

What Happens in Florida Bay Does Not Stay in Florida Bay: Seagrass Die-Off Under Climate-Change

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Climate change is ushering in a less predictive environment in which to manage natural resources, including shallow nearshore habitats that influence water quality on the Florida Reef Tract. Future climate scenarios for Everglades' Coastal Marine Foundation Communities assessed a decade ago by the authors identified seagrass ecosystem stress from multiple drivers that coalesce to enhance hypoxia in the system. These drivers, elevated temperature, salinity and recurring algal blooms that reduce light to the benthos and cause hypoxia, also stimulate sulfide toxicity in tropical carbonate seagrass systems such as Florida Bay. This is consequential, as hypoxia and sulfide toxicity have been reported to be one of the leading causes of recurrent large-scale seagrass mortality events in Florida Bay, as well as globally. Our research over the last 25 years has been focused on gaining a more complete understanding of seagrass internal and water column oxidation and factors leading to seagrass decline and die-off events in Florida Bay that lower water quality. However, we now require a vehicle to translate these data into climate change driven projections. We present a synthesis of experiments and field microsensor studies that define the fundamental triggers of seagrass die-off and a modeling tool where we integrate these data for seagrass and water quality management under various scenarios of climate change within south Florida shallow nearshore habitats.