THE DAILY UNIVERSE

BYU researchers study Utah Lake algal bloom

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A woman stands along the Utah Lake shore near a remaining spot of algae in July. BYU researchers are looking into why the algal bloom happened and what can be done to prevent it in the future. (Dani Jardine)

Utah Lake is blooming and a group of BYU researchers wants to know why.

Graduate students Erin Jones and Scott Collins have been studying Utah Lake's algae phenomenon with the help of BYU associate professor Zachary Aanderud. The researchers are trying to learn more about the bacteria and lake conditions that cause the toxic algal blooms.

"We (are) interested in looking at more of the ecology behind how those blooms are happening and what factors are controlling them," Jones said.

A huge toxic algal bloom caused officials to close Utah Lake to the public in July 2016. A toxic algal bloom returned for a short period this summer, but the lake is currently open.

"Algal blooms, especially toxic algal blooms, are a big deal," Collins said in an email. "They affect water quality around the world. As we learn how to manage our lakes better, we can reduce the opportunities for them to occur."

Collins, along with lab technician Dylan Dastrup and undergraduate research assistants, has been collecting samples of bacteria and nutrients at seven points on the lake each week since the beginning of April.

This fall, the researchers will begin isolating single strains of cyanobacteria samples for study. "Once isolated, we can put (the cyanobacteria) in controlled environments and manipulate just a few variables at a time to really establish the values for which the bacteria respond by either growing exponentially or producing toxins," Jones said.

The team will also analyze the nutrient levels of the varying forms of phosphorous and nitrogen in the lake.

"We'll be able to see what factors correlate with the algal growth for the different species that we find from sequencing," said Jones. "By (taking samples) weekly, we hope to be able to catch conditions leading up to blooms, which is where the environmental triggers actually occur."

The researchers have also been collecting extra samples to send to the Utah Department of Environmental Quality, where the samples are analyzed to provide information to the public.

"They're a real big help for us because we don't have the resources to go down there on a weekly basis," said Ben Holcomb, environmental scientist for the Utah Division of Water Quality.

According to Jones, collecting an extra sample for the department is "not really much of a sacrifice." "They're spread pretty thin, so we're happy to do what we can to help contribute to the public health awareness that the cyanobacteria represent," Jones said.

As part of the collaboration, the Utah Department of Environmental Quality provides data to the researchers about the analysis of the samples.

"It saves us a little bit of money and time by them being able to provide that analysis for us," Jones said.

According to Holcomb, the benefits are mutual.

"We're kind of complimenting each other on our needs, so it's been a really helpful process," Holcomb said.

According to Donna Spangler, the Utah Department of Environmental Quality communications director, algal blooms are naturally occurring. The conditions that cause blooms to spread include sunlight, heat, stagnant water and an excess of nutrients.

"Under certain environmental conditions … (algal bloom) certainly has a tendency to spread," she said.

However, predicting the spread can be difficult because of the many factors at play, according to Spangler.

"After it begins, it's really out of our hands," Holcomb said. "It's one of those cases where prevention is the key."

The biggest prevention measure, according to Holcomb, is to limit the amount of excess nutrients entering the lake, which is a long-term process.

The lake's nutrient content is impacted by nearby fertilizer, urban runoff and water treated at the water treatment facility, Spangler said.

While preventing future algal blooms may not be easy, the BYU researchers are optimistic their studies will help bring solutions.

"We hope that this research will help the state protect public health, as well as help them understand what they can do to improve the lake over time," Collins said.