## Executive Summary

**The health of pelagic systems and wetlands are ecologically linked through a variety of mechanisms, but the extent of that linkage appears to vary geographically. The strength of this linkage is poorly understood for Pacific Coast sites, including the San Francisco Bay-Delta Estuary (SF Bay-Delta). Critically, wetlands are the most vulnerable habitats in California under a variety of climate change scenarios, and freshwater tidal and brackish wetlands, the most productive and diverse of the SF BayDelta wetlands, are the most sensitive of any tidal wetlands to climate changes. This proposal focuses on 1) evaluating the potential impacts of climate change on SF Bay-Delta tidal wetlands, 2) improving our understanding of the linkage between these wetlands and the pelagic food web, especially fish populations, and 3) using this information to make predictions about potential effects of climate change on Bay-Delta fish populations. Climate change predictions as they would impact the SF Bay-Delta system through an altered salinity regime, resulting from higher winter-spring floods and lower summer-fall flows, and increased sea-level rise. Over the long term, shifts in Bay-Delta salinity could lead to substantial shifts in the overall distribution of fresh, brackish and salt marsh ecosystems; increases in sea level could exacerbate these shifts and lead to the additional loss of wetlands due to increased rates of inundation. We will test the overall hypothesis that pelagic fish communities are critically linked to tidal wetlands and that processes involved in climate change will impact the quality and extent of these wetlands, negatively impacting fish population sizes and stability. We will use existing literature and new field data to investigate this linkage. Surveys of plant diversity, primary production and decomposition studies will track carbon production and rates of movement out of the wetland systems. Stable isotope analysis of fishes, an intermediate invertebrate trophic level, and wetland plants will provide necessary data for interpreting the significance of any trophic pelagicwetland linkage. We will measure wetland sedimentation rates to evaluate the ability of SF Bay tidal wetlands to withstand future increases in sea-level rise. Finally, using these data, we will model the potential impact to tidal wetlands and fish populations under a variety of climate change scenarios (varying salinity, sea-level rise, sediment availability) as a way to predict future impacts to these resources and to gain insight into potential management actions.**