

FB ENVIRONMENTAL NEWSLETTER

July 2022 • Volume 10 Issue 2

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FEATURED PROJECT: BAR HARBOR COMPREHENSIVE PLAN

FBE and Resilience Planning & Design (RP&D) have continued working together on community planning projects across New England in 2022. FBE, RP&D, and RKG Associates (housing and economic development experts) are currently collaborating to assist the Town of Bar Harbor, Maine with an update to their Comprehensive Plan. Bar Harbor is a vibrant coastal community well known for its proximity to Acadia National Park, where planning requires a delicate balance of meeting heavy seasonal tourism needs, protecting sensitive and unique natural resources, and supporting the local community and economy.

FBE's project role is to support the team with expertise on natural resources, including freshwater and marine resources, ecology and habitat, agriculture and forestry, land use, and climate change. The unique physical landscape of Bar Harbor supports a rich diversity of physical and biological resources within the Town that have become the cornerstone of the local identity and economy. The composition of Bar Harbor with the presence of Acadia National Park and large tracts of conserved land benefits the Town with pristine habitat, natural beauty, and a wealth of tourism opportunities, but also challenges the Town with reduced land area for development, a lack of affordable housing for residents and workers, and heavy tourism use that exceeds the Town's infrastructure and staffing abilities. In turn, the influx of tourism also threatens the natural beauty and habitats of the area.

FBE, RP&D, and RKG Associates have completed a preliminary review of existing conditions in the Town and are now working with the Comprehensive Plan Committee to facilitate discussions and public feedback on key planning topics. Outreach efforts will engage Town residents and stakeholders in envisioning a sustainable future for the Town. The final plan is anticipated to be completed in 2023.

FBE and RP&D are also working together to complete Comprehensive Plans with three additional communities in New England: the Town of Wells, ME, the Town of Hampton, NH, and the Town of Williamstown, MA. Previously, FBE & RP&D worked together on the Burlington, VT Open Space Plan Addendum.



Sand Beach, a prominent Acadia National Park landmark, is located within Bar Harbor. © FBE



Bar Harbor, located on Mount Desert Island and encompassing a large portion of Acadia National Park, has a wealth of pristine habitat, natural beauty, and tourism opportunities.

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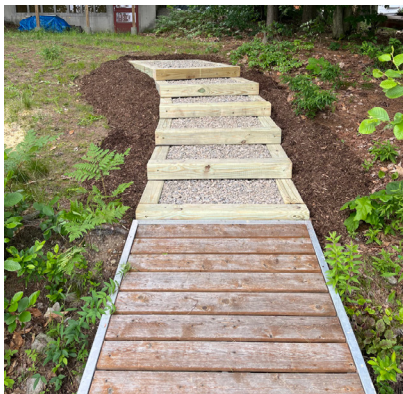
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FEATURED PROJECT: LONG POND ALUM TREATMENT



Above, the alum treatment being applied to Long Pond. © FBE

Right, completed infiltration steps at a shorefront property on Long Pond. The Long Pond Association is working to address sediment and stormwater runoff as part of a 319 grant through the Maine DEP.

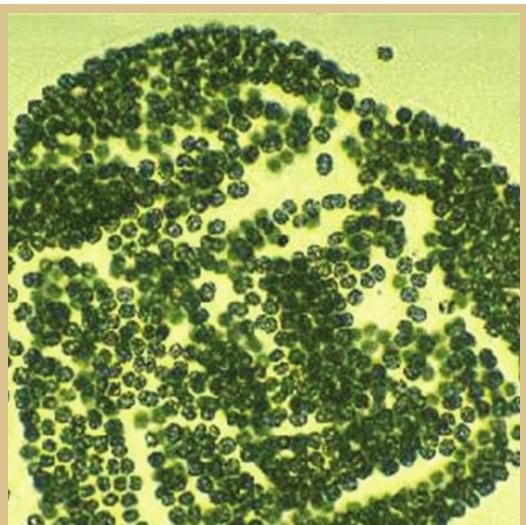


With the assistance of a technical advisory committee including representatives from the Maine DEP, Long Pond Association (LPA), St. Joseph's College, and Dr. Ken Wagner of Water Resource Services, Inc., FBE developed a Watershed-Based Management Plan (WBMP) to guide water quality restoration of Long Pond in Parsonsfield, ME. Since 2017, Long Pond has experienced severe cyanobacteria blooms during the summer months. Water and sediment core sampling, along with modeling, showed that cyanobacteria blooms in Long Pond were being fueled by internal loading of phosphorus from sediments when bottom waters went anoxic. Internal phosphorus loading in Long Pond was estimated to comprise 32% of the total phosphorus load to the lake. As such, Long Pond was deemed a candidate for an in-lake treatment using aluminum sulfate, or alum, which would reduce the internal phosphorus load in Long Pond by 90%. The LPA spearheaded a grassroots local funding effort to raise several hundred thousand dollars for not only the alum treatment but also for match required by a 319 Nonpoint Source Water Pollution Control Grant awarded to the LPA by the Maine DEP. The 319 grant is currently implementing stormwater controls on a number of residential, town, and camp properties around the lake. This critical work remediating land-based phosphorus sources to the lake will ensure that the successful application of alum to Long Pond in June 2022 will remain effective for many years.

RISING CONCERNS ABOUT CYANOBACTERIA

Cyanobacteria are photosynthetic bacteria that can grow prolifically as blooms when enough nutrients are available. Cyanobacteria blooms can (but not always) produce microcystins and other toxins that pose a serious health risk to humans, pets, livestock, and wildlife. Blooms can form dense mats or surface scum that can occur within the water column or along the shoreline.

Cyanobacteria are becoming more prevalent in low-nutrient lake systems likely due to climate change warming effects (e.g., warmer water temperatures, prolonged thermal stratification, etc.) that allow cyanobacteria to thrive and outcompete other phytoplankton species. In addition, low dissolved oxygen can release legacy phosphorus from bottom sediments and contribute to cyanobacteria blooms that capitalize on available light and nutrients in the water column. Cyanobacteria are emerging as a top concern for New England lakes. Reducing nutrient-rich runoff can substantially minimize conditions favorable for blooms.



Microcystis, the most common bloom-forming genus, is almost always toxic. © Research Gate

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Dr. Kevin Ryan with a captured turtle. © FBE

PROJECT UPDATE: RARE TURTLE SURVEYS

FBE's Dr. Kevin Ryan has been leading field surveys for rare reptiles and amphibians, including spotted turtles (*Clemmys guttata*) and Blanding's turtles (*Emydoidea blandingii*). These species typically do not exist in very high population densities and in northern New England and are near the edge of their geographical distribution. When reviewing proposed developments, surveys to assess the presence of these species are often required by state natural resource agencies. Data resulting from the surveys are used to help to determine best management practices for mitigation of activities affecting habitat for these species.

FEATURED PROJECT: LAKE WINNISQUAM WATERSHED-BASED PLAN

FBE and Horsley Witten Group, in collaboration with the Winnisquam Watershed Network and the NH Department of Environmental Services and funded by EPA Region 1, have created a Watershed-Based Plan for Lake Winnisquam. The lake, located in the greater Lake Winnepesaukee region of central New Hampshire, has experienced issues with excessive turbidity and sedimentation, spread of invasive aquatic species, increasing chloride concentrations, and occasional cyanobacteria advisories. Project staff and volunteers spent many hours conducting field surveys of the watershed and shoreline, noting areas contributing phosphorus-laden sediment to the tributaries and lake. Staff also analyzed water quality data, modeled nutrient loading, and conducted a build-out analysis to predict future impacts to water quality. In a companion effort for the Belknap County Conservation District, FBE also prioritized erosion sites in the Black Brook sub-watershed through site visits and sediment load modeling. The plan will guide efforts to protect and restore Lake Winnisquam over the next 10 years (2022-2031) to meet state water quality standards.



Sediment plume entering Lake Winnisquam after a storm.

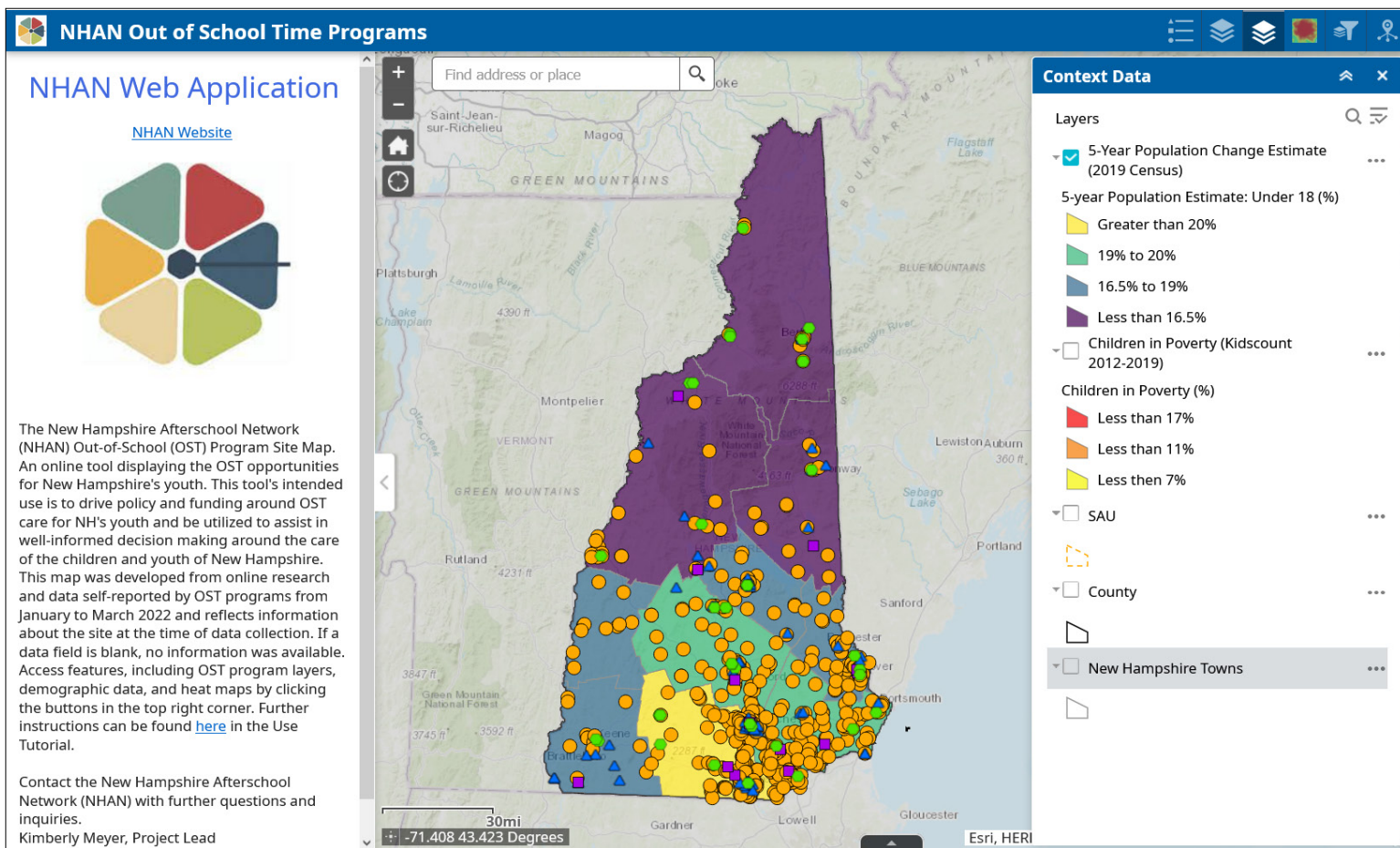
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FEATURED PROJECT: WEB-BASED GIS MAP NH AFTER SCHOOL NETWORK OUT OF SCHOOL TIME PROGRAMS



The ESRI Web App allows users to interact with the data and explore features and heat maps for their area of interest. View the map [here](#). © FBE

FBE was hired by the New Hampshire After School Network (NHAN) to build an online, interactive map of Out of School Time (OST) programs in the State of New Hampshire. FBE with the assistance from NHAN, collected extensive data through an integrated strategy of online surveys, publicly available data, and targeted phone and email follow up to gather information on 595 OST program sites. Information collected for each site includes program name, contact information, grade levels served, number of youth served, maximum capacity, setting type, funding, and location. In addition, FBE used publicly available data to create overlays of population growth, child poverty, school administrative districts, counties, and municipalities. Contextual data allows policy analysis and narrative impact, and additional contextual data can be added in the future. FBE then developed an ESRI Web App map for interactive viewing and querying of all data, including the full underlying database. Visualizations include categorized features, heat maps, sorting and filtering, and searching by location or feature attribute. FBE conducted an orientation and training workshop for NHAN, and provided a detailed report and instructions so the map can be maintained and enhanced over time.

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FBE WELCOMES NEW STAFF



Mindee Goodrum joined FBE as a Project Manager in May 2022. She has a B.S. in Environmental Science from Saint Michael's College. Prior to joining FBE, Mindee served two terms with AmeriCorps in Maine and Michigan, gaining experience with invasive plant identification and removal, GIS, conservation land management, and volunteer coordination. Most recently, she worked at the York County Soil and Water Conservation District managing multiple watershed restoration and protection projects. Outside of work, you can find Mindee hiking, working on a knitting project, curled up with a good book, or spending time with friends and family.



Jordan Foulds joined FBE as a Project Scientist I in April 2022. She has a B.S. in Environmental Science from Saint Michael's College and is projected to complete a M.S. in Natural Resource Conservation with a concentration in Aquatics from Paul Smith's College in August 2022. At FBE, Jordan assists with wetland delineations, vernal pool surveys, stream crossing assessments, GIS technical mapping, data compilation and synthesis, among other tasks. Following her B.S. degree, Jordan performed GIS mapping for natural disasters throughout the northeast and wetland delineations throughout Massachusetts. In her free time, Jordan enjoys running, hiking, skiing, and fishing throughout New England.



Maggie Kosalek joined FBE as a Project Assistant in June 2022. She has a B.S. degree in Ocean Engineering with a minor in Environmental Conservation and Sustainability from the University of New Hampshire. At FBE, Maggie assists with a variety of projects including estuarine monitoring, water quality sampling, data analysis, technical writing, and coastal shoreline restoration. In her time as an undergraduate, Maggie participated in living shorelines research with UNH and performed salt marsh surveys and erosion assessments. After graduating, she worked as a research assistant at UNH in which she constructed pressure and temperature sensors to measure wave attenuation at oyster farms in New Jersey. Outside of work, Maggie loves spending time with friends, snowboarding, scuba diving, and traveling.

MEET OUR SUMMER 2022 INTERN



Karly Meyer is a Senior at George Washington University majoring in Environmental Health with a double minor in Sustainability and Biology. Last summer, she examined the presence of microplastics in nearby ocean and river microbiomes and assisted in weekly water quality monitoring for the Anacostia Riverkeepers. During a semester abroad in Copenhagen, Denmark, she built upon her knowledge of sustainable development and strategies for urban livability. Karly hopes to pursue a career dedicated to making communities sustainable, livable, and equitable for all.

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2022 FIELD SEASON IN FULL SWING



Clockwise from top left: Maggie Kelly and Maggie Mills were featured in a News Center Maine story, available for viewing [here](#). FBE is investigating polluted clam flats in collaboration with the Town of Harpswell in 2022. © News Center Maine



Magdalyn Kosalek and Luke Frankel taking water samples at Kezar Lake. © FBE



Elliott Boardman conducting a vernal pool survey. © FBE



Mindee Goodrum and Karly Meyer take samples in Midcoast Maine. © FBE



Jordan Foulds and Cam Twombly during a Stream Crossing Assessment in New Hampshire. © FBE

STAFF UPDATES



Laura Diemer and her family welcomed their second born, Eleanor Sutton Diemer, on January 7, 2022.

CONFERENCES

Beaches Conference

Laura Diemer co-presented with Jay Diener of SHEA on “Engaging Multiple Communities and Stakeholder Groups for Development of the Hampton-Seabrook Estuary Management Plan” at the Beaches Conference in South Berwick, ME on June 10, 2022. Luke Frankel, Magdalyn Kosalek, and Karly Meyer also attended.

NH Lakes Congress

Forrest Bell spoke on a panel “Taking the Lead: Lake Associations Going Above and Beyond” and Laura Diemer presented on “Climate Adaptation & Watershed Management: Case Study of the Kezar Lake Watershed Association Climate Change Observatory” at the NH Lakes Congress in Meredith, NH on June 3, 2022. Mindee Goodrum also attended.

NEIWPCC Annual Nonpoint Source Conference

Maggie Mills and Maggie Kelly recently attended the NEIWPCC Conference in Woodstock, VT on April 27-28, 2022. The conference theme was “Clean Water: Past and Future” to celebrate the 50th Anniversary of the Clean Water Act in 2022. Topics included innovative nonpoint source pollution solutions and research.