

# Emerging international issues

**Professor James Goff**

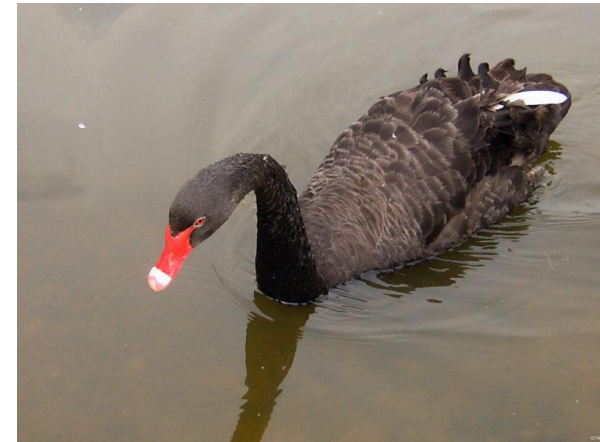
**Tsunami and Natural Hazards Research Group  
University of New South Wales**



## One fundamental issue arising:

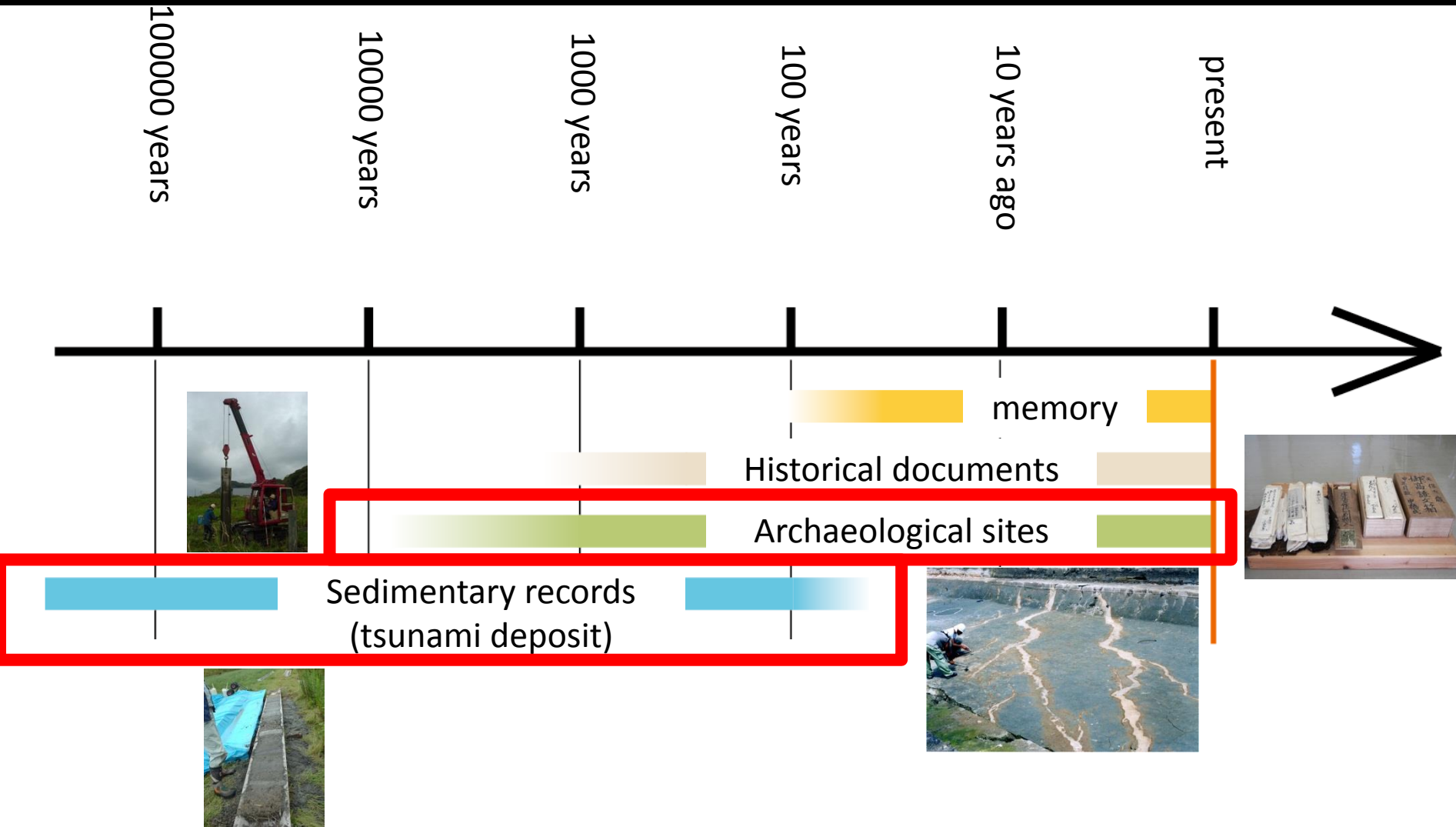
**NOT ALL EARTHQUAKES GENERATE TSUNAMIS AND NOT ALL TSUNAMIS ARE GENERATED BY EARTHQUAKES**

- **Complex sources – volcanoes/mass failures (hugely under-represented)/complex subduction zones**
- **Tsunami research demonstrably separate from seismology because that limits thinking to EQs alone**
- **Tsunamologists striving to avoid “Souteigai tsunamis” (oh yes - tsunamis has an ‘s’!)**



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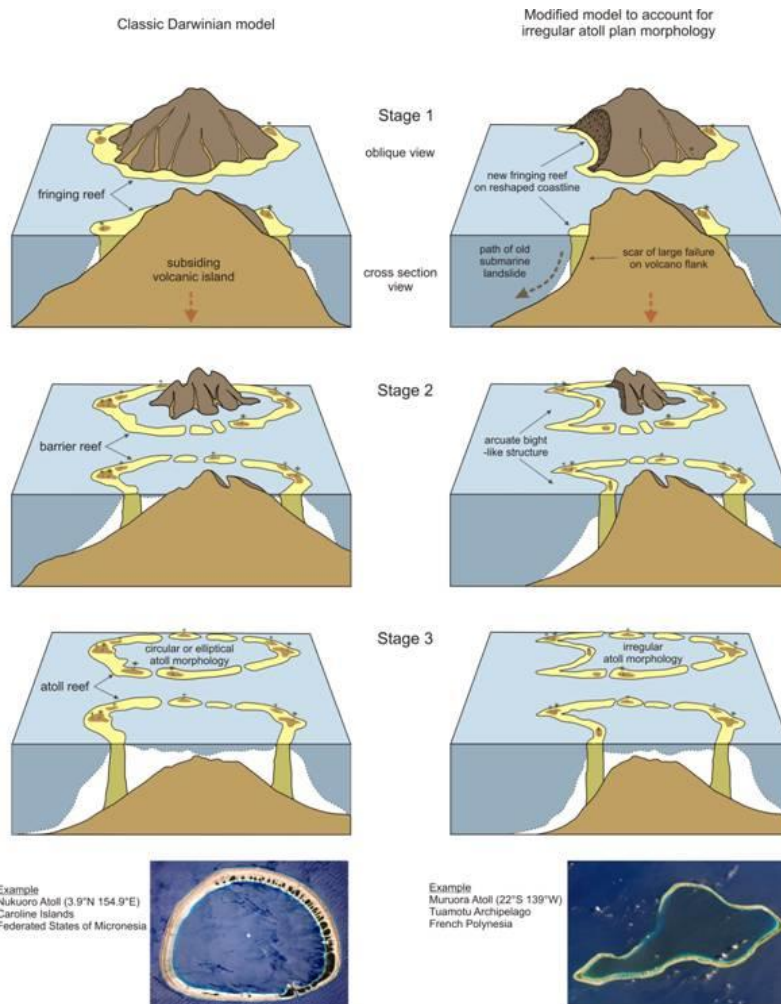
## Learning about tsunami history





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## Tsunamis occurred where no problem currently perceived



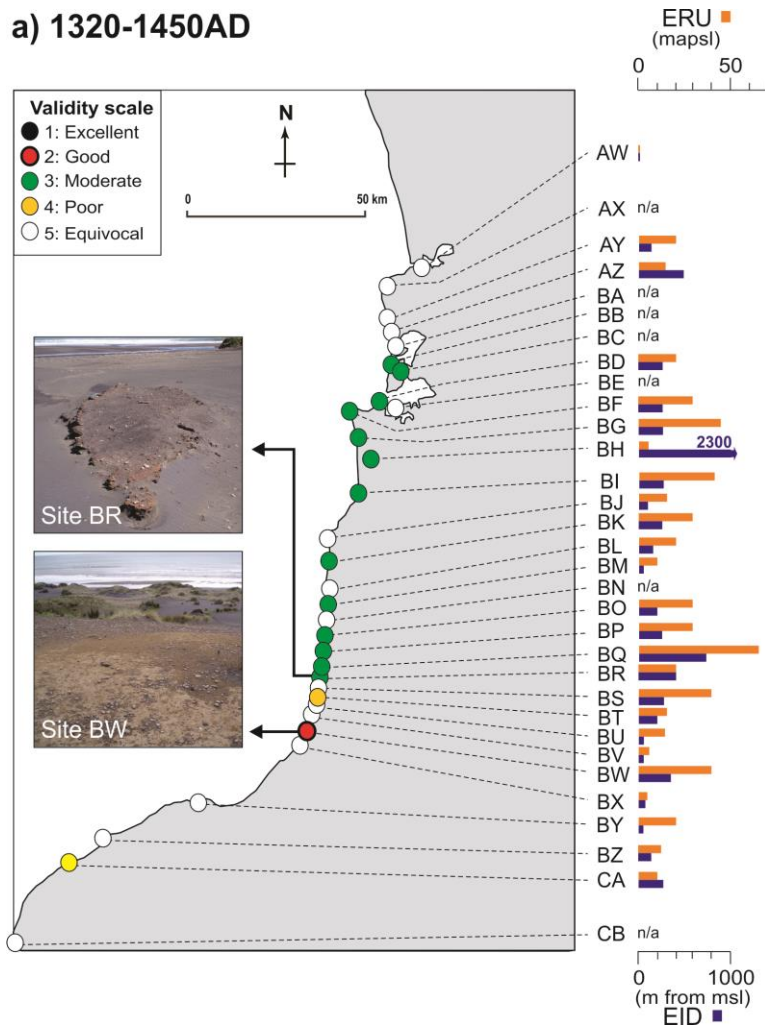
- Coastal geomorphology tells us a lot – who is looking?



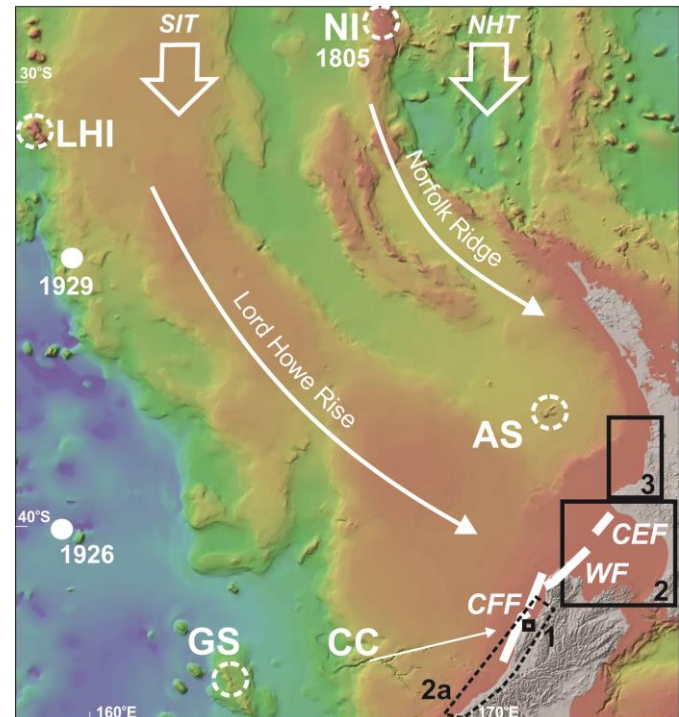
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## Tsunamis occurred where no problem currently perceived

a) 1320-1450AD

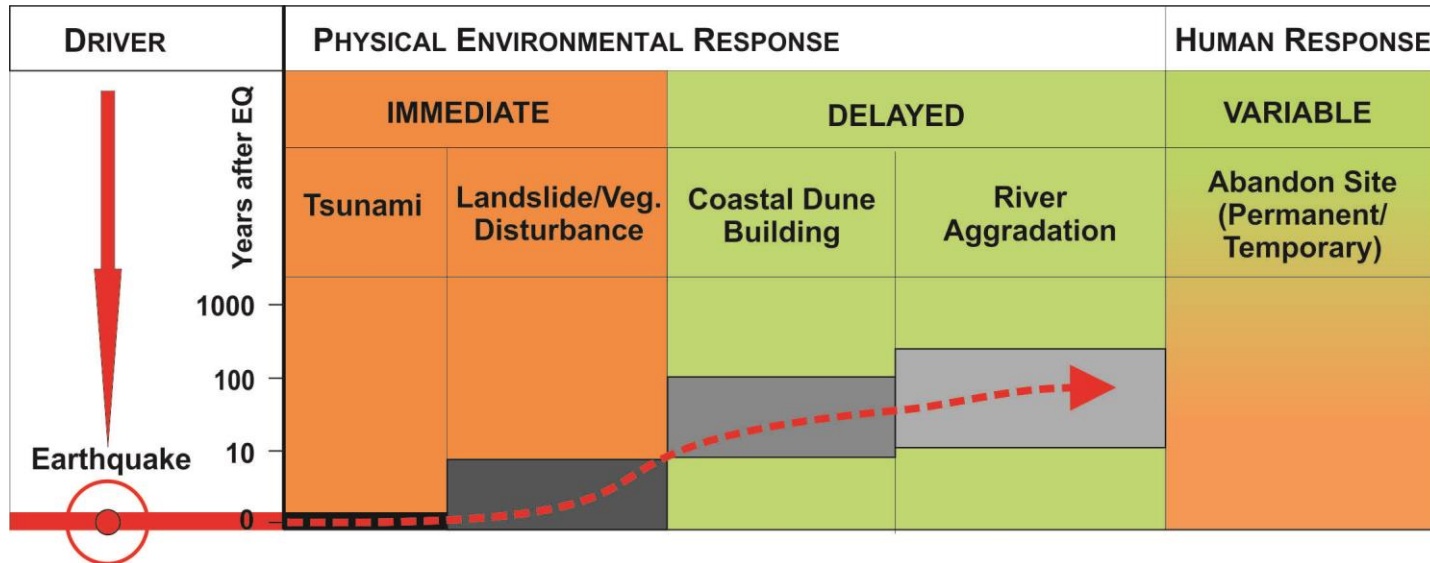


- Coastal archaeology/Purakau tells us a lot – who is looking?



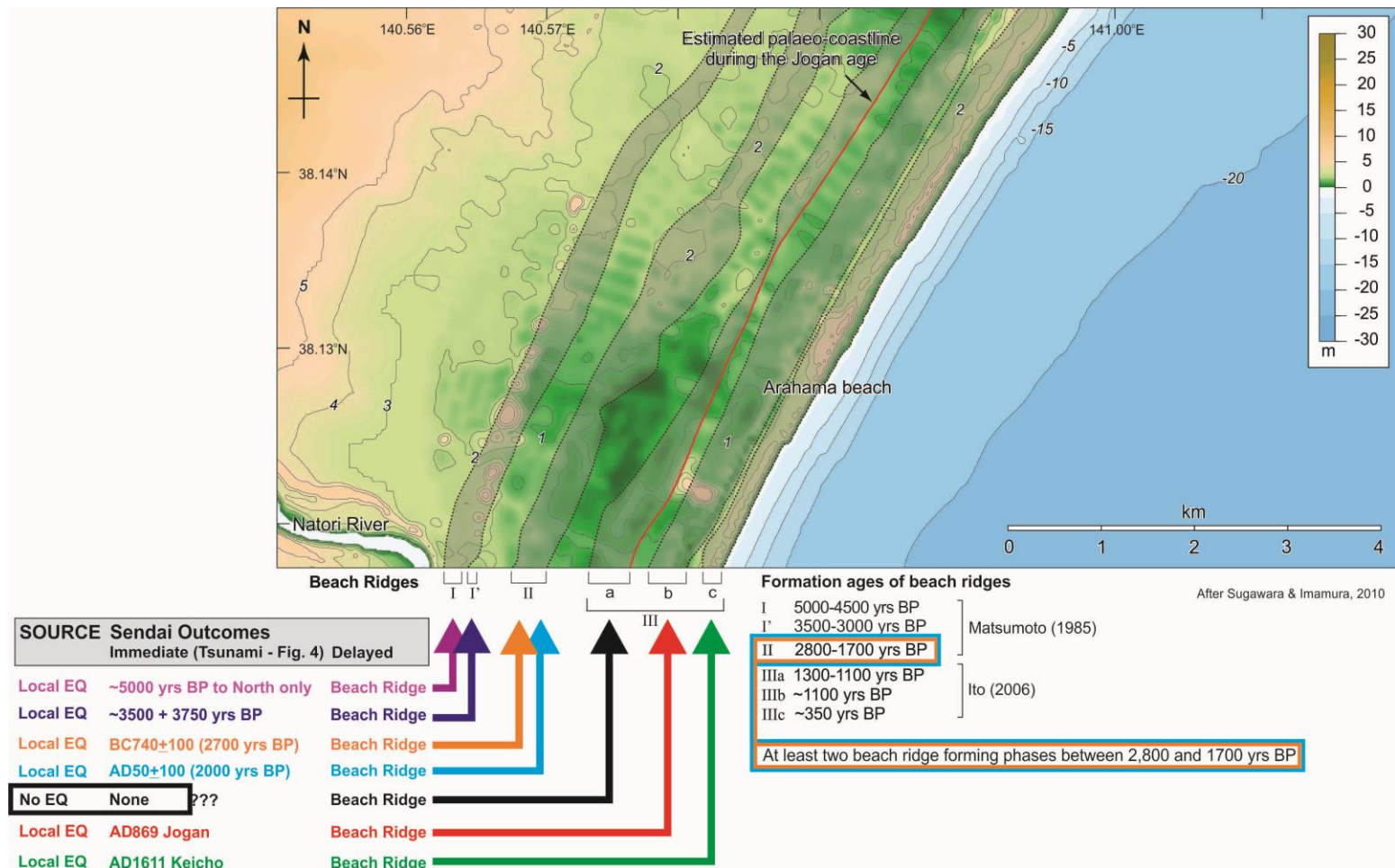
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## Tsunamis linked to numerous easily identifiable environmental after-effects



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## Japan beach ridges identify previously unknown events

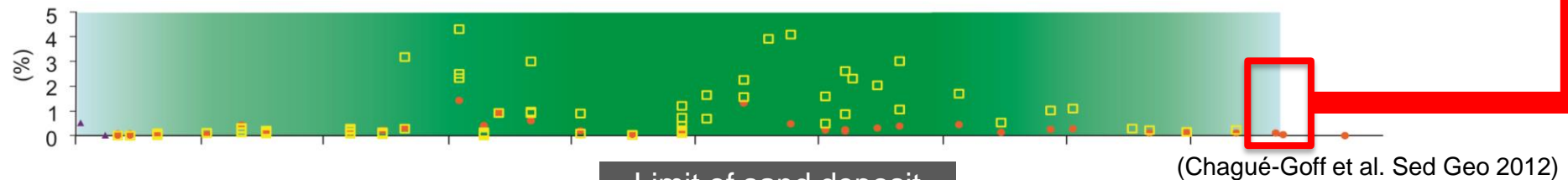




# Chemical fingerprinting

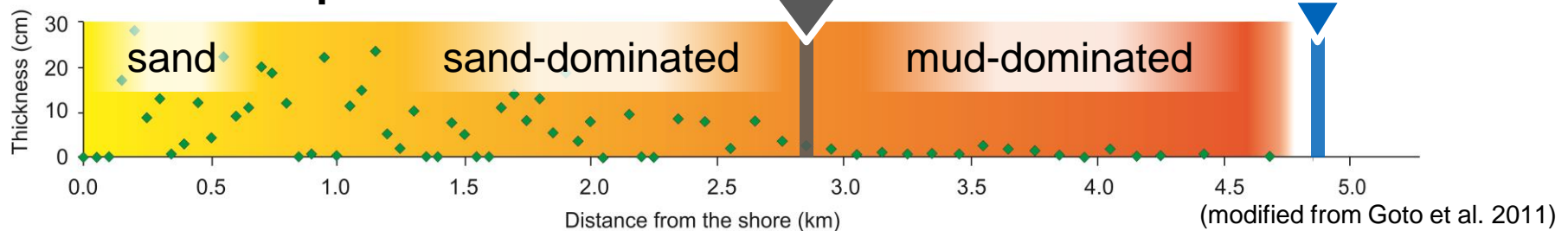


**Chlorine (= salt)**



**Tsunami deposit**

Limit of sand deposit



Extent of sand

Magnitude of tsunamis and earthquakes under-estimated

Chemical fingerprinting

Identify true extent of inundation, redraw (palaeo) inundation maps



# Emerging international issues

## Increasing focus on palaeotsunamis

- o Offers evidence of new sources and magnitudes
- o Provides Australasian/Pacific-wide data of contemporaneous events
- o Places historical “perceptions/thinking” in broader context
- o Provides PHYSICAL evidence of past events (coast may have been different but for larger events, pretty irrelevant)
- o Offers alternative to forward modelling by working backwards (inverse modelling) to determine wave heights and sources
- o Deeper time. Growing recognition of at least order of magnitude in event sizes between historical and palaeo