

Assessing Requirements for Sustained Ocean Color Research and Operations

Key Findings

- Satellite ocean color sensors measure the radiance from sunlight backscattered from the ocean and atmosphere. Deriving the ocean component of the total radiance is a complex, multi-step process, but lessons learned from the Sea-viewing Wide Field-of-view Sensor (SeaWiFS) and Moderate Resolution Imaging Spectroradiometer (MODIS) sensors provide insights that could improve current and future capabilities.
- All current sensors are beyond their design life. The launch of a new satellite, Visible Infrared Imaging Radiometer Suite (VIIRS), is planned for fall 2011, but the committee concluded that VIIRS will only produce high-quality ocean color data if a series of improvements are made. Suggested actions include implementing a monthly lunar view, supporting a MOBY-like vicarious calibration approach, and building the capability to process and reprocess ocean color data at NOAA.
- To implement the suggested improvements to the VIIRS sensor, NOAA would need to build capacity, particularly in the areas of processing and calibrating ocean color data. Because NASA is already an internationally recognized leader in producing well-calibrated ocean color data products, the committee recommends that the two agencies could work in partnership to produce, archive, and distribute data of shared interest.
- If steps to resolve issues with VIIRS are not implemented, the US will lose its capability to sustain the current time-series of high quality ocean color measurements. Non-US sensors could augment data for US users if data-exchange agreements were immediately pursued.
- Based on its review of previous ocean color missions, the committee recommends a data-centric planning effort that involves multiple agencies and input from the academic research community would help support ocean color sensing; in particular, by ensuring continuity in satellite missions, that lessons learned are incorporated into future missions, and that capabilities for processing US and non-US data are maintained.
- The data requirements for ocean color applications are so diverse that a single satellite sensor or space agency cannot meet all ocean color needs. An international collaborative effort combining the many sensors planned for the future—for example, from Japan, South Korea, and India, and by the European Space Agency—could help meet the many diverse demands of the ocean color community.
- In order to ensure continuous funding for the ocean color research that extends beyond the lifetime of any particular satellite mission and provide long-range planning, the committee suggested forming a National Ocean Color body with representatives from federal agencies, academic institutions and the private sector. This group could supply external advice to individual missions, interact with foreign partners and develop consensus views on data needs and sensor requirements.