

COMBINED PROBABILITY OF COASTAL AND RIVERINE FLOODING

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As part of our FEMA flood risk analysis and mapping efforts, Taylor Engineering created a streamlined calculation method to determine the combined probability of coastal and riverine flooding. The Combined Rate of Return (CROR) analysis tool works in conjunction with ArcMap and allows the user to visualize the flooding levels associated with each recurrence interval at chosen locations. The extreme water levels associated with these two different types of flooding processes are assumed to be physically independent and not concurrent. This simple assumption may not account for every storm-induced case; however, it allows for simple development of the compound flooding curves and is a method approved by FEMA.

To develop the curves, the flood elevation for each flood source is calculated at four different recurrence intervals. The rate of occurrence is equal to the inverse of the recurrence interval, such that the 100-year flood has a 1% annual chance of occurrence. The compound flooding curves show the 10%, 2%, 1%, and 0.2% annual chance water levels for both riverine runoff and coastal surge at a single point. These curves are created for numerous points along a longitudinal transect to find the combined water level at a given rate of occurrence. It is possible that a flood elevation is not present in the dataset for every recurrence interval, thus interpolation is used to fill in any missing information. The riverine and coastal flooding elevations associated with each recurrence interval at a given point are combined and smoothed to create the compound flooding curve. Determining the point where coastal flooding outweighs riverine flooding or vice-versa is a key component of the compound flooding analysis, and Taylor's CROR Tool eliminates the guesswork. This presentation will summarize the tool's use and how it can be applied within Florida to further flood adaptation planning.

PRESENTER BIO: Dr. Angela Schedel is a Vice President at Taylor Engineering in Jacksonville, Florida and leads the Coastal Planning group. She oversees a variety of projects conducting vulnerability assessments, creating adaptation strategies, and advocating for long-term resilience planning for local municipalities, the state of Florida, and federal clients.