**Impacts of Population Growth on the San Francisco Bay and Delta Ecosystem (SFE)**

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One challenge facing Earth system science is to understand and quantify the impacts and feedbacks of human influences on rivers, estuaries, and coastal zone ecology especially in regions of high population density like the San Francisco Bay and Delta Ecosystem (SFE). The goal of our NASA Interdisciplinary science project is to put in place a modeling framework to inform stewardship of freshwater and marine resources within the SFE and adjacent ocean ecosystems. Our SFE project combines four components: (1) satellite observations, (MERIS, HICO, Landsat-8, and in the future Sentinel-3); (2) field observations (nutrients, phytoplankton, suspended sediments, CDOM, and optical properties); (3) the CoSiNE ecological model integrated with (4) a SELFE hydrological model of the SFE. Here we present initial remote sensing results using three instruments; MERIS-FR (300m GSD, 15 ocean bands, CoastColour coastal products, 2002-2012), the Hyperspectral Imager for the Coastal Ocean (HICO, 100 m GSD, hyperspectral imager, 2009-2014) and Landsat-8 (30 m GSD with a limited land-oriented band set, ongoing). The MERIS data are used to provide a 10 year time series to compare drought and non-drought years and for model validation. HICO and Landsat-8 data provide the high resolution needed to resolve features in the rivers and shipping channels.

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