



HYDROMETEOROLOGY

Flood events and extended droughts are of significant and growing concern in many parts of the world. A critical requirement across all water resources applications is high-quality hydrometeorological information. As recognized industry leaders, we support state and federal agencies, dam safety programs, watershed management groups, water utilities, and hydropower generators with hydrometeorological inputs for flood risk assessments, climate resiliency applications, and water monitoring and forecasting. We have the meteorological expertise to complete probable maximum precipitation (PMP) using the original methods and the statistical expertise to estimate precipitation-frequency (PF) for the rare exceedance probabilities required for watershed and statewide dam safety studies.

Let's partner to address key decisions about extreme hydrologic events stemming from large, rare storms in a changing climate.



OUR HYDROMETEOROLOGICAL SERVICES

- Storm reconstructions and analyses that are integral parts of deterministic probable maximum flood calculations and probabilistic flood studies
- PF relationship development at point or watershed scales
- PMP estimation for probable maximum flood studies
- Incorporation of climate change information into water resource applications
- An easy-to-use web interface tool, MetPortal, that provides PF and PMP data





WHY RTI?

-  Industry-leading extreme precipitation experts
-  More than 2 decades of experience
-  Projects for federal, state, commercial, and international clients
-  Invaluable integrated approach
-  Champions of industry best practices
-  Solutions focused

FEATURED EXPERIENCE:



Tennessee Valley Authority (TVA): We support TVA's River Management and Dam Safety programs by developing the necessary high-quality PF inputs and pioneering the storm typing methodology and climate vulnerability analyses. This work has included not only risk assessment improvements and hydrologic hazards analysis, but also reservoir operations studies, operational forecast system modernization, hydrologic and hydraulic model calibrations, dam break flood inundation mapping, and dam failure consequence analysis.

National Oceanic and Atmospheric Administration (NOAA): We are developing Atlas 15 for NOAA's Office of Water Prediction. Atlas 15 provides authoritative seamless grids of PF estimates through a 1:1,000 exceedance probability for both nonstationary and future climates. The PF values will streamline the estimation process and assist designers of roads, bridges, and other infrastructure in meeting federal, state, and local guidelines and regulations.



Hydropower Companies: Our teams are at the forefront of incorporating climate change into PF analyses and are expanding our capabilities to include nonstationary covariates in regional frequency analyses. In response to the revised definition of PMP, which requires PF estimates at rare annual exceedance probabilities (AEPs), our work on numerous statewide studies meets this requirement. We are applying the regional Schaefer-Wallis-Taylor approach to PF estimation, delivering more reliable extreme precipitation data at AEPs of 10⁻⁷ across the province, using storm typing and enhanced spatial mapping procedures.

MetPortal: In Colorado and New Mexico, we created MetPortal, offering precipitation estimates for rare AEPs and storm types for all locations within those states, and expanded it to include PMP estimates for British Columbia. Our framework delivers timely extreme precipitation data for statewide or localized use, supporting risk-informed decisions, probabilistic flood hazard analyses, and probable maximum flood studies. Designed with the end user in mind, our products provide the essential hydrometeorological information that hydrologists and engineers need for both detailed stochastic flood analyses and simplified assessments for lower-risk dams.



Center for Water Resources

rti.org/cwr

cwr@rti.org

RTI 15935 0924