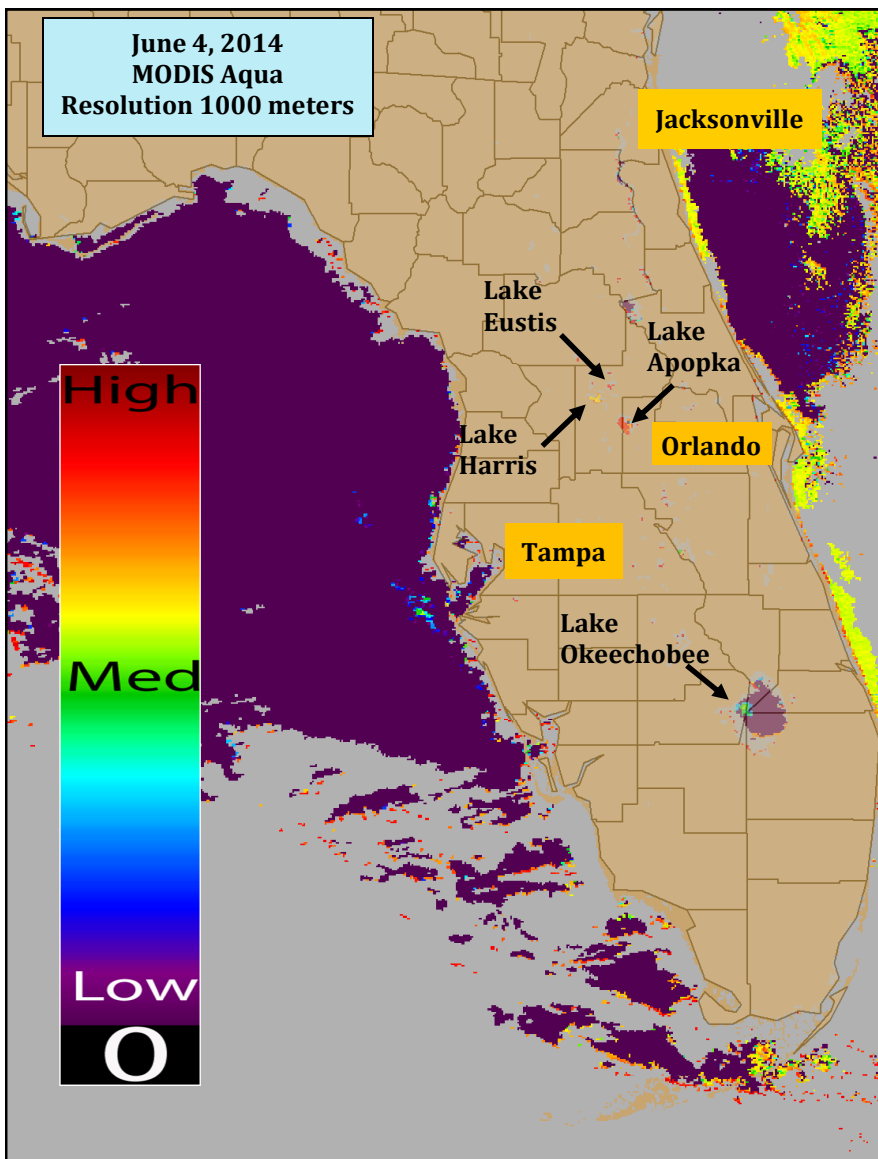


To report an illness related to a freshwater, estuarine, marine toxin or harmful algal bloom, please contact the Florida Poison Information Center at 1-800-222-1222.

Images/data are obtained from Florida Fish and Wildlife Research Institute, Florida Water Management Districts, National Oceanic and Atmospheric Administration (NOAA), NOAA National Climatic Data Centers and National Weather Centers. Support to produce this report comes from NOAA/NASA Contract NNH08ZDA001N.



CyanoHAB Conditions Report

- Lake Harris (Lake County) displayed medium estimated elevated chlorophyll-a concentrations.
- Lake Eustis (Lake County) displayed high estimated elevated chlorophyll-a concentrations.
- Lake Apopka (Orange/Lake Counties) displayed high estimated elevated chlorophyll-a concentrations.
- Lake Okeechobee (Okeechobee/Glades/Hendry/Palm Beach/Martin Counties) displayed medium estimated elevated chlorophyll-a concentrations.
- Cloud coverage obscured the imagery for most of the state (see true color image on page 2).

Ciguatera Fish Poisoning and Climate Change



Ciguatera Fish Poisoning and Climate Change: Analysis of National Poison Center Data in the United States, 2001–2011

By Daniel B. Gingold, Matthew J. Strickland, and Jeremy J. Hess

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Background: Warm sea surface temperatures (SSTs) are positively related to incidence of Ciguatera fish poisoning (CFP). Increased severe storm frequency may create more habitat for ciguatoxic organisms. Although climate change could expand the endemic range of CFP, the relationship between CFP incidence and specific environmental conditions is unknown.

Objectives: We estimated associations between monthly CFP incidence in the contiguous United States and SST and storm frequency in the Caribbean basin.

Methods: We obtained information on 1,102 CFP-related calls to U.S. poison control centers during 2001–2011 from the National Poison Data System. We performed a time-series analysis using Poisson regression to relate monthly CFP call incidence to SST and tropical storms. We investigated associations across a range of plausible lag structures.

Results: Results showed associations between monthly CFP calls and both warmer SSTs and increased tropical storm frequency. The SST variable with the strongest association linked current monthly CFP calls to the peak August SST of the previous year. The lag period with the strongest association for storms was 18 months. If climate change increases SST in the Caribbean 2.5–3.5°C over the coming century as projected, this model implies that CFP incidence in the United States is likely to increase 200–400%.

Conclusions: Using CFP calls as a marker of CFP incidence, these results clarify associations between climate variability and CFP incidence and suggest that, all other things equal, climate change could increase the burden of CFP. These findings have implications for disease prediction, surveillance, and public health preparedness for climate change.

Citation: Gingold DB, Strickland MJ, Hess JJ. 2014. Ciguatera fish poisoning and climate change: analysis of National Poison Center data in the United States, 2001–2011. *Environ Health Perspect* 122:580–586; <http://dx.doi.org/10.1289/ehp.1307196>

MODIS Images display a chlorophyll-a index generated with a Moderate Resolution Imaging Spectroradiometer provided by the National Aeronautics and Space Administration (NASA)

- Very low likelihood of a bloom
- May indicate clouds or missing data
- Low estimated chlorophyll-a concentrations
- Medium estimated chlorophyll-a concentrations
- Higher estimated chlorophyll-a concentrations

Status reports for Florida red tide are suspended until bloom conditions reoccur.

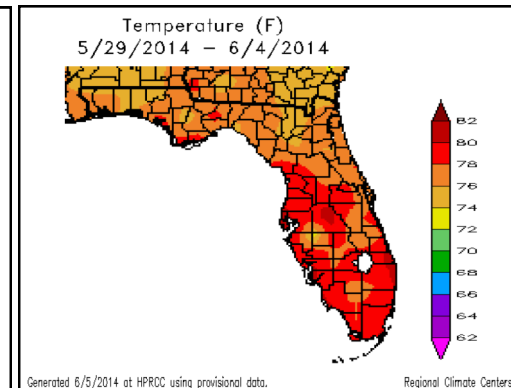
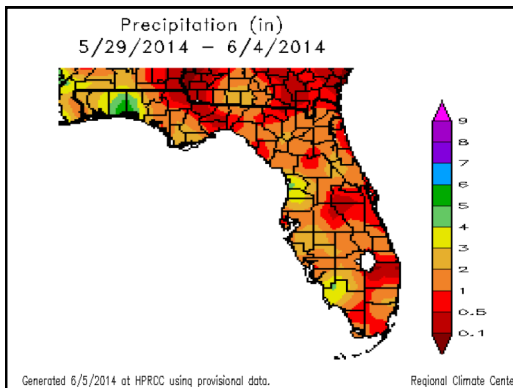
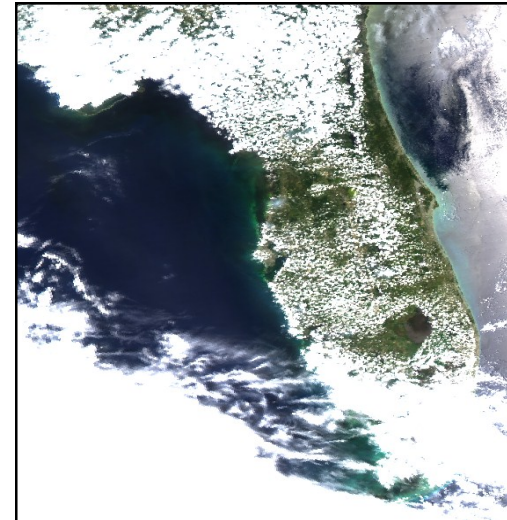
Interpreting Moderate Resolution Imaging Spectroradiometer Data

- The Moderate Resolution Imaging Spectroradiometer (MODIS) is deployed by NASA onboard the Terra (EOS AM) and Aqua (EOS PM) satellite. It passes over the earth, collecting new imagery every 1-2 days.
- This imagery is used as a surveillance tool. Data collected by the MODIS sensor are used to generate a chlorophyll-a index, which is used to forecast harmful algal blooms. The results are not specific to any one HABs species, and should be followed-up with onsite field observations. Data is only suggestive of a potential HAB event.
- MODIS uses a spectral band that is much coarser than MERIS; therefore, only select larger water bodies in FL are visible using this technology.
- MODIS is better at depicting low to medium chlorophyll-a concentrations. Once a potential bloom is depicted, a switch in algorithms may be used to improve the visibility. MODIS has a few spectral bands, which have higher resolution that are more comparable to MERIS. However, these bands do not cover all of FL.
- Several environmental factors may affect how results can be interpreted. For example, areas with abundant aquatic vegetation may present with a high chlorophyll-a index resulting in a false positive bloom reading.
- The sensor identifies biomass near the surface (in the upper few feet of water). As a result, it may underestimate the total biomass for blooms that are mixed or dispersed through the water column.
- While patches of red or warm colors may indicate higher chlorophyll-a concentrations, these data have not been verified in most cases using ground-truth methods.

Weather Conditions: Precipitation and Temperature - 05/29/14 to 06/04/14

- Weather conditions can impact the duration and location of blooms and the satellite imagery shown in this report may no longer be relevant.
- Images represent the last image taken with a realization that blooms may have moved, dissipated or intensified.
- Cloud coverage can obscure imagery and create patches or gray areas on map and obscure bloom detection.

June 4, 2014 MODIS Aqua True Color Image



To review HABs satellite reports in the Gulf of Mexico and marine waters visit the NOAA Harmful Algal Bloom Operational Forecast System bulletin archive at:
<http://tidesandcurrents.noaa.gov/hab/bulletins.html>



For Individual Weather Station Data, visit:
<http://www.sercc.com/climate>

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