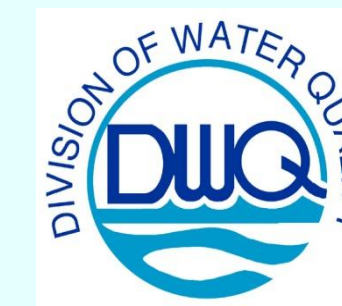


Isolated Wetlands - The Groundwater Connection

Background Information for Posters 245 and 246

June 2012

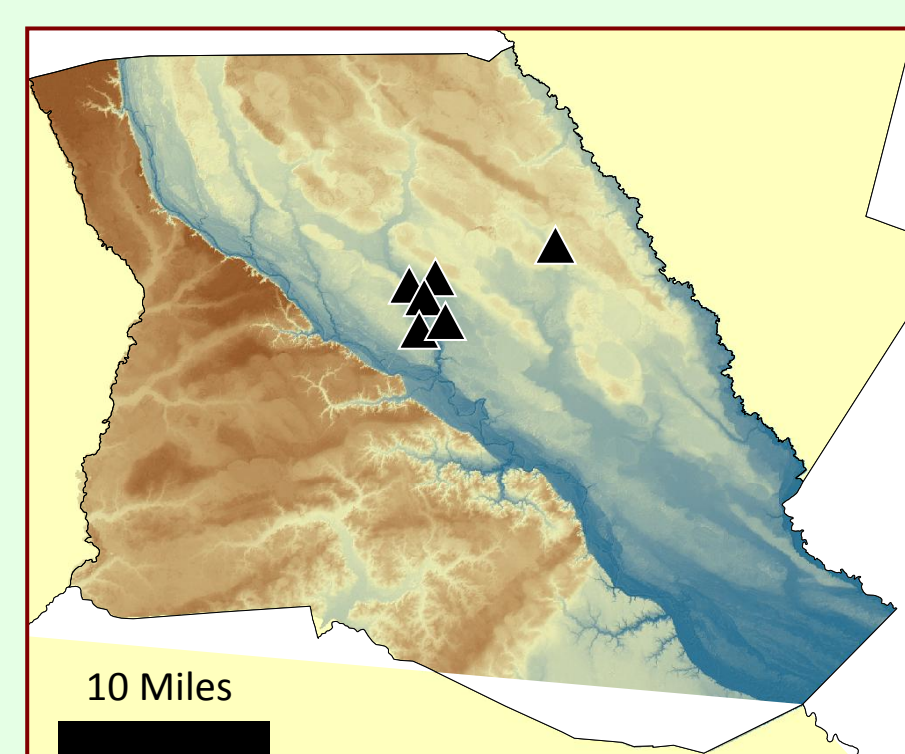
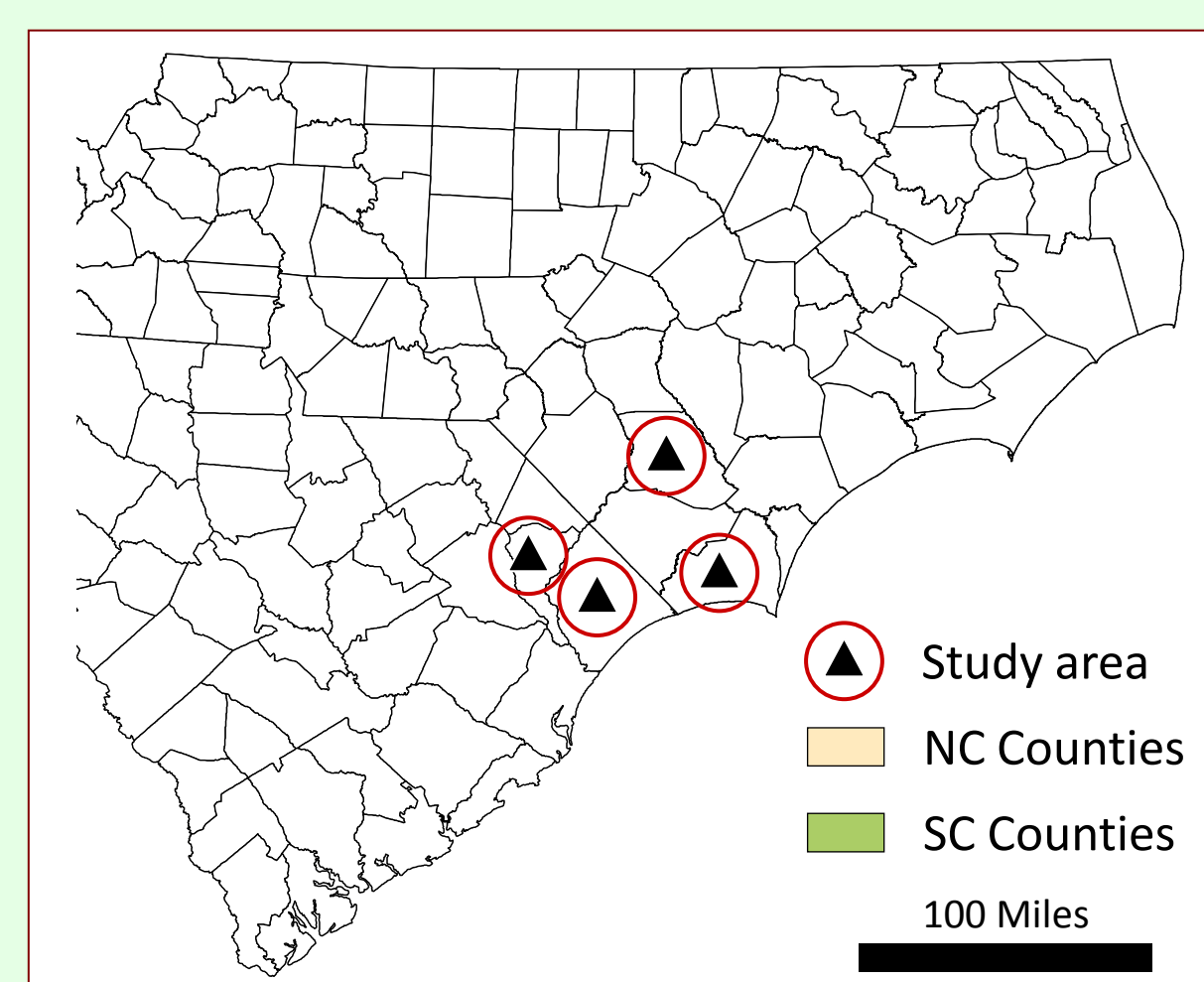


Background

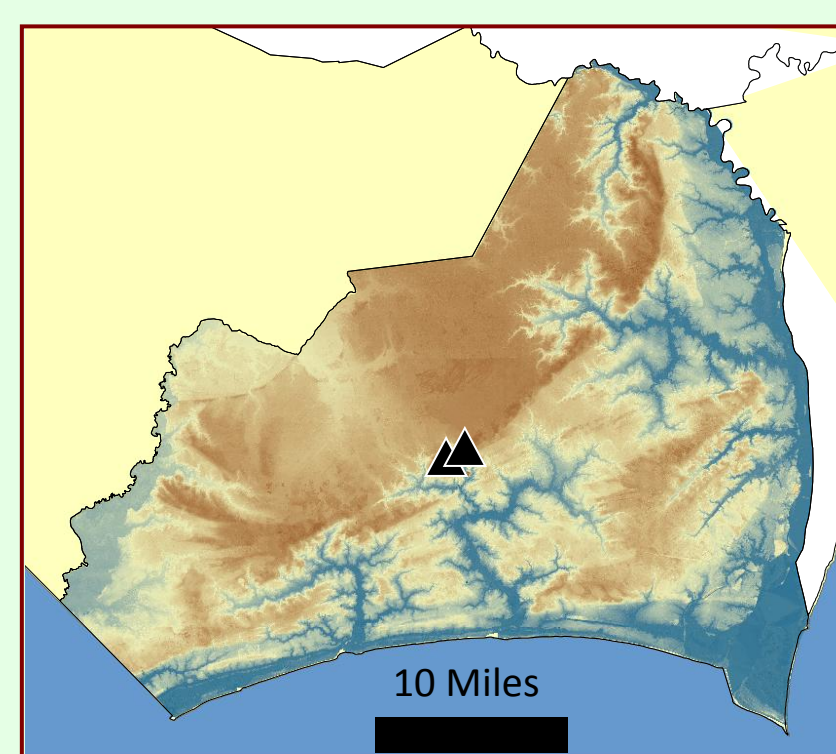
Although the ecological and functional value of wetlands in the landscape is well documented, there are still significant gaps in our knowledge of “isolated” wetlands, especially in regard to water quality and hydrology. The groundwater system serves as a hydrologic connection between isolated wetlands and traditionally navigable waters. Additionally, water quality transformations may occur between the surface and subsurface components of the isolated wetland. Understanding the impacts of alterations to isolated wetlands thus must be informed by an understanding of the role of groundwater.

As part of a multi-disciplinary investigation of isolated wetlands, DWQ and USC are investigating the hydrology and water quality function of groundwater at eight isolated wetland sites in North Carolina and four in South Carolina. Results of this investigation show that all the wetlands in the study are connected to downgradient surface water via groundwater without significant impediment from intervening confining units or aquitards. Examination of the water quality data is underway to determine the chemical relationships and transformations that may occur in the water in these systems.

Study Locations



Bladen County, NC

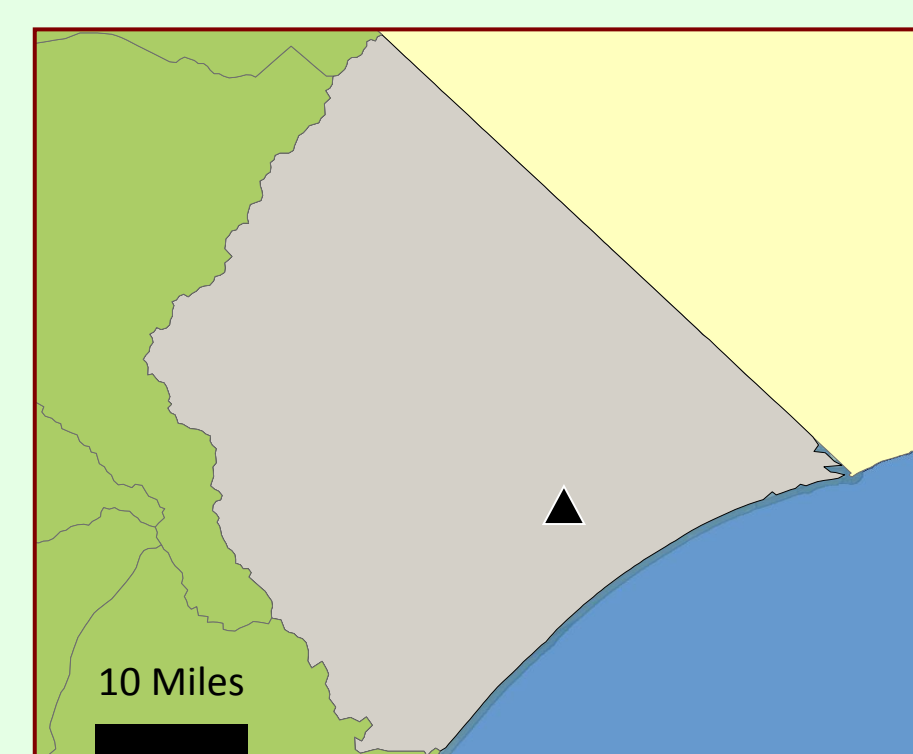


Brunswick County, NC



Marion County, SC

▲ Study site



Horry County, SC

Data Collection

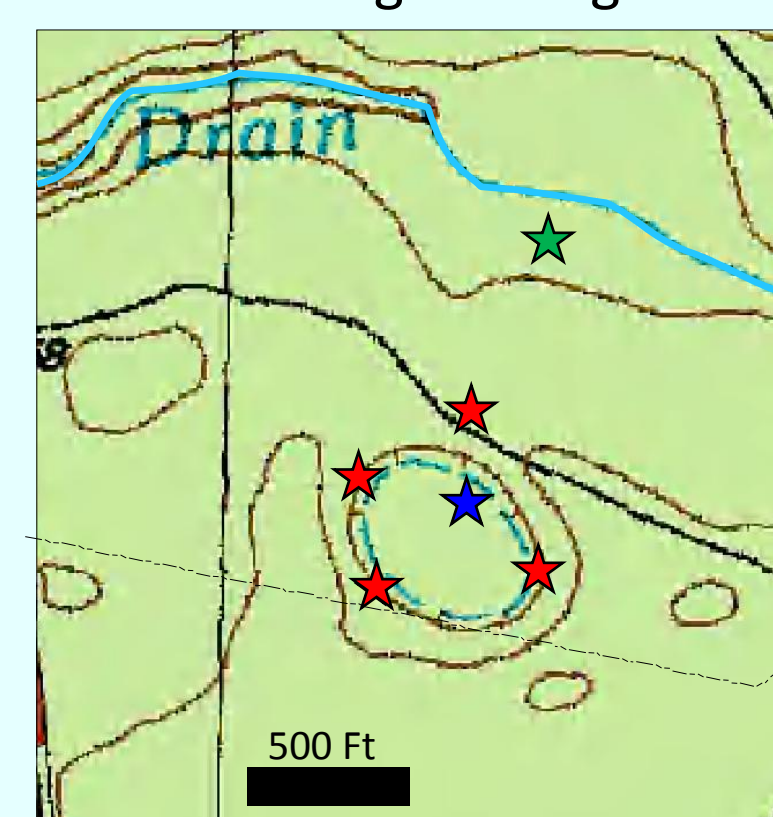


A Geoprobe drilling rig was used for coring and well installation – it is lightweight for use on soft soils, can access wooded areas, and allows for rapid assessment of geology.

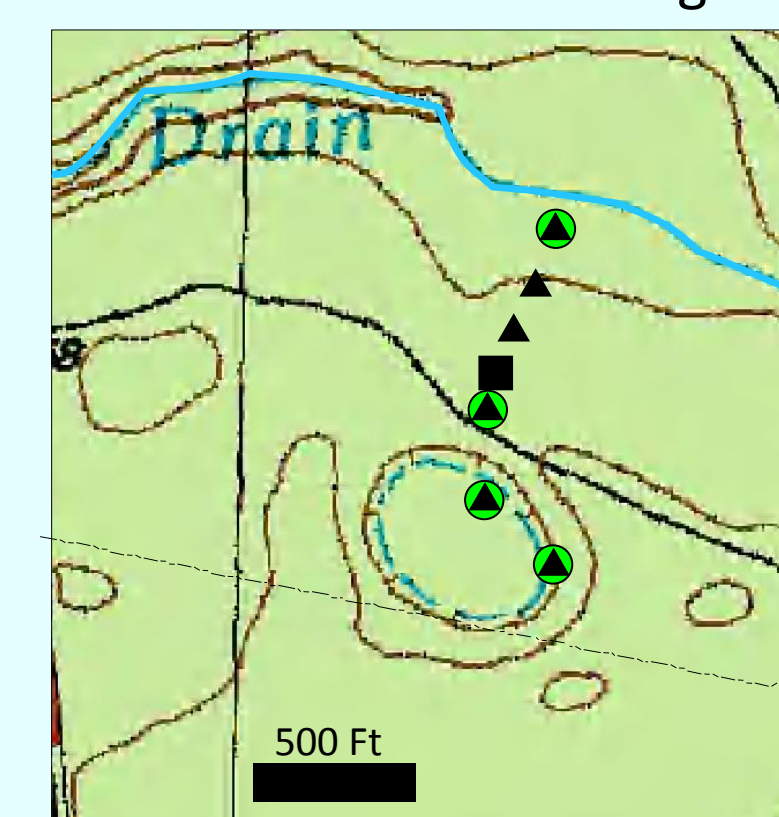
- 8 sites in NC, 4 in SC
- 44 geologic cores, 20' to 60' in depth
- 90 monitoring wells
 - Monthly water level collection for one year at all wells
 - 43 automatic water level data-loggers for one year
 - Water quality analysis quarterly for one year for:
 - Nutrients
 - Metals
 - TOC, DOC
- 10 stream gages
- Aquifer tests at three sites

Typical Site

Geologic coring



Wells and Monitoring



- | | | |
|----------------|--------------|-------------------|
| Core location: | ★ Wetland | ▲ Monitoring Well |
| | ★ Upland | ● Data Logger |
| | ★ Streamside | ■ Pumping Well |

Tiner (2003), identified 29 wetland types that may be geographically isolated. These occur in depressions, on broad flats and on slopes. Examples found in the North Carolina Coastal Plain include Carolina bays, pocosins, pine savannas, limestone sinks, sandhill seeps, vernal pools, and wet pine flats. In Bladen, Horry and Marion Counties, geographically isolated wetlands are often associated with Carolina Bays and pine savannas. In Brunswick County there are several near an escarpment possibly associated with a former beach front. One DWQ study site in Brunswick County is an apparent lime sinkhole, another is a pine savannah.

(Tiner, Ralph W., 2003, Geographically Isolated Wetlands of the United States, Wetlands, vol. 23 no. 3, September, 2003, pp 494-516)

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- South Carolina Department of Natural Resources

