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## West Coast Forecast Challenges and Development of Atmospheric River Reconnaissance

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Water management and flood control are major challenges in the Western U.S. They are heavily influenced by atmospheric river (AR) storms that produce both beneficial water supply and hazards, e.g., 84 % of all flood damages in the West (up to 99% in key areas) are associated with ARs. However, AR landfall forecast position errors can exceed 200 km at even 1-day lead time and yet many watersheds are <100 km across, which contributes to issues such as the 2017 Oroville Dam spillway incident and regularly to large flood forecast errors. Combined with the rise of wildfires and deadly post-wildfire debris flows, such as Montecito (2018), the need for better AR forecasts is urgent.

AR Recon was developed as a research and operations partnership to address these needs. It combines new observations, modeling, data assimilation and forecast verification methods to improve the science and predictions of landfalling ARs. ARs over the northeast Pacific are measured using dropsondes from up to three aircraft simultaneously. Additionally, airborne radio occultation is being tested, and drifting buoys with pressure sensors are deployed. AR targeting and data collection methods have been developed, assimilation and forecast impact experiments are ongoing, and better understanding of AR dynamics is emerging.

AR Recon is led by the Center for Western Weather and Water Extremes and NWS/NCEP. Core partners are Navy, Air Force, NCAR, ECMWF and academia. It is included in the “National Winter Season Operations Plan,” to support improved outcomes for emergency preparedness and water management in the West.

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