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4th Annual MassFM Conference

October 23, 2023
College of the Holy Cross
1 College Street

8:30 AM-6:00 PM
Hogan Campus Ballroom
Worcester, MA

massachusetts association for floodplain management

FULL AGENDA (PRELIMINARY)

8:30 Registration (coffee and light breakfast bites)

9:00 Welcome

9:10 KEYNOTE - THE GREAT VERMONT FLOOD OF JULY 2023
Stephanie Smith, State Hazard Mitigation Officer, Vermont Emergency Management

10:10 SESSION 1 -NEW STATE INITIATIVES FOR FLOOD RESILIENCE

1.1 New Resources to Support Flood Resilience in Massachusetts
Edwin Sumargo, State Climatologist, EOEEA, Office of Climate Science
Marybeth Groff, Coordinator, MEMA Hazard Mitigation and Climate Adaptation
Margot Mansfield, Assistant Climate Scientist, EOEEA, Office of Climate Science

1.2 Climate-Informed Design Precipitation for Massachusetts
Caitlin Spence, Assistant Climate Scientist, EOEEA, Office of Climate Science

10:55 Break – networking and coffee

11:10 SESSION 2 - RIVERINE AND STORMWATER FLOOD RESILIENCE CASE STUDIES

2.1 The Run of the River: Evaluating Restoration Scenarios for Flood Reduction and Fish Passage Along the Upper Nemasket River
Jonas Procton, Horsley Witten Group

2.2 Considering All Options for Safe & Resilient Access
Jeff Sires, Fuss & O'Neill

2.3 Flood Management at the Watershed Scale
Julie Dyer Wood, Charles River Watershed Association

12:15 Lunch (last 15 minutes of lunch will be annual meeting)

1:30 SESSION 3 CONCURRENT SESSIONS A&B

A. Case Studies in Equity, Justice and Engagement

3.1 Watershed Resilience Planning & Green Stormwater Implementation
Matt Dunn, PE, CFM, Bobby Sykes, PE, Pare Corporation

3.2 Lessons Learned: Climate Adaptation Planning For Sea Level Rise - Communications, Design Development, and Messaging
Christian Krahforst, Town of Hull

3.3 Greening the Lord Pond Plaza in Athol: Achieving Climate Resiliency through NBS and Ecological Restoration
Heather Gould, BSC Group

B. Field Trip - Middle River Floodplain Park (see details on page #)

2:50 Break – networking and coffee

3:05 SESSION 4 - COOL TOOLS AND RADICAL RESOURCES

4.1 What Exactly is a Floodplain Permit?
Andrew Stewart, CFM, Town of Marshfield

4.2 Storm Tide Pathways: A Collaborative Effort to Mitigate the Impacts of Coastal Flooding
Joseph Dellicarpini, NOAA/National Weather Service, Norton, MA

4.3 NOAA's High-Resolution Coastal Land Cover for the Nation
Becky Love, CCS Inc., on contract to NOAA's Office for Coastal Management

4.4 Watershed-Scale Climate Collaboratives: Toolkit & Stories from Massachusetts
Stefanie Covino, Blackstone Watershed Collaborative

4:25 Closing Remarks

4:30 Poster Session / Networking Reception

SPEAKER ABSTRACTS & BIOS:

Keynote - The Great Vermont Flood of July 2023

Stephanie Smith
State Hazard Mitigation Office, Vermont Emergency Management
Stephanie.A.Smith@vermont.gov

ABSTRACT: Catastrophic flash flooding and river flooding occurred across much of Vermont in early to mid-July 2023. Extensive flooding to communities, washouts of numerous roads and bridges, and even the occurrence of land and mudslides resulted in significant property losses. The most widespread and significant flood damage occurred as a result of prolonged heavy rainfall during July 10-11, when rainfall amounts of 3 to 9 inches were observed across the state over 48 hours. The highest 48-hour rainfall total was 9.20" in Calais, Vermont and rainfall reports of 4 to 8 inches were commonplace along the spine of the Green Mountains and adjacent communities. Hear how Vermont has been working the federal declaration and general response in order to promote greater resiliency across the state.

BIO: Stephanie joined the Recovery and Mitigation Section of VEM as the Hazard Mitigation Planner in June 2016 and became the State Hazard Mitigation Officer in February 2020. Stephanie manages the Hazard Mitigation Team, including management of FEMA's Hazard Mitigation Assistance (HMA) grant programs and the Flood Resilient Communities Fund (FRCF), as well as coordination of State Hazard Mitigation Plan development and implementation. She holds a Master's in Urban Planning and Policy from the University of Illinois at Chicago.

Session 1.1: New State Initiatives by the Massachusetts Office of Climate Science and Executive Office of Energy and Environmental Affairs (EOEEA) -New Resources to Support Flood Resilience in Massachusetts

Edwin Sumargo, State Climatologist, EOEEA, Office of Climate Science
Marybeth Groff, Coordinator, MEMA Hazard Mitigation and Climate Adaptation
Margot Mansfield, Assistant Climate Scientist, EOEEA, Office of Climate Science
Edwin.sumargo@mass.gov, Marybethgroff@mass.gov, Margotmansfield@mass.gov

ABSTRACT: The Office of Climate Science introduces a climate-informed design precipitation data resource for the state of Massachusetts. This presentation will introduce the conceptual basis by which future climate projections are incorporated into design precipitation, discuss projected trends in extreme precipitation, and present the web interface for this data resource. The presentation will also discuss next steps and use cases for the climate-informed design precipitation data in flood risk management.

BIOS: Edwin Sumargo joined the Office of Climate Science at MA EOEEA as a Climate Scientist in July 2023. Before that, he was a research hydrometeorologist at the Scripps Institution of Oceanography, working on characterizing the soil moisture modulation of rainfall-runoff processes and hydrologic modeling and validation for reservoir operations in the western states. He holds a Ph.D. in Climate Science from the Scripps Institution of Oceanography.
Marybeth Groff is the Hazard Mitigation & Climate Adaptation Coordinator at the Massachusetts Emergency Management Agency (MEMA). Ms. Groff co-leads the ResilientMass Action Team who is responsible for the implementation and maintenance of the ResilientMass Plan (aka State Hazard Mitigation & Climate Adaptation Plan). Marybeth is also the State Coordinator for the MA Silver Jackets Team.
Margot joined the StormSmart Coasts team at the MA Office of Coastal Zone Management in 2013 and became the Assistant Climate Scientist/Coastal Hazards Specialist with EEA's new Office of Climate Science in 2023. Margot supported development of the 2022 MA Climate Change Assessment and the 2023 ResilientMass Plan. She holds a M.S. in Earth Science from the University of Maine.

Session 1.2: Climate-Informed Design Precipitation for Massachusetts

Caitlin Spence, Assistant Climate Scientist, EOEEA, Office of Climate Science
Caitlin.spence@mass.gov

ABSTRACT: The Office of Climate Science introduces a climate-informed design precipitation data resource for the state of Massachusetts. This presentation will introduce the conceptual basis by which future climate projections are incorporated into design precipitation, discuss projected trends in extreme precipitation, and present the web interface for this data resource. The presentation will also discuss next steps and use cases for the climate-informed design precipitation data in flood risk management.

BIO: Caitlin Spence is the Assistant Climate Science specializing in non-coastal climate hazards in the EOEEA Office of Climate Science. Before joining the Office of Climate Science she worked in academic research, public sector data services, and engineering consulting with a focus on the hydroclimatology of flooding and other climate extremes. She is author of multiple statewide and regional data resources and climate hazard exposure and vulnerability reports within Massachusetts. She holds a Ph.D. in Civil Engineering from the University of Massachusetts Amherst and is a registered Geographic Information Systems Professional.

Session 2 - Riverine and Stormwater Flood Resilience Case Studies

2.1. The Run of the River: Evaluating Restoration Scenarios for Flood Reduction and Fish Passage Along the Upper Nemasket River

Jonas Procton
Horsley Witten Group
jprocton@horsleywitten.com

ABSTRACT:
The Nemasket River is located in Middleborough and Lakeville, MA, and is a tributary of the Taunton River. The Nemasket River supports the largest river herring run in Massachusetts; an estimated 739,000 herring were recorded migrating in the river in 2021. At the headwaters of the Nemasket River, the Assawompset Pond Complex, the largest natural freshwater pond system in Massachusetts, provides over 5,000 acres of spawning habitat for river herring.

In addition to its role as critical herring habitat, the Assawompset Pond Complex supports the water supply systems of both Taunton and New Bedford. The developed area surrounding the ponds has experienced widespread flooding, which has impacted the towns of Middleborough, Lakeville, Freetown, and Rochester. Of particular significance, a series of three heavy rainstorms in the spring of 2010 resulted in flooding that inundated homes, structures, and roadways. The relatively low gradient of the Nemasket River makes the pond complex slow to drain and, therefore, infrastructure in the surrounding floodplain can be impacted for extended time periods following flood events.

In 2021 and 2022, Horsley Witten Group, Inc. (HW) developed a hydrologic and hydraulic (H&H) model of the upper four miles of Nemasket River. The model was designed in order to better understand how the dams, bridges, and channel morphology along the Nemasket River affect water levels, flow velocities, sediment transport, fish passage, and related factors along the Nemasket River and Assawompset Pond. With input from stakeholders, HW then assessed a total of 22 scenarios involving river restoration at dams, bridges, and sections of river that have been anthropogenically altered. Using the H&H model, HW evaluated the extent to which the various restoration scenarios achieved the goals of flood reduction, fish passage, and improved recreational access.

The results of the H&H model are now being used by the Southeastern Regional Planning and Economic Development District (SRPEDD) and the local Assawompset Pond steering committee as a planning-level tool for prioritizing various restoration projects within the Nemasket River and Assawompset Pond watersheds.

BIO: Jonas has over three years of professional experience focusing on site design, stormwater management, low impact development, green infrastructure, hydrologic/hydraulic modeling, and watershed assessment. He has worked on a variety of projects related to water resources, stormwater retrofits, dam removal, and river restoration in various locations around Massachusetts, New Hampshire, and American Samoa.

2.2. Considering All Options for Safe & Resilient Access

Jeff Sires
Fuss & O'Neill
jsires@fando.com

ABSTRACT:
Many culverts and small bridges throughout Massachusetts and New England are undersized for present-day storm conditions and/or cannot be upgraded in a cost-effective manner to account for predicted future storm flows. Increasing intensity of precipitation and associated flooding require creative approaches and consideration of a range of adaptation options to achieve resiliency for undersized road-stream crossings. The Resilient MA Action Team (RMAT) has developed Climate Resilience Design Standards that urge communities to consider climate conditions for the year 2070 in addition to relevant MassDOT hydraulic design criteria.

In the case of Bunyan Road in Monson, Massachusetts, funding from the Massachusetts Municipal Vulnerability Preparedness (MVP) program allowed the Town of Monson to consider a wide range of design alternatives for the improvement of an undersized and flood-prone stream crossing at Chicopee Brook. A variety of factors were weighed as they relate to both current climatic conditions and future projected conditions into 2070. Hydrologic and hydraulic (H&H) modeling demonstrated that the existing bridge experiences roadway flooding for storms equal to or greater than the present-day, 2-year event. Past flooding has damaged the bridge and restricted access to residential properties and Town water supply infrastructure on the western side of the crossing. Initial H&H modeling of an improved crossing indicated it would be prohibitively expensive to construct a raised roadway profile and bridge span that meets relevant hydraulic design criteria published by MassDOT and eliminates flooding for future storm events, as dictated by RMAT. In addition, the cross would remain an obstruction to natural processes within the Chicopee Brook floodplain.

As such, the Town assessed the potential for alternative access routes to residential properties and Town water supply infrastructure. Options included the rehabilitation of a discontinued road from a nearby neighborhood or the construction of a road along a new alignment. Further investigation suggested the discontinued road would require intensive maintenance, particularly during the winter, due to steep grades and curves. However, the new roadway alignment could be located well beyond the Chicopee Brook floodplain along relatively flat terrain, and initial outreach indicated property owners are receptive to collaboration and negotiation with the Town. Importantly, the new roadway establishing access to the western end of Bunyan Road would also allow the Town to deconstruct the existing Bunyan Road crossing of Chicopee Brook and restore the surrounding floodplain to near-natural conditions. This presentation will detail the alternatives considered, factors weighed, and chosen approach in support of creative infrastructure adaptations that result in climate resiliency and floodplain restoration.

BIO:
Jeff Sires is a Climate Resilience Engineer at Fuss & O'Neill. He draws on his education and public works experience to develop unique and constructible solutions to current and future impacts of climate change. Much of his career has been focused on hydrology and hydraulics as they relate to fish habitat, stream crossings, and public infrastructure. He works on projects throughout New England and lives in Portland, Maine.

2.3. Flood Management at the Watershed Scale
Julie Dyer Wood
Charles River Watershed Association
jwood@crwa.org

ABSTRACT:
Since November 2020, Charles River Watershed Association (CRWA) has been working with twenty communities in the watershed to understand and address flooding across the region as our climate changes. Through this project, our team, which also includes Weston & Sampson and Communities Responding to Extreme Weather (C.R.E.W.), developed a flood forecasting model to predict where and when precipitation-based flooding will occur in various climate change scenarios. We have also used the model to test out multiple flood mitigation strategies, with a focus on nature based solutions. While municipal-scale flood models are becoming common, this project is unique due to the number of communities involved, the watershed scale focus, our exploration of nature-based solutions at multiple scales, and extensive community engagement.

The project study area covers multiple cities and towns and a highly developed area of nearly 300 square miles, including multiple environmental justice communities. Close to a dozen flood mitigation scenarios were identified and tested in the model. Most scenarios used nature-based solutions; for select scenarios, the team documented potential co-benefits, such as pollution reduction and groundwater recharge. Watershed residents, with a focus on climate vulnerable communities, have been engaged at every step of the process including selecting climate modeling scenarios and flood mitigation practices, and all modeling results are publicly available via an interactive online map. During the pandemic, our team found creative ways to engage people despite the challenges of social distancing, and over the course of the project we have successfully engaged hundreds of people in person and online, and in multiple languages. In this presentation, we will provide a brief overview of our work and share our findings for effective flood mitigation strategies.

BIO:
Julie Dyer Wood is the Director of the Climate Resilience at Charles River Watershed Association where she has worked, in a variety of roles, since 2007. Julie served as project manager for the development of the Charles River Flood Model and regularly gives presentations on the work of this unique regional partnership. Julie has a B.A. in Mathematics from Boston College and an M.S. in Environmental Science from the University of Massachusetts, Boston.

Session 3: CONCURRENT SESSION
3.1 Case Studies in Equity, Justice and Engagement

Watershed Resilience Planning & Green Stormwater Implementation
Matt Dunn, PE, CFM
Bobby Sykes, PE
Pare Corporation
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bsykes@parecorp.com

ABSTRACT:
This presentation will provide an overview of two MVP-funded watershed resiliency action plans (WRAPs). The first is Bloody Brook in Methuen - an urbanized 2 square mile watershed with a history of frequent and high impact riverine flooding within EJ communities in Methuen and Lawrence. The second is Machaug Water Resources WRAP in Sutton - an undeveloped 26 square mile watershed in Sutton with a history of riverine flooding and risk posed on aging infrastructure (dams, roadways, buildings) within the watershed. The presentation will provide an overview of resiliency planning techniques involved in WRAP work, along with contrast between urbanized and rural planning methodologies.

Additionally, our presentation details watershed planning that utilizes GIS portals to review opportunities for green infrastructure and nature-based solutions implementation to meet specific total maximum daily load (TMDL) requirements in place for a watershed. The presentation will close with a review of the process involved (review land uses to determine specific pollutant load ratings; review of topography, drainage patters, and hydrology; conceptualization of best management practices (BMPs) for sizing and pollutant removal efficiencies; analysis of credit pollutant removals) and a discussion of how these design BMPs can be integrated into asset management portals for inspections, operations, and maintenance.

BIO:
Mr. Matt Dunn, PE, CFM, leads Pare's hydrologic and hydraulic (H&H) practice area within Pare's Geotechnical Division. With 10+ years of experience within the industry, he has gained proficiency in watershed resiliency action planning (WRAP's), H&H analyses of riverine systems, dam related engineering (evaluations, rehabilitation, removal), as well as roadway crossing (culverts and bridges) assessments/replacements.

Mr. Bobby Sykes, PE leads Pare's green stormwater infrastructure (GSI) practice area within Pare's Transportation Division. His 10+ years of experience within the industry has gained him proficiency in a variety of engineering disciplines including roadway design, utilities, stormwater management, green stormwater infrastructure traffic analysis, and site design.

3.2 Lessons Learned: Climate Adaptation Planning For Sea Level Rise - Communications, Design Development, and Messaging.
Christian Krahforst
Town of Hull
ckrahforst@town.hull.ma.us

ABSTRACT:
Hull began the process of engaging community members for developing plans to address sea level rise flooding impacts and accessibility to one of its more flood-prone neighborhoods - the Hampton Circle Area (HCA). This presentation will use this case study to (1) share the lessons learned on aspects of community engagement, outreach, and communication efforts through to adaptation planning and alternatives development and, (2) to further explore how messaging used by adaptation and municipal planning practitioners can be improved. Hull is a town that occupies the southern barrier beach of outer Boston Harbor and provides some of the storm surge protection for municipalities rimming inner Boston Harbor.

The project area is within the Weir River ACEC and where approximately 50 residential homes exist. These homes are experiencing more frequent flooding from higher high tide water levels and from wind-generated waves in Boston Harbor. This area also contains a critical WWTF sewer pump station, a public park, and recreation area. The low-lying area connects two glacial drumlins, one of which-representing about 115 households which often becomes isolated during these types of flood events. A brief discussion on short-term plans that include improvements to drainage and functionality of existing structures, incorporating measures that utilize natural resource functions for flood control and storm damage protection, considerations to other important Town critical infrastructures, and how all these elements fit within an adaptive framework that allows for the neighborhood to monitor and participate in over the next several decades.

Important lessons learned on community engagement and communication include having a well-engaged, locally-informed municipal liaison; identifying solid local champions or points of contact. Evaluate other communication methods and not to rely solely (or heavily) on social media for communication and messaging. Research and understand your social media participants/ groups to ensure outreach to the target audience is all inclusive. Printed material should be a product of communication and traditional mail should continue to be used to ensure that those less likely to engage on-line or through emails are included. Messaging by climate adaptation and municipal planning practitioners is critically important and attention should not only be paid to the context of the message, but to who the message is conveyed. What message are we trying to send? Does our audience

understand the message? Have you asked them what they think the message conveys? Are we focusing too much on relatively rare events (e.g., 1% chance of flooding predicted by 2050) when the more common impacts (impassible roads, storm overwash obstructions, etc.) may be more meaningful, more effective, and/or more relatable. Examples of recent climate change and adaptation messaging and possible misconceptions will be shared and discussed.

BIO:
Christian is a climate adaptation and conservation of resources practitioner with over 20 years of experience in coastal management and resource conservation. He has participated as an advisor and researcher with others on the Boston Harbor clean up in the early 2000s, studies the transport and fate of contaminants in coastal and marine systems, and currently serves as the director of the Town of Hull's Climate Adaptation and Conservation Department and is a research associate with the University of Massachusetts/Boston.

3.3 Greening the Lord Pond Plaza in Athol: Achieving Climate Resiliency through NBS and Ecological Restoration
Heather Gould
BSC Group
hgould@bscgroup.com

ABSTRACT:
The Greening Lord Pond Plaza project is in downtown Athol, which is an environmental justice community with socially vulnerable populations, low-income elderly populations, and teens/transition age youth. Bound by four major streets the Lord Pond Plaza is characterized by a paved parking area that supports a combination of commercial uses and business types. The redevelopment of the Lord Pond Plaza addresses two key sources of climate exposure: extreme temperatures/ urban heat island effect and inland/urban flooding due to extreme precipitation events. The effects of urban heat island effect and inland flooding present significant social, economic, and environmental vulnerability for Athol.

The use of nature-based solutions/ green infrastructure, serves as an important mechanism to achieve project goals. Project stakeholders collaborated to identify solutions to enhance the climate resilience of Lord Pond Plaza while simultaneously promoting co-benefits to the community. Drawing upon previous climate resilience planning in Athol, a key project feature was to conduct robust community engagement. The public engagement was structured in a way to inform stakeholders, abutters, and the public of the site design concept that will advance to construction in a future project phase. The project team held a series of events – two public meetings, two meetings with abutters, a site walk, and a presentation to the Athol Board of Selectmen.

Aligned with community goals for social resilience, the project design applies nature-based solutions by daylighting a section of Mill Brook, creating wetlands and wildlife habitat, and increasing flood storage and stormwater bioswales as part of the overall effort to produce more green space, address heat island effect, and provide passive recreational opportunities. Besides providing flood attenuation, the project improves wetland habitat and stream connectivity. Additional co-benefits include a significant reduction of impervious surface at the plaza, increased tree canopy cover, improved vehicular and pedestrian safety, and additional opportunities for public gathering spaces.

As an ecological restoration project, it is estimated that the project will create close to 12,000 square feet of wetlands while daylighting over 500 linear feet of the perennial Mill Brook. The proposed stormwater management system will provide stormwater capture and infiltration as well as improvement to water quality. Stormwater will also be reduced through the conversion of approximately 53,000 square feet of currently paved surface into vegetated areas, including upwards of 80 new trees. The vegetation plantings will further reduce stormwater runoff quantities through uptake and areas of pollinator habitat will also be created providing habitat diversity and a source of food for insects and nectar feeding birds. For additional details please refer to the project website: https://lordpondplaza.wordpress.com.

BIO:
Heather is the Director of Planning at the BSC Group and brings more than 15 years of experience in the design and implementation of planning, environmental, economic development, and land use initiatives. She joined BSC Group as a senior planner in 2018 after a long tenure with the Worcester Executive Office of Economic Development, where she served in several positions, including as deputy chief development officer, senior project manager, and brownfields coordinator. Heather has successfully incorporated her experience with the City of Worcester to approach BSC Group's planning projects from a regulator's perspective to achieve visionary plans that can be funded and implemented.

Heather has been a valuable member of the firm's planning group and senior leadership team. She has demonstrated her ability to coordinate complex projects and offers exceptional understanding of the programs and practices that are applied to support economic development and community-building initiatives. She earned her M.A. in community development and planning from

Clark University as well as a B.A. in government and international relations, also from Clark University.

3B FIELD TRIP - Middle River Floodplain Park

Representatives from the City of Worcester will lead attendees in a walking tour of the Middle River Park (Blackstone Gateway Park) boardwalk, a case study in maximizing the public benefits of floodprone areas. Please be aware that this field trip will involve moderate to challenging walking: participants will walk from the Hogan Campus Center to the McKeon Road entrance for the tour, and then return the same way. The walk is about 0.8 miles each way, and includes about 200 ft of elevation change, mostly on stairways throughout the Holy Cross campus. Participants should wear good walking shoes and bring water.

Session 4: Cool Tools and Radical Resources

4.1 What Exactly is a Floodplain Permit?

Andrew Stewart, CFM
Town of Marshfield
astewart@townofmarshfield.org

ABSTRACT:
A Floodplain Permit is required in an NFIP Community for any proposed construction or other development in the Floodplain. Development is defined as any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials. Many NFIP Communities have mainly relied on Building Permits to document and permit construction or modification of buildings in the Floodplain, but they generally do not cover development activities unrelated to the specific construction of a structure, nor do they account for any State or Federal approvals. The NFIP Requirements state that if a Community's building permit system does not require permits for these other development activities, that the Community's permitting system be revised to ensure proper permitting of all non-building development projects in the Floodplain. Conservation, Zoning, Board of Health and Board of Public Works permits often bridge the gap, but having the permitting spread out across multiple jurisdictions without a comprehensive review or oversight allows for the potential for certain requirements or design considerations to be missed or performed incorrectly. These oversights can result in serious consequences for the property owner in the form of construction delays, unexpected costs, violations, substantial improvement determinations, etc. and can result in the Community potentially being put on probation or removed from CRS.

Some communities are developing Floodplain Permits to specifically satisfy the requirements of the NFIP and addressing all local, State and Federal requirements for Floodplain development. Online permitting now presents a unique opportunity to develop comprehensive Floodplain Permitting that satisfies NFIP requirements and helps CRS Communities improve their rating. These systems can be custom designed so a Community's CFM can review, approve and inspect all Floodplain development activity, conduct and record site visits and inspections, provide a checklist of all required permits and approvals, retain required construction, site and elevation documentation, track progress of various cross-departmental approvals and inspections, and ensure that each permit or approval gets properly completed with all agencies involved.

Andrew Stewart is a CFM and serves as the Building Commissioner and Floodplain Administrator for the Town of Marshfield. He has developed an online Floodplain Permitting system for Marshfield that utilizes the OpenGov permitting platform, designed with the specific intent of ensuring compliance with the NFIP and the Marshfield Floodplain Bylaw and improving the Town's rating with CRS. The Floodplain Permit designed for the Town of Marshfield will be presented as an example of how NFIP and CRS Communities can utilize current technology to improve Floodplain Management and permitting.

BIO:
Andrew Stewart is a CFM and serves as the Building Commissioner and Floodplain Administrator for the Town of Marshfield. He is a licensed MA Building Commissioner and Unrestricted Construction Supervisor with more than 15 years of experience in Coastal Construction. His passion for Floodplain Management stems from his love of the outdoors and the experiences he had when performing volunteer relief work following Hurricanes Katrina and Sandy. His goal is to better serve the public by bringing consistency, clarity and coordination to the various departments, agencies, standards and regulations involved in Floodplain Permitting while preparing and protecting the community and environment from the hazards associated with flooding and storm events.

4.2 Storm Tide Pathways: A Collaborative Effort to Mitigate the Impacts of Coastal Flooding
Joseph Dellicarpini
NOAA/National Weather Service, Norton, MA
Joseph.Dellicarpini@noaa.gov

ABSTRACT:
Coastal flooding along the eastern Massachusetts coastline has become a more frequent occurrence in the context of sea level rise over the past several years. Flooding occurs from the combination of tide and storm surge (referred to as total water level) and damage is exacerbated by wave action on top of the surge. The more significant events, which can cause structural damage, are often associated with strong coastal storms such as nor'easters but even minor impacts do occur during high astronomical tides when no storm is present.

For decades, the National Weather Service (NWS) has issued Coastal Flood Watches, Warnings, and Advisories in a text-based format to inform decision makers and the public of coastal flooding. These products cover long reaches of coastline with limited specificity. Over the past several years, NWS Boston/Norton, MA has produced gridded forecasts of total water level and more recently integrated GIS technology to highlight specific areas at risk through visualization.

Storm tide pathways, by virtue of their elevation relative to the elevation of a storm tide, provide a direct hydraulic connection between coastal waters and low lying inland areas. The Center for Coastal Studies (CCS) in Provincetown, MA identifies and maps current storm tide pathways and those that may function as pathways in the future. When integrated with NWS Boston/Norton's inundation mapping of total water level forecasts, the storm tide pathway information can be used by emergency managers to prepare for coastal flooding events and to plan for future improvements.

This presentation will describe the NWS forecast process and show the methods used by CCS to develop Storm Tide Pathways for a community. Examples of how the information has been used by officials in Provincetown, MA to mitigate flood impacts will be shown in order to demonstrate the utility for other communities that are affected by coastal flooding.

BIO:
Joe Dellicarpini is the Science and Operations Officer at the National Weather Service's Boston office and has over 30 years of forecasting experience. Joe's role is to oversee the office's science program which includes research, staff training, and the integration of new technology. He also provides training for the staff of meteorologists at the Boston Air Route Traffic Control Center and periodically works forecast shifts there.

Joe is a native of the New York City area and received a Bachelor of Science Degree in Meteorology from the State University of New York at Oswego. His career with the National Weather Service began as a Student Trainee in Boston while completing his undergraduate degree. Upon graduation, he worked at the Binghamton, New York Weather Forecast Office for five years and then returned to southern New England as a Hydrologic Forecaster at the Northeast River Forecast Center in Taunton. He transferred back to the Boston Weather Forecast Office as a Meteorologist before being promoted to Science and Operations Officer in 2007.

Joe's interests include aviation and coastal meteorology. He is involved with several national teams related to aviation, tropical, winter weather, and coastal inundation forecasting. Joe led the implementation of the office's Decision Support Services program which provides information to core partners and established strong working relationships with federal, state, and local partners including the broadcast media.

4.3 NOAA's High-Resolution Coastal Land Cover for the Nation
Becky Love
CCS Inc., on contract to NOAA's Office for Coastal Management
rebecca.love@noaa.gov

ABSTRACT:
The NOAA Coastal Change Analysis Program (C-CAP) has been an authoritative source for land cover data and change products for the coastal areas of our nation for decades. In the summer of 2023, NOAA released high-resolution (1-meter) land cover data for the entire coastal zone, including Alaska and the territories. There are two phases of product releases. The first phase comprises foundational layers, including impervious, canopy, and water for the contiguous Unites States, Alaska, and Pacific and Caribbean territories. The second phase involves updating these products to include the full C-CAP land cover classification scheme (up to 20 classes total,

including nine wetland categories). This is currently being done in Maine and New Hampshire, and NOAA will be normalizing these new data with existing high-resolution C-CAP products in Massachusetts, Rhode Island, and Connecticut.

The new high-resolution data sets reflect significant advancements in data processing techniques and provide considerably more spatial detail than the legacy moderate resolution (30-meter) C-CAP products. These higher resolution data can support applications and decision-making at the local level. This presentation will provide an overview of the data products, as well as an update on the schedule for their release, example applications, and opportunities to collaborate on additional and enhanced products.

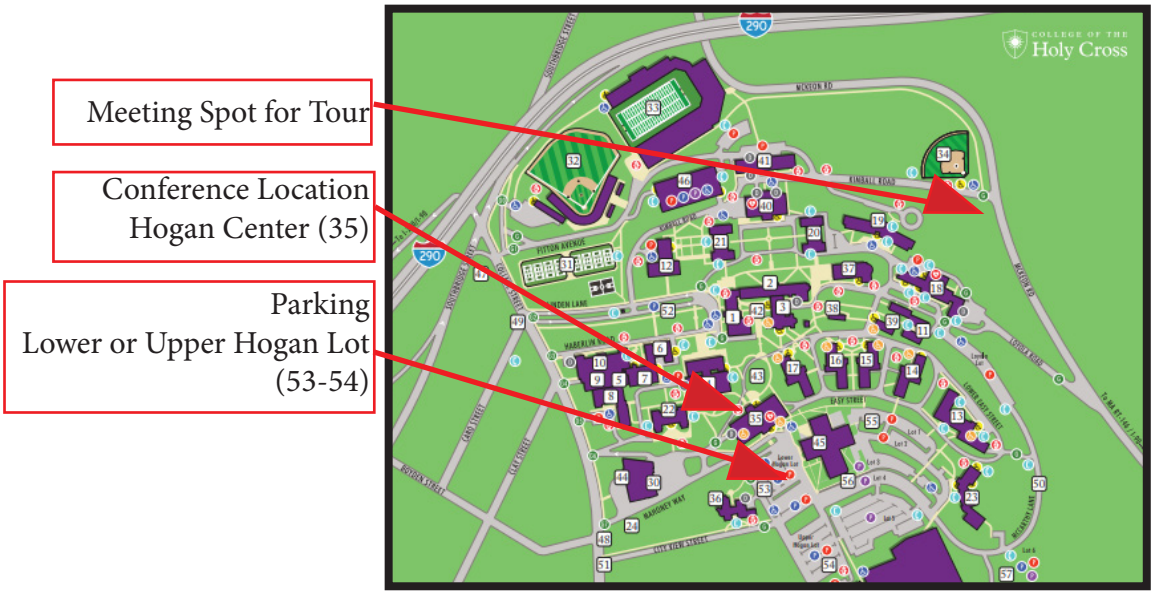
BIO:
Becky Love is a Senior Coastal Management Specialist with CSS at NOAA's Office for Coastal Management. She provides outreach and technical assistance for many of the tools and resources within the Digital Coast and has experience helping communities integrate nature-based approaches into their planning processes. She reviews land cover data and products as a member of the Coastal Change Analysis Program and is a liaison to the Waquoit Bay National Estuarine Research Reserve. Becky holds a Master of Science degree in Oceanography from the University of New Hampshire and a Bachelor of Science degree in Biological Sciences from Clemson University.

4.4 Watershed-Scale Climate Collaboratives: Toolkit & Stories from Massachusetts
Stefanie Covino
Blackstone Watershed Collaborative
scovino@clarku.edu

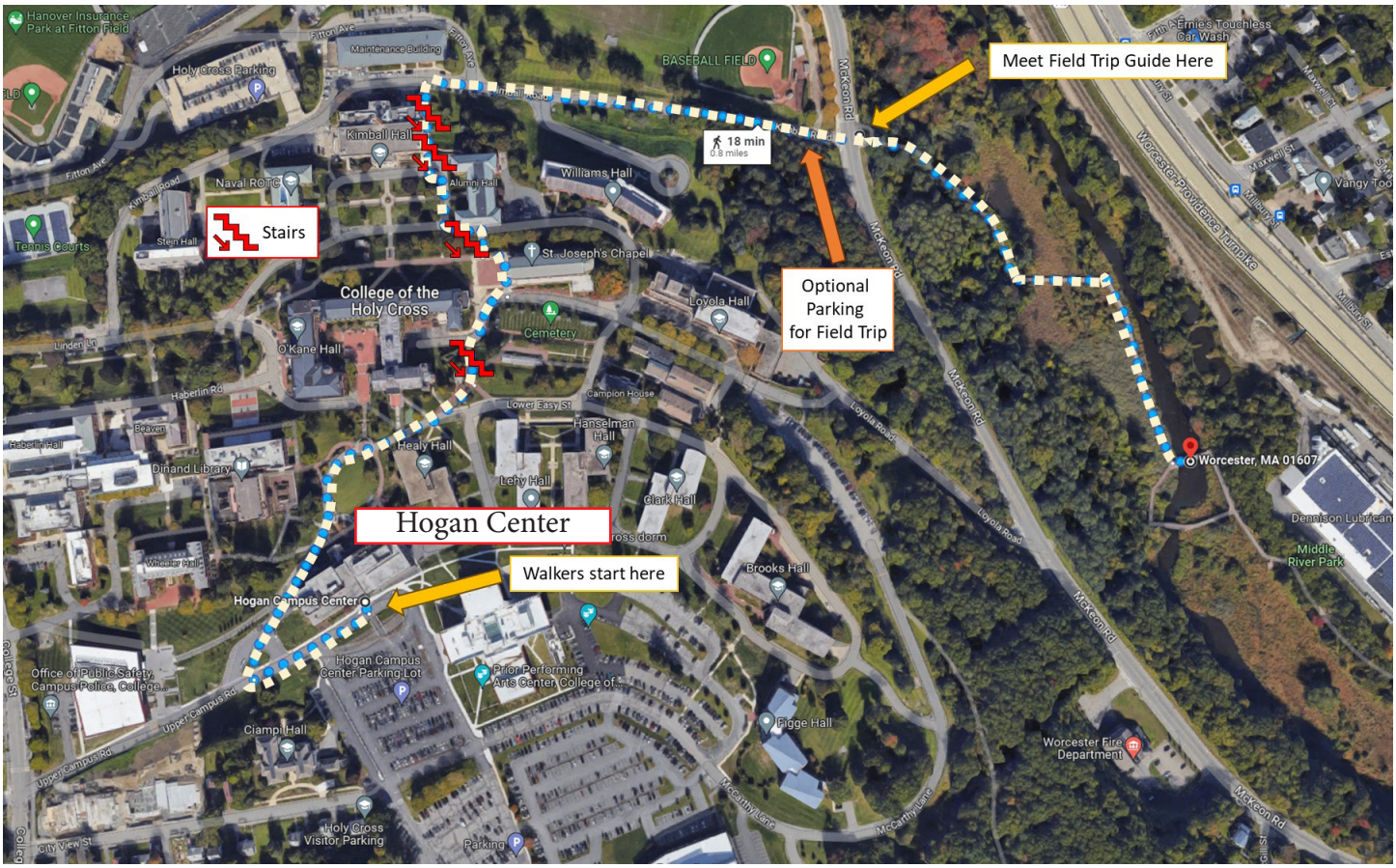
ABSTRACT:
Collaboration is essential for successful climate adaptation, and a watershed provides an effective and impactful scale for prioritizing and tackling climate impacts such as flooding, which doesn't respect municipal boundaries. We'll be sharing a new Watershed-Scale Climate Collaboration Toolkit developed by MassECAN to showcase stories from watershed-scale collaboratives across the state who are rising to the challenge and successfully partnering to improve regional resilience. This session will introduce the toolkit, including the StoryMap, fact sheets, and case studies.

BIO:
Stefanie Covino (she/her) manages the Blackstone Watershed Collaborative based at Clark University, which serves to improve climate resilience and watershed health through capacity building and technical assistance in the bi-state watershed's 39 communities and many tribes. She has an MS in Environmental Science and Policy from Clark University. She is on the Steering Committee of the Narragansett Bay Estuary Program and is a Keystone Cooperator. Her interests include land use planning, natural resource protection, stormwater management, ecological restoration, and equitable nature-based solutions to reduce climate hazards and improve community resilience. She can be reached at scovino@clarku.edu.

Campus Map, Parking and Conference Location



Suggested walking directions for Middle River Floodplain Park tour



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