A Guide for Implementing the Healthy Soils Action Plan in Design and Construction

Healthy Soils Challenge Grant Proposal

Submitted to the Massachusetts Executive Office of Energy and Environmental Affairs

Prepared by Regenerative Design Group in partnership with Linnean Solutions, BSC Group, Sasaki, Read Custom Soils, and A.D.Makepeace

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Challenge Grants Implementing the Commonwealth's Healthy Soils Action Plan
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Cover image: Residential site development in Wayland, MA

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Cover Letter

Tom Anderson
100 Cambridge Street
9th Floor
Boston, MA 02114

Dear Mr. Anderson,

The RFR for the Healthy Soils Challenge Grant invites proposals for projects that promote and implement innovative solutions for improving soil health and sustainable land management practices. In response to this call, Regenerative Design Group, together with Linnean Solutions, BSC Group, Sasaki, and A.D. Makepeace, is pleased to submit a proposal to produce a “Guide for Implementing the Healthy Soils Action Plan in Design and Construction” for consideration.

The Healthy Soils Action Plan (HSAP) identified that the development processes and management of the built environment play an enormous role in the long term function and resilience of Massachusetts' soils. While the HSAP proposes several key interventions to improve soil health in developed areas, our experience in subsequent projects demonstrates that many of the recommendations don't have a clear path to implementation or are in conflict with typical practices of the development and construction industries.

The proposed project addresses this problem and meets all four objectives outlined in the RFR. We will engage members of the design and construction industry in a series of educational and working events to share priorities from HSAP on protecting soil health and work together to identify practical solutions to achieve better soil health outcomes. The findings and recommendations from these events will be made publicly available along with a curated set of soil health resources for design and construction professionals. A series of targeted training and list of priority research and development projects will be cataloged for rapid development at the completion of this project.

We believe that the team assembled for this project is uniquely qualified to develop a practical road map to the implementation of HSAP’s recommendations for developed lands and we welcome any questions you may have.

Thank you for considering this proposal.

Sincerely

Keith Zaltzberg-Drezdahl

Managing Director of Regenerative Design Group + Lead Author of HSAP

Professionals Guide to Implementing the Healthy Soils Action Plan

Healthy Soils Challange Grant Proposal

Continue funding the Healthy Soils Pilot Program that exemplifies healthy soil practice in the developed landscape.

- Priority Action #5 of 6, *Massachusetts Healthy Soils Action Plan, Page 112*

Develop a set of post-construction soil performance guidelines focused on water quality, drought resistance, stormwater runoff, soil depth, and carbon content for all site development and construction projects.

- Priority Action #6 of 6, *Massachusetts Healthy Soils Action Plan, Page 112*

Project Description

Introduction

"The nation that destroys its soils destroys itself." ~Franklin D. Roosevelt

The 2023 Healthy Soils Action Plan (HSAP) predicts that over 360,000 acres of soil in Massachusetts will be impacted by development over the next 35 years (pg. 82), raising the total area of developed soils in 2060 to 1.2 million acres. Assuming the continuation of current business-as-usual design and construction practices, this will result in a substantial loss of beneficial soil functions such as stormwater infiltration, nutrient holding capacity, improved water quality, and the storage of soil carbon (pg. 10), according to the HSAP.

To avoid and mitigate these losses, the Healthy Soils Action Plan includes more than 25 evidence-based recommendations for changes to standard development and maintenance practices in the Commonwealth (pg. 92-104). Implementing these soil-smart shifts in practice will require tight coordination of professionals across the development process guided by a clear roadmap and specific recommended actions.

In addition to promoting the general awareness and understanding of the Healthy Soils Action Plan among design and construction professionals in Massachusetts, this project specifically furthers the following recommendations:

R2- Explore creation of comprehensive Soil Protection and Post-Construction Soil Performance Best Management Practices, with input from soil experts and stakeholders in the construction and landscaping industries. Use this BMP guidance, along with potential incentives and education/technical assistance, to protect and maximize soil health during and after site development. (pg. 94)

R4- Increase soil health education and outreach strategies for all professionals that play a role in the creation and maintenance of turf and ornamental Landscapes (pg. 94)

R5- Look at developing or updating statewide programs that celebrate, educate, and incentivize soil health practices in the developed landscape. (pg. 95)

R8- Conduct and support research and development of practices to regenerate, protect, and improve soil health in developed open space: (pg. 95)

R9- Promote protection, management, and restoration strategies that increase biodiversity, ecosystem health, carbon sequestration, and water retention and infiltration on the landscape. (pg.95)

I2- Explore transformation of current development and construction processes to avoid loss of soil health. (pg. 102)

This project seeks to craft a roadmap toward the completion of these recommendations by engaging a cross-section of professionals in construction, development, engineering, and design in a series of coordinated events. The insights and recommendations generated throughout these events Soils and Landscapes in a Whole Carbon Approach will inform the final work product of this project: "A Guide for Implementing the Healthy Soils Action Plan in Design and Construction" (the Guide). This will be a web-based resource, where professionals of multiple disciplines can access findings from events, general soil health information, published soil specifications, standards, and policies, case studies, and clear actions and recommendations to improve long-term soil health in Massachusetts' growing developed lands.

The Guide will be developed in four phases over a 16-month period from March 2024 to June 2025 (see the Methodology and Timeline sections). Each of these phases will center on industry engagement events co-sponsored by professional organizations (see Team). Between events, the Project Team, led by the primary consultants of the HSAP, will distill industry input and additional research into practice briefs. These briefs will outline the gap between current practice and related recommendations from both the Healthy Soils Action Plan and other relevant sources. In collaboration with subject matter experts from project partners, recommendations for improving typical practices and standards, and addressing common problems will be developed and refined. These recommendations and supporting resources will be presented at key industry gatherings and published to The Guide's project website.

Goals and Objectives

This project meets all four primary objectives of these healthy soils Challenge Grants in the following ways:

1. **Promote Soil Health:** To support demonstration type projects that document, prioritize and implement practices aimed at improving soil health and fertility.
    - This project includes a review of case studies for development projects in MA that demonstrate applied practices for protecting and improving soil health and fertility.

2. **Sustainable Land Management:** To encourage innovative approaches to sustainable land management that minimize environmental degradation, enhance biodiversity and/or restore degraded soil health.
    - This project will engage landscape architects, designers, and landscape installation and maintenance professionals in compiling recommended ways they can ensure the ongoing management of properties minimizes environmental degradation, enhances biodiversity, and/or restores degraded soil health.

3. **Community Engagement:** To foster community involvement and education in sustainable land practices and soil health improvement.
    - This project has an anticipated reach of over 1400 professionals through our project sponsor organizations. Industry-relevant CEUs will be offered to incentivize participation in trainings.

4. **Refine Tools for Municipal Soil Mapping, Assessment + Planning:** Update and distribute assessment and planning tools to enable municipalities, regional planning districts, and conservation organizations to visualize and integrate soil health into regular workflows.
    - The final deliverable for this project will provide specific tools and recommendations for municipalities, regional planning districts, and conservation organizations to promote and disseminate among their memberships, inform local policy and ordinances, and use as a reference for research and demonstration projects.

The Challenges:

Development projects are inherently complex and involve the input and collaboration of professionals from a variety of disciplines. Planners, regulators, architects, developers, environmental, structural, and civil engineers, ecologists, environmental monitors, landscape architects, landscape designers, and contractors may all contribute to aspects of one development project. However, there is no single, authoritative, and regionally specific source of information on how to achieve soil health shared between all of these professionals. For many of these professionals, basic literacy on the value of soils or risks of compaction and degradation is absent. As a result, builders and developers often, even with the best ambitions towards sustainable design and development, produce projects that destroy existing soils. Some of the challenges in developing a shared definition and standard for soil health are outlined below:

- **Existing soil health resources are dispersed and siloed.** Much of the existing research in understanding the impact of disturbance on soil health has been led by researchers in the fields of ecology, soil science, and agriculture, and is held in field-specific journals, apps, and tools. Some relevant/related documents relative to erosion and sedimentation control have been produced by professionals engaged in the development and forestry industries, and others have been produced relative to restoration and installation of soils during wetland and other ecosystem restoration and replication activities.

- **Example standards and specifications for healthy soil and soil Best Management Practices (BMPs) are maintained in private, discipline-specific certifications, or are recreated office by office.** Climate mitigation efforts in the fields of architecture and landscape architecture have spurred the development of holistic low- or net-zero project certifications like LEED, SITES, and the Living Building Challenge. Professional certifications include several offered by EnviroCert, registration as a professional soil scientist through the Society of Soil Scientists of Southern New England and certification as a professional soil scientist through the Soil Science Society of America. These certification programs are not tailored to all disciplines involved in development, and may not be affordable or applicable to the majority of development projects in Massachusetts. Only a very small percentage of anticipated development in the next twenty years is expected to fall within a sustainability certification regime - and while those projects are intentionally exemplary, high performance facilities, soil management literacy needs to be a universal baseline expectation for all site development.

- **Introducing new science-backed best practices has a barrier to entry in industry practices.** The gap between the scientific understanding of how to build soil health and the economically-driven systems of development needs to be directly addressed before the industry will be willing to adopt changes. In some cases the gap may be a lack of knowledge, and in some cases the gap may be in additional costs or perceived costs that prevent an action from being readily implemented. Best practices that are easy to read and apply are difficult to find, their application is inconsistent, and associated training is rarely provided for the construction workers implementing these practices.

- **Standard soil specifications used for development projects in Massachusetts typically ignore the role and dynamics of Soil Organic Carbon (SOC) in achieving and maintaining high-performance soils.** The HSAP identifies SOC as the lynch pin for long-term soil health. However, standard soil specifications (i.e. fertility, loam/sand/clay composition) are optimized for other characteristics, such as infiltration and water holding capacity, which have unknown implications for soil health in every application. These specifications need to be updated to include the current understanding of SOC. Furthermore, SOC represents over 80% of estimated global carbon stocks in terrestrial ecosystems, and represents the bulk of opportunity for the future carbon storage and sequestration capacity of Massachusetts living systems.

- **Soil Organic Carbon resources and Life Cycle Analysis modeling tools need to be regionally specific.** The potential for, and rate of, soil carbon sequestration is impacted by both existing soil characteristics and land cover. These are both highly regionally specific variables. Recommended actions need to be appropriate for soil types and land cover typologies that exist within Massachusetts.

Methodology

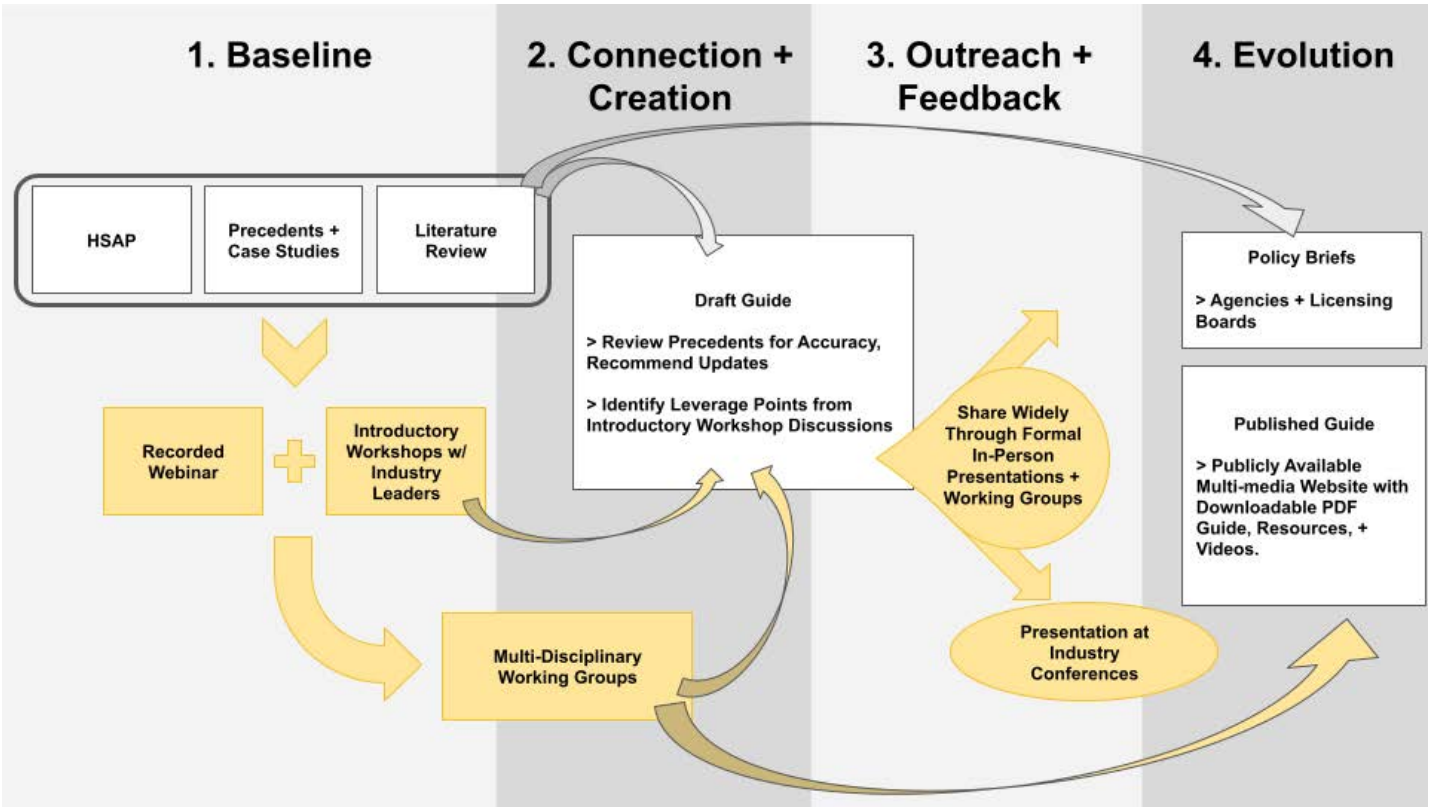
This project will meet our goals and objectives while addressing the above challenges through the engagement of design and construction professionals. This engagement-focused methodology will use gatherings of industry professionals to reconcile current practice with recommended methods to enable greater long-term soil health in Massachusetts and beyond. Wherever possible, project events will offer relevant industry CEUs.

The primary method of achieving this goal is to engage people who influence development projects in understanding and discussing the findings of the HSAP. Building a common understanding and project vocabulary among professionals from the full range of disciplines involved in development is essential in ensuring that the project principle of building soil health is held and maintained through the arc of a project, from initial conception and analysis through post-construction phases. In order for the findings from HSAP to be implemented at an impactful scale, practitioners first need to be aware of basic healthy soil principles and understand how development affects soil health and climate change resiliency.

Some areas of practice that impact long-term soil health, such as stormwater management and soil erosion and sedimentation controls, have extensive existing guidance documents and regulations. For these topics, we will evaluate the effectiveness of the existing regulations and practices in contributing to long term soil health and assess whether updates are needed. Where inadequacies, recurring or common problems, or conflicts are identified, the Project Team will draft recommendations to present in Working Group events and publish in the Guide.

Through engaging with multi-disciplinary professionals we will identify leverage points for change in the current systems of site design, construction, and maintenance. These leverage points will determine the focus for pull outs or chapters in the Guide.

The following diagram illustrates our methodology for integrating engagement activities throughout the four phases of this project and into the final published deliverables.



Expected Outcomes & Deliverables

The primary deliverables from this project will be a series of engagements and curated set of resources for Massachusetts-based industry professionals.

Through participation at existing conferences and events that consistently draw high levels of attendance, we are confident this project will fulfill five key outcomes:

1. Enhance understanding of soil health among design, construction and development professionals,

2. Strengthen existing professional networks and support new partnerships to continue and accelerate the adoption of HSAP recommendations,

3. Enable better communication and coordination across disciplines involved in the development process by growing a shared understanding of soil health and that factors that influence it,

4. Identify key challenges and limitations to implementing development related recommendations from the HSAP, and

5. Provide actionable recommendations and strategies to help the industry address these challenges.

The final deliverables for this project will be:

1. Presentation or facilitation of at least 14 total Educational and Outreach Events for Design and Construction Professionals

2. The "Guide for Implementing the Healthy Soils Action Plan in Design and Construction" multimedia website. This web-based resource will allow the public and professionals of multiple disciplines to access the findings from events, general soil health information, published soil specifications, standards, and policies, case studies, and clear actions and recommendations to improve long-term soil health in Massachusetts' growing developed lands, including:
    - Aggregation of research as a curated dataset available as annotated bibliography and/or Zotero library
    - Custom Educational Resources as downloadable 5-20 page PDFs.
    - List of resources, apps, tools, and institutions for further reading
3. 2-4 Policy Briefs for relevant agencies such as MassDEP, EOEEA, and Massachusetts Board of Building Regulations and Standards

Presentation Co-Sponsors & Industry Partners

The following list of organizations have been contacted about partnering in this effort and have expressed interest. If this proposal is funded, the project team will work with these organizations in one or more of the following ways:

- Invite members/community to participate in webinars and Working Groups
- Deliver workshops or presentations via webinars or participation in annual meetings or conferences.
- Promote public events via social media outlets + member newsletters

Organization / Event	Membership or Average Event Attendance	Target Event(s), Date
Built Environment Plus (BE+) Outreach Webinar Series	"600 + (across disciplines) Attendance: 30 to 500"	Ongoing, target Fall 2024
Builders and Remodelers Association of Greater Boston Webinar (BRAGB)	800+ member companies, member organization of the Home Builders + Remodelers Association of Massachusetts	Ongoing, Webinars + Training Events
Association of General Contractors of Massachusetts *(AGC MA)*	Over 200 union and open shop contractor members	Sustainability Committee Meeting, 2024; AGC MA Annual "What's Next Innovation Conference + Expo", February 2025
Institute for Sustainable Infrastructure (ISI)	"(International Org) 216 public-sector agencies, including academic institutions, and 250 private-sector companies. 77 licensed ENV SP trainers in MA"	Ongoing, Webinars + Training Events
Massachusetts Department of Transportation (MassDOT)	Industry defining specifications for engineering, landscape architecture, and stormwater management.	Fall + Spring Meetings (Fall 2024, Spring 2025)
Boston Society of Landscape Architects (BSLA) Webinar + Fieldbook Entry	500+ Individual Members	Field Day at Red Brook + Read Custom Soils, Fall 2024; Webinar, Fall 2024/ Winter 2025
Massachusetts Association of Conservation Commissions	Over 2,000 Conservation Commissioners and an average attendance of 700 people at the Annual Conference.	Fall Conference (October 2024) and Annual Environmental Conference (Spring 2025)
Urban Land Institute	1000 members in Boston/NE District	Networking through their Sustainability Committee

Proposed Budget

Project Phase	*Subtask*	Grant Monies	In-Kind Contributions (Project Team + Affiliated Partners)
1: Baseline	1.0 Project Management	$ 1,761	$ 140
	1.1 Literature Review, Precedents + Case Studies Compilation	$ 11,275	$ 1,400
	1.2 Introductory Workshops (3)	$ 10,270	$ 1,287
	1.3 "HSAP + What it Means for You" Webinar	$ 1,788	$ 481
1: Baseline Total		$ 25,094	$ 3,308
2: Connection + Creation	2.0 Project Management	$ 2,362	$ 483
	2.1 Summary of Identified Gaps + Leverage Points	$ 2,000	$ -
	2.2 Guide Outline + Draft Recommendations	$ 3,200	$ 175
	2.3 Working Group Engagement Events (3)	$ 8,145	$ 9,413
2: Connection + Creation Total		$ 15,707	$ 10,071
3: Outreach + Feedback	3.0 Project Management	$ 1,896	$ -
	3.1 Guide Revisions	$ 10,200	$ -
	3.2 Field Tour	$ 175	$ 11,225
	3.3 Presentations + Listening Sessions (6)	$ 10,003	$ 2,350
3: Outreach + Feedback Total		$ 22,274	$ 13,575
4: Publication + Dissemination	4.0 Project Management	$ 2,875	$ -
	4.1 Beta Launch + Review	$ 15,641	$ 1,400
	4.2 Final Draft Published	$ 7,250	$ -
	4.3 Policy Briefs	$ 6,100	$ 2,800
	4.4 Final Grant Report	$ 4,975	$ 350
4: Publication + Dissemination Total		$ 36,841	$ 4,550
Grand Total		$ 99,916	$ 31,504

Note: In-Kind value for services include donated promotional support for events from industry partners including BE+, donated use of space for events from BSC Group, and supporting labor from Regenerative Design Group, Sasaki, + Read Custom Soils / A.D. Makespeace.

The total budget for this project is **$99,916** which spans 4 phases and wraps up by the end of June 2025.

Budget line items were estimated by using our standard hourly rates:

Senior Project Lead:	$175/hr
Senior Associate:	$150/hr
Associate:	$125/hr

Team + Organizational Capacity

Members of several leading Massachusetts firms, including Regenerative Design Group, BSC Group, Linnean Solutions, Sasaki (creator and platform for the Carbon Conscious App for landscape architects and design professionals), and supported by A.D. Makepeace Companies and Read Custom Soils will join together on this project. Each of these leaders has unique expertise and together provide unparalleled depth in the design, engineering, environmental monitoring, construction, soil science, landscape architecture, and ecology fields. In addition to a robust team of industry professionals and scientists, this proposal has the support of allied professional organizations.

The firms represented in this Project Team have a proven track record of implementing successful projects of this scale. Individually, each of these firms has been at the forefront of climate resiliency work in their respective fields. **Regenerative Design Group, Linnean Solutions,** and **BSC Group** led the production of the Healthy Soils Action Plan. Since completing the majority of the work in 2021, this trio has gone on to collaborate on four MVP Program projects that operationalized the insights and recommendations from the HSAP for municipalities. In 2023, **Sasaki** launched the publicly available "Carbon Conscience" App, a web based tool that allows users to estimate and strategically reduce the embodied carbon footprint of the built environment. **A.D. Makepeace**, North America's largest cranberry grower, is the largest private property owner in eastern Massachusetts, a recognized leader in environmentally responsible real estate development and stewardship, and the parent company of **Read Custom Soils**.

Key Personnel

Keith Zaltzberg, Rachel Lindsay, Bas Gutwein, Eric Giordano *(Regenerative Design Group Cooperative)*

- **Project management + production lead**, facilitation, presentations, identification of existing challenges to achieving better soil health. RDG will lead the Scientific Literature Review, prepare graphics, format and layout final work products, assist in the creation of educational HSAP Presentations, and present at affiliate conferences.

Jim Newman LEED AP, O+M, EcoDistrict AP; Sarah Saydun, Patrick Black *(Linnean Solutions)*

- **Lead outreach and engagement strategy and process**, construction industry engagement, reviewer, listening sessions facilitation, working with Built Environment Plus and other professional organizations. Industry outreach, engagement strategy + event design, summary of event findings. Support development of presentation and website materials.

Gillian Davies PWS, SSSSNE, NHCWS, CESSWI; Casey-Lee Bastien RLA, SITES-AP, CPSI, OSHA; David Biancavilla PE, LEED AP, OSHA *(BSC Group)*

- T**echnical review + production support**, case study collection; Review soil specs + MASS DOT specs, contributes current & recommended best practices, identification of existing challenges to achieving better soil health. Support development of presentation and website materials.

Chris Hardy RLA, LEED AP+ND, CA; Tao Zhang ASLA, PLA, LEED AP ND, SITES AP *(Sasaki Carbon Conscience App)*

- **Technical review + production support**, literature review and compilation, case study collection. Contributes current & recommended best practices and the identification of existing challenges to achieving better soil health. Supports development of presentation and website materials.

Evan Miller, Peter Lorenz *(A.D. Makepeace Companies / Read Custom Soils)*

- **Industry Advisor**, review, and provide feedback, inventory current catalog of market specified engineered soils, contribute current industry best practices, identify cost implications and limitations, solicit practicality and advice from trusted landscape construction partners, identify logistics and impediments to sourcing and delivering engineered soils to the market, identification of existing challenges to achieving better soil health. Provide material, blending and basic testing services for research oriented test plots.

Previous Achievements + Letters of Support

As noted above, the partners assembled for this project each bring a variety of unique experience and deep catalog of demonstrated successes as leaders in the design, planning, carbon life-cycle, and materials fields. The appendices include detailed profiles of project team members and a selection of relevant projects from each firm.

Appendix #3 consists of letters of support from key partner organizations who are committed to convening and promoting educational and outreach events as part of this projects. Collectively, these organizations, listed below, represent 3,000 professionals or volunteers working in roles that shape soil health outcomes in development.

Built Environment Plus (BE+)

Boston Society of Landscape Architects (BSLA)

Massachusetts Association of Conservation Commissions (MACC)

A.D. Makepeace


BUILT
ENVIRONMENT
PLUS


BSLA


MACC


A.D. MAKEPEACE
Inspired by nature.

Proposed Timeline

This project will be conducted in four phases between March 1, 2024 and June 30, 2025

1. Baseline: Research + Materials Compilation

March to June 30, 2024

1.1 Summary of scientific literature review, published industry standards, and precedent materials (CD's + case studies)

1.2 Introductory Workshops (Hybrid In-person/Virtual) to establish relationships with key professional organizations and facilitate introductory presentations of the principal findings from HSAP: Understanding the HSAP and Why Soil Health Matters in [Your Industry]

1.3 Widely broadcast recorded webinar, Introductory workshop(s) with industry leaders to share HSAP, additional findings and solicit comments and questions. "HSAP + What it Means For You"

Phase 1 Milestones:

- Scientific Literature Review and Precedents summary
- 3 Hybrid Education and Networking Events
- Recorded Webinar: HSAP and What It Means for You.
  - » This event will address a multidisciplinary audience and offer relevant Industry CEUs including SITES.

2. Connection + Creation: Evaluation, Synthesis, and Networking

May to September, 2024

2.1 Summary of identified gaps, conflicts, and inadequacies of current soil standards, specifications, and standard development practices with regards to MA existing soils and land cover characteristics.

2.2 Draft recommended actions and suggested changes to existing standards and practices.

2.3 Outline of up to 9 discrete topics for the Guide PDFs. These will be targeted to fill gaps in the current practices and address the leverage points identified in phases 1+2.

2.4 3 Working Group Engagement Events: These groups will commit to exploring possible avenues and actions to increase soil health outcomes in their line of work, reviewing draft recommendations, and providing feedback and suggestions to the project team.

Phase 2 Milestones:

- Identification of gaps + needs
- Guide Outline + Draft recommendations for changes to existing standards + practices
- 3 Hybrid Working Group events

3. Outreach + Feedback

October 2024 through April 2025

3.1 Revisions to draft recommendations from Working Group participants

3.2 Field Tour of Redbrook: Inside/Out Field Day co-sponsored by the BSLA at Redbrook and Read Custom Soils for the project team + working group participants. Soil observation and demonstration review (pits/shallow hole, penetrometer)

3.3 Public Engagement Events: 6 Webinars and/or public presentations at professional conferences to build broader understanding and awareness of soil health, and get feedback from professionals on challenges and draft recommendations. (see the table in Outcomes + Deliverables for industry partners).

- These events will address a multidisciplinary audience and offer relevant Industry CEUs where possible

Phase 3 Milestone

- 6 presentations and/or workshops with targeted professional communities

4. Publication + Dissemination

January through June, 2025

4.1 Website Design + Development. Beta launch of the Guide for project team + Working Group review

4.2 Public Launch of the website and Published Guide

- Endorsements by at least 3 allied professional organizations. “Endorsement” is considered one or more public actions such as:
  - » Linking/hosting the Guide materials on their organizations website
  - » Publishing article(s) and press releases
  - » Sharing the Guide in social media outlets
  - » Adopting the Guide as a required reference for trainings and/or certifications
  - » Hosting workshops based on the Guide (with industry-relevant CEUs potentially offered)

4.3 2-4 Policy Briefs for relevant agencies, including MassDEP, OEEA, and Massachusetts Board of Building Regulations and Standards

4.4 Final Grant Report submitted to the OEEA with full list of references, resources, anticipated challenges to adaptation, and suggestions for further studies

Phase 4 Milestones

- Draft for comment published online March 30, 2025
- Final draft of all materials published online by June 30, 2025

Project Evaluation and Monitoring

Performance Metrics

1. A total reach of over 5,000 individuals through commited partner organizations (3,000+) and other target groups (2000+), with direct engagement of at least 150 design, engineering, and construction professionals at workshops, webinars, and conference presentations.
2. The compilation of current research on the impact of development and construction practices on soil health, namely soil organic carbon, water infiltration and holding capacity, soil structure, soil biodiversity, and net primary productivity, as applicable to Massachusetts soils and land cover types.
3. Catalog of gaps in research and information, and needs for additional/alternative management practices, restoration methods, and high-performance soil specifications.
4. Publicly available published Guide, with downloadable PDFs and associated web-based resources.
5. Endorsement of the Guide by at least 3 state-wide non-profits or professional organizations.

    - "Endorsement" is considered one or more public actions such as:
        - » Linking/hosting the Guide materials on their organizations website
        - » Publishing article(s) and press releases
        - » Sharing the Guide in social media outlets
        - » Adopting the Guide as a required reference for trainings and/or certifications
        - » Hosting workshops based on the Guide (with industry-relevant CEUs potentially offered)

Reporting

Progress reports summarizing project activities and accomplishments will be submitted on a monthly basis with invoices. The progress reports will include supplemental materials including copies of meeting presentations, minutes, attendance lists, annotated bibliographies, and recommendations will also be submitted as a batch each month. The final materials will be uploaded to the project webpage and submitted as PDF's to the EEA on or before June 30, 2025.

Sustainability Plan

Post-grant Project Sustainability Assessment

This project represents the continuation of a partnership established between the Regenerative Design Group, Linnean Solutions, and BSC Group that was established during the production of the Healthy Soils Action Plan. Since completing the majority of the work in 2021, this trio has gone on to collaborate on four MVP Program projects that operationalized the insights and recommendations from the HSAP for municipalities.

Regenerative Design Group is committed to hosting + maintaining the Guide website for up to 5 years after the completion of the grant. During this time an alternate host may be determined, provided they have the reach, commitment, and resources to continue the dissemination of the material.

Following the publication of the Guide materials, the Project Team intends to continue this work through partnerships with leading researchers, industry actors, and professional associations. As the attached firm profiles demonstrate, each of the Project Team members already has a track record of being an industry leader in bringing healthy soils and the importance of decarbonizing development to our projects and the general public.

The compilation of materials, gaps in resources and information identified, and new relationships established during the engagement activities of this project will inform the focus of future workforce trainings and research, as well as propel avenues of additional funding. Funding to translate the documents into Spanish and Portuguese will be pursued imediately following publication.

There are many barriers and well-worn ways of working in the development processes that lead to poor soil performance and negative environmental outcomes. While HSAP outlines some strategies to improve soil function, implementing significant changes to typical clearing and grading practices, dominant soil specifications, and reliance on off-site materials requires longer-term research and the development efforts that extend beyond the timeframe outlined in the 2024 HSCG Initiative RFR. Recognizing that, the partners to this proposal-- Regenerative Design Group, BSC Group, Linnean Solutions, Sasaki, and A.D. Makepeace-- have already begun designing and seeking funding for additional projects. These projects include the development and trials of high-performance bulk materials and site preparation methods for Post Construction Soil Health Outcomes. As funding becomes available, performance trials will be established on property of Read Custom Soils, a subsidiary of A.D. Makepeace and other partner institutions. These actions will be elaborated on and informed by the work in this project. We anticipate soliciting funding for further research and development during subsequent funding cycles and in partnership with an academic institution.

- Research pre-development soil characteristics for case study sites identified during this project (using NRCS SSURGO data) for key performance variables including infiltration, holding capacity, and SOC
- Test current conditions at statically significant number of locations within development and within conserved land nearby (include forested land)
- Establish test plots on representative Massachusetts soil units to trial different soil management treatments including restoration and custom soil blends for disturbed areas, and mulching and soil disturbance materials and regimes
- Key outcomes include: impact of development practices on soil as compared to forest, impact of active restoration of in-situ soils (decompaction, decompaction and carbon amendment, carbon amendment only), differential performance of custom replacement soils.
- We anticipate that the work described in this proposal will reveal additional needs and pathways to ensure the professionals in the architecture, engineering, and construction industries have the knowledge, materials, and tools necessary to achieve greater soil health. The team assembled for this project is committed to using these findings to address these gaps through continuing and expanding collaboration.

Risk Assessment for Project, Partners, & Timeline

The members of this team and our partners have an excellent track record of delivering high-quality experiences and work products on-time and on-budget. The attached resumes and project qualification sheets provide documentation of these work products and the high degree of qualification we bring to this project, including numerous professional certifications, advanced degrees, and decades of professional experience. It is notable to mention that two of the larger projects, HSAP and the Apple Country Natural Climate Solutions project, spanned the beginning of the COVID pandemic. This required a hard pivot to remote or distanced options in outreach, education, and field-based events. The success of these projects gives us confidence that we can navigate unforeseen challenges. We have identified the following risks and mitigation strategies for the completion of the Guide:

Lack of participation from key professional segments

- Robust outreach built on existing relationships and networks will help keep participants accountable for their contributions to the Project.
- By participating in existing conferences and offering available CEUs where possible, attending our events will have professional justification.

Staffing changes/disruptions

- Each firm of the project team has a deep bench of staff that could step in should unexpected disruptions require a change of project staffing. In anticipation of this potential, RDG, BSC, and Linnean Solutions will hold regular project meetings internally with understudies and construct a resilient file sharing system accessible to all members of each firm.

Tasks take longer than expected

- As mentioned, each firm on the project team has a deep bench. Should tasks take longer than expected, we have the capacity to pull in additional staff to ensure that key deadlines are met, as well as a solid track record of delivering high caliber work products.

COVID Resurgence / Other Pandemic

- While in person and hybrid events are planned for this project, all events will be designed to allow for remote and asynchronous engagement. Recorded sessions will also serve as resources for future outreach and education.

In summary, we put forward this proposal as a low risk investment due to the capacity of the partners, the ability to deliver this scope of work within this budget and without requiring additional third party funds for completion, and the fact that this work is primarily a compilation of existing primary research and education sources and producing essentially a communications-associated set of deliverables. No new primary science is required for these deliverables to be successfully completed, and success is not contingent upon other third party institutional endorsements or funding.

Appendices

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Appendix 3: Letters of Support 90

Appendix 1: Firm Profiles & Project Examples

resilient communities. productive landscapes. nature-based solutions.

OUR FIRM

Regenerative Design Group is a worker-owned ecological design practice dedicated to creating productive landscapes and resilient communities. We work across scales, offering innovative, practical, and flexible solutions for individuals, institutions, and communities.

Our capacity for interdisciplinary thinking is informed by our backgrounds in ecology, agriculture, conservation, architecture, and education. Grounded in the principles of permaculture design, our team weaves the elements of any project into a high-functioning whole system.

COOPERATIVELY OWNED AND RUN

Founded in 2009, Worker-Owned since 2021

Founding Board of Directors, 2021

OUR WORK

Research

We support clients and their communities in articulating their vision and goals, and bringing rigorous ecological analysis and long-term climate projections to the table.

Master Planning & Campus Design

We develop designs for campuses that combine food production and learning, guiding the transition from high-input management to diverse educational landscapes.

Regenerative Agriculture & Farm Design

We work with communities and farm owners to develop diverse farming and agroforestry systems that support the farm's social, environmental, and economic goals.

Productive Habitats & Ecosystem Regeneration

We work to restore and enhance existing natural systems that provide fresh air, clean water, food, fuel, fiber, wildlife, shelter, and wild forage.

Residential Design & Integrated Homesteads

We help homeowners envision and create beautiful, efficient homes and landscapes that invite engagement through the production of food and integration of natural systems.

Massachusetts Healthy Soils Action Plan

CLIENT

Massachusetts Executive Office of
Energy + Environmental Affairs, 2019-2023

SERVICES + ACCOMPLISHMENTS

Analysis and modelling of Soil Organic Carbon (SOC) stock, segmented by land cover type

Projection of 2050 SOC flux, based on land cover change

Soil-smart planning and management priorities

Stakeholder engagement

Management of 40 person working group

PROJECT OVERVIEW

The Massachusetts Healthy Soils Action Plan (HSAP) is the nation's first effort to understand, protect, and revitalize soil function in all land uses statewide. This Plan, commissioned by Massachusetts Executive Office of Energy and Environmental Affairs, reveals the tremendous impact land use and management has on the soils of the Commonwealth and sets forth strategies and actions to increase soil health as a way to improve food security, ecosystem function, and climate resilience across the region.

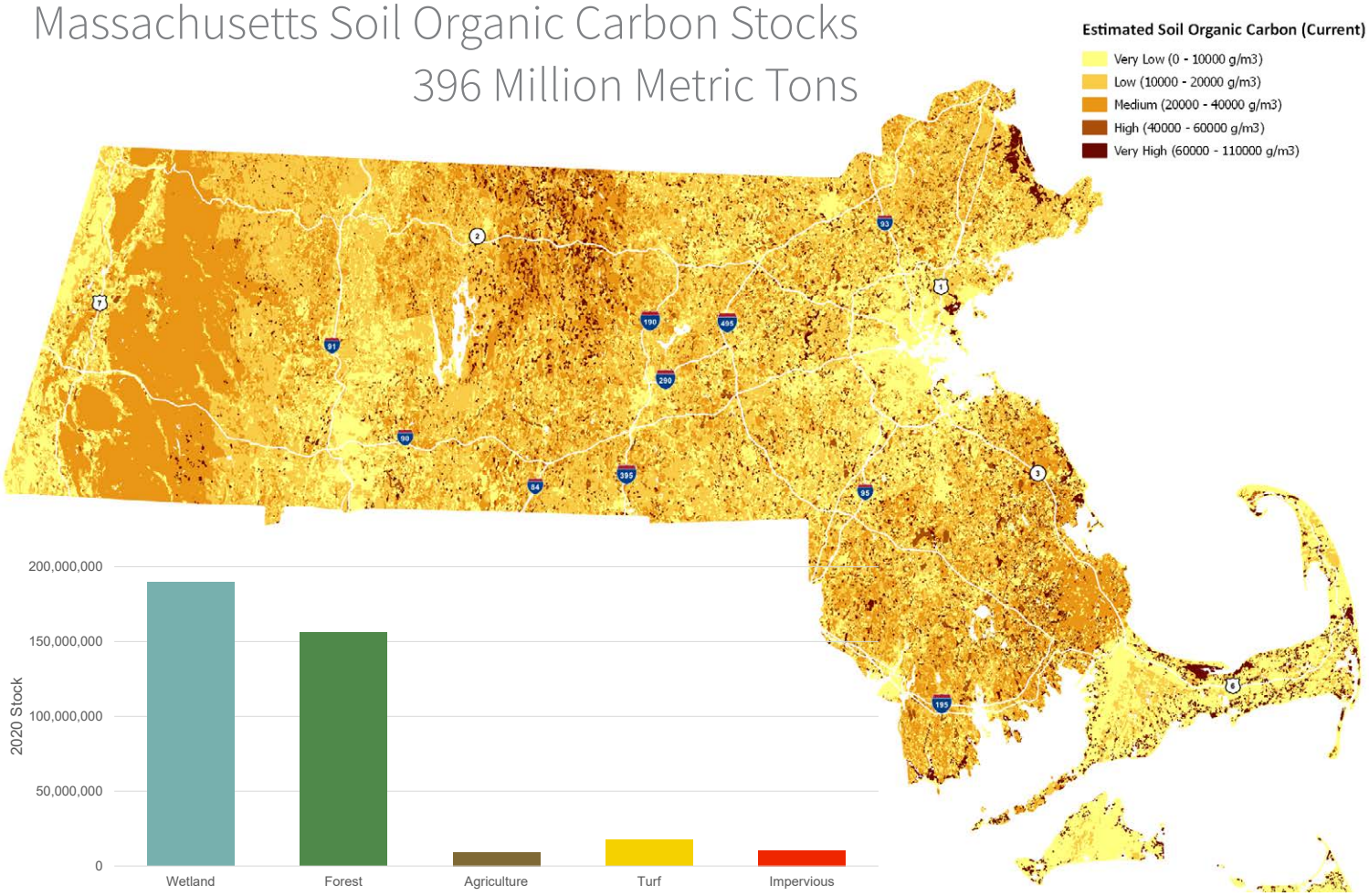
Through an 18-month process the consultant team, led by Regenerative Design Group, conducted a detailed literature review and geospatial analysis to understand the key factors and dynamics that shape soil health. This included the development of a novel method for quantifying soil organic carbon (SOC) based on land cover and drainage classification.

With guidance and review of a 40-member Working Group, representing state and federal agencies, conservation organizations, scientific advisors, and community stakeholders, RDG developed a series of evidence-based strategies and actions aimed at transforming the impact of soil management on climate from a negative to a positive.

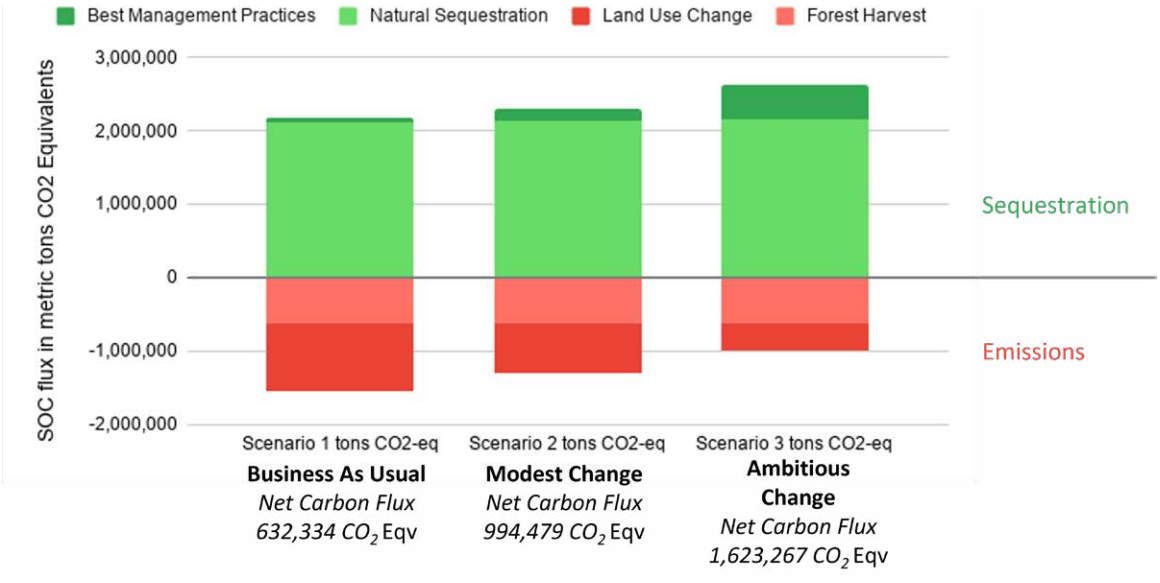
The result is a roadmap for policymakers, land managers, and soil health advocates to understand the interconnected nature of the Commonwealth's landscapes and the role they play in soil carbon sequestration and climate resilience.

Regenerative DesignGroup

Massachusetts Soil Organic Carbon Stocks
396 Million Metric Tons



2050 Comparison of Annual Soil Organic Carbon Fluxes



Apple Country Natural Climate Solutions Project

CLIENT

Towns of Bolton + Harvard with Devens Regional Enterprise Zone Massachusetts Municipal Vulnerability Preparedness Program, 2019

SERVICES + ACCOMPLISHMENTS

Refined method for modeling soil organic carbon using land cover

Analysis and modelling of soil organic carbon stocks, segmented by land cover type

Projection of annual soil organic carbon fluxes for 2050 based on land use change predictions

Development of soil-smart planning and management BMPs

LINNEAN SOLUTIONS

Regenerative DesignGroup

PROJECT OVERVIEW

In a regional effort to address the challenges of climate change, biodiversity loss, and regional development pressures, the towns of Bolton, Harvard, and Devens engaged BSC Group, Linnean Solutions, Woodwell Climate Research Center, and Regenerative Design Group to identify regional vulnerabilities and recommend nature-based climate solutions (NbS) that will increase the resiliency of their communities and ecosystems.

Nature-based Solutions provide cost-effective climate resilience by providing multiple co-benefits, including reduction of greenhouse gas emissions, improved water quality and water supply, reduced flooding, improved air quality, cooler local temperatures, fish and wildlife habitat and support for biodiversity, recreational and aesthetic opportunities, and improved physical and mental public health.

Regenerative Design Group led the mapping and analysis of soil carbon components of this project and contributed to the identification of nature based solutions to increase regional climate resilience. To assist the communities to understand the impact of land use on health of their soils and contributions to climate resilience, RDG remapped NRCS soil carbon based on land cover (top right) and created an infographic of projected soil organic carbon fluxes in 2050 (bottom right).

Land Cover Adjusted Soil Organic Carbon

When adjusted for land cover, the total stock of SOC in Apple Country increased from 2.2 million metric tons (SSURGO) to 2.8 million metric tons, a difference of 400,000 tons.

This work suggests that the amount of carbon stored in the soils of this region is underestimated, diminishing the significance of conserving and regenerating forests and wetlands.

These maps reveal how land cover directly impacts the SOC.

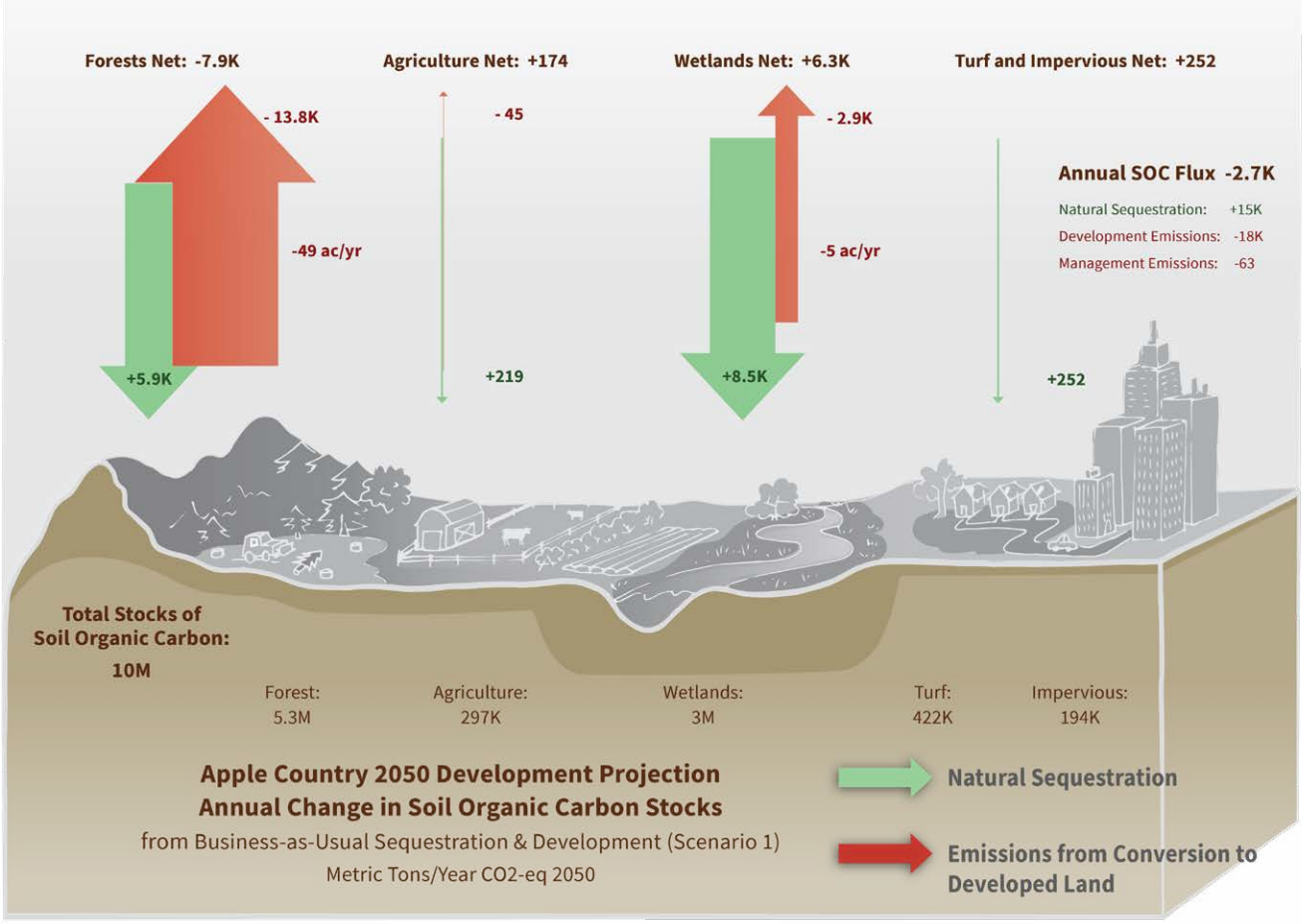
ORIGINAL SSURGO SOC

2.2 Million Metric Tons

LAND COVER ADJUSTED SOC

2.8 Million Metric Tons

2050 Soil Organic Carbon Fluxes



SuAsCo Nature Based Solutions Project

CLIENT

Towns of Hudson, Framingham, and Natick, Municipal Vulnerability Preparedness Program, 2022-2024

SERVICES + ACCOMPLISHMENTS

Analysis and modelling of Soil Organic Carbon (SOC) stock

Projection of 2050 SOC flux, based on land cover change

Soil-smart planning and management priorities

Selection of and recommendations for high-impact locations for nature based solutions

Focus on environmental justice and climate vulnerable populations

LINNEAN SOLUTIONS

Regenerative DesignGroup

PROJECT OVERVIEW

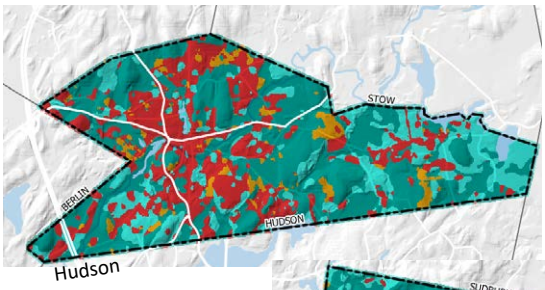
Launched in the fall of 2022, the SuAsCo Natural Climate Solutions project is a joint effort by stakeholders in the towns of Hudson, Framingham, and Natick with consultant partners from Regenerative Design Group, Linnean Solutions, and BSC Group to identify high impact sites for nature based interventions that will support the towns' climate resilience.

This project has a strong focus on environmental justice and improving conditions for climate vulnerable populations. Demographic data was overlaid with other data on known ecological hazards to create a human health and vulnerability map that contributed to developing project priorities.

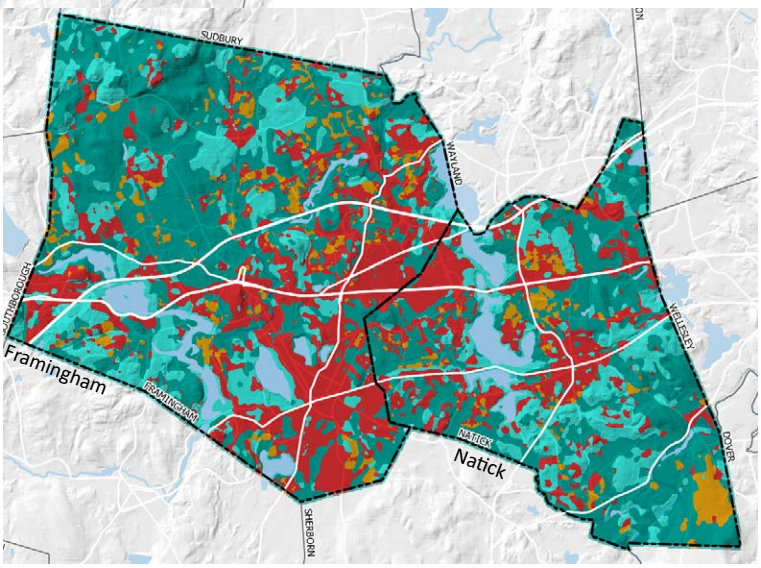
With the understanding that soil health is foundational to the function of all terrestrial ecosystems, Regenerative Design Group lead an initial phase of the project to establish a baseline estimation of current soil health in the towns and analyze the effects existing land cover and management practices have on these resources. The findings were summarized in a series of maps entitled Soil Functions for Resilience (top right).

From this baseline, the team completed an analysis that combines RDG's refined soil carbon predictions with other ecological data to map ecological planning priorities. The result is a map of planning districts (bottom right) with different priorities (e.g. restore and transform or plan and manage for resilience). Recommended actions for each district and an analysis of ideal candidate sites are major products of this project. Proposed sites for nature based solutions will receive a multi-stage assessment of vegetative health by drone monitoring.

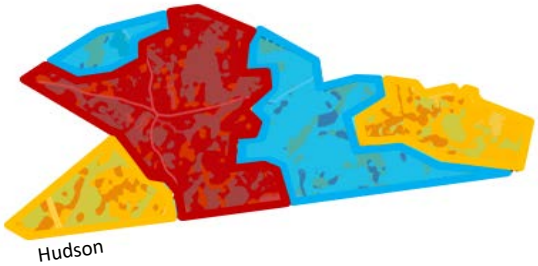
Soil Functions for Resilience



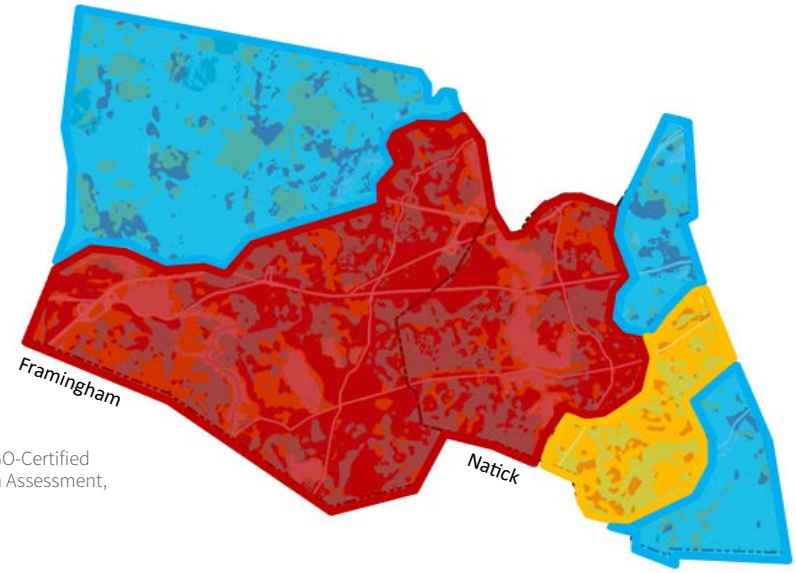
- High Performance Soils & High Carbon Soils
- Average Function Soils
- Degraded Soils with High Regeneration Potential
- Highly Degraded Soils



Ecological Planning Priorities



- Restore & Transform
- Plan & Manage for Resilience
- Intensive Intervention



Data Sources: Soils SSURGO-Certified NRCS, NRCS Rapid Carbon Assessment, MassGIS 2016 Landcover

Deerfield Soil Health Plan

CLIENT

Town of Deerfield
Municipal Vulnerability Preparedness Program, 2022

SERVICES + ACCOMPLISHMENTS

Analysis and modelling of Soil Organic Carbon (SOC) stock, segmented by land cover type

Soil-smart planning and management priorities

Stakeholder engagement

Sample bylaws aimed at protecting and improving soil resources

Soil sampling across a variety of land types providing the basis for future soil health tracking

Design and execution of a “soil health field day” for 120 high school students

Regenerative DesignGroup

PROJECT OVERVIEW

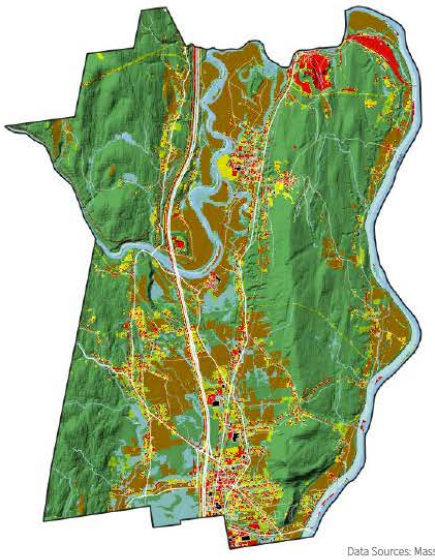
The Deerfield Healthy Soils Project is based on the premise that protecting and improving soil function across land uses is an essential component of climate-resilient planning. The overall goal of this project was to identify the most impactful actions and strategies that the community of Deerfield, Massachusetts can implement to steward its soils in ways that support the myriad of co-benefits and beneficial functions of healthy ecosystems including enhanced carbon sequestration and storage, greater fertility, and improved water dynamics.

Over the course of a year, Regenerative Design Group led a process that included high resolution modeling of Deerfield’s current healthy soil resources; presentations, workshops, and conversations with stakeholders with a special focus on farmers considering the town’s large agricultural community; soil sampling across a variety of land types providing the basis for future soil health tracking; a “soil health field day” for 120 high school students; and the development of several recommendations for potential bylaw improvements aimed at protecting and improving soil resources.

This project was completed in 2022 as part of a larger Municipal Vulnerability Preparedness action in the town of Deerfield, MA. Regenerative Design Group (RDG) worked closely with Chris Curtis (Conservation Works) who was the lead planner for the larger MVP project and who was the lead author of the sample bylaws included in our report. The consultants reported directly to Deerfield’s Climate Change and Energy Committee in carrying out the work of the project.

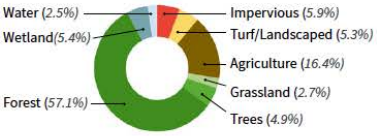
Land cover + Soil Organic Carbon Stocks in Deerfield, MA

Landcover



Data Sources: MassGIS 2016 Landcover

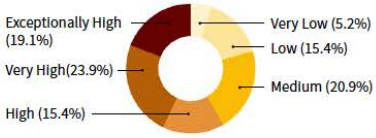
Forest	12,525 ac
Agriculture	3,506 ac
Wetland	1,160 ac
Turf & Landscaped Areas	1,123 ac
Trees	1,041 ac
Impervious	965 ac
Grassland or Shrub	571 ac
Open Water	527 ac



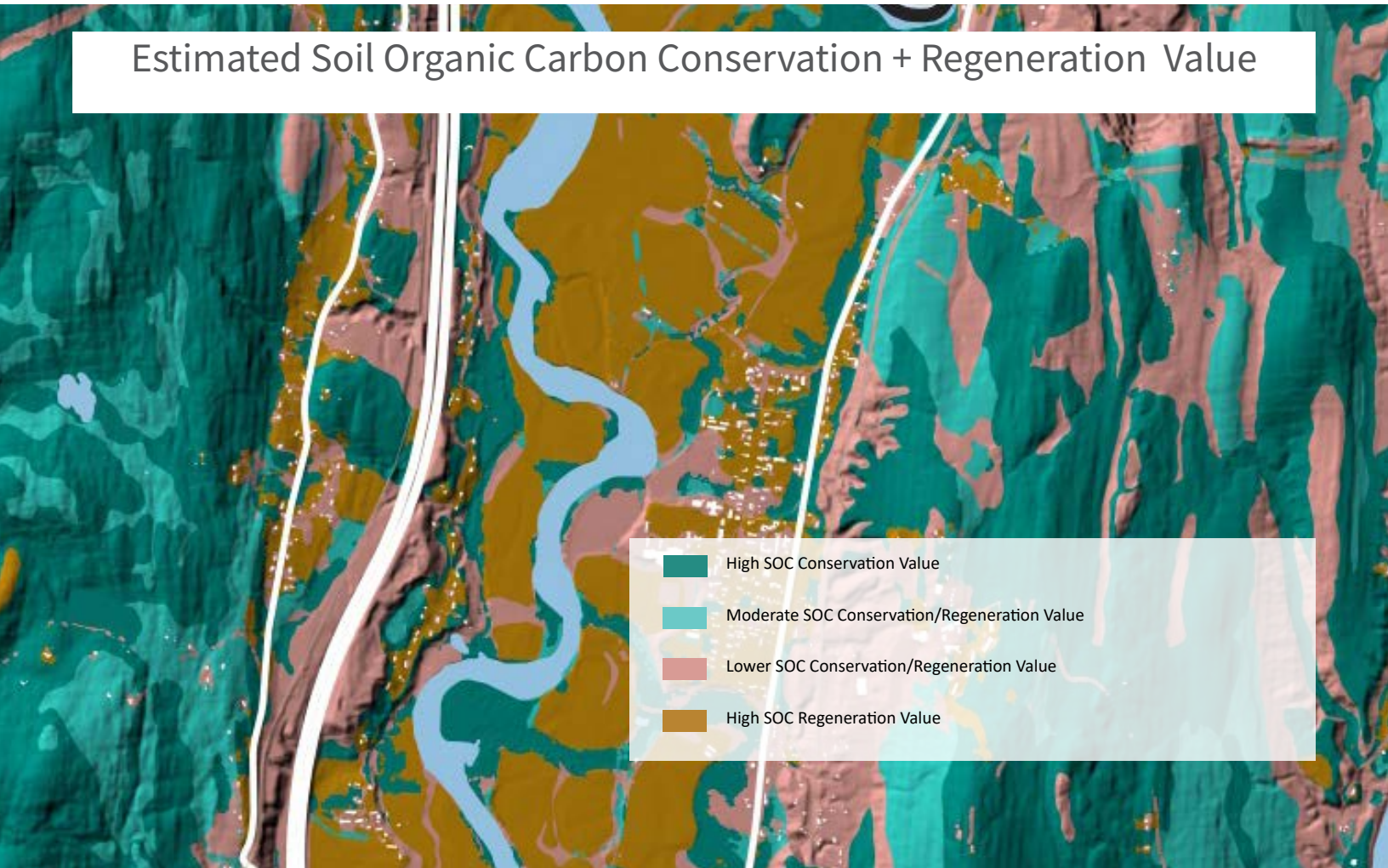
Predicted Soil Organic Carbon

Data Sources: Soils SSURGO-Certified NRCS, NRCS Rapid Carbon Assessment, MassGIS 2016 Landcover

Very Low (0-20 tons/acre)	1,120 ac
Low (20-40 tons/acre)	3,299 ac
Medium (40-60 tons/acre)	4,481 ac
High (60-80 tons/acre)	3,306 ac
Very High (80-100 tons/acre)	5,107 ac
Exceptionally High (100+)	4,097 ac



Estimated Soil Organic Carbon Conservation + Regeneration Value



Estimating land cover-based soil organic carbon to support decarbonization and climate resilience planning in Massachusetts

CLIENT

Journal of Soil Security, 2022

SERVICES + ACCOMPLISHMENTS

Meta-analysis of scientific literature on soil organic carbon in various land cover types

Development of land cover SOC averages

Estimation of total SOC statewide SOC stocks for Massachusetts

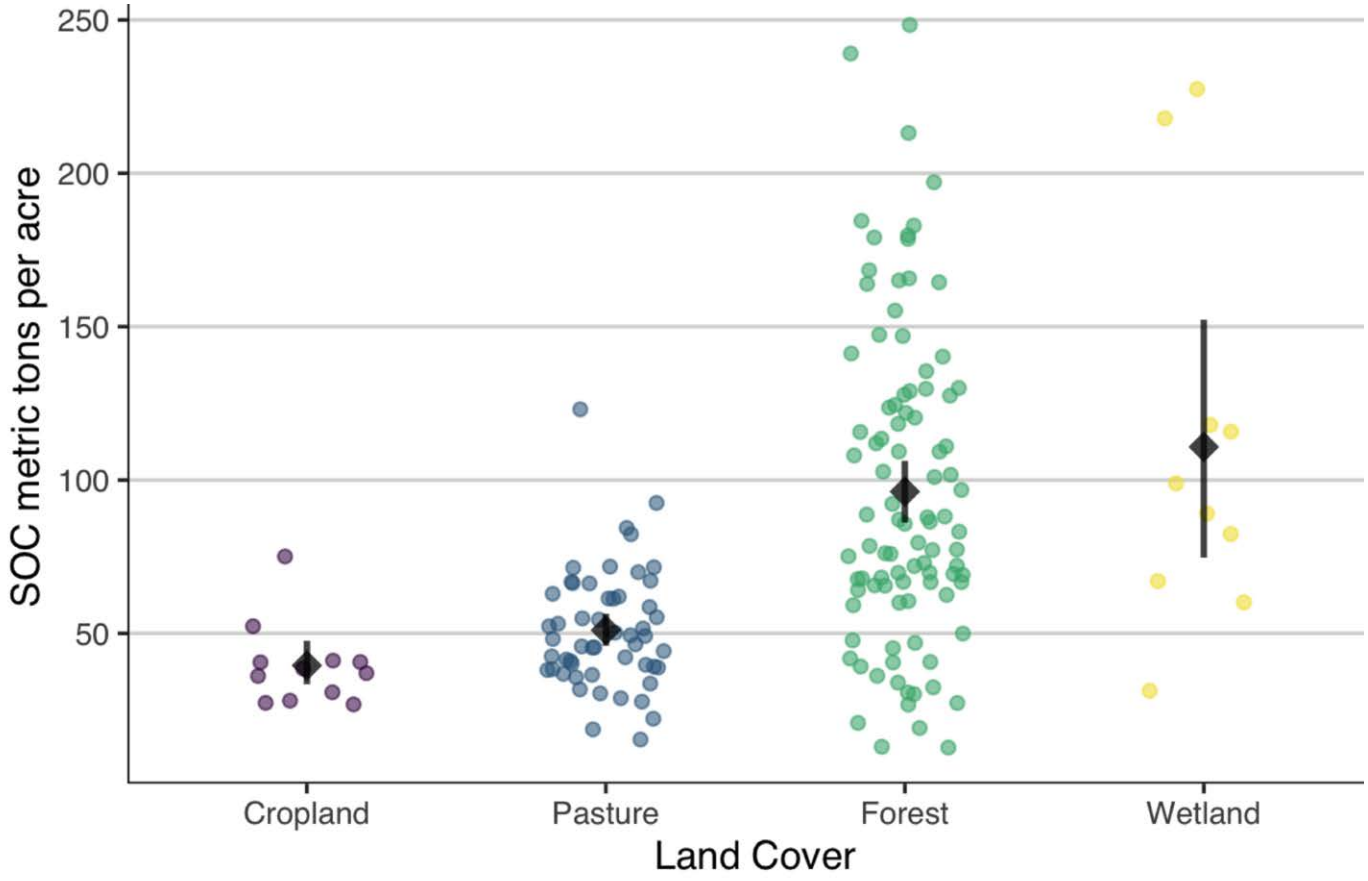
ABSTRACT

Land management and land cover change exert a strong influence on soil organic carbon (SOC) storage. As scientific, political, and business communities increase their awareness of the essential roles SOC plays in climateregulation and ecosystem functions, efforts to quantify the impacts of land use and anagement on SOC have increased rapidly. Existing methods of estimating SOC stocks from widely available data do not account for land cover, and are therefore of limited usefulness in understanding the impacts of past and future land use change.

This project explores a method of linking land cover to SOC using data from public datasets and the scientific literature, to provide an SOC Inventory for Massachusetts, and compares the results to those derived from a common baseline approach. Our method derives average land cover SOC values by combining data from the USDA-NRCS Rapid Carbon Assessment and the National Cooperative Soil Characterization Database with values

from a meta-analysis of scientific literature. These are applied to the total area of the 20 most abundant landcover classes of Massachusetts. We compare this land cover-based approach with a baseline using SOC values found in the Soil Survey Geographic Database (SSURGO), applied to each soil map unit found within Massachusetts.

Our approach produced an estimated stock of 481 million metric tons of SOC, 109 million metric tons greater than the SSURGO baseline. We use these estimates to explore the use of the land cover based SOC values to project the impacts of likely land cover change by 2050.



CONTEXT + KEY FINDINGS

After the completion of the Massachusetts Healthy Soils Action Plan, members of RDG's consulting team published an article on the novel approach to estimating soil organic carbon at the state or larger regional scale.

Figure 3 (above) graphs the SOC mt/ha to a 1 meter depth for 172 samples tested by the National Resource Conservation Service from within 100 miles of the Massachusetts border. Cropland

An exerpt from Table 1 (right) contains the average SOC values for each major land cover type found in Massachusetts.

2016 High Resolution Land Cover Class	Average Soil Organic Carbon MT ha 1m depth	Source of SOC Value
Impervious (2)	54	Meta-analysis/ SSURGO
Developed or Open Space (5)	99	Meta-analysis/ SSURGO
Cultivated Crops (6)	81	RaCA/SCDB
Pasture or Hay (7)	126	RaCA/SCDB
Grassland or Herbaceous (8)	113	RaCA/SCDB
Deciduous Trees- non forest (9)	54	Meta-analysis/ SSURGO
Evergreen Trees- non forest (10)	54	Meta-analysis/ SSURGO
Forest (11)	214	RaCA/SCDB
Scrub/Shrub (12)	121	Meta-analysis/ SSURGO
Palustrine Forested Wetland (13)	825	RaCA/SCDB
Palustrine Scrub/Shrub Wetland (14)	825	RaCA/SCDB
Palustrine Emergent Wetland (Persistent) (15)	825	RaCA/SCDB
Estuarine Forested Wetland (16)	398	Meta-analysis/ SSURGO
Estuarine Scrub/Shrub Wetland (17)	398	Meta-analysis/ SSURGO
Estuarine Emergent Wetland (18)	398	Meta-analysis/ SSURGO

About Linnean Solutions

Linnean Solutions is a mission-driven firm that guides governments, organizations, and communities in reaching ambitious resilience and climate action goals. Through a mix of technical and facilitation-based processes—including climate action planning, resilience strategy development, vulnerability assessments, passive house certification, workshop and process facilitation, carbon accounting and life cycle analyses, and regenerative development training—Linnean supports communities in charting a path to a vibrant future.

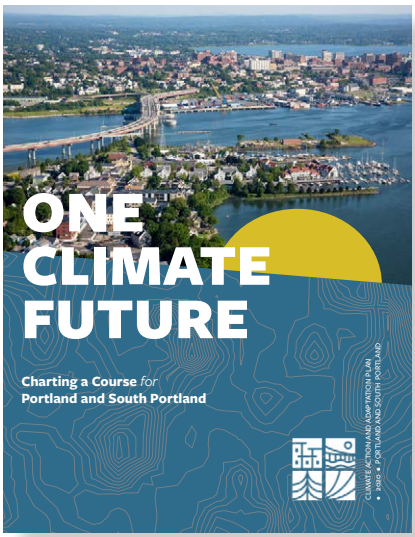
Linnean has worked with communities throughout the Northeast to assess, develop, plan, and implement citywide climate change strategies, including for Portland and South Portland, ME, Medford, MA, Northampton, MA, and Amherst, MA. Linnean has also worked at the State level, on the Massachusetts healthy Soils Action Plan, redesigning the Massachusetts Vulnerability Program (MVP) Community Resilience Building Workshop, and other large-scale projects. We co-develop processes with communities to build collective capacity and community ownership for climate solutions— made possible when all voices are heard and have influence over decision-making processes, particularly those who will be most affected by their outcomes.

At the building scale, Linnean advises project teams and building portfolio owners on energy efficient, healthy, and resilient building design, including developing resilience assessment tools and building guidelines for the multifamily housing sector. Linnean brings familiarity and expertise in passive house and high performance building design, land use policy and resilience zoning, thermal modeling, urban infrastructure planning, public resources and programs for social resilience, and ecosystem-based solutions for more vital, just, and healthier communities.

Linnean Solutions was founded in 2011 and is based in Cambridge, MA and Portland, ME.

See linneansolutions.com

Linnean Solutions Project Samples



Reference: Troy Moon, Sustainability Coordinator, City of Portland
Phone: (207) 756-8362
Email: thm@portlandmaine.gov

One Climate Future: Climate Action and Adaptation Plan

Portland, ME and South Portland, ME | Jan. 2019 - Sep. 2020

"One Climate Future" is a unique (and potentially unprecedented!) planning effort by two cities—Portland and South Portland, Maine—to address climate change in coordination. Linnean led this two-city project, bringing together community groups, businesses, institutions, and city departments to chart a course for a thriving future in the face of climate change. The process included assessing climate vulnerability across infrastructural, social, environmental, and economic systems; inventorying greenhouse gas emissions; modeling future emissions under a variety of policy scenarios; launching a wide range of online and in-person engagement activities designed around inclusivity and equity; facilitating stakeholder workshops; developing a set of strategies related to buildings, energy, transportation, waste, and community resilience; and producing the One Climate Future Plan in tandem with sowing the seeds for ongoing plan implementation, climate conversations, and community action. For more information see: oneclimatefuture.org

Reference: Rebecca Longvall, Conservation Agent, Town of Bolton
Phone: (978) 779-3304
Email: rlongvall@townofbolton.com

Apple Country Natural Climate Solutions Project

Harvard, MA; Bolton, MA; Devens Regional Enterprise Zone | Nov. 2020 - Jun. 2021

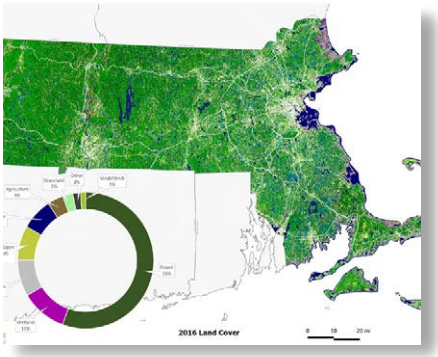
Linnean Solutions is collaborating with a team of regenerative landscape designers, ecologists, environmental engineers, the towns of Harvard and Bolton, and the Devens Regional Enterprise Zone to identify opportunities for increasing community and ecosystem resilience through nature-based solutions in Harvard, Bolton, and Devens. Among other goals, the project will identify best management practices for supporting the health and capacity of soils, agriculture, forests, wetlands, and floodplains to store carbon and provide resilience benefits, as well as identify opportunities to implement those best management practices at specific sites throughout the three communities. The project's soil assessments and best management practices with respect to soils—including how to expand their capacity to infiltrate stormwater and store carbon—draw on findings from the Massachusetts Healthy Soils Action Plan, which Linnean developed with Regenerative Design Group in 2020. For more information see: climateresilient.wixsite.com/applecountry

Reference: Wayne Feiden, Director of Planning and Sustainability
Phone: (413) 587-1265
Email: wfeiden@northamptonma.gov

Northampton Climate Resilience and Regeneration Plan

Northampton, MA | Mar. 2018 - May 2019

Linnean partnered with the City of Northampton in 2018 on a year-long effort to advance citywide climate adaptation and mitigation planning, and to create a framework for addressing climate change in all of the City's future planning, decision-making, and capital projects. In the first phase, Linnean facilitated the city's Municipal Vulnerability Preparedness (MVP) Process, a program funded and designed by the Commonwealth of Massachusetts that uses community workshops to identify vulnerabilities, strengths, and strategies for increasing the city's resilience. As a result of the MVP process, Northampton was awarded an MVP Action Grant for "Northampton Designs with Nature," a project that focused on implementing green infrastructure to reduce flooding in the city. Additional project components included updating the city's greenhouse gas inventory, aligning the city's sustainability plan with the STAR Communities Framework, facilitating a number of community workshops and outreach activities, and developing a suite of community-driven actions for the city to reach carbon neutrality and adapt to climate change. Linnean led the development of the city's Climate Resilience and Regeneration Plan as part of the city's comprehensive plan, Sustainable Northampton. For more information see: www.northamptonma.gov/2069/Climate



Reference: Keith Zaltzberg, Regenerative Design Group
Phone: (413) 325-7968
Email: keithz@regenerativedesigngroup.com

Massachusetts Healthy Soils Action Plan

Commonwealth of Massachusetts | Mar. 2019 - Jul. 2021

The Massachusetts Executive Office of Energy and Environmental Affairs is looking to develop a Healthy Soils Action Plan (HSAP) that will guide land stewards of all stripes—farmers, foresters, public and private land managers, conservation agents, homeowners, businesses, and developers—in best practices that will build, rather than deplete, soil. Linnean is working with a team of landscape ecologists and soil biologists to map and assess the state's soil resources; host a series of listening sessions with agricultural, municipal, institutional, and other private land owners; and facilitate a working group of diverse experts in developing a blueprint for improving the state's soils. As an ultimate goal, the Healthy Soils Action Plan will serve as a user-friendly tool for all types of land owners, encouraging new stewardship practices that will lead to soils rich in organic matter and biological activity, that have enhanced capacity to sequester carbon, produce nutrient-dense food, aid in stormwater management, and are resilient to climate change.

MASSDEP NO NET LOSS OF CARBON IN WETLANDS IN MASSACHUSETTS

CLIENT

Massachusetts Department of Environmental Protection (MassDEP)

SERVICES

Development of Innovative Wetland Carbon Protection and Restoration Strategy, Policy, and Regulations

Software Development

Wetland Carbon Accounting Science

Wetland Mapping

Leading a consulting team, BSC is working with MassDEP to identify innovative strategies, approaches, concepts, and regulatory recommendations to achieve No Net Loss of Carbon in Wetlands in Massachusetts and to meet wetlands-related climate goals outlined in the Massachusetts Clean Energy and Climate Plan for 2025 and 2030, Chapter 8: Protecting Our Natural and Working Lands. Our project team includes BSC, Regenerative Design Group, the Massachusetts Association of Conservation Commissions (MACC), and the Woodwell Climate Research Center.

BSC is researching wetland carbon policies, regulations, and projects in all 50 states as well as in other countries, researching wetland carbon bylaws and regulatory provisions in Massachusetts municipalities, and leading the project team in developing innovative wetland carbon protection and restoration strategies, approaches, and regulatory recommendations, including collaborating with MACC as they update their local wetland bylaw database.

Project team member Regenerative Design Group is developing a cutting-edge wetland mapping approach based on machine learning that identifies previously cryptic wetlands, such as forested wetlands, which traditional mapping methods often have difficulty detecting.

This mapping, combined with Woodwell Climate Research Center's research on inland/freshwater and coastal/saltwater carbon accounting tools and current science on wetland greenhouse gas fluxes, provides the necessary inputs for BSC to develop the requirements, recommendations, and mock-ups for an interactive Massachusetts carbon accounting tool for both inland/freshwater and coastal/saltwater wetlands.

CONNECTICUT DEPARTMENT OF AGRICULTURE

HAMPTON, CT

CLIENT

Connecticut Department of Agriculture

SERVICES

Soil Science

Restoration

Wetland Delineation

Roadway Design

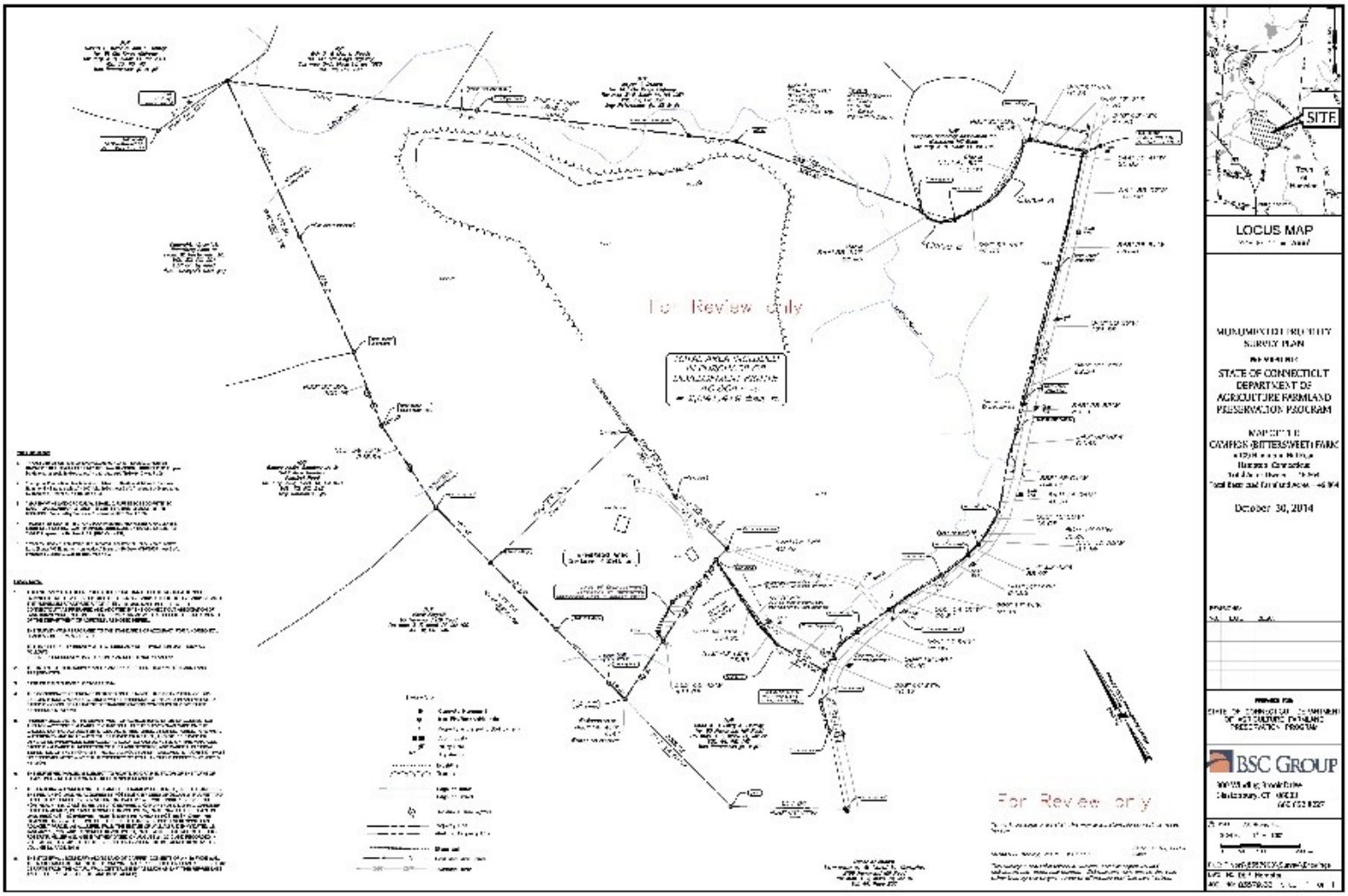
Land Survey

Scientists at BSC are collaborating with clients to achieve ecologically sustainable and financially viable solutions tailored to their needs. As an extension of that mission, BSC's soil scientists have been conducting oversight in the review of proposed farmland restoration projects at various farms around Connecticut on behalf of the CT Department of Agriculture (DoAg). BSC's dedicated soil scientists have successfully overseen, or are actively working on, 20 projects related to this grant process.

BSC works with the awarded farmers to review the proposed work at the farm site, and then prepare a farmland restoration plan for the project, thereby enabling the farmers to complete their restoration project and obtain a grant. BSC's work helps to provide assurance to DoAg that critical natural resources won't be impacted during farmland restoration and that the land being restored is of high agricultural value. This is done through the combination of wetland and soil expertise to maintain the balance between agriculture and the preservation of Inland Wetlands and Watercourses.

The BSC survey team provided professional land surveying services for DoAg's Farmland Preservation Program for the Campion Bittersweet Farm. The project contains 47 acres of land in Hampton, CT. The survey involved a property boundary determination of the remainder of the original farm, containing approximately 120 acres.

The records research involved thoroughly reviewing the property history and comprehensively searching the abutting land owners. The resultant work has disclosed the property boundaries with an analysis of the property rights of the adjoining owners and the identification of recent property encroachments; upon completion of the survey, our field crews set all missing monumentation at required intervals and drafted legal descriptions for the proposed conveyance of development rights in compliance with the program's initiative.



175 MILLWOOD STREET ENVIRONMENTAL MONITORING

FRAMINGHAM, MA

CLIENT

Framingham Conservation Commission

SERVICES

Environmental Monitoring

Wetland Restoration

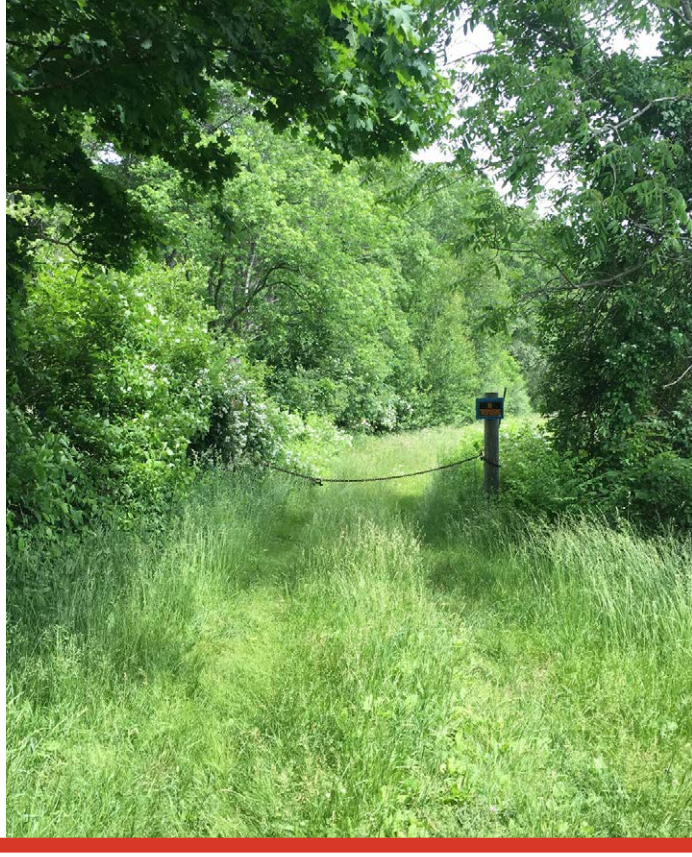
Wildlife Conservation

Landscape Architecture

Stormwater Management

Environmental Engineering

BSC coordinated and managed the environmental monitoring for the construction of a residential subdivision on a former golf course. Our multi-disciplinary team of wetland scientists, landscape architects, and engineers provided full-service environmental monitoring. The project entailed supervision of daylighting and restoration of a stream, wetland restoration, review of stormwater management structures during construction, post-storm inspections, weekly environmental monitoring and associated reports, review of plan changes including changes to sewer line Installation, protection of nesting migratory birds during construction phase, assisting Conservation Commission with amending Order of Conditions, and responding to issues as they arose.



ENVIRONMENTAL MONITORING SERVICES FOR THE CROSBY CORNER INTERCHANGE IMPROVEMENT PROJECT

CONCORD AND LINCOLN, MA

CLIENT

Massachusetts Department of Transportation (MassDOT)

SERVICES

Construction Oversight

Environmental Compliance Monitoring

Surveying

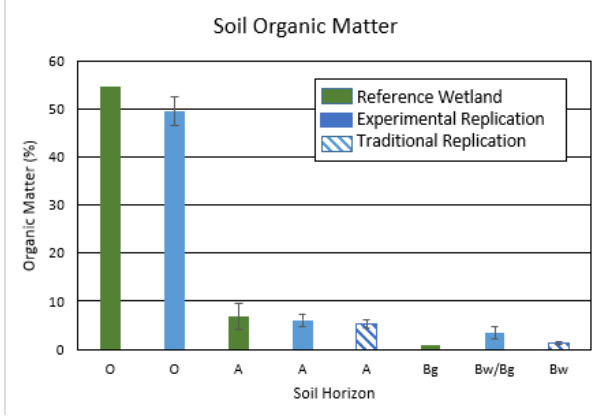
Wildlife Habitat Monitoring

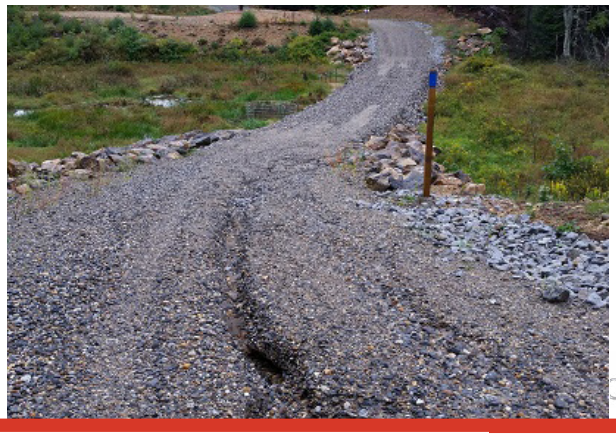
Wetland and Stream Restoration Monitoring and Design

BSC acted as the environmental monitor during the construction of the Route 2 Safety Improvement Project in Concord and Lincoln, MA, to ensure compliance with the Massachusetts Department of Environmental Protection variance, the Army Corps of Engineers individual permit, and the National Pollutant Discharge Elimination System permit program. Requirements include construction monitoring and reporting, preparation of requests for plan changes, wetland and stream restoration and mitigation monitoring and design.

As part of wetland mitigation monitoring, BSC installed IRIS tubes to monitor development of hydric soils in mitigation wetlands, and monitored stream restoration of a previously piped stream. BSC also conducted wildlife monitoring and reported on a new wildlife tunnel, including the use of track beds and camera traps.

For Phase 2 of this project, MassDOT retained BSC again to perform wetland mitigation services for the roadway reconstruction project. For this new task assignment, BSC developed design and construction drawings to construct two potential new wetland mitigation areas in the Town of Concord, one of which is a parcel of land owned by MassDOT, and the other to include the restoration of an area owned by the Town of Concord. BSC conducted existing conditions topographic surveys and prepared ROW plans.





NATIONAL GRID I135/J136 UTILITY ROAD PROJECT

WINCHENDON, MA

CLIENT

National Grid

SERVICES

Climate Resilience

Wetland Carbon Conservation

Wetland Restoration

Wetland Creation

Wetland Delineation

Permitting

GIS Mapping

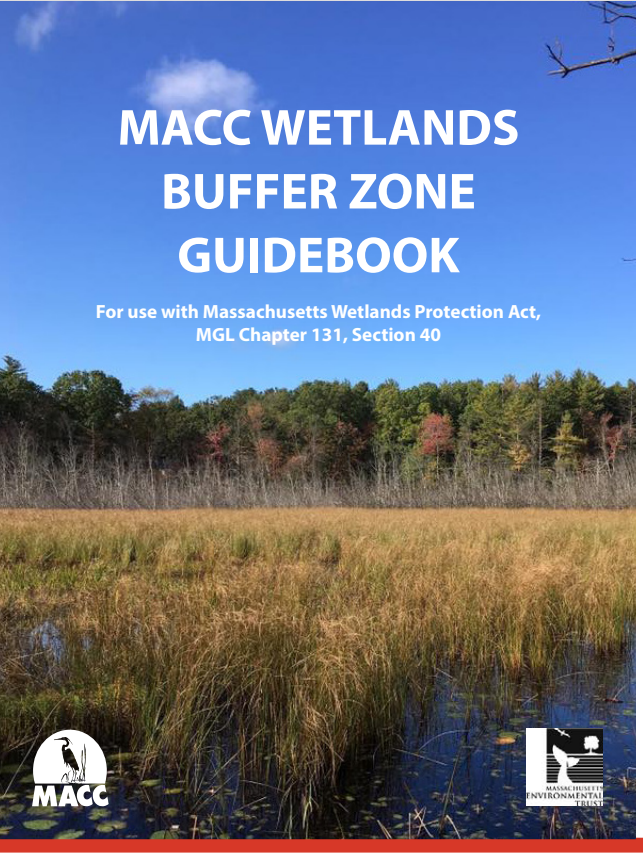
GPS Survey

As part of our on-call licensing and permitting contract with National Grid, BSC provided ecological services for the design and construction of a permanent utility-grade road along the I135N and J136N transmission lines in Winchendon, MA. During the field investigation phase, BSC completed wetland delineation and GPS survey, GIS mapping of wetlands and environmental constraints, and local, state, and federal permit plans.

BSC guided and oversaw wetland restoration and creation activities and provided an innovative approach to wetland replication that fostered the conservation of soil carbon (climate mitigation) and enhanced drought survival (climate resilience).

This innovative approach led to:

1. An acceleration of establishing the wetland vegetative cover as well as preserving soil carbon, structure, and function by transferring intact soil profile and surface vegetation from impact area to restoration and mitigation area.
2. A reduction of both environmental impacts and financial costs: reduced area of exposed soil, eliminated need to stockpile soils, reduced work hours required to construct wetland, and reduced number of plants and supplemental soil to be purchased and the carbon emissions associated with their transport.



WETLAND BUFFER ZONE GUIDEBOOK PROJECT

STATEWIDE, MASSACHUSETTS

CLIENT

Massachusetts Association of Conservation Commissions (MACC)

SERVICES

Climate Resilience

Research

Technical Writing

Wetland Carbon

Wetland Science

BSC was responsible for researching and writing a comprehensive guidebook on the science and regulation of wetland resource area buffer zones and Riverfront Areas under the Massachusetts Wetlands Protection Act and local bylaws and ordinances. Preparation of the guidebook included coordination with the MACC Buffer Zone Guidebook review team, scientific literature search, and development of recommendations for the science-based review of projects under existing state regulations and local bylaws and ordinances as well as how to develop local bylaws and ordinances supported by current scientific findings.

The guidebook provides a discussion of wetland buffer zones and Riverfront Area regulations in the context of climate change, outlining how buffer zones contribute to the protection of carbon in wetlands, support climate adaptation and climate resilience benefits that wetlands provide, and protect wetlands from the impacts of climate change.

APPLE COUNTRY ECOLOGICAL CLIMATE RESILIENCY AND CARBON PLANNING AND ASSESSMENT

BOLTON, MASSACHUSETTS

CLIENT

Towns of Bolton and Harvard and the Devens Regional Enterprise Zone

SERVICES

Climate Resilience Planning

Climate Vulnerability Assessment

Community Stakeholder Engagement

Development of Educational Resources

Ecological Carbon Assessment

Grant Proposal Preparation

Identification of Nature-based Solutions

As part of a regional approach to climate resilience planning, BSC worked with the Towns of Bolton and Harvard and the Devens Regional Enterprise Zone (Devens) and led a multi-disciplinary consulting team that included healthy soils experts (Linnean Solutions and Regenerative Design Group) and a forest ecologist and forest carbon expert (Woodwell Climate Research Center) to provide climate resiliency and carbon planning assessment services. The project was funded by an MVP Action Grant awarded to the communities following a BSC-supported application process.

Apple Country's vast landscape of forests, farmland, wetlands, and active floodplains is essential in the area's ecological functioning, carbon functioning, and regional community and environmental resiliency. BSC's team of ecologists, landscape architects, climate resilience specialists, designers, engineers, and GIS specialists analyzed local ecological resources, conducted community outreach and engagement, and developed GIS mapping to produce predicative climate-focused documents and maps that identify and prioritize Nature-based Solutions (NbS) and best management practices and policies.

The project report highlighted opportunities for resilience and protection of wetland and forest carbon using NbS and implemented climate-smart best management practices and policies. The resulting report provided a regional perspective, analysis, and recommendations, as well as town-specific assessment and recommendations.

Public engagement played a significant role in the project, requiring meaningful community input. BSC implemented a process to understand community opinions, local knowledge, needs, and future visions, including print, digital, and COVID-compliant online and in-person involvement opportunities. To encourage engagement, a project website included interactive data-viewer mapping, surveys, educational materials, and project documents.

Additionally, core team meetings and site tours were held to encourage cross-town discussion of regional solutions and identify site-specific NbS. A self-guided site tour of natural resources and NbS was provided in addition to a COVID-19-safe online community meeting.

CLIMATE RESILIENCY OUTREACH FOR COASTAL FLOODPLAINS AND WETLANDS

STATEWIDE, MASSACHUSETTS

CLIENT

Massachusetts Department of Environmental Protection, Bureau of Water Resources, Wetlands Program

SERVICES

Climate Resilience

Coastal Ecology, Floodplains, & Wetlands

GIS

Public Outreach & Engagement

BSC is working with the Massachusetts Department of Environmental Protection and the Massachusetts Office of Coastal Zone Management to develop effective and visually engaging multimedia products to:

- explain the purpose and functionality of coastal floodplains
- how they support climate resilience, and prevent or minimize storm damage and flooding
- why protecting and restoring coastal floodplains is crucially important amidst sea level rise and more intense coastal storms
- and how the upcoming proposed regulatory change will assist in ameliorating these climate-related challenges.

BSC is providing the client with multi-disciplinary expertise in ecology, climate resilience, and GIS, as well as hands-on experience working in coastal communities across the state, to develop a suite of outreach products, including an interactive ArcGIS StoryMap, a set of brochures, poster, and a video. Through six featured locations across the Commonwealth, these deliverables describe how the floodplain serves Massachusetts communities, how worsening storms and rising sea levels impact them, and how to protect the coastal floodplain. BSC has engaged creative partners to enhance the project with professional photography, videography, and graphic design.

ENVIRONMENTAL MONITORING SERVICES FOR THE ROUTE 18 ROADWAY RECONSTRUCTION AND WIDENING

ABINGTON AND WEYMOUTH, MA

CLIENT

Massachusetts Department of Transportation (MassDOT)

SERVICES

Construction Oversight

Environmental Compliance Training and Materials

Environmental Monitoring and Reporting

Permitting

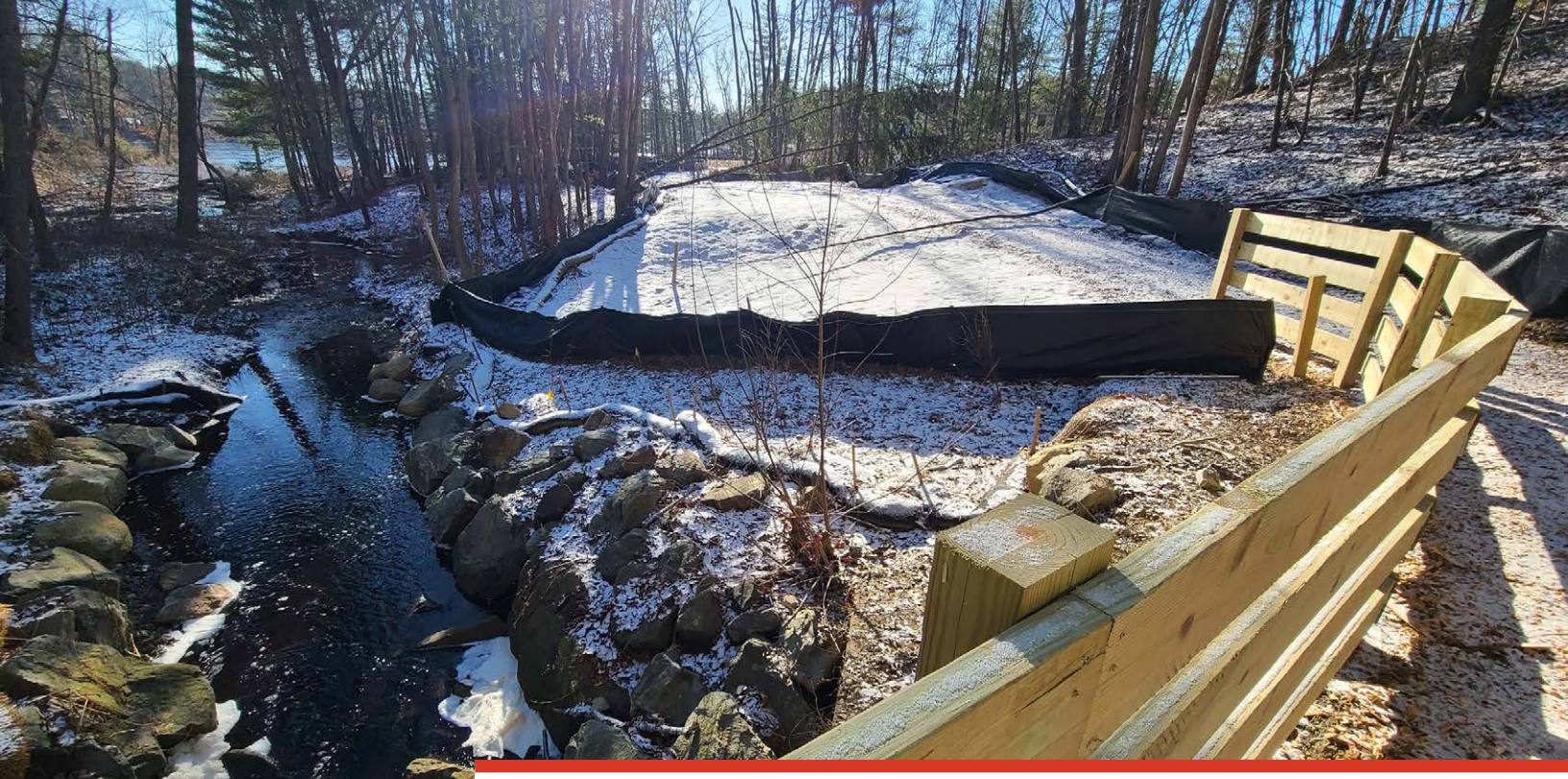
SWPPP Review and Edit

Wetland Restoration Monitoring

BSC provided environmental monitoring consulting services for the reconstruction and widening of Route 18. The project area was approximately 4.1 miles long, from Highland Place in Weymouth to Route 139 in Abington, and included the replacement of the Route 18 Bridge over the Massachusetts Bay Transportation Authority (MBTA) line. Altering approximately 12,000 square feet of bordering vegetated wetlands, it was estimated that 30,000 square feet of wetland mitigation was necessary, including restoration of a filled wetland and adherence to MassDOT soil specifications.

Acting as the on-site monitor and environmental compliance coordinator, BSC oversaw the site's overall construction and reported findings to the Massachusetts Department of Environmental Protection, U.S. Army Corps of Engineers, and MassDOT to ensure compliance with the permit conditions. BSC assisted MassDOT in completing the 30-day and 60-day pre-construction submittals to MassDEP, pursuant to the Wetlands Protection Act and WQC variance decision, and reviewed and edited the contractor's stormwater pollution prevention plan to ensure compliance with the variance.

BSC's team conducted site visits twice a week and was responsible for reviewing field conditions, inspecting sediment and erosion controls, ensuring compliance with wetland restoration plans and specifications, photo-documenting site conditions, reviewing inspection logs from the contractor, and coordinating all necessary corrective actions. BSC also produced bi-weekly reports summarizing the construction status and site constraints.



BAILEY'S POND PEER REVIEWS

AMESBURY, MA

CLIENT

City of Amesbury

SERVICES

Construction Phase Environmental Monitoring

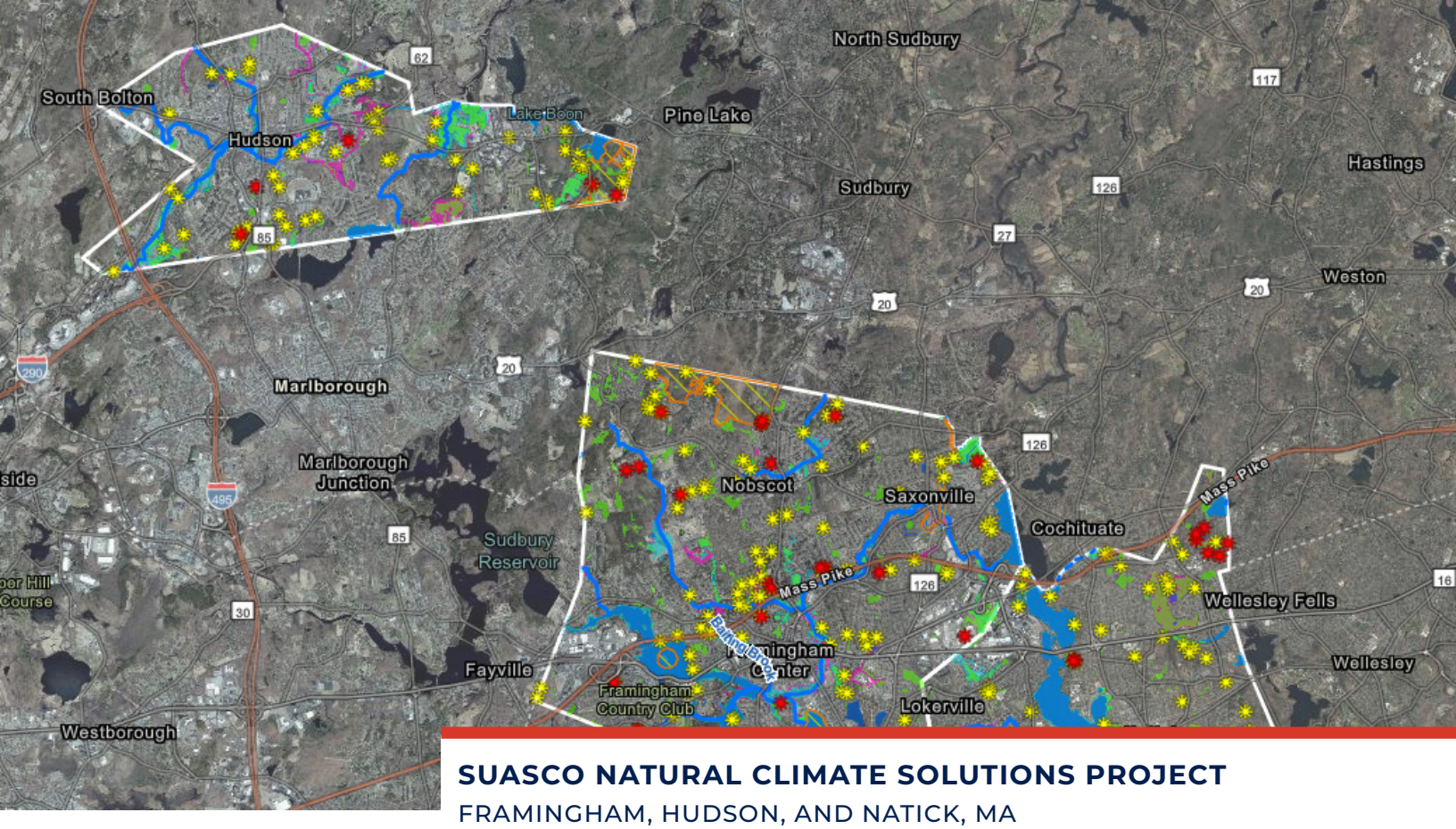
Environmental Permit Peer Review

Representation of Conservation Commission During MassDEP Appeal Process

BSC worked with both the planning board and conservation commission in the City of Amesbury to provide peer review services for the permitting phase and with the conservation commission for environmental monitoring during the construction phase for a project to construct a 100-unit Residential Development project on the shores of Bailey's Pond.

BSC reviewed the Notice of Intent, wetland delineation, and wetland restoration and mitigation plan for compliance with the Massachusetts Wetlands Protection Act and associated regulations, the Amesbury Wetlands Protection Ordinance and regulations, Massachusetts stormwater management policy and guidelines, and general engineering standards. The peer reviews included a field review of wetland resource area boundaries, including the riverfront area and a review of an alternatives analysis; stormwater management report and plan, wetland and buffer zone restoration and mitigation plan, and invasive species management plan; and the preparation of letter reports on findings and recommendations, review of supplemental and revised information, and attendance at conservation commission and planning board meetings. Notably, BSC provided consulting services on behalf of the commission during the Massachusetts Department of Environmental Protection appeal process and successfully defended the commission's decision.

BSC's scientists provided environmental monitoring services throughout all stages of construction, including the pre- and post-construction phases. Our monitoring services ensured compliance with state and local wetland resource regulations and the project's Order of Conditions. This included on-site inspections of seven mitigation and restoration areas, including an approximately 5,900 square-foot wetland restoration area; a stormwater management system that provides for seven stormwater basins; a utility crossing involving temporary disturbance of Bordering Vegetated Wetlands, Bank, Land Under Water, Land Subject to Flooding, and Riverfront Area; and maintenance of erosion and sedimentation controls within jurisdictional areas. The BSC team was also responsible for monitoring the construction of the wetland and buffer zone restoration areas. We regularly coordinated with the Amesbury Conservation Commission.



SUASCO NATURAL CLIMATE SOLUTIONS PROJECT

FRAMINGHAM, HUDSON, AND NATICK, MA

CLIENT

City of Framingham and the Towns of Hudson and Natick

SERVICES

Climate Resilience

Ecology

Environmental Justice

Forest Carbon and Climate Mitigation

GIS

Nature-based Solutions

Public Outreach

The SuAsCo Natural Climate Solutions Project is a collaborative effort between municipalities in the Sudbury-Assabet-Concord (SuAsCo) watershed (Hudson, Framingham, and Natick) to identify opportunities for Nature-based Solutions (NbS) that prioritize the needs and well-being of both residents and ecosystems, especially people who live in Environmental Justice and Climate Vulnerable communities within the towns while providing essential ecosystem services to the whole community.

BSC led a team of consultants to collaborate with the communities to identify opportunities for wetlands, floodplains, forests, and other ecosystems to support broader resilience planning efforts and expand communities' capacity to protect, restore, and enhance carbon sequestration and other ecosystem services through community-driven assessment of NbS, providing recommendations to improve regulations; and developing and providing educational materials and opportunities. BSC developed education and outreach materials and activities, including a project website with a data viewer and StoryMaps linked to QR codes at NbS sites.

Appendix 2: Team Member Profiles and Resumes

Regenerative DesignGroup

Keith Zaltzberg-Drezdahl

Managing Director, Head of Planning, Worker-Owner

Keith is a founding partner of Regenerative Design Group. His approach to design is grounded in understanding the ecological and social potential of place, rigorous analysis, and systematic assessment. Keith combines this approach with on-the-ground skills and a strong social justice mission to create landscapes that are rooted in place and community. He is a lecturer and instructor on permaculture design, urban agriculture, resilience planning and food systems. Keith has taught at The Conway School and Smith College and holds a BS in Environmental Design from UMass-Amherst.

FOCUS AREAS

- Landscape Carbon Accounting & Planning
- Resilience Planning & Adaptive Design
- Soil Resource Planning
- Regenerative Agriculture & Urban Farm Design
- Project Management

TECHNICAL SKILLS

- GIS Mapping and Analysis
- AutoCAD
- Adobe Creative Suite

LECTURES + WORKSHOPS

- Soil Organic Carbon Estimation. Soil Science Society of America.
- Developing Healthy and Resilient Communities: A Case Study. Architecture Boston Expo
- Regenerative Design for Change Makers, Omega Institute

SELECTED PROJECTS

MA No Net Loss of Carbon in Wetlands | MassDEP

Development of a wetland mapping approach based on machine learning that identifies previously ambiguous wetlands. This project aims to identify innovative strategies, approaches, concepts, and regulatory recommendations to achieve No Net Loss of Carbon in Wetlands in Massachusetts. Project team includes BSC Group, the Massachusetts Association of Conservation Commissions (MACC), and the Woodwell Climate Research Center.

Nashua River Resilient Lands Management | Clinton and Bolton, MA

MVP Project. Development of management and stewardship guides and identification of leverage points for town bylaws changes to increase the resilience and functioning of important landscapes and ecosystems in Clinton and Bolton.

Soil Health Assessment | Deerfield, MA

MVP Project. Analysis of exisiting soil function by land cover and assessment of vulnerabilities and opportunities for soil health. Scope included healthy soils workshops and outreach events. *2022 Sustainability + Resiliency Award from the American Planning Association - Massachusetts Chapter*

Soil Health Productivity Assessment & Planning | Trustees of Reservations

Collaborated with American Farmland Trust to assess field-specific soil health and whole-site ecological health of seven Trustees farm properties. Designed and facilitated three workshops for Trustees staff and land managers. Final report included recommendations for soil health management, agroecological interventions and a discussion of trade-offs.

Climate Resiliency and Carbon Planning | Apple Country, MA

MVP Project. Worked with BSC Group and Linnean Solutions to assess and analyze ecological resources, and provide recommendations for nature-based solutions in the Towns of Bolton and Harvard and the Devens Regional Enterprise Zone. Extensive mapping, community outreach, site walks, and soil health assessments.

Soil Resource Assessment & Planning | Massachusetts Healthy Soil Action Plan

Project lead coordinating a 10-person project team and 50-person working group in GIS-analysis, scientific literature review, expert interviews, and broad stakeholder engagement to develop a comprehensive Healthy Soils Action Plan for all major land uses in Massachusetts. *2023 Special Recognition Award for Significant Value to Landscape Architecture from the Boston Society of Landscape Architects*

Greenhouse Gas Environmental Impact Assessment | Massachusetts Environmental Policy Act Office

Provided QAQC and technical team support in the development of a model to estimate greenhouse gas emissions and carbon sequestration loss from tree clearing associated with proposed expansion of a utility right of way.

Regenerative Land Use Experiment | Major Northeast Utility Company

Assessment of potential for additional carbon sequestration through innovative land and vegetation management practices on ROW lands across three state for a major utility. Led in-depth study of current land cover, carbon stocks, and management practices to develop high level toolkits for land management teams.

SELECTED PUBLICATIONS

Gutwein, S., Zaltzberg-Drezdahl, K., Toensmeier, E., & Ferguson, R. S. (2022). Estimating land cover-based soil organic carbon to support decarbonization and climate resilience planning in Massachusetts. Soil Security, 9, 100076. https://doi.org/10.1016/j.soisec.2022.100076

Regenerative DesignGroup

Sebastian Gutwein

Managing Director, GIS Specialist, Worker-Owner

Sebastian is a living systems designer whose extensive experience draws from the arts, ecology, politics and place. His understanding of how things work and how they interrelate allow him to design and plan for challenges that range from water conveyance to agricultural programming to complex GIS analysis and construction management. Since 2015, Sebastian has been the Land Surveying and Digital Design Instructor at The Conway School. He is currently in the GeoDesign Program at Penn State.

FOCUS AREAS

- Site Design & Planning
- Solar Site Design & Housing Layout
- Resilience Planning & Adaptive Design
- Whole Systems Integration
- Landscape Analysis & Assessment
- Food Systems Evaluation & Design
- Implementation, Construction & Project Management

TECHNICAL SKILLS

- Digital Rendering
- GIS Analysis + Assessment
- Document Production & Design
- Land Surveying

SELECTED PROJECTS

MA No Net Loss of Carbon in Wetlands | MassDEP

Lead data and GIS analyst for a wetland mapping approach based on machine learning that identifies previously ambiguous wetlands. This project aims to identify innovative strategies, approaches, concepts, and regulatory recommendations to achieve No Net Loss of Carbon in Wetlands in Massachusetts. Project team includes BSC Group, the Massachusetts Association of Conservation Commissions (MACC), and the Woodwell Climate Research Center.

Soil Resource Assessment & Planning | Commonwealth of Massachusetts

Lead data and GIS analyst. Developed novel, data-driven model for quantifying statewide soil organic carbon stocks and impact of land cover change on soil carbon.

Municipal Vulnerability Preparedness Projects: Soil Resilience Planning | Various Municipalities, MA

Lead data and GIS analyst. Development of unique and comprehensive models that combine soil and other ecological data with social and cultural information to identify high impact locations for nature based solutions for climate resilience. Mapping and research support for community engagement workshops and outreach events.

Greenhouse Gas Environmental Impact Assessment | Massachusetts Environmental Policy Act Office

Land use and carbon analyst. Directed development of environmental impact assessment model for greenhouse gas emissions and carbon sequestration loss from tree clearing associated with proposed expansion of a utility right of way.

Regenerative Land Use Experiment | Major Northeast Utility Company

Land use and carbon analyst. Assessed potential for additional carbon sequestration through innovative land and vegetation management practices on ROW lands across three state for a major utility. Conducted in-depth study of current land cover, carbon stocks, and management practices to develop high level toolkits for land management teams.

SELECTED PUBLICATIONS

Gutwein, S., Zaltzberg-Drezdahl, K., Toensmeier, E., & Ferguson, R. S. (2022). Estimating land cover-based soil organic carbon to support decarbonization and climate resilience planning in Massachusetts. Soil Security, 9, 100076. https://doi.org/10.1016/j.soisec.2022.100076

Regenerative DesignGroup

Rachel Wyatt Lindsay

Head of Site Design, Senior Designer, Worker-Owner

Rachel works with clients to design and implement productive, resilient landscapes. She draws from experiences in organic farming, Latin-American sustainable development, and art to design with cultural sensitivity and environmental integrity. For projects of all scales, Rachel applies a soil, carbon, and water conservation lens to find opportunities to reduce the environmental impact of installation while meeting the client's goals and aesthetics. Her projects encourage people to engage with their local ecosystems and apply holistic and low-stress approaches toward gardening and landscaping.

FOCUS AREAS

- Low Impact Site Design
- Soil Smart Design & Practices
- Productive & Edible Landscape Design
- Regenerative Small-Scale Agriculture & Gardening
- Ecosystem Integration with Native Plants
- Pollinator Habitat
- Project Management

SELECTED PROJECTS

Soil Resource Assessment & Planning | Commonwealth of Massachusetts

Research assistant, coauthor, and document production manager for the Healthy Soils Action Plan for all major land uses in Massachusetts. *2023 Special Recognition Award for Significant Value to Landscape Architecture from the Boston Society of Landscape Architects.*

Low Impact Forest Residence | Hurley, NY

Site design and construction support for a new home in a pine, oak, and hickory forest, with a rapid rate of re-establishment due to strict limitation on soil disturbance, rigid soil amendment specifications, and native plant designs.

Ecologically Sensitive Residence | Wayland, MA

Landscape design for a pre-existing home surrounded by ecologically valuable wetlands and floodplain forest. Plans included the relocation of snapping turtle nests, minimal soil disturbance, and a native-forward plant palette.

Residential Site Grasslands Regeneration | Littleton, MA

Soil and ecosystem restoration for an 8-acre clear cut new home site, including the establishment of edible landscaping, 4 acre native meadow, and successional restoration of an oak, red maple, and American chestnut forest.

The Gann Farm | Gann Academy, Waltham, MA

Supporting design services for an existing 3-acre student farm, including regenerative principles for no-till vegetable production, outdoor classroom, and a 1-acre food forest.

RiverMills Green Infrastructure Renovation | Chicopee, MA

Lead designer for site analysis, troubleshooting, vegetation inventory, and stormwater infiltration renovation plans for an existing green infrastructure system at the RiverMills Senior Center, a brownfield redevelopment project in the Riverfront Area of the Chicopee River.

Urban Pollinator Streetscape | Northampton, MA

Lead designer for the transformation of a lawn-dominated landscape into a fully perennial multi-season pollinator habitat garden with rainwater collection and infiltration.

Tropical Agroforestry Farm Assessment + Land-Use Master Plan | Gashora, Rwanda

Associate designer and document production management for the Rwanda Institute for Conservation Agriculture preliminary feasibility assessment.

EDUCATION + PROFESSIONAL DEVELOPMENT

- B.A. Anthropology + Studio Art, Wesleyan University, 2005
- M.S. Ecological Design, The Conway School of Landscape Design, 2015
- Massachusetts Association of Conservation Commissions Fundamentals Certificate, 2022
- Greenfield Conservation Commission, 2016-2018, Vice-Chair 2018-2022
- SosteNica: The Sustainble Development Fund of Nicaragua, Board Member 2012 - present
- Agroecology and Biointensive Agriculture, Las Cañadas, Cooperative, Huatusco Mexico, 2010
- Fullbright Scholar, Nicaragua 2009

LECTURES + WORKSHOPS

- *Eco-Friendly Solutions for the Home Garden and Landscape* and *Regenerative Farming: Sustainable agriculture and its ties to global well-being* - Wesleyan University Institute of Lifelong Learning
- *Planning for Change: Design and Land Management in a Time of Climate Change* - Simsbury Land Trust
- *Rain Gardens: Why they are important, and how to make one that works* - Springfield Garden Club
- *Green Infrastructure Workshop Series* - City of Holyoke, MA + Pioneer Valley Planning Coalition
- *Designing Gardens for the Benefit of All* - Association of Professional Landscape Designers

Regenerative DesignGroup

Eric Giordano

Assistant Designer

Eric is a designer, musician, and avid composter. He has run several community gardens in NYC, where he built rainwater harvesting systems, ran a composting hub, and contributed design thinking for several garden projects. He received a Permaculture Design Certification from the Center for Bioregional Living, a Master Composter Certification from the NYC Compost Project, a Certificate of Horticulture from the Brooklyn Botanic Garden, and a Masters of Science in Ecological Design from the Conway School.

FOCUS AREAS

- Site Design & Planning
- Resilience Planning & Adaptive Design
- Landscape Analysis & Assessment
- Food Systems Evaluation & Design

TECHNICAL SKILLS

- Digital Rendering
- GIS Analysis + Assessment
- Document Production & Design
- Drone Surveying

SELECTED PROJECTS

Municipal Vulnerability Preparedness Projects: Soil Resilience Planning | Various Municipalities, MA

Mapping and production support to develop unique and comprehensive models that combine soil and other ecological data with social and cultural information to identify high impact locations for nature based solutions for climate resilience. Research and production for community engagement workshops and outreach events.

Deerfield Healthy Soils Project | Deerfield, MA

Mapping, research, graphics, and report production for a comprehensive guide to protect soil health in Deerfield, MA. Included recommended bylaw updates for protecting vulnerable soil resources. *2022 Sustainability + Resiliency Award from the American Planning Association - Massachusetts Chapter.*

Greenhouse Gas Environmental Impact Assessment | Massachusetts Environmental Policy Act Office

GIS analysis and development of environmental impact assessment model for greenhouse gas emissions and carbon sequestration loss from tree clearing associated with proposed expansion of a utility right of way.

Regenerative Land Use Experiment | Major Northeast Utility Company

Mapping and Production support for assessment of potential for additional carbon sequestration through innovative land and vegetation management practices on ROW lands across three states for a major utility. Contributed research of current land cover, carbon stocks, and management practices to develop high level toolkits for land management teams.

LINNEAN SOLUTIONS

Jim Newman, , LEED AP, O+M; EcoDistrict AP
Founder and Principal

Jim is the founder and Principal at Linnean Solutions, a mission-driven firm that helps local and state governments, institutions, projects, and communities reach resilience and sustainability goals. Jim's twenty years of experience includes climate mitigation and adaptation planning; the development of sustainability and resilience frameworks, manuals, zoning and regulatory reviews, and certification programs; carbon and life cycle analyses for rethinking building construction and waste; resilience assessments at the building and urban scales; and stakeholder engagement processes to strengthen communities. As a Living Environments in Natural, Social, and Economic Systems (LENSES) Facilitator and Trainer, Jim regularly leads community planning workshops, and trains others in becoming effective facilitators. He is a member of the RELi/ USGBC Steering Committee, where he has worked to bring a social equity lens to the development of the new certification standard for resilient buildings. Jim is a key author of several influential resilience reports and tools—including the Enterprise Community Partners' *Ready to Respond: Strategies for Multifamily Building Resilience* manual.

Previous to Linnean, Jim worked with BuildingGreen as the Director of Strategy, where he led the development and introduction of most of BuildingGreen's online products including LEEDuser.com, BuildingGreen Suite, and the High Performance Buildings Database.

DISCIPLINES

Regenerative systems thinking; Carbon mitigation planning and life cycle assessment; Resilience and vulnerability analysis; Climate mitigation and adaptation planning; Building performance monitoring; LEED certification project management; Process facilitation and community engagement

ACCREDITATIONS

LENSES Practitioner, CLEAR;
Regenerative Practitioner, Regenisis Group;
LEED Accredited Professional with specialty (O+M);
EcoDistrict Accredited Professional;
Certified Municipal Vulnerability Preparedness (MVP) Technical Service Provider

EDUCATION

MS in Management Science, Lehigh University;
BS in Architectural Design, Massachusetts Institute of Technology

ACTIVITIES

Member, Cambridge Resilience Zoning Task Force
Co-Facilitator, New England Living Future Collaborative
Member, USGBC Resilience Working Group
Member, USGBC RELi Steering Committee
Member, Board of Directors, Resilient Design Institute
Member, Board of Directors USGBC MA Chapter
Member, Board of Directors, CLEAR

RECENT PRESENTATIONS

Marblehead Harbor 2020: *Partnerships for Adaptation and Resilience*
Boston Society for Architecture 2020: *Who Designs the City?*
Greenbuild 2019: *Crisis, Zombies, and Climate Optimism*
ABX 2019: *It's 2050 and Boston is Carbon Free: What now?*
Living Future 2019: Workshop: *Developing Regenerative Metrics*
Urban Regeneration Forum 2018: Keynote: *Exploring Resilience through the Lens of Regeneration*
Greenbuild 2018: Workshop: *Elevating Equity in Development*
NESSBE Health of Place 2017: Presentation: *Resilience and Social Justice*

LINNEAN SOLUTIONS

SELECTED PROJECT EXPERIENCE

Linnean Solutions, Cambridge, MA and Portland, ME
Founder and Principal | 2010 - Present

- Nashua River Communities Resilient Lands Management Project and Regulatory Review, Towns of Bolton & Clinton, MA (2021 - 2023), *Project Director*
- MVP 2.0 - Development of the updated Municipal Vulnerability Preparedness Planning process, Commonwealth of Massachusetts (2022 - 2023), *Project Director*
- Portfolio Resilience Assessment, Newport Restoration Foundation, Newport, RI (2021), *Co-Project Director*
- Climate Action and Adaptation Plan, City of Medford, MA (2019-2021), *Project Director*
- Campus Resiliency Plan, University of Massachusetts Amherst (2019-2022), *Project Director*
- Apple Country Ecological Climate Resiliency and Carbon Planning and Assessment, Bolton, MA, Harvard, MA, Devens, MA (2020-2021), *Engagement and Soil Health Consultant*
- Climate Action, Adaptation, and Resiliency Plan, Town of Amherst, MA (2020-2021), *Project Director*
- Resilience consulting and embodied carbon assessment, John M. Tobin Elementary School, Cambridge, MA (2019-2021), *Resilience and Sustainability Consultant*
- "One Climate Future" Climate Action and Adaptation Plan, Cities of Portland & South Portland, ME (2019-2020), *Project Director*
- Massachusetts Healthy Soils Action Plan, Commonwealth of Massachusetts (2019-2020), *Engagement Process Lead*
- Sustainable and Efficient Waste Management Plans consulting for the construction sector, Center for EcoTechnology, Northampton, MA (2018 - 2021), *Project Director*
- Municipal Vulnerability Preparedness Process, Town of Amherst, MA (2019), *Project Director*
- "Northampton Designs with Nature" Green Infrastructure Planning, City of Northampton, MA (2018), *Engagement Process Lead*
- Climate Change Vulnerability Assessment and Public Engagement Strategy, City of Medford, MA (2019), *Project Director*
- Historic property resilience assessment, Newport Restoration Foundation, Newport, RI (2019), *Co-Project Director*
- Resilience Workshops and Property Assessment Tool, Delaware State Housing Authority (2019), *Resilience Consultant*
- Life Cycle Carbon Assessment, EchoStone Housing, Lagos, Nigeria (2019)
- Greenhouse Gas Inventory and Sustainability Plan, City of Fountain, CO (2019), *Project Director*
- Educational energy dashboard design and implementation, multiple elementary schools, Los Angeles, CA (2019-2020)
- Climate Resilience and Regeneration Plan and Municipal Vulnerability Preparedness Workshops, City of Northampton, MA (2018), *Project Director*

SELECTED PUBLICATIONS

Co-authored Technical Reports

- Enterprise Community Partners. *Ready to Respond: Strategies for Multifamily Building Resilience.* (2015).
- Linnean Solutions, The Built Environment Coalition, & The Resilient Design Institute. *Building Resilience in Boston: "Best Practices" for Climate Change Adaptation and Resilience for Existing Buildings.* Report for the Boston Green Ribbon Commission. (2013).
- Community Assessment of Freeway Exposure and Health (CAFEH). *Improving Health in Communities Near Highways.* (2015).

Co-authored Peer-reviewed Articles

- Brugge, Doug, et al. Developing Community-Level Policy and Practice to Reduce Traffic-Related Air Pollution Exposure. Environmental Justice. (2015), 8(3): 95-104.

LINNEAN SOLUTIONS

Sarah Saydun

Climate Planner

Sarah is a climate planner, facilitator, and firm believer in the transformative power of relationships. She has spent over a decade in Boston working with youth and organizing for social justice. Before joining Linnean, she managed positive youth development programs at ZUMIX in East Boston and GreenRoots in Chelsea, working closely with young folks to identify and develop their strengths as artists, organizers, and advocates in their communities. As a climate planner at Linnean, she works with local governments and communities to develop collaborative, intersectional, and values-centered approaches to mitigating and adapting to climate change. Current projects include coordinating a regional climate action and adaptation plan in Maine and facilitating a community-driven land management for climate resilience project in Central Massachusetts. Sarah is completing her Master's in Urban and Environmental Policy and Planning at Tufts, and her thesis explores equitable climate adaptation at the intersections of housing and environmental justice.

DISCIPLINES

Participatory and democratic planning, collective governance and consensus building, facilitation, equitable climate resilience, positive youth development

LANGUAGES

French (Fluent)
Spanish (Conversational)

EDUCATION

MA in Urban and Environmental Planning, Tufts University
BA in International Affairs and Human Services, Northeastern University

EXPERIENCE

10 years

SELECTED PROJECT EXPERIENCE

Linnean Solutions, Cambridge, MA and Portland, ME

Climate Planner / Project Manager | 2022 - Present

- Resilient Together: The Point, City of Salem (2023 - Present)
- Nashua River Communities Resilient Land Management, Towns of Clinton and Bolton, MA (2022 - Present)
- Penobscot Climate Action, Bangor Area Comprehensive Transportation System, City of Bangor, Town of Orono, ME (2022 - Present)

Other Relevant Experience

- Resident Research Coordinator and Youth Programs Organizer at GreenRoots with the Healthy Neighborhood Study (2021 - 2022)
- York Climate Action Plan, York, ME (2021)
- Research Assistant, From Civic Participation to Community Control: Assessing and Strengthening Participatory Planning for Commercial District Development Without Displacement in Boston's Dudley Neighborhood (2019 - 2021)
- Curriculum development and co-facilitation, Teaching Democracy (2020 - 2021)
- Pathways Manager, ZUMIX (2016-2019)

LINNEAN SOLUTIONS

Patrick Black

Climate Planner

Having worn several professional hats as a counselor, builder, designer, and now planner, Patrick seeks to bring people into deeper relationships with the natural world around them through cooperative decision making and collaborative action. He's excited about the potential to activate thinking and action at scale, and lives for that "a ha!" moment when insight strikes. Recent projects have involved supporting the participatory mapping and community site selection process for the development and installation of community pocket forests, as well as stormwater flow mapping and analysis for climate action planning in the Penobscott (Maine) region—both to build the opportunity to use nature-based solutions for greater ecological and community resilience. In his time away from work, Patrick can be found traversing the wooded landscape on bikes, skis, or foot, with good friends and his dog, Ollie, in tow.

DISCIPLINES

Regenerative design, participatory facilitation and decision making, youth mentorship/leadership, spatial analysis, outdoor leadership

EDUCATION

MA in Urban and Environmental Planning, Antioch University of New England
BA in Transpersonal Psychology, University of West Georgia

EXPERIENCE

4 years

SELECTED PROJECT EXPERIENCE

Linnean Solutions, Cambridge, MA and Portland, ME

Climate Planner | 2021 - Present

- Main Streets Regional Pocket Forest Pilot Project, Town of Ayer, MA and Devens Regional Enterprise Zone (2022 - Present)
- Nashua River Communities Resilient Land Management, Towns of Clinton and Bolton, MA (2022 - Present)
- Penobscot Climate Action, Bangor Area Comprehensive Transportation System, City of Bangor, Town of Orono, ME (2022 - Present)

Other Relevant Experience

- Research assistant - Local Solutions Conference; Antioch University (2021)
- Spatial analysis consulting (2020 - Present)

BSC GROUP

Gillian

Davies, PWS, SSSSNE, NHCWS, CESSWI

Senior Ecologist/Natural Climate Solutions Specialist
Project Manager, Senior Associate

YEARS OF EXPERIENCE

32

EDUCATION

MES, Ecosystem Ecology
Yale University School
of the Environment

BA, Psychology
Williams College

Certificate of Completion in
the New England Regional Soil
Science Certificate Program
University of Massachusetts

AFFILIATIONS

Global Development and Environment Institute, Tufts University, Visiting Scholar (2018-present)

Society of Wetland Scientists - Chair WOTUS ad hoc Committee, Co-Lead Climate Change & Wetlands Initiative; 2016-2017 President, Past President, President Elect

MEET GILLIAN

Gillian provides expertise and innovative solutions encompassing environmental construction/post-construction inspection, ecosystem-based climate change resiliency and mitigation assessment and planning, state and federal permitting, wetland delineation, impact analysis, wetland restoration/mitigation planning, design and monitoring, peer-review for Conservation Commissions, and expert witness testimony.

A well-respected leader in the field of wetland sciences, Gillian holds many prestigious titles at industry organizations dedicated to promoting the understanding, conservation, protection, restoration, science-based management, and sustainability of wetlands. She currently serves on the INTECOL Wetlands Working Group, Chairs the SWS WOTUS *ad hoc* Committee, and Co-Leads the SWS Climate Change and Wetlands Initiative. She is also a Visiting Scholar at the Tufts University Global Development and Environment Institute. In the past she has held such titles as SWS President, President of the SWS New England Chapter, SWSPCP President, and President of the Association of Massachusetts Wetlands Scientists.

Gillian has provided numerous workshops and presentations on a variety of topics including wetlands, soils, and climate change, in Massachusetts, internationally, and previously as an education/outreach specialist for the MassDEP. She has published numerous professional and academic articles, both peer-reviewed and otherwise, including co-authoring a 2018 *Wetlands* journal publication titled, *Wetlands in a Changing Climate: Science, Policy, and Management*, ranked in the top 3% of all articles of similar age in all journals tracked by Altmetric, and giving a plenary presentation on climate change and wetlands at the 2021 INTECOL International Wetlands Conference.

AFFILIATIONS (CONT.)

Society of Wetland Scientists Professional Certification Program, 2021-2022 President; President Elect

Society of Wetland Scientists New England Chapter; 2014-2015 President, Vice President

INTECOL (International Association for Ecology) Wetlands Working Group, Member (2021-present)

Association of Massachusetts Wetlands Scientists; 2002-2003 President, Vice President

REGISTRATIONS

Registered Soil Scientist, Society of Soil Scientists of Southern New England

CERTIFICATIONS

Professional Wetland Scientist, Society of Wetland Scientists #2181 (2011)

Certified Wetland Scientist – NH #071 (1999)

Certified Erosion, Sediment, and Storm Water Inspector, Envirocert International, Inc.

Certified Municipal Vulnerabilities Preparedness Provider – MA

GOVERNMENT SERVICE

MA Executive Office of Energy and Environmental Affairs & Commission for Conservation of Soil, Water & Related Resources Healthy Soils Action Plan Work Group (2019–2020)

GOVERNMENT SERVICE (CONT.)

MA Department of Transportation Wetland Mitigation Banking Group (2018)

MA Executive Office of Energy and Environmental Affairs Natural Resources and Habitat Subcommittee to the Climate Change Adaptation Advisory Committee (2009)

MA DEP Wetlands & Waterways Circuit Rider (1999-2003)

OTHER VOLUNTEER

National Academy of Sciences, Engineering, and Medicine Transportation Research Board Panelist (2018–2022)

Gillian Davies, PWS, SSSSNE, NHCWS, CESSWI

PROJECT EXPERIENCE HIGHLIGHTS

MassDEP No Net Loss of Carbon in Wetlands in Massachusetts Project, Statewide

Project Manager & Senior Ecologist

Leading multidisciplinary team to develop recommendations and methodologies for No Net Loss of Carbon in Wetlands in Massachusetts policies and regulations. Consulting team is developing innovative wetland soil carbon mapping based on machine learning and researching and developing concepts and preliminary design for an interactive carbon accounting tool for both Teal Carbon (inland freshwater) wetlands and Blue Carbon (coastal saltwater) wetlands.

MassDOT, Route 2, Lincoln and Concord, MA

Senior Wetland & Soil Scientist; & Certified Erosion, Sediment & Storm Water Inspector

Provided environmental monitoring services for complex highway improvements project (construction of new interchange, road widening, safety improvements), including monitoring of two large wetland replication areas (totaling 77,963 s.f.), with relocated streambeds. During monitoring of wetland mitigation areas, responsible for implementing innovative approach (IRIS tubes) to assessing hydric status of soils. The project area encompassed approximately 60 acres, is 2,751 meters long, and included multiple work areas operating simultaneously. Environmental Monitoring included responsibility for monitoring project compliance with MA Wetlands Protection Act Variance and Stormwater Pollution Prevention Plan conditions, preparing numerous reports, developing solutions to emerging issues, and coordinating with state and federal regulatory agencies, as well as MassDOT and the project contractor.

National Grid I135/J136 Utility Road Project, Winchendon, MA

Senior Wetland & Soil Scientist & SWPPP Inspector

Developed cost-effective climate-resilient wetland replication design that resulted in enhanced conservation of soil structure, soil carbon and soil moisture, improved drought resilience, acceleration of establishment of wetland vegetation, and minimization of introduction of invasive species. Supervised wetland mitigation area construction. At the end of first growing season, data plot contained 100% wetland vegetation among dominant species, and vegetation appeared to have survived the 2016 drought. Performed SWPPP inspections during construction of utility road.

175 Millwood Street Environmental Monitoring, Framingham Conservation Commission, Framingham, MA

Project Manager, Senior Ecologist & CESSWI for environmental monitoring for construction of residential subdivision on former golf course. Managed multi-disciplinary team of wetland scientists, landscape architects and engineers for full-service environmental monitoring. Project entailed supervision of daylighting and restoration of a stream, wetland restoration, review of stormwater management structures during construction, post-storm inspections, weekly environmental monitoring and associated reports, review of plan changes including changes to sewer line Installation, protection of nesting migratory birds during construction phase, assisting Conservation Commission with amending Order of Conditions, and responding to issues as they arose.

Apple Country Natural Climate Solutions Project: Bolton, Harvard, and Devens Regional Enterprise Zone

Project Manager & Senior Ecologist

Coordinated team of consultants and 3 communities to identify Nature-based Solutions to climate change and biodiversity loss. Project identified opportunities for wetlands, floodplains, forests, soils, and other ecosystems to support broader resilience planning efforts, and expanded communities' capacity to protect, restore and enhance carbon sequestration and other ecosystem services by providing a model for community-driven assessment of NbS; providing recommendations to improve regulations; and developing and providing educational materials and opportunities.

Nashua River Communities Resilient Lands Management Project: Bolton and Clinton, MA

Natural Climate Solutions Specialist & Senior Ecologist

Collaborating with the Massachusetts Association of Conservation Commissions, Gillian led development of wetland climate change local by-laws and regulations. This project aims to improve community climate resilience and ecosystem carbon mitigation by protecting and restoring ecosystem services through the development and adoption of better land management practices and articulated through the writing of forest management and lawns and landscaping management guides.

Gillian Davies, PWS, SSSSNE, NHCWS, CESSWI

Massachusetts Association of Conservation Commissions Wetland Buffer Zone Guidebook Project, Belmont, MA

Project Manager & Lead Author

Responsible for project to research and write comprehensive guidebook on the science and regulation of wetland resource area buffer zones and Riverfront Areas under the Massachusetts Wetlands Protection Act and local bylaws and ordinances. Preparation of guidebook included supervision of junior staff and coordination with Massachusetts Association of Conservation Commission Buffer Zone Guidebook review team, scientific literature search, and development of recommendations for science-based review of projects under existing state regulations and local bylaws/ordinances, as well as how to develop local bylaws and ordinances supported by current scientific findings. The guidebook provides a discussion of wetland, buffer zone and Riverfront Area regulation in the context of climate change, outlining how buffer zones contribute to protection of carbon in wetlands, support climate adaptation and climate resiliency ecosystem services that wetlands provide, and protect wetlands from the impacts of climate change.

Massachusetts Department of Transportation, Route 18, Weymouth, Abington, Southfield, MA

Senior Wetland & Soil Scientist; & Certified Erosion, Sediment & Storm Water Inspector

Provided environmental monitoring services for complex highway widening project (road widening, bridge replacement, safety improvements), including monitoring construction of wetland replication area (totaling 42,210 s.f.) and wetland restoration areas. The project area was 4.1 miles long and included multiple work areas operating simultaneously. Environmental Monitoring included responsibility for monitoring project compliance with MA Wetlands Protection Act and Water Quality Certification Variance and Stormwater Pollution Prevention Plan conditions, preparing numerous reports, developing solutions to emerging issues, and coordinating with state and federal regulatory agencies, as well as MassDOT and the project contractor.

Bailey's Pond NOI, Representation in MA DEP Appeal Process, Construction Monitoring, Amesbury, MA

Project Manager, Senior Ecologist

Conducted peer review of NOI, including Riverfront Area delineation following beaver activity and assessment of site for status as previously developed, degraded site. Provided consulting services to Amesbury Conservation Commission throughout the MassDEP appeal process, where Commission decision was successfully defended. Managed staff during construction monitoring phase to provide construction monitoring services for Conservation Commission.

Homeowner, Paxton, MA

Project Manager, Expert Witness, Senior Wetland & Soil Scientist

Assessed regulated wetland resources on homeowner's property and potential damages from upstream/upgradient abutter activities. Assessment included evaluation of soils on several properties, and evaluation of disturbed conditions on upstream/upgradient abutter's property. Provided Expert Witness testimony in Worcester Superior Court in support of homeowner's lawsuit to obtain a remedy to ongoing impacts from upstream abutter.

MassDEP Wetlands Climate Resiliency Outreach for Coastal Floodplains Project: Statewide

Senior Wetland & Ecological Resilience Advisor

Advising project team on wetland and ecological resilience science for project to produce public outreach products (video, StoryMap, and pamphlets) to communicate the critical importance of the coastal floodplain for community resilience and ecological function. The project supports changes to MassDEP regulations that safeguard the coastal floodplain as coastal communities and ecosystems experience increasing damages from coastal storms and sea level rise.

Rights of Wetlands Operationalization for Biodiversity and Community Resilience Project: Bolivia, Ecuador, Guyana, Kenya, Sri Lanka

Senior Ecologist

Providing policy and science advice for a project to facilitate operationalization of a rights of wetlands approach to improve biodiversity conservation and poverty alleviation in five countries. Pathways for recognition of rights of wetlands to support improvements for wetlands, biodiversity and local communities include community level wetland management, cultural/ethical framing, policy and legal instruments, and governance frameworks. Countries include those where a rights of nature approach has been established and those where it is a newer approach. Rights of wetlands knowledge, experience and project products will be shared between the five countries.

BSC GROUP

Caseylee Bastien, RLA

Landscape Architect Associate

YEARS OF EXPERIENCE

23

EDUCATION

BS, Landscape Architecture, University of Massachusetts, Amherst

REGISTRATIONS

Registered Landscape Architect

- MA #1554 (2008)
- RI #LA.0000667 (2018)
- NH - #00192 (2021)

CERTIFICATIONS

- SITES-AP (2017-2019)
- Certified Playground Inspector (CPSI) (2013-Present)
- OSHA Construction Safety and Health

MEET CASEY-LEE

Caseylee designs landscape solutions that speak to the purpose and personality of a site so that it resonates with the client and users. His passion to research and innovate defining features into his designs adds meaning and value to a wide variety of project types including parks, streetscapes, transportation, institutions, and natural habitats. He has experience in horticulture and lighting design and provides coordination and design of graphic and sculptural arts, digital modeling, fabrication, and installation. Casey-Lee has a strong regard for social justice and works diligently to bring the right solution to every project regardless of the means available to a community.

PROJECT EXPERIENCE HIGHLIGHTS

I-495 Wetland Restoration Along Concord River, Lowell, MA

Landscape Architect

Provided wetland replication support for environmental monitoring efforts along the Concord River. Supported the development of a green infrastructure solution, including modifications to the contributing upland watershed through baffles and level spreaders over enhanced cultural grassland; stabilizing green grout soils and plantings within the stone to slow and cool storm water; and utilization of root wad snags, live fascines, and live stakes in addition to standard wetland replication and erosion control. To prevent highway closures, developed a plan to use canoes for implementation, enabling the project to be completed at a fraction of the projected cost and within the same season.

Chelsea Greenway, Chelsea, MA

Landscape Architect

Designed landscape architecture for the environmental restoration and interpretive wildlife habitat formation at a former landfill between the Mill Creek tidal river and the Chelsea Greenway. Bordered on the upland side by a mixed use commercial and high-density residential neighborhood, this restoration balances ecological and recreational needs. Developed management strategies for invasive species and contaminated soils as well as tidal influence and saltmarsh restoration. Produced estimates and feasibility analysis of invasive vegetation management methods, including saltwater inundation, controlled burning, and mechanical and chemical methods. This was followed by the development of engineered habitat archetypes to restore the site to one of prime wildlife value paired with interpretive features and passive recreation.

Constructed Wetland Restorations, MassDOT, Various Locations, MA
Landscape Architect

Coordinated with environmental scientists regarding invasive species control, canopy restoration, flow correction, species and habitat enhancement, design of constructed wetlands, and salt marshes for the inspection and analysis of constructed drainage ways and wetlands at various locations. Designed correction and restoration of these facilities to meet MassDOT, local conservation commission, and Army Corps of Engineers requirements. Recent projects include Route 110, Amesbury; Lagoon Pond Drawbridge, Martha's Vineyard; Sudbury River Bridge Route 9, Framingham; Route 44 interchange, Carver; and Regional Transportation Center, Woburn.

Torbert Macdonald Park Landscape Planning Project, Mystic River Watershed Association (MyRWA), Medford, MA
Landscape Architect

Designed outreach materials including conceptual site plan and associated landscape management plan for Torbert Macdonald Park. Building on prior design and planning studies, worked with MyRWA to leverage grant sources and staff/volunteer efforts to fundamentally change the processes and perspective of development and management within the park. This new vision combines storm resiliency and ecosystem enhancement to orchestrate the experience of park visitors through neighborhood and internal connectivity, education, ecological health, and river access.

Island End River Living Shoreline, Chelsea and Everett, MA
Landscape Architect/ Project Manager

Provided landscape architecture for the planning, community outreach, digital modeling, web design, planting design, detailing of grey/green nature-based living shoreline/ storm resiliency features, estimating, permitting support, and construction documents for a linear quarter mile of riverbank and a half mile of associated riverfront area. The project included new universal access trails, riparian corridor and riverbank restoration planting, habitat enhancements, structured saltmarsh plantings, educational interpretive signage, and related amenities to improve natural function and accessibility.

Island End River Daylighting, Adaptive Management Plan Chelsea and Everett, MA (ACOE)
Landscape Architect/ Project Manager

BSC was asked to take over management and monitoring of riverbank revegetation after completion of the structural daylighting project performed as part of site redevelopment. Previous plantings had failed, and it was determined that a new methodology was required. Caseylee developed an adaptive landscape management plan to be implemented and overseen by BSC Ecologists and City staff. This included green grout planting of tidal saltmarsh and coastal bank grasses, and top of bank nurse plantings to alter the microclimate. New plantings required a solar powered tidal river drawn irrigation system, desalination, and an invasive species management plan.

Lagoon Pond and Drawbridge Pedestrian Walk and Estuary Restoration, Martha's Vineyard, Oak Bluffs and Tisbury, MA
Landscape Architect

Provided schematic walkway designs, plans, and details for aquatic plantings and revetments, as well as graphic design for interpretive signage, for the addition of pedestrian walks between the Beach Road Bascule bridge and public/private beaches. Project included channel dredging and habitat enhancements to the Lagoon Pond lobster breeding estuary, part of DEP's Mass Estuaries Project. Challenges included developing comfortable walkways that would meet ADA/MAAB in the context of a drawbridge and tidal channel per the requirements of MassDOT, local Conservation Commissions, and the Army Corp of Engineers.

Blackstone Gateway Park, Worcester, MA
Landscape Architect

Part of the initial planning and design of this project for many years, responsible for the development of trails and elevated boardwalks with overlooks and bridges along and over the Blackstone River. Tasks associated with this project included development of gateway gardens, boardwalk and bridge details, ecological restoration planting plans, compensatory flood storage, geotechnical analysis, and interpretive signage.

BSC GROUP

Michael
Clark, PE, LSP, BCEE, ENV SP, TPI

Vice President
Project Manager & Consulting Engineer

YEARS OF EXPERIENCE
41

EDUCATION
MS, Civil/Geotechnical Engineering
University of Lowell

BS, Civil Engineering
University of Lowell

REGISTRATIONS
Professional Engineer

- MA, CT, RI, and ME
- MA #34142

Licensed Site Professional

- MA #9055

MassDEP Registered Third Party Inspector

- SW48-0000010

CERTIFICATIONS
- ENV™ Sustainability Professional
- Board Certified Environmental Engineer

AFFILIATIONS
- American Society of Civil Engineers
- Licensed Site Professionals Association
- North American Geosynthetics Society

MEET MIKE
Mike has extensive experience as a project manager and consulting engineer on environmental, transportation, energy, and land development projects throughout the northeastern United States. He has conducted environmental projects under the regulatory frameworks of CERCLA, RCRA Corrective Action, the Massachusetts Contingency Plan, and various state solid waste and contaminated site remediation programs. He has provided environmental and geotechnical due diligence services for a variety of land acquisition and development projects, including commercial scale solar PV on closed landfills and Brownfield sites. He has provided geotechnical engineering services for corporate office parks and mixed-use developments, transportation projects including roadways and railroad facilities, geotechnical design and construction support for wastewater treatment plants and water supply systems, and closure design and construction administration for numerous municipal and industrial landfills.

Mike has served as outside expert on several cases providing litigation support services. Mike is past corporate environmental manager for the Boston & Maine Corporation/Pan Am Railways and is a past member of the Licensed Site Professionals Association (LSPA) Technical Practices Committee.

PROJECT EXPERIENCE HIGHLIGHTS

MBTA Environmental Due Diligence for South Coast Rail, Southeastern Massachusetts

Project Manager

Responsible for directing environmental engineering services in support of the South Coast Rail Project. Mike led the development of an Environmental Management Plan and Contaminated Soil Management Plan to address the next phases of work as well as the preparation of ASTM Phase I and Phase II Environmental Site Assessment (ESA) Reports for numerous properties that will be acquired. Later phases of work included additional ASTM Phase II ESAs including soil borings/monitoring well installations, groundwater sampling, UST geophysical investigation, and preparation of ESA reports. Responsible for project budget and schedule.

Cost Recovery and Litigation Support, Somerville, MA
Outside Expert

Providing expertise to MBTA in their efforts to recovery response costs incurred to manage contaminated soil and groundwater during construction of the Green Line Extension project. The contamination originated from the historic release of chlorinated volatile organic compounds (CVOCs) at 50 Tufts Street in Somerville, owned by UniFirst Corporation.

MBTA System-wide MS4 Program Development
Project Manager

Program Manager for the MBTA's hybrid, transportation-related stormwater MS4 program. Leading the efforts of multiple consulting firms to conceptualize a systemwide NPDES permit covering stormwater discharges across all operating assets. First year efforts are focused on mapping and cataloging MBTA assets and surface water bodies that receive stormwater discharges and developing a permitting strategy. Future initiatives will involve refining MBTA's understanding of unpermitted discharges, working with MBTA's asset management team to incorporate the information into Trapeze, developing Best Management Practices, preparing transportation specific MS4 applications, and developing a Stormwater Management Program Plan.

MBTA Pump Station Infrastructure and Vulnerability Assessments
Project Manager

Working as a subconsultant, BSC provided environmental services under an on-call climate change contract with the MBTA. Assisted in mapping the water discharge locations for the 54 pump room assets.

Remediation of Dominion Energy's Ash Settling Basins, Salem, MA
LSP-of-Record

Served as LSP-of-Record for the cleanup of the former ash settling basins at the Dominion Energy power station in Salem, MA. Approximately 2,500 cubic yards of ash sediment were removed from the basins, dewatered on site using a filter press, then transported for disposal in Rochester, NH.

Remediation of Georgia-Pacific's Parcel A, Fitchburg, MA
LSP-of-Record

Responsible for providing strategic direction to the consulting team working to comply with the Massachusetts Contingency Plan to remediate Parcel A. Four Release Tracking Numbers (RTNs) have been issued by MassDEP for releases of a variety of hazardous materials into the environment from the long history of waste disposal practices on Parcel A. A total of 20,000 cubic yards of short paper fiber waste was beneficially reused at the Fitchburg - Westminster Landfill.

MBTA Bus Maintenance Facility Modernization Program, Eastern MA
LSP-of-Record

Responsible for assisting MBTA as part of the 10- to 15-year bus maintenance facility modernization program. Within the program, the existing bus maintenance facilities will be reconstructed and expanded to allow indoor bus storage and eventual conversion of the fleet to battery electric buses. Also leads a group of scientists providing environmental permitting services.

Piper Lane Subdivision, Acton Conservation Commission, Acton, MA
LSP

Peer review services for a proposed 40B project to construct a residential development in close proximity to wetlands including a vernal pool, and adjacent to town conservation land. Peer review included review of stormwater management plans and assessment of issues related to onsite contaminated soil. Advised the client on measures to mitigate impacts to buffer zone and wetland resources from erosion/runoff of contaminated soil.

PRIOR TO JOINING BSC, MIKE CONTRIBUTED TO THE FOLLOWING PROJECTS:

Assessment of Blasting-Related Impacts on Groundwater, Merrimack, NH
Lead Engineer

Assessed groundwater quality before and after blasting in response to reported effects on private drinking water wells from adjacent rock-blasting activities associated with a commercial development.

BSC GROUP

David
Biancavilla, PE, LEED AP

Vice President
Principal & Director of Civil Engineering Services

YEARS OF EXPERIENCE
24

EDUCATION
BS, Civil Engineering
Merrimack College

REGISTRATIONS
Professional Engineer

- MA #47846
- NH #15328
- RI #12552

CERTIFICATIONS
- LEED® Accredited Professional
- OSHA 10-hour Occupational Safety and Health Training

AFFILIATIONS
- Boston Society of Civil Engineers Section/ASCE
- Urban Land Institute

MEET DAVE
Dave has engineering experience in managing and designing commercial, residential, and public engineering projects in Massachusetts, Rhode Island, and New Hampshire. He has managed multi-disciplined projects, obtained state and local permits, and has prepared and managed construction documents for projects both large and small. As Director of Civil Engineering Services, Dave leads BSC's New England-based team of engineers, providing project guidance and QA/QC review.

PROJECT EXPERIENCE HIGHLIGHTS

Intel Corporation Parking Lot, Hudson, MA
Project Engineer

Responsible for preparing construction plans for the restoration of a temporary parking lot leased by Intel. The project consisted of two soccer fields with associated parking and erosion control measures. Dave performed weekly site inspections during the duration of the construction. The design required detailed cost estimating and the matching of cut and fills of the site while trying to bury unsuitable soils located on site.

Cambridge Discovery Park, Cambridge, MA
Project Manager

Responsible for managing the design team for civil/site design of the Cambridge Discovery Park. Dave prepared site plans, a drainage report, and flood storage calculations for the project to meet the permitting requirements in accordance with local and state regulations. The project involved the long-term master planning of the entire park, including relocating utilities, design of interior park roadways, and stormwater management systems for the park's full build-out.

Department of Conservation and Recreation, Horseneck Beach Campground, Westport, MA
Principal

Oversaw the planning of a 500-acre waterfront park within the Town of Westport encompassing 100 existing campsites as well as associated roads and utilities. Responsibilities included the review and assessment of physical plant conditions, development of an existing conditions report, preparation of a study report for buildings in the area, and the development of preliminary designs to address all structural deficiencies, places for infrastructure improvement, and utility upgrades. Dave was also responsible for preparing preliminary designs for all associated campground amenities, including shade pavilion, basketball court, fire rings, and playgrounds.

Evergreen Solar Manufacturing Facility, Devens, MA

Project Manager

Managed the design and permitting of a 500,000-square-foot manufacturing facility for an International solar panel production company. Dave was responsible for overseeing comprehensive services provided by BSC Group for the design/build contract which included civil/site engineering, environmental planning and permitting, ecological assessment, landscape architecture, and land surveying. The project's site design incorporated low impact development techniques using rain gardens along with the natural treatment and handling of stormwater with the use of bio-retention ponds to treat and infiltrate stormwater generated in parking areas.

Massachusetts Institute of Technology Cogeneration Plant, Cambridge, MA

Project Manager

Managed the civil/site work associated the construction of a new 40-MW cogeneration plant to support MIT's power needs. Comprehensive services included survey and civil/site engineering consisting of site design, materials management, stormwater management, utility enabling, permitting, bidding, and construction phase services.

Web Industries, Facility Expansion, Holliston, MA

Project Manager

Worked on the expeditated 20,000 square feet of the existing office and manufacturing expansion of the Web Industries facility on Hopping Brook Road in the Hopping Brook Park to support increased production demands for medical devices used in Covid-19 test kits. The project involved multi-discipline involvement from many design professionals, the design of the site parking and utilities, design of interior connecting access roadways and paths, and an expanded Title V septic system. This project received approvals from the Holliston Planning Board and the Holliston Board of Health.

Boston Housing Authority, Site, Sewer and Drainage Improvements, Lenox Street Development, Boston, MA

Project Manager & Project Engineer

Responsible for the design of approximately 3,000 linear feet of new drainage, including particle separator and check valves, as well as approximately 1,000 linear feet of new sewer. Dave also designed new parking lot and sidewalk layout. The design process included preparing specifications and bid drawings. The project required and received Boston Water and Sewer Commission approvals. The design evolved from working with BWSC and the sewer and drainage improvements proposed in Kendall Street project. Dave also served as Construction Representative during the construction phase of Lenox Street project. Responsibilities included maintaining daily logs of contractor's progress and pay items, processing any change orders and all pay requests, and preparing an as-built of the new work, including drainage, sewer, paving, and curbing. Project responsibilities also included noting all existing utilities and inspecting quality of work per the specifications.

City of Taunton, Robert Treat Paine Drive Improvement, Taunton, MA

Principal

In charge of the redesign of approximately 5,500 linear feet of improvements meeting complete street standards for bicycle lanes and sidewalks. The project also included improving an unnamed roadway to City standards, including water, sewer, sanitary sewer pump station, and drainage improvements. Additional improvements included drainage, lighting, and electrical upgrades. BSC supported the City in seeking and receiving MassWorks funds for the much-needed improvements and have worked closely with the City and private stake holders.

Lesley University Lunders Arts Center, Cambridge, MA

Project Manager

Managed the site design for the relocation and redevelopment of a 168-year-old church into an art school building at Lesley University. The project involved the development of a new glass building connected to the former, relocated church. BSC Group worked with a large interdisciplinary team to provide support during the regulatory process, design, and construction. Site design included stormwater management systems in accordance with city regulations, the reconstruction of a portion of Roseland Street, site utilities, and signal and accessibility improvements to the intersection of Massachusetts Avenue and Roseland Street.

BSC GROUP

Melissa
Kaplan, PWS

Project Manager & Wetland Scientist
Senior Associate

YEARS OF EXPERIENCE

20

EDUCATION

MS, Marine Biology
Nova Southeastern University

BS, Zoology
University of Florida

REGISTRATIONS

Professional Wetland Scientist, Society of Wetland Scientists

- CT #2327 (2013)

CERTIFICATIONS

- OSHA 10-Hour Construction Safety and Health
- APM Project Management Master

AFFILIATIONS

- Connecticut Association of Wetland Scientists
- Connecticut Power & Energy Society
- Environmental Business Council of New England and Connecticut
- Association of Massachusetts Wetland Scientists
- Native Plant Trust, PCV Program Rare Plant Volunteer Surveyor

MEET MELISSA

Melissa is a Professional Wetland Scientist and the Manager of the Ecological Sciences Department in BSC's Connecticut Office with extensive environmental and biological consulting experience and specialization in: federal, state, and local environmental licensing and permitting throughout New England (MA, CT, NH, and RI); threatened and endangered species surveys; construction inspections; and mitigation design and habitat restoration. She has worked on numerous projects from the early coordination phase, to biological assessments and permitting phases, and to the final construction and wetland monitoring phase; including public and private development, natural gas pipeline, electric utility, solar, and transportation projects.

PROJECT EXPERIENCE HIGHLIGHTS

Borrego Solar PV Site Feasibility Analysis, 11 Elkington Farm Road, New Milford, CT
Senior Wetland Scientist

Oversaw field investigations and wetlands report for a potential PV Solar site in New Milford, Connecticut. Coordinated and oversaw wetland delineations, soil analysis, and reporting. Also coordinated with other team members, including professional survey.

Crooked Springs Dam and Pond Feasibility Assessment and Alternatives Analysis, Chelmsford, MA
Project Manager

Responsible for completion of a feasibility assessment and alternatives analysis to provide potential options for the Crooked Spring Dam and Pond for the Town of Chelmsford, MA. The Crooked Spring Dam and associated structures are 30 years old and have begun failing. As a result, the Town wanted to understand what options were available for the dam and associated pond. As part of the study, Melissa oversaw the ecological reconnaissance and drafted an ecological assessment for each of the alternatives, which included the identification of environmental study needs and permitting requirements. Working with the subconsultant, BSC helped compile the feasibility study report for the Town. The project involved a BSC-led public outreach meeting to gain input from the public on their preferred option. BSC presented the results of the feasibility/alternative study to the public, the Town of Chelmsford's Conservation Commission, and the Town of Chelmsford's Land Management Committee.

National Grid, Substations Flood Mitigation Project, Various Towns, MA and RI
Project Manager

Responsible for preparing and overseeing local, state, and federal permitting for various flood mitigation and climate resiliency projects at 16 substations in MA and RI. Melissa prepared permit applications, coordinated with team members, and obtained necessary information, modeling, and calculations to permit various flood protection measures at the substations. Other project tasks included obtaining Orders of Conditions from MassDEP and approvals from 16 different Conservation Commissions, an Assent (Type A) from RI CRMC, and zoning approvals from many towns in both MA and RI. Melissa conducted detailed coordination with conservation commissions and zoning boards to obtain permits in a timely fashion; oversaw the preparation of maps sets that included hurricane storm surge (using SLOSH), sea level rise and coastal impact, Limit of Moderate Wave Action location, and Environmental Resources; and oversaw the construction of the flood mitigation/climate resiliency projects.

Solar Provider Group, 3 Solar PV sites in Uxbridge, Mendon, and Southampton, MA
Project Manager

Responsible for leading field work, professional survey, and mapping of three potential solar sites in central Massachusetts. Melissa managed wetland delineations and tree surveys, and coordinated land surveying activities at the site as well as attended pre-application Planning Board meetings. Other project responsibilities included close coordination with the client and the field teams to accurately map out the site for potential use as photovoltaic power generating facilities under the MA SMART program.

National Grid, 101L1 Feeder Tie and Switchgear Relocation Project, Nantucket, MA
Project Manager

Responsible for preparing and submitting local, state, and federal permits for the project. The project was located within the floodplain and involved the upgrade of switchgear, enlarging of existing manholes, and the installation of new underground duct bank and manhole system adjacent to the Candle Street Substation. Since the switchgears were located within the floodplain, they were proposed to be relocated to an elevated platform as a flood protection/climate resiliency measure. The switchgear platform was proposed for installation with filled tidelands and required a Chapter 91 license amendment for approval. Melissa prepared, submitted, and provided additional information to MassDEP to obtain the Chapter 91 license amendment. Other project responsibilities included preparing a Notice of Intent for submitting to MassDEP and Nantucket Conservation Commission; overseeing the preparation of the Chapter 91 drawings as well as site plan and landscape drawings for zoning board and Nantucket Historic District Commission approval; and working closely with the Nantucket Conservation Commission, MassDEP, and the National Grid team.

Eversource Energy, Podick Substation Permanent Road and Mitigation, Amherst, MA
Project Manager

Responsible for the local, state, and federal permitting and mitigating impacts for the construction of a permanent gravel utility road in wetlands outside the Podick Substation in Amherst, MA. As mitigation for the impacts, BSC helped design and permit a wetland replication that restored an old agricultural field adjacent to a wetland and stream system. At the request of the Town of Amherst, BSC also designed an amphibian pool at the wetland replication site to hopefully provide Eastern spadefoot toad vernal pool breeding site. Also oversaw construction and monitoring of the constructed wetland replication/amphibian pool area.

National Grid, Newburyport Stabilization Project, Newburyport Substation #36, Newburyport, MA
Project Manager

Prepared and submitted local, state, and federal permits for the replacement and stabilization of the seawall located at the Newburyport Substation #36. The existing deteriorated bulkhead and timber piles were removed and replaced with a stone revetment to stabilize the shoreline and prevent future erosion. Melissa coordinated and submitted a joint Chapter 91 and 401 Water Quality Certification permit application and a Pre-Construction Notification to the US Army Corps of Engineers. Other project responsibilities included obtaining an ENF from MEPA and an Order of Conditions from the Newburyport Conservation Commission. Melissa worked closely with the Newburyport Conservation Commission, other agencies, and the National Grid team.

BSC GROUP

Diana
Walden

Senior Environmental Scientist
Associate

YEARS OF EXPERIENCE

23

EDUCATION

MS, Wildlife and Fisheries Conservation
University of Massachusetts Amherst

BS, Environmental Studies and Biology
St. Lawrence University

CERTIFICATIONS

- Electrical Safety Certified
- 10-hour OSHA Construction Site Safety and Health

AFFILIATIONS

- Association of Massachusetts Wetland Scientists (AMWS), Vice President

MEET DIANA

Diana has extensive project experience assisting clients with the wetland, waterways, and protected species permitting and regulatory processes at the state and local levels in Massachusetts, New Hampshire, and Connecticut. Her skills include wetland ecology and delineation, wildlife conservation and habitat evaluations, and assessment of instream habitat and aquatic communities. Her project work and experience has been gained through utility, public, and private sector clients, and she regularly provides services involving environmental compliance inspection of construction, stormwater issues, and sediment and erosion control best management practices. Work at the federal level has included permitting with the US Army Corps of Engineers, US EPA and USFWS, and US Coast Guard.

PROJECT EXPERIENCE HIGHLIGHTS

MassDOT Erosion and Sediment Control Field Guide

Environmental Scientist

Responsible for the preparation of MassDOT's Erosion and Sediment Control Field Guide. The field guide is designed to be used by contractors in the field and introduces to erosion and sediment controls, regulatory programs, and suggests Best Management Practices by key topics, including Prevention, Runoff Control Practices and Devices, Erosion Control Practices and Devices, Sediment Control Practices and Devices, Good Housekeeping and General Operations, and Project Close-Out. For ease of use in the field, the Field Guide includes an Erosion and Sediment Control Practice Matrix. The Field Guide is available for download from the MassDOT web site.

MassDOT, Route 3 Realignment, Duxbury, MA

Environmental Scientist

Responsible for the permitting and part of MassDOT's owner's representative team for the Base Technical Concept (BTC) and selection of the Design Build team for the realignment of Route 3 and replacement of a set of overpass bridges. Responsible for the permit process for the BTC from early environmental coordination checklist, Categorical Exclusion, 401 WQC, and a PCN with USACOE. Wetlands along the route were delineated; categorized by Cowardin community type; described by vegetative species, soils, and hydrologic features; and evaluated for functions and values. Oversaw installation of groundwater monitoring wells and prepared the required wetland replication and restoration design details. Transitioning into an oversight role for the Environmental Monitor team during the construction phase.

Wetland Replication Area for Residential Development, Dover, MA

Wetland Scientist

Performed monitoring and compliance during the construction of a small wetland replication area. Components included evaluating the soil to confirm the base design elevation, discussions with contractors on preserving existing plant material, approving species substitutions, and preparing the baseline monitoring report to MassDEP. BSC completed two years of monitoring and reporting, bringing the property into compliance with the Administrative Consent Order.

DCR, Neponset River Greenway, Boston, MA

Environmental Scientist

Responsible for the preparation of permit applications for environmental permits for a section of the DCR Neponset River Greenway. The project will be constructed in collaboration with MassDOT and will include a section of boardwalk crossing intertidal and salt marsh habitat, realignment at several intersections and multi-use trail construction adjacent to the embankment of I-93. Prepared the early environmental coordination checklist and NEPA Categorical Exclusion required for MassDOT projects. Also prepared the Notice of Project Change with MEPA, Notice of Intent with Boston Conservation Commission, 401 WQC, Chapter 91 Waterways License, and a PCN with USACOE. Other project coordination included FHWA Programmatic GARFO/NMFS review for Essential Fish Habitat and federally listed species.

Nathan Hale Greenway, Coventry and Bolton, CT

Environmental Scientist

Responsible for the completion of a baseline assessment along the abandoned Route 6 corridor in the Towns of Coventry and Bolton, CT. Field data collected will be used to conduct an alternative analysis of routing options for the greenway. The focus of the project is to develop a preferred alignment for the Greenway followed by the preliminary design that has been publicly vetted and supported by stakeholders and includes an understanding of construction costs.

National Grid, Park Street Substation, Gardner, MA

Environmental Scientist

Served as the main environmental inspector for weekly compliance monitoring for the construction of a new substation, demolition of an existing substation and removal of tap line structures. Completed and distributed the inspection reports and photo documentation on a weekly basis. Responsible for contractor training, maintaining the SWPPP, and communicating updates or field changes to the project team and local permitting authority. The project was granted a Certificate of Compliance with the Gardner Conservation Commission.

Vernal Pool Investigation and Restoration, Andover, MA

Wetland Scientist

Responsible for investigating the presence of certification criteria for a vernal pool feature on a proposed redevelopment site. Following identification of obligate species, BSC was responsible for working with the design firm to create a mitigation plan to restore a portion of the overwintering, forested upland habitat. The restoration plan included invasive species management, removal of impervious material, native plantings, and placing woody debris.

Stream Impact Review and Restoration, Route 110, Amesbury, MA

Wetland Scientist

Evaluated construction -related impacts to a stream and adjacent Bordering Vegetated Wetland which were more extensive than the amount authorized by permits. Evaluated pre-construction conditions, existing conditions, and is assisting MassDOT with recommendations for mitigation, including techniques to restore habitat and increase heterogeneity in the stream. Rock vanes, log deflectors, coir log terraces and live staking of riparian vegetation were designed. Compliance monitoring continues with annual reporting, invasive species management, and evaluation of riparian enhancement and plantings.

Stream Restoration Evaluation, Shaker Mill Brook Becket, MA

Wetland Scientist

Responsible for evaluating the potential for fish passage at a series of step pools created during the removal of a crushed bridge culvert. The bridge had been replaced with an open bottom arch culvert and natural substrate had been restored. Permitting agencies questioned whether fish passage would be possible during low flow. Peer review was provided to determine whether a low-flow channel and thalweg had been effectively established and whether the grades between steps would allow fish passage as documented by the literature.

BSC GROUP

Alison
Milliman

Environmental Scientist
Senior Associate

YEARS OF EXPERIENCE

15

EDUCATION

MS, Natural Resources Science
University of Rhode Island

BS, Wildlife and Conservation Biology
University of Rhode Island

CERTIFICATIONS

- Certified Profession in Erosion and Sediment Control (CPESC)

MEET ALISON

Alison is an environmental scientist with experience conducting natural resource investigations and managing associated environmental permitting tasks. Her expertise includes performing environmental inspections to verify permit compliance for electrical transmission line corridors. Her experience with permitting and regulatory issues spans all levels of local government including, but not limited to, MA and RI wetlands permits, RI Energy Facility Siting Board Environmental Reports, MEPA Environmental Notification Forms and Environmental Impact Reports, EPA NPDES NOI and SWPPPs, 401 Water Quality Certifications, and Section 404 permits.

Alison is a Certified Professional in Erosion and Sediment Control with the capability to produce and sign Stormwater Pollution Prevention Plans (SWPPP) for electric transmission projects. Her field work has included threatened and endangered species surveys, invasive plant surveys, wetland delineation surveys, cultural resource surveys, and breeding bird surveys.

PROJECT EXPERIENCE HIGHLIGHTS

National Grid, A1/B2 Transmission Line Refurbishment Project, Various Locations, MA
Permitting Specialist

Alison is taking a lead role in the MEPA permitting for this 54-mile transmission line refurbishment project. Responsible for coordinating with the project team to develop an analysis and outreach strategy for the MEPA Public Involvement Protocol for Environmental Justice Populations and is currently the technical lead on the preparation of the Expanded Environmental Notification Form.

National Grid, 315 & 303/327/3520 Transmission Line Refurbishment Project, Various Locations, MA
Project Manager

Responsible for the preparation of the MEPA Single EIR, U.S. Army Corps of Engineers PCN, MA 401 Water Quality Certification, and the MA State Freshwater Wetlands Protection Act Notice of Intents. The Project involves transmission line refurbishment activities along approximately 75 miles within the States of Massachusetts and Rhode Island.

National Grid, 339 and 349 Transmission Line Asset Condition Refurbishment Project, Various Locations, MA
Project Manager

Responsible for the oversight of the project permitting and field efforts. The project involves rebuilding of both 339 and 349 transmission lines for over 17 miles. Project milestones to date include completion of the federal, state, and local permitting for the geotechnical soil boring investigations.

National Grid, Narragansett Electric Company, Substation Fence Replacement Project, Various Locations, RI
Project Manager

Responsible for the preparation of the RIDEM and local Soil Erosion and Sediment Control permitting for 13 substation fence replacement projects in RI.

Cape Cod Aggregates Corporation
Project Manager

Responsible for the preparation of the eNOI and SWPPP for Cape Cod Aggregates' Freetown, MA facility under the 2021 EPA Multi-Sector General Permit. Alison completed a site review and updated the SWPPP to address the Project site's stormwater drainage pathways, collection systems, outfalls, and potential pollutant sources.

Aggregate Industries
Senior Permitting Support

Provided permitting support for the preparation of eNOI and SWPPPs under the 2021 Multi-Sector General Permit for multiple properties in MA owned by Aggregate Industries. Alison provided ecological expertise to ensure compliance with environmental regulatory requirements such as Outstanding Resource Waters, cultural and historic resources, and rare and endangered species.

PRIOR TO JOINING BSC, ALISON CONTRIBUTED TO THE FOLLOWING PROJECTS:

National Grid, New England East-West Solution (NEEWS) 115/345 kV Projects, Multiple States
Environmental Specialist & Lead Compliance Monitor

Provided environmental services and monitoring for the NEEWS program, a major 115/345 kV reliability improvement initiative and one of the largest power delivery projects undertaken in New England during the past 30 years. Responsible for managing the field component of the environmental compliance monitoring program, daily coordination with the contractors, providing oversight of environmental monitoring during construction activities and post-construction restoration, and preparing and submitting construction updates and reports to the Rhode Island Department of Environmental Management, U.S. Army Corps of Engineers, and local town offices.

Grand Army and Pottersville Projects, Somerset and Swansea, MA
Project Scientist

Responsible for the preparation of the MEPA filings, the U.S. Army Corps Pre-Construction Notification, working jointly with others to prepare the MA State Freshwater Wetlands Protection Act Notice of Intent, the 401 Water Quality Certification, and the Compensatory Wetland Mitigation Plan. Responsible for managing the field and training component of the environmental compliance and monitoring program. The project involved the construction of two new switching stations and associated transmission line upgrades and DCT separation.

NEEWS Project, Greater Springfield Reliability Project; Connecticut Interstate Reliability Project; and Rhode Island Interstate Reliability Project
Project Scientist

Involved in field investigations for wetland delineations, U.S. Army Corps of Engineers wetland forms, vernal pool surveys, invasive and threatened and endangered species surveys (including use of radio telemetry), and environmental monitoring. Developed permitting documents for the RI Energy Facility Siting Board Environmental Report, the RIPDES SWPPP and NOI, and the Conceptual Wetlands Mitigation Plan and Highway Methodology Wetland Function and Values forms for the U.S. Army Corps 404 Application. The project involved a set of improvements to the electric transmission system in Connecticut, Rhode Island, and Massachusetts. The project consisted of approximately 75 miles of a new 345 kV transmission line to improve the transmission system's capacity to move power into Connecticut from Massachusetts and Rhode Island, and also included modifications to existing systems in Connecticut and Rhode Island as well as to the existing substations in Connecticut, Rhode Island, and Massachusetts.

BSC GROUP

Paul Martin

Senior Ecologist
Senior Associate

YEARS OF EXPERIENCE

37

EDUCATION

M.S. Zoology
University of New Hampshire

B.A. Biology
Carleton College

CERTIFICATIONS

- OSHA Construction Safety and Health
- PADI SCUBA

AFFILIATIONS

- Coastal and Estuarine Research Federation
- Society of Wetland Scientists
- American Fisheries Society
- Northeast Energy and Commerce Association-co-chair of the Environmental Committee
- Environmental Business Council-Coastal Resources Committee

MEET PAUL

Paul is a Senior Project Manager with BSC Group. With a valuable background as an ecologist as well as a permitting consultant, he provides extensive experience in managing effective teams for a variety of complex projects.

In addition to Paul's technical expertise in ecology, impact assessment, and permitting, he also expertly represents clients during public, agency, and stakeholder group meetings and hearings where his scientific credibility and persuasive arguments lead to respectful and successful outcomes.

PAUL HAS EXTENSIVE EXPERIENCE EVALUATING AND PERMITTING DIVERSE PROJECT TYPES IN MANY GEOGRAPHIES, INVOLVING TERRESTRIAL, AQUATIC, AND MARINE RESOURCES. WITH HIS KNOWLEDGE HE HAS HAD REPEATED SUCCESS IN HELPING CLIENTS GET THEIR PROJECTS COMPLETED.

PROJECT EXPERIENCE HIGHLIGHTS

Georgetown Peer Review, Georgetown Conservation Commission, Georgetown, MA

Senior Project Manager

Provided review and comment on an NOI filed for the installation of a pond aeration system to address degraded water quality conditions. Provided report to the Conservation Commission, completed a site visit, responded to applicant questions, and participated in two hearings before the project was approved.

Sam Wright Field Restoration, Easton Conservation Commission, Easton, MA

Senior Principal Scientist

Provided input to the development of a habitat restoration plan that included dam removal, wetland creation, and evaluated options for other activities such as invasive species management, turtle nesting habitat, pollinator species plantings, grassland bird nesting habitat. Reviewed plans to install shallow piezometers, reviewed data and provided input into wetland restoration.

Jacksonville Road Slope Failure Restoration Project, Colrain, MA
Senior Principal Scientist

Managed the wetlands investigations, and development of municipal and state wetland applications. Performed a site visit, represented the client at Conservation Commission hearings. The slope failure occurred along the North River and forced the closure of one lane on Jacksonville Road. The river is habitat for the state listed longnose sucker, requiring consultation with MA NHESP.

Malden Brook and SNUP Dam Removal, Massachusetts Department of Environmental Restoration, Weymouth and West Boyleston, MA
Senior Project Manager

Managed wetland delineations, topographic and civil survey, permitting assessment, evaluation of potential impacts associated with the two small dam removals, including the draining of a small pond behind the Malden Brook dam, and two partially collapsed culvert removals on Malden Brook.

Greening Lord Pond Plaza, Town of Athol, MA
Senior Principal Scientist

As part of a Municipal Vulnerability Grant, managed the wetland delineations, preparation of a Notice of Intent under the MA Wetlands Protection Act, and a filing under Section 404 General Permits. The Project involves daylighting about 700 ft of a stream, creation of wetland and wildlife habitat, improvements to stormwater management systems in the surrounding parking lot. Successfully obtained the necessary environmental permits.

Becker Pond Dam Removal, Mount Washington, MA
Sr. Principal Scientist

Assisted in the preparation of an SEIR under MEPA regulations, associated with a proposed dam removal on a small stream on property that The Nature Conservancy had acquired. State fish and wildlife restoration grant funding is being applied to the design, environmental review, and permitting of the project.

PRIOR TO JOINING BSC, PAUL CONTRIBUTED TO THE FOLLOWING PROJECTS:

Durante Mitigation Site, MBTA, Massachusetts
Senior Principal Scientist

Provided mitigation efforts for the redevelopment of the MBTA's Greenbush commuter rail line. Impacts to salt marsh required salt marsh mitigation efforts as a result of state and federal wetlands permitting. Environmental site assessment work was undertaken to support re-design of a conceptual salt marsh creation plan to accommodate identified areas of contamination on the Durante property,

Quabbin Reservoir Watershed Change Study, Metropolitan District Commission, Boston, MA
Project Biologist

Responsible for data collection and literature review regarding the effects of changes in the watershed on the quality of water in a drinking water supply reservoir. Emphasis was placed on land use changes, logging, and vegetation removal due to over-browsing by deer. Paul developed recommendations for the protection of the watershed of the largest drinking water supply reservoir in Massachusetts.

Transmission Line Wildlife Habitat Study, New England Power, Westborough, MA
Project Manager

Responsible for the oversight of preparation for a report on wildlife habitat values of transmission line rights-of-ways for a New England Power report used to create a brochure for distribution to interested parties. Literature searches were performed, and the findings synthesized into a short document reporting the potential benefits of rights-of-way for wildlife species.

Dam Removal Assessment, Rising Paper Company, Stockbridge, MA
Project Biologist

Responsible for determining the environmental impacts and permitting effort associated with the removal of a dam from the Housatonic River. Paul reviewed available information, determined scope of work and cost estimates for further environmental assessment and remediation. PCB contaminated sediments behind the dam and shoreline wetlands were major issues of concern.

BSC GROUP

Katie
Kemen, MBA

Director of Climate Resilience Services
Senior Associate

YEARS OF EXPERIENCE
16

EDUCATION
Master of Business Administration
Simmons University

B.Sc. Public Health
The George Washington University

Project-level GHG Accounting
The Greenhouse Gas Management Institute

AFFILIATIONS
Environmental Business Council-New England, Climate Change and Air Committee

MEET KATIE
Katie brings experience in the field of emergency management and business continuity with a focus on resilient public health and healthcare systems. Much of her work has focused on regional or systems-level projects to understand risk and vulnerabilities and develop mitigation and response plans to address future risk. She is skilled at engaging diverse stakeholder groups across professional disciplines, levels of government, and from the community through analysis, planning, and implementation.

PROJECT EXPERIENCE HIGHLIGHTS

MBTA Capital Delivery Climate Resilience & Equity Metrics Development, MBTA Service Region, MA
Project Manager

Supported the MBTA in achieving its goals of climate resilience and equity by identifying key metrics for evaluation to track and increase the agency's climate change and social equity goals within Capital Delivery. Katie led a baseline analysis of MBTA, state, federal and key partner documents to identify existing goals, targets, and data for acting on and measuring climate resilience and social equity. This analysis informed the phase to develop interim climate and equity performance metrics. Additional project tasks included workshop preparation and facilitation, key stakeholder interviews, and a memorandum of findings.

Resiliency Program, Massachusetts Department of Transportation, MA
Assistant Resiliency Program Manager

Providing strategic planning, program development, and technical assistance in support of MassDOT's resiliency initiatives. Specific areas of support include program scoping, roadmap, and charter development, review and analysis of resilience regulations and funding, advising on mechanisms to incorporate climate resilience data and considerations into project development and delivery processes to support enhances resilience tracking, reporting, and grant eligibility, representing MassDOT's interests on statewide climate initiatives, and technical research, as assigned.

WITH A BACKGROUND IN PUBLIC HEALTH AND HEALTHCARE, KATIE CONNECTS THE DOTS BETWEEN BUSINESS OPERATIONS AND THEIR IMPACT ON HUMAN HEALTH AND WELL-BEING.

Katie Kemen, MBA

MVP Apple Country Natural Climate Solutions Project: Bolton, Devens, Harvard, MA
Climate Adaptation & Resilience Specialist

Involved In multi-consultant regional project to holistically assess natural resource assets and vulnerabilities and develop prioritized Nature-based Solutions to address community climate resilience and ecological carbon storage. Natural resources assessed included soils, forests, wetlands, agricultural lands, and turf/ornamental lands. Project included extensive community education and outreach, including core team, stakeholder and community-wide meetings, site walks, website with interactive data viewer mapping, ESRI StoryMaps, focused wetlands and climate change materials, and a COVID19-safe self-guided tour of natural resources throughout project area. The project and report identify site-specific NbS as well as management and regulatory strategies to improve infrastructure, social and environmental community climate resilience.

MBTA Climate Change Vulnerability Assessment, MBTA Service Region, MA
Senior Climate Adaptation Planner

Responsible for the development of a Vulnerability Assessment relative to MBTA power, signals, and communication assets within its metro-Boston service region. The project involved a robust data collection and organization effort, the development of a GIS asset mapping database, a first-order prioritization index for identified assets, and an initial vulnerability asset screening report. Katie helped develop the methodology for assessing vulnerability of MBTA's power, signal, and communications assets.

Lower Mystic Regional Climate Assessment, Resilient Mystic Collaborative, Somerville, MA
Climate Adaptation & Resilience Specialist

As part of the infrastructure assessment, Katie designed, facilitated, and evaluated a virtual tabletop exercise that examined the cascading effects among critical infrastructure failures. The Resilient Mystic Collaborative includes 7 municipalities and 15 critical infrastructure agencies ranging from energy, transportation, food distribution and healthcare working together to solve for climate resilience at a district-level – focusing on both the resilience of the underpinning infrastructure, and the impact of infrastructure failures on the resilience of vulnerable populations in the area.

Municipal Vulnerability Preparedness Planning Grant 2.0, MA Executive Office of Energy and Environmental Affairs
Project Manager

Assisting MA EOEEA in development of an updated Municipal Vulnerability Preparedness (MVP) planning grant program. As part of a vendor team, Katie led the development of technical business requirements and content for an interactive online tool "GEAR" (Guides for Equitable and Actionable Resilience). The GEAR integrates text, interactive maps, and case studies to support communities in exploring local sources of social vulnerability at the intersection of climate hazards (extreme heat, sea level rise, etc.) and community systems (food, transportation, etc.). Further, Katie led the development of several grant implementation such as training videos and resilience project implementation guides.

Vine Brook Watershed Flood and Urban Heat Island Assessment, Burlington, MA
Project Manager

Facilitated development of a suite of resilience actions intended to address urban flood impacts from extreme precipitation and urban heat island effects from anticipated extreme climate events. Oversaw ecology field work and assessments to evaluate opportunities to implement Nature-based Solutions to address anticipated impacts due to climate change. Led development of a final report focused pathways to implement regulatory, educational, and construction-based resilience strategies. Managed grant reporting activities for the client. The project included desktop and field assessments, public education and engagement, and a findings and recommendations report.

Vulnerability Assessment and Climate Action and Adaptation Plan, Bangor Area Comprehensive Transportation System, Bangor, ME
Project Manager

Leading a multi-firm project team responsible for conducting a regional climate vulnerability analysis, greenhouse gas Inventory, and climate action and adaptation plan for Bangor, Orono, and nine surrounding communities. Serving as technical lead on the regional climate vulnerability assessment.

Chris Hardy

RLA, LEED AP+ND, CA

Landscape Architect | Senior Associate

SASAKI

Chris's experience includes an array of projects around the world, ranging from master plans to complex, constructed urban landscapes. Chris focuses on the integration of ecology and culture, with a commitment to exemplary craft in the built environment.

With a conservation biology and community design background, Chris has a particular passion for developing solutions to ecological and climate design problems through community processes and the use of technology. Chris has been the principal investigator for Sasaki's landscape Carbon Conscience research team from 2019 to the present. This project includes building both landscape and architectural datasets and translating them into a free and accessible design application, providing carbon metrics for planning and urban design analysis.

Prior to Sasaki, Chris worked at SWA San Francisco and earlier at MNLA in New York City. Outside of practice, Chris participates in the design community through advocacy, teaching, service, and writing. Chris serves as cochair of ASLA's Climate Action Plan Carbon and Biodiversity Subcommittee. He has taught construction technology and design studios and coauthored a book on outdoor performance facilities. Chris believes that every project is not only a design opportunity, but an opportunity to experiment, listen, and learn.

EDUCATION

Cornell University
Masters of Landscape Architecture with Honors

Duke University
Bachelors of Science in Biology, Minor in Environmental Science

ACADEMIC POSITIONS

UC Berkeley Extension
LD ARCH X405: Construction Technology II

LD ARCH X468: L-3 Studio, Neighborhood Design Studio

LD ARCH X465: Digital Landscape Graphics

LD ARCH X469: Portfolio Workshop

Cornell University
LA 4940 Environmental Toxicology for Landscape Architects.

LA 4010 Urban Design Studio

LA 4910 Introduction to Computer Graphics.

REGISTRATIONS

Registered Landscape Architect: CA

ISA Certified Arborist

LEED AP+ND

PROFESSIONAL AFFILIATIONS

CoChair of the ASLA Climate Action Committee Carbon Drawdown & Biodiversity Subcomittee

U.S. Green Building Council

American Society of Landscape Architects

International Society of Arboriculture

Sasaki LA+CE Technical Resources Group

SELECT EXPERIENCE

The Ellinikon Park; Athens, Greece

Hinitsa Bay; Porto Heli, Greece

Bonnet Springs Park; Lakeland, Florida

Cary Towne Center; Cary, North Carolina

Greenwood Community Park Master Plan and Implementation; Baton Rouge, Louisiana

NBC Universal Creative Village; Los Angeles, California

NBC Universal Studio Production District Plan; Los Angeles, California

Reston Fountain Plaza; Reston, Virginia

Sentinel Peak Specific Plan; Los Angeles, California

Smale Riverfront Park Phase 6; Cincinnati, Ohio

UCSF Parnassus Medical Campus Design Guidelines; San Francisco, California

PREVIOUS EXPERIENCE

Atherton Civic Center; Atherton, California

Foundry Sqaure, San Francisco, California

Caltrain Plaza & Streetscape; South San Francisco, California

Dublin Crossing Regional Park; Dublin, California

Golden State Warriors Chase Arena; San Francisco, California

Ironhorse Trail Park; Dublin, California

Ping Yuen Public Housing; San Francisco, California

Plaza de César Chávez; San Jose, California

Portsmouth Square Park; San Francisco, California

Truman Library Master Plan, Independence, Missouri

Springlight City, Ho Chi Minh City, Vietnam

COFCO Andingmen Project, Beijing, China

Disney Plaza, Pudong District, Shanghai, China

Disney Park Public Space, Shanghai, China

Gemdale Gangxia, Shenzen, China

Beijing International Plaza, Beijing, China

Citic Dalian, Dalian, China

Hu Lu Dao Ecocity, Hu Lu Dao, China

Governors Island Park; New York, New York

Queens West 2 Garden; New York, New York

SUNY Farmingdale Landscape Master Plan; Farmingdale, New York

Shoelace Park; New York, New York New York

Tishman Speyer Foundry III; San Francisco, California

Truman Presidential Library; Independence, Missouri

Uber Headquarters Roof Gardens; San Francisco, California

University of Cincinnati MRMU Student Housing; Cincinnati, Ohio

RESEARCH & ADVOCACY

Landscape Architecture Foundation Fellow, 2022-2023

Co-Author & Primary Researcher, "Designing with a Carbon Conscience: A web-based application to inform planning and urban design projects on potential carbon impacts." Sasaki Research Program.

Co-author "Outdoor Theatre Facilities: A Guide to Planning and Building Outdoor Theatres.", published with Southeastern Theater Conference (SETC)

SWA Post-Occupancy Coordinator 20013-2015

Patrick Curran Fellowship: The Role of Landscape in EcoDistrict Planning

DesignConnect: Co-founder of Cornell's APA award winning community design organization

Hayward's Sheriff's Office: Pro-bono design services as part of community policing strategy.

North Carolina Coastal Federation: Pro-bono design services for resiliency planning and headquarters.

Chinese Culture Center: Pro-bono design services for urban landscape furnishings

City of Chicopee: Pro-bono design services for Uniroyal Facemate Site.

AWARDS

The PLAN Awards – Shortlist, Landscape category, The Ellinikon Park; 2023

Architizer A+ Awards, Finalist, Unbuilt Sustainable Non-Residential Project, The Ellinikon Park; 2023

World Architecture Festival Awards, Winner, Carbon, Climate & Energy Category, The Ellinikon Park; 2023

Fast Co. World Changing Ideas Awards, Winner in Urban Design category, The Ellinikon Park; 2023

Landscape Architecture Foundation Fellow; 2022

American Society of Landscape Architects, Colorado Chapter, President's Award of Excellence– Analysis & Planning category The Ellinikon Park; 2022

Boston Society of Landscape Architects, Honor Award – Analysis & Planning; The Ellinikon Park; 2022

Boston Society of Landscape Architects, Merit Award – Analysis & Planning; Greenwood Community Park Master Plan and Implementation; 2022

Florida Department of Environmental Protection, Southwest District, Environmental Stewardship Achievement Award; Bonnet Springs Park; 2022

American Society of Landscape Architects, Colorado Chapter, Honor Award–Analysis & Planning category; Greenwood Community Park Master Plan and Implementation; 2021

The Architect's Newspaper, Best of Design Awards, Honorable Mention, Unbuilt – Landscape category; Greenwood Community Park Master Plan and Implementation; 2020

Cornell College of Architecture, Art and Planning, Michael Rapuano Memorial Award for Excellent in Design; 2010

American Society of Landscape Architects, ASLA Honor Award; 2010

Landscape Architecture Foundation, National Olmsted Scholar Finalist; 2010

Duke University, Dean's Research Award; 2007

SPEAKING ENGAGEMENTS

Greenbuild Conference Session, "Improve Your Carbon Drawdown: Leverage Landscape Architecture Strategies to Increase Sequestration and Resilience ," 2023

Ecological Society of America, "Understanding the role of biogenic carbon in current WPLAs: Design with a Carbon Conscience," 2023

Institute for Sustainable Infrastructure webinar, "Understanding the carbon impacts of sitework,"2023

International Living futures institute webinar, "Designing Carbon Positive Landscapes," 2023

ASLA Conference Session, "Decarbonizing Design: Planning through Details", 2022

ASLA Conference Session, "Post-Occupancy Initiative," 2015

C40 Cities, "Understanding the carbon cycles of our urban areas," 2022

Tao Zhang

ASLA, PLA, LEED AP ND, SITES AP

Landscape Architect Principal | Ecologist

SASAKI

Trained as an ecologist and landscape architect, Tao is active in the arena of ecological design, striving to bridge the gap between practice and science. As well as being mindful and invested in creative expression, he seeks inspiration from a deep understanding of the project's socioecological context.

Tao is an integral part of Sasaki's strong global practice and has led a number of award winning projects and research initiatives. He is a strong advocate for critical thinking and independent research to invigorate the profession. Tao has been published in peer-reviewed journals and speaks frequently at conferences around the world.

OFFICE LOCATION

Boston, Massachusetts

YEARS OF EXPERIENCE

17

EDUCATION

University of Michigan
Master of Landscape Architecture; Master of Science in Sustainable Systems;
PhD pre-candidate, Ecosystem Ecology

Fudan University
Master of Science in Landscape Ecology; Bachelor of Science in Natural Resources and Environment Biology

REGISTRATION

Licensed Landscape Architect: NY

LEED AP ND

SITES AP

PROFESSIONAL AFFILIATIONS

American Society of Landscape Architects

ACADEMIC POSITIONS

Harvard Graduate School of Design
Guest Lecture; 2015, 2018-2024

University of Michigan
Guest Lecturer, 2023

University of Arizona in Tucson
Guest Lecturer, 2023

University of Hawaii
Guest Lecturer, 2021

University of Washington
Guest Lecturer, 2021

University of Minnesota
Visiting Studio Critic; 2018

Massachusetts College of Art and Design
Guest Lecturer; 2017, 2020

Rhode Island School of Design
Adjunct Studio Professor; 2016 | Visiting Studio Critic; 2013, 2015, 2018, 2019, 2020

DESIGN AWARD JURY EXPERIENCE

Architizer A+Awards Jury, 2023

Cincinnati Design Awards Jury, 2022

Azure AZ Awards Jury, 2022

Boston Society for Architecture (BSA) Design Awards Jury, 2021

World Landscape Architecture Awards Jury, 2020

Landscape Architecture Foundation National Olmsted Scholars Jury, 2018

PROJECT EXPERIENCE

Beidaihe New District Master Plan; Qinghuangdao City, China

Chengdu Giant Panda Reserve; Chengdu, China

Chengdu Jinjiang Riverfront; Chengdu, China

Chengdu Longquanshan Urban Forest Park; Chengdu, China

Chengdu Olympic City Detailed Master Plan; Chengdu, China

Chengdu Tianfu Vanke City; Chengdu, China

Chongqing Waterfront; Chongqing, China

Denver Airport; Denver, Colorado

Eastern Institute of Technology International Competition for Campus Planning Design and Architectural Schematic Design; Ningbo, China

Fuxing Island Innovation District; Shanghai, China

Jiading Central Park; Shanghai, China

Jio Institute Master Plan; Mumbai, India

Lenovo R&D Campus; Wuhan, China

Light Year City Central Park; Tianjin, China

Malu Art District Conceptual Plan; Shanghai, China

New Jersey Institute of Technology New Campus in Egypt; Cairo, Egypt

Qingdao High-Speed Railyard Innovation Center Master Plan and Urban Design; Quingdao, China

Robinson Range; Austin, Texas

Samsong Bromex; Korea

Science Park IV; the Philippines

Shanghai Hongkou Soccer Stadium Urban Design; Shanghai, China

Shenzhen Buji River Redevelopment; Shenzhen, China

Suzhou Creek; Shanghai, China

University of British Columbia Campus Vision 2050; Vancouver, Canada

University of Michigan Campus Plan; Anne Arbor, Michigan

University of South Carolina Campus Plan; Columbia, South Carolina

Wuhan Yangtze River New Axis Urban Design; Wuhan, China

Xinyang University Masterplan; Xinyang, China

Yichang Landscape Master Plan; Hubei Province, China

Zhangjiabang Park; Shanghai, China

PUBLICATIONS

Zhang, T. in press. Urban Design Practice: China in Chp 11: Global Cities. Routledge Handbook of Urban Design Practice.

Pieprz, D., R. Sheth, T. Zhang. 2021. Rethinking the Future of the University Campus. Journal of Green Building. V16(3): 253-274

Pieprz, D., R. Sheth, T. Zhang. 2021. Rethinking the Future of Campus. Time + Architecture. 178: 22-29

Zhang, T. 2021. Chengdu Tianfu City Landscape. Chinese Landscape Year Book 2018-2019. 204-211

Zhang, T. 2021. Music, Science, Landscape & Leadership. Fieldbook. 11: 80-81

Grove, M., and T. Zhang. 2020. Forged By Flood: Wuhan Yangtze Riverfront. Landscape Architecture Frontiers. 8(3): 130-145

Tao Zhang. 2019. Waterfront design, beyond what's in sight, creates a greater perceptible space. Designverse.

Ocampo, M., and T. Zhang. 2018. Living with Water: Embracing Cultural Adaptions to Floods. Eco-Business.

Zhang, T., and M. Grove. 2018. A discourse on Landscape Architecture: At the Intersection of Design, Ecology, Resilience, and Research. Landscape Architecture Frontiers. Vol. 034: 54-61 [peer reviewed]

Grove, M., and T. Zhang. 2017. Shanghai Suzhou Creek Urban Design. Landscape Architecture Frontiers. Vol. 025:110-121

Grove, M. and Zhang, T. 2016. Shanghai Zhangjiabang Urban Design and Landscape Masterplan. Landscape Architecture Frontiers. Vol. 021:70-85

Grove, M. and Zhang, T. 2016. Evidence-based design in Shanghai: large parks as a palette of ecosystem services, economic opportunity, and social inclusion. Tasting the landscape. 53rd IFLA World Congress Proceedings: 229.

Grove, M. and T. Zhang. 2016. An agricultural economy for 21st century Beijing: Songzhuang art and agriculture city. Tasting the landscape. 53rd IFLA World Congress Proceedings: 60-61

Zhang, T. etc. 2015. Zhangjiabang Park. World Landscape Architecture Magazine. WLA 23, Annual: 46-49

Zhang, T. 2015. Water as a resource and inspiration of my design. Landscape Record. Vol. 1/2015.02: 120-122

Wang, Z., PY Tan, Zhang, T., and J Nassauer. Perspectives on narrowing the action gap between landscape science and metropolitan governance: Practice in the US and China. Landscape and Urban Planning 125:329-334 [peer reviewed], 2014

SELECT AWARDS

The Plan Awards, Public Space Winner, Shenzhen Pingshan Blueway Corridor, 2023

ASLA, Urban Design Honor Award: Jiading Central Park, 2020

Society for College and University Planning, Merit Award for Excellence in Planning for a New Campus, Jio Institute Campus Master Plan; 2023

MIPIM Asia, Winner, Best Urban Regeneration Project category: Chengdu Jin Riverfront Park Master Plan, 2022

World Architecture Festival and Awards, Highly Commended, Urban Context – Landscape category: Jiading Central Park, 2021

THE PLAN AWARD, Shortlist, Urban Planning category: Chengdu Jin Riverfront Park Master Plan, 2021

World Architecture Festival and Awards, Shortlist, Masterplanning – Future Project category: Chengdu Panda Reserve, 2021

Boston Society of Landscape Architects, Honor Award – Analysis & Planning: Chengdu Jin Riverfront Park Master Plan, 2021

Shanghai Design Awards, Silver in the Architecture – Proposed Category: Xinyang University South Bay Campus Master Plan, 2021

Asia Pacific Urban Land Institute (ULI) Excellence Award, Finalist: Jiading Central Park, 2021

EVAN M. MILLER

SR. PROJECT MANAGER

508.322.4162
EMILLER@ADMAKEPEACE.COM
PLYMOUTH, MA

FOCUS

Landscape Architecture, Planning and Development at Redbrook, a 1,400 Acre Conservation-Based Subdivision in Plymouth, MA. Research and Development for emerging engineered soils trends at Read Custom Soils, New England's most experienced precision soil blender in Wareham, MA.

SKILLS & ABILITIES

Registered Landscape Architect focusing on community development and residential planning, design, and permitting through construction. Leveraging that background, I oversee the crossover between emerging trends within the Landscape and Construction industry and engineered and precision blended soils.

EXPERIENCE

2021-Present	**Sr. Landscape Architect for Project Development** Redbrook Residential Community Project Management, Design and Permitting through Construction.
2021-Present	**Research and Development for Engineered Soils** Read Custom Soils Identify emerging trends within the Landscape Architecture Industry to build relationships.
2011-2021	**Landscape Architect** VHB Provide design, management, and hand rendered and computer-generated graphics for landscape architecture and planning projects in a variety of disciplines including university and campus design, commercial, mixed-use, office and institutional, healthcare, TOD Transit Oriented Design, Stadium, streetscape, and parks and recreation design.
2005-2011	**Associate Landscape Designer** HadenStanziale Management of multiple concurrent design projects. Duties included proposal, scope, and budget writing; scheduling and management of production staff; project design and production, business development, client interaction and response, product and vendor research, consultant management, specifications, construction administration and project bidding, cost estimates; production of graphics and rendering (plan/section/elevation/perspective); and construction drawing and design review.

2010-2011	**Adjunct Professor** North Carolina State University Co-teacher of graduate level Landscape Architecture Description Studio. Guided 30 students through the process of describing landscapes by systematically analyzing their natural and cultural systems and experiential qualities to comprehensively define design problems and inform design decisions. Developed curriculum for reading, writing, site observation, precedent study, user input, and participatory activities in urban and non-urban settings.
2000-2002	**Staff Archaeologist** Thomas Jefferson's Poplar Forest Conducted Phase I, II, and III archaeological investigations at an early 19th-century history museum. Performed field excavations, laboratory processing of artifacts, conducted site tours, assisted in student instruction during annual University of Virginia field school and summer teacher's continuing education programs, attended and presented research papers at national and regional archaeology conferences.

EDUCATION

May 2005	**Master of Landscape Architecture** North Carolina State University
May 2000	**Bachelor of History** Gettysburg College

COMMUNICATION

Strong written and verbal communication skills, including the ability to provide constructive feedback and collaborate effectively with writers, editors, and other stakeholders.

LEADERSHIP

Ability to manage multiple projects simultaneously and meet tight deadlines, while maintaining the highest standards of quality.

PETER S. LORENZ

7 Woodfield Road, Wellesley, MA 02482 ● peterslorenz@gmail.com ● 925-324-5758

Versatile and highly-effective leader with an extensive, successful background in leading organizations to result-oriented goals, financial gains, and developing and conveying communications messages in a strategic, articulate, and thoughtful manner. Proven track record in motivating diverse workforce, improving operational efficiency, and delivering impactful results. Success managing crisis communication and proactively expressing ideas and agendas in fast-paced environment with the public, executives, stakeholders, and media. Well-respected and highly-regarded amongst colleagues, senior executives, and external partners.

PROFESSIONAL EXPERIENCE

Vice President, Business Development and Policy March 2023 - Present
A.D. Makepeace Companies – Wareham, MA

Lead corporate initiatives on behalf of The A.D. Makepeace Company, North America's largest cranberry grower, and Read Custom Soils, New England's largest and most experienced sand and soil manufacturer, to grow current revenue while identifying new business opportunities in Massachusetts and New England. Leverage existing product with Company desire to reduce carbon emissions, expand onsite renewable energy, and diversify portfolio of assets – including residential and commercial real estate holdings. Direct efforts to advance company policies and objectives involving local, state, and federal government affairs. Develop, maintain, and expand relationships with associated governmental and regulatory bodies and committees, stakeholders, and business organizations.

Chief of Staff March 2021 - March 2023
Executive Office of Energy and Environmental Affairs - Boston, MA

Responsible for management and day-to-day operation of 2,700 person organization with $300 million annual budget. Build and manage organizational systems for communication and information flow for statewide workforce. Lead communications team of twelve in rapid response and crisis communications efforts while planning media strategy to align with policy objectives. Trusted advisor to senior executives advising on vision and messaging for initiatives relative to clean energy technologies, climate change policy, public utility regulation, and environmental protection. Represent organization before Governor of Massachusetts, state-appointed boards of directors and commissions, media, and external corporations. Coordinate messaging and policy decision making on issues with statewide impact and serving as national models including offshore wind procurements and deployment of climate change strategies. Direct responsibility for high-level human resources decision making and problem resolution. Oversee other functions including human resources, operations, finance, and government relations.

Senior Advisor to the Secretary June 2019 – March 2021
Executive Office of Energy and Environmental Affairs - Boston, MA

Served as chief advisor to Governor-appointed cabinet Secretary tasked with protecting the Commonwealth's environmental resources, securing clean energy resources, and accelerating climate change efforts. Provided Secretary and senior administration officials with guidance on development of policy initiatives and communications strategy. Fostered and leveraged relationships with external stakeholders to promote legislative initiatives and message vision of the Executive Office composed of 2,500 employees. Developed and continuously enhanced communications plan designed to build awareness and support of energy and environment policy agenda of the Governor of the Commonwealth.

Assistant Secretary of Communications January 2019 – June 2019
Executive Office of Energy and Environmental Affairs - Boston, MA

Strategically aligned energy and environmental legislative and policy initiatives of the Governor of the Commonwealth with coordinated, targeted messaging to local and national media. Consulted with the Office of the Governor about long-term media strategies on behalf of the Commonwealth as it relates to both communications and public policy. Served as primary on-the-record spokesman for cabinet-level secretariat. Problem-solved and managed crisis communications while collaborating with Secretary, Chief of Staff, and other senior team members on issues of public affairs. Executed daily roles and responsibilities while continuing to oversee twelve person communications team.

Communications Director January 2015 – December 2018
Executive Office of Energy and Environmental Affairs - Boston, MA

Developed and managed strategic communication plans for the Commonwealth's energy and environment agencies. Coordinated the communications operations, including daily media responses and proactive/earned media opportunities on behalf of a cabinet-level secretariat composed of nine agencies. Maintained close working relationships with members of local and national media outlets as on-the-record official to ensure accurate and timely reporting of matter relating to the energy and environmental agenda of the Governor. Managed a team of twelve communications professionals tasked with the coordinated delivery of a state-wide and national media strategy.

Massachusetts House of Representatives – Boston, MA
Communications Director March 2011-December 2014
Deputy Communications Director August 2010-February 2011
District Affairs Associate October 2009-February 2011

Quickly rose to manager-level position ultimately entrusted with defining, developing, and implementing a state-wide media strategy for minority party in the House of Representatives. Formulated and delivered Party and Caucus message to local and national press organizations. Cultivated relationships with large and small market print and broadcast media. Leveraged opportunities to represent elected officials as on-the-record spokesman. Drafted talking points, press releases, media advisories, speeches and social media content for Minority Leader and Caucus which is in-turn distributed to over 500 individuals and media outlets. Routinely advised elected officials on messaging and media strategy. Composed content and oversaw production of numerous digital and social media platforms.

EDUCATION

Bachelor of Arts, Journalism April 2008
Northeastern University — Boston, MA

Appendix 3: Letters of Support

January 30, 2024

Tom Anderson, Executive Secretary
Commission for Conservation of Soil, Water & Related Resources
Office of Energy & Environmental Affairs
100 Cambridge Street, 9th Floor
Boston, MA 02114

Dear Mr. Anderson,
Built Environment Plus would like to express our support for Regenerative Design Group's (RDG) proposal to develop **A Guide for Implementing the Healthy Soils Action Plan in Design and Construction** as a response to the Challenge Grants Implementing the Commonwealth's Healthy Soils Action Plan (HSAP).

This project will address a gap between the current understanding of Soil Organic Carbon (SOC) and the standards of practice in the design and construction industries. We need a roadmap and industry enthusiasm for soil health, and by engaging a cross-section of professionals in construction, development, engineering, and design in a series of coordinated events this project will raise the level of understanding and commitment to protecting and building healthy soils in development projects across the state.

Built Environment Plus, formerly known as the USGBC Massachusetts Chapter, is a membership-based community organization advocating and educating for a green built environment at the state and local level. Built Environment Plus provides green building education, networking, advocacy, and leadership opportunities for the sustainable building practitioner, across disciplines, in the community and beyond. Our events and programming are supported and enhanced by the volunteer efforts of our community members.

I wholeheartedly endorse Regenerative Design Group's application for the Healthy Soils Challenge Grant and we are committed to supporting the execution of the project with in-kind education and outreach as well as specific supported convening activities. If further information or clarification is required, please do not hesitate to contact me.

Thank you for considering this letter of support, and I look forward to witnessing the positive impact that these projects will undoubtedly have on the soil health of Massachusetts.

Sincerely,

Meredith Elbaum, Executive Director
Built Environment Plus

Address: PO BOX 366, Somerville, MA 02143
Website: https://builtenvironmentplus.org
Phone: 617-752-2422
Email: meredith@builtenvironmentplus.org

BSLA
Boston Society of
Landscape Architects

TO Tom Anderson
100 Cambridge Street
9th Floor
Boston, MA 02114

RE Challenge Grants Implementing the Commonwealth's Healthy Soils Action Plan

DATE January 31, 2024

Dear Mr. Anderson,

The Boston Society of Landscape Architects (BSLA) would like to express our strong support for Regenerative Design Group's (RDG) proposal to develop **A Guide for Implementing the Healthy Soils Action Plan in Design and Construction** as a response to the Challenge Grants Implementing the Commonwealth's Healthy Soils Action Plan (HSAP).

This project will address a gap between the current understanding of Soil Organic Carbon (SOC) and the standards of practice in the design and construction industries. We need a roadmap and industry enthusiasm for soil health, and by engaging a cross-section of professionals in construction, development, engineering, and design in a series of coordinated events this project will raise the level of understanding and commitment to protecting and building healthy soils in development projects across the state.

Since 1913, BSLA has served as the professional organization for landscape architects in Massachusetts and Maine. Our membership includes over 600 landscape architects, and our audience includes several thousand in the larger design and construction industry across New England who regularly engage in our programs, publications, and events. **BSLA will support the dissemination and adoption of the Guide for Implementing the HSAP in Design + Construction.** Specifically, we expect that this support will include (but not be limited to):

- Dedicate an article to the program in the BSLA *Fieldbook* fall 2024 edition (in print and online)
- Host a free webinar with the project team to introduce the project to BSLA members and the New England landscape design and construction industry
- Host a free educational site tour to examine ideas and examples from the Guide

BSLA wholeheartedly endorses Regenerative Design Group's application for the Healthy Soils Challenge Grant and believes that this project will significantly contribute to the objectives set forth in the HSAP. For further information or clarification, please do not hesitate to contact me at gretchen@bslanow.org or 617 686 4362.

Thank you for considering this letter of support. We look forward to witnessing the positive impact that these projects will undoubtedly have on the soil health of Massachusetts.

Sincerely,

Gretchen Rabinkin AIA, Affiliate ASLA
Executive Director, Boston Society of Landscape Architects

READ CUSTOM SOILS

Experience. Quality. Consistency.

January 31, 2024

Tom Anderson
Executive Office of Energy and Environmental Affairs
100 Cambridge Street
9th Floor
Boston, MA 02114

Dear Mr. Anderson,

On behalf of Read Custom Soils, I would like to express support for Regenerative Design Group's (RDG) proposal to develop **A Guide for Implementing the Healthy Soils Action Plan in Design and Construction (Guide)** as a response to the Challenge Grants implementing the Commonwealth's Healthy Soils Action Plan (HSAP).

This project will address a gap between the current understanding of Soil Organic Carbon (SOC) and the standards of practice in the design and construction industries. By engaging a cross-section of professionals in construction, development, engineering, and design in a series of coordinated events this project will raise the level of understanding and commitment to protecting and building healthy soils in development projects across the Commonwealth.

Read Custom Soils, a division of the A.D. Makepeace Company, is planning to host an event this fall in coordination with the Boston Society of Landscape Architects (BSLA) to discuss the importance and value of engineered soils in the built environment. We welcome Regenerative Design Group and the Project Team to present the recommendations from the Guide during this event and future related events.

I am excited to endorse Regenerative Design Group's application for the Healthy Soils Challenge Grant. This project aligns seamlessly with the objectives outlined in the HSAP, and I anticipate the substantial positive impact it will make on the soil health of Massachusetts. Should you need additional information or clarification, please feel free to reach out to me.

Sincerely,

Christopher J. Ierardi
Vice President and General Manager

Massachusetts Association of Conservation Commissions
protecting wetlands, open space and biological diversity through education and advocacy

January 29, 2024

Thomas Anderson
Executive Office of Energy & Environmental Affairs
100 Cambridge Street, 9th Floor
Boston, Massachusetts 02114

RE: Support for Regenerative Design Group for Healthy Soils Action Plan Proposal

Dear Mr. Anderson:
Massachusetts Association of Conservation Commissions (MACC) supports Regenerative Design Group's (RDG) proposal to develop **A Guide for Implementing the Healthy Soils Action Plan in Design and Construction** as a response to the Challenge Grants Implementing the Commonwealth's Healthy Soils Action Plan.

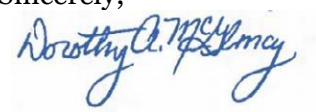
This project addresses a gap between the current understanding of soil organic carbon and the standards of practice in the design and construction industries. A "roadmap" is needed to outline the importance of soil health, and by engaging a cross-section of professionals in construction, development, engineering, and design in a series of coordinated events, this project will raise the level of understanding and commitment to protect and build healthy soils in development projects across the Commonwealth.

MACC provides environmental education and assistance to more than 2,500 conservation commissioners throughout Massachusetts each year. Municipal and state staff, energy industry professionals, consultants, attorneys, and non-profit organizations participate in our environmental training programs and conferences. We are a leading advocate for environmental protection, and we participate in governmental advisory committees, provide comments on environmental regulations, and advocate for strong, science-based legislation.

Our Annual Environmental Conference is the largest environmental conference of its kind in New England. Each year, more than 700 participants come together to learn about climate resilience and innovative environmental programs designed to protect wetlands, open space, and natural resources. We welcome Regenerative Design Group and the Project Team to present valuable information about healthy soils to our members at Lunch & Learn webinars, in-person training classes, and conference workshops.

We support Regenerative Design Group's application for the Healthy Soils Challenge Grant. They will be a great asset to this project. Thank you for considering this letter of support.

Sincerely,



Dorothy A. McGlincy
Executive Director
dorothy.mcglincy@maccweb.org

10 Juniper Road / Belmont, MA 02478
Phone: 617-489-3930 / Fax: 617-489-3935 / www.maccweb.org

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(413) 658-7048

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