



**Welcome**

U.S. Environmental Protection Agency's (EPA)

**Graduate Research Internship Program (GRIP) Opportunities  
for NSF Graduate Research Fellows**

November 21, 2017  
3:00PM – 5:00 PM EST



# Agenda

## Agenda

- 3:00 p.m.** Introduction  
James H. Johnson, Jr., PhD, Director, EPA National Center for Environmental Research
- 3:05 p.m.** Welcome  
Gisele Muller-Parker, PhD, Program Director, NSF Graduate Research Fellowship Program
- 3:10 p.m.** Purpose of Webinar and Overview  
Jayne Michaud, MPH, Fellowships Program Lead, EPA NCER
- 3:15 p.m.** Lightning Round Presentations  
EPA Researchers (the start times are approximate)
- 3:15 p.m.** ORD Research Programs
- 3:20 p.m.** National Risk Management Research Laboratory (NRMRL)
- 3:35 p.m.** National Health and Environmental Effects Research Laboratory (NHEERL)
- 4:00 p.m.** National Exposure Research Laboratory (NERL)
- 4:30 p.m.** Final Questions
- 5:00 p.m.** Adjourn



National Center for Environmental Research (NCER)

Center Director  
Dr. James H. Johnson Jr., Ph.D.



# Welcome to the EPA - NSF GRIP Webinar



**Gisele Muller-Parker, Ph.D.**  
Program Director  
Graduate Research Fellowship  
Program  
Division of Graduate Education  
National Science Foundation



**Christopher Hill**  
Graduate Research Fellowship  
Program  
National Science Foundation



## Welcome to the EPA - NSF GRIP Webinar



**Jayne Michaud, MPH**  
Fellowships Program Manager  
National Center for Environmental  
Research  
Office of Research & Development  
U.S. Environmental Protection Agency

**To provide NSF Graduate Research Fellows the opportunity to grow professionally with a rewarding research experience and receive mentoring from our scientists, all while focusing on the protection of human health and the environment.**



- Review EPA GRIP opportunities:  
<https://www.epa.gov/research-fellowships/graduate-research-internship-program-grip-opportunities-epa>
- Contact the EPA researcher, discuss your professional development goals
- Prepare your application and apply through NSF by Dec. 15
- EPA GRIP projects
  - Range from 3 to 12 months
  - Located on EPA premises
  - EPA provides in-kind support (non-financial)



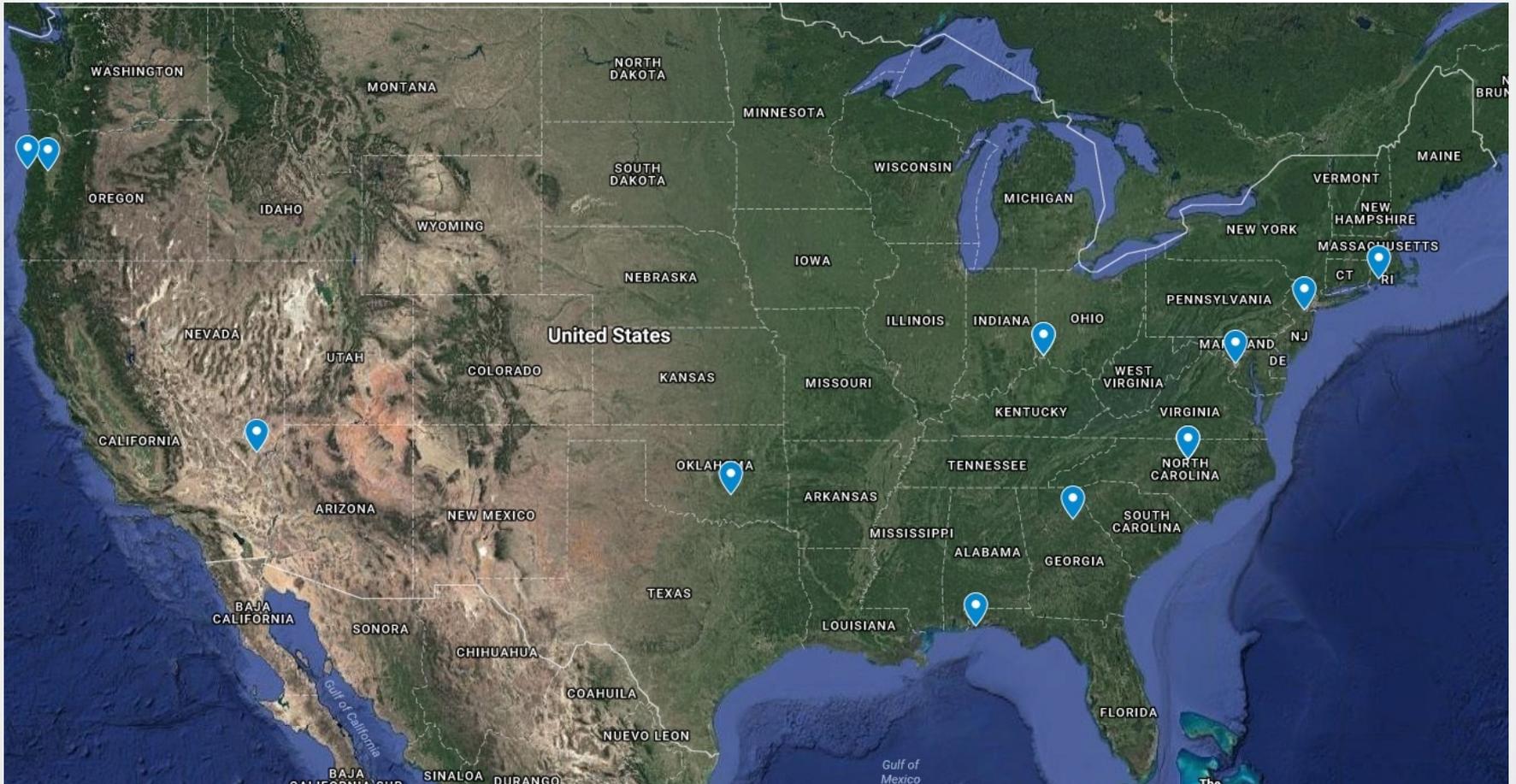
## **EPA Office of Research and Development (ORD)**

Develops knowledge, assessments, and scientific tools that form the underpinnings of the vast majority of EPA's protective standards and guidance.

- [ORD Research Programs](#)
- [National Risk Management Research Laboratory](#) (NRMRL)
- [National Health and Environmental Effects Research Laboratory](#) (NHEERL)
- [National Exposure Research Laboratory](#) (NERL)



# Office of Research and Development Laboratories





# Office of Research and Development National Research Programs



## GRIP: Sustainable and Healthy Communities Research, Water

### Topic: [100 Resilient Cities \(100RC\)](#)

- Opportunity to learn about the Rockefeller Foundation's 100 Resilient Cities program, the common resiliency issues in cities and help determine which EPA tools & methods could be used to address them.
- Duration: 6 - 12 months
- Location: ORD Safe & Healthy Communities National Research Program, Research Triangle Park, NC
- Contact: Gary Foley ([foley.gary@epa.gov](mailto:foley.gary@epa.gov))

DEFINING URBAN RESILIENCE

Resilience is about **surviving and thriving**, regardless of the challenge.

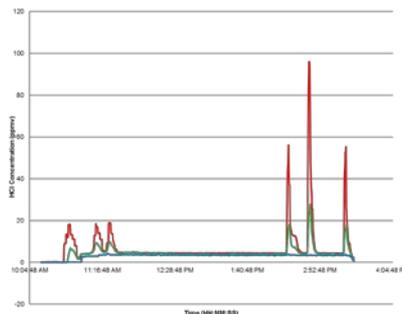


# National Risk Management Research Laboratory (NRMRL)

North Carolina - Research Triangle Park, Durham  
Ohio - Cincinnati

## Topic: Fundamental UV/IR Reference Spectra Analysis and Evaluation

- Work with EPA researchers to apply high resolution FTIR and UV spectrometer systems for combustion emissions measurements with a focus on an improved understanding of reference spectra.
- Duration: 6-12 months
- Location: NRMRL, Research Triangle Park, NC
- Contact: Jeff Ryan ([ryan.jeff@epa.gov](mailto:ryan.jeff@epa.gov))





# GRIP: Air Research

## **Topic: Combining Measurements and Modeling to Better Understand Ammonia Air-Surface Exchange Processes**

- The research project is unique in that it will include both measurements and modeling, thereby offering a mix of opportunities for professional development. The candidate will interact with a broad group of scientists including atmospheric chemists, ecologists and meteorologists. This research effort directly supports the review of the secondary National Ambient Air Quality Standards (NAAQS) for oxides of nitrogen and sulfur and, as such, provides an opportunity to learn about the science/policy interface between EPA's Office of Research and Development and the Program Offices that develop and implement the NAAQS.
- Duration: 12 months
- Location: NRMRL, Durham, NC
- Contact: John Walker ([walker.johnt@epa.gov](mailto:walker.johnt@epa.gov))



### **Topic: Development of an Innovative Measurement Method for Carbonyls in Air**

- Opportunity to gain experience with air pollution sampling methods, analytical method development and with operation of state-of-the-art analytical instrumentation. The student will have numerous opportunities to network with EPA researchers and to participate in collaborative EPA research projects. The student will be able to present their research in scientific conferences and will gain experience with producing peer-reviewed publications.
- Duration: 6-12 months
- Location: NRMRL, Research Triangle Park, NC
- Contact: Ingrid George ([George.Ingrid@epa.gov](mailto:George.Ingrid@epa.gov))



## **Topic: Particulate Matter and Black Carbon Emissions Inventories and Measurement Techniques**

- Opportunity to work with knowledgeable and accomplished EPA ORD researchers to gain a better understanding of global particulate emissions as well as cutting edge measurement technologies for black carbon. In addition to knowledge gained, the intern would have the opportunity to network with researchers and policy makers and would have the option to participate in other leadership training organizations (EPA RTP Chapter of NLTO, the Networking and Leadership Training Organization) available onsite.
- Duration: 12 months
- Location: NRMRL, Research Triangle Park, NC
- Contact: Tiffany Yelverton ([yelverton.tiffany@epa.gov](mailto:yelverton.tiffany@epa.gov))



### **Topic: Black Carbon Emissions from Residential Combustion in Arctic Nations**

- Any potential climate impacts associated with these residential combustion technologies is not well understood. This is an opportunity to work with EPA engineers and scientists and examine the literature to identify key Black Carbon sector-related information that can help design the database structure. Develop knowledge about critical technology information and the important conditions and variables necessary to design impactful and relevant laboratory testing of residential biomass combustion devices.
- Duration: 12 months
- Location: NRMRL, Research Triangle Park, NC
- Contact: Carlos Nunez ([nunez.carlos@epa.gov](mailto:nunez.carlos@epa.gov))



### **Topic: Quantifying Greenhouse Gas Emissions from Water Impoundments**

- Opportunity to gain experience working with a team, identifying research questions, interpreting environmental data, and communicating research results to scientists, stakeholders and policy makers. The student will also gain exposure to multiple research partners and work closely with colleagues at the EPA, USGS, Army Corps of Engineers and multiple universities.
- Duration: 3 - 12 months
- Location: NRMRL, Cincinnati, OH
- Contact: Jake Beaulieu ([beaulieu.jake@epa.gov](mailto:beaulieu.jake@epa.gov))



## **Topic: Research and Technology Transfer on Groundwater Quality and Remediation**

**Multiple opportunities for research and technology transfer on groundwater quality, remediation of superfund sites, and nutrient cycling. Opportunities can be tailored to fit the intern's interests and background. Examples include: 1) indirect wastewater discharge to floodplains and wetlands; 2) use of decision support systems to improve agricultural water quality; 3) testing of innovative technologies for groundwater remediation; 4) nanomaterials fate and transport in the environment; 5) contaminants of emerging concern in groundwater; 6) green infrastructure and groundwater quality.**

- **Duration: 6 -12 months**
- **Location: NRMRL, Research Triangle Park, NC**
- **Contact: Richard Lowrance ([lowrance.Richard@epa.gov](mailto:lowrance.Richard@epa.gov))**



# National Health and Environmental Effects Research Laboratory (NHEERL)

Florida - Gulf Breeze

Georgia – Athens

North Carolina - Research Triangle Park

Oregon – Corvallis, Newport

Rhode Island - Narragansett

## Topic: Development of an Innovative Mobile App for Assessing Honey Bee Colony Health by Citizen Scientists

Key project elements and workflow.



- Opportunity to **(1)** work with an interagency and cross-disciplinary team to design and build a smartphone application for data collection, storage and retrieval, **(2)** establish a valuable network of professional partners, and **(3)** acquire the skills necessary to communicate with diverse audiences.
- Duration: 4 - 12 months
- Location: NHEERL, Research Triangle Park, NC
- Contact: David Lehmann ([lehmann.david@epa.gov](mailto:lehmann.david@epa.gov))

## Topic: Development and Application of Methods for Assessing Immunocompetence in Bees

Hands-on experience working with bees in the laboratory.

1) Challenging the bee immune system by microinjecting bacteria into the hemolymph.



2) Monitoring the effects of pesticide exposure on bee development in the laboratory.



- Opportunity to **(1)** work with an interagency project team of scientists to develop experimental assay protocols, **(2)** learn the essential skills to design scientifically defensible experiments, **(3)** establish a valuable network of professional partners, and **(4)** acquire the skills necessary to communicate with diverse audiences.
- Duration: 4 - 12 months
- Location: NHEERL, Research Triangle Park, NC
- Contact: David Lehmann ([lehmann.david@epa.gov](mailto:lehmann.david@epa.gov))



# GRIP: Safer Chemicals Research

## Topic: Identifying Neurophysiological Signatures of Neurotoxicant Action

- Opportunity to: 1) Apply computational approaches to a 1000+ compound dataset for effects on network neurophysiology; 2) join a multidisciplinary team including biologists, toxicologists, mathematicians and data scientists; 3) learn data analysis approaches, database analysis and management, and use of programming languages such as R; 4) design experiments to confirm computational models; 5) Serve as an author or co-author on published work.
- Duration: 3 - 12 months
- Location: NHEERL, Research Triangle Park, NC
- Contact: Tim Shafer ([shafer.tim@epa.gov](mailto:shafer.tim@epa.gov))



## GRIP: Water Research

### Topic: Development of Gene Centric Modeling for Nutrient Cycling

- Opportunity to be actively involved with a research group applying state-of-the-art molecular approaches in microbial ecology and biogeochemical methods to model aquatic ecosystems. The NHEERL Gulf Ecology Division is a multidisciplinary research facility focusing on coastal ecosystems and ecosystem services. The student will gain insights into how basic research is further developed to provide the information and predictive tools used by governmental agencies to make decisions that safeguard the environment and human health.
- Duration: 12 months
- Location: NHEERL, Gulf Breeze, FL
- Contact: John Rogers ([rogers.johne@epa.gov](mailto:rogers.johne@epa.gov))



# GRIP: Water Research

## Topic: Use Multidisciplinary Science to Develop Coral Reef Biocriteria Protective of Biological Communities & Final Ecosystem Goods & Services

- Opportunity to work with a scientific team on basic research translated into applied research problems to better inform decision-makers. Unique professional growth experiences will teach how basic research is developed to provide the information & predictive tools used by governmental agencies to make decisions that safeguard clean water, environment integrity & human health. Work at the Gulf Ecology Division on the Gulf of Mexico on research which focuses on coastal ecosystems and ecosystem services. The student will work with research partners across different program and regional offices of EPA, NOAA, USGS, NPS & multiple universities.
- Duration: 6-12 months, can be intermittent & tailored to fit student's schedule
- Location: NHEERL, Gulf Breeze, FL
- Contact: Debbie Santavy ([santavy.debbie@epa.gov](mailto:santavy.debbie@epa.gov))





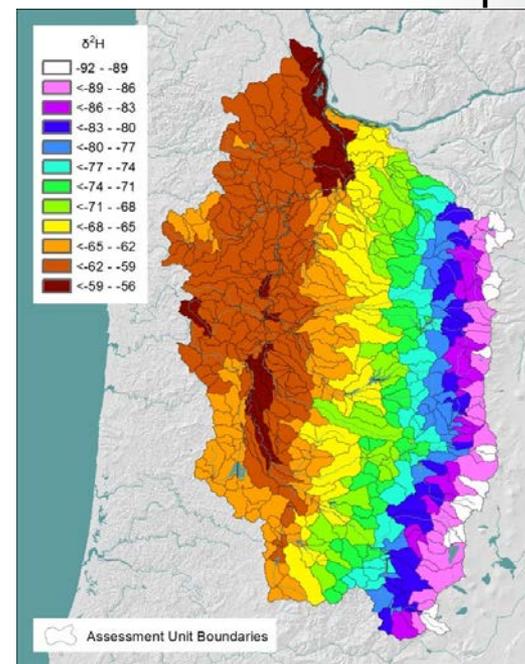
## **Topic: Drivers and Impacts of Coastal Acidification in Pacific Northwest Estuaries**

- Opportunities include being a member of diverse research team working on coastal acidification and mentoring on how science can be used to inform management decisions. Depending upon the intern project, training opportunities may include training on state-of-the-art carbonate chemistry measuring systems and conducting mesocosm experiments. This intern will be at Hatfield Marine Science Center (HMSC), which is a consortium of university, federal and state agencies. The HMSC community provides many professional development opportunities, including seminar series, training and volunteer opportunities, and the ability to interact with diverse research and management community.
- Duration: 3 - 12 months
- Location: NHEERL, Newport, OR
- Contact: Cheryl Brown ([brown.cheryl@epa.gov](mailto:brown.cheryl@epa.gov))

## Topic: Using Water Isotopes to Determine Flow Sources and Test How Landscape Characteristics Inform the Hydrologic Behavior of the Columbia River

1. Apply stable isotope techniques to characterizing landscapes, water flow, climate change, and environmental changes.
  2. Link isotopes and hydrologic landscape classification
  3. Learn with scientists analyzing and interpreting stable isotopes, and developing HLs and other spatial databases on surface water attributes (StreamCat and LakeCat, Hill et al. 2016).
- Duration: 3 -12 months
  - Location: NHEERL, Corvallis, OR
  - Contact: J. Renee Brooks ([brooks.reneej@epa.gov](mailto:brooks.reneej@epa.gov))

Willamette Basin Isoscape





# GRIP: Ecosystems Research

## Topic: Ecosystem Services -- Translating Data to Information

- Opportunity to work with a team of natural and social scientists on the cutting edge of linking changes in ecosystems to changes in human well-being.
- Duration: 6 -12 months
- Location: NHEERL, Corvallis, OR
- Contact: Paul Ringold ([ringold.paul@epa.gov](mailto:ringold.paul@epa.gov))



## GRIP: Atlantic Ecology Division

### **Topic: Linking short-term responses to ecologically-relevant outcomes**

- Opportunity to participate in the conduct of collaborative integrative lab, field and modelling efforts to characterize molecular-to-organismal level responses and make quantitative testable predictions of population level outcomes from exposures to chemicals and other stressors.
- Duration: 12 months
- Location: NHEERL, Narragansett, RI
- Contact: Diane Nacci([Nacci.diane@epa.gov](mailto:Nacci.diane@epa.gov))

### **Topic:** Assessing nutrient attenuation benefits of alternative restoration methods at former cranberry farms in Cape Cod, MA

- Project description: Collapsing cranberry prices, out-of-state competition, and an aging cohort of farmers are leading to a wave of farm retirements and opportunities for wetland restoration.
- EPA scientists are working with landowners, farmers, managers, academicians, and NGO's in developing restoration approaches that provide nitrogen attenuation, and subsequently improve water quality to meet total maximum daily load (TMDL) requirements.
- Large-scale stable isotope tracer experiments, mass balance modeling, and mechanistic studies to understand underlying bacterial rates and processes to attenuate nitrogen loads are proposed.
- Duration: 6 – 12 months
- Location: NHEERL, Narragansett, RI
- Contact: Cathleen Wigand, PhD

([wigand.cathleen@epa.gov](mailto:wigand.cathleen@epa.gov); 401-782-3090)





## **Topic:** Water– Spatial Statistical Network Modeling

- Training opportunity to learn how to develop and apply spatial statistical network models for stream/river temperature in the Northeast.
- Duration: 3-12 months
- Location: NHEERL, Narragansett, RI
- Contact: Naomi Detenbeck ([detenbeck.naomi@epa.gov](mailto:detenbeck.naomi@epa.gov))



### **Topic: Using Zebrafish to Detect Developmentally Neurotoxic Chemicals Research**

- This internship will use a cutting-edge laboratory model, the zebrafish, to assess the variables that affect zebrafish larval behavior and develop new tests that assess nervous system function.
- Duration: 3-12 months
- Location: NHEERL, Narragansett, RI
- Contact: Stephanie Padilla ([padilla.stephanie@epa.gov](mailto:padilla.stephanie@epa.gov))



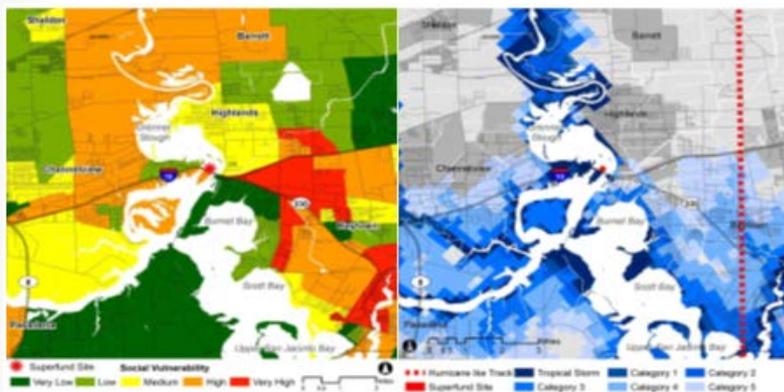
# National Exposure Research Laboratory (NERL)

Nevada - Las Vegas

North Carolina - Research Triangle Park, Durham

Ohio - Cincinnati

## Topic: Flood Induced Contaminants Fate and Transport and Exposure Risks in Vulnerable Communities



An example above shows community vulnerabilities 20 miles east of downtown Houston, TX in flood-prone areas sorted by socioeconomic status (left) and surge inundation zones (right) near the San Jacinto River Waste Pit site in Harris County (Brody et al., 2014.)

- Duration: 12 months
- Location: NERL, Research Triangle Park, NC
- Contact: Pai-Yei Whung ([whung.pai-yei@epa.gov](mailto:whung.pai-yei@epa.gov))

- The graduate research intern will be able to work with EPA EnviroAtlas, floodplain map, couple contaminant sites, source models, hydrology (soil) models and human exposure models.
- This internship provides the graduate a professional experience to understand how environmental science can be used for public health decision making
- This research opportunity takes a system approach to focus on environmental fate/transport of regulated or emerging contaminants due to flood (drought) and its far-field exposures.
- The research results can be submitted for peer-review publications.
- The results could be applied to contaminant clean-up guidelines for vulnerable communities.



# GRIP: Sustainable and Healthy Communities

## Topic: Urban remote sensing

- Use remote sensing to map land cover and analyze urban landscapes at high spatial resolution (1 m pixels) for applications in human and ecosystem health.
- Key words: remote sensing, mapping, GIS, space and aircraft imagery, lidar, math, algorithms, cloud computing, information extraction, geospatial big data, human and ecosystem health.
- Duration: 6-12 months
- Location: NERL, Sensing and Spatial Analysis Branch, Research Triangle Park, NC
- Contact: Drew Pilant ([pilant.drew@epa.gov](mailto:pilant.drew@epa.gov))





## GRIP: Air Research

### Topic: Data Integration and Assimilation for Forecasting Air Quality

- Gain access to current national air monitoring data bases and high speed computing equipment to allow the development of novel models to better predict air pollution across the contiguous U.S.
- Duration: 12 months
- Location: NERL, Research Triangle Park, NC
- Contact: Vasu Kilaru ( [kilaru.vasu@epa.gov](mailto:kilaru.vasu@epa.gov) )

## Topic: Satellite Water Quality Monitoring

- The candidate will have fun working with a team (see photo) focused on providing satellite information to the public and managers. A collaborative effort integrates the work of EPA, NASA, NOAA, and USGS to provide an approach for using satellite ocean color capabilities in U.S. fresh and brackish water quality management decisions. There is plenty of flexibility to develop fresh ideas of interest to the candidate.
- Duration: 12 months
- Location: NERL, Research Triangle Park, NC or Cincinnati, OH
- Contact: Blake Schaeffer ([schaeffer.blake@epa.gov](mailto:schaeffer.blake@epa.gov))





# GRIP: Water Research

## Topic: Data Analysis of Sequences and qPCR for Microbial Communities during Algal Blooms

- Student will learn microbial community structures and functions during algal blooms, engage with a multidisciplinary research team to apply bioinformatics, explore novel functional genes/gene clusters from transcriptomic sequences, explore toxin and toxin producing gene qPCR, conduct validation experiments.
- Duration: 12 months
- Location: NERL, Cincinnati, OH
- Contact: Jingrang Lu ([lu.jingrang@epa.gov](mailto:lu.jingrang@epa.gov))





## GRIP: Air Research

### **Topic: Smartphone App to Predict Air Pollution Exposure**

- The intern will collaborate with leading air pollution scientists as part of a research team. The intern will learn about the science of air pollution exposure modeling and its real-world application for reducing people's exposure. Finally, the intern will have the opportunity to develop and co-author scientific presentations and peer-reviewed publications.
- Duration: 12 months
- Location: NERL, Research Triangle Park, NC
- Contact: Michael Breen ([breen.michael@epa.gov](mailto:breen.michael@epa.gov))

## Topic: Performance Evaluation of Low-Cost Air Quality Sensors

- Opportunity to work on cutting-edge research in air quality sensors. Gain first-hand experience in the use of a new, novel, low-cost air quality sensors and provide essential insight into methods for collecting robust data to support future community based air monitoring.
- Duration: 6-12 months
- Location: NERL, Research Triangle Park, NC



Example of sensors being tested in triplicate

Contact: Andrea Clements  
([clements.andrea@epa.gov](mailto:clements.andrea@epa.gov))



# GRIP: Health Research

## Topic: Science Communication: Importance of Complex Computational Models for Evaluating Impacts of Environmental Contaminants on Health Outcomes

- As the pace and complexity of emerging science increases, there is a critical need for clear, accessible communication of this science both within the research community and so that policy and decision makers can understand and act on state-of-the-art information. This internship offers an opportunity for developing and demonstrating skills in science translation to foster uptake by researchers in the wider scientific community as well as to inform public and private sector policies and decisions on potential risk and public health. The intern will have the opportunity to publish articles in scientific magazines.
- Duration: 3 - 12 months
- Location: NERL, Research Triangle Park, NC
- Contact: Elaine Cohen Hubal ([hubal.elaine@epa.gov](mailto:hubal.elaine@epa.gov))



# GRIP: Safer Chemicals Research

## **Topic: Liquid Chromatography- Quadrupole Time of Flight Mass Spectrometry**

- The participant will increase knowledge and skills in the use of liquid chromatography/mass spectrometry (QTOF and TOF), develop non-targeted analysis skills, learn new computational approaches, and fine tune scientific writing.
- Duration: 12 months
- Location: NERL, Research Triangle Park, NC
- Contact: Elin Ulrich ([ulrich.elin@epa.gov](mailto:ulrich.elin@epa.gov)) or Mark Strynar ([strynar.mark@epa.gov](mailto:strynar.mark@epa.gov))



# GRIP: Other - Epidemiology Research

## **Topic: Assessing the Benefits of the Natural Environment to Individual Well-being**

- Engage in cutting-edge research in advanced quantitative analysis of environmental health data, as well as applied research that will inform better decision-making in regards to protection of the natural environment, ecosystem services and public health.
- Duration: 12 months
- Location: NERL, Research Triangle Park, NC
- Contact: Kim Rogers ([rogers.kim@epa.gov](mailto:rogers.kim@epa.gov))



# GRIP: Other - Environmental Geophysics Research

## Topic: Environmental Geophysics Research and Development

- Engage in a range of projects involving applications of geophysical methods to subsurface processes including:
  - Contaminant fate & transport
  - Remediation monitoring
  - Landfill moisture mapping
  - Groundwater – surface water interactions
  - Green Infrastructure recharge monitoring
- Projects include the use of current field geophysical equipment, software, data processing, and analysis.
- Duration: 6-12 months
- Location: NERL, Las Vegas, NV
- Contact: Dale Werkema ([werkema.d@epa.gov](mailto:werkema.d@epa.gov))



# GRIP: Ecosystems Research

## **Topic: Quantifying the Consequences of Spatio-temporal Dynamics of Mangroves Forests in the Provision of Ecosystem Goods and Services**

- Mangrove forests provide important ecosystem goods and services to the world's dense coastal population and support important functions of the biosphere. The forests are under threat from both natural (e.g. typhoons, sea level rise) and anthropogenic forces (rapid economic development, population growth). The loss of these ecosystems can lead to the loss of critical functions of mangroves including coastal protection, carbon sequestration and biodiversity—thus threatening the resiliency and vitality of coastal social-ecological systems.
- Duration: 12 months
- Location: NERL, Research Triangle Park, NC
- Contact: Chandra Giri, ([giri.Chandra@epa.gov](mailto:giri.Chandra@epa.gov))



## Additional Information

- Please check the EPA web page for updated opportunities.

<https://www.epa.gov/research-fellowships/graduate-research-internship-program-grip-opportunities-epa>

- NSF GRIP information is available at:

[https://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=505127](https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505127)

- NSF GRIP e-mail address: [grip@nsf.gov](mailto:grip@nsf.gov)



## Final Questions?

Please check the web page for any updates

### [EPA GRIP Opportunities for NSF Graduate Research Fellows](#)

EPA program lead: [Michaud.jayne@epa.gov](mailto:Michaud.jayne@epa.gov)



## Meeting Post Script

**As stated during the webinar, EPA will continue to update the web page with new internship opportunities for eligible NSF Graduate Research Fellows.**

**A new opportunity was posted under “water research:**

**<https://www.epa.gov/research-fellowships/research-and-technology-transfer-groundwater-quality-and-remediation>**

**Contact: Richard Lowrance ([Lowrance.Richard@epa.gov](mailto:Lowrance.Richard@epa.gov))**

**In addition, a potential project pertaining to nutrient pollution was mentioned during the discussion. Contact: Denice Shaw ([shaw.denice@epa.gov](mailto:shaw.denice@epa.gov))**