# Development of a Coastal Drought Index using Salinity Data

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**Abstract.** The freshwater-saltwater interface in surface-water bodies along the coast is an important factor in the ecological and socio-economic dynamics of coastal communities. It influences community composition in freshwater and saltwater ecosystems, deter-mines fisheries spawning habitat, and controls freshwater availability for municipal and industrial water intakes. There are many definitions of drought, with most describing a decline in precipitation having negative impacts on water supply and agriculture. Indices have been developed for hydrological, agricultural, meteorological, and socio-economic drought types that incorporate data such as rainfall, streamflow, soil moisture, groundwater levels, and snow pack. These indices were developed for upland areas and may not be appropriate for characterizing drought in coastal areas. Because of the uniqueness of drought impacts on coastal ecosystems, a need exists to develop a coastal drought index. The availability of real-time and historical salinity datasets provides an opportunity to develop a salinity-based coastal drought index. The challenge of characterizing salinity dynamics in response to drought is excluding responses attributable to occasional saltwater intrusion events. Our approach to develop a coastal drought index modified the Standardized Precipitation Index and applied it to sites in South Carolina and Georgia. Coastal drought indices characterizing 1-, 3-, 6-, 9-, and 12-month drought conditions were developed. Evaluation of the coastal drought index indicates that it can be used for different estuary types, for comparison between estuaries, and as an index for wet in addition to drought conditions.