

## **“Salt Marsh Restoration 101”**

### **RESOURCE HANDOUT**

NEAFWA Workshop, April 28, 2021

### ***Saltmarsh Sparrow Related***

FWS Saltmarsh Sparrow page: [fws.gov/northeast/saltmarsh-sparrow/](https://fws.gov/northeast/saltmarsh-sparrow/)

Salt Marsh Bird Conservation Plan (2019): [www.acjv.org/documents/salt\\_marsh\\_bird\\_plan\\_final\\_web.pdf](https://www.acjv.org/documents/salt_marsh_bird_plan_final_web.pdf)

ACJV Saltmarsh Sparrow page: [acjv.org/saltmarsh-sparrow/](https://acjv.org/saltmarsh-sparrow/)

Saltmarsh Sparrow Conservation Plan (2020): [https://www.acjv.org/documents/SALS\\_plan\\_final.pdf](https://www.acjv.org/documents/SALS_plan_final.pdf)

Conserving the Saltmarsh Sparrow dashboard: <https://arccg.is/v9nrm>

[Click here for link to Saltmarsh Sparrow Habitat Prioritization Tool](#)

This tool compares 8,680 salt marsh breeding habitat patches across the Saltmarsh Sparrow range, based on current and long-term potential to support the species. Patches were ranked by seven factors that positively or negatively affect Saltmarsh Sparrow nesting habitat quality, based on regional data.

**Webinar** on this tool available here: [Saltmarsh Sparrow Habitat Prioritization Tool Webinar 5/5/2020](#)

### ***Marsh Restoration, Prioritization, & Assessment Tools***

#### **Salt Marsh Integrity Index (SMI)**

U.S. Geological Survey (USGS) researchers ([Nagel et al.](#)) developed a multi-metric index of salt marsh condition on federal lands (National Park Service & National Wildlife Refuge System), that has been used to evaluate marsh health, measure change over time, and model management scenarios.

[Project details are available here.](#)

A presentation on SMI is [available online](#).

#### **National Assessment of Salt Marsh Resilience**

National Estuarine Research Reserve (NERR) researchers measured marsh resilience at the landscape scale for all lower 48 states. [www.nerra.org/landscape-scale-marsh-resilience/](https://www.nerra.org/landscape-scale-marsh-resilience/)

#### **Marsh Resilience Assessment Tool (MARS)**

Researchers at National Estuarine Research Reserves created this framework to evaluate tidal marsh resilience to sea-level rise (MARS) with a suite of metrics.

<https://www.nerra.org/marsh-resilience-assessment/>

A journal article detailing this effort is here: <https://doi.org/10.1016/j.biocon.2016.10.015>

### **Unvegetated / Vegetated Marsh Ratio (UVVR)**

U.S. Geological Survey (USGS) researchers developed this tool to assess marsh resilience to sea level rise and other stressors. It measures the ratio of unvegetated to vegetated area across an entire marsh system, including marsh, channels, ponds, and flats. Higher UVVR values reflect more open water and less vegetative cover, which indicates vulnerability to ongoing marsh loss. A [national assessment](#) is based on Landsat data; [high-resolution metrics](#) are available for part or all of MA, NY, NJ, and MD/VA. [Project details are available here.](#)

**Webinar** on this tool available here: [Using UVVR for salt marsh management and restoration](#)

**Note:** an evaluation and comparison of MARS & UVVR metrics was published by [Wasson et al. 2020](#)

### **Wetland Assessment Tool for Condition and Health (WATCH)**

The [Partnership for the Delaware Estuary](#) created the **Wetland Assessment Tool for Condition and Health (WATCH)** to guide restoration practitioners in evaluating multiple aspects of current and future tidal salt marsh conditions and inform potential restoration alternatives.

<https://www.delawareestuary.org/science-and-research/tools/watch-tool/>

**Webinar** on this tool available here: [Wetland Assessment Tool for Condition and Health \(WATCH\)](#)

## **Webinars Related to Salt Marsh Restoration Techniques**

*Farmers in the Marsh* – How extensive historical agricultural activities have changed salt marshes

By Susan Adamowicz, Geoffrey Wilson, and David Burdick

<https://www.youtube.com/watch?v=EaR2164Zvq0>

*Using Dredged Sediment to Create Vanishing Habitats and Restore Tidal Wetlands*

By Lenore Tedesco (The Wetlands Institute & Seven Mile Island Innovation Lab)

<https://www.youtube.com/watch?v=-nWlp0UcO7o>

*Salt Marsh Revegetation Using Runnels* – How digging runnels--shallow creeks--can restore tidal hydrology in drowning marshes, help them revegetate and adapt to accelerated sea-level rise.

By Susan C. Adamowicz, David Burdick, Wenley Ferguson, and Geoffrey Wilson

<https://www.youtube.com/watch?v=VnJ138SmyDE>

## **Additional Data Layers & Tools**

### **C-CAP High-Resolution Land Cover and Change**

NOAA's Office for Coastal Management developed a nationally standardized, raster-based inventories of U.S. coastal land cover data derived from analysis of multiple dates of remotely sensed imagery.

[Availability of high-resolution data varies by state](#), but more states are expected to become available.

**Coastal National Elevation Data:** <https://www.usgs.gov/core-science-systems/eros/coned/data-tools>

The U.S. Geological Survey (USGS) Coastal National Elevation Database Applications (CoNED) Project Viewer contains integrated topobathymetric data (topobathy) of merged renderings of both topography (land elevation) and bathymetry (water depth).

**The Nature Conservancy – Coastal Resilience & Resilient Land Mapping Tools:**

The Coastal Resilience tools provide support for decision-makers working at regional and national scales to assess where to act for risk reduction, adaptation and conservation. Not all states in our region are included, but there is information for Maine, Connecticut, New York, New Jersey and Virginia.

<https://coastalresilience.org/tools/>

<https://maps.tnc.org/resilientland/>

**Delaware Bay Wetland Projections**

EPA researchers used the SLAMM model to determine spatially-explicit wetland distributions and projections in space and time under conditions of accelerated sea level rise (SLR). Predicts changes in low & high marsh at seven salt marsh complexes (four in New Jersey, three in Delaware).

Website: <https://www.epa.gov/gcx/about-delaware-bay-wetland-projections>

Publication: [http://ofmpub.epa.gov/eims/eimscomm.getfile?p\\_download\\_id=538289](http://ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=538289)

**Causal Analysis/Diagnosis Decision Information System (CADDIS)**

EPA researchers developed this on-line application to help users conduct causal assessments, primarily in stream ecosystems. It provides a logical, step-by-step framework for stressor identification based on the U.S. EPA's [Stressor Identification Guidance Document](#). Although designed for streams, it provides a conceptual framework applicable to other wetland ecosystems, including salt marshes.

<https://www.epa.gov/caddis>

**Adaption Design Tool (ADT)**

EPA researchers developed this tool to improve the adaptive capacity of ecosystem-based management activities in the context of extreme events and rapid environmental change. The tool guides users through a series of design considerations to adjust currently-planned management actions to be more climate-smart, brainstorm and craft new adaptation actions to address remaining vulnerabilities, and identify research gaps and interactive effects that need to be considered.

<https://www.epa.gov/gcx/about-adaption-design-tool-adt>