SREL Wildlife Research in Par Pond and Lower Three Runs Creek: Studies of the Past Decade

Presentation for SRS CAB

November 14, 2022

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Savannah River Ecology Laboratory
UNIVERSITY OF GEORGIA

SREL's Mission:

"To enhance our understanding of the environment by acquiring and communicating knowledge that contributes to sound environmental stewardship."

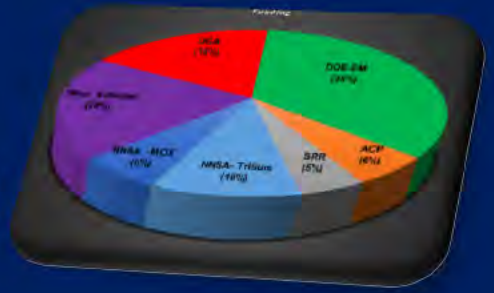
"To provide the public with an independent evaluation of the ecological effects of SRS operations on the environment"

- An interdisciplinary program of field and laboratory **Research** conducted largely on the SRS and published in the peer-reviewed scientific literature
- **Education** and research training for undergraduate and graduate students
- **Service** to the community through environmental outreach activities

SREL's Value Proposition to DOE

SREL is a significant scientific asset to the DOE and its contractors on the SRS

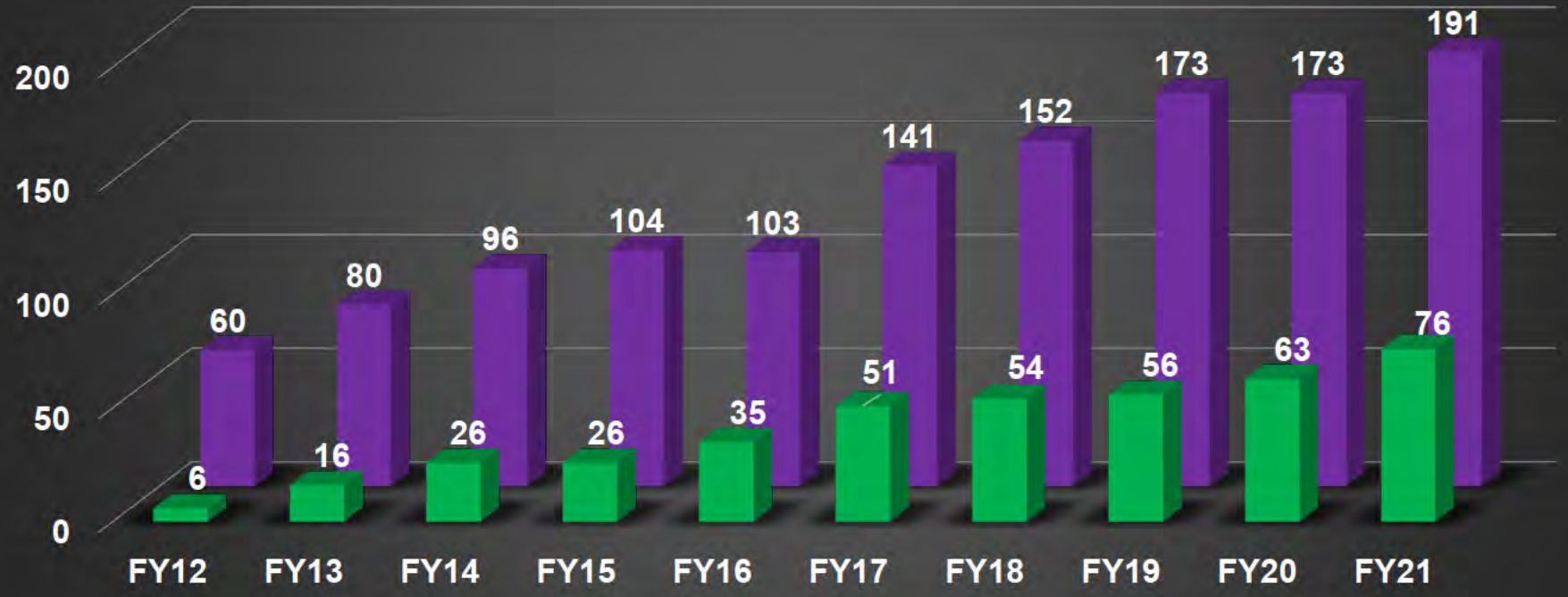
SREL is a good investment by DOE on the SRS



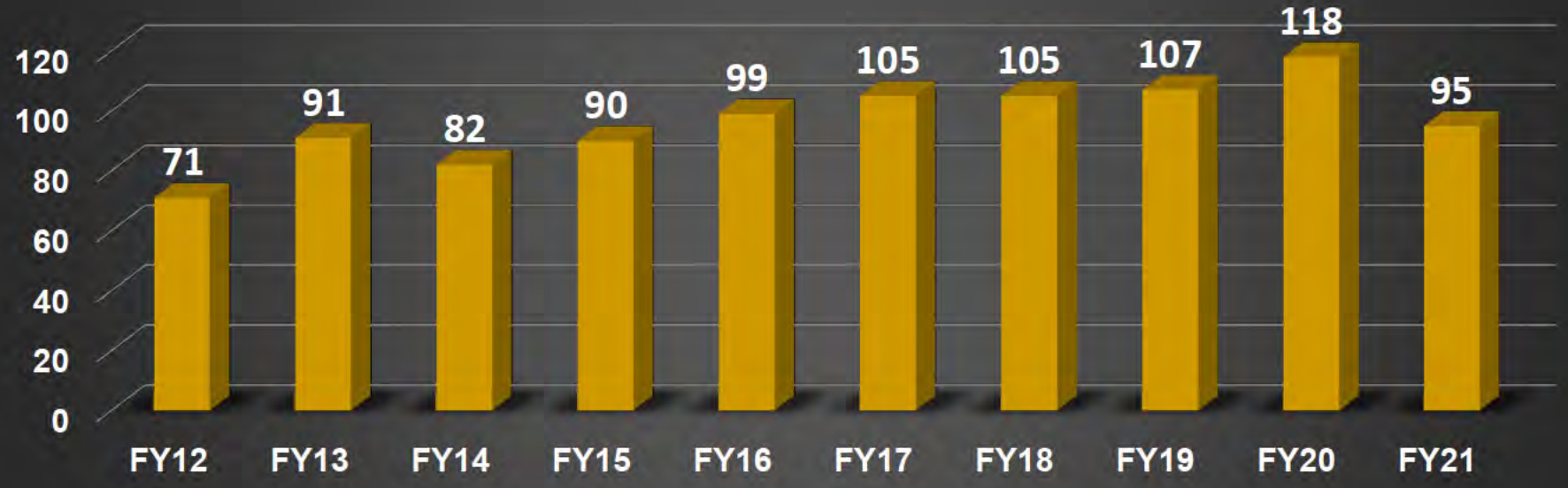
SREL's outreach program builds public trust in local communities

SREL's education programs fill gaps in critical scientific expertise for SRS and the nation

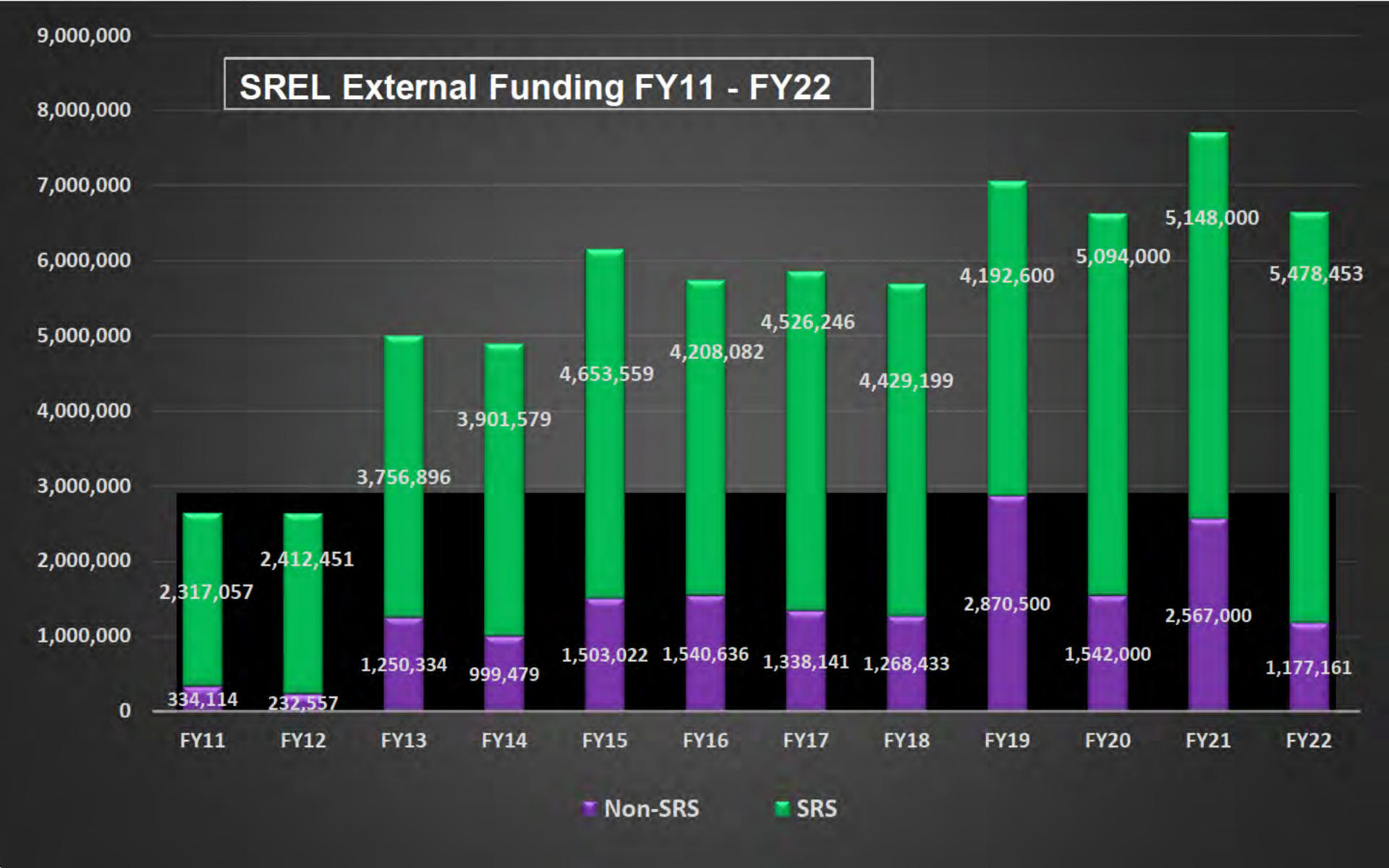
Workforce w/Grad Students



Publications



963 publications in the past decade


SREL External Funding FY11 - FY22
9,000,000
8,000,000
7,000,000
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
2,317,057
2,412,451
3,756,896
3,901,579
4,653,559
4,208,082
4,526,246
4,429,199
4,192,600
5,094,000
5,148,000
5,478,453
334,114
232,557
1,250,334
999,479
1,503,022
1,540,636
1,338,141
1,268,433
2,870,500
1,542,000
2,567,000
1,177,161
FY11
FY12
FY13
FY14
FY15
FY16
FY17
FY18
FY19
FY20
FY21
FY22
Non-SRS
SRS

Funding Sources FY22

DOE EM

DOE NNSA

UGA

NSF

Dept. of Interior

USDA APHIS

USDA Forest Service

USDA NRCS

Dept. of the Army

National Fish and Wildlife Foundation

Cooperative Ecosystem Studies Unit Piedmont

Animal Welfare Institute

Richmond County (GA)

Assorted University Subcontracts

Studies of Wildlife on SRS by SREL

- Decided to provide information on all wildlife research related to contaminants on the SRS for the past decade (201 -2021)
- I provide information relative to area of the site that the work occurred on
- I provide the species (or species group) and some information on the types of contaminants that were evaluated
- I pull out focal areas of studies that can be used as good examples of the types of research we conduct

201 2014 (13 Unique studies)

Species Studied

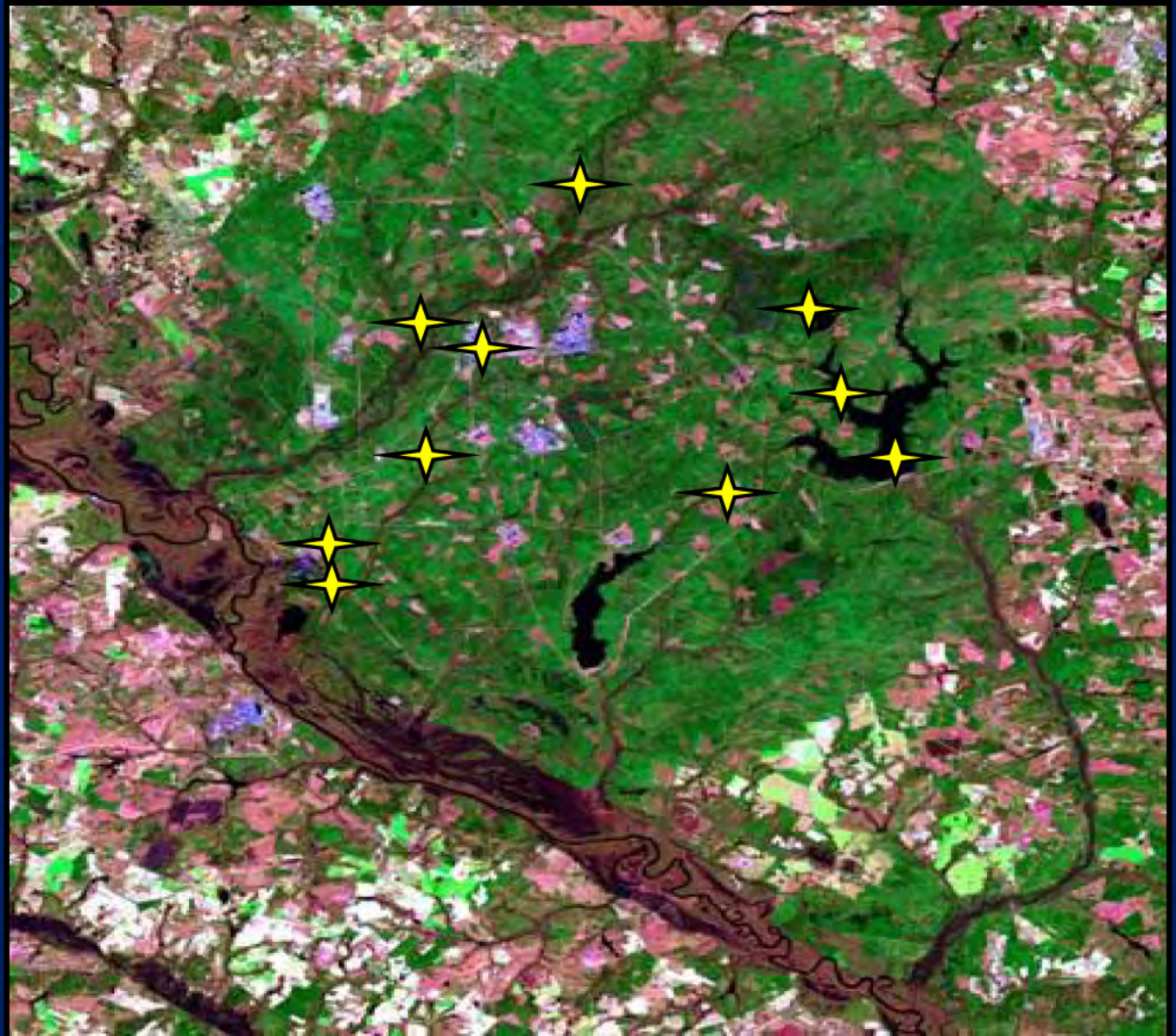
Alligators, Frogs, Toads, Salamanders, Fish, Invertebrates, Fresh Water Turtles, Waterfowl, Squirrels, Wild Pigs, Crayfish, Small Mammals, Raccoons, American Coots

Types of Contaminants

Heavy Metals, Mercury, Methylmercury, Radiocesium and Other Radionuclides, Trace Metals, Stannous Chloride

Areas of the Site

D Area, Tim's Branch, P Area, Steeds Pond, R Canal, Beaver Dam Creek, F Area, Par Pond, Fourmile Branch, Pond B, and SRS Wide



201 2017 (16 Unique Studies)

Species Studied

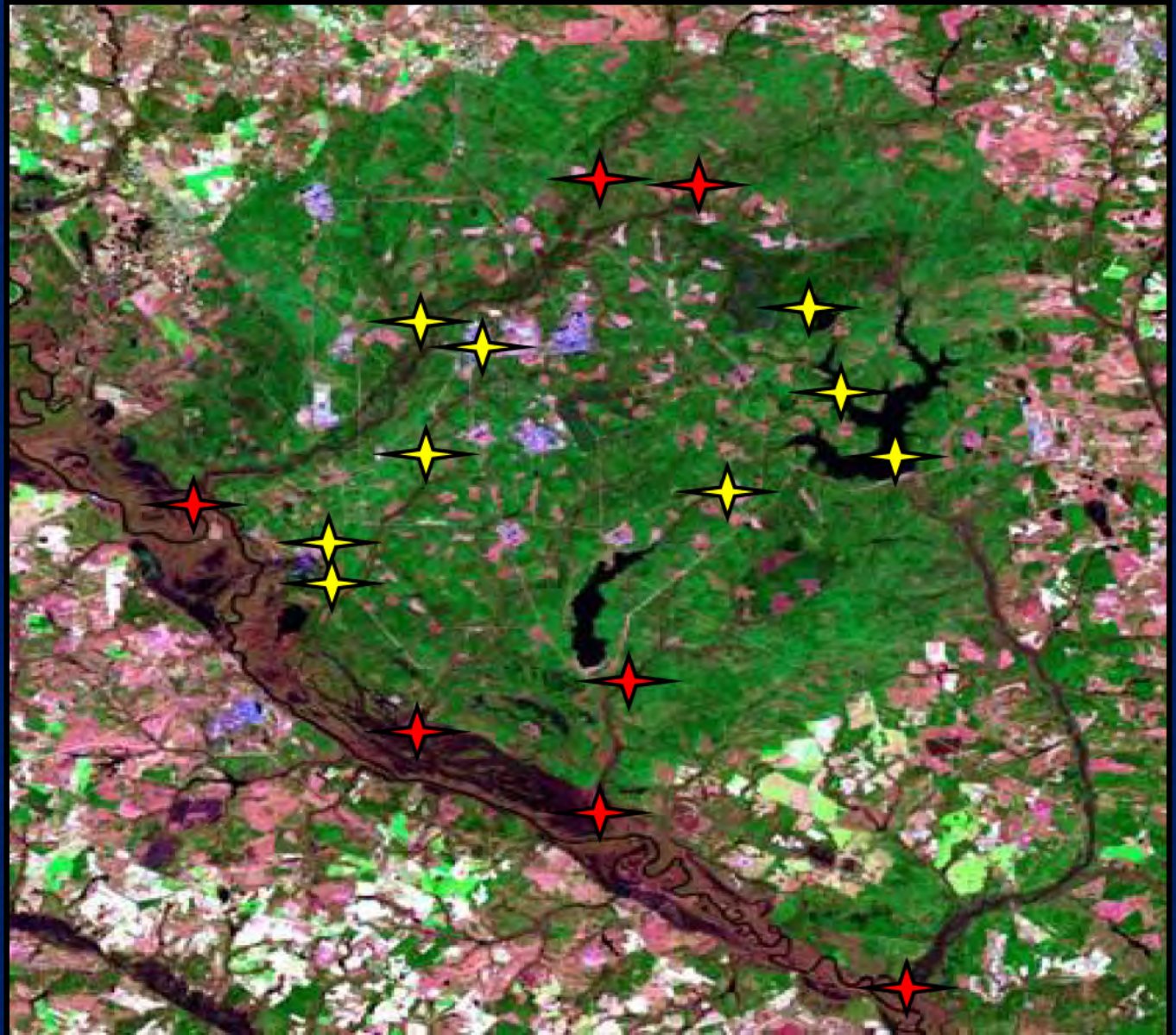
Small Mammals, Fish, Invertebrates, Wild Pigs, Raccoons, Insects, Frogs, Toads, Salamanders, Fresh Water Turtles, Waterfowl, Squirrels, American Coots, Sonbgbirds, Eastern Wild Turkeys, Beaver, River Otter, White-tailed Deer, Alligators

Types of Contaminants

Heavy Metals, Mercury, Methylmercury, Radiocesium and Other Radionuclides, Trace Metals

Areas of the Site

D Area, R Canal, Fourmile Branch, Pond A, Pond 2, Beaver Dam Creek, P Area, F Area, Par Pond, Pond B, Upper Three Runs Creek, Pen Branch, Savannah River, and SRS Wide



201 2021 (16 Unique Studies)

Species Studied

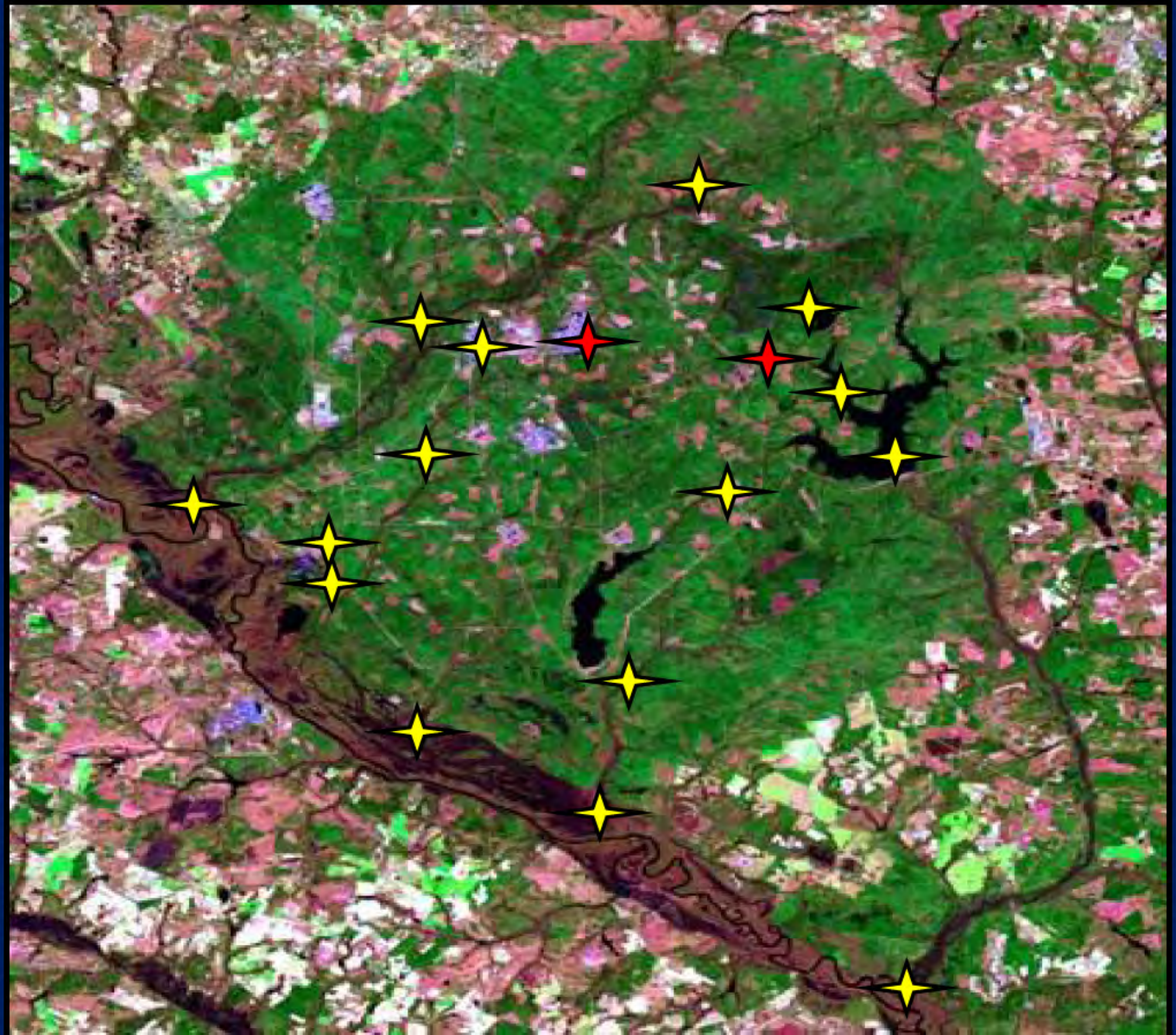
Watersnakes, Eastern Wild Turkeys, Wild Pigs, Beaver, Raccoon, River Otter, Fresh Water Turtles, Frogs, Toads, Salamanders, Fish, Waterfowl, Aquatic Invertebrates, Birds, White-tailed Deer, Alligators

Types of Contaminants

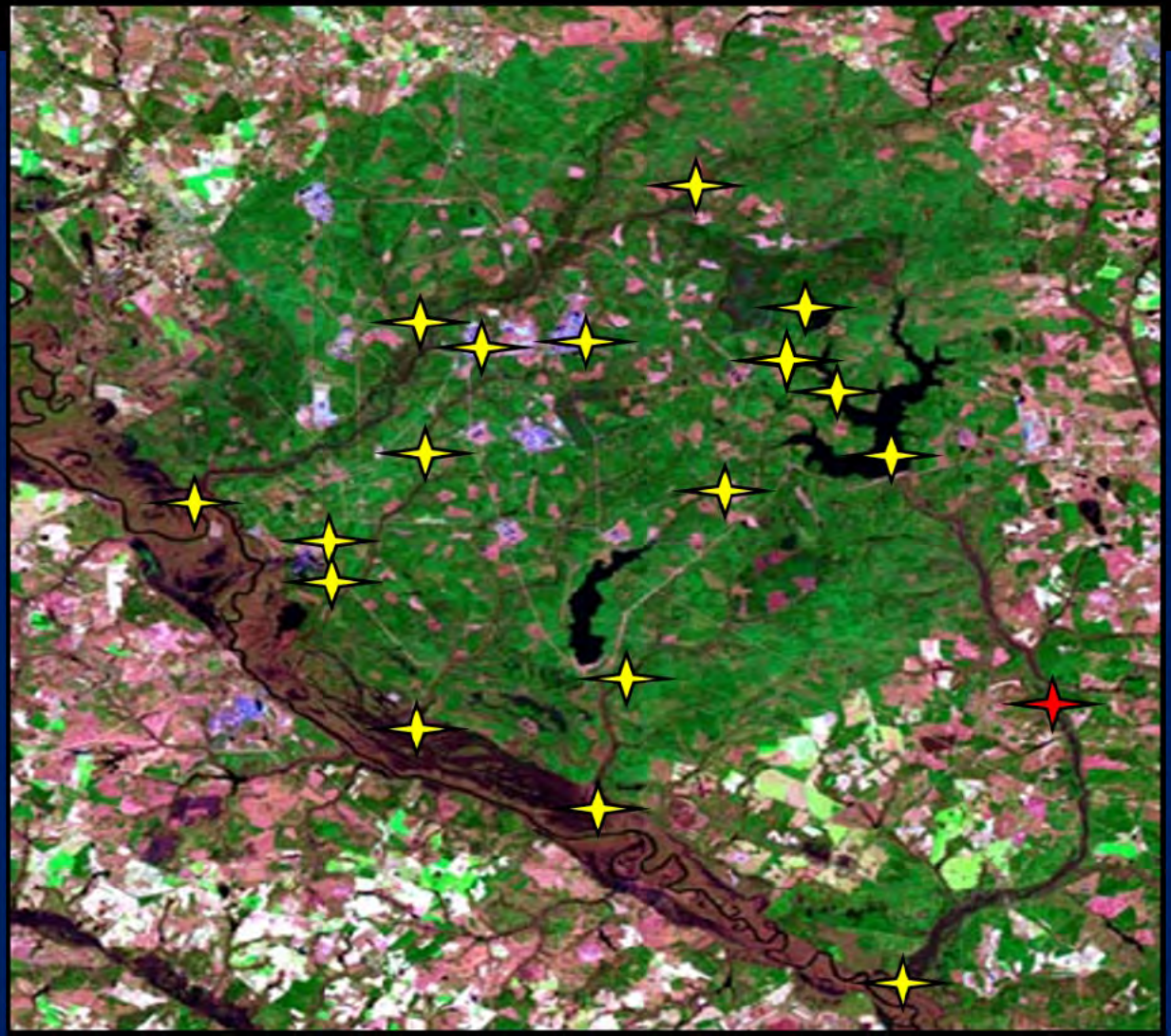
Heavy Metals, Mercury, Methylmercury, Radiocesium and Other Radionuclides, Trace Metals, Copper, Zinc, Consumption Risk

Areas of the Site

Savannah River, P Area, F Area, Fourmile Branch, Beaver Dam Creek, Par Pond, H Area, Joyce's Branch, and SRS Wide



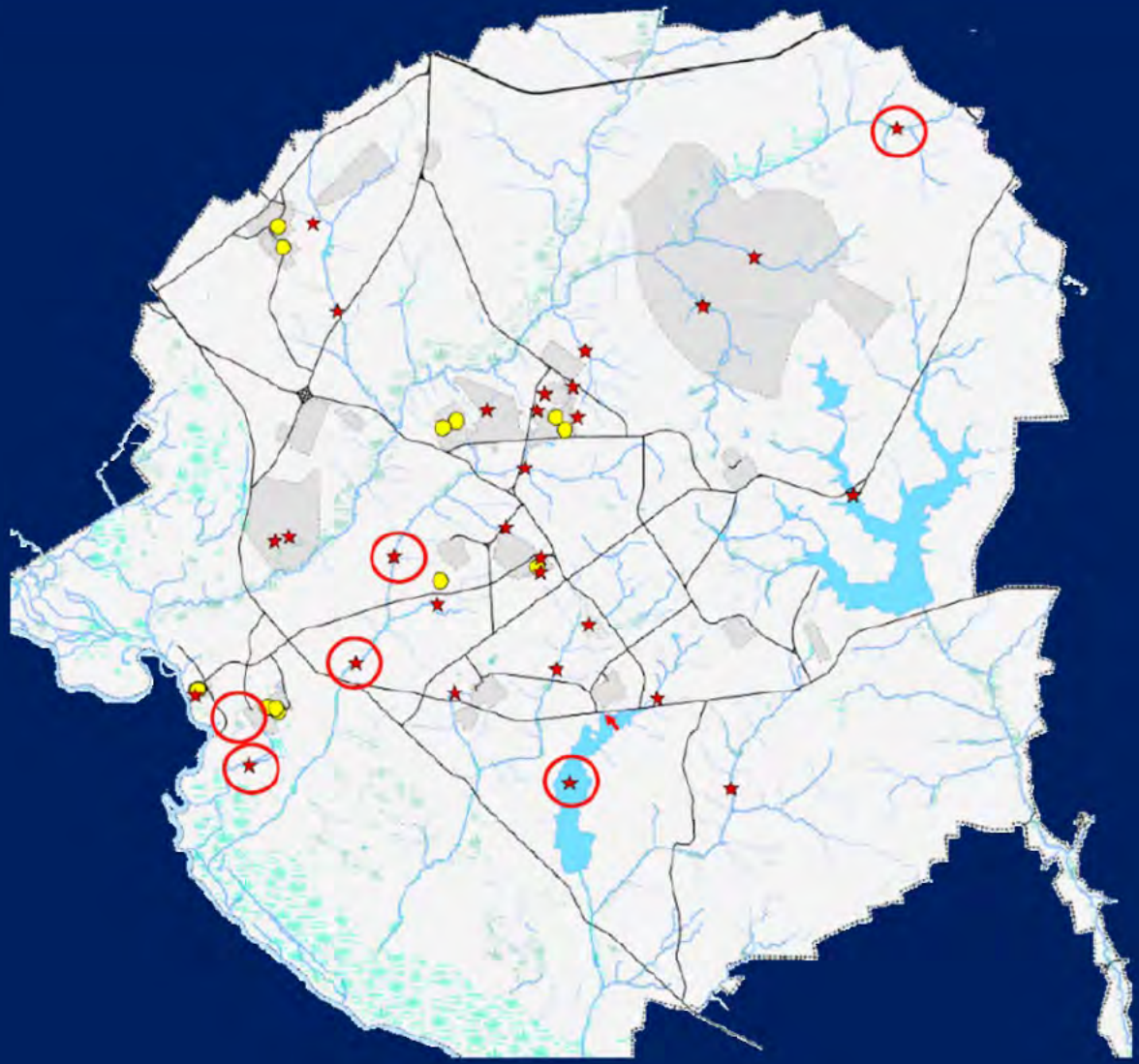
Important FY22 Addition



Example of Ongoing FY22 Studies that are Site Wide Across Multiple Integrator Operable Units (IOU's) on the SRS

This Sampling Map Indicates Ongoing Sampling for PFAS on SRS by SREL

Red Circles are Sampling Locations Shared Between Studies for PFAS, Aquatic Invertebrates, Fish, and Other Wildlife Species



A Few Important Facts

- The summary I just provided covers only those studies that assessed contaminants and wildlife on the SRS (hundreds of scientific publications)
- SREL also works on contaminants in the soil and water on the SRS as well as on contaminants in wildlife for locations off the SRS
- I did not include the research that has generated SREL's hundreds of publications on wildlife ecology, invasive species, disease ecology, and conservation both on the SRS and in other locations around the world

A Few More Important Facts

- SREL core funding is used to support the laboratory through partial support for salaries, operating expenses, and maintenance
- Most site related contaminant research comes from funding provided by NNSA or EM -Funded Area Closure Projects for specific work scope that is important to their mission and regulatory compliance
- When possible, SREL will take core funding and apply it toward research questions that we feel are important and which are being overlooked – For FY2 24 we are looking at PFAS using such funds

Species Selection

- SREL works on a wide diversity of species for a wide variety of reasons, these include:
  - Potential Consumption Risk

Potential Consumption Risk

Species Selection

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  - Ecological Receptors and Environmental Risk Assessment

Ecological Receptors and Environmental Risk Assessment

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  - Biomonitoring

Biomonitoring

Species Selection

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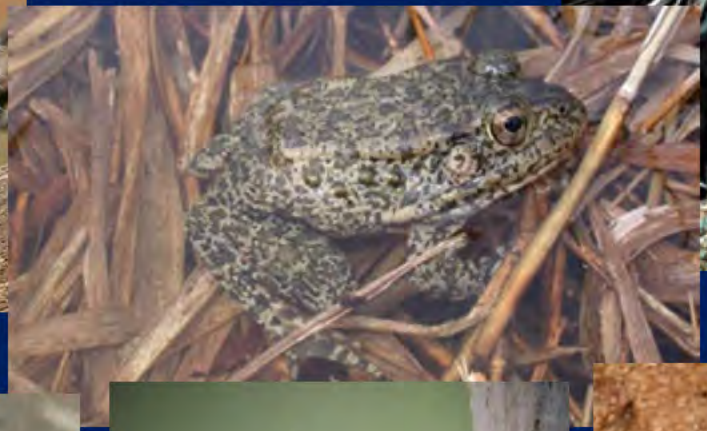
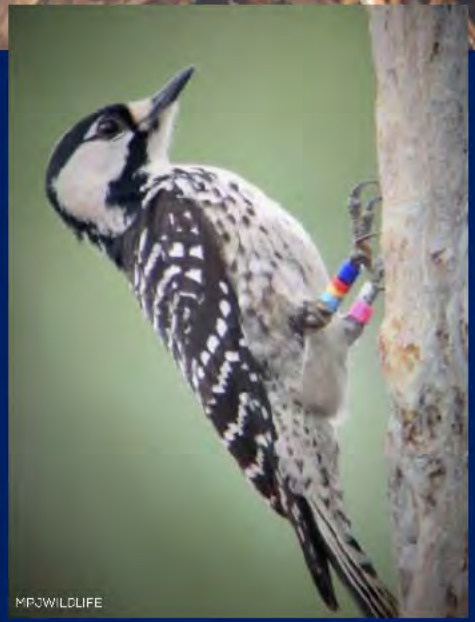
  - Environmental Stewardship

Environmental Stewardship





Species Selection

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  - Potential Consumption Risk
  - Ecological Receptors and Environmental Risk Assessment
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  - Environmental Stewardship
  - Human-Wildlife Conflict

Human-Wildlife Conflict

Species Selection

- SREL works on a wide diversity of species for a wide variety of reasons, these include:
  - Potential Consumption Risk
  - Ecological Receptors and Environmental Risk Assessment
  - Biomonitoring
  - Environmental Stewardship
  - Human-Wildlife Conflict
  - Mechanistic Understanding of Contaminant Effects

Mechanistic Understanding of Contaminant Effects

NERP Scholars Program - Background

- SREL Conducted an NSF-funded Research Experience for Undergraduates Program for 5 years (pre COVID) – focused on underrepresented populations in ecology and first generation college students in local HBCU's and colleges with high enrollments from underserved communities – highly successful and a number of these students went on to be MS students at SREL and other Schools
- I was asked to write a white paper on how housing for undergraduate interns and graduate students at SRS was tied to advancing environmental justice concerns
- I approached DOE EM about how to increase stability of SREL for the future while specifically addressing some of the environmental justice issues the SRS has in local communities – the NERP Scholars Program
- SREL has the experience, training, and motivation to run this unique program for DOE to address environmental justice issues in local communities around SRS and the program is a big step toward the long term stability of SREL on the SRS

NERP Scholars Program - Overview

- Unique Education Program Which Ties Directly to Communities Affected by Environmental Justice Issues of the SRS
- Undergraduate Experiential Learning for Students from Disadvantaged Populations in Communities Surrounding the SRS
- Path to Graduate School for Undergraduate Interns from Summer Experiential Learning Programs Conducted at SREL
- Recruitment from Local High Schools and Regional HBCU's
- Addresses Increasing Executive Branch Emphasis on Environmental Justice and Climate Change

Savannah River Ecology Laboratory