NETWORK FOR ENGINEERING WITH NATURE

PROJECT FACT SHEET

Integrating water resources infrastructure with upland management to advance nature-based solutions for water quantity and quality

SUMMARY

Maintaining water quality while managing water resources, especially under changing landscapes and climates, is a difficult goal to achieve. There are multiple drivers as well as potential control points managed by multiple entities. To ensure nature-based solutions meet both water resource goals, a landscape-scale approach to implementation and coordination of disparately managed systems (e.g., uplands and water infrastructure) is needed, thus ensuring efficiencies at scale, appropriate modeling, and targeted analysis tools.

OBJECTIVE

In this project we explore and quantify how the coordinated management of upland landscapes and traditional or nature-based water resource infrastructure (typically operationally separate systems) can help to improve both water quantity and water quality outcomes at a system-scale. We combine advanced data science methods with new process-based watershed and water quality models to simulate these complex systems to explore the opportunity space.

APPROACH

We first focus on data scoping and exploratory analysis of these integrated systems and the need and feasibility of this approach using data science tools and participatory modeling. We also begin working simultaneously on applying advanced data science methods (e.g., transfer learning, causal learning) and newly integrated process-based models that can simulate the drivers and outcomes of management decisions across the landscapes in these complex systems.

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