How can at-risk communities be ready for tsunamis generated by non-seismic and complex sources?

Safe Ocean Laboratory Satellite Activity: Further Challenges for Warnings of Tsunamis - 6 April 2022

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Challenges for emergency managers

➢ **Adequate information/data for planning & response:**

- **Before an event:** Risk information (likelihood & consequence) - rather than only a probability of a hazard occurring.
- **Close to an event:** Impact-based warnings, or at least an indication of size/scale of the potential hazard (i.e. expected size/scale of an eruption) - to support an appreciation of the extent of potential impact.
- **During an event:** Threat assessment based on observational detection & forecasting (rather than source modelling) seems to be the way to go:
  - ✓DART (without DART observations the Hunga Tonga – Hunga Ha'api tsunami may well have arrived unheralded)
  - ✓Remote sensing/satellites (can also support observation of human behaviour by social scientists before, during, after event; development of dynamic population exposure/vulnerability models)

Challenges for communities

- **Level of understanding required?**
  - Can we expect our communities to learn the sources of tsunami and their nuances?
  - Understanding that tsunamis are not only caused by earthquakes; their behaviour may be different; and there are things we don't know, is sufficient.
  - Key is awareness of natural warnings, and specifically to act on observations of unusual sea behaviour and/or a big boom or shockwave - even when there is no long/strong shaking. If this happens, evacuation should be immediate.
  - The above suggests education on what "unusual sea behaviour" and "big boom or shockwave" may look/feel like.
  - Tailoring the approach to the local context is essential – empowering local communities to manage their own risk.

UNESCO/IOC Tsunami Ready Recognition Programme - can assist

I	**MITIGATION (MIT)**
1	MIT-1. Have designated and mapped tsunami hazard zones
2	MIT-2. Have a public display of tsunami information.
3	MIT-3. Initial estimate of the number of people that live in the tsunami hazard zone.
4	MIT-4. Identification of available economic, infrastructural, political and social resources.
II	**PREPAREDNESS (PREP)**
5	PREP-1. Easily understood tsunami evacuation maps as determined appropriated by local authorities in collaboration with communities.
6	PREP-2. Outreach and public awareness education materials developed and distributed.
7	PREP-3. Hold at least three outreach or educational activities annually.
8	PREP-4: Conduct a biennial tsunami community exercise.
III	**RESPONSE (RESP)**
9	RESP-1. Have a tsunami emergency operations plan (EOP).
10	RESP-2. Have the capacity to manage emergency response operations during a a tsunami.
11	RESP-3. Have redundant and reliable means to receive 24-hour official tsunami alerts.
12	RESP-4. Have redundant and reliable means to disseminate 24-hour official tsunami alerts to the public.

Understanding the hazard & risk

Community awareness

Planning & capacity

Tsunami Ready

Opportunities: Tsunami Ready

Indicator Area	Description	Opportunity
Mitigation (2)	Have a public display of tsunami information.	Include potential non-seismic sources
Preparedness (2)	Outreach and public awareness education materials developed and distributed.	Include examples of non-seismic sources; what unusual sea behaviour, big boom/shockwave may look/feel like.
Preparedness (3)	Hold at least three outreach or educational activities annually.	Include examples of non-seismic sources; what unusual sea behaviour, big boom/shockwave may look/feel like.
Response (1)	Have a tsunami emergency operations plan.	Include risk of non-seismic sources in hazard description to ensure planning & policy take these into account.

TR Boards (evaluators) to check for these inclusions.

Thank you

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