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Terrestrial Brackish Groundwater Discharge Associated with Seawater Intrusion: Everglades National Park, Florida USA

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In contrast to the growing recognition of the importance of submarine groundwater discharge, little attention has been given to the situation where seawater intrusion occurs far inland of the coastline such that brackish to saline groundwater discharges to overlying coastal wetlands in a mechanism termed herein as Terrestrial Brackish Groundwater Discharge (TBGD). If these coastal wetlands are dominantly freshwater and oligotrophic, than the discharge of the brackish groundwater can have a large impact on the coastal ecology. The Florida Everglades is one of the world's largest freshwater wetlands. Seawater intrusion has been observed in the underlying unconfined aquifer as far inland as 6 to 28 km of the coastline.

A geochemical investigation of both the groundwater and surface water in the southern Everglades was conducted to investigate the occurrence of TBGD associated with seawater intrusion. Both surface water and groundwater were collected from the seawater intrusion zone on an approximate monthly basis between January 1997 and September 1999. A comparison of equivalent fresh-water head levels in brackish groundwater wells with the overlying surface water indicate the potential for constant discharge of brackish groundwater. During times of high water levels, the surface water chemistry remained fresh. Enhanced chloride, sodium, and calcium concentrations, indicative of brackish groundwater discharge, were observed in the surface water at times of low water levels. The brackish groundwater discharge was distinguished from surface seawater in that it contained elevated concentrations of calcium, due to dissolution of the carbonate aquifer. Elevated concentrations of ^{4}He were also found in the brackish groundwaters, suggesting that the transport of ^{4}He is enhanced with the seawater intrusion zone. Preliminary estimates of the importance of the TBGD to water and solute budgets indicate that the groundwater discharge can contribute between 1 and 35% of the overlying surface water flow.

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