

NOUS41 KWBC 151730  
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Public Information Statement 22-59  
National Weather Service Headquarters Silver Spring MD  
130 PM EDT Thu Sep 15 2022

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From:         Dr. Thomas Graziano  
              Director, Office of Water Prediction

Subject: Soliciting Comments on Proposed Methods to Update the National  
Precipitation Frequency Standard through November 15, 2022

The Hydrometeorological Design Study Center (HDSC) of the NWS Office of Water Prediction is updating the modeling framework of the NWS's authoritative precipitation frequency analysis product (currently NOAA Atlas 14) which provides precipitation depth/intensity duration frequency information and derived complementary information. This update would allow for the modeling of temporal nonstationarity and the integration of future climate projections. The update will provide continuous spatial coverage for the United States and affiliated territories using the most recently available precipitation observations, and will provide enhanced supplemental products. The NWS is soliciting comments and feedback on this proposed update through November 15, 2022.

The update will supersede the current precipitation frequency estimates for areas with existing coverage and will be delivered as part of a proposed Atlas 15 volume series. Future review and feedback on the updated products will be coordinated prior to publication and operational implementation of the data service delivery. Information about the current HDSC Precipitation Frequency Standard Product based on Atlas 14 can be found at <https://hdsc.nws.noaa.gov/hdsc/pfds/>.

A detailed description of the research supporting the proposed framework update is available in the assessment report titled: Analysis of Impact of Nonstationary Climate on NOAA Atlas 14 Estimates. This report can be found at:

[https://hdsc.nws.noaa.gov/hdsc/files25/NA14\\_Assessment\\_report\\_202201v1.pdf](https://hdsc.nws.noaa.gov/hdsc/files25/NA14_Assessment_report_202201v1.pdf)

The proposed changes include:

A. Updating the statistical methodology to account for temporal nonstationarity as follows: (1) replacing the current L-moment parameterization estimation technique with the generalized maximum likelihood technique; (2) adding covariates (additional variables, such as radiative forcing) to the estimation of the distribution parameters to account for regional temporal changes in historical or future extreme time

series; (3) altering regional techniques by replacing the manual regionalization grouping and period of record weighting with automated grouping and weighting based on the triweight kernel function, utilizing the distance, period of record, and/or other measures; (4) integrating the interpolation into the parameter estimation instead of relying on the post-processing interpolation technique; (5) altering the spatial interpolation by replacing the Oregon State University PRISM group's developed mean annual maximum (MAM) product with their mean annual precipitation (MAP) product, which is used as a base dataset; (6) bootstrapping the estimates based on historical observations to account for the uncertainty.

B. Adding new product features to account for future precipitation information from climate model projections: (1) providing future estimates as adjustment factors to the precipitation frequency estimates based on historical observations; (2) providing adjustment factors based on the multi-model approach to account for the uncertainties associated with climate projections and future estimates; (3) for methodology that is based on the climate projection time series, using the updated methodology in part A to calculate the precipitation adjustment factors.

The HDSC is accessible at the following landing page:

<https://www.weather.gov/owp/hdsc/>

Please provide feedback through the NWS official survey at:

<https://www.surveymonkey.com/r/ProposedChangesforAtlas15>

For additional feedback, comments or questions on this product, please contact: [hdsc.questions@noaa.gov](mailto:hdsc.questions@noaa.gov).

National Public Information Statements are online at:

<https://www.weather.gov/notification/>

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