

The Climate Change Vulnerability Assessment Tool for Coastal Habitats

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The Climate Change Vulnerability Assessment Tool for Coastal Habitats (CCVATCH) is a spreadsheet-based decision support tool that incorporates local data and knowledge with climate change information to evaluate the climate vulnerability of habitats. The premise of the CCVATCH is that changes in climate not only affect ecosystems directly, but also interact with current stressors to impact habitats, and that adaptive capacity, imparted from a system's natural traits or potential management actions, can lessen these impacts.

The CCVATCH guides a team of local experts, including land managers and researchers, through a series of questions to assess the current condition of the habitat and the possible interactions of changes in air/water temperature, precipitation, relative sea level, and frequency/severity of storm events, with the ecosystem stressors invasive species, nutrients, sediment supply, and contamination. The team then evaluates traits of the habitat that may contribute to ecological resilience, and available management actions and likely human responses to identify potential sources of adaptive capacity for the habitat. The CCVATCH Guidance document summarizes available research findings, provides information resources, and outlines how other tools may be used to allocate a numerical score for each potential climate exposure by non-climate stressor interaction and adaptive capacity element. The CCVATCH spreadsheet calculates a final numerical vulnerability score, which can be used to rank the relative vulnerability of assessed habitats within a defined area.

The CCVATCH was developed over several years within the National Estuarine Research Reserve (NERR) System, with input from local land managers, researchers, and state and federal agency representatives. The tool design and facilitation process was tested across multiple habitats at each of two pilot sites at the Chesapeake Bay, Virginia and North Inlet–Winyah Bay, South Carolina NERRs. Collaborative efforts among the four New England NERRs, and between the North Carolina and South Carolina NERRs, are underway to use the CCVATCH to increase understanding of the relative vulnerabilities of coastal habitats both at specific sites at each Reserve and across regions. Current information about documented impacts of a changing climate on coastal habitats, the interactions between climate change and non-climate stressors, and the degree to which conditions influence adaptive capacity, is in many instances unknown or uncertain. In addition to providing a mechanism for local experts to anticipate habitat response based on the available information, these regional CCVATCH projects will also capture the 'state of knowledge' related to the interaction of climate change with existing stressors on habitats, and will help to identify local data gaps and research needs. Understanding which climate–stressor interactions are most likely to contribute to the loss (or gain) of a particular habitat will help managers and local decision-makers to select the most appropriate strategies to either eliminate or reduce the stressor, or alternatively, to improve the processes and conditions that support the resiliency of the habitat.