

# **ESTIMATING SUBMARINE GROUNDWATER DISCHARGE ON ST. CATHERINE'S ISLAND, GA VIA RADON-222**

**Scott D. Thorson and Jacque L. Kelly**

---

AFFILIATION: Georgia Southern University, Statesboro, GA 30460

REFERENCE: *Proceedings of the 2017 Georgia Water Resources Conference*, held April 19-20, 2007, at the University of Georgia

---

Submarine Groundwater discharge (SGD) is an important pathway for material transport and one of the most accurate approaches for measuring SGD fluxes is using the natural radioactive tracer radon. Radon-222 exists in high concentrations in groundwater and low concentrations in seawater and forms from the decay of heavier elements which are more prevalent in immature sediments. The goal of this study was to understand the spatial distribution and fluxes of groundwater discharge around the southwestern part of St. Catherine's Island using radon-222. We hypothesized that there were several areas of groundwater discharge coming from the island, and that the fluxes would be comparable to fluxes from similar study areas. In December 2016 we conducted our radon survey by boat around the southwestern part of the island and measured radon concentrations in surface waters using a RAD-7 continuous radon monitor. Our collection took place during low tide, because the outgoing tide draws more groundwater to the surface than during high tide. During the survey we also took several discrete groundwater samples from areas along the shore that showed active groundwater discharge. We created a standard mass-balance mixing model to quantify the groundwater discharge. We identified several areas of SGD around the southwestern part of the island with groundwater fluxes comparable to previous studies. A more extensive investigation of the site can help determine if the rate of groundwater discharge correlates with seasonal changes and varying tidal conditions.

*Program reference: 1.4.05*