

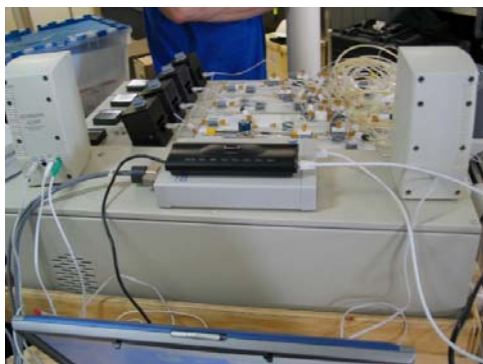
SUNDAY, SEPTEMBER 11, 2005

Dinner for Two: Diatoms and Dinoflagellates

BY JESSICA HENDRICKSON

Midships, in a small lab next to the control station - Julian Herndon pauses for a second to look at the complex system of spaghetti-like tubes before him. Everything is in order. "I can process about 200 samples on a good day," he says excitedly. But, not long ago, a couple of not-so-good days interrupted the flow.

These nutrients are necessary for the phytoplankton (diatoms and dinoflagellates) to grow - just like how the fertilizers you put on your garden at home help land plants to grow.



It was a tragic morning when the Nanopure Infinity water filtration system broke. The Nanopure is a Brita-like filter that makes the purest possible water (H₂O without any ions). Julian needs the purified water to make new chemicals daily. It took more than three people, including crew members and scientists, to fix the Nanopure system. With old, salvaged parts and expert tinkering from Julian and the Resident Marine Technician, Cambria Colt the system was back in running order.

Many of the ship's scientists bring samples to Julian for analysis. Julian runs the samples using a robotic auto-sampler and his nutrient auto-analyzer, where the samples are mixed with his chemicals and analyzed. After only two minutes, a water sample has finished its wild ride through the maze of tubing. This process tells scientists the

concentration of key nutrients such as nitrate, phosphate, and silicate in the water samples.

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ECOHAB-PNW scientists want to know where these nutrients come from. Depending on the direction of the wind, near-shore waters are either driven towards the coast and forced downwards (downwelling), or steered away from the coast, forcing water from below the surface to rise (upwelling). When the latter happens, it brings seawater rich in dissolved nutrients to the surface. This happens because deep underwater currents stir up sediments from the ocean floor, picking up nutrients and carbon from organic materials such as dead whales and sunken ships, and bringing the nutrients to the surface. Nutrients can also be deposited into the ocean ecosystem by land run-off from rivers and human activities, and the atmosphere (from desert dust storms).

Scientists also want to know which phytoplankton species use which nutrients. The type of nutrients that an organism takes in may determine whether it can grow in a specific place and could contribute to the phytoplankton being more or less toxic. With the help of Julian Herndon and his nutrient analyses, ECOHAB-PNW scientists can get closer to answering these crucial questions for a better understanding of how potentially harmful phytoplankton work within their ecosystem, and ultimately, how to protect human health from toxins these algae may produce.

Pura Vida! – A Tico's Life at Sea

BY DEBORAH MCARTHUR

Nutrient Lab - Julian Herndon reflects his upbringing. The fact that he's a "tico" is



apparent in the efficient way he conducts his work, his relaxed style of clothes, his unshaven face and the

hammock and beach chairs set up in his nutrient lab. Where Julian comes from people say "Pura vida" for "muy bien", that's Spanish for "very good". "Pura vida" is also an attitude and lifestyle.

A tico is a native of Costa Rica, the country in Central America where Julian grew up. Julian credits his interest in marine systems to his experience volunteering for the National Park Service, including time spent on Cocos Island, a tropical paradise.

Julian completed a Masters degree with Dr. Bill Cochlan at San Francisco State University and continues working with Dr. Cochlan as a technician. He's been going to sea on research cruises for almost ten years. Julian likes to camp, kayak, snowboard and learn more about the ecology and physiology of harmful algal blooms -- "especially how they use nutrients," he says.

Julian's tico ways helped him work through the technical difficulties with the scientific equipment on the ship. Once the problem was resolved and hundreds of samples are again being processed, he can relax in the his hammock and say, "Pura vida!" (Pure life!)