

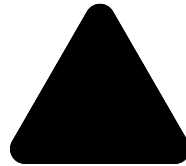


UTAH DEPARTMENT *of*
**ENVIRONMENTAL
QUALITY**

Utah Lake Algal Bloom Monitoring 2019

Update August 5, 2019

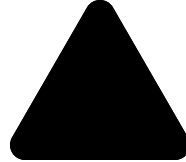
Lincoln Beach: Danger



Danger Advisory

- Waterbody closed
- Keep out of the water

Provo Bay and Goshen Bay: Warning



Warning Advisory

- Do not swim or water ski
- Do not ingest the water
- Keep pets and livestock away
- Clean fish well and discard guts
- Avoid areas of scum when boating

Report a Bloom

24-Hour DEQ Environment
Incidents Line: (801) 536-
4123

Call Utah Poison

Control Center

(<http://poisoncontrol.utah.edu>

).



If you believe you or your pet have been exposed to a harmful algal bloom, call **(800) 222-1222**.

Visit the Utah Lake Water Quality Study

page

(<https://deq.utah.gov/water-quality/utah-lake-water-quality-study>).

Visit the 2019 Photo Gallery

(<https://deq.utah.gov/water-quality/photo-gallery-utah-lake-algal-bloom-2019>).

Utah County Alerts

To sign up for updates go to alerts.utahcounty.gov (<https://member.everbridge.net/index/1332612387832225#/login>) and create an account. Select contact methods. Create profile, select location. Choose alert subscription “Utah Lake” under “Utah County Alerts.”

Get BloomWatch App

Help us track cyanobacteria blooms with your smartphone. Go to cyanos.org (<http://cyanos.org/bloom-watch/>) for more info

[watch](#), for more info.



(<https://play.google.com/store/apps/details?id=com.mdw.bloomWatch>).



(<https://itunes.apple.com/us/app/bloomwatch/id1107300124?mt=8>).



Lincoln Beach, July 29, 2019

Toxin-test results and cyanobacteria cell-counts from samples collected by the Division of Water Quality (DWQ) on July 29, 2019, show decreases in toxin levels and cell counts. The Lincoln Beach Marina, however, continues to register high levels of both toxins and cyanobacterial cell-count densities. Aphanizomenon, Dolichospermum, and Microcystis were the three main cyanobacteria taxa found in the samples.

The DWQ monitoring crew observed three types of cyanobacteria present in the Lincoln Beach area. The crew observed cottage-cheese type cyanobacteria with high concentrations of isolated clumps along the shore north of the Lincoln Beach Marina. The marina itself contained isolated clumps of cyanobacteria that resembled grass clippings. High winds at Goshen Bay appear to have dispersed the cyanobacteria in the bay, and the crew noted that the water column was visibly clear. The water column at Provo Bay was a green/brown color and contained small, visible cyanobacteria particulates.

Two consecutive weeks of sampling are required before a health advisory can be

Two consecutive weeks of sampling are required before a health advisory can be lifted or downgraded.

A Danger Advisory indicates a high relative probability of acute health risk, cell-count density of >10 million cells per milliliter (cells/mL), microcystin levels >2,000 micrograms per liter ($\mu\text{g/L}$), or anatoxin-a levels >90 $\mu\text{g/L}$. A Warning Advisory indicates a moderate relative probability of acute health risk, cell-count density of 20,000 – 10 million cells per milliliter (cells/ml), microcystin levels of 4-2,000 micrograms per liter ($\mu\text{g/L}$), or anatoxin-a levels above non-detect.

The Danger Advisory remains in place for Lincoln Beach Marina. The Warning Advisory remains in place for Goshen Bay and Provo Bay.

North of the Lincoln Beach Marina

- Sample Type: Surface sample
- Sample Date: July 29, 2019
- Microcystin: 460 micrograms per liter ($\mu\text{g/L}$)
- Anatoxin-a: <0.10 $\mu\text{g/L}$
- Cell Counts: 2,679,877 cells per milliliter (cells/mL)

Lincoln Beach Marina (Surface Sample)

- Sample Date: July 29, 2019
- Microcystin: 750 micrograms per liter ($\mu\text{g/L}$)
- Anatoxin-a: <0.10 $\mu\text{g/L}$
- Cell Counts: 5,058,407 cells per milliliter (cells/mL)

Lincoln Beach Marina (Elbow-Depth Integrated Composite Sample)

- Sample Date: July 29, 2019
- Microcystin: 0.36 micrograms per liter ($\mu\text{g/L}$)
- Anatoxin-a: <0.10 $\mu\text{g/L}$
- Cell Counts: 14,918 cells per milliliter (cells/mL)

Middle of Provo Bay

- Sample Type: Elbow-depth integrated composite sample
- Sample Date: July 29, 2019
- Microcystin: 0.13 micrograms per liter ($\mu\text{g/L}$)
- Anatoxin-a: <0.10 $\mu\text{g/L}$
- Cell Counts: 22,754 cells per milliliter (cells/mL)

Goshen Bay

- Sample Type: Elbow-depth integrated composite sample
 - Sample Date: July 29, 2019
 - Microcystin: 0.14 micrograms per liter ($\mu\text{g/L}$)
 - Anatoxin-a: $<0.10 \mu\text{g/L}$
 - Cell Counts: 286 cells per milliliter (cells/mL)
-

Update August 1, 2019



Goshen Bay, July 22, 2019

The Utah County Health Department (UCHD) has lifted the lake-wide Warning Advisory for Utah Lake after cyanobacteria cell-count concentrations from samples collected on July 22, 2019, in the open water near Pelican Point were well below the recreation health-based threshold values for a Warning Advisory. Toxin-test results were also well below advisory thresholds.

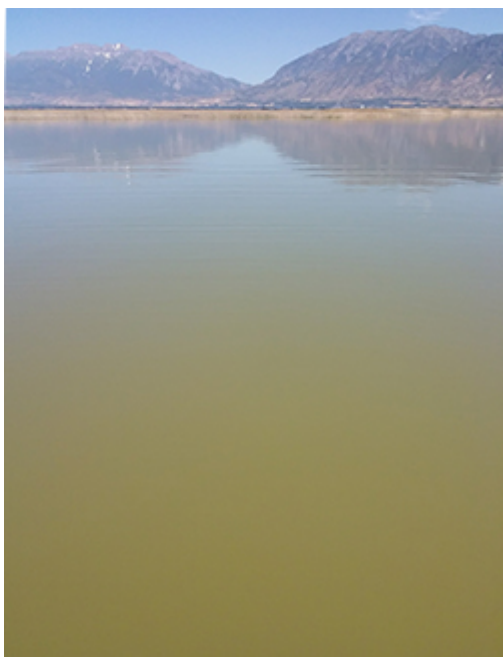
Cyanobacteria cell-counts from samples collected in Provo Bay on July 22, 2019, showed values of 35,706 cells/mL, which are above the threshold values for a Warning Advisory. Toxin results were well below Utah recreational health advisory thresholds. Cell counts from samples collected in Goshen Bay on July 22, 2019, showed values of 53,803 cells/mL, which are above the threshold values for a Warning Advisory. Toxin-test results showed levels well below Utah recreational health advisory thresholds.

The Division of Water Quality (DWQ) conducted open-water response sampling on July 22, 2019, and visited 13 locations across the lake. A number of the sites had a green hue but no visible cyanobacteria or particulates in the water column. The crew observed several types of cyanobacteria in the southwest area of the lake. The beach north of Lincoln Marina contained cyanobacteria with the consistency of “cottage cheese” with high concentrations of isolated clumps along the shore. Isolated clumps of cyanobacteria resembling grass clippings were observed inside Lincoln Marina. The water column in the open water near

Goshen Bay also contained concentrated cyanobacteria resembling grass clippings.

The Danger Advisory remains in place for Lincoln Marina. Warning Advisories have been issued for Provo Bay and Goshen Bay, and UCHD will post signs in those locations today.

A Danger Advisory indicates a high relative probability of acute health risk, cell-count density of >10 million cells per milliliter (cells/mL), microcystin levels >2,000 micrograms per liter ($\mu\text{g/L}$), or anatoxin-a levels >90 $\mu\text{g/L}$. A Warning Advisory indicates a moderate relative probability of acute health risk, cell-count density of 20,000 – 10 million cells per milliliter (cells/ml), microcystin levels of 4-2,000 micrograms per liter ($\mu\text{g/L}$), or anatoxin-a levels above non-detect.



Provo Bay, July 22, 2019

Middle of Provo Bay

- Sample Type: elbow-depth integrated composite sample
- Sample Date: July 22, 2019
- Microcystin: 0.19 micrograms per liter ($\mu\text{g/L}$)
- Anatoxin-a: <0.10 $\mu\text{g/L}$
- Cell Counts: 35,706 cells per milliliter (cells/mL)

North of Lincoln Marina

- Sample Type: surface sample
- Sample Date: July 22, 2019

Sample Date: July 22, 2019

- Microcystin: >2000 µg/L
- Anatoxin-a: <0.10 µg/L
- Cell Counts: 9,192,281 cells/mL

Lincoln Marina

- Sample Type: elbow-depth integrated composite sample
- Sample Date: July 22, 2019
- Microcystin: 59 µg/L
- Anatoxin-a: <0.10 µg/L
- Cell Counts: 146,076 cells/mL

Goshen Bay

- Sample Type: elbow-depth integrated composite sample
- Sample Date: July 22, 2019
- Microcystin: 0.25 µg/L
- Anatoxin-a: <0.10 µg/L
- Cell Counts: 53,803 cells/ml

South of Pelican Point

- Sample Type: elbow-depth integrated composite sample
- Sample Date: July 22, 2019
- Microcystin: 0.32 µg/L
- Anatoxin-a: <0.10 µg/L
- Cell Counts: 2,229 cells/mL

Update July 25, 2019: Lincoln Beach



*Lincoln Beach, July 22,
2019*



*Lincoln Beach, Jul 22,
2019*

The Utah County Health Department has put Lincoln Beach at Utah Lake on a Danger Advisory which includes a beach closure. Signs will be placed in Lincoln Beach Marina.

A Danger Advisory indicates a high relative probability of acute health risk, cell-count density of >10 million cells per milliliter (cells/mL), microcystin levels >2,000 micrograms per liter ($\mu\text{g/L}$), or anatoxin-a levels >90 $\mu\text{g/L}$.

Update July 24, 2019: Lincoln Beach

On July 22, 2019, the Division of Water Quality (DWQ) HABs monitoring crew was on Utah Lake for follow-up response monitoring and routine monitoring.

The crew observed isolated clumps of bright green cyanobacteria with a cottage cheese consistency on the water surface in and around the Lincoln Beach marina. Three dead fish were observed in the water. DWQ collected surface and elbow-depth integrated composite samples at the marina.

On July 24, 2019, toxin results from Utah Public Health Laboratory (UPHL) showed microcystin toxin levels in the surface sample were above the threshold for a Danger Advisory. Cyanobacteria cell-count results received on July 24, 2019, showed cell volume was also nearing the threshold for a Danger Advisory.

Microcystin is a potent liver toxin and possible human carcinogen. Cyanotoxins can also kill livestock and pets that drink affected waters. [Fish and bird mortalities \(https://www.epa.gov/national-aquatic-resource-surveys/indicators-algal-toxins-microcystin\)](https://www.epa.gov/national-aquatic-resource-surveys/indicators-algal-toxins-microcystin) have also been reported in waterbodies with persistent cyanobacteria blooms.

Toxin Test Results

- Surface sample
 - >2,000 micrograms per liters ($\mu\text{g/L}$) of microcystin
 - <0.10 $\mu\text{g/L}$ anatoxin-a
- Elbow-depth integrated composite sample
 - 34 $\mu\text{g/L}$ microcystin
 - <0.10 $\mu\text{g/L}$ anatoxin-a

Cyanobacteria Cell-Count Concentrations

- Surface sample: 9,192,281 cells per milliliter (cells/mL)
 - Integrated sample: 146,076 cells/mL
-

Update July 23, 2019

The Division of Water Quality (DWQ) returned to Utah Lake on July 15, 2019 and collected elbow-depth integrated composite samples in the open water of Utah Lake. Results showed a decrease in the toxin microcystin and cell counts with levels of both below advisory thresholds. Utah Lake requires one more sample below thresholds before the Warning Advisory can be lifted.

- Toxin test results: 0.111 micrograms per liter ($\mu\text{g/L}$) of anatoxin-a: >0.10 $\mu\text{g/L}$ of microcystin.
 - Cyanobacteria cell-count concentrations: surface sample:14,316 cells/mL
-

Update July 12, 2019

On Wednesday, July 10, 2019, The Division of Water Quality (DWQ) collected water samples in the open water of Utah Lake. The monitoring crew observed large blooms extending at least from Pelican Point down to the entrance of Provo Bay with cyanobacteria visible in the water column and large clumps on the surface.

DWQ received cyanobacterial cell-count concentration results from PhycoTech on July 12, 2019, of 449,874 cells per milliliter (cells/mL) on the surface and 27,455 cells/mL within the water column. These cell-count densities exceed the recreation health-based threshold for a Warning Advisory. Based on these data, the Utah County Health Department has issued a Warning Advisory for Utah Lake.

The Utah County Health Department will be posting warning signs around the lake at Lincoln Beach, Sandy Beach, Pelican Point, Lindon Harbor, American Fork Harbor, Saratoga Springs City Marina, and Saratoga Springs HOA Marina.

Water samples were also delivered to the Utah Public Health Lab (UPHL) for further analysis. UPHL testing showed anatoxin-a levels of <0.10 micrograms per liter ($\mu\text{g/L}$), and microcystin levels at 1.07 $\mu\text{g/L}$ on the surface and 0.185 $\mu\text{g/L}$ for the depth integrated sample. Both are below the recreation health-based threshold for a Warning Advisory. While toxins were not detected at the time of sampling, the large majority of the cells found are of the genus *Aphanizomenon*, which has the ability to produce both microcystin and anatoxin-a.

A Warning Advisory indicates a moderate relative probability of acute health risk, cell-count density of 20,000 – 10 million cells per milliliter (cells/mL), microcystin levels of 4-2,000 micrograms per liter ($\mu\text{g/L}$), or anatoxin-a levels above non-detect.

Update July 9, 2019

The Utah County Health Department (UCHD) has **lifted the Warning Advisory for Provo Bay** following two consecutive weeks of samples below advisory levels.

Samples collected by the Division of Water Quality (DWQ) on June 27, 2019, and July 3, 2019, were below cyanobacteria cell-count and toxin recreation health-based thresholds.

June 27, 2019

- Sample from open water, middle of Provo Bay; elbow-depth integrated composite sample
- Toxin test results: <0.10 micrograms per liter ($\mu\text{g/L}$) of anatoxin-a: 0.122 $\mu\text{g/L}$ of microcystin
- Cyanobacteria cell-count concentrations: 3.949 cells per milliliter (cells/mL), down from 370,112 cells/mL in the June 18, 2019, sample

July 3, 2019

- Sample from open water, middle of Provo Bay, elbow-depth integrated composite sample
 - Toxin test results: <0.10 $\mu\text{g/L}$ of anatoxin-a: 0.26 $\mu\text{g/L}$ of microcystin
 - Cyanobacteria cell-count concentrations: 4,445 cells/mL
-

Update June 24, 2019

The Utah County Health Department (UCHD) issued a Warning Advisory on June 24, 2019, for Provo Bay after samples collected on June 18, 2019, showed high cyanobacteria cell-count concentrations. UCHD will be posting advisory signs at Sandy Beach and the Utah Lake State Park Marina.

The Division of Water Quality (DWQ) visited Utah Lake on June 17, 2019, and June 18, 2019, to collect samples and assess lake conditions. The monitoring crew did not observe visible cyanobacteria or particulates in the water column at numerous Utah Lake sample sites with the exception of Provo Bay. DWQ collected surface and depth-integrated composite samples in the open water in the middle of Provo Bay after observing a bright green hue and small green particulates in the water column.

DWQ received cyanobacteria cell-count concentrations from PhycoTech on June 24, 2019, of 370,112 cells per milliliter (cells/mL) in the surface sample. These cell-count densities exceed the recreation health-based threshold for a Warning Advisory. Most of the cyanobacteria found in the sample were identified as *Dolichospermum*, a taxon known to produce both anatoxin-a and microcystin.

Toxin test results were <0.10 micrograms per liter ($\mu\text{g/L}$) for anatoxin-a and 0.42 $\mu\text{g/L}$ for microcystin, both of which are well below the recreation health-based threshold for an advisory.

DWQ will collect samples in Provo Bay this week to chart the progress of the bloom and monitor for changes in cell-count densities and toxin levels.

Update June 17, 2019

The Utah County Health Department (UCHD) lifted the Warning Advisory at the Saratoga Springs City Marina after samples collected by the Division of Water Quality (DWQ) on June 5, 2019, and June 13, 2019, showed microcystin levels of 0.12 micrograms per liter ($\mu\text{g/L}$). These values are well below the recreation health-based threshold for a Warning Advisory.

Per the Utah Department of Environmental Quality/Utah Department of Health guidelines, an advisory can be lifted after two weeks of data indicate that the hazard has passed.

Update June 11, 2019

The Division of Water Quality (DWQ) received cyanobacteria cell-count concentrations and taxa identification for samples collected on May 30, 2019, and

June 5, 2019.

Cell-count concentrations were well below the recreation health-based threshold for an advisory with the exception of the May 30, 2019, surface sample from the Saratoga Springs Public Marina Picnic Area. Cell-count densities for this sample were 1.19 million cells per milliliter (cells/ml), which exceeds the recreation health-based threshold for a Warning Advisory. The predominant cyanobacteria taxon was microcystis, but dolichospermum, another potent toxin-producer, was also found in the sample. Elevated cell-count concentrations match the high microcystin levels found at the same location.

Toxin levels and cell-count densities have dropped significantly since the May 30, 2019, sample, indicating the bloom is dissipating. However, the Warning Advisory for the Saratoga Springs Public Marina Picnic Area will remain in effect until cell-count concentrations and toxin test results from samples collected over two consecutive weeks fall below the recreation health-based advisory level.

Sample Location and Sample Type

June 5, 2019

- Lindon Marina (elbow-depth integrated composite sample)
- Saratoga Springs City Marina (elbow-depth integrated composite sample)

Cyanobacteria Cell-Count Concentrations

- Lindon Marina: 229 cells per milliliter (cells/ml)
- Saratoga Springs City Marina: 123 cells/ml

Sample Location and Sample Type

May 30, 2019

- Saratoga Springs City Marina (surface sample)
- Saratoga Springs City Marina (elbow-depth integrated composite sample)
- Lindon Marina (elbow-depth integrated composite sample)

Cyanobacteria Cell-Count Concentrations

- Saratoga Springs City Marina (surface sample): 1,194,701 cells/ml
- Saratoga Springs City Marina (elbow-depth integrated composite sample): 2973 cells/ml
- Lindon Marina: none detected

Update June 10, 2019

The Division of Water Quality (DWQ) collected samples at the Saratoga Springs Public Marina Picnic Area and Lindon Marina on June 5, 2019. Toxin test results for microcystins were well below advisory levels for both samples.

The updated toxin result for the depth-integrated sample collected on May 30, 2019, at the Saratoga Springs site was 14 micrograms per liter ($\mu\text{g/L}$) for microcystin. This toxin level was over three times greater than the health-based recreation threshold.

The Warning Advisory for the Saratoga Springs Public Marina Picnic Area will remain in effect until toxin test results from samples collected over two consecutive weeks fall below the health-based recreation advisory level.

Sample Location and Sample Type

- Saratoga Springs City Marina (elbow-depth integrated composite sample)
- Lindon Marina (elbow-depth integrated composite sample)

Toxin Test Results

- Saratoga Springs City Marina: 0.12 micrograms per liter ($\mu\text{g/L}$) of microcystin
 - Lindon Marina: <0.10 $\mu\text{g/L}$ of microcystin
-

Update June 5, 2019





*Saratoga Springs Public Marina
Picnic Area, Utah Lake, May 30,
2019.*

The Division of Water Quality (DWQ) visited Utah Lake for routine monitoring on May 30, 2019, and collected three samples total at two locations that appeared to be experiencing cyanobacterial blooms. DWQ delivered these samples to the Utah Public Health Lab (UPHL) for further testing after toxin-test strip results came back invalid.

Both samples for the Saratoga Springs Public Marina Picnic Area significantly exceeded the recreation health-based threshold for a Warning Advisory for microcystin, with the surface sample registering microcystin levels 375 times greater than the advisory level.

Water-quality scientists observed that the Lindon Marina Beach was a green hue with small particulates. The potential bloom/green color was concentrated in the northeast beach area outside the marina. The Saratoga Springs Public Marina Picnic Area had isolated green clumps concentrated along the shore of the beach, and particulates were visible throughout the water column. All other sites were clear with no visible particulates.

DWQ monitoring crews returned to Utah Lake on June 5, 2019, to collect additional samples in the affected area. Samples will be sent to UPHL for toxin testing and Phycotech for cell-count concentrations and species identification.

The Utah County Health Department (UCHD) has issued a Warning Advisory for the Saratoga Springs Public Marina Picnic Area and posted signs at the picnic area. The remainder of the lake is NOT under an advisory.

A Warning Advisory indicates a moderate relative probability of acute health risk, cell-count density of 20,000 – 10 million cells per milliliter (cells/ml), microcystin levels of 4-2,000 micrograms per liter ($\mu\text{g/L}$), or anatoxin-a levels above non-detect. Advisory actions:

- Do not swim or water ski
- Do not ingest the water
- Keep pets and livestock away
- Clean fish well and discard guts
- Avoid areas of scum when boating

Sample Location and Sample Type

- Lindon Marina (elbow-depth integrated composite sample)
- Saratoga Springs City Marina (surface sample)
- Saratoga Springs City Marina (elbow-depth integrated composite sample)

Toxin Test Results

- Lindon Marina Beach: <0.10 micrograms per liter ($\mu\text{g}/\text{L}$) of anatoxin-a; 0.13 $\mu\text{g}/\text{L}$ of microcystin
- Saratoga Springs City Marina (surface sample): <0.10 $\mu\text{g}/\text{L}$ of anatoxin-a; 1500 $\mu\text{g}/\text{L}$ of microcystin (1200x dilution)
- Saratoga Springs City Marina (depth-integrated sample): <0.10 $\mu\text{g}/\text{L}$ of anatoxin-a; between 5 and 250 $\mu\text{g}/\text{L}$ of microcystin (actual microcystin levels to be determined after additional dilutions)

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⚠ [Environmental Incidents \(https://deq.utah.gov/general/report-an-incident\)](https://deq.utah.gov/general/report-an-incident): (801) 536-4123