

# The National Environmental

*Serving an Essential*

Research Park at

*Mission for 25 Years*

## Savannah River Site

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*Larry C. Williams*  
Authorizing Official

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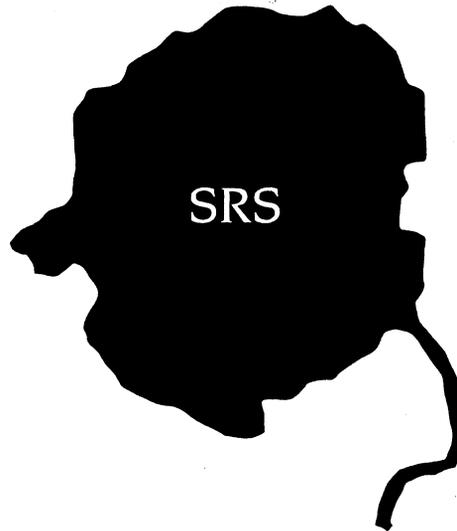
# Savannah River Site

South Carolina

Aiken



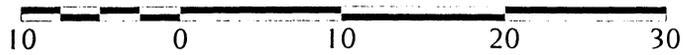
Augusta



SRS

Georgia

Miles





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# The University of Georgia

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Savannah River Ecology Laboratory

Dear Reader,

Early in 1970, President Richard M. Nixon endorsed and ordered the implementation of 10 recommendations he had received from the Office of Science and Technology subsequent to the concurrence of the newly formed Council on Environmental Quality. The tenth recommendation included the following statement:

"In view of the importance of preserving natural areas throughout the world, the concerned Federal agencies should accelerate their efforts to set aside representative locations for ecological research and wildlife preservation while there is still time."

This wise recommendation served as the basis for the Atomic Energy Commission's designation of the Savannah River Site as the country's first National Environmental Research Park (NERP) in the spring of 1972. According to a news release issued at the time, "The designation opens the site to scientists from other government agencies, universities and private foundations for use as a protected outdoor laboratory where long-term projects can be set up to answer questions about man's impact on the natural environment."

For the past quarter of a century, the Savannah River NERP has firmly established the value of this vast "outdoor laboratory" as engineers, ecologists and land managers worked together to improve our understanding of how human activities affect the environment. More than 170 doctoral dissertations and master's theses have clearly demonstrated the value of this national treasure in educating environmental scientists of the 21st century, providing us with a fuller understanding of how to minimize the adverse impacts of human activities on the environment.

As we celebrate the 25th anniversary of the country's first NERP during 1997, we hope you will join with us in recognizing the tremendous value of these and other federal lands for continued environmental and ecological research. For it is here that we can learn to satisfy our economic and social needs without diminishing the capacity of the earth to nurture future generations.

Sincerely,

Nat B. Frazer, Ph.D.  
Park Director, Savannah River NERP

# The National Environmental Research Park at Savannah River Site

*"In most places where you have large-scale industrial activities, the natural systems tend to suffer greatly. What we've proven here is that it is possible to have both."*

- Dr. Michael H. Smith

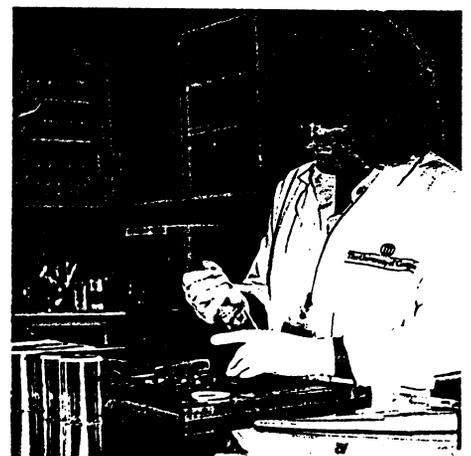
Along the western border of the state of South Carolina lies a place that is both a major industrial facility and a productive natural reserve. Spanning more than 300 square miles, the site plays a key role in the nation's defense mission by housing nuclear reactors and waste processing facilities, as well as research laboratories. A unique coupling of technology and natural and semi-natural ecosystems sit side by side at the Savannah River Site (SRS) near Aiken, South Carolina.

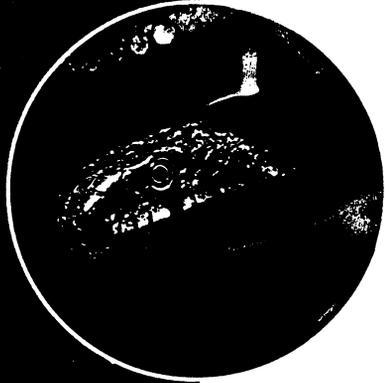
At the height of the Cold War in the early 1950s, the Atomic Energy Commission, now the U.S. Department of Energy, acquired the vast land area for the SRS. Here, the government built reactors to produce nuclear materials for weapons, and the plant served a critical role in maintaining America's military defense during the years that followed. Today, the site still serves important functions in national defense, waste processing,

environmental remediation and ecological research.

The nuclear facility is also the nation's first National Environmental Research Park (NERP). Designated as such by the U.S. Department of Energy (DOE) in 1972, the SRS serves as an outdoor laboratory for environmental research on energy technologies and the effects of human activities on the natural environment. In the 25 years since the park was first named, the SRS has come to demonstrate the compatibility of nature, human technology and environmental research.

Dr. Michael H. Smith, director of the University of Georgia's Savannah River Ecology Laboratory (SREL), which conducts ecological research on the SRS, views the site as an exceptional place to conduct business. "In most places where you have large-scale industrial activities, the natural systems tend to suffer greatly. What we've proven here is that it is possible to have both."





## NERP Defined

*"First, it provides us with the ability to do quality research that is good for the site and good for the country. And secondly, it allows us to 'market' the site and our achievements so we can entice other people to come here and generate the world-class research that we're all trying to do."*

*- Ernie Chaput*

It was with this premise -- that nature and industry can co-exist -- that the NERP concept was born in the late 1960s. At that time, a growing environmental awareness by the general public and recommendations by scientists and members of Congress pointed to a need for protected areas for research and education. Since SRS was named the country's first NERP, DOE has designated six other DOE land areas as research parks.

With the creation of NERPs, the government sought to provide land on which to study the interactions of industrial and natural systems, thus helping us understand how humans can best manage both, while providing a healthy business environment. In addition to providing a place where scientists can investigate fundamental environmental questions, the research park program is also an arena where industry can partner with science to demonstrate and improve technologies for remediation and restoration of contaminated soils and groundwater.

Ecological research efforts at SRS and the other NERPs focus on a number of pertinent issues, including how to assess the environmental consequences of energy and weapons development and other human activities. Additional studies

determine how to eliminate or minimize the adverse effects these activities may have on the environment and how best to remediate those areas negatively affected by past activities.

To Ernie Chaput, former deputy manager of DOE's Savannah River Operations Office, the advantages

of the site's status as a research park are clear. "First, it provides us with the ability to do quality research that is good for the site and good for the country. And

secondly, it allows us to 'market' the site and our achievements so we can entice other people to come here and generate the world-class research that we're all trying to do."

DOE environmental counsel Russell Shearer emphasizes the importance of the environmental work that has been carried out since 1951, including the two decades during which the SRS functioned as a research park before being officially designated.

"I see the research park as balancing a number of important interests. It provides industry for the area, environmental cleanup, and of course, environmental research," Shearer says. "The environmental mission we serve here is essential."





# SRS: The Nation's First Environmental Research Park

*"You need to have baseline, unimpacted areas so you can measure the effects of human activities on the environment.*

*You also need natural areas as examples of how a site should look and function once it's cleaned up. The set-aside areas are critical*

*in that regard."*

*- Dr. Nat Frazer*

The 310-square-mile SRS provides an ideal setting for an environmental research park. This vast tract of land, stretching over parts of Aiken, Barnwell and Allendale counties, South Carolina, contains examples of most of the major upland ecosystems found in the Southeast.

"The SRS is a unique block of land and an important entity, especially when broken landscapes are now so common," says Beth LeMaster, wildlife, fisheries and botany staff officer for the USDA Forest Service at SRS.

Only about 10 percent of the land area of the SRS is used for industrial purposes. Site operations, including remediation efforts, are managed by Westinghouse Savannah River Company (WSRC), a prime contractor to the DOE.

The natural resource areas

of the SRS are managed by the USDA Forest Service, under an interagency agreement with the Energy Department. A wide variety of habitat types found on the site includes acres of mixed hardwood and pine forests, more than 300 natural freshwater wetlands called Carolina bays, a swamp forest bordering the Savannah River and many other natural and semi-natural areas. About 130,000 acres are covered by pine-dominated forests, including the diverse longleaf pine, fire-dependent ecosystem, which is also managed for multiple uses by the Forest Service.

An especially valuable component of the Savannah River NERP is the DOE Research Set-Aside Areas, representative habitats that DOE has preserved for ecological research. The 30 areas, encompassing





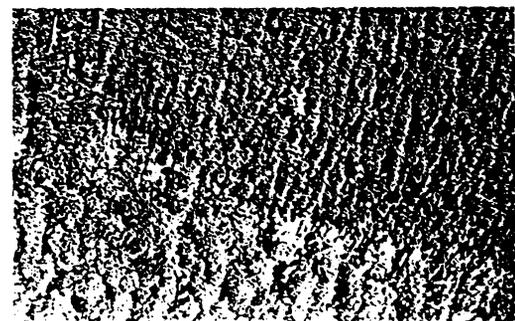
more than 14,000 acres, are protected from most routine site operations, and active management is not allowed. Largely unaffected by industrial activities, the set-aside areas serve as natural reference areas or "controls" for environmental research and monitoring efforts.

"You have to have set-aside areas," says Dr. Nat Frazer, associate director of SREL and director of the Savannah River

NERP. "You need to have baseline, unimpacted areas so you can measure the effects of human activities on the environment. You also need natural areas as examples of how a site should look and function once it's cleaned up. The set-aside areas are critical in that regard."

The large, undeveloped areas of the SRS provide excellent habitat for an extraordinary diversity of native plants and animals. For example, 50

species of mammals, 101 species of reptiles and amphibians, almost 100 species of freshwater fish, more than 240 species of birds and many other species of wildlife are found here.



## The Research Tradition at SRS

*"The research that has been conducted here is critical to our understanding of this area and the entire geographic region. If you look at our knowledge of the wildlife, vegetation, aquatic systems and geology of the area, you could conclude that SRS is one of the best characterized areas in the world."*

*- Dr. Whit Gibbons*



More than 45 years of research at the SRS have paid tremendous dividends in terms of environmental knowledge. A vast database exists for the SRS, not just for the natural aspects of the large land area, but also for the effects that human activities have had on the wildlife, vegetation, soil, air and water resources. Extensive studies have been conducted in many scientific disciplines from archaeology to zoology.

Over the years, a multitude of groups and individuals have participated in research at the SRS. The majority of the effort has been expended by personnel employed by the major contractor organizations and other federal agencies at the site, including Westinghouse Savannah River Company and its predecessor E.I. duPont deNemours Company, the Savannah River Ecology Laboratory and the USDA Forest Service.

The "ecological intelligence" that has been amassed for the past 45 years at SRS serves the site and the scientific community well, says Ambrose Schwallie, president of WSRC. "We know the natural forces at work here and can put them to good use," Schwallie says. "We have established sound baselines, have maintained them and do quality research."

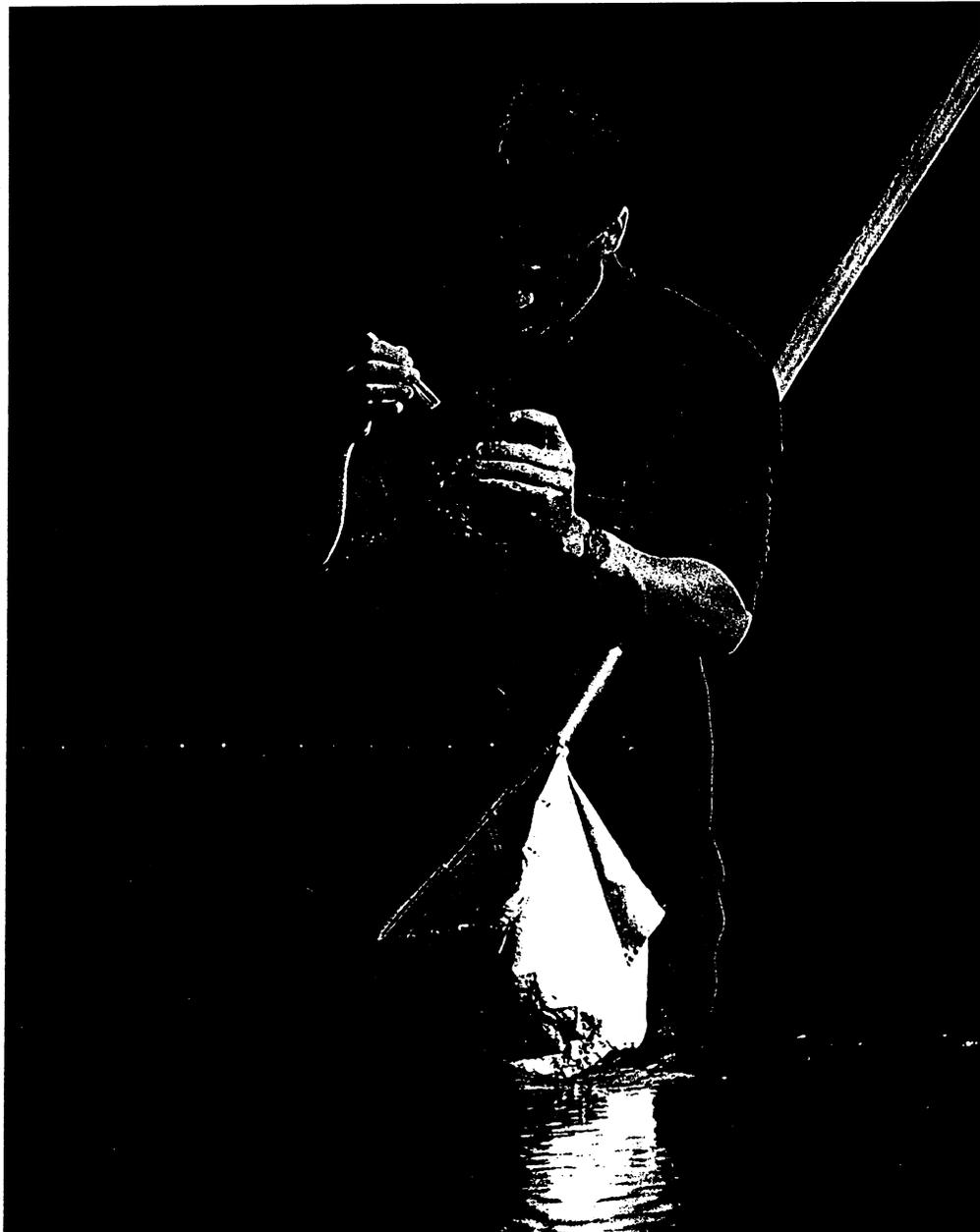
Environmental research has been in progress since the site was first chosen as a production and research facility in the early 1950s. At that time, the government's interest in the numbers and types of species on the land prompted early research studies by scientists from the University of Georgia, the University of South Carolina, the Philadelphia Academy of Natural Sciences and Clemson University. Since then, and particularly since the NERP designation at the SRS, research programs have continued and

expanded to include scientists from throughout the United States and abroad, including the former Soviet Union. Such collaborations are yet another value of the NERP program.

"One of the important concepts of the research park is that it be a user facility," says SREL research manager Dr. Carl Strojan. "This site provides a place where users can come from all over the country to take advantage of the resources of the research park," he continues, adding that the SRS effort has been successful.

Dr. J. Whitfield Gibbons, SREL senior ecologist, notes how much information has been amassed by various researchers at SRS since 1951. "The research that has been conducted here is critical to our understanding of this area and the entire geographic region. If you look at our knowledge of the wildlife, vegetation, aquatic systems and geology of the area, you could conclude that SRS is one of the best characterized areas in the world."

One of the earliest focuses of the research at SRS -- and one that continues today-- is baseline studies of the land area, including annotated checklists and taxonomic keys for many species of animals and plants, surveys of the status and distribution of certain populations, and special purpose surveys, such as those directed at specific habitats or endangered or threatened species. This basic research has resulted in an immense storehouse of valuable information about the natural and human-influenced areas on the site.



## Technology Development and SRS

*"This is the perfect venue where such projects can be carried out, industry can come here and work on new and better ways to develop technology assisted by scientists and engineers who are thoroughly familiar with this environment."*

- Dr. Nat Frazer

One of the major thrusts of the research efforts at SRS today, and one that falls neatly within the original goals of the NERP program, is developing remediation technologies to address the effects of the Energy Department's activities on the environment. Specific research programs designed to address various pollutants at SRS, including radioactive and toxic waste, are being carried out by scientists at SREL and Westinghouse's Savannah River Technology Center.

"We focus on applied research and development of environmental cleanup technologies," explains WSRC scientist Brian Looney. By developing new remediation technologies SRS scientists hope to collect "smarter, less expensive" data that will help solve the waste problems on site, he says.

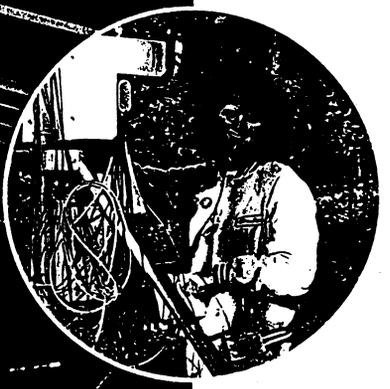
DOE's Dr. Karen Hooker, who directs the Program Management and Coordination Division, explains that her objective is to

deploy these technologies to meet the waste management and environmental restoration needs of the site.

"We are using the brainpower from this site and from across the complex to ensure that we are using the most effective technologies to clean up SRS," Dr. Hooker says. She explains that during the process, DOE is collaborating with other DOE laboratories and industry to ensure that both the SRS and the private sector reap long-term benefits from these activities.

Dr. Frazer of SREL explains that the cleanup technologies being developed at SRS illustrate how the NERPs can serve not only a community, but the nation. "This is the perfect venue where such projects can be carried out," he says. "Industry can come here and work on new and better ways to develop technology assisted by scientists and engineers who are thoroughly familiar with this environment."





# Research Park Education and Outreach

*"It would be difficult to overemphasize the value of the educational function we serve here. This site, with its dedicated personnel and excellent facilities, is a choice setting for training students in the sciences."*

*- Dr. Whit Gibbons*

The NERP program at SRS performs yet another critical function in addition to its support of basic and applied research. At the heart of the program is a mission to educate and inform. The Savannah River NERP makes this possible through the site's highly respected education and outreach programs. Together, through efforts to educate students and the general community, WSRC, SREL, the Savannah River Archaeological Research Program, and the U.S. Forest Service (in a cooperative agreement with the University of South Carolina -- Aiken) reach hundreds of thousands of people each year.

Education has been a major thrust of the site for more than three decades. SRS provides an opportunity for students -- from elementary school through graduate school -- to learn about and train in the environmental sciences, including ecology, geology, chemistry and many other disciplines. The NERP allows them to pursue science-oriented projects and offers the resources to do so. Thousands of students have visited the SRS since the NERP was first established in 1972. More than 100,000 students, teachers and post-doctoral personnel took advantage of SRS educational opportunities in 1995 alone through hands-on research or educational presentations.

"It would be difficult to

overemphasize the value of the educational function we serve here," Dr. Gibbons says. "This site, with its dedicated personnel and excellent facilities, is a choice setting for training students in the sciences."

Of equal importance is educating the general public. Each year site organizations host thousands of people, inviting them in to see one of the most important defense and research sites in the world. Hundreds of tours are conducted each year of both industrial facilities and natural areas.

SRS personnel are also widely available for presentations to schools, civic groups, religious organizations and other interested groups. Regular presentations are made on such diverse topics as environmental remediation at the site, reptiles and amphibians of the area, forestry practices at the site and environmental compliance issues.

Forest Service personnel on site are major contributors to these efforts; in 1995 they reached more than 19,000 students ranging from age 8 to adult. The USDA Forest Service now has three classrooms for this purpose and 13 field sites where students participate in hands-on math, science and engineering lessons.

"One of the main reasons for our success has been the cooperation of our sponsor organizations, including DOE and the





local school districts. Lessons are developed by natural resource professionals working with local teachers," says Steve Lenzo, education program manager of the Forest Service.

Another component of the outreach efforts of the site is the SREL Conference Center, which is located inside the northern boundary of the site and next to the largest research set-aside area. Here, groups come for workshops, nature walks, "Ecocamps" and the very popular "Ecologist for a Day" program.

"The Conference Center not only provides a way to communicate with the local public," Dr. Smith says, "but it allows people more access to the SRS; I think that's important."



# The Future of the Savannah River National Environmental Research Park

*"I think the research park is good for the value systems of the public, that is, people who care about wildlife, natural habitats and the like. Furthermore, it is important to find ways to run businesses and still have a decent environment for people to live in. I think that's our challenge."*

- Dr. Michael H. Smith

As the missions of some national agencies -- including the Department of Energy -- change, so may the future of the land areas they manage. For now, however, the NERP at SRS remains intact, continuing under the stewardship of DOE. The essential missions of ecological research, environmental remediation and education continue.

A public group called the SRS Citizens Advisory Board, which serves the community and the government, recently made recommendations pertaining to the future of the Savannah River NERP. They agree that the site should continue as a "national asset," serv-

ing the country in its important defense role and also maintaining and expanding its environmental research.

"I think the research park is good for the value systems of the public, that is, people who care about wildlife, natural habitats and the like," Dr. Smith says. "Furthermore, it is important to find ways to run businesses and still have a decent environment for people to live in. I think that's our challenge."

Mr. Schwallie agrees, adding, "This site serves science and the nation well. We need to grow the economy with special attention to the care of the environment." At SRS, that goal is being realized to the benefit of all.



