

# ***Great Lakes Workshop Series*** ***On Remote Sensing of Water Quality***

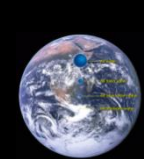
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## ***Workshop 2***

***Ann Arbor, MI***  
***May 7-8***

***Larry C. Liou***

***Space Science Project Office***  
***NASA John H. Glenn Research Center***

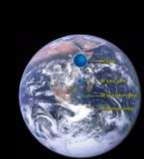


# ***Acknowledgement***



## ***Special thanks to:***

- ***The NASA Applied Earth Science Program for support***
- ***All steering committee members for the steering and co-organizing effort***
- ***Dr. Robert Shuchman, Amanda Grimm, Colin Brooks, and Michelle Wienert of Michigan Tech Research Institute for the technical & logistic leadership & support***



# Steering Committee



**Larry Liou**  
(Co-Organizer)

**Lead for Freshwater Research**  
NASA Glenn Research Center

**Dr. Robert Shuchman**  
(Co-Organizer)

**Co-Director**  
Michigan Tech Research Institute  
Michigan Tech University

**Dr. Steve Greb**

**Hydrologist**  
Wisconsin Department of Natural Resources

**Dr. George Leshkevich**

**Physical Scientist**  
NOAA Great Lakes Environmental Research Laboratory

**Dr. John Bratton**

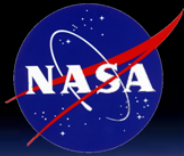
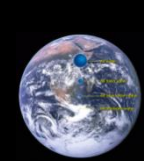
**Deputy Director**  
NOAA Great Lakes Environmental Research Laboratory

**Dr. Jennifer Read**

**Executive Director**  
Great Lakes Observing System

**Dr. John Lekki**

**Optical Systems Research Engineer**  
NASA Glenn Research Center



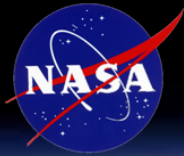
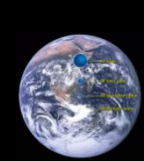
# ***Goal for the Workshop Series***

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**“Identification of gaps in science and technology for remote sensing of water quality**

***Featuring:***

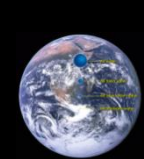
- ***An emphasis on Great Lakes waters***
- ***Building upon results of past workshops***
- ***Formulation of potential, short, pilot projects***



# ***Objectives for the Workshops***

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- Identify gaps between the needed and the available water quality data
- Describe the science, technology, & missions required for satisfying the needs
- Foster Great Lakes remote sensing and community development and data sharing



# Workshop 2 Format



## ➤ Plenary talks

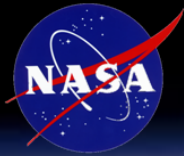
- Lay ground information for breakout discussions in afternoon

## ➤ Breakout discussion topics

1. Moving forward with a regional remote sensing strategy
2. Data distribution of Great Lakes remote sensing data
3. Algorithm comparison studies
4. Create plan to maintain an active Great Lakes RS community
5. Remote sensing derived products sharing & credit to originators
6. Define time series RS datasets (i.e. HABs, primary Productivity)

Day 1

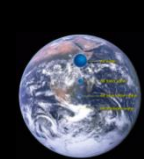
Day 2



# *Post Workshop Activities*

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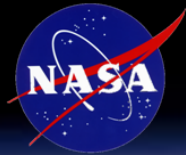
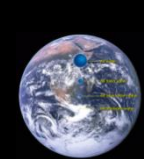
- **Publish workshop result as a possible input to 2017 Earth Science Decadal Survey**
- **Continue to engage participants' communities for exchanges and collaboration**
- **Collaborate on the short (10-week) projects identified at the workshop**



*~ Guided by the Decadal Survey & Science Plan ~*

- **Water & Energy Cycle**
  - **Fundamental Science**
- **Water Resource**
  - **Quantity**
  - **Quality**
  - **Decisions/Management**
  - **Capacity Building**





# ***Roles in Water Research NASA GRC Can Fill***

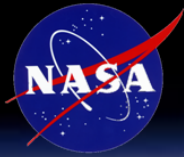
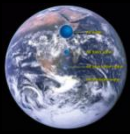
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- **Help organize the remote sensing products and services, including communities and activities**
- **Coordinate remote sensing related water quality research regionally, nationally, & internationally**
- **Coordinate in-situ (air, water surface & under, and ground stations) and remote sensing measurements**
- **Develop instrument for remote sensing, airborne, in-situ, and in-water**
  - ✓ **Test and validation**



# GRC Air Fleet for Arial Remote Sensing





# *Questions? Inputs?*

*Larry Liou*

NASA GRC

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