



## **Savannah River National Laboratory Core Repository:** Core used in real world environmental and geotechnical assessments

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The coastline of South Carolina is familiar to geoscientists as a field laboratory for observing modern coastal processes as analogs for ancient sedimentary environments. Inland, the southeastern Atlantic Coastal Plain physiographic province extends from the fall line to the shoreline and is underlain by mostly unconsolidated sediments deposited along a passive emergent margin during the Mesozoic and Cenozoic eras. The sediments of the southeastern Atlantic Coastal Plain in South Carolina are stratified quartz sand, clay, calcareous sediment, and conglomerates that dip gently seaward and range from late Cretaceous to Holocene.

At the United States Department of Energy Savannah River Site (SRS), the site geologic data archive includes more than 12,000 borings, wells and cone penetrometer soundings, more than 300 km (200 mi) of seismic reflection data, many kilometers of seismic refraction data, and regional soil gas chemical surveys. Many of the borings were cored and more than 80 km (50 mi) of core are archived in the Savannah River National Laboratory (SRNL) Core Repository. The repository provides a unique opportunity to observe fluvial, deltaic, and shallow marine sand, mud and calcareous sediments of the upper Atlantic Coastal Plain along with the underlying Paleozoic bedrock and Triassic Dunbarton Basin sequences.



At the SRS, primary uses of the core are to understand sediment heterogeneity and resulting effect on contaminant migration, groundwater availability, and other environmental applications as well as geotechnical facility siting and foundation design. Physical properties (grain size, porosity, permeability, Kd, etc.) are incorporated into radiological performance assessments and groundwater fate and transport models.

Displayed cores include crystalline basement and rocks of the Triassic Dunbarton Basin as well as fluvial, deltaic, and shallow marine sequences. Detailed characterizations illustrate how SRS uses core and subsurface data in real world geotechnical and environmental applications.





B. Location of Savannah River Site in the Upper Atlantic Coastal Plain physiographic province

C. Schematic illustration of Cretaceous and Tertiary environments of deposition

D. Schematic cross-section showing Cretaceous and Tertiary sediments overlying Paleozoic crystalline basement rock and Triassic graben sediments.

E. Lithostratigraphic and hydrostratigraphic classification for Cretaceous and Tertiary sediments at SRS

F. Gamma log and photomosaic of Cretaceous and Tertiary sedimentary sequence from borehole GCB-5



Eocene

Paleocene

Cretaceous





GR run 1 version 1 (GAPI)

Ε



Nearshore

Marine

partly calcareous

Triassio

basin

Fluvial

Nearshore to

Open Marine

**Paleozoic basement** 

Deltaic to

Shallow Shelf

**Upper & Lower** 

Delta Plain



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