

**American Public Health Association (APHA) 2010 Annual Meeting  
Nov 6-10, 2010, Denver, CO**

**Presenter (Oral Presentation):**

Max J. Moreno

**Authors:**

Max J. Moreno<sup>1</sup>, Mohammad Z. Al-Hamdan<sup>2</sup>, Maurice G. Estes, Jr.<sup>2</sup>, and Douglas L. Rickman<sup>3</sup>

(1) Global Hydrology and Climate Center NSSTC/MSFC/NASA, Fellow of the Nasa Postdoctoral Program/Oak Ridge Associated Universities, 320 Sparkman Drive, Huntsville, AL 35805.

(2) Public Health Applications, NASA/USRA, 320 Sparkman Dr., Huntsville, AL 35805.

(3) Global Hydrology and Climate Center NSSTC/MSFC/NASA, NASA/National Space Science and Technology Center, 320 Sparkman Drive, Huntsville, AL 35805.

**Selection:**

GIS Mapping, Global Health Surveillance and Public Policy

**Title:**

Use of MODIS Terra imagery to estimate surface water quality standards, using Lake Thonotosassa, Florida, as a case study

**Abstract**

Lake Thonotosassa is a highly eutrophied lake located in an area with rapidly growing population in the Tampa Bay watershed, Florida. The Florida Administrative Code has designated its use for "recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife." Although this lake has been the subject of efforts to improve water quality since 1970, overall water quality has remained below the acceptable state standards, and has a high concentration of nutrients. This condition is of great concern to public health since it has favored episodic blooms of Cyanobacteria. Some Cyanobacterial species release toxins that can reach humans through drinking water, fish consumption, and direct contact with contaminated water.

The lake has been historically popular for fishing and water sports, and its overflow water drains into the Hillsborough River, the main supply of municipal water for the City of Tampa, this explains why it has been constantly monitored *in situ* for water quality by the Environmental Protection Commission of Hillsborough County (EPC). Advances in remote sensing technology, however, open the possibility of facilitating similar types of monitoring in this and similar lakes, further contributing to the implementation of surveillance systems that would benefit not just public health, but also tourism and ecosystems. Although traditional application of this technology to water quality has been focused on much larger coastal water bodies like bays and estuaries, this study evaluates the feasibility of its application on a 46.6 km<sup>2</sup> freshwater lake. Using surface reflectance products from Moderate-Resolution Imaging Spectroradiometer (MODIS) Terra, this study evaluates associations between remotely sensed data and *in situ* data from the EPC. The parameters analyzed are the surface water quality standards used by the State of Florida and general indicators of trophic status.

Learning Objectives:

- Evaluate the feasibility of using remote sensing to identify surface water quality conditions useful to warn and prevent cases and outbreaks of diseases related to harmful algal blooms in urban lakes.
- Describe the potential of using remote sensing to facilitate surveillance systems to prevent conditions leading the harmful algal blooms.
- Describe the convenience of applying remote sensing to monitoring of surface water quality on urban lakes.