

SOURCES OF WATER IN SALT MARSHES: DETANGLING DRIVERS OF NUTRIENT PROCESSING, AND PLANT PRODUCTIVITY

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Salt marshes occupy the dynamic boundary between land and sea, offering crucial ecosystem services like nutrient cycling and carbon storage. Freshwater inputs from upland systems interplay with tides to determine the water sources and solutes within salt marshes. While terrestrial freshwater contributions have gained recognition for their significance in affecting hydrological dynamics in intertidal wetlands, we know very little about freshwater inputs to marshes and how freshwater affects salinity and plant productivity. This study investigates the influence of terrestrial freshwater inputs and tidal forces on salt marsh hydrology and its ramifications on subsurface salinity and plant productivity. Our research focuses on an estuary along California's central coast, where we observe seasonal fluctuations in terrestrial freshwater contributions, porewater salinity, and the productivity of pickleweed (*Sarcocornia pacifica*, also known as *Salicornia pacifica*). Our findings reveal a connection between salt marsh porewater salinity, shallow subsurface saturation, and pickleweed productivity. Elevated water levels in the uplands in winter and spring affect the upper and middle marsh, while during the summer and fall, tidal inputs become more influential throughout the marsh. This seasonal shift underscores the pivotal role of terrestrial uplands in shaping salt marsh connectivity and ecosystem functioning. Moreover, our research highlights the complex relationship between drought, historical precipitation patterns, and salt marsh hydrology. It underscores that the sensitivity of salt marshes to climate change results from interactions between rising sea levels and varying freshwater inputs that operate on seasonal to interannual timescales.

PRESENTER BIO: Dr. Braswell is an Assistant Professor in SFFGS and a state extension specialist with Florida Sea Grant. She is a coastal ecologist interested in aquatic connections between upland watersheds and coastal ecosystems. Her research seeks to understand impacts of anthropogenic pressure on coastal ecosystems including salt marshes and oyster reefs.