How resilient are our shores?
Applications of nuclear techniques to the study of storm surges, tsunamis and sea-level rise

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2011 Tohoku-oki tsunami inundating the Sendai plain (near Sendai airport)
Chemical fingerprinting

Chlorine (= salt)

Tsunami deposit

Limit of sand deposit

Magnitude of tsunamis and earthquakes under-estimated

Identify true extent of tsunami inundation, redraw (palaeo) tsunami inundation maps
How big? How often?

2011 Tohoku-oki

1611 Keicho?

915 Towada-a tephra

869 Jogan

$^{210}\text{Pb}$
$t_{1/2} \approx 22.3 \text{ yr}$

AMS $^{14}\text{C}$
$t_{1/2} \approx 5730 \text{ yr}$

Photo: K. Goto, 2013
Tropical Cyclone Yasi, Category 5
How big? How often?

- Tropical Cyclone Yasi, 2011
- Tropical Cyclone Larry, 2006
- Tropical Cyclone Winifred, 1986
- Innisfail Tropical Cyclone, 1918

(from Nott et al., JGR 2013)
Thank you