



U.S. National Science Foundation  
Directorate for Technology, Innovation  
and Partnerships

## Project Title

Measuring and Mitigating Land Management Impacts on In-Stream Water Quality with Sensor-Informed Data Fusion and Community-Led, Climate Financed Riparian Restoration

## Awardee

Virridy

## Phase 2 Award/Contract #

49100425C0009

## Award Contract Type

R&D

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## NSF Funding Directorate

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## PROJECT ABSTRACT

Globally, over 4.4 billion people drink contaminated water. In the United States, half of America's rivers are impaired in part by nutrient, fecal and per- and polyfluoroalkyl substances (PFAS) contamination and do not meet Clean Water Act standards. Contamination stems from stormwater and agricultural runoff, treated and untreated wastewater and organic decomposition. Monitoring of the source, concentration, risk and trends of water contamination exposure is a major limitation toward improved water quality management both in the United States and globally.

Virridy has developed the Lume™ to remotely measure contamination risk in water. The Lume uses fluorescence combined with remote sensing informed machine learning analytics to estimate contamination parameters, including fecal, algae, nutrients and PFAS, with remote reporting to alert water stakeholders. This sensor technology is the first to demonstrate a fully integrated in-situ, autonomous, internet-connected water contamination risk sensor.

Virridy received an NSF Phase 1 award to address the challenges of monitoring water contamination exposure by coupling the Lume sensor technology with the registration of the first-ever methodology to enable the generation of carbon credits, salable for revenue and associated with replacing gray infrastructure with green infrastructure to improve watershed health.

In addition to NSF support, Virridy is leveraging NSF Small Business Innovation Research to fuse sensor and remote sensing data. The University of Colorado Boulder and Colorado State University provide expert faculty in the topics of instrumentation, remote sensing, data science, behavioral science, water resources, water quality and lifecycle analysis. Virridy has also cultivated community and municipal partnerships in Colorado, across the United States and around the world.