow

Environmental molecular biology

- Molecular biology methods to understand the toxicity of environmental contaminants in plants and fish (toxicogenomics)
- Molecular biomarkers for pathogen detection (microbial source tracking)
- DNA barcoding for detection of aquatic invasive species
- Aquatic microbiome for water quality bio-assessment
- Detection of toxic algae using DNA and RNA markers



Dann Sklarew

Faculty Fellow

Watershed Stewardship

Sustainability Science and Education



- Brook trout sustainability index
- Public participation and governance in water resources management
- Sustainability project on college campuses

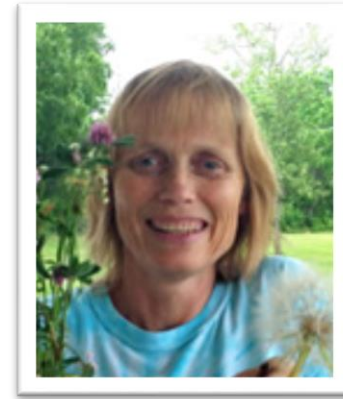


Cindy Smith

Faculty Fellow and K12 Director

K12 Schools Programs

Sustainability Education

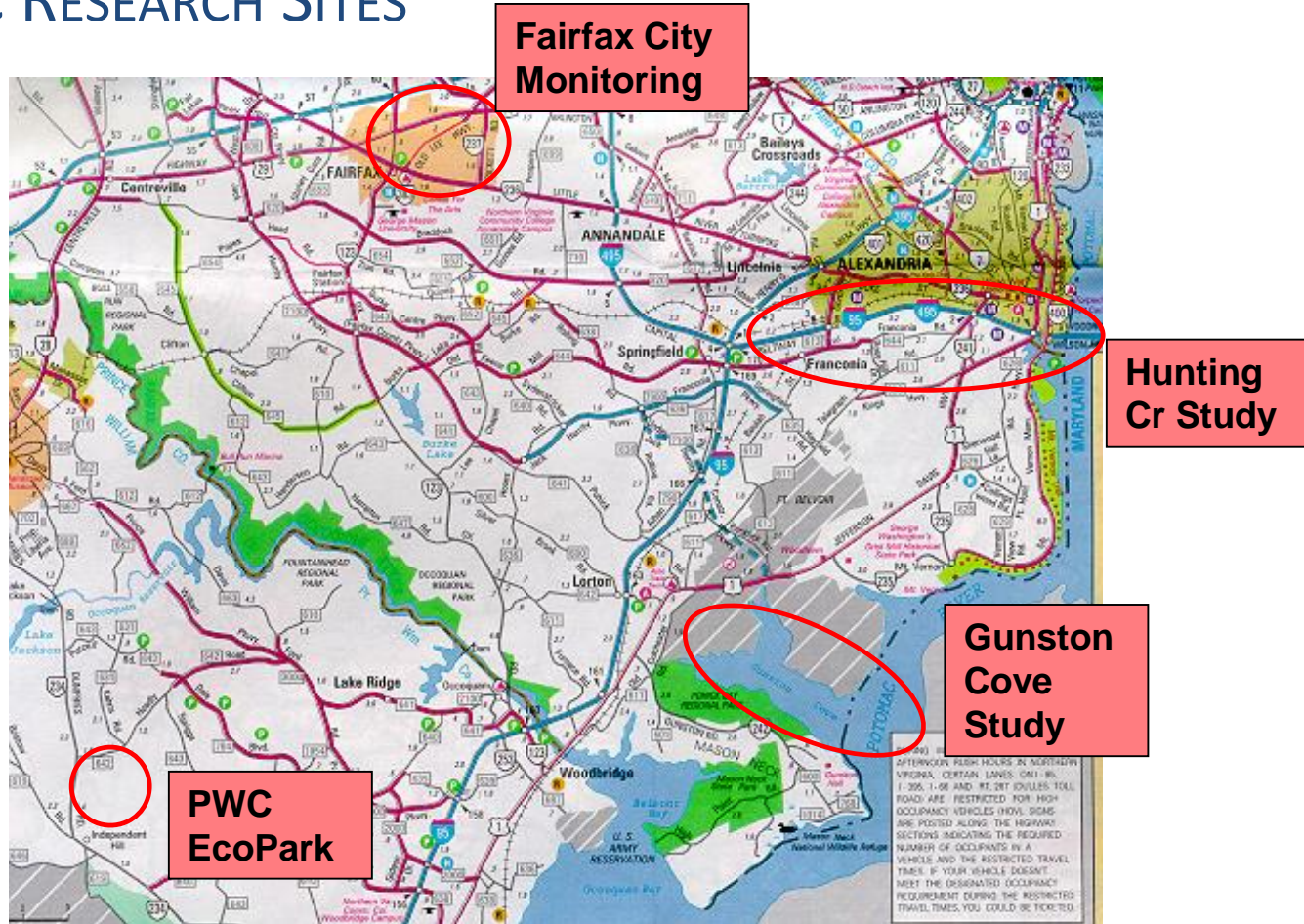


- **Meaningful Watershed Educational Experiences**

- 6000 6th Graders/yr in PW Co Public Schools
- 5000 7th Graders/yr in Fairfax Co Public Schools
- 20-30 Grad & Undergrad students/yr serving as Field Interpreters



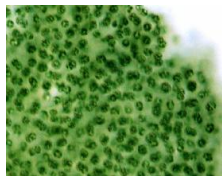
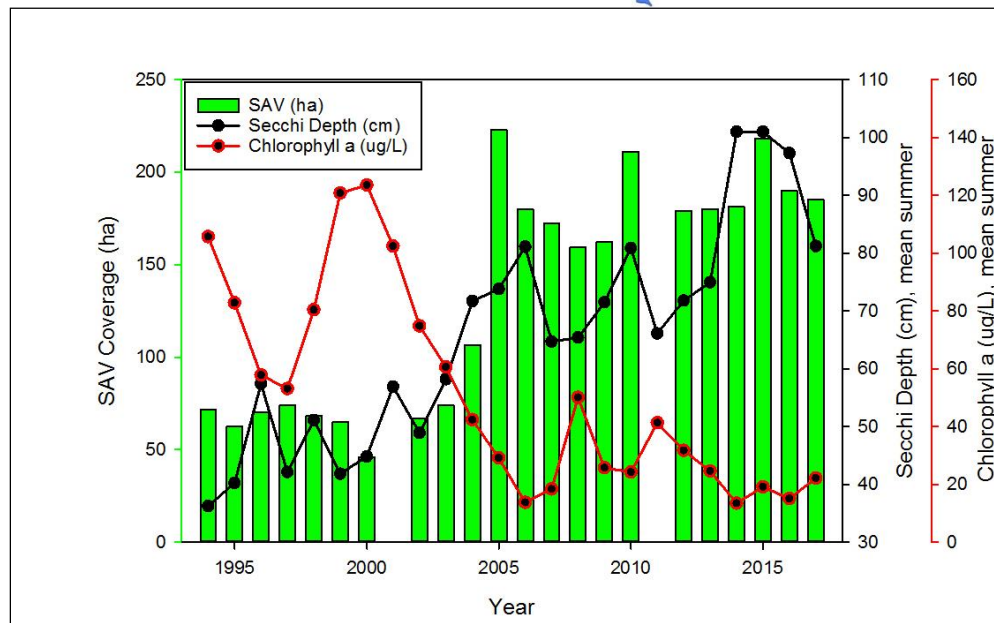
PEREC RESEARCH SITES



MAJOR RESEARCH PROJECTS

○ Gunston Cove

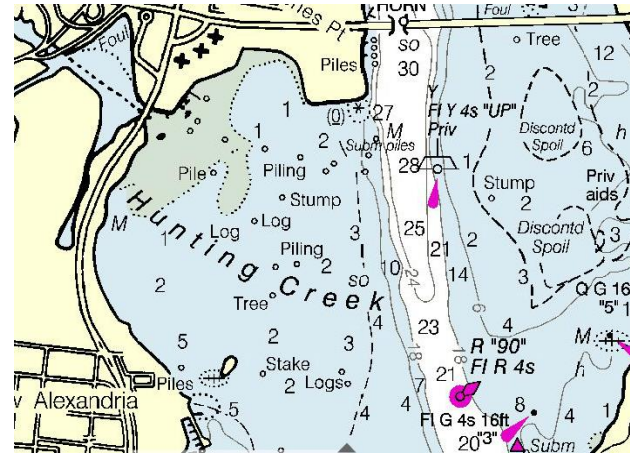
- Begun in 1984 to track effectiveness of remedial measures to control nutrient loading of the Potomac
- Partnership with Fairfax County
- Has documented long-term recovery of the Gunston Cove ecosystem including large increases in SAV (submersed aquatic vegetation) and a shift in dominant phytoplankton taxa from cyanobacteria to diatoms
- Total funding: >\$2 million



MAJOR RESEARCH PROJECTS

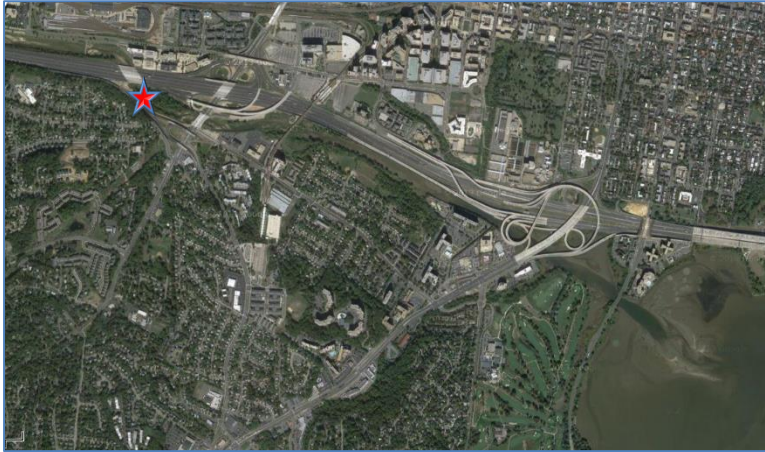
○ Hunting Creek

- Begun in 2003 to track effectiveness of remedial measures to control nutrient loading of the Potomac
- Modeled after Gunston Cove Study, but includes some additional components:
 - *E. coli* (combined sewer issues)
 - Organic micropollutant studies
 - Water quality mapping
- Partnership with Alexandria Renew Enterprises

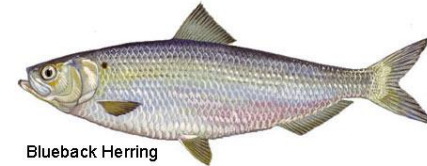


HUNTING CREEK - FISH SAMPLING

- Intensive sampling at Head of Tide site March – May to address anadromous fish spawning utilization
- To everyone's surprise, we have discovered river herring spawning in Cameron Run, a highly urbanized drainage at a site adjacent to the Beltway!



Alewife



Blueback Herring



PEREC MOVING TO PSC

LOOKING FORWARD TO GREAT THINGS!

