



Understanding future extreme sea levels: tools and information to support coastal management

Wednesday 20 March 2019, 2:30–3:30 pm (AEDT)

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Extreme sea levels caused by a combination of the tide, storm surge and waves have the potential to cause significant damage to coastal assets. For example, who can forget the dramatic images of the swimming pool sliding into the ocean on Sydney's northern beaches caused by a storm in June 2016? In a warming climate, we expect these extreme events to become increasingly frequent and severe.

Engineers and coastal planners require robust information and data on extreme sea levels to design new infrastructure or to make adaptation solutions to existing assets, such as raising buildings onto stumps, building sea walls or redirecting drainage networks. Such information includes the statistical probability of exceeding a certain water level height (such as the floor height of a beachfront building) and how many years it would take on average to experience sea levels at that height again. This information on extreme sea levels is calculated by ranking the top water level events in a water level record, and then statistically analysing the events to provide an improved model estimate on the probability of climate extremes.

To make the extreme sea level analysis accessible and usable by coastal planners and managers, the web-based tool *Canute3.0* within the *Sea Level Waves and Coastal Extremes* website has been developed to provide an easy way for users to investigate these extremes, both in the present and for future time periods, under three different scenarios of anthropogenic greenhouse gas emissions.

The Earth Systems and Climate Change Hub is supporting the development of the *Sea Level Waves and Coastal Extremes* website and the development of various tools, including the *Canute3.0* tool. Researchers from the Hub are ensuring climate change projections information and data are communicated effectively to a wide range of stakeholders including other researchers, businesses, governments and local planners and managers.

In this webinar, Dr Julian O'Grady from CSIRO will provide an overview of the latest current and future extreme sea level science, and will provide a demonstration of how to use the newly released *Canute3.0* to estimate the frequency of future extreme water levels under different greenhouse gas emission scenarios.



Dr Julian O'Grady is a researcher within the Earth Systems and Climate Change Hub *Project 2.10 Coastal hazards in a variable and changing climate*. He has over a decade of experience using numerical models to simulate waves, hydrodynamics and sediment transport from coastal waters to the shoreline. He applies statistical analysis to investigate climate drivers and extreme events and to estimate the impact damaging storms have on coastlines in Australia and the Pacific, and how this could change in the future.

The Earth Systems and Climate Change Hub science webinars are open to anyone interested in finding out more about the Hub's research (noting that the content may assume some understanding of climate change science and the fields being discussed).