

Development of Point-of-Use Trace Metal Sensor and In-situ Sediment Extraction

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Our research looks to harness the power of organic material and iron (Fe)-rich New Jersey sediment to detect toxic metals with a sediment-sensor, and from the sediment-sensor signal calculate total metal concentrations using a geochemical model. Spiking New Jersey sediment with enzymes naturally found in the environment

(ecoenzymes) breaks down larger complex organic materials, making the toxic metals attached to Fe more available for electrochemical sensor detection.

Alexander Sananes, an Undergraduate Researcher, has developed a graphical user interface (GUI) which

implements a numerical model based on regional sediment geochemistry and predicts a total metal concentration from the sediment-sensor signal.

A partnership with the North Brunswick Public Library has provided the opportunity to conduct “Home Laboratory” experiments (contactless pickup) with local 4th to 12th grade students.

Those interested in participating will learn about pollutants in the Raritan River and apply environmental “forensic” technology through building an electrochemical circuit. Any questions regarding sediment-sensor capabilities and remote student outreach please reach out to Philip Sontag (PI) at philip.sontag@rutgers.edu or (715) 271-3014.

