**Exceedance Probability Analysis for the South Carolina Rainfall Event of October 2015**

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The Hydrometeorological Design Studies Center (HDSC) analyzed annual exceedance probabilities (AEPs) of the worst case rainfall for the South Carolina rainfall event that occurred during 2 - 4 October 2015. The rainfall event delivered rainfall amounts that exceeded 20 inches in 48 hours in some locations.

AEP is probability of exceeding a given amount of rainfall for a given duration at least once in any given year at a given location. It is an indicator of the rarity of rainfall amounts and is used as the basis of hydrologic design. The rarity of this event is illustrated in three figures below. Figure 1 shows how the maximum observed rainfall amounts compared to corresponding rainfall frequency estimates for AEPs from 1/10 (10%) to 1/1000 (0.1%) for durations from 1-day to 60-day for a rain gauge in South Carolina - US1SCCR0069, Mount Pleasant 6.4 NE (32.89655°N, 79.796166°W). The rain gauge is part of the Community Collaborative Rain, Hail & Snow Network (CoCoRaHS). The AEPs are estimates from the NOAA Atlas 14, Volume 2. As can be seen from Figure 1, observed rainfall amounts have annual exceedance probabilities of significantly less than 1/1000 for all durations from 2-day to 60-day (ending on October 5).

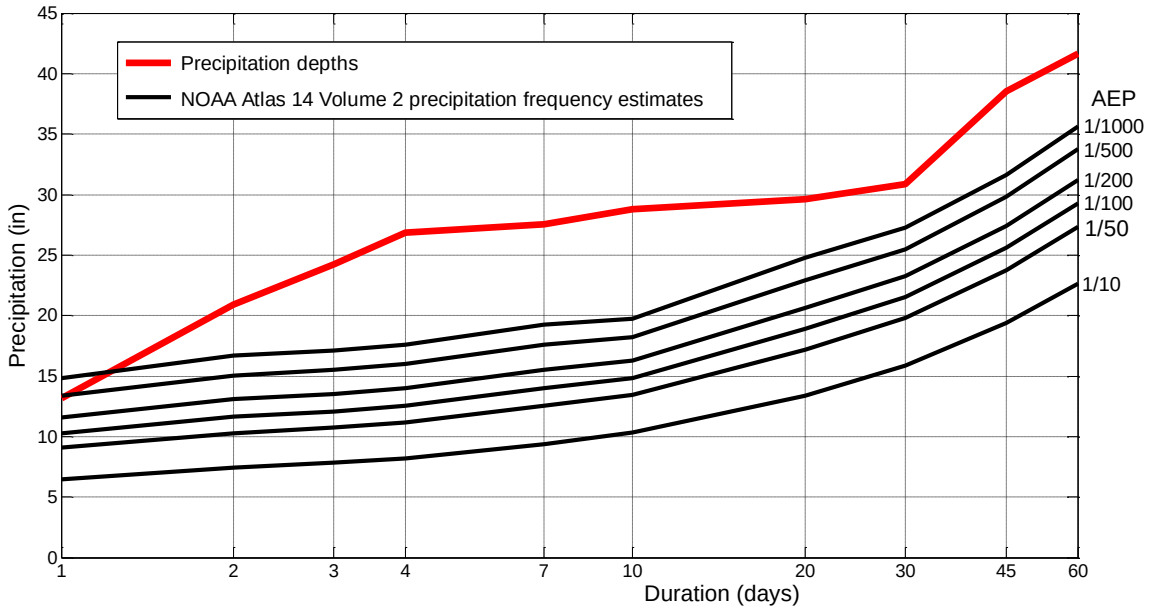


*Figure 1. Maximum observed rainfall amounts in relationship to corresponding precipitation frequency estimates for the* US1SCCR0069 *gauge.*

The maps in Figures 2 and 3 show the areas that experienced rainfall magnitudes with AEPs ranging from 1/10 (10%) to smaller than 1/1000 (0.1%) for the 24-hour and 72-hour duration, respectively. The 24-hour and 72-hour durations were selected as examples; maps for other daily durations look similar to the 72-hour map. Note that the beginning and ending of the worst case observation period is not necessarily the same for each location. As a result, these maps don't represent isohyets at any particular point in time, but rather the whole event. Rainfall amounts are derived from the National Centers for Environmental Prediction (NCEP), Environmental Modeling Center's (EMC) Stage IV analysis. Rainfall frequency estimates are from the NOAA Atlas 14, Volume 2.

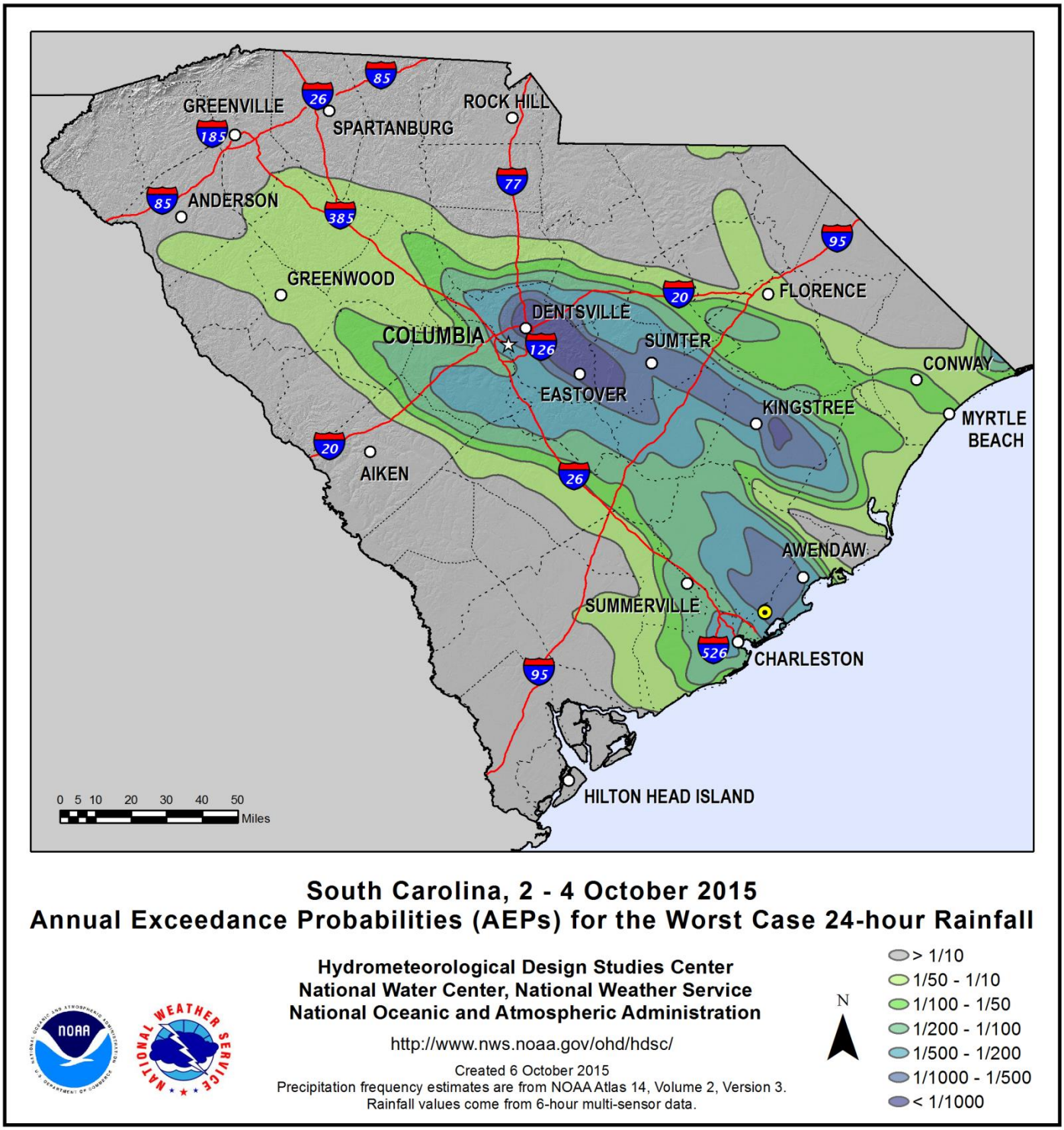


*Figure 2. Annual exceedance probabilities for the worst case 24-hour rainfall from 2 to 4 October 2015. The yellow marker is the location of the US1SCCR0069 CoCoRaHS gauge.*

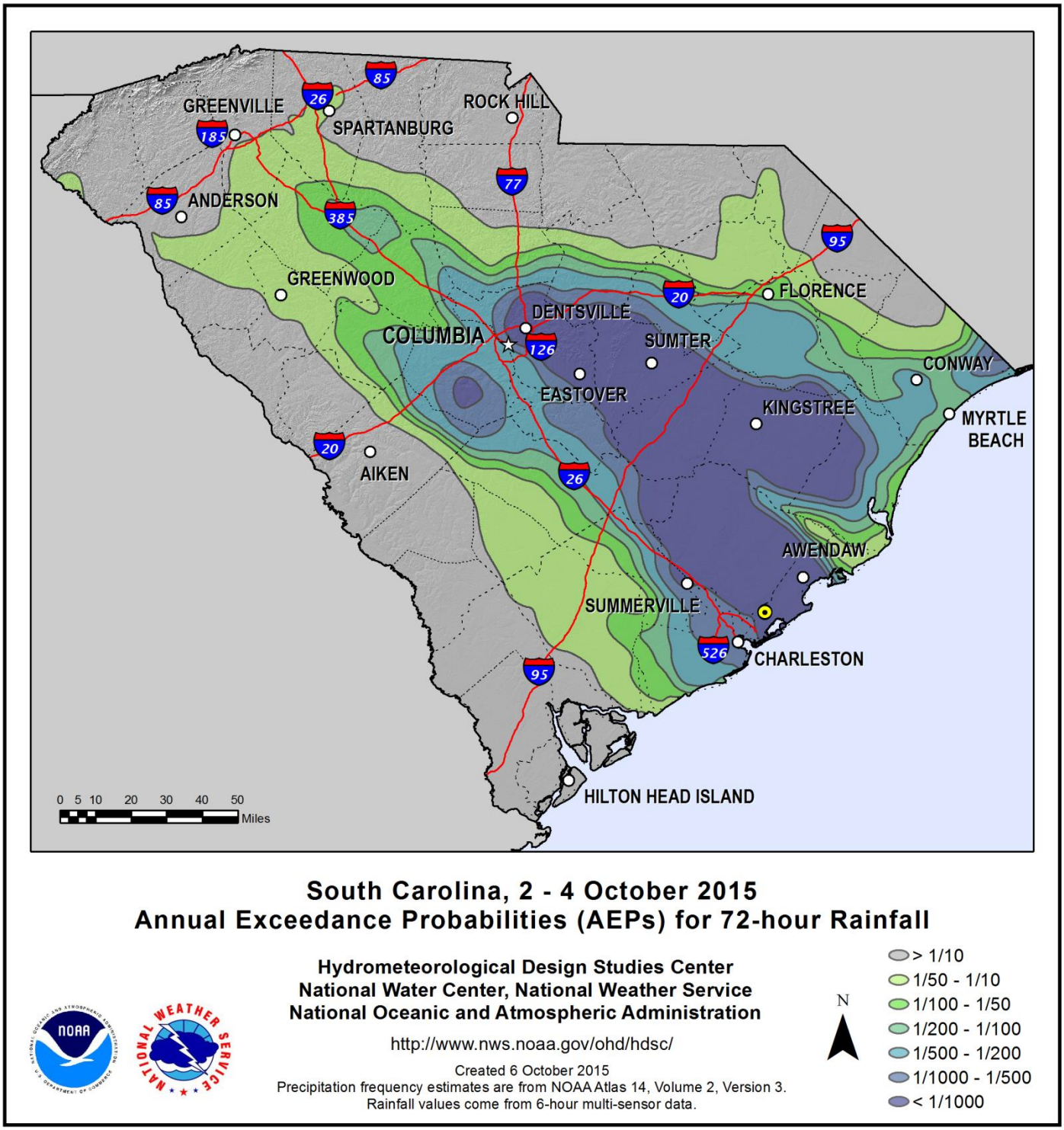


*Figure 3. Annual exceedance probabilities for the worst case 72-hour rainfall from 2 to 4 October 2015. The yellow marker is the location of the US1SCCR0069 CoCoRaHS gauge.*