

Eastern-SNOW: A Coordinated Eastern United States Snow Observation Network

ELIZABETH A. BURAKOWSKI¹, ALIX CONTOSTA¹, MICHAEL DURAND², AND
JENNIFER JACOBS¹

ABSTRACT

In the eastern United States, snow is essential to ecosystem function, to economic prosperity of rural communities, and to water supplies of both urban and rural areas. The snowpack can also pose hazards when it causes flooding and infrastructure damage. Snow performs similar roles the western US, but while a robust network of 800+ automated and standardized stations provide a detailed climatology of western US snow, the eastern US lacks such a spatiotemporally rich network. The hundreds of COOP observer stations that provide the majority of snow depth data in the East suffer from inconsistencies in reporting standards, missing data, and poor measurement quality, limiting the ability of eastern US snow data to meet a variety scientific, policy, and management needs. Furthermore, few COOP observers report snow water equivalent (SWE), and only five automated Soil Climate Analysis Network (SCAN) sites in the eastern US provide automated SWE observations. Because most models simulate snow depth as SWE, the dearth of eastern US automated and standardized SWE records leaves researchers lacking requisite data for model validation that underlies weather forecasting, flood risk assessment, and future climate projections. Here, we report on the current inventory of eastern US snow records. We will use the inventory to identify data gaps, prioritize community research needs, and inform design of a robust, coordinated Eastern United States Snow Observation netWork (Eastern-SNOW) whose objectives are to: (1) establish a standardized database for all eastern US snow observations, (2) identify priority locations for new, automated snow sensor sites, and (3) streamline data collection and processing from these sites. Although the proposed Eastern-SNOW network will complement the existing SNOTEL network, it will serve the unique research, management, and policy needs of the eastern US, particularly within the context of a changing winter climate.

¹ Institute for the Study of Earth, Oceans, and Space, University of New Hampshire, Durham, NH, USA

² School of Earth Science, The Ohio State University, Columbus, OH, USA