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Abstract for a paper to be presented at the ASDSO West Regional Conference, Omaha, Nebraska, May 20-22, 2007 by Ed Tomlinson, PhD

Statewide Probable Maximum Precipitation (PMP) Study for the State of Nebraska

Applied Weather Associates (AWA) is conducting a regional probable maximum precipitation (PMP) study for the state of Nebraska. This project will provide a PMP analysis that includes comprehensive evaluations of extreme rainfall storm events including storm analyses, storm maximization, storm transpositioning, and storm aspect ratio and orientation evaluations. The results of these analyses will provide the basis for computing PMP values. All extreme rainfall storm events that have occurred over meteorologically and geographically similar regions are being studied. Comprehensive analyses of both synoptic extreme rainfall systems and smaller scale Mesoscale Convective Complexes (MCCs) extreme rainfall storms are being provided.

This PMP study is identifying significant extreme rainfall storm events listed in HMR 51 and in the EPRI Michigan/Wisconsin Regional PMP Study that are appropriate for Nebraska. Additionally, a storm search is being completed to identify all other extreme storms including storms not identified in HMR 51 as well as extreme rainfall events that have occurred since the publication of HMR 51. Storm isohyetal and depth-area-duration analyses will be completed for extreme rainfall storm events not previously analyzed.

The rainfall amounts associated with all extreme rainfall storm events identified will be adjusted throughout the state of Nebraska using standard procedures. Published storm analyses and maximization factors when available from the National Weather Service are being used. Appropriate more recent storms identified in the EPRI Michigan/Wisconsin regional PMP study are included along with any new storms identified in the storm search. A gridded analysis procedure is being used with the contribution of each transpositioned storm applied across a grid that not only covers the state of Nebraska but extends into bordering states to insure continuity across state lines.

The largest of the adjusted rainfall amounts will be used to compute PMP values for all area sizes and durations included in HMR 51. These include durations of 6, 12, 24, 48 and 72 hours and area sizes of 10, 200, 1000, 5000, 10000, and 20000 square miles. Storm types that affect different area sizes and durations will be identified. Envelopment of the largest rainfall totals will be applied to insure spatial and temporal continuity of the final PMP values.