the science of | The St. Johns River

Transcript

Science on the St. Johns: Algal Blooms

http://thescienceof.ju.edu/science-on-the-st-johns-algal-blooms/

Narrator: Harmful algal blooms are all too familiar in Northeast Florida. These blooms are caused by different types of microscopic plant-like bacteria that grow rapidly due to fertilizers and warm temperatures, and can overtake ecosystems. JU's Marine Science Research Institute houses the St. Johns river keeper, as well as a helpful algal bloom research lab, and they were ready to show you a bloom up close and answer questions about blooms and toxins at *Science on the St. Johns*.

Jacquelene DeGraw: So, my name's Jacque DeGraw. I'm a volunteer with the St. Johns river keeper. We're currently working on a project called the citizen's science project, in which we encourage people to be the eyes and the ears of the river to keep a look out for algae blooms. We also offer educational resources on how to take samples of algae blooms and send them into the Riverkeeper so that we can test them and find out where they're occurring and what kinds of algae blooms are occurring.

Narrator: This bottle has water from an algal bloom from Riverside Pond. After a few drops of water are placed on a slide, a microscope provides a revealing look.

Visitor: Yeah, they're dots. Little tiny dots. Like a plant. Isn't that cool?

Narrator: Each of these small dots is a single cell, and the cells are held together to form large colonies, which is why we can see clumps of them with the naked eye. Just down the hall in JU's Harmful Algal Bloom lab, we can see the evidence that the bloom has produced live toxins.

Kyla Siemens: I'm studying microcystins which are liver toxins that are formed by algal blooms. Algal blooms are quit prevalent in Florida because we have a lot of nutrients that come from run-off from fertilizers and from agriculture, and from industry and sewage. So, these are microcystins, which are liver toxins from algal blooms. This is the basic skeleton that all microcystins follow and they each just have variations of different groups. For example, this part might be different. So, with my research, I'm identifying the different microcystins that we have in the water, that way we can understand how toxic the water is.

Narrator: After sample preparation, Kyla analyzes the bloom extract with a mass spectrometer to identify the microcystins which have different diagnostic masses.

Kyla Siemens: We shoot it with a laser, and it's in a crystal structure. The crystal structure explodes and the microcystin flies through a vacuum chamber and hits a plate that tells us that it is 995 Dalton of mass. That represents this microcystin. So, with that, I'm able to identify the different microcystins we have in the water to understand how toxic they are.

Narrator: This is just one of the projects that allows us to understand algal blooms in our waterways. Coming to Science on the St. Johns allows you to learn about algal blooms by investigating one yourself, as well as talking to advocates and scientists.