

FBE ENVIRONMENTAL

NEWSLETTER

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FEATURED PROJECT: UPPER SACO RIVER WATERSHED PROJECTS

FBE has been working in the Upper Saco River watershed for several years completing monitoring, planning, and outreach projects. This year, FBE has added five new projects and numerous collaborations expanding our knowledge of water resources in the area.

1. In partnership with the Saco Headwaters Alliance (SHA), FBE recently published *Watching Our Waters: A Report on Water Resource Monitoring in the Saco Headwaters Watershed*. Check for updates in December at <https://www.sacoheadwatersalliance.org>.
2. Funded by the Clean Water State Revolving Fund, FBE is leading a floodplain mapping and water quality threat analysis for the Town of Hart's Location to investigate nonpoint source pollution threats to the Saco River, its tributaries, drinking water sources, and the stratified drift aquifer.
3. FBE is working with SHA on a municipal outreach project to develop a clean water checklist tool. This tool will assist municipalities in identifying source water threats within their jurisdiction, protecting source waters, and enhancing understanding of the importance of drinking water protection and source water conservation.
4. Funded by the National Fish and Wildlife Foundation, FBE, the Greater Lovell Land Trust, and partners at SHA are developing a Watershed-Based Management Plan for a portion of the Upper Saco River and Kearsarge Brook. The goal of this plan is to address the watershed's aquatic life integrity impairment and protect source waters.
5. FBE is working with the Town of Hart's Location and the Saco-Swift Rivers Local Advisory Committee to address stormwater and nonpoint source pollution that is impacting river water quality. Floodplain mapping associated with this project will fill a significant data gap for this region.



FBE staff conducting a river crossing assessment in the Upper Saco River watershed. Credit: FBE

FBE HAS A NEW LOCATION IN DOVER, NEW HAMPSHIRE!

FBE's New Hampshire office has moved from Portsmouth to the heart of downtown Dover! We are very excited to join the vibrant Dover community and work within the Cocheco Mill Space at 383 Central Ave, Suite 267. We look forward to inviting folks to meet at our new space when it is safe to do so!



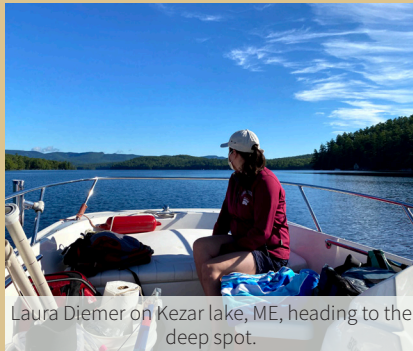
Cocheco Mills Dover, NH. Credit: FBE

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Laura Diemer on Kezar lake, ME, heading to the deep spot.



Kevin Ryan observed breeding northern leopard frogs in a vernal pool of the Kennebec in late spring.



Maggie Kelly collecting groundwater samples from wells around a landfill.



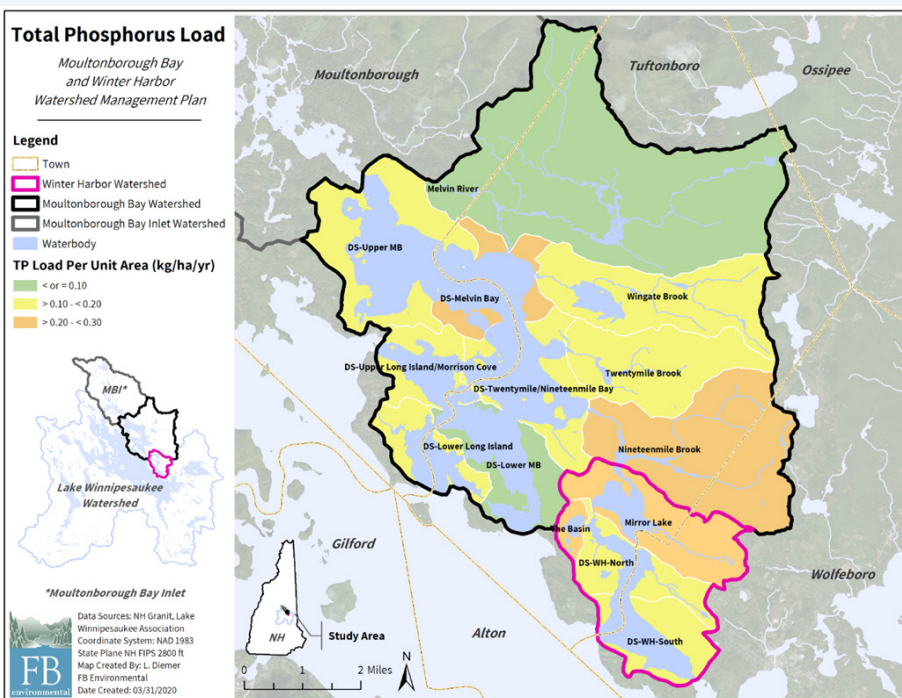
Christine Bunyon collecting water quality samples at Kezar Lake, ME.

FEATURED PROJECT: MOULTONBOROUGH BAY & WINTER HARBOR WATERSHED MANAGEMENT PLAN

FBE worked with project partners at DK Water Resource Consulting and Horsley Witten Group, along with representatives from each of the three communities in the watershed (Moultonborough, Tuftonboro, and Wolfeboro) and the Lake Winnepesaukee Association, to write a watershed management plan for the Moultonborough Bay and Winter Harbor watersheds. Located on the northeast side of Lake Winnepesaukee, NH, these embayments are considered oligotrophic, or high-quality waters, but have been listed as impaired by the State of New Hampshire because of the occurrence of cyanobacteria (*Gloeotrichia echinulate*).

The goals are two-fold: (1) to improve water quality in both Moultonborough Bay and Winter Harbor through a 5% reduction in current total phosphorus load; and (2) to assess the spatial and temporal distribution and causes of *Gloeotrichia* blooms observed and determine geographically specific objectives to reduce the occurrence of localized blooms. FBE conducted a build-out analysis of the watersheds to identify the theoretical point in time when all available land has been developed to the maximum extent permitted by current zoning and environmental constraints. Using the lake loading response model, FBE simulated water quality at full build-out of the watershed. Results indicated that total phosphorus loading may increase by 70% at full build-out to occur as early as 2072.

FBE scientists created a robust action plan for water quality restoration in these watersheds. The plan identified high priority pollutant sites in the watershed and along the shoreline that require remediation. Horsley Witten Group provided several preliminary engineered designs for these high priority sites. The plan also included recommendations for expansion of water quality monitoring efforts and outlined gaps in current municipal ordinances in each community and opportunities for improved protection of natural resources through regulation.



PROJECT ANNOUNCEMENTS & UPDATES: CAPE ELIZABETH TRAIL INVENTORY

FBE worked with the Conservation Committee for the Town of Cape Elizabeth, Maine to perform an assessment of all trails and associated boardwalks along the Greenbelt Trails for a capital improvement plan within the Town. FBE evaluated all existing boardwalks, identified areas that would benefit from additional boardwalks, and collected supporting data to facilitate permitting required for executing recommended trail maintenance actions and future boardwalk construction. Recommendations for boardwalk infrastructure improvements on the Greenbelt Trails were designed to maintain the scenic and natural characteristics of these properties while also allowing for continued public access and recreation.

FORE RIVER SANCTUARY CLIMATE CHANGE MONITORING

In partnership with the Southern Maine Conservation Collaborative and Portland Trails, FBE installed a picture post in the Fore River Sanctuary to monitor long-term changes to the marsh due to climate change, such as water levels, vegetation, subsidence, erosion, and land use. The pictures, which can be viewed [here](#), will create a time-lapse sequence of photos that will document changes from this picture post throughout the year.

MAINE AND NEW HAMPSHIRE GOLF COURSE MANUALS

FBE has been working with the Maine and New Hampshire chapters of the Golf Course Superintendents Association of America to create a Golf Course Best Management Practices (BMP) Manual specific to each state. FBE has coordinated with external reviewers who have contributed their expertise to each chapter of the manual, which covers topics such as Course Planning, Design and Construction, Irrigation, Golf Turf Fertilization and Nutrient Management, Integrated Pest Management, Sustainable Landscaping, Water Quality Management, and Energy Management. These manuals will assist golf course managers in their continued commitment to environmental sustainability and stewardship. FBE is currently finalizing these documents which are expected to be released in early 2021.

OPEN SPACE ADDENDUM FOR THE CITY OF BURLINGTON, VERMONT

FBE will be working alongside the Burlington Conservation Board and Resilience Planning and Design LLC to enhance open spaces in the city for community and environmental resilience. A large component of this project will be public outreach, education, and engagement with the community. Initiatives will promote nature-based solutions to achieve specific environmental objectives such as the mitigation of carbon emissions, flood control, increases in carbon storage, and the mitigation of greenhouse gases in the wake of climate change by promoting ecosystem services of forests, wetlands, and agricultural lands.



Cape Elizabeth boardwalk. Credit: FBE



Picture Post. Credit: UNH Sea Grant



Owl's Nest Resort & Golf Club. Credit: Greg Person



City Hall Park, Burlington VT.
Credit: Vermont Agency of Transportation

Bangor Daily News

[In a Boothbay Harbor, Scientists Are Tying Lobstermen's Ropes in Knots to Protect Whales](#)

Oct. 7, 2020: FBE and the Maine Department of Marine Resources have been working to test how much force is required for hundreds of pieces of rope to snap while identifying knot combinations used by fishermen to help protect whales from becoming entangled in gear.

The Lincoln County News

[State Extends Closure of Clam Flats in Broad Cove](#)

Sept. 25, 2020: FBE has been working with the Town of Bremen, Maine to mitigate sources of pollutants contributing to the closure of shellfish beds.

VIRTUAL MEETINGS

FBE has adapted to overcome these unprecedented times by turning to virtual meetings. Starting each week with a "Monday Morning Coffee and Business" zoom chat, FBE staff have been able to come together to ensure workloads remain full and evenly distributed, and each member is receiving the support they need. FBE has also run several successful virtual meetings with both existing and prospective clients, and has hosted many project presentations including watershed management plan updates for the Gregg Lake, Moultonborough Bay and Winter Harbor, and Long Pond watersheds. Our virtual presentations have received many positive remarks from participants as we look forward to connecting through in-person meetings in the future.

CONFERENCES AND PRESENTATIONS

Project Managers Kevin Ryan and Amanda Gavin attended the virtual MAWS (Maine Association of Wetland Scientists) workshop where they reviewed wetland and stream regulations with other consultants and regulators.

Project Manager Laura Diemer hosted a virtual public webinar on Aug. 5, 2020 presenting the final results and recommendations of the Gregg Lake Watershed Management Plan.

Project Manager/Hydrologist Margaret Mills hosted a 55-person public webinar on Sept. 24, 2020 introducing the findings and recommendations of the Moultonborough Bay and Winter Harbor Watershed Management Plan.

STAFF UPDATES

Amanda Gavin was recently selected to join the Board of Directors for Maine Lakes Society and is participating on the Education and Environmental Justice Committee.

