

# DROUGHT AND COASTAL ECOSYSTEMS: AN ASSESSMENT OF DECISION MAKER NEEDS FOR INFORMATION

Kirsten Lackstrom, Amanda Brennan, Kirstin Dow<sup>1</sup>

The National Integrated Drought Information System (NIDIS) is in the process of developing drought early warning systems in areas of the U.S. where the development and coordination of drought information is needed. In summer 2012, NIDIS launched a pilot program in North and South Carolina, addressing the uniqueness of drought impacts on coastal ecosystems. The monitoring and management of drought in coastal regions presents several challenges. While commonly used drought indices incorporate data such as rainfall, streamflow, soil moisture, groundwater levels, and snow pack, such indices were developed for upland areas and may not be appropriate indices for characterizing coastal drought. Furthermore, current systems of drought management focus primarily on agricultural impacts, fire risks, and maintaining water supplies for municipal and industrial use, energy production, and navigation. Understanding of drought impacts on other interests and sectors (e.g. environmental resources, public health, and water quality) remains limited. In addition, these impacts are currently not well integrated into existing planning and response processes at national, regional, state, and local levels.

This paper introduces the NIDIS-Carolinas program and provides information about one of the pilot projects. Interviews with fishermen, outdoor recreation business owners, and land managers in the Beaufort County (SC) and Carteret County (NC) areas were conducted to document and assess local-level experiences with drought and decision makers' needs for drought information and resources in the coastal Carolinas. Their concerns center on water quality conditions, particularly salinity levels and fluctuations, and the availability of freshwater to meet the needs of coastal animals, plants, and habitats. Fluctuating salinity levels affect the movement, location, and abundance of many aquatic species, thereby affecting their accessibility to fishers. On managed lands, drought conditions increase fire risks and make impoundments unsuitable for waterfowl and fish, thereby affecting conservation objectives and limiting recreational use of those areas. Interviewees do not regularly use formal sources of drought information but consider a range of locale-specific information related to weather (precipitation, temperature), salinity, wind, tides, and other environmental conditions in making decisions. Interviewees indicated interest in baseline data regarding "normal" and extreme hydroclimate conditions and integration of drought information with other coastal and ecological monitoring efforts. Findings from this project will help inform other components of the program, including the development of a drought index for coastal regions based on USGS real-time salinity measurements, the identification of ecological thresholds, and testing of ecological indicators of drought for coastal ecosystems.

<sup>1</sup>Kirsten Lackstrom, Research Associate, Carolinas Integrated Sciences and Assessments, Department of Geography, University of South Carolina, Columbia, SC 29208

Amanda Brennan, Climate Outreach Specialist, Carolinas Integrated Sciences and Assessments, Department of Geography, University of South Carolina, Columbia, SC 29208

Kirstin Dow, Professor, Carolinas Integrated Sciences and Assessments, Department of Geography, University of South Carolina, Columbia, SC 29208

*Citation for proceedings:* Stringer, Christina E.; Krauss, Ken W.; Latimer, James S., eds. 2016. Headwaters to estuaries: advances in watershed science and management—Proceedings of the Fifth Interagency Conference on Research in the Watersheds. March 2-5, 2015, North Charleston, South Carolina. e-Gen. Tech. Rep. SRS-211. Asheville, NC: U.S. Department of Agriculture Forest Service, Southern Research Station. 302 p.