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Catastrophic palaeoenvironmental change – there is more to palaeotsunamis than just sediment

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Palaeotsunami research is deeply entrenched in geological thinking. This is hardly surprising given that the conventional way of tracking these events down is through a study of the sediments they leave behind. Recent events such as the 2009 South Pacific and 2004 Indian Ocean Tsunamis however, show all of us that there is considerably more environmental impact involved – people die, buildings are destroyed, water rendered undrinkable, seawalls destroyed, trees uprooted, rivers change their course, fish are washed inland, and debris washed offshore, etc.

It is becoming increasingly clear that if you only use geology then you simply do not have enough information to fully understanding what you are looking at. While most of us recognise that the study of palaeotsunamis is indeed a multi-disciplinary exercise requiring expertise in sedimentology, micropalaeontology, macropalaeontology, geochronology, and palaeoseismology, palaeoecology, geochemistry, and geochronology at the very least – very few of us actually bother to go about using all of these, let alone anything else. Invariably we focus on the disciplines we know best - our "comfort zone" - and invariably we come up with a statement that says something along the lines of "we are not 100% certain but these are probably palaeotsunami deposits". This is simply not acceptable. Not only do we have this traditional suite of expertise at our fingertips, but if we really thought about it we would also want to consider disciplines such as geomorphology, archaeology, and anthropology. Together these disciplines represent most, but undoubtedly not all, of the toolkit needed to do a better job. Some examples are given of the value added through the use of this enlarged suite of disciplines.

If we are to realistically attempt to understand the evidence left behind by palaeotsunamis, geology is not enough. We need to understand the processes involved, and to do so must carry out rigorous multi-disciplinary studies of historic events. When we take that information back into the palaeo record we stand a far better chance of identifying prehistoric tsunamis. We must recognise though that there will always be instances when we cannot definitively identify palaeotsunami deposits – not all of the features we seek will have been preserved or were present in the first place, but by expanding our toolkit we do at least give ourselves a better chance of success.