

California's Surface Water Ambient Monitoring Program (SWAMP)

Freshwater Harmful Algal Blooms (HABs) in California and SWAMP's Statewide Strategy



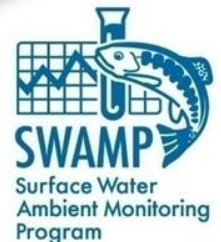
North Coast WQCB
CyanoHAB Public
Workshop

February 24, 2016

Beverley Anderson-Abbs

SWAMP – OIMA

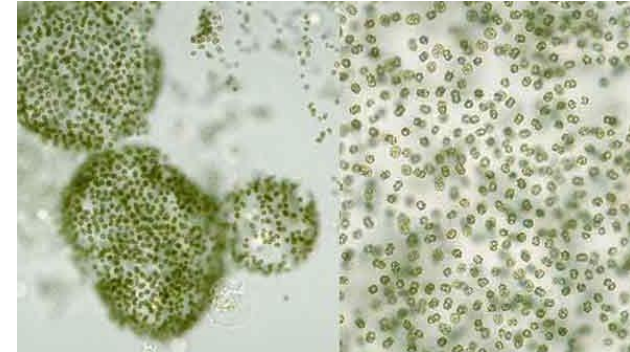
Beverley.Anderson-Abbs@waterboards.ca.gov



Cyanobacteria and other Freshwater HABs

Cyanobacteria (formerly called blue-green algae)

- Occur in most waterbodies (fresh, brackish, marine)
- Exist as single cells or as colonies
- Can form dense blooms



Potentially harmful (harmful algal bloom, HAB)

Other HABs

- *Prymnesium parvum* (fish kills)
- *Didymosphenia germinata* (Adverse effects on fish and invertebrate populations)



Why California needs a Freshwater Harmful Algal Bloom (HAB) Strategy

- HABs increasing worldwide and in California
 - Increasing water temperatures
 - High nutrient concentrations
 - Drought – less water, low flows
- HABs create significant water quality issues
- There is a California marine HABs program



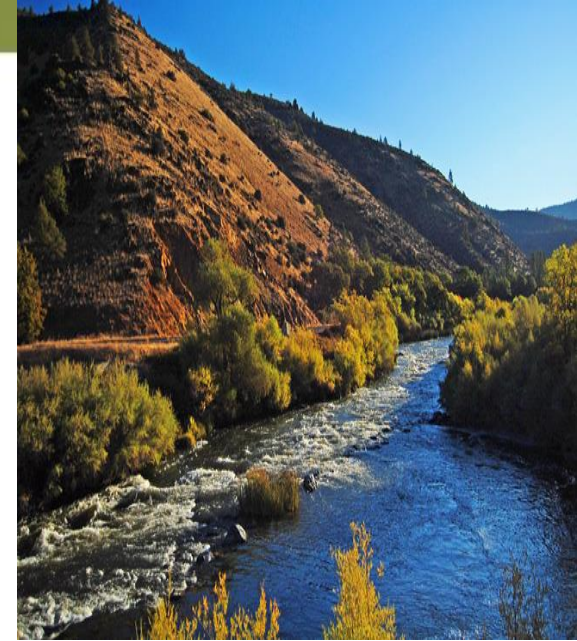
Where are they?



Lakes



Wetlands



Rivers and streams



Estuaries



Marine waters

Microcystis

- Most common toxic cyanobacteria
- Produces microcystins
- Microcystin human health thresholds
 - OEHHA recreation = 0.8 ug/L
 - USEPA drinking water = 0.3 ug/L



Areas in California with Recurrent Toxic Algae Blooms

Klamath Basin

Clear Lake

San Francisco Bay area/Delta

Pinto Lake/Monterey Bay

**Southern California
Prymnesium “Golden algae”**

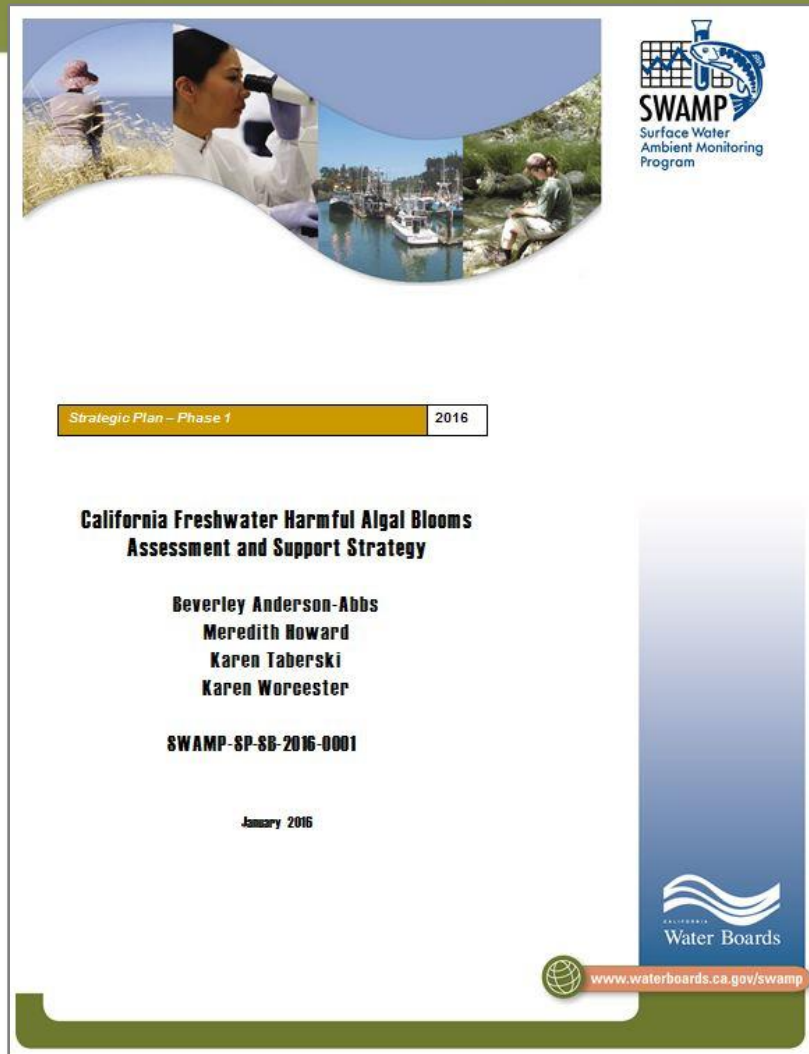


SWAMPs Freshwater HABs Assessment and Support Strategy

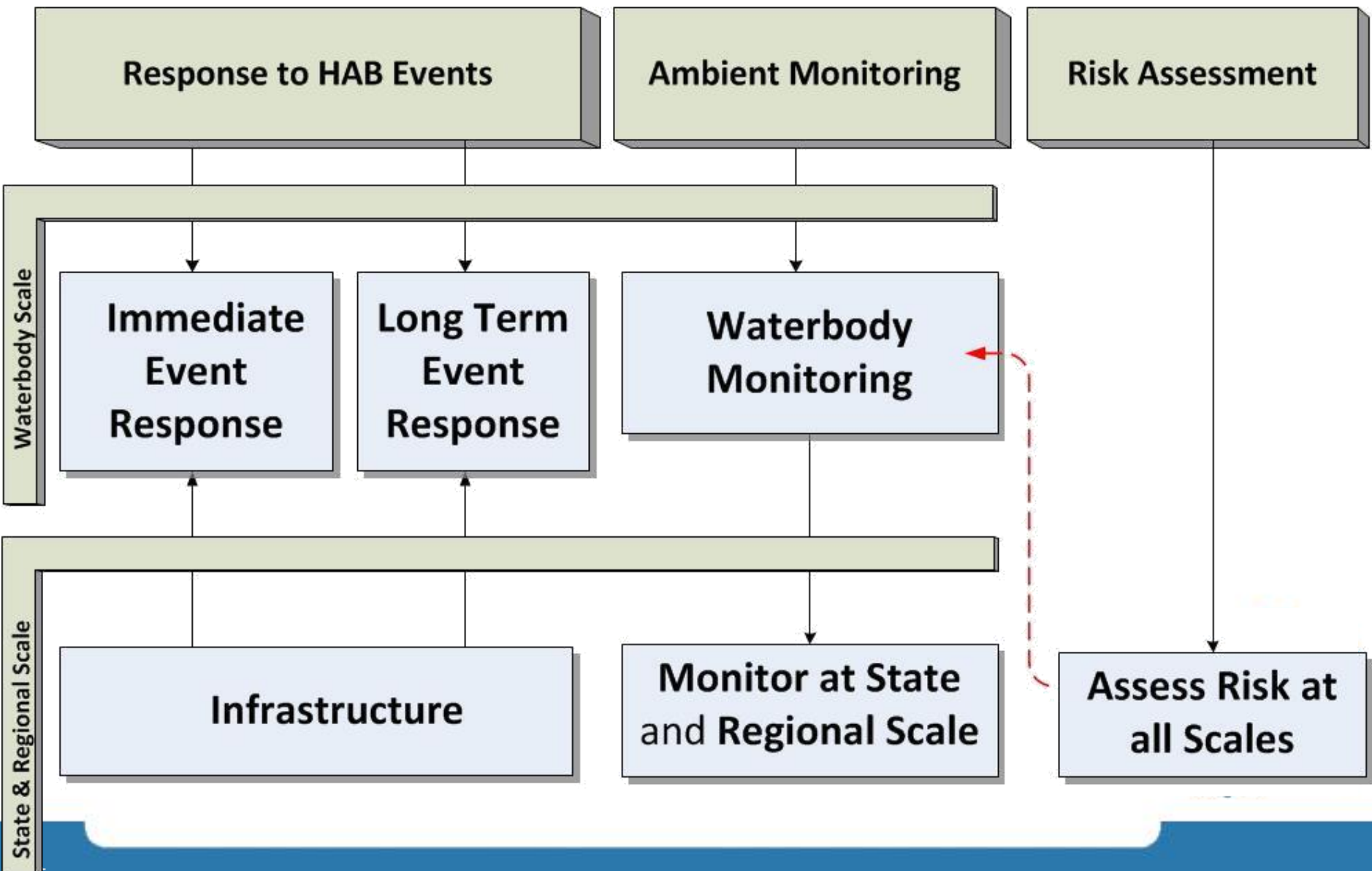
- Goal – articulate a coordinated and widely supported, long-term program to assess, communicate, and manage freshwater HABs



- Ca. CyanoHAB Network (CCHAB) anticipated to coordinate/implement strategy



Freshwater HABs Assessment and Support Strategy Framework



Infrastructure

Satellite Imagery

- Historic trends
- Notifications
- Bulletin and Newsletter
- Temporal trends

Centralized Website and Reporting System

- Data
 - storage
 - visualization
 - access
- CWQMC portal

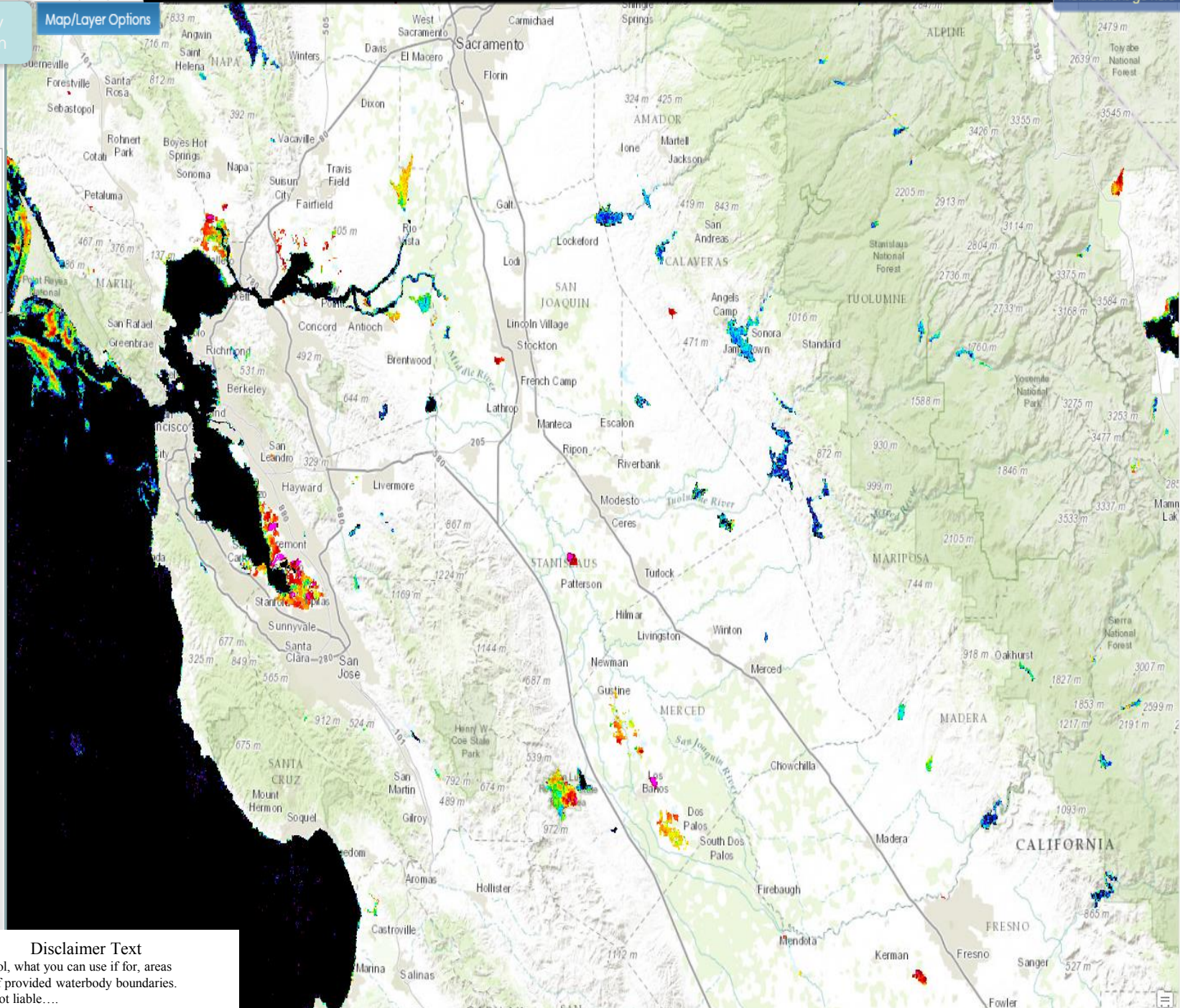
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Water Board Region 2

- [Anderson Lake](#)
- [Broad Slough](#)
- [Calaveras Reservoir](#)
- [Carquinez Strait](#)
- [Central Bay](#)
- [Laguna Lake](#)
- [Lake Curry](#)
- [Lake del Valle](#)
- [Lake Hennessey](#)
- [Lower South Bay](#)
- [Napa River island slough complex](#)
- [New York Slough](#)
- [Nicasio Reservoir](#)
- [Quarry Lakes](#)
- [Richardson Bay](#)
- [Sacramento River](#)
- [San Antonio Reservoir](#)
- [San Joaquin River](#)
- [San Pablo Bay](#)
- [South Bay](#)
- [Suisun Bay](#)
- [Upper Crystal Springs Reservoir](#)

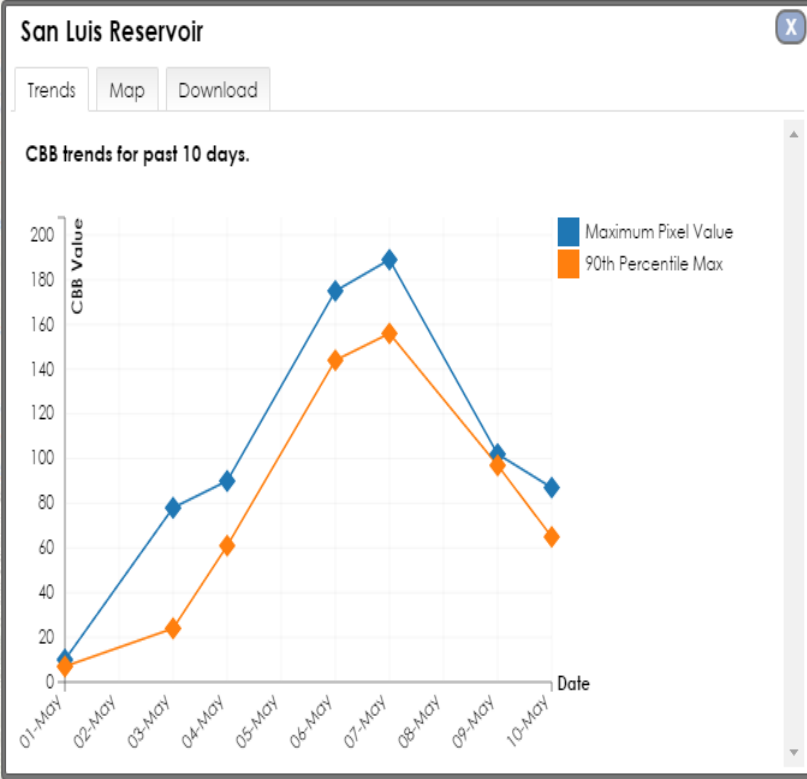
Water Board Region 3

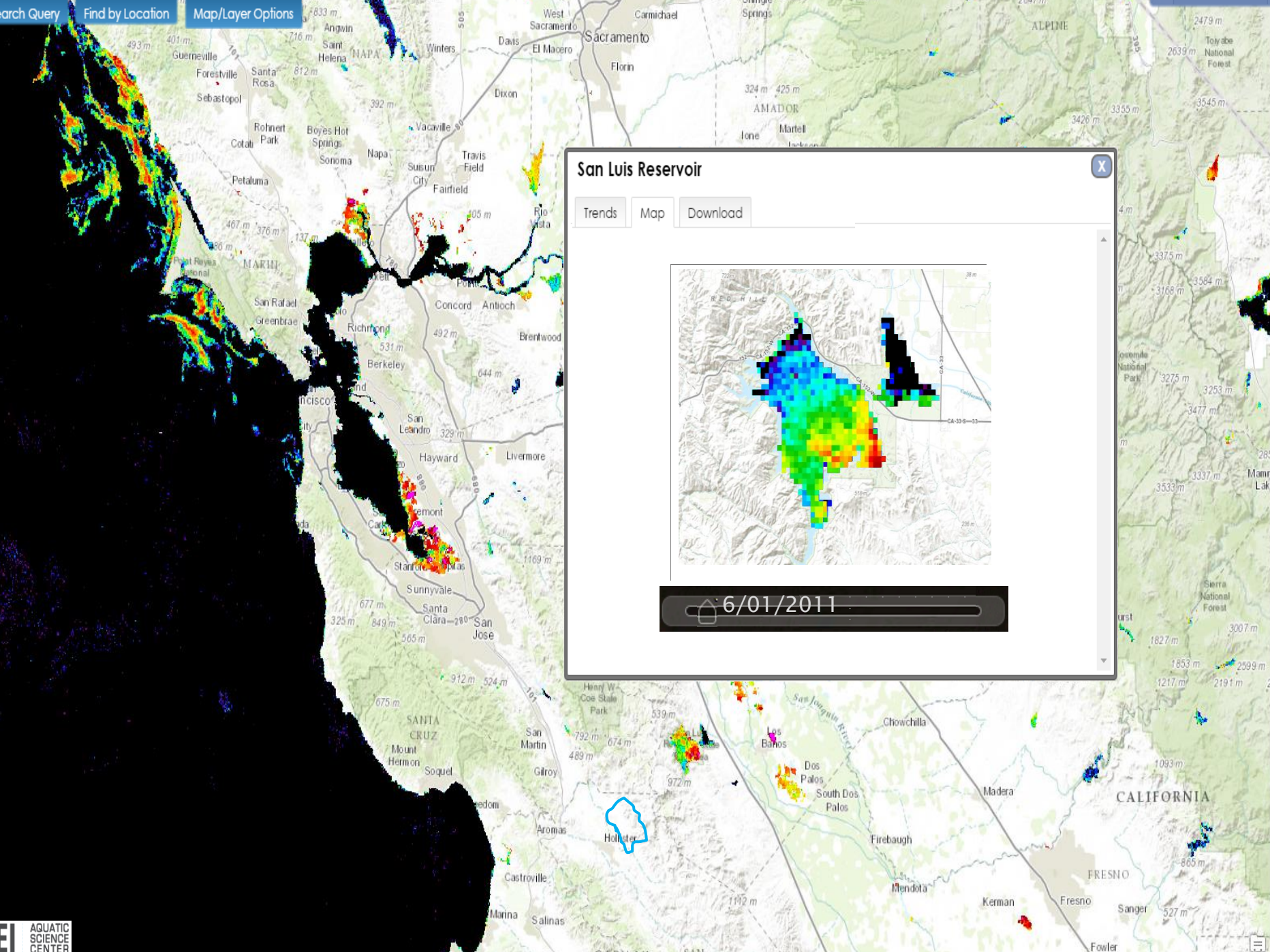
- [Bernardz Reservoir](#)
- [Lake San Antonio](#)
- [Nacimiento Reservoir](#)
- [Whale Rock Reservoir](#)
- [Soda Lake](#)



Disclaimer Text

Use of tool, what you can use if for, areas outside of provided waterbody boundaries. Intent. Not liable....

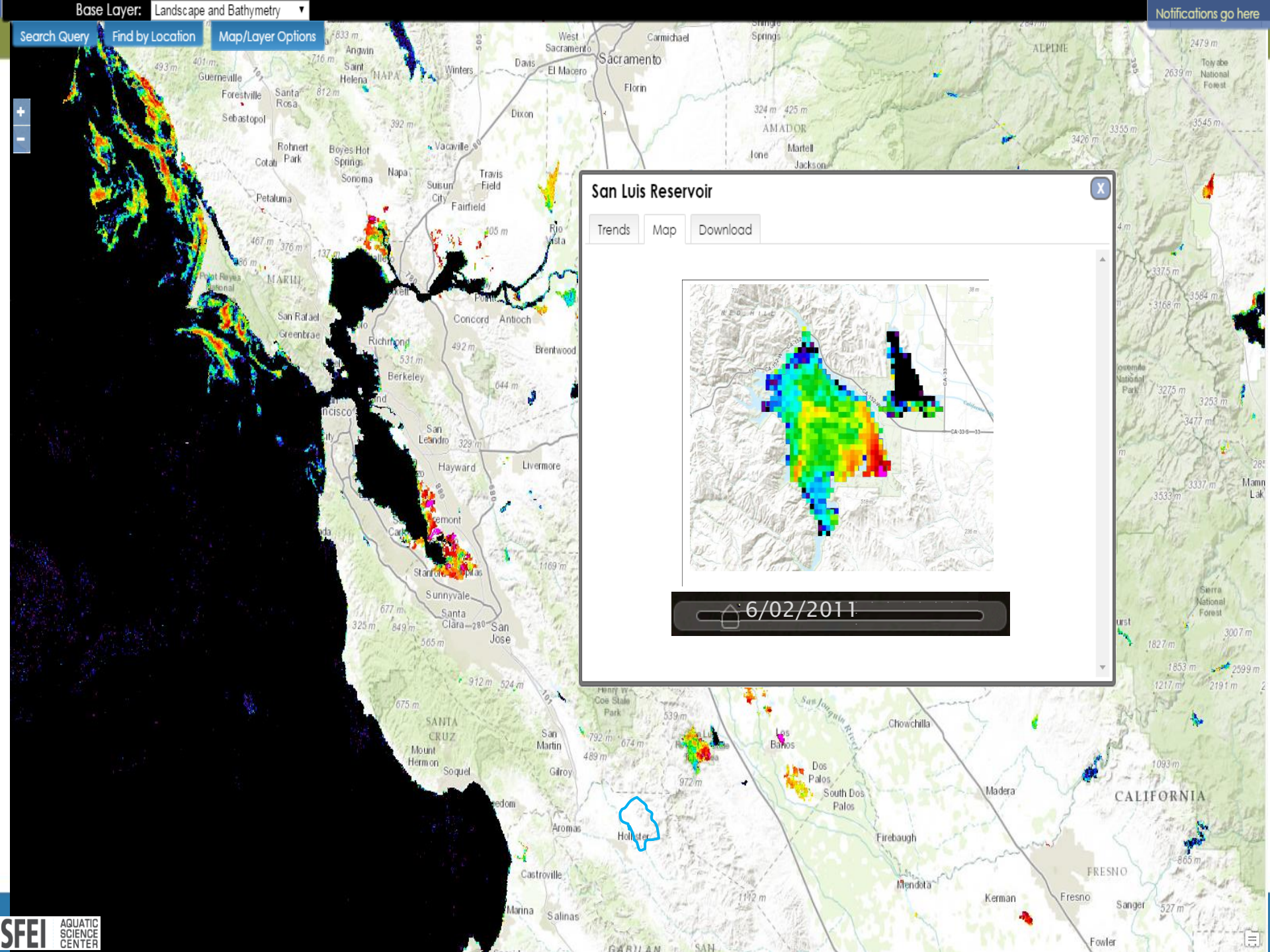




San Luis Reservoir

Trends Map Download

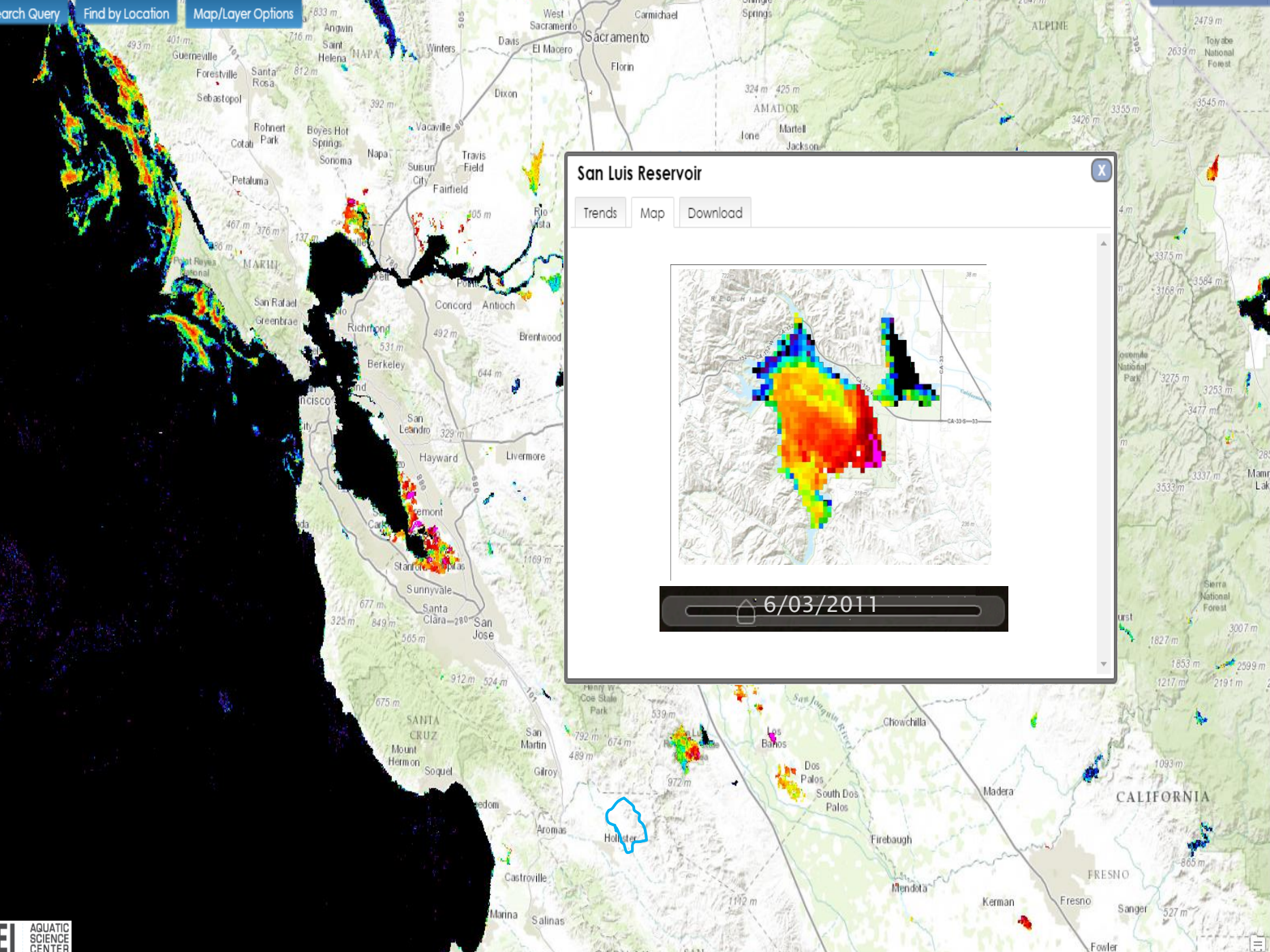
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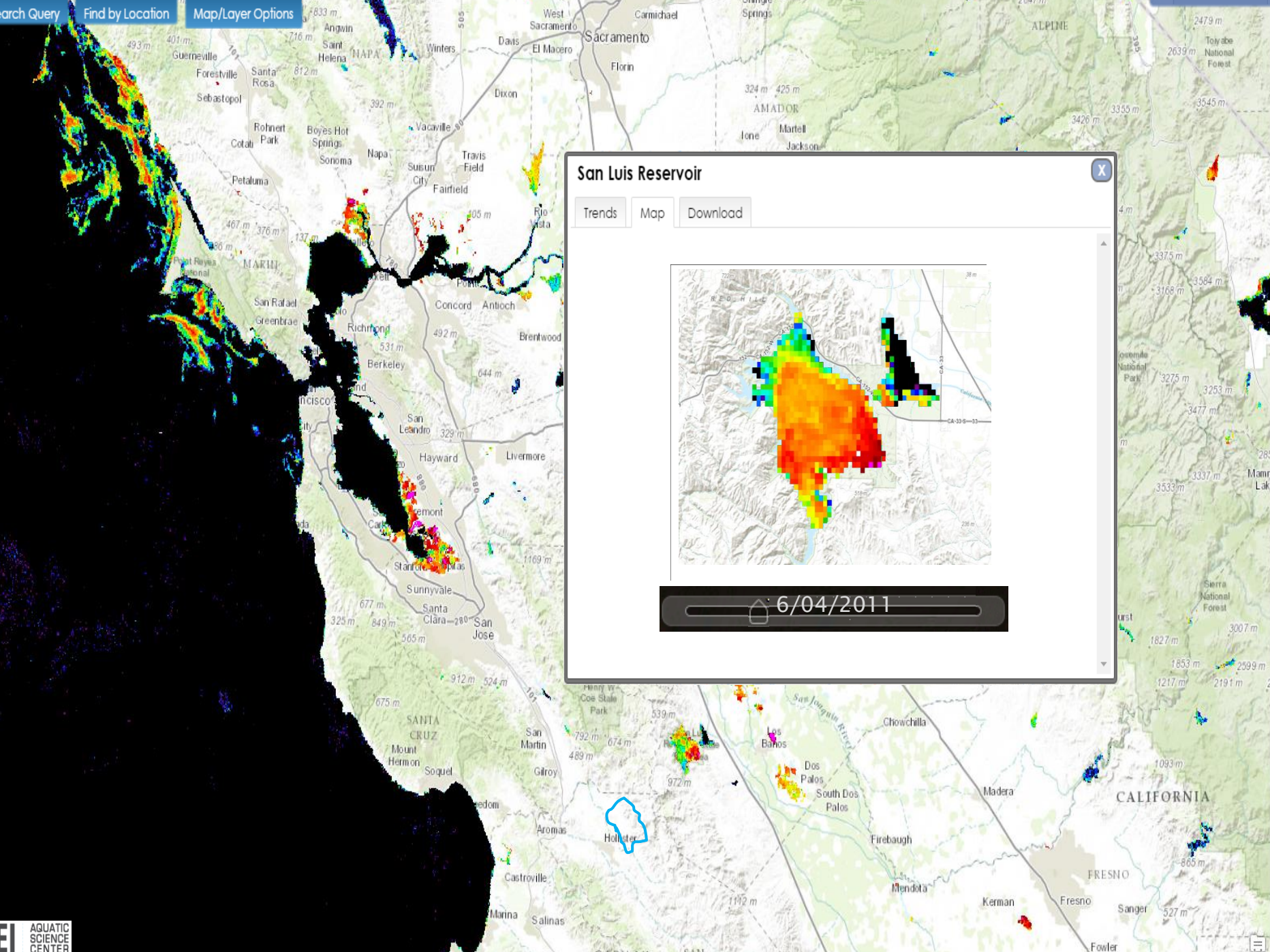
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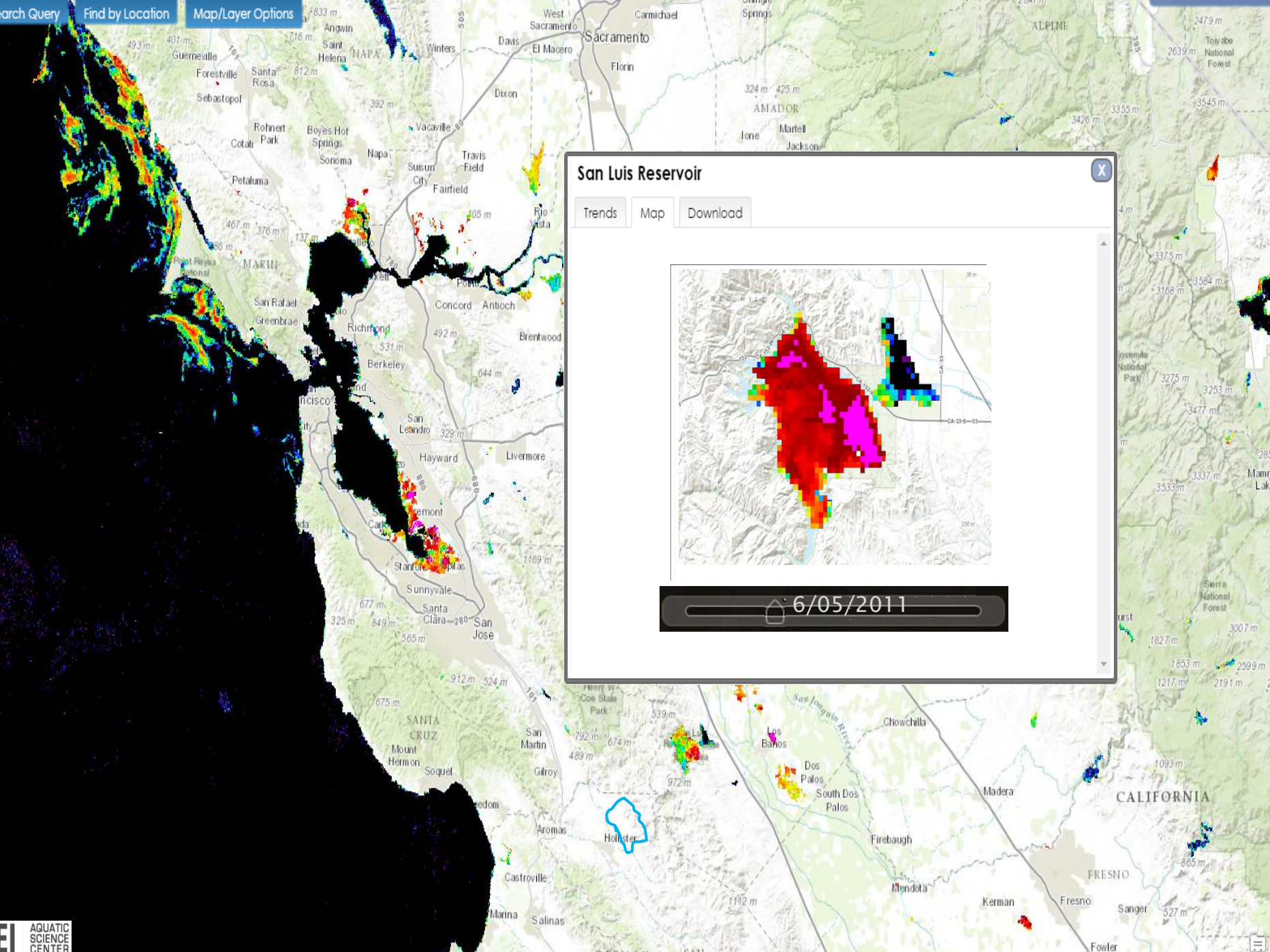
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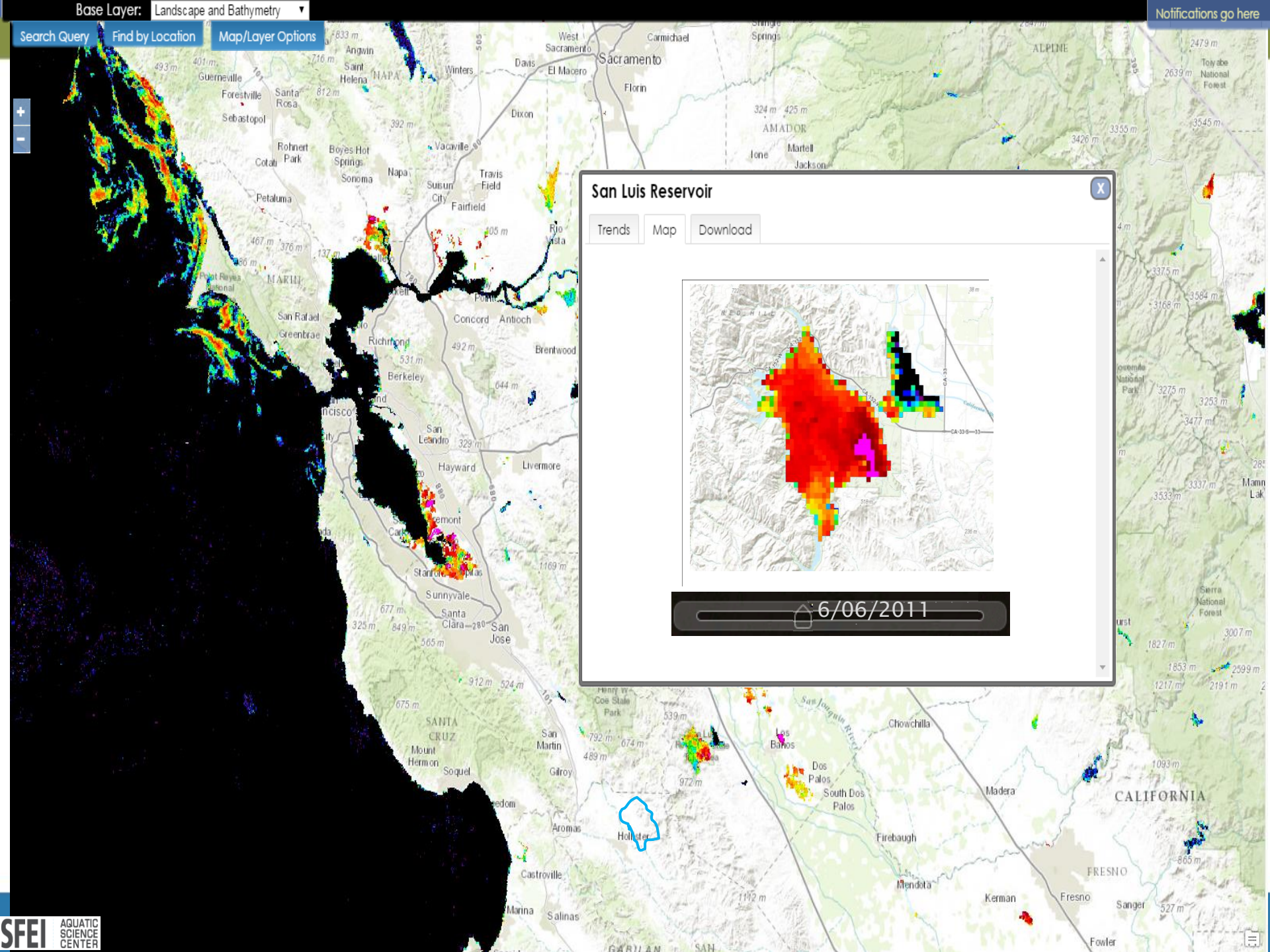
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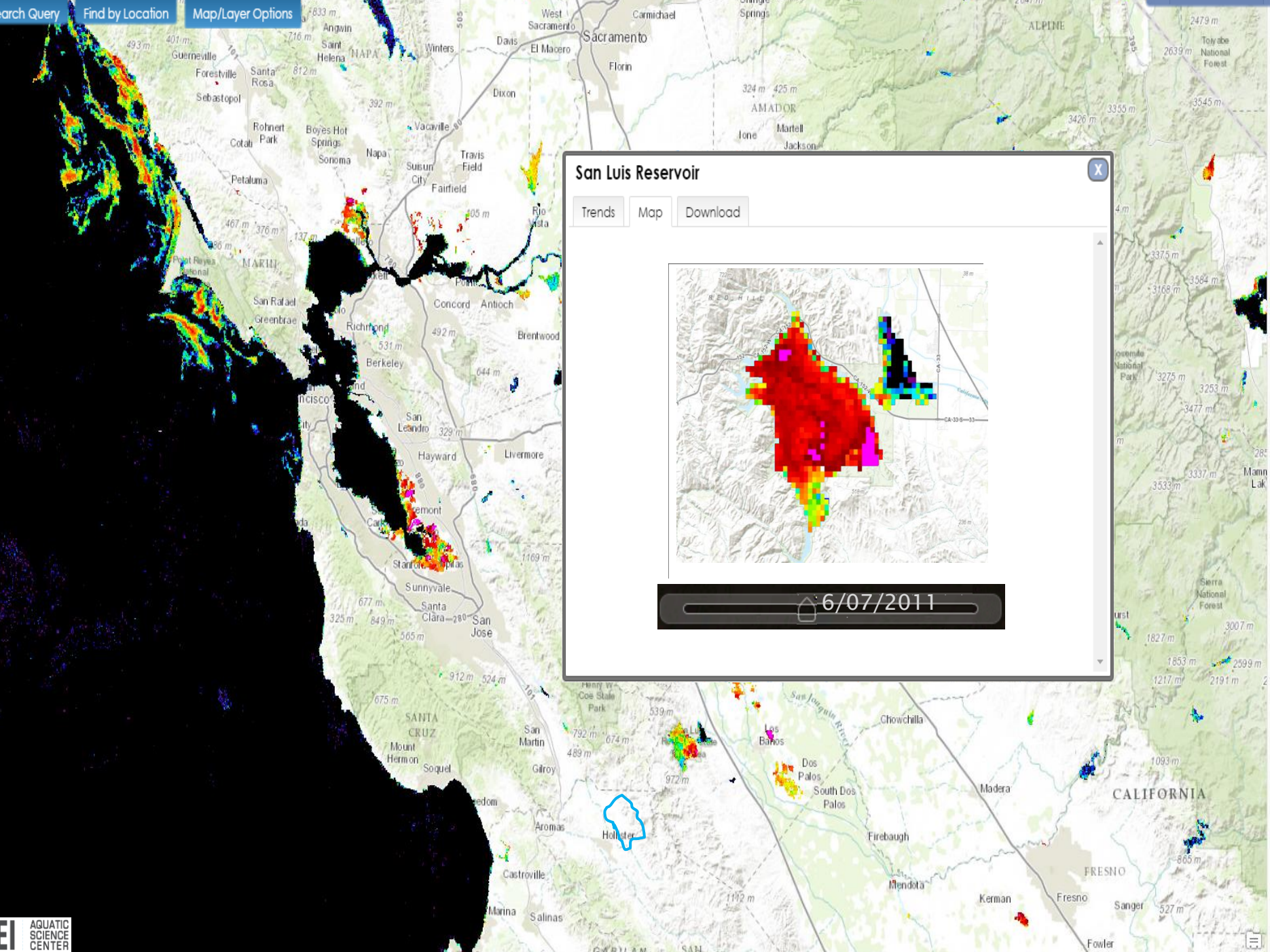
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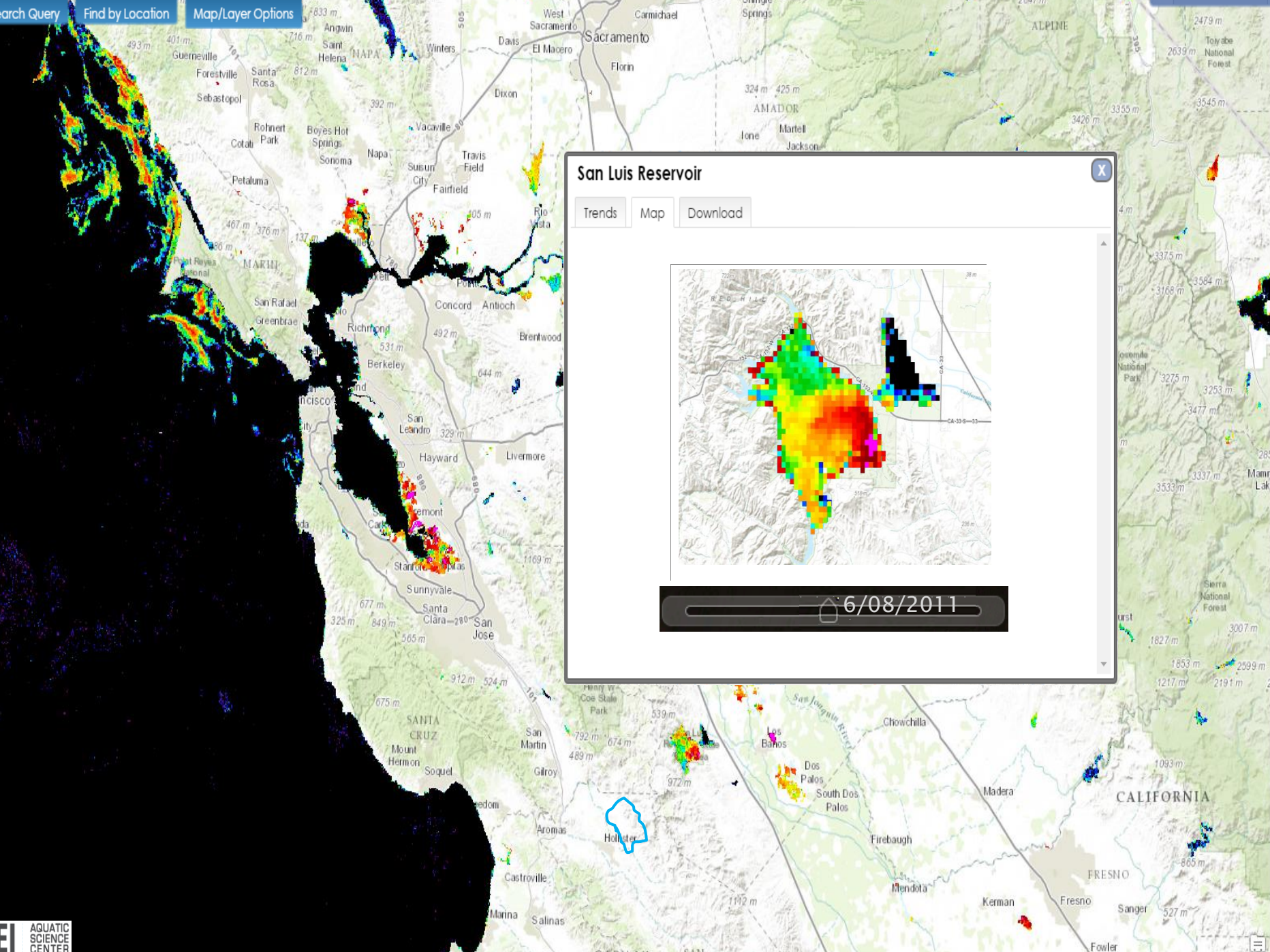
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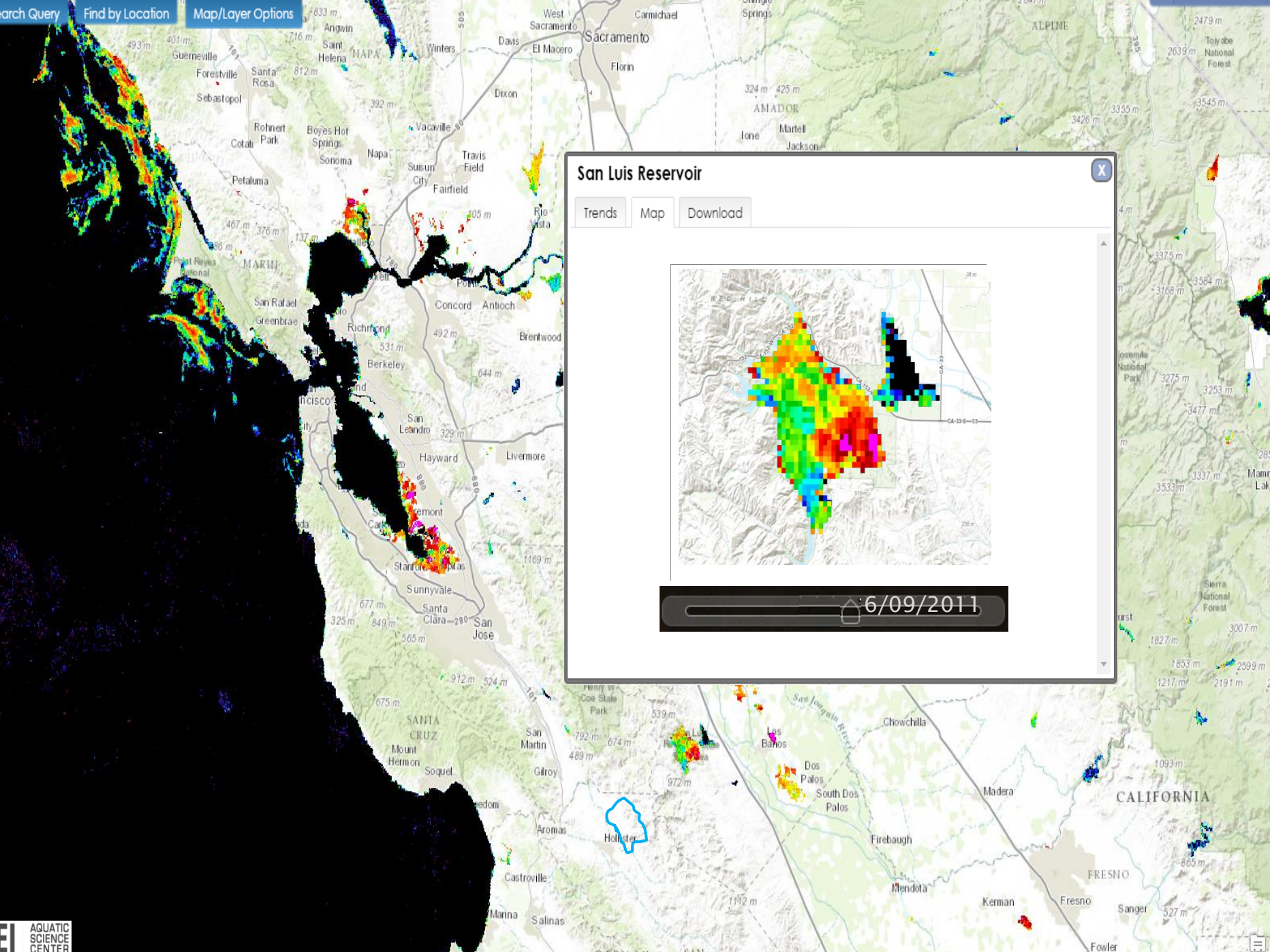


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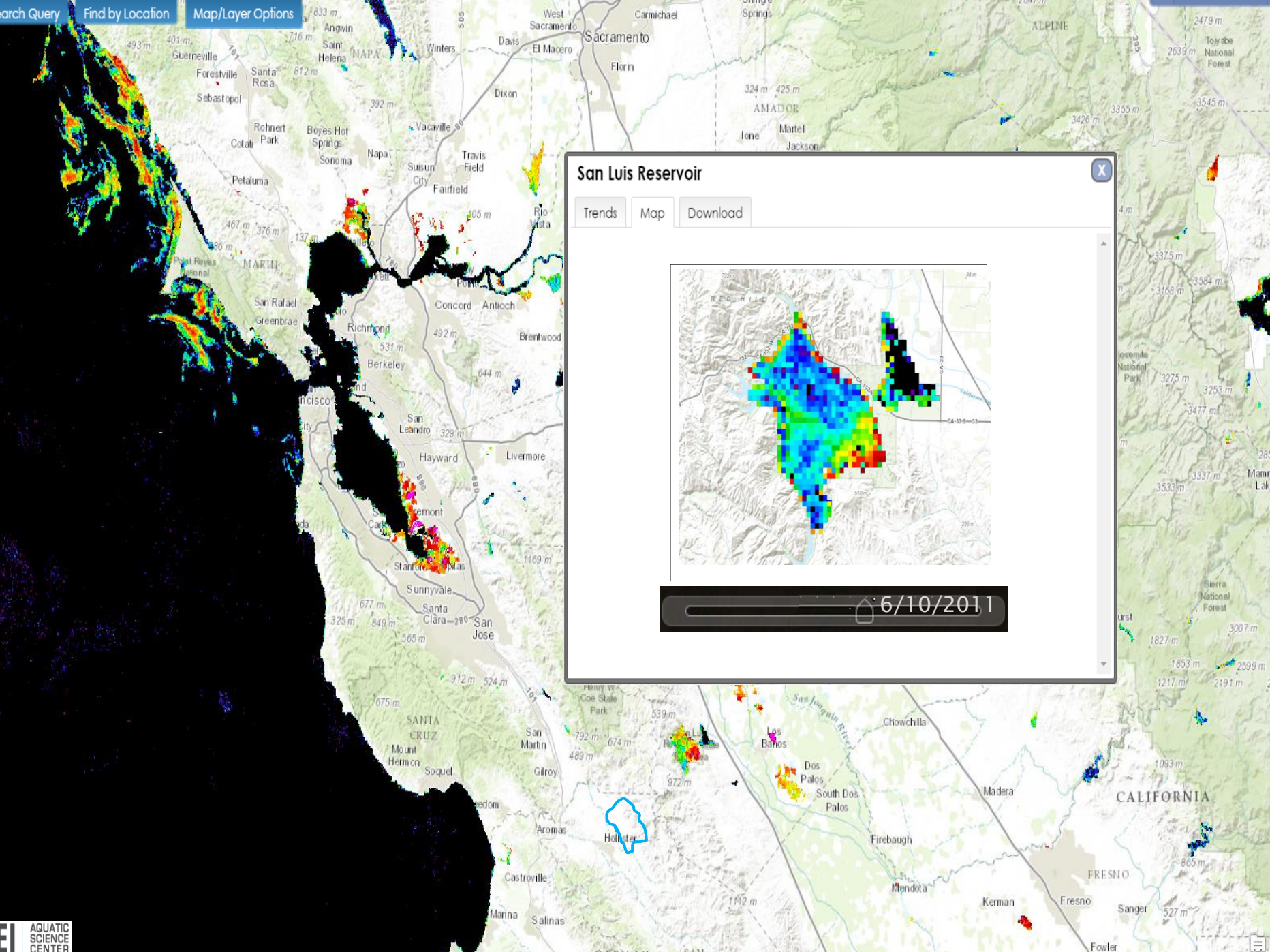




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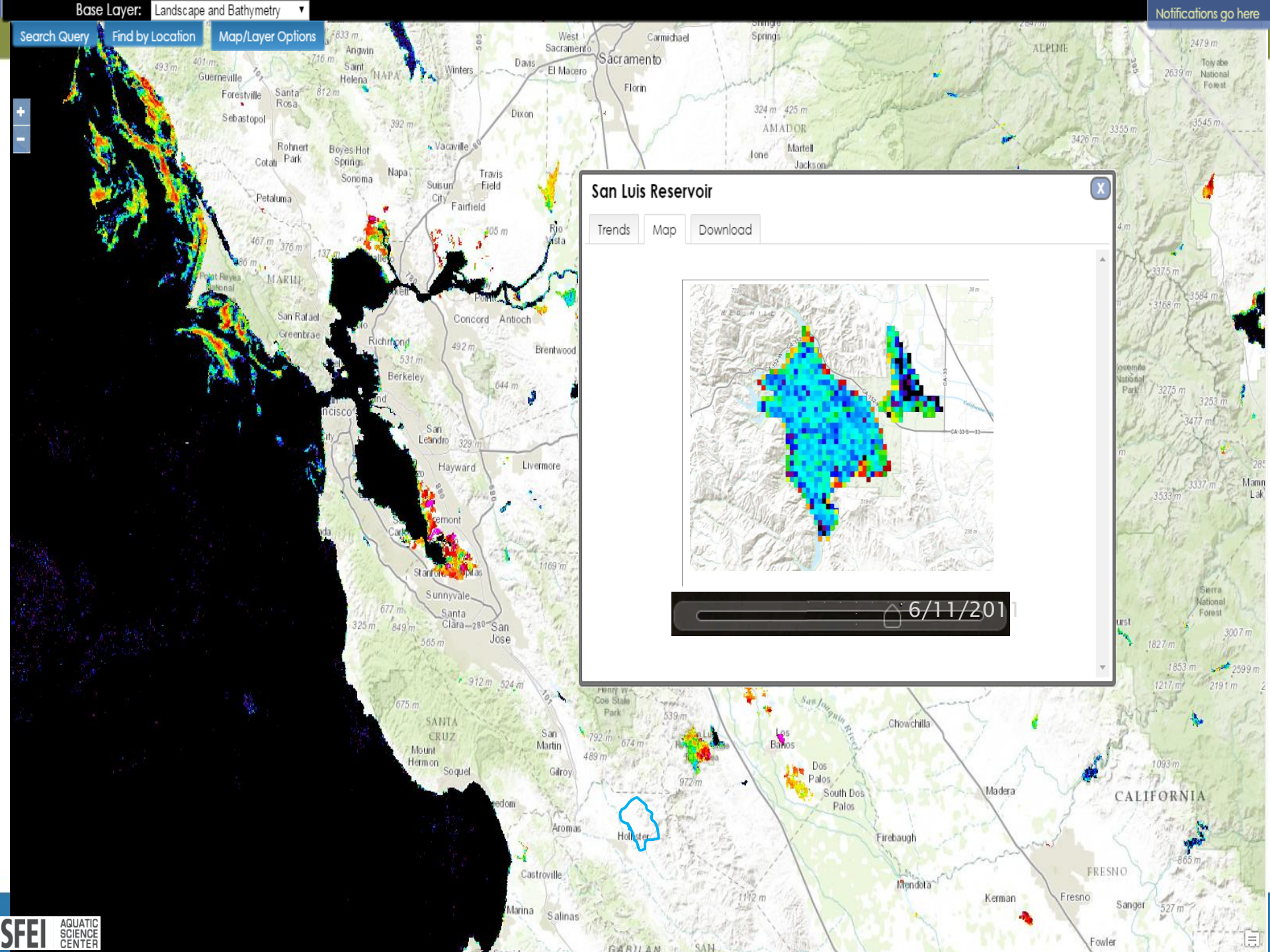
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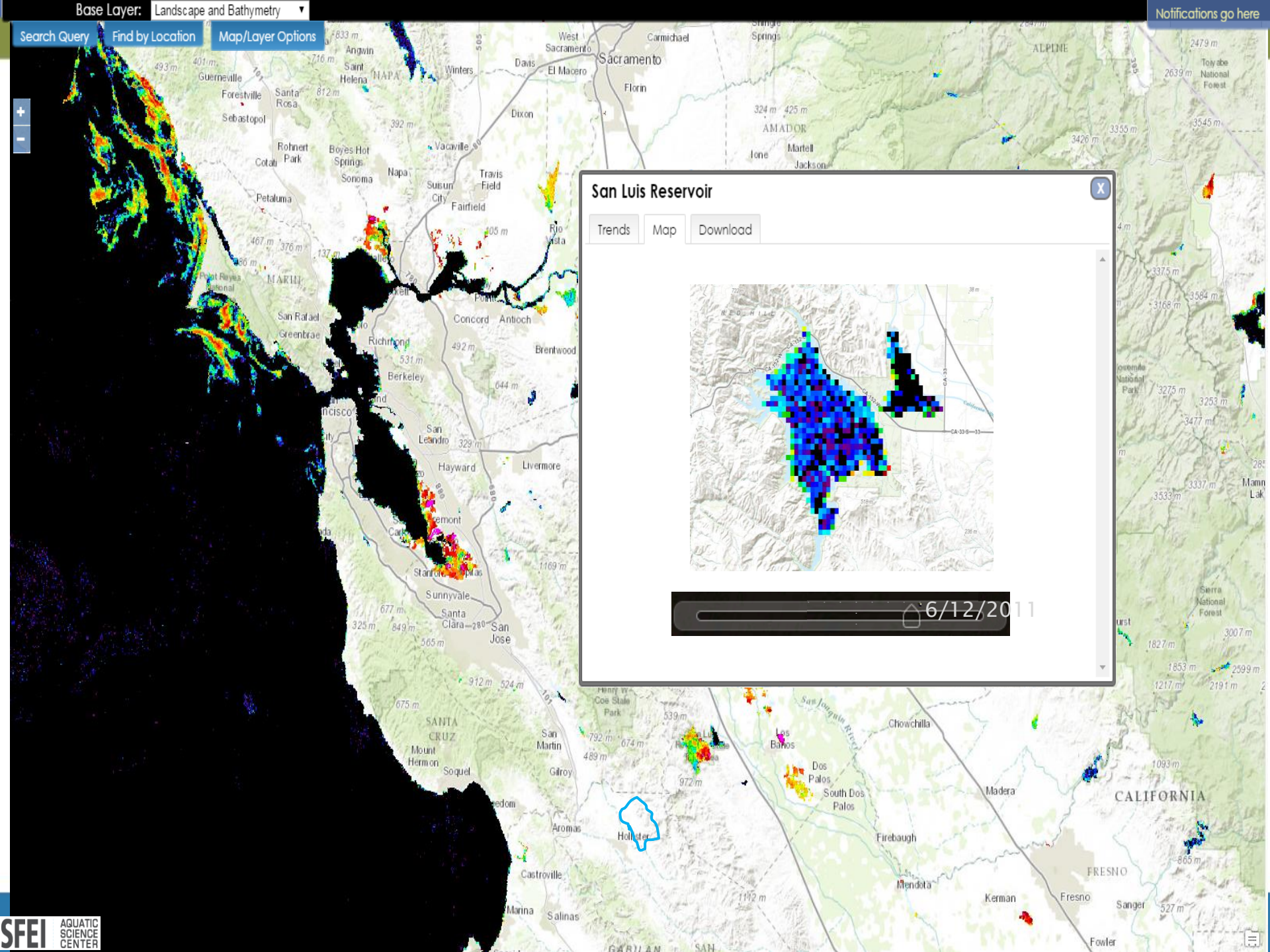
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Infrastructure

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Event Response Guidance Documents

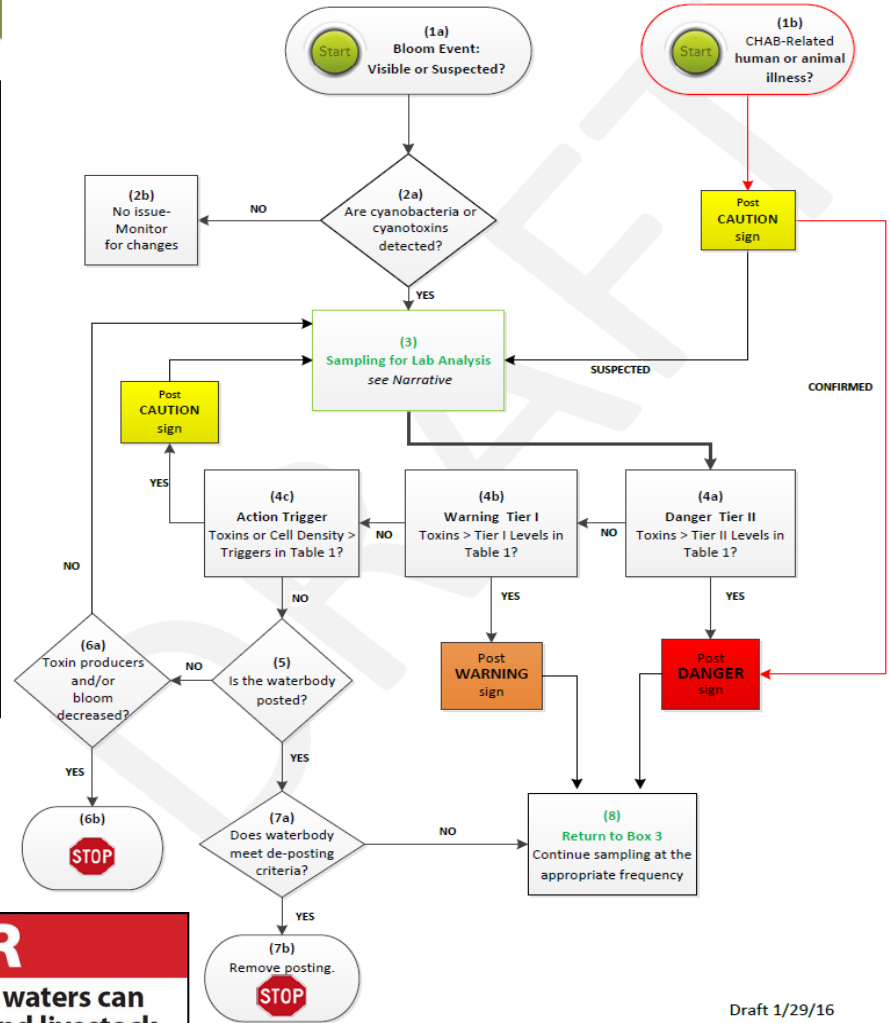
- CCHAB Guidance
- Sampling and analysis
- Management and remediation

Table 1. CyanoHAB Trigger Levels for Human Health

DRAFT

	Caution Action Trigger	Warning TIER I	Danger TIER II
Primary Triggers^a			
Total Microcystins^b	0.8 µg/L	6 µg/L	20 µg/L
Anatoxin-a	Detection ^c	20 µg/L	90 µg/L
Cylindrospermopsin	1 µg/L	4 µg/L	17 µg/L
Secondary Triggers			
Cell Density (Toxin producers)	4,000 cells/mL	--	--
Site Specific Indicators of Cyanobacteria	Blooms, scums, mats, etc.	--	--

a. The primary triggers are met when ANY toxin exceeds criteria
 b. Microcystins refers to the sum of all measured microcystin variants. (See Box 3)
 c. Must use an analytical method that detects ≤ 1µg/L Anatoxin-a



CAUTION

Harmful algae may be present.
For your protection, please:

DO NOT SWIM OR WAD near algae or scum.

KEEP CHILDREN AWAY from algae in the water or on the shore.

DO NOT drink this water or use it for cooking.

Call your doctor or veterinarian if you or your pet get sick after going in the water.
For more information, contact:

WARNING

Toxins from algae in these waters can harm people and kill

NO SWIMMING

STAY AWAY from scum, and cloudy or discolored water.

DO NOT use these waters for drinking or cooking. Boiling or filtering will not make the water safe.

For people, the toxins can cause:
 • Skin rashes, eye irritation
 • Diarrhea, vomiting

Call your doctor or veterinarian if you or your pet get sick after going in the water.
For more information, contact:

DANGER

Toxins from algae in these waters can harm people and kill pets and livestock

STAY OUT OF THE WATER UNTIL FURTHER NOTICE. Do not touch scum in the water or on shoreline.

DO NOT let pets or livestock drink or go into the water or go near the scum.

DO NOT eat fish or shellfish from these waters.

DO NOT use these waters for drinking or cooking. Boiling or filtering will not make the water safe.

For people, the toxins can cause:
 • Skin rashes, eye irritation
 • Diarrhea, vomiting

For animals, the toxins can cause:
 • Diarrhea, vomiting
 • Convulsions and death

Call your doctor or veterinarian if you or your pet get sick after going in the water.
For more information, contact:

Draft 1/29/16



February 2016

***Standard Operating Procedures
And
Health and Safety Protocols
– For –
Sampling and Monitoring of
Freshwater Cyanobacterial Harmful
Algal Blooms and Other Nuisance
Blooms in California***



Prepared for:

California State Water Resources Control Board



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Laboratory Resources

- Chemical analysis of toxins
- Taxonomic identification

Training and education

- Summer 2015 and 2016 – Four locations
- Management and remediation

Applied Research and Tool Development

- Satellite imagery-small lakes
- Remediation Methods
- New laboratory tools

Outreach

- Education
- Coordination and Communication protocols

The End



NOTICE

Blue Green Algae is Present in Lake Del Valle

During summer and fall, the presence of blue green algae in lakes can result in a buildup of toxins. While near-water activities such as picnicking, biking, and hiking are safe, take the following precautions to help protect yourself, your family (including pets), and your friends:

- **No bodily contact with the water. Supervise children and pets at all times—they are particularly vulnerable.**
- **Keep pets, especially dogs, out of the water.**
- **Skin in contact with blue green algae should be rinsed with tap water.**
- **Fish may be consumed after removing guts and liver, and rinsing fillets in tap water.**

For more information, contact East Bay Regional Park District at (510) 544-2328 or visit the California Department of Public Health online www.cdph.ca.gov/healthinfo/environmental/water/Pages/bluegreenalgae.aspx

