MEETINGS

Inland and Coastal Waters

Workshop for Remote Sensing of Coastal and Inland Waters; Madison, Wisconsin, 20–22 June 2012

Coastal and inland water bodies, which have great value for recreation, food supply, commerce, transportation, and human health, have been experiencing external pressure from direct human activities and climate change. Given their societal and economic value, understanding issues of water quality, water quantity, and the impact of environmental change on the ecological and biogeochemical functioning of these water bodies is of interest to a broad range of communities.

Remote sensing offers one of the most spatially and temporally comprehensive tools for observing these waters. While there has been some success with remotely observing these water bodies, many challenges still remain, including algorithm performance, atmospheric correction, the relationships between optical properties and biogeochemical parameters, sufficient spatial and spectral resolution, and a lack of uncertainty estimates over the wide range of environmental conditions encountered across these coastal and inland water bodies.

A NASA-sponsored workshop took place at the University of Wisconsin-Madison in June 2012 to address these challenges. The 53 participants included researchers from Australia, Canada, China, Estonia, Germany, and the United States. The workshop focused on parameters that can be remotely sensed that lend insight into how coastal and inland aquatic systems are changing on seasonal and interannual time scales related to climate-induced environmental change and direct human impact. The scope was limited to products that can be derived from visible spectral reflectance (aquatic color) and infrared emissivity (surface temperature) and the science considerations surrounding these products.

The workshop summarized the current state of remote sensing in these complex waters, identifying gaps in knowledge and data needs and priorities, providing a framework for near- and long-term science goals. The workshop covered topics including products that are currently able to be retrieved; algorithm refinement and development for improved and desired products; spectral, spatial, and temporal limitations and needs; relationships between optical and biogeochemical properties; atmospheric correction; uncertainty considerations; in situ data availability and needs; planning for full utilization of forthcoming sensors with improved spatial, spectral, and temporal resolution; and priorities for the future.

Several issues were identified as being able to be resolved in the near term. Interest in inland and coastal waters across numerous scientific, management, and societal realms has led to a variety of data policies and protocols. It was recommended that a professional identity be developed that encompasses the intersection of communities, to be led by a dedicated staff person to spearhead unifying observations. The immediate data needs identified include (1) getting existing optical and biogeochemical data into a single repository to enable efficient algorithm development and validation efforts, (2) updating standard observation protocols to include considerations for the high dynamic range of parameters encountered in these waters, and (3) developing a standard set of recommended observations across investigators and nations.

The planned outcome of the workshop is a published review of the state of remote sensing of coastal and inland waters with prioritized recommendations for future research and enabling activities. Further information regarding the workshop, including presentations, can be found at http://www.ssec.wisc.edu/meetings/ciw/.

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