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## A Method to Develop Signals to Trigger Adaptation to Sea-level Rise

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**Abstract:** Dynamic adaptive pathways planning (DAPP) is being used to plan for adaptation to increasing, but uncertain, risk over time. Signals and triggers are critically needed—comparing observed values with their pre-specified trigger-values will enable timely adaptive actions. We demonstrate a statistical modelling approach to design signals and triggers to avoid the consequences of deeper and more frequent flooding as sea level continues to rise, and apply it to a New Zealand sea level case study. The key advance is the framing of storm-tide frequency in terms of probable timing of the number of events that reach a specific height threshold within a set monitoring period. This framing is well suited to adaptive planning for different hazards, because it allows to specify an exact period over which to monitor threshold exceedances, and thus to signal or trigger adaptive actions in time to avoid adaptation thresholds, while accounting for the probable spread of timing to indicate the probability of premature warnings, or of triggering adaptation too late.

**Keywords:** sea-level rise, coastal flooding, adaptive planning