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Title: Coastal and flooding hazards – what are we doing in the Australian Climate Service program?

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Abstract:

Coastal and flooding hazards from extreme water levels can lead to erosion and inundation, impacting communities by creating accessibility issues and damage to structures, roadways, and amenities. Extreme water levels at the coast cause inundation and increase the risk of waves causing erosion and damage. Environmental processes that contribute to extreme sea levels are astronomical tides, storm surges, waves (setup and runup), interannual and interdecadal variability, and sea level rise. Heavy rainfall can also lead to flooding and inundation. However, compound events where high coastal water levels (storm surge, king tides, seasonal variability, sea level rise) coincide with high riverine discharge and heavy rainfall can lead to the greatest impacts. The frequency, intensity and magnitude of coastal and flooding hazards are expected to increase in the coming decades.

The Australian Climate Service (ACS) is a multi-million dollar program, funded by the Australian Federal Government, set up to meet the climate and natural disaster risk information needs of the National Emergency Management Agency (NEMA). Through ACS, our team will be developing risk and resilience intelligence and tools for coastal and flooding hazards across a range of time and space scales, to better support decision makers. Planned outputs include

- a next generation global wave hindcast
- a 40 year total water level hindcast for the Australian coastal zone
- seasonal sealevel forecast products, incorporating tides and regional sealevel rise estimates
- inundation mapping
- risk maps for compound flooding

In addition to developing decision support tools, we will be advancing our knowledge and understanding of the processes and predictability of coastal and flooding hazards in the Australian coastal zone, particularly in terms of compound events. Disaster risk management is currently the primary focus of ACS, however there is huge scope for leveraging this investment for other applications in the coastal zone, including fisheries, biosecurity and public health. This new program of work will provide valuable tools and insight to both assist stakeholders in managing climate risk and vulnerability, and increase the resilience of the Australian community, in a warming climate.