Presentation to the Savannah River Site Citizens Advisory Board

Savannah River Ecology Laboratory (SREL) FY18 Update

January 28, 2019

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Professor, University of Georgia (UGA)

The University of Georgia

Objectives

- **Savannah River Ecology Lab (SREL) Mission**
- **Staffing**
- **Funding and Work Scope**
- **Significant Events**
- **Advances**
- **Opportunities For Fiscal Year 2019**
- **Emerging Missions For Fiscal Year 2019**
- **Challenges for Fiscal Year 2019**

Consistent with the Facilities Disposition and Site Remediation Committee's 2019 Work Plan

Acronyms

ACP	Area Closure Project
DOE	Department of Energy
DOE-HQ	Department of Energy – Headquarters
DOE-SR	Department of Energy – Savannah River
ERDA	U.S. Energy Research and Development Administration
HVAC	Heating, Ventilation and Air Conditioning
NNSA	National Nuclear Security Administration
SREL	Savannah River Ecology Laboratory
SRNL	Savannah River National Laboratory
SRR	Savannah River Remediation
SRS	Savannah River Site
UGA	University of Georgia
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFS-SR	U.S. Forest Service – Savannah River

SREL History

1951 - Atomic Energy Commission (AEC) had concerns about environmental impacts resulting from Savannah River Site (SRS) construction and operations.

Dr. Eugene Odum

1951 to present – Funding from AEC, ERDA, and Department of Energy (DOE)

1954 – Established permanent lab on the SRS

1977 – Established current lab facilities

SREL's Mission:

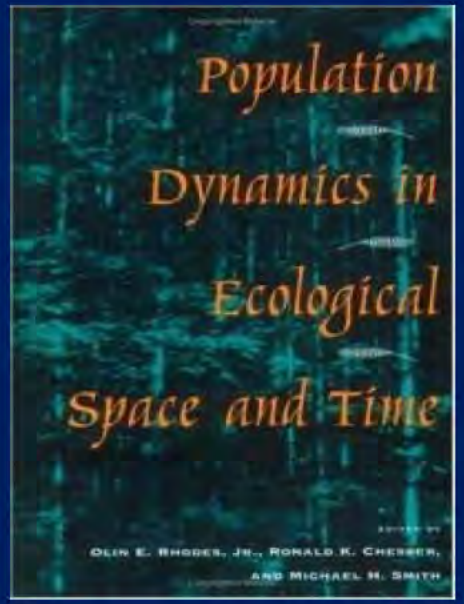
"To enhance our understanding of the environment by acquiring and communicating knowledge that contributes to sound environmental stewardship."

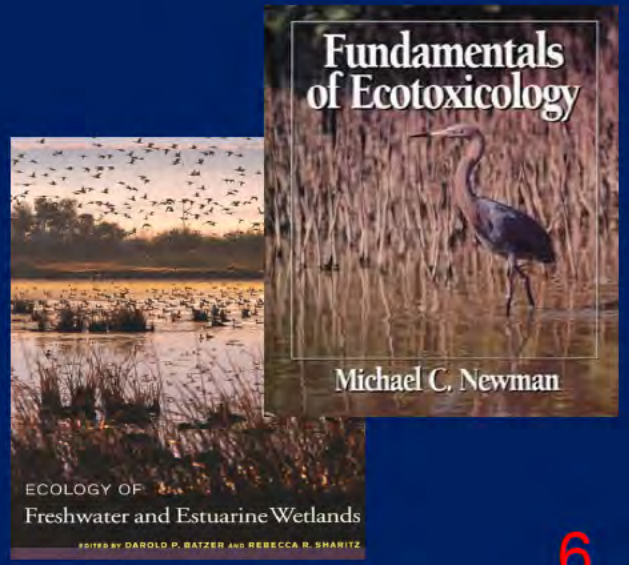
"To provide the public with an independent evaluation of the ecological effects of SRS operations on the environment"

- 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 Research Program's

- >**3490** peer-reviewed scientific publications to date
- **64** books





SREL Education Program

Education Programs

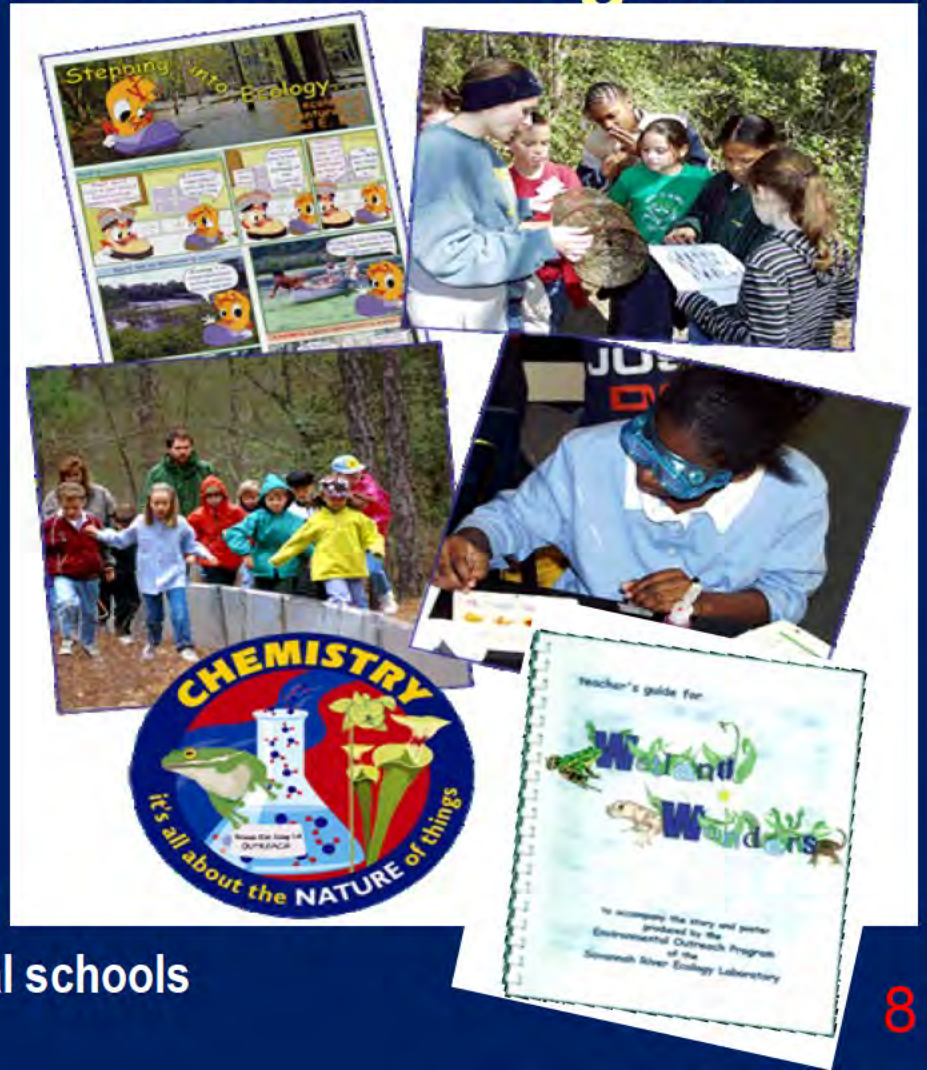
- >400 theses and dissertations
  - 198 M.S.
  - 223 Ph.D.
- SREL graduate students have received more than 125 awards
- Over 700 undergraduates representing all 50 states have participated in SREL-sponsored research to date

SREL Environmental Outreach Program

- Integrates SREL research into presentations for the general public
- Provides hands-on classroom and field experience for students
- Conducts educator workshops

In FY18, SREL reached ~ 68,300 people by providing :

- 414 talks
- 36 public tours
- 34 exhibits at local or regional events, and
- 34 "Ecologist for a Day" programs for local schools



SREL in FY18

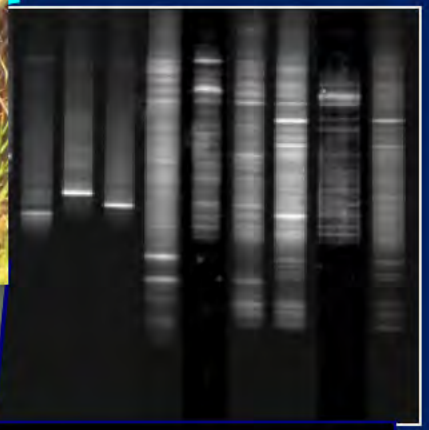
- **UGA Employees**
  - Research Faculty – 7
  - Tenure Track Faculty - 6
  - Post Docs – 5
  - Outreach - 7
  - Res. Professional - 14
  - Research Support - 32
  - Graduate Students - 54
  - Undergraduates - 8
  - Admin & Support - 19

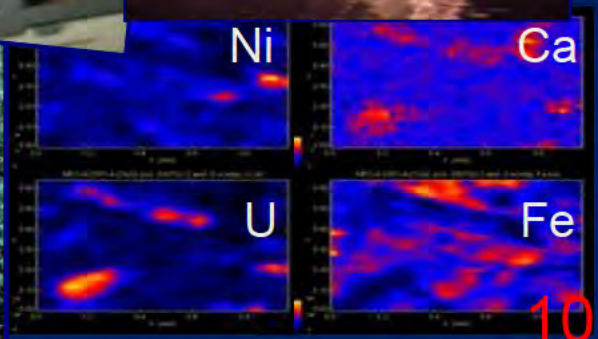
152 Staff & Students

- **Facilities & Research Areas**
  - A-Area (laboratories, equipment, offices, animal care, storage)
  - Par Pond (low-dose facility)
  - 30 DOE Set-Asides
  - 75 field research sites

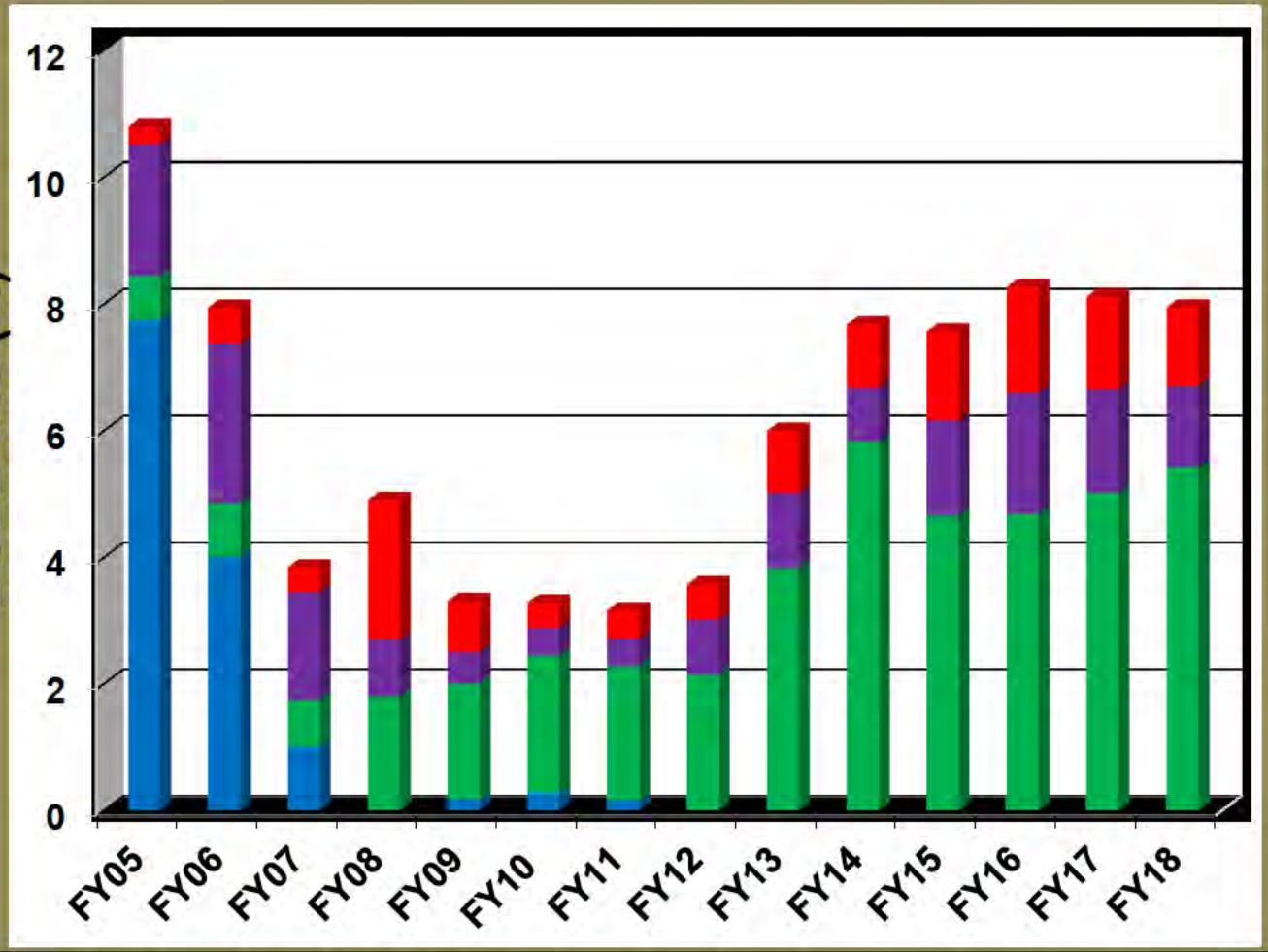
Disciplinary Expertise

- Aquatic and Terrestrial Ecology
- Geology / Soil Science
- Environmental Microbiology
- Epigenetics
- Molecular Genetics
- Environmental Chemistry
- Radioecology
- Ecotoxicology and Risk Assessment
- Wildlife Ecology
- Disease Ecology
- Plant Physiology
- Proteomics and Glycomics





Recent Funding History



Significant Events in FY18

UGA

- Allowed majority (66%) of the 34% Indirect Costs to be retained by SREL
- Cost-Shared 5 faculty positions with SREL
- Provided funding for equipment and personnel
- Cost-shared graduate student and postdoctoral positions

DOE / SRS / External

- Building, equipment, utilities, and site access
- Funding provided by Department of Energy – Savannah River (DOE-SR) under **5-year Cooperative Agreement**
- Funding provided by DOE – National Nuclear Security Administration (NNSA) for Mixed Oxide Fuel Fabrication Facility and Tritium related research
- Continued project funding from Area Closure Project (ACP) and Savannah River Remediation (SRR)
- 1.25 million in external funding from non-SRS sources leveraged

Advancements in FY18

1. Work scope:

Research Set-Asides, Site Use Permitting

- Enacted significant land management activities for set asides

Graduate and Undergraduate Education Programs

- Advised 54 graduate students and hosted 8 undergrads in ongoing NSF funded Research Experience for Undergraduates Program in Radioecology
- Hosted a total of over 87 graduate students conducting research on SRS
- Taught 19 courses on main UGA campus and 3 at SREL

General Public Outreach and Education Programs

- Conducted over 513 public outreach events reaching >68,000 people

Interdisciplinary Research

- Continuing collaborative research programs with Savannah River National Laboratory (SRNL), U.S. Forest Service–Savannah River (USFS-SR), Savannah River Remediation (SRR), UGA, U.S. Department of Agriculture (USDA), U.S. Army Corps of Engineers (USACE) & other university, federal, state, and private partners Involving research on radionuclide and metal remediation, feral swine control & radioecology

Advancements in FY18

1. Work scope: Continued

Site-wide Source of Ecological Expertise

Provided ecological research support to Area Closures Project, SRR, SRNL, etc.

Scientific Expertise

Submitted Renewal Grant for REU in Radioecology

Submitted 92 Proposals as PI or coPIs to External Granting Agencies

Hired Replacement Assistant Research Scientist

Scientific Productivity

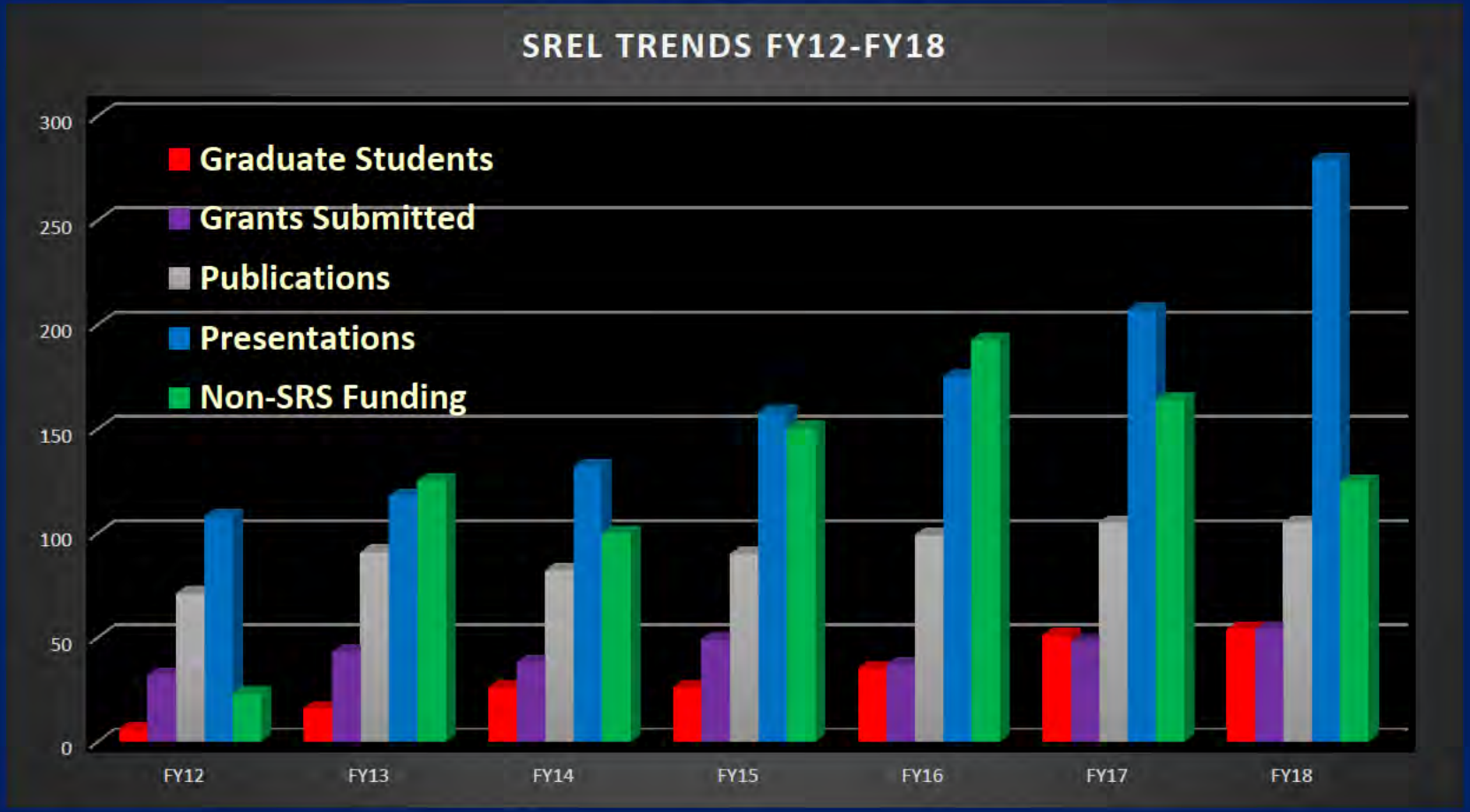
SREL staff and students published over 105 scientific articles and gave over 279 scientific presentations in FY18

Analytical Services

SREL staff and students analyzed over 5,500 samples for metal contaminants using ICP-MS or ICP-OES technologies

SREL staff and students analyzed over 2,000 samples for total or methyl mercury using SREL-based equipment

Scholarly Productivity



Advancements in FY18

2. Facilities:

Main SREL facilities

Major repairs, paint, carpet and lab renovations

Constructed new ACL-2 Facility for Insect Research

Partial Renovation of Avian Holding Facilities

Remodeled 1 additional laboratory and 4 additional offices

3. Scientific Equipment:

Analytical equipment purchases to enhance research on contaminants of soil, water, and biological materials

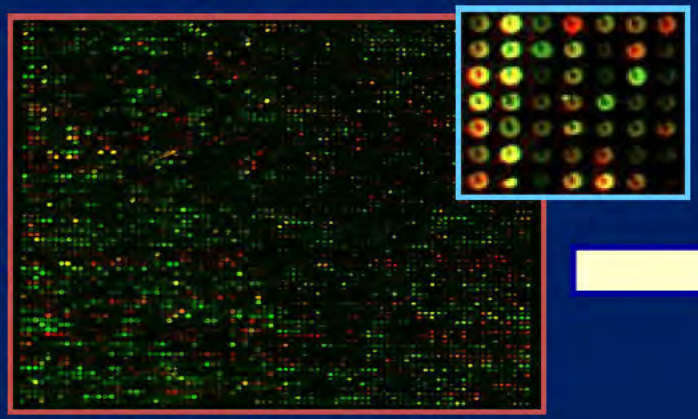
Significant upgrades to equipment related to radioecology and wildlife research

Opportunities for FY19

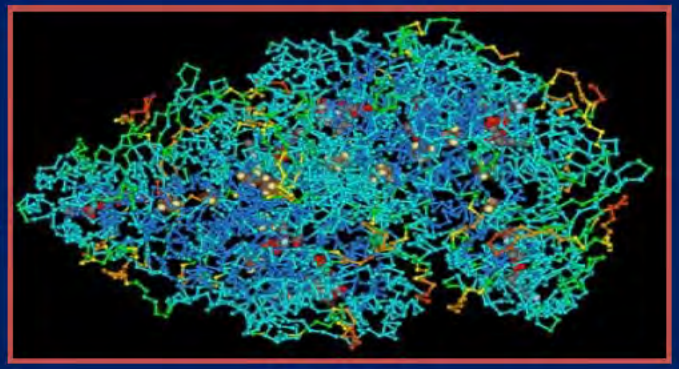
1. Maintain graduate student enrollment
2. Continued growth in undergrad experiential learning
3. Continued growth in scholarly productivity
4. Increased investments by DOE for facilities, equipment, and critical staff (e.g., safety, admin, research support)
5. Continued development of missions on the SRS:
   a) Radioecology and Low Dose Radiation Effects
   b) Metal and Radionuclide Ecotoxicology
   c) Radionuclide Fate and Transport Studies
   d) Radionuclide Outreach and Education Programs

Low Dose Radiation Surveillance and Monitoring Research and Development

DNA molecule



DNA micro array



protein

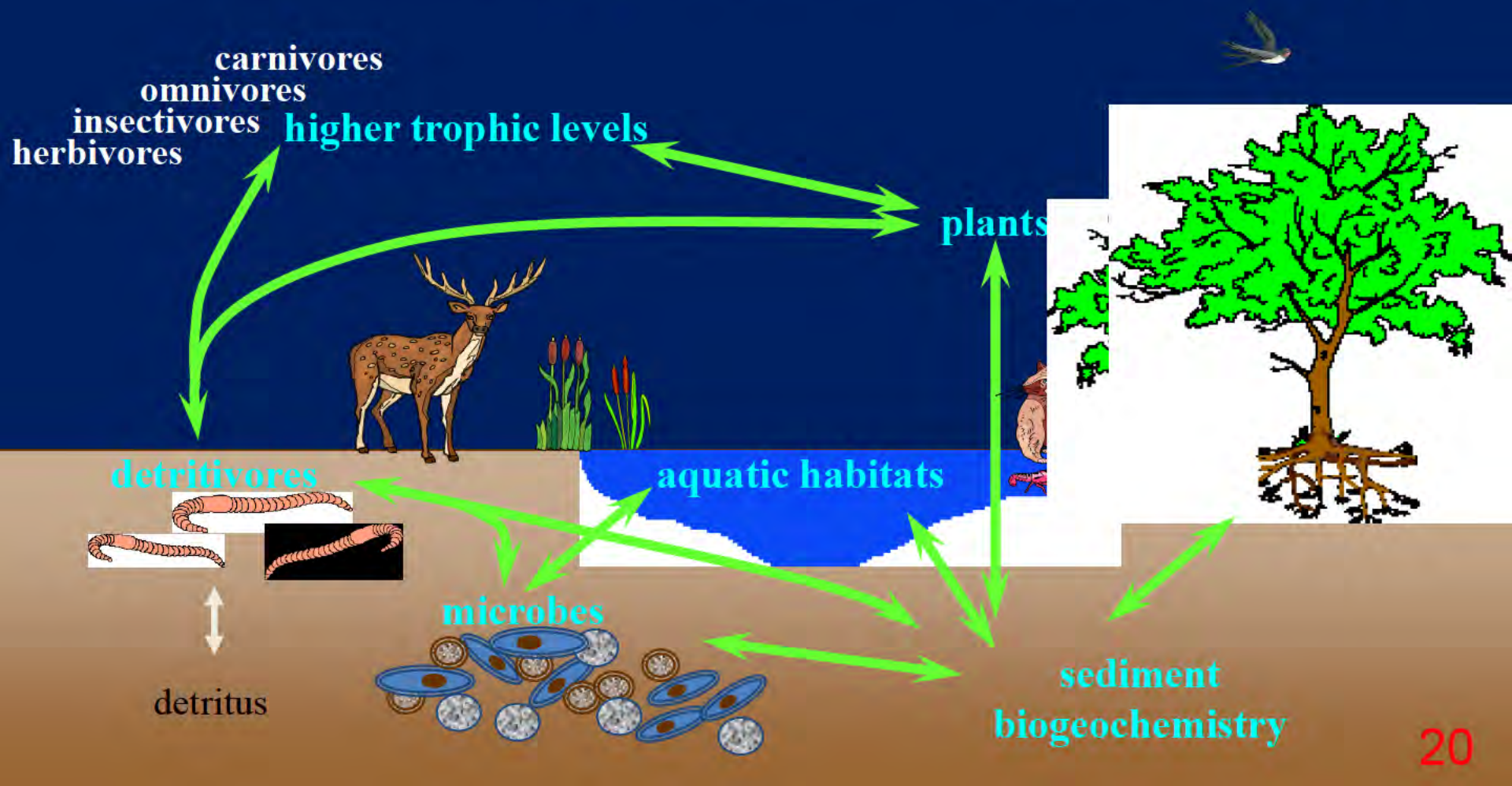
organisms

ecosystem

Next Generation Radioecology

- **Low dose effects on:**
  - **Ecosystem Services**
  - **Reproduction**
  - **Aging**
- **Chronic radiation exposure and disease resistance**
- **Ecosystem-level endpoints for radiological risk assessment**

Ecosystems Approach to Ecotoxicology



Research on Wildlife Movement, Behavior and Uptake

Outreach and Monitoring for Local Communities

Challenges for FY19

1. Funding Environment for External Grants and Contracts
2. Discontinuation of MOX Project (currently funds ~50% of SREL Outreach Program)
3. Graduate and Undergraduate Housing Needs
4. Administrative Burden at Current Staff Levels
5. Staff Turnover for Safety and Scientific Programs
6. SREL Roof Replacement
7. Additional Resources to Fulfill NERP Mission on SRS

THANK YOU