**Inland and Coastal Water Applciations of Ocean Colour Observations from a Geostationary Orbit**

Maria Tzortziou1, John Haynes2

Nearshore environments are among the most vulnerable yet economically valuable ecosystems on Earth. Estuaries and coastal oceans are critically important as essential habitat for marine life, as highly productive ecosystems, as a strong economic driver for coastal communities, and as a highly dynamic interface between land and ocean biogeochemical cycles. Still, our present capabilities to observe inland and coastal water dynamics from space are limited in their temporal, spatial, and spectral resolution. These limitations, in turn, constrain our ability to monitor and understand physical and biogeochemical processes in nearshore environments, or predict the response and resilience of nearshore ecosystems to current and future pressures including sea level rise, coastal urbanization, and anthropogenic pollution.

On a geostationary orbit, and with high spatial resolution and hyper-spectral capabilities, NASA's Decadal Survey mission GEO-CAPE (GEO-stationary for Coastal and Air Pollution Events) will provide, for the first time, a satellite view of diurnal dynamics, evolution of processes, and episodic events along the near-shore waters of the United States. GEO-CAPE will observe U.S. lakes, estuaries, and coastal regions at sufficient temporal and spatial scales to resolve near-shore processes, tides, coastal fronts, and eddies, track sediments and pollutants, capture diurnal biogeochemical processes and rates of transformation, monitor harmful algal blooms, oil spills, water-quality, and coastal hazards. Here we discuss the societal benefits and unique applications value of GEO-CAPE ocean colour observations and data products, to identify potential user communities (e.g., operational users, managers, policy implementers) and allow integration of end-user needs into future mission planning.

1. Email: [mtzortziou@ccny.cuny.edu](mailto:mtzortziou@ccny.cuny.edu) Address: NASA Goddard Space Flight Center, and The City University of New York, New York, NY, USA

2. Email: [jhaynes@nasa.gov](mailto:jhaynes@nasa.gov) Address: NASA Headquarters Applied Sciences Program, Washington DC, USA