

Joseph Famely, M.E.M.

Senior Environmental Scientist

EXPERTISE

Focused on environmental and sustainability planning, Mr. Famely has expertise in assessing climate change vulnerability and risk for infrastructure and natural resources, and developing adaptation and resiliency plans for communities and organizations. As a trained provider in the Massachusetts Municipal Vulnerability Preparedness (MVP) Program, he has facilitated community engagement workshops following the Community Resilience Building Framework and successfully obtained funding through the MVP Action Grant program.

In addition to numerous sea level rise and storm surge vulnerability assessments in the New England region, he has developed customized greenhouse gas assessment tools to help organizations benchmark and track their carbon footprints and prepare sustainability reports, and led strategic land use planning projects.

Mr. Famely's background in risk assessment, urban ecology, and environmental design brings a systems thinking approach to projects and facilitates collaboration with engineering and design professionals, as well as with clients and stakeholders.

QUALIFICATION SUMMARY

- 18 years' experience in the environmental science and planning
- Certified MA Municipal Vulnerability Preparedness Program Provider
- Climate change vulnerability assessment / adaptation planning
- Land use sustainability planning and metrics
- Greenhouse gas inventory and sustainability reporting
- Environmental impact statements
- Ecological risk assessment
- Project management and grant writing

WORK EXPERIENCE

2009–Present	Woods Hole Group, Inc. (Senior Environmental Scientist)
2011–2012	Except Integrated Sustainability (Sustainability Consultant)
2009–2012	Anthrology (Sustainability Consultant)
2008	Yale Urban Design Workshop (Sustainability Planning Fellow)
2006–2007	Exponent (Environmental Scientist)
2000–2006	Menzie-Cura & Associates (Environmental Scientist)



Education

2009 – M.E.M.
Yale School of Forestry & Environmental Studies

2000 – B.A.
Bowdoin College

Licenses & Registrations

- MA EOEEA Municipal Vulnerability Preparedness (MVP) Program Provider
- OSHA 40-Hour HAZWOPER

Publications & Presentations

7

KEY PROJECTS

Sandwich Municipal Vulnerability Preparedness Program

MVP Lead Facilitator

Led the Sandwich Community Resilience Building workshop following guidelines for the MA EOEAA Municipal Vulnerability Preparedness (MVP) Program. Presented the Community Resilience Building framework and regionally downscaled climate change projections, and discussed potential hazards and risks. Guided stakeholders and workshop facilitators in assessing local vulnerability of infrastructure, environmental and societal assets, and developing and prioritizing actions to reduce vulnerability and increase resilience throughout the community. Led the preparation of the Summary of Findings report, and wrote a successful MVP Action Grant (\$88,025) that enabled the Town to fund a detailed sea level rise and storm surge vulnerability assessment for infrastructure and natural resources.

Falmouth Municipal Vulnerability Preparedness Program

MVP Facilitator

Facilitated stakeholder engagement on climate change vulnerability and adaptation for the Falmouth Community Resilience Building workshop following guidelines for the MA EOEAA Municipal Vulnerability Preparedness (MVP) Program. Guided stakeholders in assessing local vulnerability of infrastructure, environmental and societal assets, and developing and prioritizing actions to reduce vulnerability and increase resilience throughout the community.

Provincetown Municipal Airport Coastal Vulnerability Assessment

Project Manager

Developed sea level rise and storm surge vulnerability assessments for present and potential future impacts to the Provincetown (MA) Municipal Airport under two scenarios – closed and opened tidal gates at the Hatches Harbor dike road. The vulnerability assessments were used to inform adaptation and resiliency planning for the airport.

Environmental Permitting for Dredging and Dredge Materials Management in Support of Electric Boat Facilities Master Plan

Technical Lead, Greenhouse Gas Assessment

Preparing an alternatives analysis for the comparative carbon footprints of two dredging and dredge material disposal alternatives.

MassDOT I-90 Allston Interchange Project Environmental Impact Report

Environmental Planner

Assessed climate change vulnerability (including sea level rise, storm surge, and heat) for existing conditions and multiple design alternatives for a major urban highway realignment project environmental review. Authored EIR sections on climate change impacts, as well as described design features and specifications (mitigation) that would enhance system resiliency for the future.

KEY PROJECTS (CONTINUED)

MBTA Blue Line Vulnerability Assessment and Adaptation Prioritization

Technical Lead, Geospatial Analysis

Developing vulnerability assessments for sea level rise and storm surge impacts to Aquarium and Maverick T Stations and supporting infrastructure. The assessments will include probability and depth of inundation, flood residence time, and detailed flood pathway analyses to inform Blue Line climate resiliency planning.

Boston Harbor Barrier Alternatives Evaluation

Technical Lead, Geospatial Analysis

Developed a detailed inventory of district shoreline solutions necessary throughout the Boston region over time (to 2100) to plan adequate protection under various Harbor Barrier and No Harbor Barrier alternatives. Also analyzed the areas of avoided flood risk over time based on these adaptation alternatives. Both assessments informed the benefit/cost analyses in the “*Feasibility of Harbor-wide Barrier Systems Preliminary Analysis for Boston Harbor*” report.

Palm Beach (FL) Coastal Vulnerability Assessment and Adaptation Prioritization

Technical Lead, Geospatial Analysis

Developing a sea level rise and extreme weather vulnerability and risk assessment for the Town of Palm Beach, Florida. Coordinating with Town staff to obtain sea wall elevations to fill data gaps for the vulnerability assessment, and to develop a consequence of loss scoring matrix for all Town infrastructure to inform the risk assessment and help prioritize adaptation investments.

Trustees of Reservations Coastal Vulnerability Assessment and Adaptation Prioritization

Technical Lead, Geospatial Analysis

Prepared vulnerability assessment, based on results of a highly resolved sea level rise and extreme weather model, for all Trustees of Reservations coastal properties. Worked closely with Trustees’ staff to develop a coastal vulnerability index for all assets, including infrastructure, habitats, endangered species, natural resource recreational areas, and historical/cultural resources, which will inform prioritization of resilience projects across 30+ properties.

Stonington (CT) Coastal Vulnerability Assessment and Adaptation Prioritization

Technical Lead, Geospatial Analysis

Prepared vulnerability maps, based on results of the U.S. Army Corps of Engineers’ North Atlantic Coast Comprehensive Study (NACCS) extreme weather model, for a coastal community in Connecticut with multiple tidally-influenced rivers and embayments. Vulnerability maps were then used to support emergency preparedness and adaptation scoping over various planning horizons – present day, 2030, and 2070.

Ecological Risk Assessment Review and Development of Cleanup Goals

Project Manager/Environmental Scientist

Conducted a technical review of a Stage II ecological risk characterization for a former printing facility in Massachusetts, and developed recommendations for finalization and submittal. Developed risk-based remedial goals for cadmium in sediment and wetland soil, and oversaw a sediment coring program to determine the vertical and horizontal extents of cleanup.

KEY PROJECTS (CONTINUED)

Sea Level Rise and Storm Surge Inundation Mapping for Great Marsh Communities

Technical Lead, Geospatial Analysis

With funding from a Hurricane Sandy Coastal Resiliency Grant, and in partnership with National Wildlife Federation and USGS, prepared vulnerability maps for six Essex County (MA) communities based on results of a highly resolved sea level rise and extreme weather model. Vulnerability maps were then used to support emergency preparedness and adaptation planning, with specific emphasis on nature-based solutions.

Climate Change and Extreme Weather Vulnerability Assessments for Massachusetts Coastal Communities

Technical Lead, Geospatial Analysis

Prepared vulnerability maps, based on results of a highly resolved sea level rise and extreme weather model, for a number of Massachusetts coastal communities, including: Gloucester, Swampscott, Revere, Winthrop, Chelsea, Everett, Malden, Medford, Somerville, Cambridge, Boston, Quincy, Hingham, Hull, and Oak Bluffs. Vulnerability maps were then used to support emergency preparedness and adaptation scoping over various planning horizons – present day, 2030, and 2070.

MassDOT – FHWA Pilot Project for Climate Change and Extreme Weather Vulnerability Assessments and Adaptation Options of the Central Artery

Technical Lead, Geospatial Analysis

GIS analyst on a technically advanced, leading-edge pilot project for the Federal Highway Administration evaluating vulnerability to sea level rise and extreme weather events for the Central Artery in Boston, MA using a highly resolved, numerical processes model. Contributed to the development of a geodatabase of infrastructure assets for vulnerability assessment and evaluation of adaptation options. Performed model post-processing and QA/QC, and prepared asset vulnerability maps to support vulnerability assessment, emergency response planning, and adaptation planning.

CTDOT SEIS for the Designation of Dredged Material Disposal Site(s) in Eastern Long Island Sound

Project Manager

Collaborated with partners at Louis Berger and the University of Connecticut to develop the Supplemental EIS evaluating dredged material disposal site alternatives in Eastern Long Island Sound. Developed analyses of sediment toxicity and bioaccumulation, calculated a dilution criterion for ocean disposal suitability from suspended particulate phase toxicity tests, and authored relevant sections of the SEIS.

Sesuit Harbor Use and Capacity Study

Project Manager

Lead a team of engineers, marina development advisors, and landscape architects in the preparation of a master plan for a municipal marina in Dennis, MA. Analyzed current use and capacity, land and water assets, harbor regulations and by-laws, fee structure, and marina operations and maintenance. Provided the Town with recommendations and cost estimates for land and water improvement design alternatives, and recommendations for changes to administrative and capital processes, to support the safe and efficient operation of the harbor.

KEY PROJECTS (CONTINUED)

Boston Coastal Climate Change Adaptation and Engineering Alternatives

Technical Lead, Geospatial Analysis

Developed a range of sea level rise and storm surge scenarios using LIDAR data and a customized GIS connectivity analysis to evaluate potential risk to property and critical infrastructure. Supported the development of preparedness plans and engineering adaptations for two sites in Boston – Long/Central Wharves and UMass Boston, which were presented in the Boston Harbor Association’s “*Preparing for the Rising Tide*” report.

Groton (CT) Coastal Climate Change Adaptation and Engineering Alternatives

Technical Lead, Geospatial Analysis

Worked with Battelle Ocean Sciences and the University of Southern Maine on assessing the impacts of climate change on coastal communities of Groton, Connecticut. Specifically, the regions of Groton Long Point and the infrastructure surrounding the Mystic River were evaluated. The evaluation included the impacts of sea level rise and storm events on potential flooding using LIDAR data and a customized GIS connectivity analysis. For each location, supported the development of conceptual designs for engineering adaptation alternatives. The alternatives ranged from management approaches (e.g., evacuation, floodproofing of structures, etc.), to soft-engineering options (e.g., beach nourishment, creation of wetlands, etc.), to more significant hard engineering structures (e.g., modular seawalls, revetments, tide gates, hurricane barriers, etc.).

Seagrass Restoration Optimization Strategies in a Changing Climate: Southern New England and New York

Environmental Scientist

Evaluated the interactive effects of multiple stressors (eutrophication, climate-induced heat stress, sea-level rise-induced light reduction) on the potential success of future seagrass conservation and restoration efforts. Assisted in the development of a database cataloguing relevant characteristics of 170 embayments from Long Island to Cape Cod – including estuarine area and volume, estuarine flushing time, watershed nitrogen loading, sediment physical characteristics, and extent of current or historical seagrass. Contributed to nitrogen loading analyses for twenty selected embayments and ranked overall risk to stressors. The Nature Conservancy uses this tool to prioritize investments in restoration projects, adjoining land preservation, and local changes in policy and planning.

Ecological Risk Assessment in a Tidally Influenced Freshwater Wetland and Creek in Fairfield (CT)

Environmental Scientist

Conducted a baseline ecological risk assessment for a former metals facility in Connecticut. Planned and led field investigations, managed data analysis, and authored risk characterization report. The analysis included modeling risks to ecological receptors in the wetland and creek from metals and polycyclic aromatic hydrocarbons.

Ecological Risk Assessment in a Riparian Environment in Canton (MA)

Project Manager/Environmental Scientist

Conducted a Stage I and Stage II ecological risk characterization for a former rubber and vinyl tape facility in Massachusetts. Planned and led field investigations, managed data analysis, and authored risk characterization

KEY PROJECTS (CONTINUED)

report. The analysis included modeling metals and polycyclic aromatic hydrocarbons in fish and plant tissue from sediment concentrations.

Eastham (MA) Conservation Land Inventory and Analysis

Project Manager

Conducted an inventory of conservation land in Eastham, including private, municipal, and nonprofit land trust-owned parcels. Reviewed Registry of Deeds documents and relevant Massachusetts conservation law to supplement parcel data with information on the date, method and purpose of protection, the custodian of the protected land, the level of protection, and the existence of wetlands, unrestricted areas, or building envelopes. The work product included a database of conservation land which is hyperlinked to all Registry of Deeds and Town of Eastham documents relevant to the conservation restrictions and readily appended to the Town's GIS system. The analysis included recommendations for increasing the level of protection on conservation lands.

Yale Community Carbon Fund Calculator

Technical Lead, Transportation and Solid Waste Emissions

Developed a greenhouse gas emissions model for the Yale Office of Sustainability to calculate emissions related to travel, commuting, and events associated with the Yale University community. The calculator is a web-based application which includes integrated explanatory text and a standalone report on methodology. The tool enables members of the community to determine the appropriate quantity of emissions to offset with an online donation to the Yale Community Carbon Fund, which supports carbon mitigation projects for organizations and low-income households in New Haven.

Long Island Sound Dredged Materials Management Planning

Environmental Scientist

Conducted a review of literature on dredge materials management and environmental data for Long Island Sound. Reviewed potential sites throughout the Sound for alternative placement of dredge materials – including beach nourishment via direct placement, upland beneficial use, shoreline confined disposal, and nearshore placement for beach nourishment and shoreline protection. Reviews of alternatives included site visits and desktop review (in an ArcGIS environment) based on spatial analysis of environmental, physical, cultural, and infrastructure impacts of project development. Prepared a synthesizing report in support of the USACE's Dredged Materials Management Plan for Long Island Sound.

Delaware Estuary Regional Sediment Budget

Technical Lead, Geospatial Analysis

Performed an estuary-wide analysis of historical shoreline change to derive a sediment source term for the fine sediment budget. Using synoptic historical shoreline data and sediment properties data for the wetland coast, calculated the surface area of the estuarine shore lost and gained between the 1880s and 2008, as well as the mass of mineral or organic sediment produced through time. The time-averaged rate of sediment production by shore erosion was then used for the sediment budget analysis, prepared for the USACE Philadelphia District.

KEY PROJECTS (CONTINUED)

Shoreline Change Analyses for Private Properties on Long Island

Technical Lead, Geospatial Analysis

Conducted numerous quantitative spatial analyses of shoreline and dune movement over time in support of Coastal Erosion Hazard Area evaluations in New York. Analyzed multiple historical aerial photographs to digitize the shoreline and calculate long-term rates of change along transects through the beach and dune. Summarized results and recommended changes in the delineation of resource areas based on review of the data with respect to the New York State Coastal Erosion Management Regulations.

New Bedford Harbor Superfund Site

Environmental Scientist

Data analysis and technical reporting in support of Remedial Investigation and Feasibility Study for New Bedford Harbor Operable Unit #3. Analyzed sediment and tissue chemistry data along with toxicity tests and benthic community data to support management decisions in areas outside the harbor. Supported the development of the ecological risk assessment, which was submitted to USACE and USEPA.

Greenhouse Gas Impacts Modeling for a New York Real Estate Development Environmental Review

Project Manager/Technical Lead, Greenhouse Gas Assessment

Developed a greenhouse gas model to evaluate the impacts of multiple development alternatives for a proposed socially- and environmentally-conscious resort and residential community development's Environmental Impact Statement under the New York State Environmental Quality Review process. Prepared summary tables and text for the EIS submittal as well as a full report documenting the methodology and results.

Greater Dwight Development Corporation Neighborhood-Scale Sustainability Master Plan

Environmental Planner

In collaboration with the Yale Urban Design Workshop, developed a neighborhood-scale sustainability plan for a nonprofit community-based development organization in New Haven, CT. The master plan included spatially-informed sustainability metrics (carbon, water, air pollution, greenspace, social, etc.) and suggested projects for continuous improvement.

Materials Flow Analysis on the Island of O'ahu

Environmental Scientist

Researched and prepared report on material flows in the sectors of imports, exports, and natural resource extraction on the island of O'ahu for the Hawaii Community Foundation. The industrial ecology research aggregated available public data and supplemented with phone and field interviews. The report summarized findings and proposed strategies for the optimization of material flows on an isolated island.

PUBLICATIONS AND PRESENTATIONS

Hoffnagle, B, J Famely, T Wickwire, T O'Shea, V Antil. 2017. Poster Presentation: The Use of a Coastal Vulnerability Assessment to Prioritize Habitat Adaptation Strategies in Response to Future Climate Change. Cape Cod Natural History Conference, Barnstable, MA. March 11, 2017.

PUBLICATIONS AND PRESENTATIONS (CONTINUED)

Wickwire T.W. and J. Famely. 2016. The Value of GIS and the Ecological Risk Framework for Analyzing Climate Vulnerability of Ecological Assets. ECO: Environmental Coastal and Offshore, October 2016; 18-22.

Bain, A., N. Caruso, J. Famely, R. Herzl, and J. Wu. 2009. Master Plan for Nusajaya / Zone B, Iskandar, Malaysia. Yale School of Architecture Retrospecta 08-09.

Famely, J. 2008. Adapting Vernacular Architecture for Sustainable and Restorative Environmental Design Elements. Presented Urban Villages, Inc.

Famely, J., E. Gladek, and C. Ziemba. 2008. Material flows on the island of Oahu: Imports, exports, and resource extraction. New Haven: Yale Center for Industrial Ecology.

Von Stackleberg, K., C. Amos, C. Butler, T. Smith, J. Famely, M. McArdle, B. Southworth, and J. Steevens. 2006. Screening Level Ecological Risk Assessments of Some Military Munitions and Obscurantrelated Compounds for Selected Threatened and Endangered Species. ERDC-TR-06-11. Engineer Research and Development Center – Construction Engineering Research Laboratory. Champaign, IL.

Famely, J., W.T. Wickwire, and C.A. Menzie. 2005. Assessment and planning approaches in watershed assessment: The embayment eutrophication case study. New England Estuarine Research Society, Spring, 2005 Meeting, Eastham, MA, April 27, 2005.