

Lab-to-field: Nanostructured sensors for monitoring pollutants in coastal ecosystems

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Project Location:

University of Rhode Island - Kingston

Project Description:

Small, low cost sensors are needed to improve our ability to detect and monitor environmental pollutants that harm coastal ecosystems. Critical to the success of any sensor is the ability to integrate it within existing instrumentation that is used in the field to monitor coastal ecology. Through this project, students will translate experimental research on nanostructured sensors and device design to field research where the sensor devices are connected to buoys and/or autonomous vehicles. The nanostructured sensors will be created using gold and silver nanomaterials to provide sensitive detection of nitrogen and phosphorus, both nutrient pollutants, via Surface Enhanced Raman Spectroscopy (SERS). Specific goals of this work will include designing and characterizing nanostructured sensor elements, integrating these elements into 3D printed devices and with field instrumentation, and optimizing sensor design by engineering selective surface coatings.

The proposed project directly addresses the need for new, innovative sensors that can be integrated within existing ocean instrumentation for improved data collection. The testbed for these sensors will be Narragansett Bay and provides an excellent opportunity for student training in research translation.

*This project involves **both field and lab work***

Required/preferred skills for student applicant:

Engineering or physical science background preferred.

Student transportation needed for project?

No