

Researchers are devising new methods to more accurately estimate long-term flood risk across Australia

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University of Adelaide researchers are devising new methods to more accurately estimate long-term flood risk across Australia.

The researchers are examining the possible causes of floods and how they interact with each other. This information is being used to create sophisticated models which will be used by engineers to better calculate [flood](#) risks for different locations.

"In the past, engineers have tended to make decisions as though every flood has just a single cause, for example unusually heavy rainfall or an extreme ocean water level," says Dr Seth Westra, Senior Lecturer in the School of Civil, Environmental and Mining Engineering.

"Multiple causes and how they interact have rarely been considered but, ironically, many big floods that have occurred in Australia have been extremely complex, with many different things happening at the same time."

For instance, Dr Westra says, the devastating Queensland floods of 2011 superficially appeared to be caused by intense rainfall, but the flood wouldn't have had been so large if the catchments hadn't already been waterlogged from a very wet spring.

"Accurate assessment of the risk of floods in any particular area is

important for town planning and council zoning and in designing flood protection infrastructure like bridges and levees," says Dr Westra.

"But properly understanding the risk of flooding means we have to assess the likelihood of these different events coinciding – acting together in a synergistic way to cause an extreme flood. For example do you tend to get big storm surges at the same time as heavy rainfall?

"Even when something has never happened in the past, it's possible that the elements could align in a different way in the future to cause a flood event. Think of Hurricane Sandy in the US, which was brought about by the combination of an extremely unusual set of conditions to wreak havoc in New York.

"We need to be able to assess what sorts of floods can possibly occur in the future, even if we haven't observed or recorded similar events.

"In Australia, this estimation is complicated further by the fact that we don't have great long-term records of flood risk. We're a relatively new country and in a lot of catchments there may only be 30 years of good data – so we have to make educated guesses as to what might be possible in the future."

Climate change is adding another dimension to the difficulty of flood risk estimation. "Under climate change, each risk factor will probably change in the future – but it will be a complex picture, much more nuanced than is often reported," says Dr Westra.

"Certainly some places will see increased floods, but other locations could even see a reduction in [flood risk](#)."

Provided by University of Adelaide

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