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National Watershed Research Network

ACCOUNTING FOR CLIMATE CHANGE IN POST-CONSTRUCTION STORMWATER STANDARDS

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Executive Summary

Stormwater management systems have historically been designed based on the assumption that climate is stable. The unprecedented rate of change in global climate patterns therefore has important implications for stormwater managers; yet, incorporating climate information into stormwater management has been a challenge for many communities.

The objective of this study was to review the existing state post-construction stormwater standards to provide a clearer understanding of the current stormwater management approaches to climate resiliency. To achieve this objective, the Center for Watershed Protection (CWP) first reviewed the technical literature to identify: 1) vulnerabilities posed by climate change to effective stormwater management and 2) best stormwater design practices to manage these vulnerabilities. Next, CWP evaluated state-published stormwater standards with respect to each state's specific stormwater vulnerabilities and the degree to which stormwater-related climate adaptations have been incorporated into standards.

The review identified four major climate impacts most relevant to stormwater best management practice (BMP) function (Figure ES-1) and rated the extent to which each impact is expected in each U.S. region. By overlaying these projected climate impacts with the projected increase in developed land over the next 25 years, CWP then categorized each state based on its overall **vulnerability** to stormwater-related climate impacts.

The review also identified a typology of stormwater adaptations to the major climate impacts, organized around seven categories: 1) design storm data & BMP sizing, 2) BMP selection and siting, 3) BMP storage, 4) conveyance & pre-treatment, 5) material selection, 6) maintenance, and 7) landscaping & plant selection. Based on the typology of stormwater adaptations, CWP developed a questionnaire and scoring sheet to evaluate the extent to which existing state stormwater standards incorporate these adaptations and, in particular, if the standards have been modified to address the climate impacts most important in that state's region. The questionnaire also evaluated the extent to which the standards are up to date and based on the best available science and practices.

CWP used the resulting scores to characterize the overall **readiness** of each state to adapt their stormwater standards to expected climate impacts. Figure ES-2 shows each state's combined vulnerability and readiness ranking.

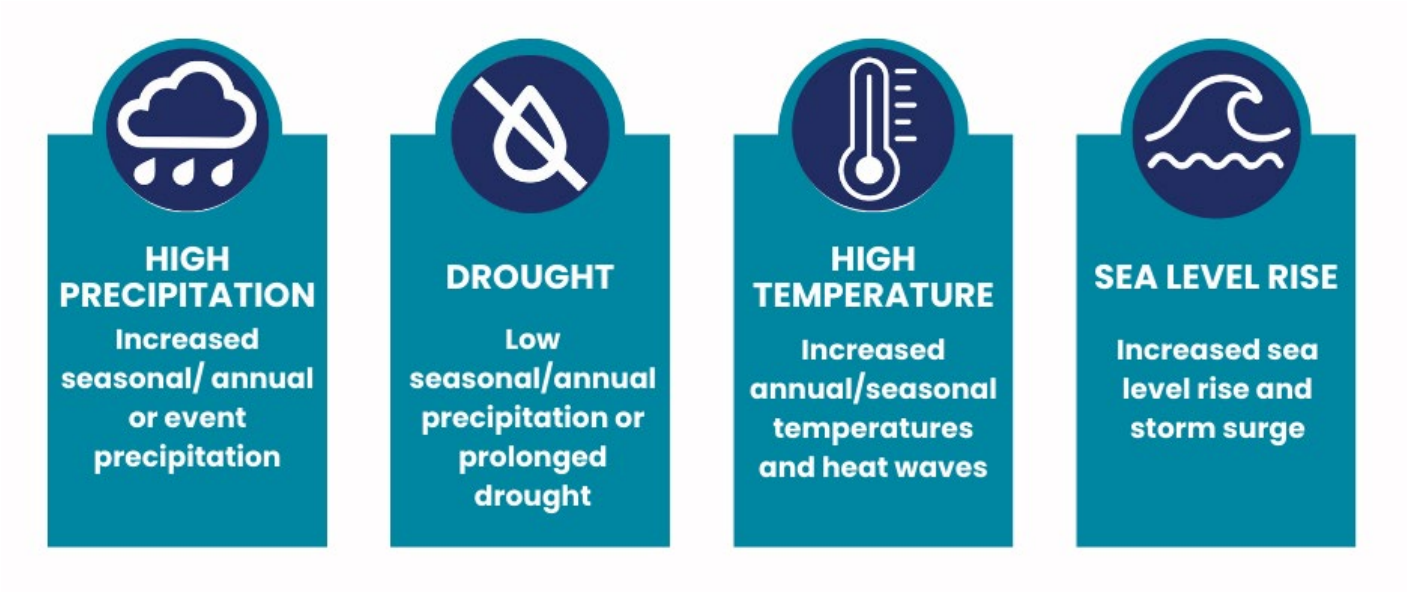

Figure ES-1. Major Stormwater-Related Climate Impacts

Finally, CWP compared state vulnerabilities to readiness and identified recommendations for states to close the gaps. This paper includes state-specific recommendations for improvements to post-construction stormwater standards. Local or regional agencies who wish to evaluate their own stormwater standards can do so using a similar process as this study and the Climate Assessment Tool for Stormwater Standards provided with the report.

This study focused on improving resilience to stormwater-related climate impacts through changes to stormwater standards at the state level. This paper serves as a resource for state and municipal stormwater managers to look up their projected levels of climate vulnerability and readiness and access actionable recommendations for adapting stormwater standards to climate change. It also provides a snapshot of each state's vulnerability and readiness relative to other states to highlight where action is urgently needed.

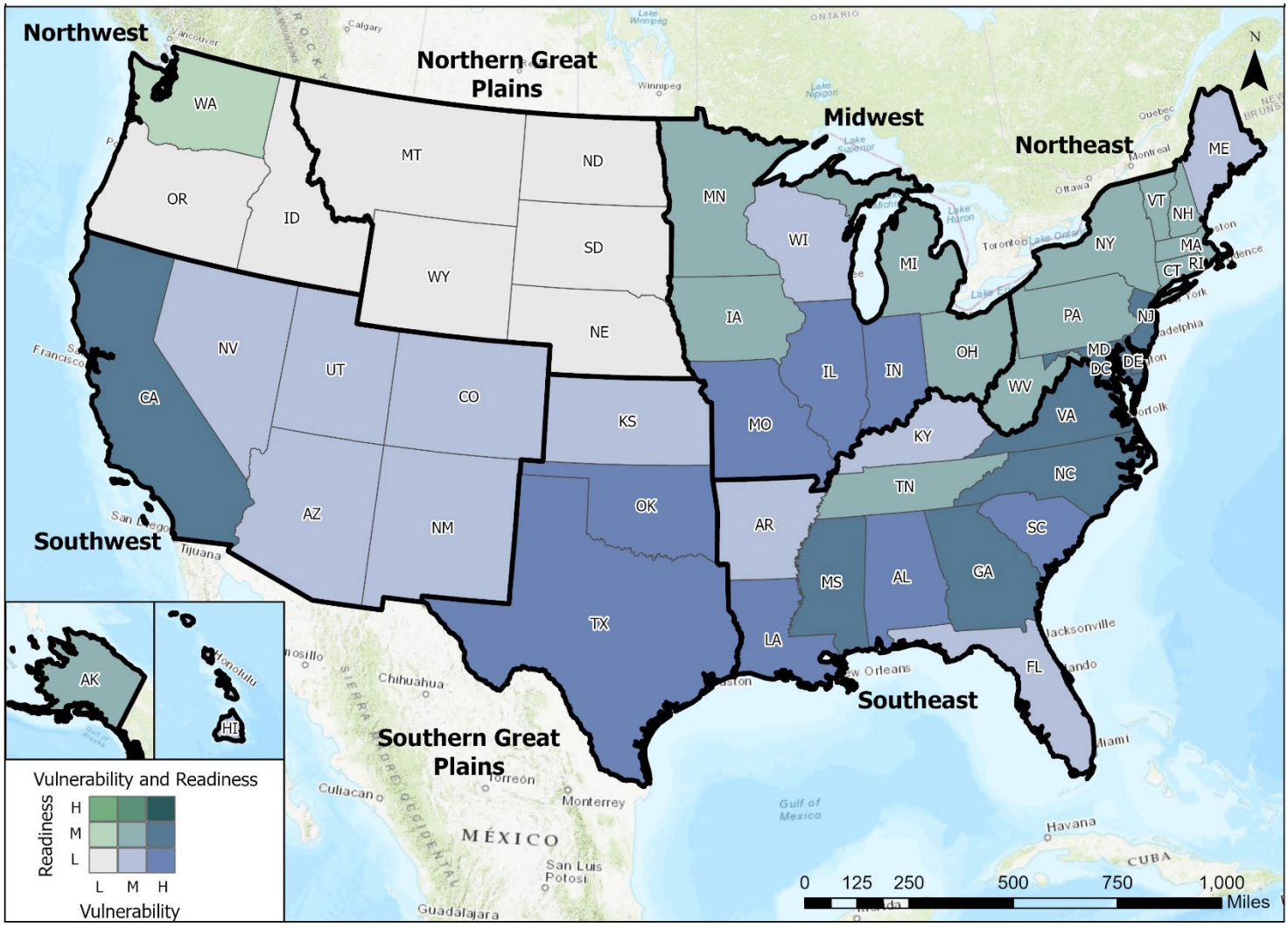

Figure ES-2. State Vulnerability and Readiness Categorization