

Floodplain Assessment, Mapping, Valuation, and Tracking Tool for the Vermont Functioning Floodplain Initiative (FFI)

STONE
ENVIRONMENTAL
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Services / Expertise

Web Application Development
Decision-Support Tool Design
Floodplain and River Restoration Science
Spatial Analysis and GIS
Stakeholder Engagement and Requirements Gathering
Watershed Science and Water Quality Analysis

Technology

ArcGIS Online
Postgresql 12.x
React
Agile development

Markets

State Government / Regulatory Agencies
Natural Resource Conservation

Project Location

Montpelier, Vermont

Date Completed

2019–Present

Project Owners

Vermont Department of Environmental Conservation

SLR Consulting

Project Managers

Roy Schiff (Primary), SLR Consulting

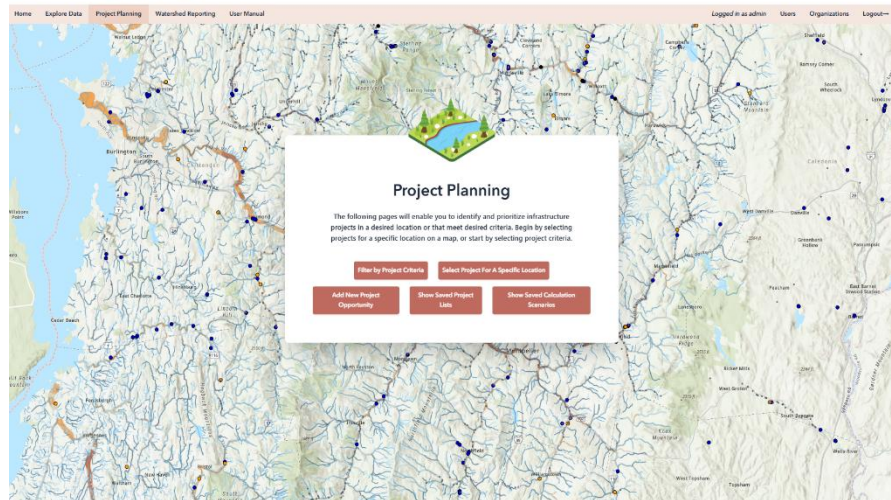
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Stone Project Team

Evelyn Boardman (as VTDEC River Scientist)
Rebecca Diehl, Ph.D (with UVM)
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FFI Functioning Floodplain Initiative



The Functioning Floodplain Web Application interface.

THE Functioning Floodplains Initiative (FFI) was developed in partnership with the Vermont Department of Environmental Conservation (VT DEC) to help planners, watershed organizations, conservation practitioners, and state agencies identify, evaluate, and communicate opportunities for nature-based floodplain and river restoration across Vermont. Vermont's rivers and floodplains provide critical functions by storing floodwaters, reducing erosion hazards, filtering nutrients, and supporting aquatic habitat, but those benefits depend on maintaining connectivity between rivers and their surrounding floodplains. Where that connection has been lost, effective restoration requires not only sound science and technical analysis, but also tools that make complex information accessible and actionable for a wide range of audiences.

In collaboration with SLR Consulting, VT DEC's Rivers Program, and University of Vermont, we developed and continue to enhance the FFI Web Application, a publicly accessible web-based decision-support platform that combines watershed science, spatial analysis, and user-friendly visualization tools. Central to the initiative is a quantitative framework, developed by a team of multidisciplinary consultants and researchers, that evaluates river and floodplain conditions and helps users understand the potential benefits of restoration actions. Built-in calculation modules allow users to estimate site-specific outcomes related to a suite of ecosystem services including floodplain reconnection, phosphorus reduction and crediting, flood resilience, habitat improvement, while also supporting watershed-scale planning, restoration, and tracking goals.

Stone led the design and development of the web application, which is built on Esri's ArcGIS platform and supported by a custom backend database. Development followed an iterative process of stakeholder engagement, requirements gathering, prototype testing, and application refinement. The tool allows users to explore



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interactive maps, review reach-scale river and floodplain condition data, run calculation modules that estimate site-specific restoration benefits, evaluate restoration opportunities, and generate watershed-scale summaries. Recent enhancements added a role-based user management system that enables VT DEC staff and partners to save project lists, calculation scenarios, and input data within the application, supporting multi-stage coordination workflows and progress tracking against basin-level total maximum daily load goals. We continue to collaborate with VT DEC's Rivers Program to enhance the FFI tool to meet planning, coordination, and tracking needs.

Equally important to the platform itself was making the science accessible and applicable to a broad range of users. Initial stages of the project included gathering of user stories and stakeholder input, while subsequent phases involved conducting coordinated training opportunities covering the underlying science and methodology, conceptualized workflows, and case studies.

The FFI continues to serve as a statewide resource for identifying, prioritizing, and communicating potential outcomes of project opportunities that restore river and floodplain function. Our ongoing partnership with VT DEC's Rivers Program and established collaboration with SLR Consulting provide strong familiarity with Vermont's flood resilience initiatives, existing agency networks, and the communication challenges associated with advancing flood resilience across the state.

The application is publicly accessible at <https://ffi.stone-env.net/>.

