Transcript

Science on the St. Johns: Sun, Fun, and Science …

http://thescienceof.ju.edu/science-on-the-st-johns-sun-fun-and-science/

Narrator: At Jacksonville University's Marine Science Research Institute, the annual *Science on the St. Johns* brings rods and reels to kids, games, fun, and of course—science! Hands on science activities, demonstrations of equipment, and scientific instruments, explanations of research projects, and issues facing our river were all at hand. Join me as I tour some of the exhibits in science on display at *Science on the St. Johns*.

Julia Goodman: This is our water quality instrument that we use when we're taking water quality on the boats. We take water quality at every net that we sample. And what we take is, we do the salinity, the conductivity, the temperature of the water, and the pH of the water.

Melinda Simmons: If we were out in the open ocean, we'd do this off the back of a boat with a much bigger net, but today we just want to get some phytoplankton to look at under the microscope and show people what's going on in the St. Johns River today.

Narrator: This mesh plankton net filters the water, concentrating the plankton and small particles into the bottle. This young scientist gets an up close look under the microscope.

Hannah Knighton: Here we have a sample from the Ortega River. What we did was take a liter of water and filter it, and we found 39 microplastics on this small sample.

Narrator: Using microscopes, visitors were able to view these tiny microfiber threads from the Ortega River as well as learn how they ended up in the river in the first place.

Justina Dacey: You can find microfibers in our clothing, such as fleece jackets, nylons, polyesters. And so when you're doing a load of laundry, these microfibers actually get released into the water and then they go into our water treatment plants, which don't have the abilities to filter them out, and so these microfibers actually get into our waterways such as our rivers, and lakes, and eventually into our oceans.

Shelby O'Brien: I'm looking at identifying *Vibrio* bacteria in oyster tissue and water samples from Sisters Creek, which is part of the old Duval County shellfish harvesting area. Using our mass spectrometer, we're able to identify our different species of *Vibrio* looking at the similarities and differences.

Narrator: And visitors were able to get up close to some of these *Vibrio* bacteria growing in Petri dishes.

Janel Palomo: This is *Vibrio parahaemolyticus*. It can cause gastrointestinal infections. You can get diarrhea, vomiting, fevers from this, dehydration - severe dehydration from it.

Julia Goodman: Basically this project is, is - If we were to go out today and go take an oyster and eat it raw, what are the chances that we could potentially get infected with a harmful bacteria?

Narrator: And down the hall in the Miller Wilson Lab ....

Lucy Sonnenberg: You may be wondering how we get the sediment from the bottom the river. In some of the places that sample, it's over 20 feet deep. What we use is a petite ponar, which is the device that grabs onto the sample once it's deployed. Lower it gently into the water, allow it to hit the top of the sediment where it will deploy.

Narrator: Sediments obtained using this powerful jaw are then taken back to the lab and analyzed for mercury pollution.

Algal blooms were also on display. You could view an algal bloom under the microscope, as well as learn about local advocacy efforts.

Jacquelene DeGraw : We're currently working on a project called the Citizen Science Project, in which we encourage people to be the eyes and the ears of the river to keep a lookout for algae blooms.

Narrator: Just down the hall in JU's Harmful Algal Bloom lab ....

Kyla Siemens: I'm studying microcystins, which are liver toxins that are formed by algal blooms. We shoot it with a laser and it's in a crystal structure. The crystal structure explodes and the microcystin flies thorough a vacuum chamber and hits a plate that tells us that it is 995 Dalton of mass.

That represents this microcystin. With that, I'm able to identify the different microcystins we have in the water, to understand how toxic they are.

Narrator: And around the corner, isotopes in Jacksonville water are being analyzed.

Jeremy Stalker: The beautiful thing about water and isotopes in water is that it fingerprints the water. We can tell something about the physical system that water came from. Rainfall has a very specific fingerprint. Groundwater has a very specific fingerprint. Sea water has a very specific fingerprint.

So here's the output from the instrument. These red lines here are actually the isotope values of the particular samples, and these values are very consistent with the rainfall in this area. What we're seeing in our D.I. water, even here at the laboratory, is it mimics the rainfall falling on Jacksonville.

Quinton White: The *Science on the St. Johns* event was developed to allow us to expose the general public to what we're doing here at the MSRI and to help them understand some of the issues and problems with the St. Johns river.

When I was walking around looking at the people and the children and seeing the smiles and the interaction, and the questions. The sense of awe, that sense of wonder that a lot of people have when they start looking at what's going on, things they didn't understand, didn't know about, had a chance to talk to people about, ask about. It really was exciting.