



Local tsunami research leads the world

When we hear the word tsunami, images of huge waves devastating communities in foreign countries instantly spring to mind.

The Western Australian coastline is potentially vulnerable to the impacts of tsunami inundation. This is especially so given our proximity to Java and Sumatra. We also have buildings situated close to the coast, and low lying coastal land.

We do know that WA will not experience large cresting waves, but what effect the worst case scenario may have, has been relatively unknown until now.

Research developed by FESA and Geoscience Australia (GA), the first of its type in the world, outlines just what impact a tsunami could potentially have on WA communities across three different scenarios.

Assistant Chief Operations Officer Natural Hazards Gary Gifford said while it is unlikely we would experience the type of tsunami that devastated Japan, Chile and Indonesia, given the right source event we may experience land inundation.

“Tsunamis are recorded in Australia about once every two years, with most presenting little threat of land inundation to our coastal communities,” Gary said.

“What we are more likely to experience are abnormal waves, tides and currents associated with the tsunami that can be dangerous to swimmers and mariners.

“Only in a very rare and extreme tsunami is it possible for low lying coastal areas

to be inundated and for adjoining roads and infrastructure to be at risk of damage.

“While the average annual probability of this occurring is minute, as emergency services we need to plan and prepare for it as well as educate communities on the hazard and its effects.”

FESA and GA’s collaboration on the tsunami threat to the state dates back to 2007.

The first phase focused on assessing the tsunami impact on selected North West communities.

More recently the second and third phases looked at the risk to South West Western Australia.

“The purpose of the research was to assist emergency managers by providing impact estimates and tools to support planning and response processes for urban communities along the WA coast,” Gary said.

Models used by GA have been developed from an evolving scientific understanding of tsunami and its effects, plus an emerging capability to model events.

Individual parts of the modelling method have been validated using wave tank experiments and tide gauge data where possible.

Recently the entire methodology was validated against the 2004 Indian Ocean tsunami impact at Patong Beach in Thailand.

The research looked at three tsunami events, with two representative of a

1 in 10,000 year hazard generated by earthquakes off the Java coast, and the third outlining what may happen if the 1833 Sumatra earthquake was to reoccur.

“It found that South West communities on low lying land close to the coast are likely to be at a greater risk as opposed to North West towns, which have high sand dunes and are built further from the coast,” Gary said.

“While there are different levels of risk to all the modelled communities, we know that on beaches, marinas and ports there are likely to be abnormal waves, tides and currents.

“This is a very exciting time for emergency services as we now have information to help us develop plans to provide a timely and effective response to our communities.”

With this information to hand FESA will now consult with Local Emergency Management Committees to develop relevant local tsunami plans, implement community education programs to address the tsunami hazard, increase tsunami awareness and brief external stakeholders.

Marine tsunami threat: Warns of potentially dangerous waves, strong ocean currents and the possibility of some localised overflow on the immediate foreshore.

Land tsunami threat: Warns people in low lying coastal areas of major land inundation, flooding, dangerous waves and strong ocean currents.