

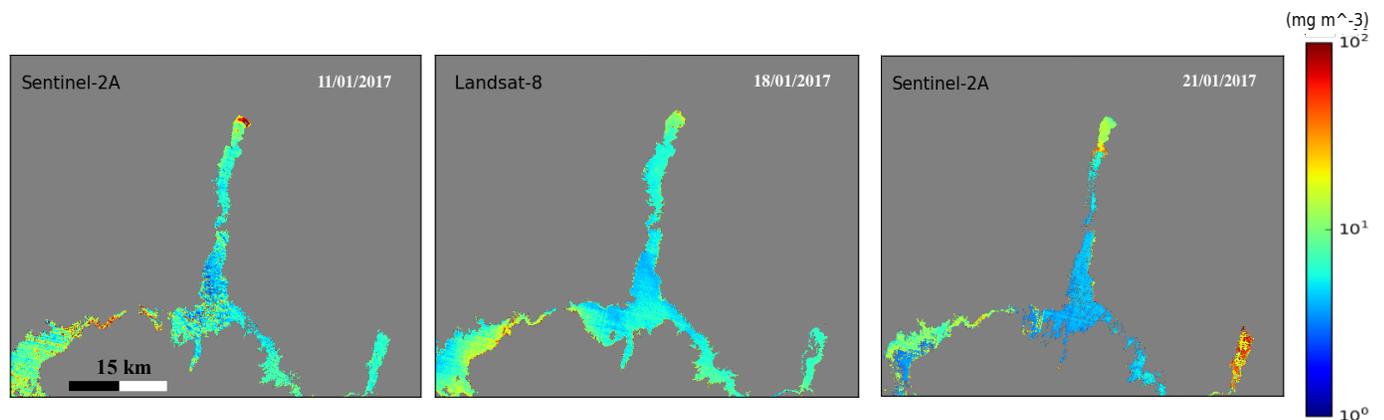


## Towards a satellite-based near real-time monitoring system for water quality

Date: September 27 2017

Location: NASA Goddard Space Flight Center's Visitor Center  
Greenbelt MD

Over the years, Landsat data have enabled scientists to understand how Earth resources are changing at local, regional, or global scales, however, these data have not been integrated into a common water quality monitoring systems. With NASA-USGS Landsat-8 data and the European Space Agency's Sentinel imagery, i.e., Sentinel-2 & -3, we are entering a new era where daily satellite observations of nearshore coastal and/or inland freshwater systems are becoming possible, cloud cover permitting. For example, shown below are three examples of chlorophyll-a products derived from Landsat-8 and Sentinel-2 images over Lake Mead, NV. These products are generated via NASA ocean color processing software package; the products provide information on lake-wide variability of near-surface concentrations of chlorophyll-a at no cost as opposed to expensive discrete grab-samples conducted in the field.



Three examples of chlorophyll-a products over Lake Mead, NV, January 2017.

This one-day workshop will introduce attendees to the concept of a proposed *web-based near real-time tool* designed to inform end users of anomalous water quality conditions in their regions of interest. Supplied with Landsat-Sentinel products and built upon existing monitoring systems at the Earth Science Division of NASA Goddard Space Flight Center, this web-based tool will facilitate user access, remove the need for extensive training, reduce monitoring costs (e.g., through guided field sampling), and inform users of potential hazards (e.g., blooms, spills). Through this workshop, NASA expects to formulate the next steps towards making such a near real-time system a reality with input and guidance from potential users.

### OBJECTIVES

The overarching goal of this workshop is to engage with the end user community and seek out their requirements for a near real-time water quality warning system. More specifically, we aim to

- Establish new partnerships and learn end user experiences

- Demonstrate NASA's existing early-warning systems
- Identify and prioritize water quality end-user product needs and required resolutions
- Identify resources and define joint projects/developments for testing/validations

## **ANTICIPATED ACTIONS/OUTCOMES**

1. Define pilot projects to test the prototype web-based tool
  - a. Test the efficiency of the tool for detecting anomalies
  - b. Choose an initial product of highest interest for the warning system
2. In situ data sharing agreements for validation

## **WHO TO ATTEND**

This one-day workshop is intended for state or federal water managers in charge of water quality, water supply, drinking water, restorations, ecosystems, fisheries. Also, representatives from developmental organizations (e.g., World Bank) and academics who interact with end users are encouraged to attend. Note that travel support is *not* provided through NASA.

## **VENUE**

The workshop will be held at NASA Goddard Space Flight Center's [Visitor Center](#) on Sept 27th 2017.

## **WORKSHOP INVITATIONS**

*Participation in the workshop is by invitation.* Please express your interest in participating by completing the online registration form (below). The workshop organizing team will follow up with invitations to as many registrants as possible, subject to the capacity of the venue.

## **REGISTRATION FORM**

Please sign up using the link below.

[https://docs.google.com/forms/d/e/1FAIpQLSdNudY5YxIxBJkgJSl3jZ7VQy9IetHLi3VNDBTVZSs\\_aDDaUmA/viewform?usp=sf\\_link](https://docs.google.com/forms/d/e/1FAIpQLSdNudY5YxIxBJkgJSl3jZ7VQy9IetHLi3VNDBTVZSs_aDDaUmA/viewform?usp=sf_link)

## **PRELIMINARY AGENDA**

- Remote sensing of aquatic systems (~ 45 mins)
  - Introduction to remote sensing of water quality (Landsat + Sentinel) (20 min)
  - Algorithms & in situ measurements (15 min)
- User perspective, experiences and needs (~ 1 hour): 5-7min each
  - Anticipate and respond to WQ problems/emergencies
  - Current monitoring practices using satellite data products
  - Integrating in situ and satellite products
  - Requirements for a near real-time warning system

- Web-based early warning systems (~ 1 hour)
  - Fire Information for Resource Management System (FIRMS)  
<https://firms.modaps.eosdis.nasa.gov/>
  - Demonstration of an early warning water-quality tool for select sites
  
- Discussions (panel) (~ 1 ½ hour)
  - Economic value of satellite products for water quality (VALUABLES)
  - Products of highest interest for the warning system
  - In situ data sharing & integrations with satellite products
  - Integrations with surface models
  - Form a community for interactions between data providers and users
  - Develop application portals to facilitate access to best-practice products