## EARTH OBSERVATION SYMPOSIUM (B1) Future Earth Observation Systems (2)

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OCAPI: THE "OCEAN COLOUR ADVANCED PERMANENT IMAGER"

## Abstract

We present the "ocean colour permanent imager" (OCAPI) mission concept, which consists of a visible and near infrared radiometer to be accommodated as a host on a commercial platform on a geostationary orbit. The instrument would image the entire Earth disk about every hour, with a ground resolution at the equator of ca. 250m. About 13 spectral bands are proposed, so as to ensure highly accurate atmospheric correction of the observations above all types of waters, and production of the geophysical quantities of interest. The overall objectives of this mission are organised under 3 "categories" or "tiers": 1- Within a range of conditions of observation (e.g., solar view angles, cloudiness), the diel dynamics of the ocean will be accessible. The first objective in this case is to study the ocean ecosystem functioning at the diurnal scale. 2- When a little less observations will be available over a day, the second group of objectives is related to observation and understanding of rapidly evolving phenomena (e.g., river outflows, aerosol plumes, phytoplankton blooms, hazards, (sub)meso-scale features, tidal cycles), which are rather under the influence of physical forcings. 3- When the conditions of observation do not allow the diel changes to be sampled, there is still the capability to dramatically improve spatial coverage at the daily scale. This is of tremendous importance for all operational uses, from data assimilation into coupled biological-physical 3D models to services to users in coastal zones. The science domains that will benefit from OCAPI observations include the study of the diurnal variability of ocean optical and biogeochemical properties, the use of this diel variability to determine the primary productivity of the ecosystem, the study of the coupling at sub-meso scales between physics and biology and the consequences on primary production and carbon fluxes, data assimilation into coupled ocean physical-ecosystem models, the study of dynamics of the coastal ocean ecosystems and habitats, the quantification of sediment and carbon transport and fluxes from land to ocean, the study of aerosol transport from land to sea, including dust or volcanic aerosols. OCAPI would provide a large variety of products and applications that would contribute to developing an "Earth system science approach", where the many compartments of the Earth functioning are jointly investigated.