

Extreme Rainfall in Florida; Local Climatologies Revisited

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Extreme rainfall often produces dangerous floods. Control of surface runoff, and thus mitigation of harmful flooding, is based on climatological frequencies (return periods) of such extreme rainfall. Design storms, defined as rainfall amounts expected to occur within a chosen period and having a chosen return period, form a basis for flood mitigation efforts. With an aim of furthering management of risk of flooding from extreme rainfall events, this study reviews spatial and temporal variability of local climatologies of extreme rainfall in Florida.

For 62 cooperative and first-order observing sites in Florida, daily rainfall values for the period 1948-2004 were acquired from NCDC files. These daily values were used to compile totals for periods of 24, 48 and 72 hours, with emphasis placed on a 48-hour period. Both annual maximum and partial duration rainfall data were included. Return periods were computed from both Gumbel and Generalized Extreme Value (GEV) distributions whose moments were derived via the method of L-moments.

Results from the two extreme value distributions are very similar at some sites, but do vary at other locations. In general, the GEV distribution captures the extreme values better at individual sites, particularly for longer return periods. Also, differences in design storm values are seen in results from annual maximum versus partial duration rainfall data.

Previous studies have compiled climatological frequencies of extreme rainfall for a variety of climate and water-management zones in Florida. Results of the current study suggest rainfall frequencies obtained from regionally-composited distributions may be sufficiently representative to provide alternatives to at-site frequencies in some areas. Finally, examples of frequencies of potential surface runoff derived from maximum rainfall frequencies are presented.

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