

# **DIRECT LINKAGES BETWEEN ONSHORE KARST AQUIFERS AND OFFSHORE MARINE ENVIRONMENTS: CRESCENT BEACH SPRING, FLORIDA**

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Crescent Beach Spring is a continuously flowing offshore spring located 4 km off the northeast coast of Florida in the Atlantic Ocean. The source aquifer for Crescent Beach Spring is the Ocala Limestone (upper Eocene), which is the most productive formation of the Floridan Aquifer. In addition, Crescent Beach Spring discharges relatively fresh (9.4 milliSemens/centimeter) particulate-laden water from the Ocala at a water depth of 38 meter, creating zero visibility in the throat of the spring. The high flow rates (10 - 300 cubic feet per second) display a noticeable boil on the sea surface and a hydrogen sulfide odor is distinguishable for some distance downwind.

The likelihood of contaminating source waters and subsequently transporting contaminants from onshore aquifer systems to offshore marine environments is extremely great at Crescent Beach Spring, as well as at many other well-known offshore springs throughout Florida. In addition, ground water can transport nutrients and metals from agricultural and urban areas, not only impacting the quality of drinking water, but also influencing changes in benthic habitats where ground waters discharge into overlying marine waters.

This study has been initiated to link offshore hydrostratigraphy, implementing seismic profiling and geochemical signatures of the discharge waters, with onshore sources. In April 1999, divers inserted a well point to collect representative ground water discharging from Crescent Beach Spring. Ground water was analyzed for nutrients, ions, metals, stable- and radioisotopes, and age dates. Initial results suggest that discharge water is fresher than that observed in 1995 and lower in selective metals and major ions. Ammonia is an order of magnitude greater than overlying surface waters. Groundwater ammonia levels are consistent with reducing environments found in the Floridan Aquifer System. Previous work has been conducted at CBS but not to the extent that has been accomplished in this study. Comparing recent with previous data will help indicate what the possibilities of contaminating the aquifer source waters are as well as ascertaining groundwater-flow rates and residence times.