

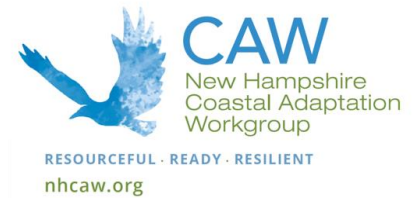


**STAYING THE COURSE, MOVING AHEAD:
PROGRESS TOWARDS A MORE RESILIENT WATERSHED**
2021 CLIMATE SUMMIT – RESOURCES PACKET

2021 CLIMATE SUMMIT

Staying the Course, Moving Ahead:

Progress Towards a More Resilient Coastal Watershed



SUMMIT AGENDA

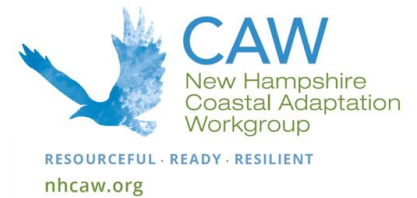
DAY 1 – WEDNESDAY, MAY 26	
1:00pm	Day 1 Welcome from CAW Co-Chair <i>Sherry Godlewski, NH Department of Environmental Services</i>
1:15pm	2019-2020 NH Coastal Flood Risk Summary <i>Nathalie DiGeronimo, NHDES Coastal Program</i>
1:35pm	Keynote Address <i>A.R. Siders, Assistant Professor, University of Delaware</i>
2:20pm	Seacoast Transportation Corridor Vulnerability Assessment <i>Julie LaBranche, Rockingham Planning Commission</i>
2:35pm	<i>BREAK</i>
2:45pm	Hampton Flood Mitigation Study <i>Jennifer Hale, Town of Hampton</i>
3:00pm	Climate Resilience in the Prescott Park Master Plan <i>Cheri Ruane, Weston & Sampson</i>
3:15pm	Forward-Looking Floodplain Mapping in Lee, NH <i>Kyle Pimental, Strafford Regional Planning Commission</i>
3:30pm	Lessons Learned from Community-Based Programs <i>Alyson Eberhardt, NH Sea Grant and UNH Extension</i>
3:45pm	Day 1 Wrap Up and Closing Remarks <i>Kirsten Howard, NHDES Coastal Program</i>
4:00pm	<i>ADJOURN</i>

DAY 2 – THURSDAY, MAY 27	
9:00am	Day 2 Welcome from CAW Co-Chair <i>Abigail Lyon, Piscataqua Region Estuaries Partnership</i>
9:15am	Climate Champion Award Presentation <i>Nathalie DiGeronimo, NHDES Coastal Program</i>
9:30am	Portsmouth Extended Flood Hazard Area <i>Peter Britz, City of Portsmouth</i>
9:45am	Rye Climate Adaptation and Resilience Standards <i>Kim Reed, Town of Rye</i>
10:00am	Sawyer Mill Dam Removal from a Flood Perspective <i>Kevin Lucey, NHDES Coastal Program</i>
10:15am	<i>BREAK</i>
10:25am	Virtual Field Trip to Wagon Hill Farm <i>Tom Ballestero, University of New Hampshire</i>
10:45am	Comprehensive Plan for Resilient Salt Marsh <i>Cory Riley, Great Bay National Estuarine Research Reserve</i>
11:00am	Drought Status and Outlook for Coastal NH <i>Tom O'Donovan, NH Department of Environmental Services</i>
11:15am	Snow Cover, Vernal Windows, and Winter Whiplash <i>Elizabeth Burakowski, University of New Hampshire</i>
11:30am	Design Snow Water Equivalent and Snowmelt <i>Jennifer Jacobs, University of New Hampshire</i>
11:45am	Day 2 Wrap Up and Closing Remarks <i>Cory Riley, Great Bay National Estuarine Research Reserve</i>
12:00pm	<i>ADJOURN</i>

2021 CLIMATE SUMMIT

Staying the Course, Moving Ahead:

Progress Towards a More Resilient Coastal Watershed



SPEAKERS



Nathalie DiGeronimo – NHDES Coastal Program

Email: nathalie.m.digeronimo@des.nh.gov | Website: www.des.nh.gov/water/coastal-waters

Nathalie is the Resilience Project Manager for the New Hampshire Coastal Program and is responsible for helping state agencies, coastal municipalities, and residents adapt to sea-level rise. She is a Certified Floodplain Manager, active member of the New Hampshire Coastal Adaptation Workgroup, and co-chair of the Coastal States Organization Coastal Hazards Planning and Adaptation Workgroup. Nathalie previously served as a Planning and Policy Analyst for the Hawaii Coastal Zone Management Program. She holds a Master of Coastal Environmental Management from Duke University and a B.A. in Biology from Occidental College. Nathalie is happiest on or by the sea and enjoys baking and eating bread.



A. R. Siders – University of Delaware

Email: siders@udel.edu | Website: www.sidersadapts.com/ & www.udel.edu/faculty-staff/experts/ar-siders/

A.R. Siders is an assistant professor in the Biden School of Public Policy and Administration and the Department of Geography and Spatial Sciences and a core faculty member of the Disaster Research Center at the University of Delaware. Her research focuses on climate change adaptation decision-making and evaluation, and her recent projects have focused on managed retreat as an adaptation strategy and the equity implications of coastal adaptation.



Julie LaBranche – Rockingham Planning Commission

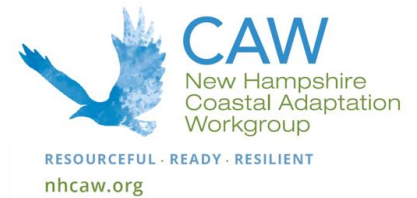
Email: jlabranche@therpc.org | Website: www.therpc.org

Julie LaBranche is a Senior Planner with the Rockingham Planning Commission in southeast New Hampshire. Her work in the region includes assisting communities with development of plans, zoning ordinances and regulations relating to land use, natural resource protection, climate change and resiliency, energy efficiency and conservation, and stormwater management. Julie participates as a member of the NH Sea Grant Policy Advisory Committee, New Hampshire Coastal Adaptation Workgroup, and served on the Executive Committee for the Northern New England Chapter of the American Planning Association from 2009-2015. She holds a B.S. in Geological Sciences from Salem State College, MA and a M.S. in Earth Sciences-Geology from Montana State University, Bozeman.

2021 CLIMATE SUMMIT

Staying the Course, Moving Ahead:

Progress Towards a More Resilient Coastal Watershed



Jennifer Hale, P.E. – Town of Hampton

Email: jhale@hamptonnh.gov | Website: www.hamptonnh.gov

Jennifer Hale is the Director of Hampton Department of Public Works (DPW) with 25 years of experience related to engineering design, policy decision and project management. Since joining DPW in 2005, she has overseen projects including emergency seawall repairs and new designs, flood studies related to sea level rise and repetitive loss as well as many other infrastructure and roadway projects. Throughout her career, Jennifer has demonstrated her commitment to working to solve problems. Jennifer has a Bachelor of Science in Civil Engineering, is professional engineer; a licensed septic designer, a certified professional in erosion and sediment control and a graduate of Leadership Seacoast.



Cheri Ruane, FASLA – Weston & Sampson Engineers, Inc.

Email: ruanec@wseinc.com | Website: www.westonandsampson.com

Cheri is a landscape architect with more than 20 years of experience in multi-disciplinary project management and resilient design. With special expertise on socially and politically-complex projects, she is a leader in community outreach and presentations for waterfront projects across New England. Cheri has managed the design and construction of over \$100 million in public improvements to parks and recreation properties, many of which integrate sustainable and climate-resilient designs at waterfront and riverfront sites. As a practice leader and vice president at Weston & Sampson, Cheri continues to develop and evolve resilient design strategies that engage and inspire.



Kyle Pimental – Strafford Regional Planning Commission

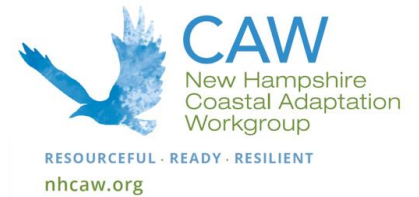
Email: kpimental@strafford.org | Website: www.strafford.org/

Kyle is a Principal Regional Planner with 12 years of experience providing technical planning assistance to address important environmental issues in municipalities across southeastern New Hampshire. He possesses a solid understanding of natural resource management, GIS, climate adaptation, hazard mitigation planning, and local land use practices. Kyle is a skilled grant writer and project manager having secured funding to support the development of local land use policies, regulatory amendments, master plan updates, and other regional efforts. He has a golden retriever named Buffett that he adores. In his spare time, he enjoys fishing, hiking, live music, traveling, and will never turn down a beer with good company.

2021 CLIMATE SUMMIT

Staying the Course, Moving Ahead:

Progress Towards a More Resilient Coastal Watershed



Alyson Eberhardt – New Hampshire Sea Grant Extension

Email: alyson.eberhardt@unh.edu | Website: www.seagrants.unh.edu

Alyson Eberhardt is a Coastal Ecosystems Specialist for NH Sea Grant Extension. She works with community members, natural resource managers, and researchers to support efforts to protect and restore coastal ecosystems. She manages the Coastal Research Volunteers, a citizen science program that partners with community volunteers to work on local, coastal research projects to inform local decision making.



Kirsten Howard – NHDES Coastal Program

Email: kirsten.b.howard@des.nh.gov | Website: www.des.nh.gov/water/coastal-waters

Kirsten Howard is the Resilience Program Coordinator for the New Hampshire Department of Environmental Services Coastal Program. Kirsten assists New Hampshire's 17 coastal communities to plan and prepare for coastal hazards such as sea-level rise and storm flooding by providing technical assistance and grant support. She also works with state agencies to incorporate coastal climate risk into their decisions. Kirsten received her B.A. from Brown University and her M.S. from the University of Michigan. Kirsten lives in Portsmouth with her husband Andy and their dog Timber.



Peter Britz – City of Portsmouth

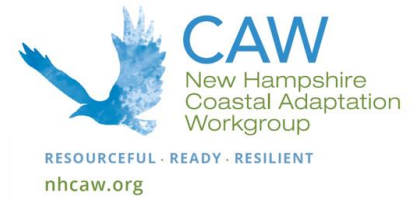
Email: plbritz@cityofportsmouth.com | Website: www.cityofportsmouth.com

Peter Britz is the Environmental Planner/Sustainability Coordinator for the City of Portsmouth where he works on environmental planning and permitting and coordinates the City's sustainability efforts as an eco-municipality. He has over 25 years of coastal and environmental planning experience. He is staff to the Conservation Commission and the Mayor's Blue Ribbon Committee on Sustainable Practices. He serves on the City's Technical Advisory Committee and coordinates toxics remediation. He has worked on City wide mapping projects as well as the City's Coastal Resilience Initiative (CRI) and Historic District Vulnerability Assessment and the North Mill Pond Greenway.

2021 CLIMATE SUMMIT

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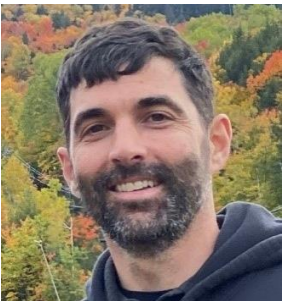
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Kimberly Reed – Town of Rye

Email: kreed@town.rye.nh.us | Website: www.town.rye.nh.us

In 2000, Kimberly became a Planning Board member then became the town's Planning and Zoning Administrator in 2006. Kimberly's role is to assist anyone interested in understanding the zoning, land development regulations, climate change and coastal hazards, master plan and any future development and their impacts. Since taking the position, Kimberly has expanded her role as the Emergency Management Assistant; clerk of the Joint Loss Management Team; and became a Certified Floodplain Manager. Her position combines her Political Science degree from UNH with an Operational Management Master's degree from Antioch NE working with people, politics, and the environment.



Kevin Lucey – NHDES Coastal Program

Email: kevin.p.lucey@des.nh.gov | Website: www.des.nh.gov/water/coastal-waters

Kevin Lucey, Habitat Coordinator for the NHDES Coastal Program (NHCP), manages projects for the restoration, conservation, and evaluation of jurisdictional coastal ecosystems in NH. Kevin has worked for NHCP for 15 years and has focused on: salt marsh monitoring, invasive plant management, dam removal, and culvert assessment and prioritization. His work plays a vital role in supporting coastal communities in their identification of high priority restoration and conservation opportunities.



Tom Ballestero – University of New Hampshire, Coastal Habitat Research Team

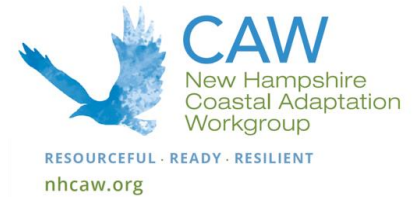
Email: tom.ballestero@unh.edu | Website: www.seagrant.unh.edu/CoastalHabitatRestoration

Dr. Ballestero is a hydrologist and water resources engineer with just over 40 years of experience. His experience with restoration of impaired aquatic systems extends back to 1976 in projects focusing on stream hydraulics and flood hydrology. At the University of New Hampshire Dr. Ballestero teaches advanced courses on hydrology, hydraulics, restoration, sediment transport, and monitoring. Dr. Ballestero is the former Director of the New Hampshire Water Resources Research Center and the UNH Stormwater Center. He is presently a commissioner for the New England Interstate Water Pollution Control Commission. Dr. Ballestero holds professional licensure as a: Professional Engineer, Professional Hydrologist, Professional Geologist, and Groundwater Professional.

2021 CLIMATE SUMMIT

Staying the Course, Moving Ahead:

Progress Towards a More Resilient Coastal Watershed



Cory Riley – New Hampshire Fish and Game, Great Bay National Estuarine Research Reserve

Email: cory.riley@wildlife.nh.gov | Website: www.greatbay.org

Cory Riley works for NH Fish and Game managing the Great Bay National Estuarine Research Reserve. Before joining GBNERR, she spent ten years at the National Oceanic and Atmospheric Administration. Throughout her career she has developed and advanced estuarine education, research, and training and land stewardship programs from the local and national perspective, and used her expertise in strategic planning, facilitation, policy analysis, performance metrics and evaluation to protect coastal ecosystems. Cory holds a Bachelor's Degree in Biology from the College of William and Mary and a Masters in Environmental, Coastal and Ocean Science from the University of Massachusetts, Boston.



Thomas O'Donovan – New Hampshire Department of Environmental Services (NHDES)

Email: thomas.e.odonovan@des.nh.gov | Website: www.des.nh.gov/water

With over 38 years of public service in positions of increasing responsibility, Tom has served as a senior leader in the US Army Corps of Engineers, a senior manager within the Department of Energy and as a Project Director in the construction industry. He is currently the NHDES Water Division Director responsible for 274 professionals, an operating budget of \$168 million and over a billion dollars of ongoing financial infrastructure investment in the state. His credentials include a Masters in Civil Engineering, registration as a Professional Engineer and certification as Project Management Professional.



Elizabeth Burakowski – University of New Hampshire

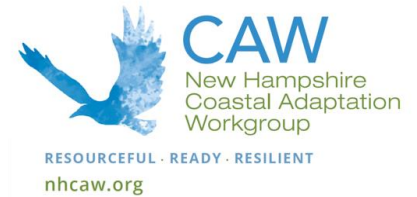
Email: elizabeth.burakowski@unh.edu | Website: www.eos.unh.edu

Dr. Elizabeth Burakowski is a Research Assistant Professor at the University of New Hampshire in the Institute for the Study of Earth, Oceans, and Space. Liz uses climate models, remote sensing, surface observations and citizen science to better understand changes in climate and impacts on society. Her interdisciplinary research centers around the interactions among climate, land use, and society in the Northeastern United States with a focus on winter climate change.

2021 CLIMATE SUMMIT

Staying the Course, Moving Ahead:

Progress Towards a More Resilient Coastal Watershed



Jennifer Jacobs – University of New Hampshire

Email: jennifer.jacobs@unh.edu | Website: www.ceps.unh.edu

Jennifer Jacobs is a Professor in the Department of Civil and Environmental Engineering at the University of New Hampshire. She has over 25 years of experience using novel weather and climate information to enhance infrastructure design and practice with a specialty in cold weather and snow. She is the Director of the National Science Foundation funded The Infrastructure and Climate Network (ICNet), a card carrying member of the New Hampshire Coastal Adaptation Workgroup, and long-time climate summit participant.

PRESENTATION SUMMARIES & LINKS TO ADDITIONAL RESOURCES

2019-2020 NEW HAMPSHIRE COASTAL FLOOD RISK SUMMARY, *Nathalie DiGeronimo, NHDES Coastal Program*

The 2019-2020 New Hampshire Coastal Flood Risk Summary is comprised of two parts. [Part I: Science](#) (2019) provides a synthesis of the state of the science relevant to coastal flood risks in New Hampshire and includes updated projections of relative sea-level rise, coastal storms, groundwater rise, precipitation and freshwater flooding. [Part II: Guidance for Using Scientific Projections](#) (2020) provides science-based and user-informed guiding principles and a step-by-step approach for incorporating updated coastal flood risk projections into planning, regulatory and site-specific efforts.

Additional Information:

- Part I: Science - <https://scholars.unh.edu/ersc/210/>
- Part II: Guidance for Using Scientific Projections - <https://scholars.unh.edu/ersc/211/>

KEYNOTE ADDRESS, *A. R. Siders, University of Delaware*

Managed retreat – the purposeful movement of people and infrastructure away from hazards like flooding coasts – is a controversial adaptation strategy. In this talk, I'll focus on why it is important for communities to consider managed retreat as an option, why these conversations need to happen sooner rather than later, and what best practices have emerged for managing strategic retreat.

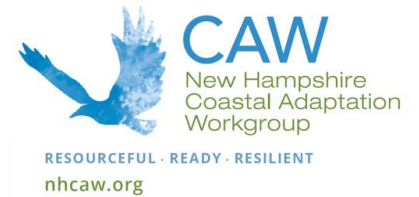
Additional Information:

- Managed retreat in the US, One Earth 2019 - <https://www.sciencedirect.com/science/article/pii/S2590332219300806>
- The case for strategic and managed retreat, Science 2019 - <https://science.sciencemag.org/content/365/6455/761>
- Special issue on managed retreat and environmental justice, JESS 2021 - <http://link.springer.com/article/10.1007/s13412-021-00700-6>

2021 CLIMATE SUMMIT

Staying the Course, Moving Ahead:

Progress Towards a More Resilient Coastal Watershed



SEACOAST TRANSPORTATION CORRIDOR VULNERABILITY ASSESSMENT, Julie LaBranche, Rockingham Planning Commission

The goal of the Seacoast Transportation Corridor Vulnerability Assessment is to enhance regional coordination in New Hampshire for transportation networks vulnerable to sea-level rise and other coastal hazards in order to maximize information sharing, identify opportunities to fill data gaps, and develop shared understanding of options for future transportation planning. Coastal storms and flooding already threaten state and local transportation infrastructure in New Hampshire's seacoast. These risks are expected to increase with sea-level rise, causing potential daily inundation of some transportation assets within the next 80 years. Sea-level rise and other climate change impacts will need to be considered as municipalities and NHDOT maintain or replace aging existing transportation assets and design and construct new systems. Effective adaptation to increasing coastal flood risks will depend upon coordination among transportation decision-makers, municipalities, regulators, and other authorities to share information and develop consistent (or complimentary) transparent methods to ensure a safe and functioning NH Seacoast transportation network.

Additional Information:

- Project Webpage - <https://www.therpc.org/regional-community-planning/climate-change/STCVA>

HAMPTON FLOOD MITIGATION STUDY, Jennifer Hale, Town of Hampton

The Town of Hampton recently completed a Flood Mitigation Analysis of two low-lying barrier beach neighborhoods. This included the area surrounding Meadow Pond and the neighborhoods adjacent to Hampton Harbor. The purpose of this study was to evaluate the current and future flood patterns and to identify alternatives to reduce future flood risks. The results undeniably indicated that the future flood risk in Hampton will continue, foreseeably get worse and most importantly that changes are needed. With a list of recommended alternatives, the Town is now in a position to educate, implement and make the necessary changes that are needed to prevent future property loss and protect our resources.

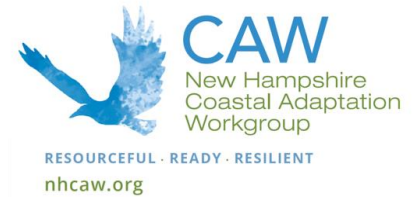
Additional Information:

- Meadow Pond Final Report - https://hamptonnh.gov/DocumentCenter/View/4137/Final-Report-Meadow-Pond_SLR
- Hampton Harbor Final Report - https://hamptonnh.gov/DocumentCenter/View/4138/Final-Report-Harbor_HTA

2021 CLIMATE SUMMIT

Staying the Course, Moving Ahead:

Progress Towards a More Resilient Coastal Watershed



CLIMATE RESILIENCE IN THE PRESCOTT PARK MASTER PLAN, Cheri Ruane, Weston & Sampson Engineers, Inc.

For improvements at Prescott Park, Cheri and her team will soon be implementing new approaches to park design in the era of climate change. Located at the mouth of the Piscataqua River, the park is vulnerable to King Tides, sea level rise, storm surges, and flooding. Cheri's team developed a master plan and a subsequent approach to implementation that reflects climate adaptation, mitigation, and flood protection considerations for this signature park. Using a blend of proven engineering and design best practices and innovative strategies, Cheri and her team are redesigning Prescott Park to withstand and recover from climate-related events.

Additional Information:

- Recommendations Report - http://files.cityofportsmouth.com/files/prescottpark/PParkCommitteeReport_CC.pdf

FORWARD-LOOKING FLOODPLAIN MAPPING IN LEE, NH, Kyle Pimental, Strafford Regional Planning Commission

This presentation will use the Town of Lee as a case study to discuss the benefits and importance of floodplain modeling efforts when amending local regulations.

Additional Information:

- Lee Floodplain Study Maps - <http://straftord.org/services/climatechange.php>
- Assessing Flood Risk in the Lamprey River Watershed: <http://100yearfloods.org/>

LESSONS LEARNED FROM COMMUNITY- BASED PROGRAMS, Alyson Eberhardt, New Hampshire Sea Grant Extension

This presentation will share results of projects of the Coastal Research Volunteers including the NH Volunteer Beach Profile Monitoring Program and sand dune restoration and monitoring efforts. Data from both projects provide evidence that beaches and dunes are valuable storm protection assets and should be restored and maintained wherever possible. In addition, findings from the Coastal Landowner Technical Assistance Program, which provides technical assistance to coastal residents concerned about flooding and/or erosion on their property, will be shared including a summary of concerns, priorities, and information needs.

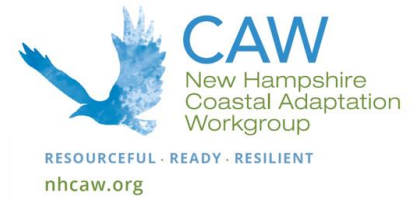
Additional Information:

- New Hampshire Volunteer Beach Profiling Program - <https://seagrant.unh.edu/beach-profiling>
- Coastal Landowner Technical Assistance Program - <https://seagrant.unh.edu/LTAP>
- Coastal Habitat Restoration - <https://seagrant.unh.edu/CoastalHabitatRestoration>

2021 CLIMATE SUMMIT

Staying the Course, Moving Ahead:

Progress Towards a More Resilient Coastal Watershed



PORTSMOUTH EXTENDED FLOOD HAZARD AREA, *Peter Britz, City of Portsmouth*

This presentation is intended to cover how the City of Portsmouth updated and adopted floodplain regulations to address National Flood Insurance Program requirements and to address climate change.

Additional Information:

- Prepare. Protect. Portsmouth - <https://www.cityofportsmouth.com/planportsmouth/cr>

RYE CLIMATE ADAPTATION AND RESILIENCE STANDARDS, *Kimberly Reed, Town of Rye*

This presentation will focus on the new Climate Adaption and Resilience Standards section in the town's comprehensive update of their Land Development Regulations. These new standards were the result of previous project application negotiations by the Planning Board that utilized data from the Tides to Storms Vulnerability Assessment indicating areas of high flood risk from projected sea-level rise and coastal storm flooding. An overview of the general requirements of this section will be discussed.

Additional Information:

- Land Development Standards for the Town of Rye, NH - <https://ecode360.com/35132999>

SAWYER MILL DAM REMOVAL FROM A FLOOD PERSPECTIVE, *Kevin Lucey, NHDES Coastal Program*

After more than 10 years of planning, the Lower and Upper Sawyer Mill Dams have been removed from the Bellamy River. This presentation will provide an overview of the process to restore a river, manage environmental risk, and reduce flooding through the removal of 2 high hazard dams. Kevin will discuss: dam safety design standards, hydrology and hydraulics, the preliminary results of the Letter of Map Revision (LOMR), and efforts to optimize channel conditions through Sawyer Mill to restore aquatic connectivity.

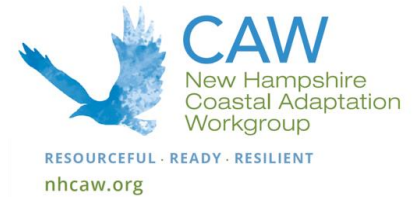
Additional Information:

- Dam Removals in New Hampshire Benefit Public Safety, Fish Migration - <https://www.fisheries.noaa.gov/feature-story/dam-removals-new-hampshire-benefit-public-safety-fish-migration>
- A River's Freedom: Removing Old Dams Creates New Hope for the Bellamy River - <https://www.nature.org/en-us/about-us/where-we-work/united-states/new-hampshire/stories-in-new-hampshire/a-rivers-freedom/>

2021 CLIMATE SUMMIT

Staying the Course, Moving Ahead:

Progress Towards a More Resilient Coastal Watershed



VIRTUAL FIELD TRIP TO WAGON HILL FARM, *Tom Ballestero, University of New Hampshire*

Living shoreline design at the Wagon Hill Farm site in Durham, NH will be presented along with factors leading to impairment at the site, how design accommodated/addressed impairments, and lessons learned.

Additional Information:

- Wagon Hill Farm Living Shoreline Restoration Project - <https://www.nhcaw.org/project/wagon-hill-farm-living-shoreline-phase-iii/>

COMPREHENSIVE PLAN FOR RESILIENT SALT MARSH, *Cory Riley, New Hampshire Fish and Game, Great Bay National Estuarine Research Reserve*

The NH Marsh Plan project is developing a systematic way to delineate marsh units, assess their resiliency, and screen potential management actions such as restoration, land use policy, and land protection. Spatially available data will analyze the current conditions, vulnerability, and adaptation potential of 224 NH marsh units. Project deliverables will include: profiles that summarize the analysis and recommended management actions for each marsh; data and profiles on an interactive web mapping service; and a field assessment protocol to consider aspects that are too small to detect with GIS or non-spatial (site access, cultural resources, etc.).

Additional Information:

- National Landscape Scale Study of Marsh Resilience - <https://www.nerra.org/landscape-scale-marsh-resilience/>

DROUGHT STATUS AND OUTLOOK FOR COASTAL NH, *Thomas O'Donovan, New Hampshire Department of Environmental Services*

This presentation will briefly cover concerns of a Water Division Director and dive deeply into how we got set up for our current drought. Participants will learn about where we stand with the drought, past drought occurrences, the NHDES drought assistance program, and what municipalities and residents can do to take steps to manage the drought conditions.

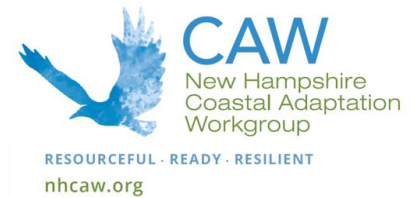
Additional Information:

- NHDES Drought Webpage - <https://www.des.nh.gov/climate-and-sustainability/storms-and-emergencies/drought>

2021 CLIMATE SUMMIT

Staying the Course, Moving Ahead:

Progress Towards a More Resilient Coastal Watershed



SNOW COVER, VERNAL WINDOWS, AND WINTER WHIPLASH, *Elizabeth Burakowski, University of New Hampshire*

Over the past 100 years, New England winters have warmed several degrees and has lost nearly three weeks of snow cover. Combined with warmer springs and earlier leaf out, we've seen a lengthening of the vernal window – the transitional shoulder season between winter and spring with impacts on local hydrology and carbon cycling. The rapid changes in winter contribute to a pressing need to understand winter weather whiplash events and their outsized impact on coupled human and natural systems. In this talk, we'll explore how winters have changed in the past and what to expect for the future.

Additional Information:

- Confronting Our Changing Winters - <https://hubbardbrook.org/confronting-our-changing-winters>

DESIGN SNOW WATER EQUIVALENT AND SNOWMELT, *Jennifer Jacobs, University of New Hampshire*

This presentation showcases our new national design standard maps for current and future snow and snowmelt.

Additional Information:

- Technical Paper - <https://doi.org/10.1029/2020WR028126>