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Smithsonian Environmental Research Center

Fact Sheet

The Smithsonian Environmental Research Center is the leading national research center for understanding environmental issues in the coastal zone. The world's coastal zones are home to more than 70 percent of the global population and subject to intensive activity. Through interdisciplinary, experimental research, SERC scientists are working to understand how ecosystems interact and are linked in this critical zone where the land meets the sea, and how physical and chemical processes sustain life on Earth.

Scientific Research

SERC researchers are managing 78 projects funded by grants from public and private organizations and eight endowed programs in four ecological areas: global change, landscape ecology, coastal ecosystems and population and community ecology. Research achievements include:

- SERC is the national center for the analysis of invasive species in marine and estuarine ecosystems. The Invasions Biology Program measures invasion patterns through nationwide field surveys of all U.S. coastal states, and includes the National Ballast Water Information Clearinghouse, which reports nationwide patterns of ship ballast water delivery and management to the U.S. Coast Guard and Congress.
- SERC's global change research includes the world's longest running field experiment on the effect of increasing atmospheric carbon dioxide on plant communities, and the world's longest data record on the increase in ultraviolet solar radiation impacting Earth.
- SERC is an international leader in watershed studies. Research at SERC on the effects of land-use on water quality – including agriculture and coastal development – demonstrates the important role of streamside forests in preventing nutrient runoff into estuaries. SERC also has the longest record of acid rain for the mid-Atlantic region, and relates precipitation inputs to watershed discharges.
- One of the world's largest research programs analyzing mangrove forests, the vital ecosystem at the land margin of tropical oceans, is organized and coordinated from SERC.

- SERC has built a 35-year database on species composition and populations dynamics of plants and animals in the Chesapeake Bay region.
- SERC research focuses human impacts on the largest estuary in the United States, the Chesapeake Bay, with long-term analyses of the ecological regulation of plankton blooms, food web dynamics, blue crab ecology, fish population biology, host-parasite interactions, wetland functions, and estuarine indicators of water quality and habitat value. These variables are linked to watershed discharges and land-use parameters.

Publications and Conference Participation

SERC scientists have published more than 1,100 scientific papers, journal articles and books about ecological dynamics and human interactions with the environment.

Education and Public Programs

To prepare the next generation of ecologists and environmental scientists, SERC provides educational opportunities for students from kindergarten through the post-doctoral level. SERC has trained more than 800 undergraduate interns; 460 post-doctoral, doctoral and graduate student fellows from more than 150 colleges and universities. On average 47 interns and 33 fellows participate in SERC's professional training program annually.

A variety of hands-on science experiences and environmental field trips are available for school groups, along with workshops for teachers that offer scientific training, continuing education, and environmental curriculum through a combination of activities. Video conferencing facilities enable more than 100 classrooms across the country to participate in SERC's educational programming yearly, and interactive electronic field trips reached more than 20 million participants in 2005. SERC's education department also offers programs for the general public including on site tours and special activities, parent-child reading hour, lunch-time programs with scientists, an evening lecture series, guided canoe expeditions through the estuary, and a free annual open house.

Facility

Established in 1965 SERC's modern laboratory and education facilities lie along the shore of the Chesapeake Bay, 26 miles east of Washington, D.C. The site encompasses 3,000 acres of land and 14 miles of protected shoreline that serve as a natural laboratory for long-term ecological research. The unique location provides valuable opportunities to study the interactions of aquatic, terrestrial and atmospheric components of complex landscapes.

SERC researchers base their research at this main facility, but extend their studies around the world, using the Chesapeake Bay as a model for ecological processes and human impacts in other areas. Comparative studies extend throughout the world from the Indian River Lagoon in Florida, the Meso American barrier reef off Belize, and the tropical ecosystems of the Panamanian isthmus, to Prince William Sound, Alaska, Japan and the Southern Ocean.

Budget

In Fiscal Year 2006, SERC received \$3.06 million in federal appropriations and \$5.7 million in federal grants and philanthropic donations from foundations, corporations and private citizens.

Staff

SERC has a team of 16 principal scientists and 75 technical support staff with expertise in terrestrial and marine ecology, zoology, physiology, biology and microbiology. SERC's environmental education staff of four professionals interprets and communicates research findings to school children and to the public through on-site educational programs, video conferences, electronic field trips and via its Web site. A network of 150 collaborators from the United States and 60 internationally use SERC's research facilities.