
From: Wood, Michelle@Waterboards <Michelle.Wood@waterboards.ca.gov>
Sent: Thursday, August 04, 2016 7:23 PM
To: armorales@ucdavis.edu
Cc: Joab, Christine@Waterboards; Murvine, Angela@Waterboards; Anderson-Abbs, Bev@Waterboards; Lisa Medina [EH]
Subject: RE: Stockton CA Microcystis Algae Blooms
Attachments: PHS EHD Joint Release BGA 060816.pdf; Egeria Densa Treatment; Water Hyacinth Treatments

Hello Mr. Morales,

I appreciate your concerns about the growing algae problem in the Delta and Stockton area. Below I provide contacts and Internet links for more information about Microcystis Algae Blooms (aka cyanobacteria, blue green algae, BGA) in follow-up to our telephone conversation earlier this afternoon. Thank you for calling me on the phone so I could learn more about your concerns and provide relevant information.

Please don't hesitate to let me know if you have any trouble opening the attached files or have additional questions.

Michelle

1. **Sign postings and press release** by San Joaquin County Public Health Services and Environmental Health Department regarding BGA health concerns:
 - a. Please see the attached Adobe Acrobat PDF file, PHS EHD Joint Release BGA 060816.pdf, for the press release.
 - b. The press release states: "Environmental Health Department staff will be posting Health Advisory signs at local marinas cautioning swimmers, boaters and recreational users to avoid contact with BGA." As I stated during our call, I recommend you follow up with San Joaquin County regarding your concerns about the lack of signage at the public park you visited.
 - c. Contact information: Lisa Medina, (209) 468-3455, lmedina@sjcehd.com

2. **Regarding whether or not to eat fish caught in a bloom area:**
 - a. The above-mentioned San Joaquin County press release states: "Consume fish only after removing guts and liver, and rinsing fillets in clean drinking water. Mussels should not be consumed."
 - b. The joint press release by the Central Valley Water Board and California State Parks for the San Luis Reservoir and O'Neill Forebay stated: "People should not eat mussels or other bivalves collected from these areas. Limit or avoid eating fish from these areas; if fish are consumed, remove guts and liver, and rinse filets in clean drinking water."

3. **Agency and research efforts to address BGA and aquatic weeds:**
 - (a) California Cyanobacteria Harmful Algal Bloom (CCHAB) Network:

This is a network composed of representatives from many state, federal, and local agencies, tribal groups and academic institutions, with the shared goal of better addressing cyanobacteria concerns and impacts occurring statewide. The CCHAB Network is a workgroup of the Water Quality Monitoring Council and their webpage can be found here: http://www.mywaterquality.ca.gov/monitoring_council/cyanohab_network/index.html. This site provides an extensive amount of information and resources available to public agencies and private entities concerning cyanobacteria. You may find the resources section of interest.

 - (b) California Freshwater HAB Assessment and Support Strategy:

The State Water Resource Control Board's Surface Water Ambient Monitoring Program (SWAMP) has developed a strategy to develop a coordinated and widely supported long-term program to assess, communicate, and manage CyanoHABs, cyanotoxins, and other nuisance freshwater HABs.. You can find more information on their website: http://www.waterboards.ca.gov/water_issues/programs/swamp/freshwater_cyanobacteria.shtml

(c) Research about causes of and management practices for HABs:

(i) Delta Nutrient Research Plan development:

You can learn about efforts to develop a Delta Nutrient Research Plan

at: http://www.waterboards.ca.gov/centralvalley/water_issues/delta_water_quality/delta_nutrient_research_plan/index.shtml.

As we discussed during our telephone call, elevated nutrient concentrations may contribute to multiple water quality problems in the Delta, such as increased production of blue green algae and macrophytes (water hyacinth and *Egeria densa*), among other problems.

(ii) BGA Researchers:

Wayne. W. Carmichael, Ph. D.

Professor Emeritus

Aquatic Services

Oregon Lakes Association Board of Directors

Clatsop County Soil and Water Conservation District Board of Directors

wayne.carmichael@wright.edu

(503) 755-0711

<provides cyanoHAB consulting, identification and enumeration>

Meredith Howard, Ph.D.

Senior Scientist

Southern California Coastal Water Research Project

3535 Harbor Blvd. Suite 110

Costa Mesa, CA 92626

meredithh@sccwrp.org

Phone (714) 755-3263

Fax (714)-755-3299

Peggy Lehman, Ph.D.

California Department of Water Resources

(916) 376-9753

Peggy.Lehman@water.ca.gov

Raphael Kudela, Ph. D.

Professor of Ocean Sciences

University of California Santa Cruz

kudela@ucsc.edu

William Cochlan, Ph. D.

Romberg Tiburon Center for Environmental Studies

(415) 338-3541

(d) Types of activities underway to control aquatic weeds in the Stockton area:

Please see the two attached Microsoft Outlook email files that provide information and links regarding local efforts to control aquatic weeds. Prolific growth and die-off of invasive aquatic weeds such as water hyacinth and *Egeria* can also cause odor and other water quality problems.

4. **What concerned individuals can do:**

You asked during our telephone call, what can regular people (versus agencies and researchers) do to help reduce BGA? I responded that picking up pet waste and not over-fertilizing (and over-watering) lawns in urban areas would be a great start to help reduce the amount of nutrients that are transported to our waterways by urban runoff and can provide food for BGA to grow, as well as contribute to other water quality problems that can harm swimmers, such as pathogens. You may learn more options from the above and below resources.

5. **Additional information** about algae blooms available at state and federal agency websites:

<http://www.cdph.ca.gov/healthinfo/environhealth/water/pages/bluegreenalgae.aspx>

<http://oehha.ca.gov/ecotoxicology/general-info/information-microcystins>

<https://www.epa.gov/water-research/harmful-algal-blooms-cyanobacteria>

From: Wood, Michelle@Waterboards

Sent: Tuesday, August 02, 2016 3:32 PM

To: 'armorales@ucdavis.edu'

Cc: Joab, Christine@Waterboards; Murvine, Angela@Waterboards; Anderson-Abbs, Bev@Waterboards

Subject: RE: Stockton CA Microcystis Algae Blooms

Good afternoon, Mr. Morales:

My name is Michelle Wood. Angela directed your email to me because the City of Stockton and Delta are in the Central Valley region of the Water Boards and I work for the Central Valley Water Resources Control Board.

I would like to discuss your questions over the telephone because there are several sources of information that might be relevant for your concerns. My telephone #: 916-464-4650.

If you reach my voicemail, please leave a message with a couple dates and times that would be convenient for you to talk and I will call you back.

Michelle

Michelle L. Wood
 Senior Environmental Scientist
 Nonpoint Source, Assessment & Planning Unit
 California Regional Water Quality Control Board
 Central Valley Region
 11020 Sun Center Drive #200
 Rancho Cordova, CA 95670
 Tel: (916) 464-4650
 Email: mlwood@waterboards.ca.gov



From: Anthony Morales [<mailto:armorales@ucdavis.edu>]

Sent: Monday, August 01, 2016 6:33 PM

To: Murvine, Angela@Waterboards

Subject: Stockton CA Microcystis Algae Blooms

Hello Angela Murvine, my name is Anthony Morales. I am concerned about the growing algae problem which plagues the Sacramento–San Joaquin River Delta, particularly around the city of Stockton. Two years ago, when the algae first made an appearance, there was word from the University of California, Davis professionals that the Microcystis Blooms could be toxic to both fish and people. Since then, there has been no update from them, the local government, or state government on the water quality. Not that I've seen, anyway. I recently went to the Stockton Waterfront and noticed that the proliferation of the potentially toxic algae had become far more noticeable than it had ever been in previous years (due to the sickly green color of the water and putrid scent in the air). One of the key focuses on previous research of Delta waters was the prevention of future blooms, though clearly if the problem persists, not enough is being done. I had decided that the ambiguity on how truly safe or toxic these waters are is unacceptable; especially since the river surrounds a public park where I frequently see children playing. I've done some research and came to know of your organization. I was hoping to see if you know what can be done for my community in this regard. I've found several resources that could potentially help, though I don't particularly know where to start or who exactly to contact. Your assistance would be greatly appreciated. Thank you for your time.

Preventive Measures for the formation of algae blooms?

<https://www.epa.gov/nutrient-policy-data/control-and-treatment>

A report on the health of the Delta waterway (which has been confirmed to be polluted)

<https://watersgeo.epa.gov/mywaterway/rdetail.html>

From: Wood, Michelle@Waterboards <Michelle.Wood@waterboards.ca.gov>
Sent: Thursday, August 04, 2016 7:06 PM
To: Wood, Michelle@Waterboards
Subject: Egeria Densa Treatment

From: CA State Parks, DBW Aquatic Invasive Species Program [<mailto:ais@parks.ca.gov>]
Sent: Friday, July 29, 2016 11:30 AM
To: Joab, Christine@Waterboards
Subject: Egeria Densa Treatment



Submersed Aquatic Vegetation Control Program

CA State Parks, Division of Boating and Waterways
Egeria Densa, Curlyleaf Pondweed

Treatment for August 1 thru August 5, 2016



Treatments for August 1 thru August 5		
CC	SAC	SJ
107-111, 171		

[View Larger Image](#)

"Treatment sites and schedules are subject to change based on regulatory requirements, weather conditions,

SITE REFERENCES

- 107 - Piper Slough
- 108 - Sandmound Slough
- 109 - Sandmound Slough
- 110 - Taylor Slough
- 111 - Taylor Slough
- 171 - Delta Cove

COUNTY REFERENCE

- CC - Contra Costa
- SAC - Sacramento
- SJ - San Joaquin

plant growth and movement, waterway traffic, listed fish presence surveys, and other conditions."

- Applications will be conducted during the hours of 7am to 4pm bi-weekly, Monday thru Friday.
- Herbicide applications during the time frame will utilize Fluridone (Sonar) only.

[TREATMENT SITE MAP](#)

[VIEW OUR WEBSITE](#)



DIVISION OF BOATING AND WATERWAYS
ONE CAPITOL MALL, SUITE 500
SACRAMENTO, CA 95814

1-888-326-2822 ais@parks.ca.gov

Ca State Parks, Division of Boating and Waterways,
One Capitol Mall, Suite 500, Sacramento, CA 95814

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From: Wood, Michelle@Waterboards <Michelle.Wood@waterboards.ca.gov>
Sent: Thursday, August 04, 2016 6:02 PM
To: Wood, Michelle@Waterboards
Subject: Water Hyacinth Treatments

From: CA State Parks, DBW Aquatic Invasive Species Program [<mailto:ais@parks.ca.gov>]
Sent: Friday, July 29, 2016 11:26 AM
To: Joab, Christine@Waterboards
Subject: Water Hyacinth Treatments



FLOATING AQUATIC VEGETATION CONTROL PROGRAM

CA State Parks, Division of Boating and Waterways
Water Hyacinth and Spongeplant

Treatments for August 1 thru August 5, 2016



COUNTY							
ALA	CC	MER	SAC	SI	STAN	SOL	YOLO
79	19b-24b, 83a, 84a, 85b, 86b, 87a, 88, 89a, 90a, 91a, 93-97 98b, 99a, 101a, 102, 103a, 104a, 105-118, 171	401-427, 500-537	18a, 19a, 20, 21a, 22, 23a, 24a, 209a-213a, 214-219, 250b, 251b, 252b, 253b	6-14, 16, 18b-26, 28, 30-33, 35-37, 39-41, 45-49, 52-68, 70-82, 83b-85b, 86a, 87a, 89b, 90b, 91b, 92b, 98a- 104b, 200-208, 209b-213b, 291, 300-309	310-323, 700-718	251a, 252a, 253b, 267, 269-274, 277, 282	250a, 269

Since March 10, 2016, approximately 1,600 acres of water hyacinth and/or spongeplant have been treated at 149 sites with 428 total treatments.*

** Data are preliminary and subject to change.*

[View Larger Image](#)

"Treatment sites and schedules are subject to change based on regulatory requirements, weather conditions, plant growth and movement, waterway traffic, listed fish presence surveys, and other conditions."

- Spraying will be conducted during the hours of 7am to 4pm weekly, Monday thru Friday.
- Herbicide applications during the treatment period will utilize Glyphosate (Roundup Custom),

Detailed Site Information

Northern Treatment Site Map

Imazamox (Clearcast), Penoxsulam (Galleon), and
2,4-D (Weedar 64)

Treatment Period:

Area 2-4: Mar. 10, 2016 - Nov. 30, 2016

Area 1: June 1, 2016 - Nov. 30, 2016

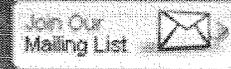
County References:

ALA - Alameda; CC - Contra Costa;
MER - Merced; SAC - Sacramento; SJ - San Joaquin;
STAN - Stanislaus; SOL - Solano; YOLO - Yolo

***Southern Treatment
Site Map***

***Fish Passage
Protocol***

Visit Our Website



DIVISION OF BOATING AND WATERWAYS
ONE CAPITOL MALL, SUITE 500
SACRAMENTO, CA 95814

1-888-326-2822 ais@parks.ca.gov

CA State Parks, Division of Boating and Waterways,
One Capitol Mall, Suite 500, Sacramento, CA 95814

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SAN JOAQUIN COUNTY

Public Health Services*Healthy Future*P.O. Box 2 009 · 1601 East Hazelton Ave · Stockton, CA 95201
phone (209) 468.3411 · fax (209) 468.3823 · www.sjcphs.orgSan Joaquin County
Environmental Health Department1868 E Hazelton Avenue
Stockton, California 95205Website: www.sjcehd.com

Phone: (209) 468-3420

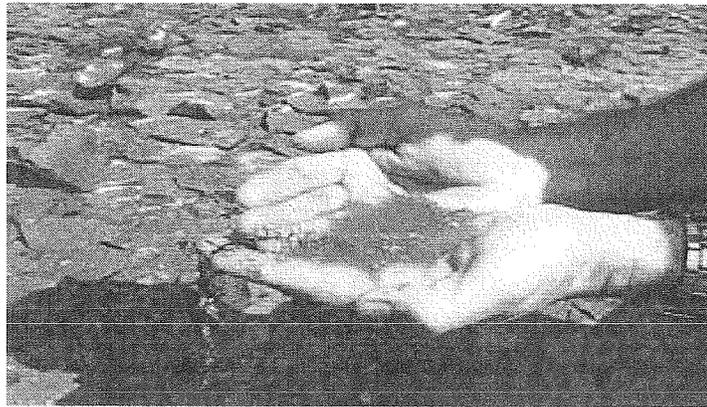
Fax: (209) 464-0138

FOR IMMEDIATE RELEASE

CONTACT for this Release:

Lisa Medina

Office Phone: (209) 468-3455

Email: lmedina@sjcehd.com**BLUE-GREEN ALGAE HEALTH CONCERNS FOR
HUMANS AND ANIMALS***Blue-Green Algae*

STOCKTON, CA (June 8, 2016) – Warm temperatures are here and when conditions are right, blue-green algae can rapidly build-up or bloom on the surface of reservoirs, rivers, creeks, lagoons, lakes and ponds. Environmental Health and Public Health officials are urging swimmers, boaters, and recreational users to avoid contact with blue-green algae (BGA), also known as cyanobacteria. The algae blooms may produce toxins that can present a health hazard to humans and animals. The algae blooms can look like green, blue-green, white, or brown foam and scum floating on the water. Children are especially vulnerable because they play on the shoreline, drink more water than adults when swimming, and are of a smaller body size. Dogs are especially vulnerable to BGA poisoning and many dogs are lost each year because they tend to drink more water and lick algae off their fur.

Human Exposure General Health Effects:

- Rashes or other skin irritations.
- Allergy-like reactions, runny nose or sore throat.
- Toxins ingested in large amounts can cause sharp, severe stomach problems like diarrhea and vomiting, liver damage, numb limbs, tingling fingers and toes or dizziness.

Animal Exposure Health Effects:

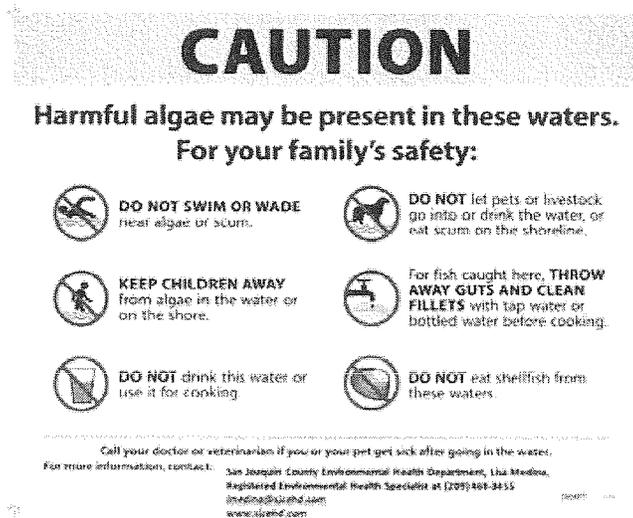
- Weakness, staggering
- Difficulty breathing
- Convulsions
- Vomiting and diarrhea
- Death if not treated

-more-

Statewide Guidance on Harmful Algae Blooms recommends the following:

- Avoid wading and swimming in water containing visible blooms or water containing algae scum or mats, which are most often present at the shoreline.
- Take care that pets and livestock do not drink the water or swim through scums, mats, nor lick their fur after going in the water. Wash exposed pets in clean drinking water.
- If no algae scums or mats are visible, you should carefully watch young children and warn them not to swallow the water.
- Do not drink, cook, or wash dishes with untreated water.
- Consume fish only after removing guts and liver, and rinsing fillets in clean drinking water. Mussels should not be consumed.
- Get medical treatment right away if you think you, your pet, or your livestock might have been poisoned by blue-green algae toxins.

Environmental Health Department staff will be posting Health Advisory signs at local marinas cautioning swimmers, boaters and recreational users to avoid contact with BGA.



Graphic courtesy of California Cyanobacteria Harmful Algal Bloom (CCHAB) Network

For more information, visit:

San Joaquin County Environmental Health Department: <http://www.sjcehd.com> or call (209) 468-3420
San Joaquin County Public Health Service: <http://www.sjcphs.org> or call (209) 468-3411

California Cyanobacteria Harmful Algal Bloom (CCHAB) Network:
http://www.mywaterquality.ca.gov/monitoring_council/cyanoHab_network/index.html

California Department of Public Health:
<http://www.cdph.ca.gov/healthinfo/environhealth/water/Pages/Bluegreenalgae.aspx>

State Water Resources Control Board:
http://www.waterboards.ca.gov/water_issues/programs/bluegreen_algae/

Office of Environmental Health Hazard Assessment: <http://oehha.ca.gov/ecotox/microcystins.html>

U.S. Centers for Disease Control & Prevention: <http://www.cdc.gov/>

U.S. Environmental Protection Agency: <http://epa.gov/gmpo/habpage.html>