

Cyanobacteria Assessment Network (CyAN)

Serie de Capacitaciones en Línea NASA ARSET

Semana 4: El Monitoreo a Gran Escala Usando la Teledetección y la
Ciencia Ciudadana

26 de septiembre de 2017

Wilson Salls

ORISE Research Fellow

U.S. EPA Office of Research and Development



Declaración de Misión y Objetivos

“Apoyar la gestión ambiental y el uso por parte del público de los lagos y estuarios de EEUU proporcionando una capacidad de detectar y cuantificar floraciones de algas y la calidad del agua relacionada usando registros de datos satelitales.”

- Crear una metodología **estándar y uniforme** para identificar floraciones de algas nocivas (HABs)
- Desarrollar un sistema de **diseminación** de información
- Entender las conexiones entre las condiciones **sanitarias, económicas y ambientales** y las HABs



Productos del Trabajo de CyAN

- Validación de datos de campo
- Desarrollo de algoritmos
- Evaluación de algoritmos
- Factores del terreno
- Efectos sobre la salud
- Beneficios económicos de la alerta temprana
- Diseminación de datos



Fuente: MERIS/NASA; procesado por NOAA/NOS/NCCOS

Datos In Situ



National Water Quality Monitoring Council
Working together for clean water

Water Quality Data

[WQP Home](#) [Download Data](#) [How to use the WQP](#) [National Results Coverage](#) [About the WQP](#)

LOCATION

Place:

Country: ?
State: ?
County: ?

Point Location: ?

Within miles of
North:
South:
East:
West:
Lat:
Long:

Bounding Box: ?

[Use my location](#)

SITE PARAMETERS

Site Type: ?
Organization ID: ?
Site ID: ?
HUC: ?
Minimum sampling activities per site: ?

[Search Upstream and Downstream \(BETA\)](#) ?

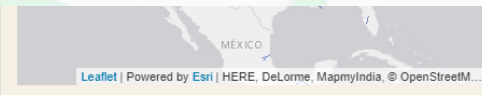


SAMPLING PARAMETERS

Sample Media: ?
Characteristic Group: ?
Characteristics: ?
Project ID: ?
Parameter Code: (NWIS ONLY) ?
Minimum results per site: ?
Date range - from: to:
Biological sampling parameters: ?
Assemblage: ?
Taxonomic Name: ?

<https://www.waterqualitydata.us/>

STATES



DATA SOURCE

Select database:

[Show sites on map](#)

Style sites:

Select data to download:

- Site data only
- Sample results (physical/chemical metadata)
- Sample results (biological metadata)
- Sample results (narrow)
- Sampling Activity
- Sampling Activity Metrics
- Result Detection Quantitation Limit Data

File format:

- Comma-separated
- Tab-separated
- MS Excel 2007+
- KML (Keyhole Markup Language - for Sites only)

Sort data

[DOWNLOAD](#)

[Show Web Service Calls](#)

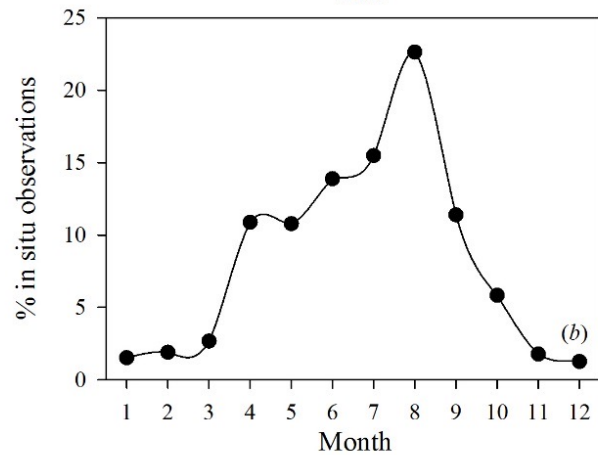
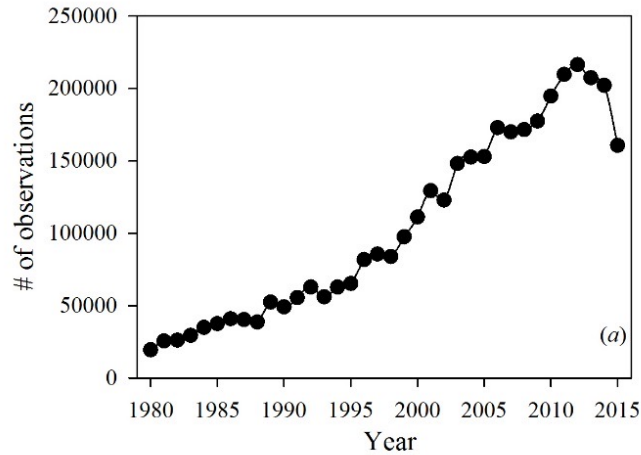
[Show ArcGIS Online Parameters](#) ?

[Contact us](#)

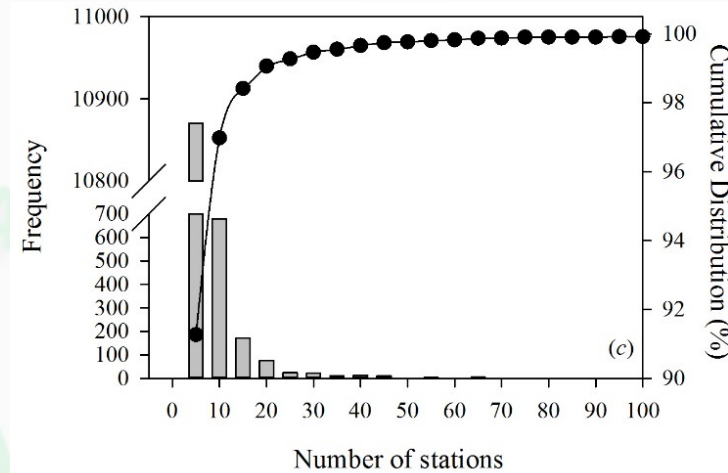


Muestreo In Situ: Resolución Espacial y Temporal

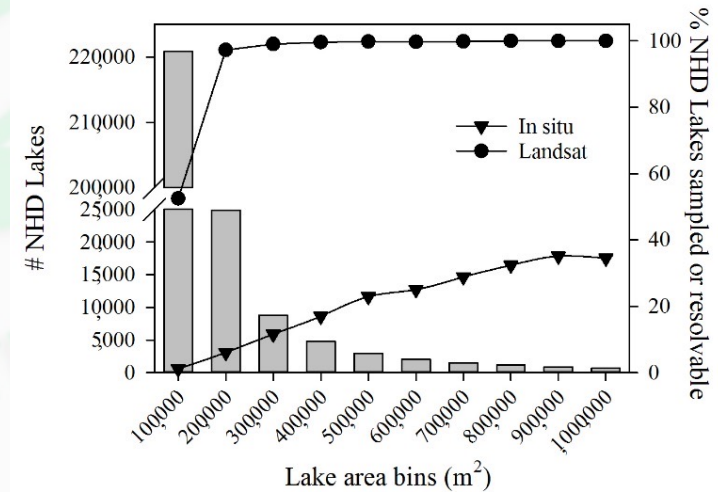
Ejemplo: Temperatura Lacustre



Número de observaciones in situ al año (sup.) y distribución de muestras por mes (inf.).



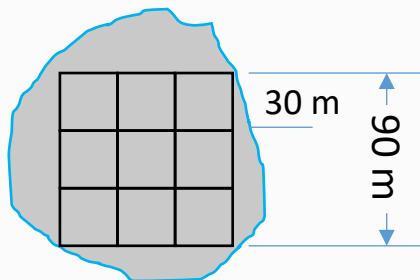
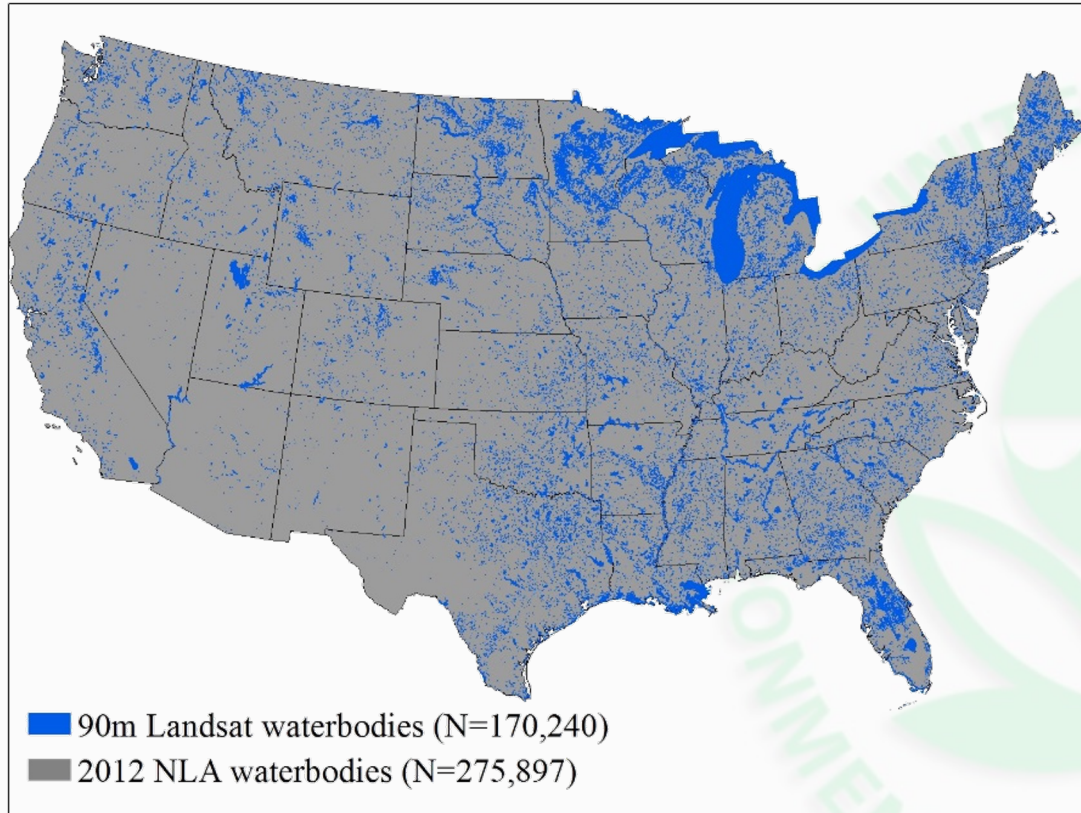
Número de estaciones por lago y distribución acumulativa por lago.



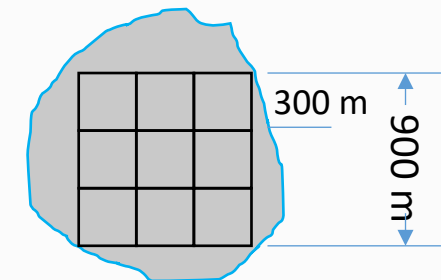
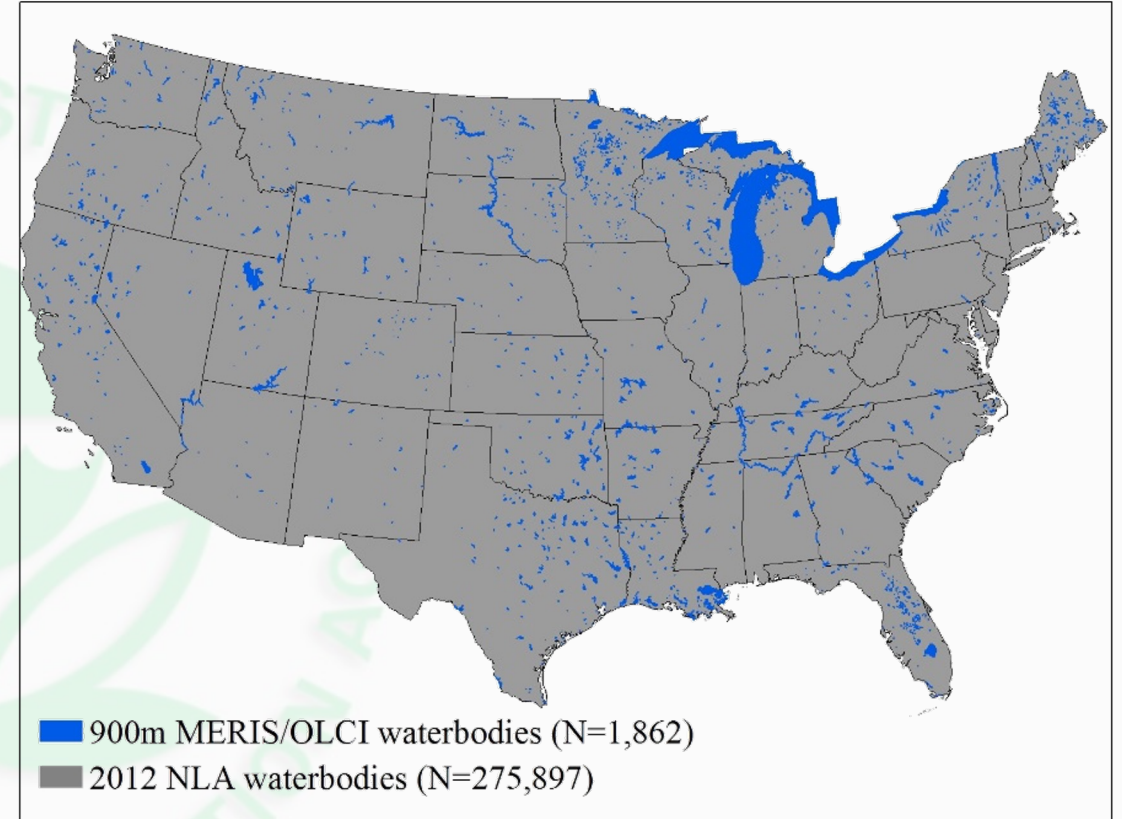
Porcentaje de lagos muestreados por área superficial

Resolución Espacial

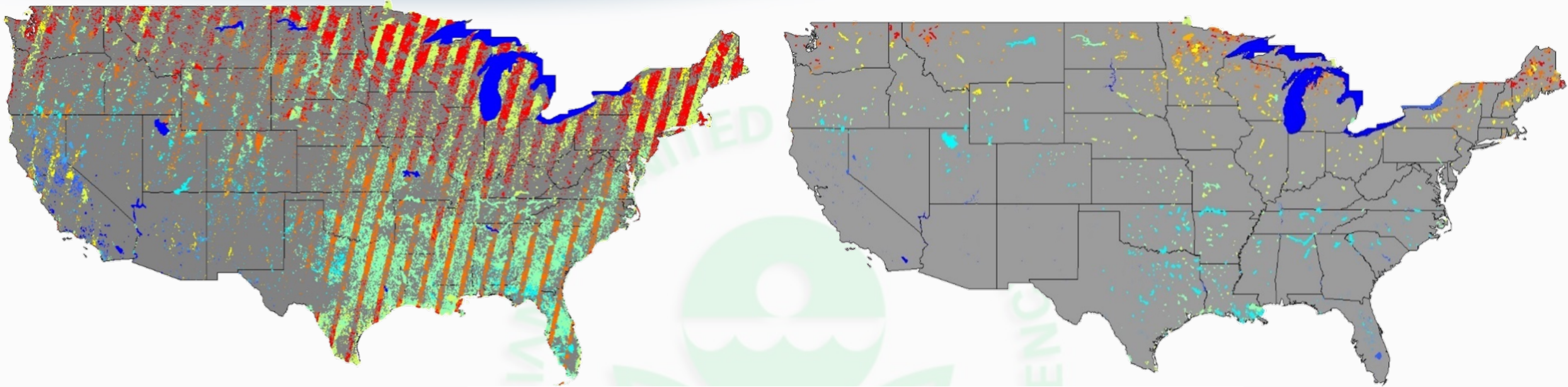
Landsat 8 Operational Land Imager (OLI)



Envisat MEdium Resolution Imaging Spectrometer (MERIS)



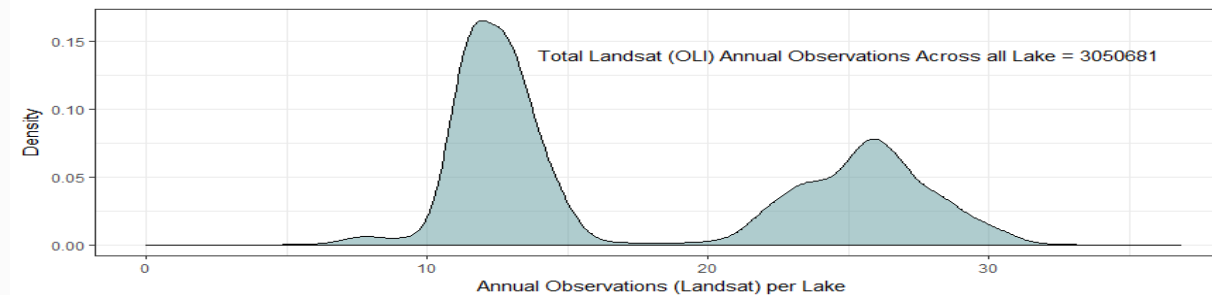
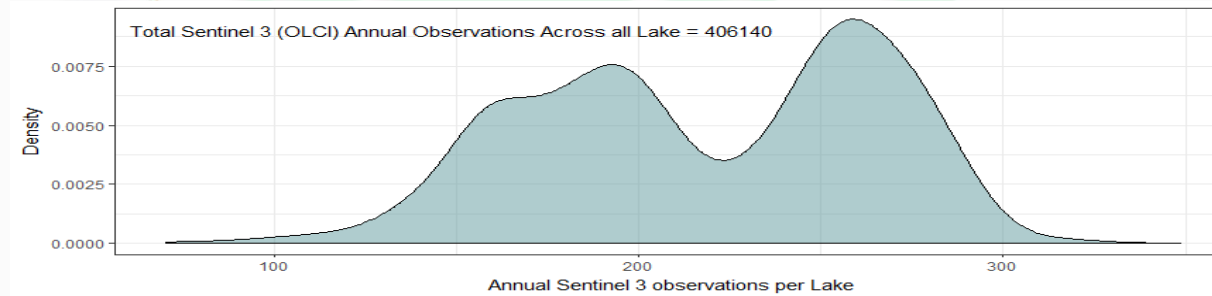
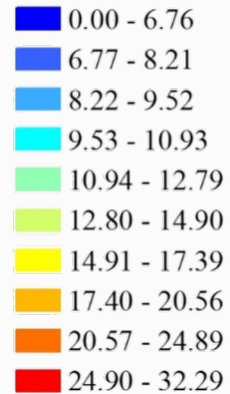
Resolución Temporal



Observaciones libres de nubes por año

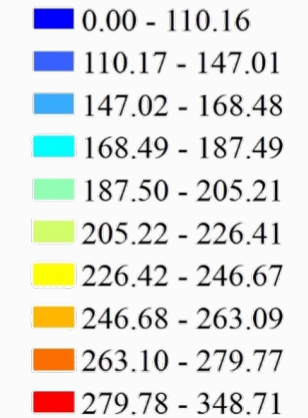
Landsat_Full_Year_Cloudfree_views

#Observations/Yr

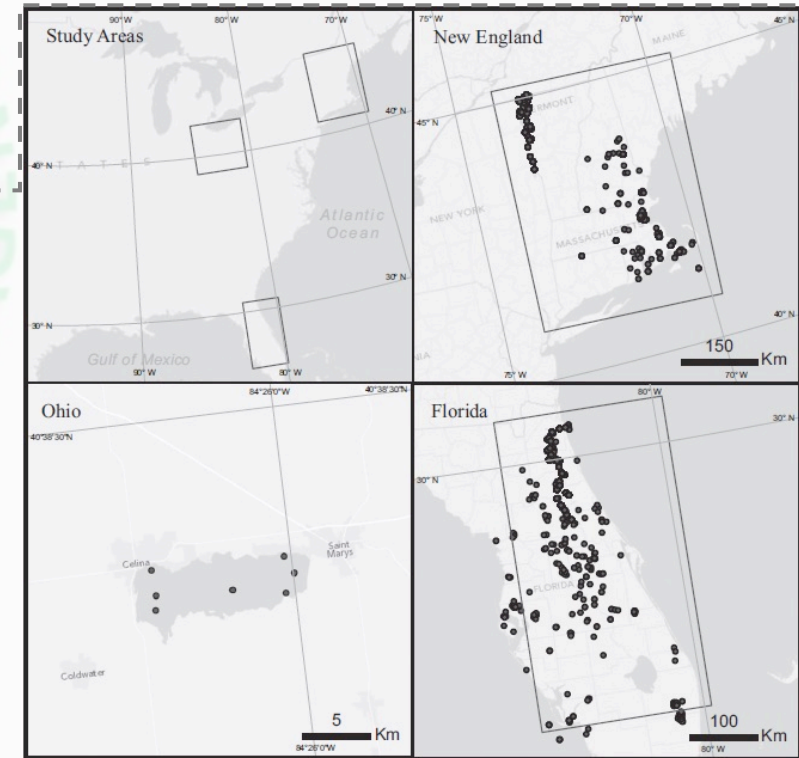
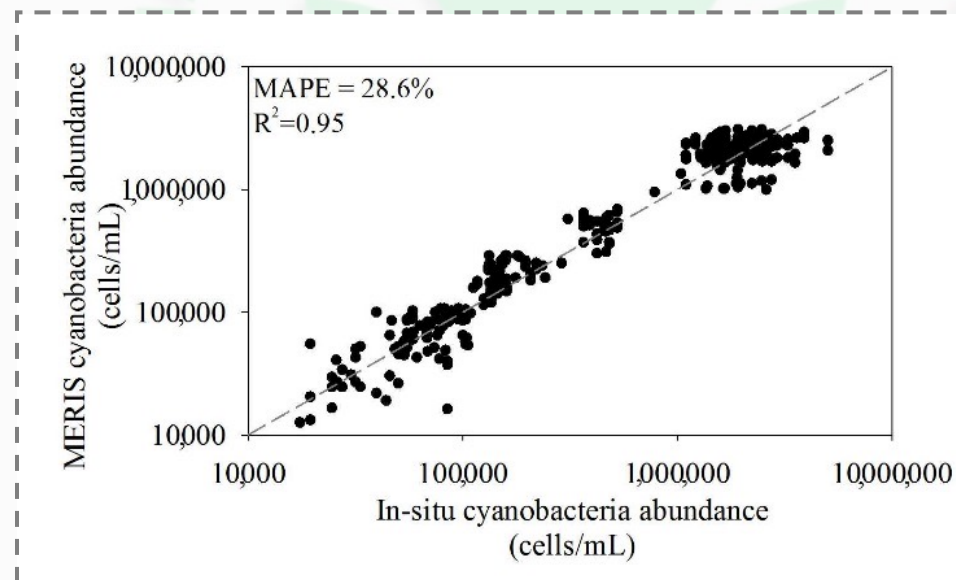
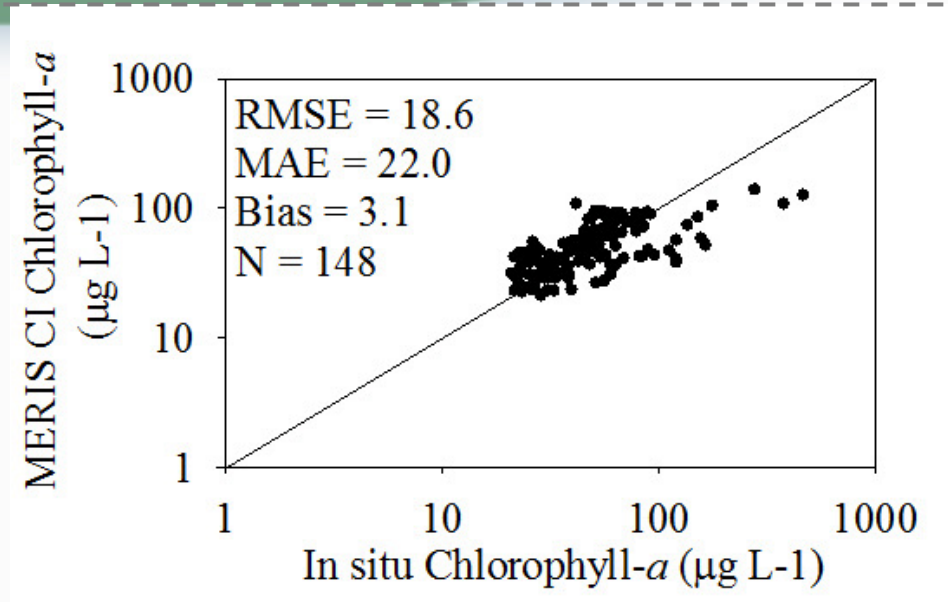
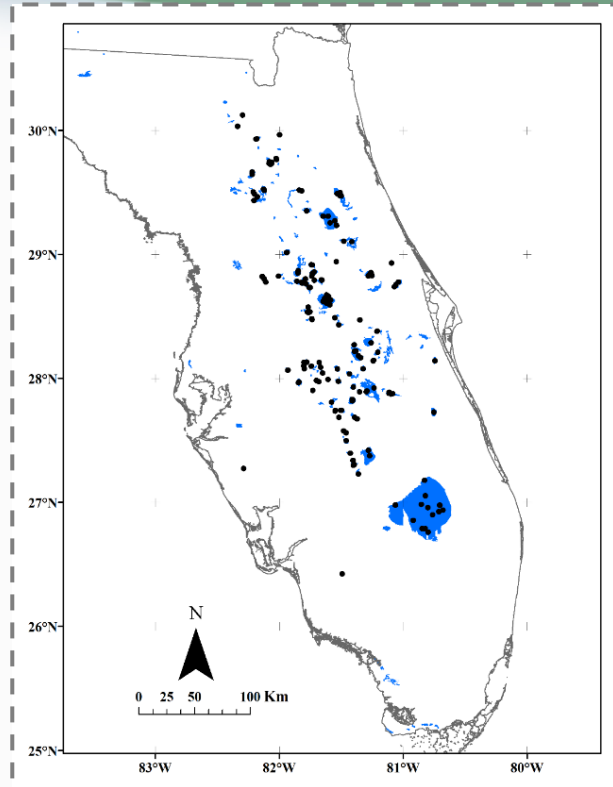


Sentinel 3

Observaciones por año

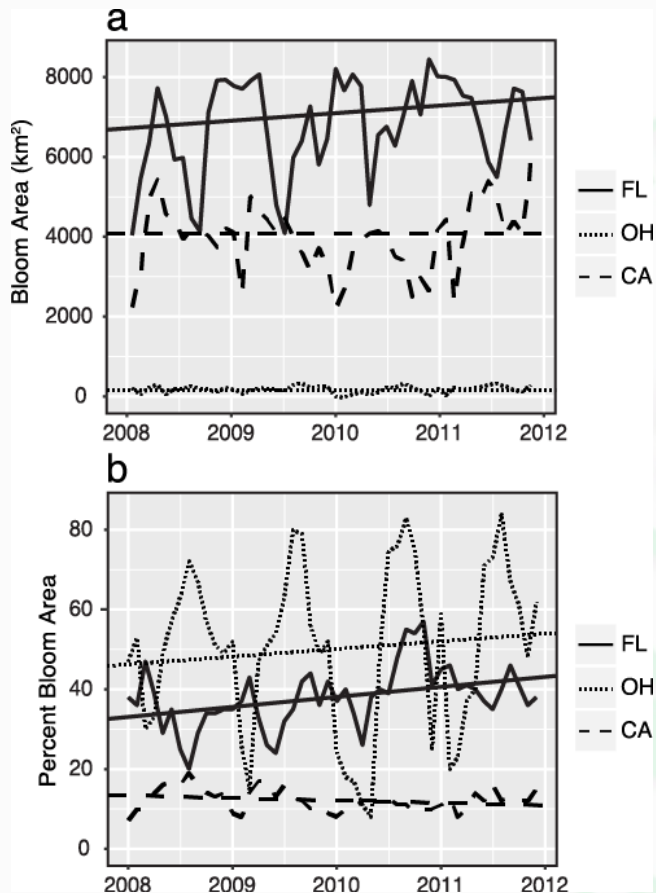


Validación



Fuente: Lunetta et al. 2015.
Evaluación de la detección del
conteo de células de cianobacterias
derivada de imágenes MERIS a lo
largo del Este de EEUU. RSE 157:24-

Extensión Espacial de CyanoHABs



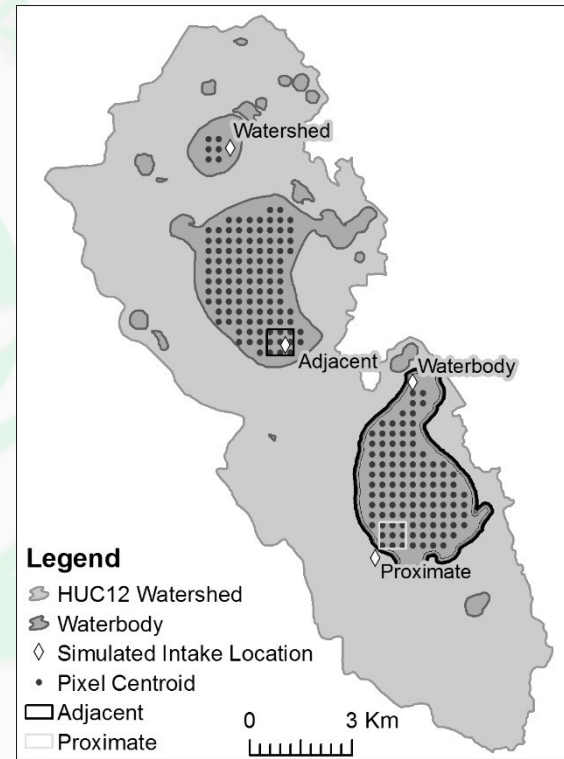
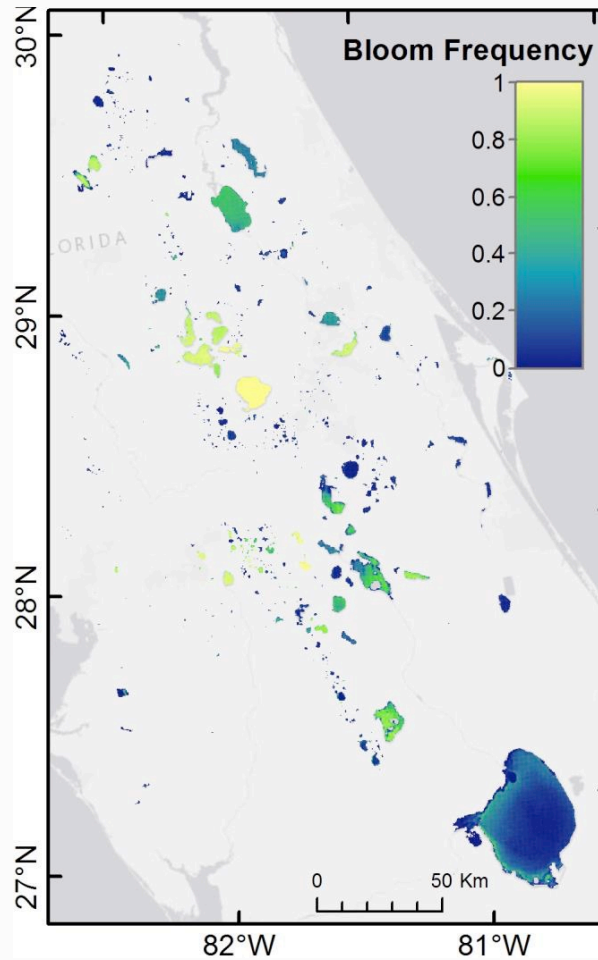
region	WHO	Y
FL	ND	3.3
	bloom	4.1
	low	7.8
	mod	26.4
OH	high	1.9
	ND	7.94
	bloom	>100
	low	Inf
CA	mod	7.72
	high	29.4
	ND	2.9
	bloom	43.9
	low	6.5
	mod	24.4
	high	31.9

Variabilidad residual (Y):

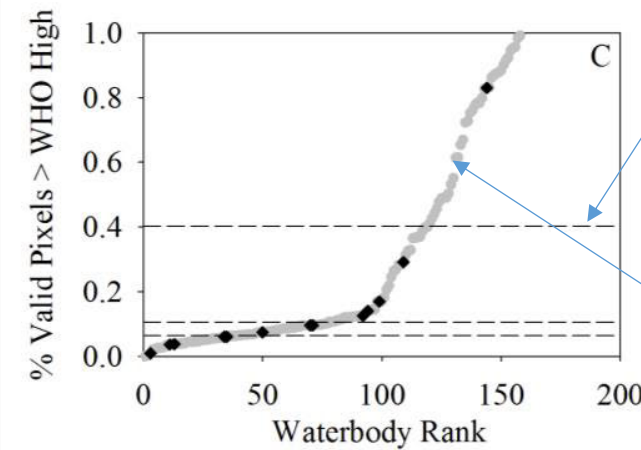
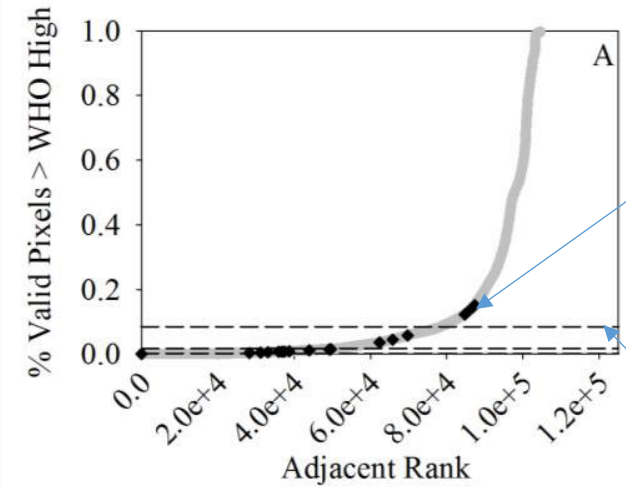
Años necesarios para indicar una tendencia de cyanoHABs



Frecuencia de CyanoHABs



La Priorización del Agua Potable y de las Aguas Recreativas



Ranking por ingreso de agua potable en la superficie

Cuartiles

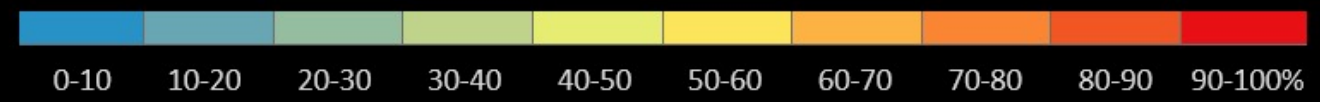
Ranking de lagos individuales



-DATOS PRELIMINARES-

Frecuencia de Cianobacterias

Porcentaje de fechas de observación con alta concentración cianobacterial (>100,00 células/ml). Años 2008-2011

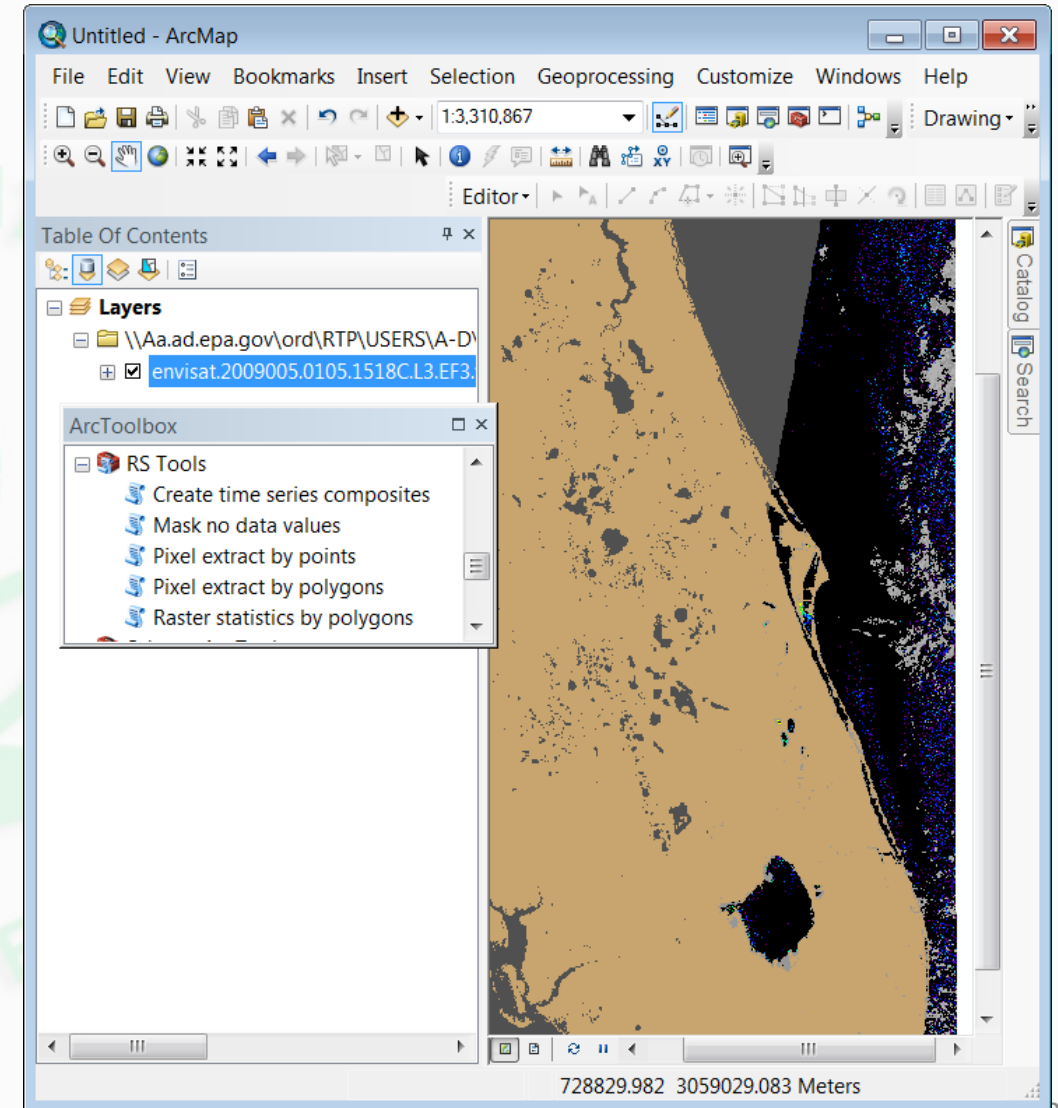


Herramientas

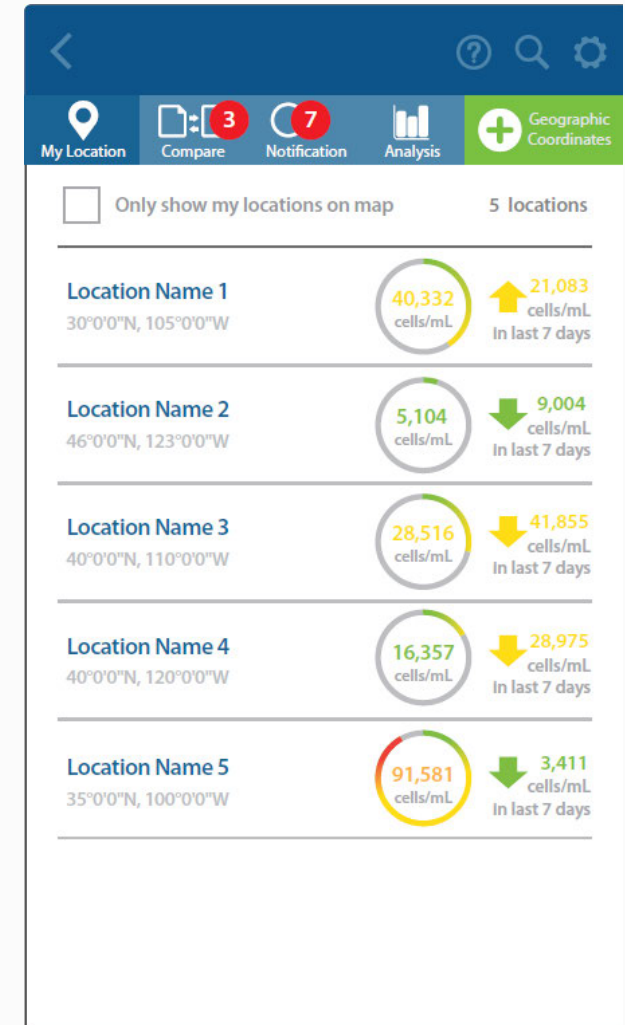
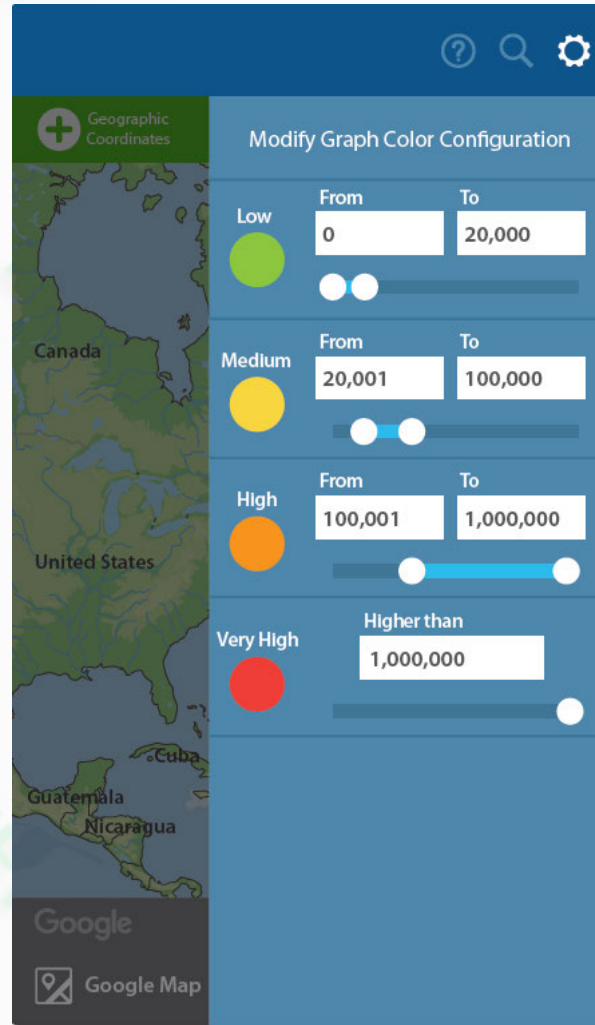
- NASA SeaDAS
- NOAA RS Toolt
 - ArcGIS Toolbox para extraer dagos de archivos geoTIFFs
 - Comuníquese con Michelle Tomlinson para tener acceso: michelle[punto]tomlinson[aroba]noaa[punto]gov

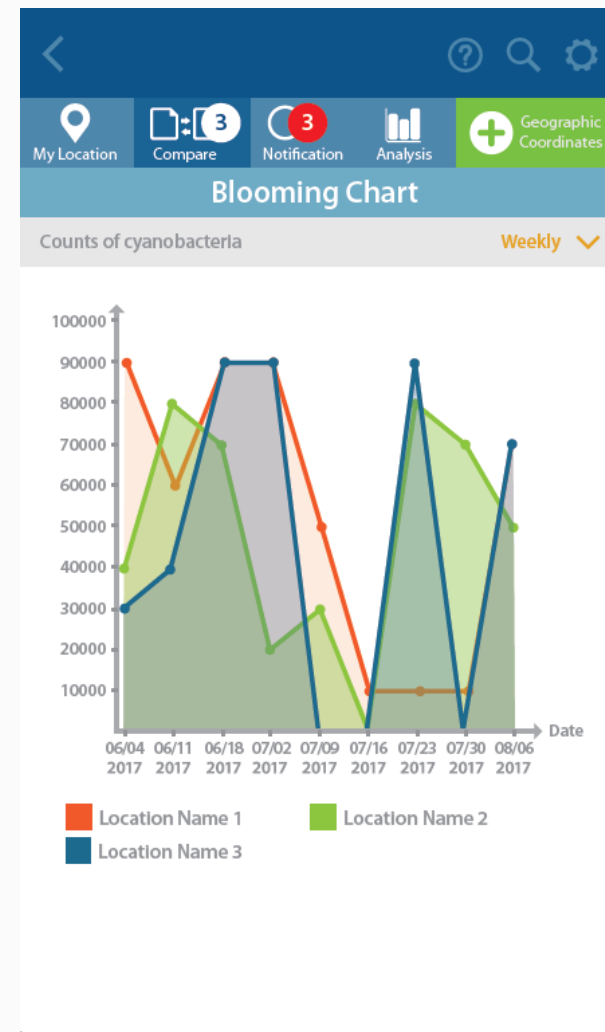
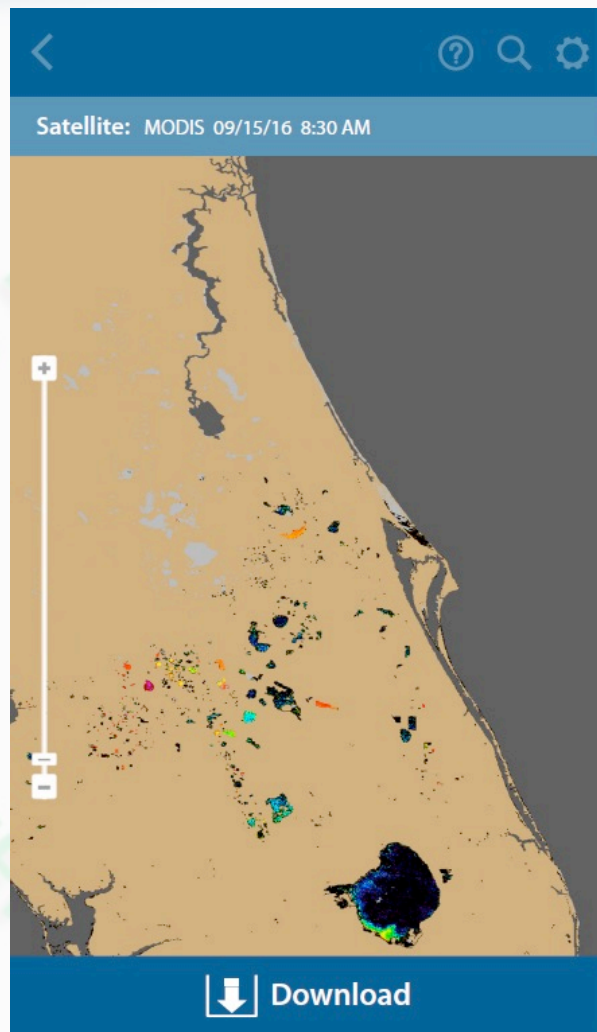
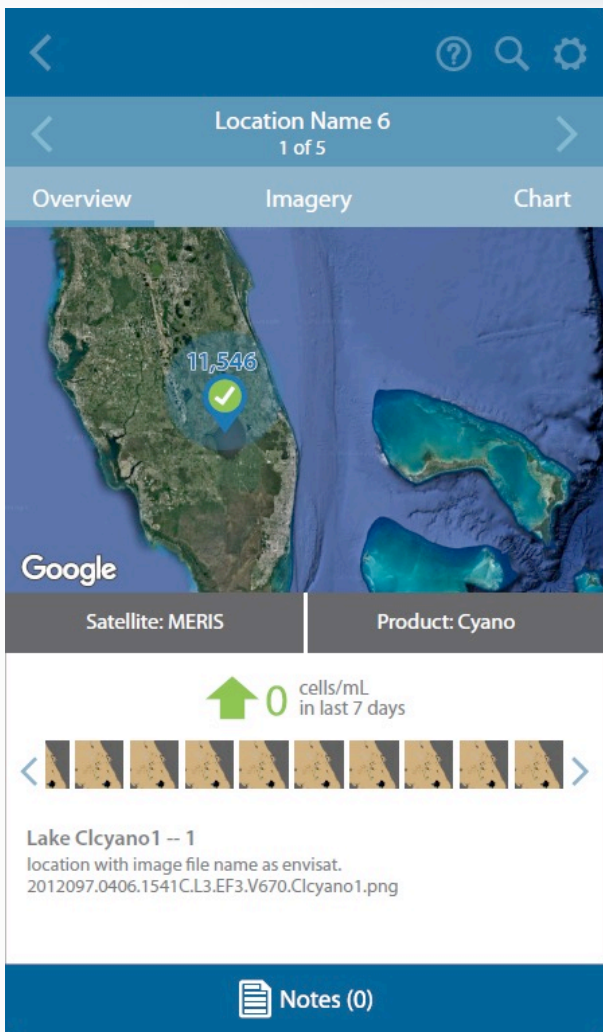


<https://seadas.gsfc.nasa.gov/>



Aplicación Móvil CyAN EPA



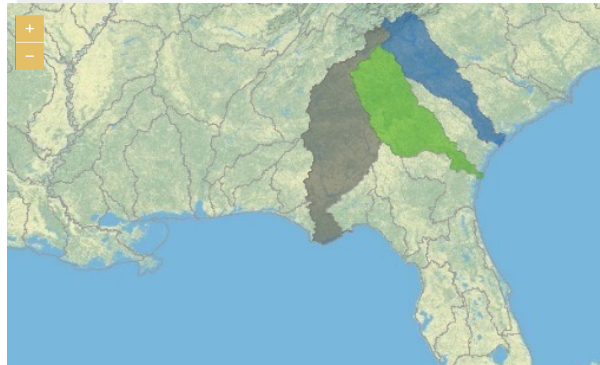


Comienza con EnviroAtlas

CyAN Historic Data Dashboard



Watersheds Lakes Points



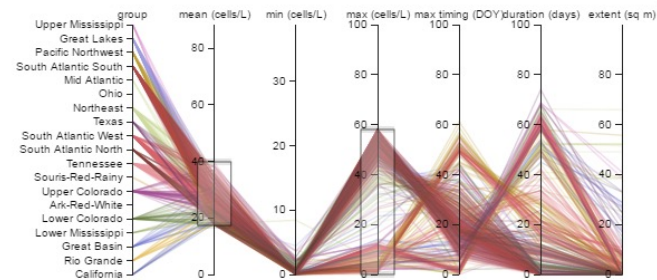
Explore cyanobacteria trends over time. Choose to view patterns for entire watersheds, individual lakes, or point locations.

Select areas of interest by clicking on the map, searching the table, or selecting parameter ranges using the graphical "Bloom Properties" query tool.

Cyanobacteria Annual Max Concentration (cells/L)



Graphical Bloom Properties Query Tool



10 records per page

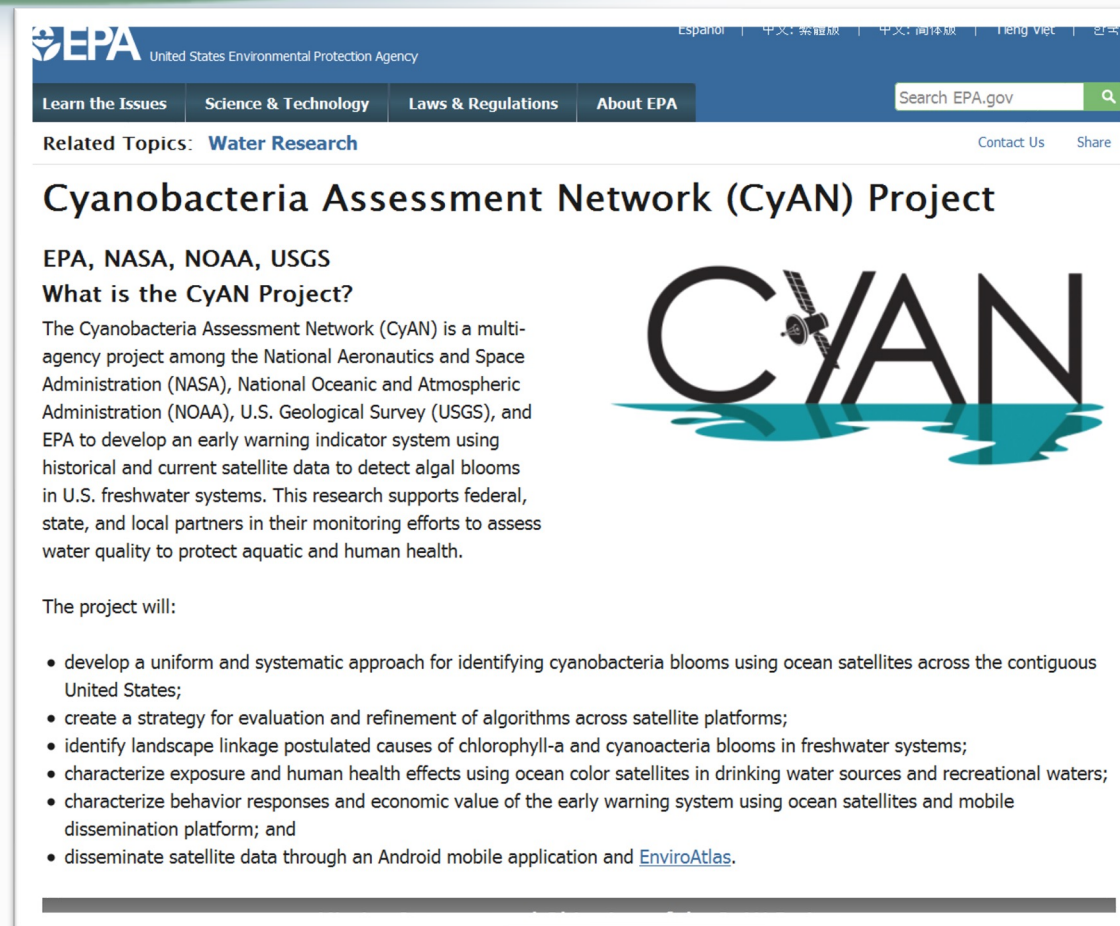
Search:

watershed HUC8	duration (days)	extent (meters)	max (cells/L)
030601	4	102	4
030701	5	140	5
031200	5.5	60	5.5

Showing 1 to 3 of 3 entries

← Previous 1 Next →

¡Gracias!



The screenshot shows the EPA website header with the logo and navigation menu. The main content area features the title "Cyanobacteria Assessment Network (CyAN) Project" and a sub-header "EPA, NASA, NOAA, USGS". Below this is a section titled "What is the CyAN Project?" followed by a paragraph describing the project's goals. To the right of the text is a graphic of the word "CYAN" in large letters, with a satellite orbiting the letter 'Y' and a reflection of the letters in water below. A list of project goals is provided at the bottom of the page.

EPA United States Environmental Protection Agency

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Cyanobacteria Assessment Network (CyAN) Project

EPA, NASA, NOAA, USGS

What is the CyAN Project?

The Cyanobacteria Assessment Network (CyAN) is a multi-agency project among the National Aeronautics and Space Administration (NASA), National Oceanic and Atmospheric Administration (NOAA), U.S. Geological Survey (USGS), and EPA to develop an early warning indicator system using historical and current satellite data to detect algal blooms in U.S. freshwater systems. This research supports federal, state, and local partners in their monitoring efforts to assess water quality to protect aquatic and human health.



The project will:

- develop a uniform and systematic approach for identifying cyanobacteria blooms using ocean satellites across the contiguous United States;
- create a strategy for evaluation and refinement of algorithms across satellite platforms;
- identify landscape linkage postulated causes of chlorophyll-a and cyanoacteria blooms in freshwater systems;
- characterize exposure and human health effects using ocean color satellites in drinking water sources and recreational waters;
- characterize behavior responses and economic value of the early warning system using ocean satellites and mobile dissemination platform; and
- disseminate satellite data through an Android mobile application and [EnviroAtlas](#).

epa.gov/cyanoproject

salls.wilson@epa.gov