

**TSUNAMI EVACUATION MAPS, INFORMATION BOARDS, SIGNAGE AND  
SIRENS FOR SOUTH EFATE AND SOUTH SANTO, VANUATU**  
**Pacific Islands GIS/RS User Conference, 28 November – 1 December 2016**

Presented by: Morris J. Harrison  
 Contact: [mharrison@Vanuatu.gov.vu](mailto:mharrison@Vanuatu.gov.vu)  
 Date: 30 November 2016



**Vanuatu  
 Meteorology & Geo-Hazards  
 Department**



**Ministry of Climate Change, Meteorology, Geo-Hazards,  
 Energy, Environment and Disaster Management**

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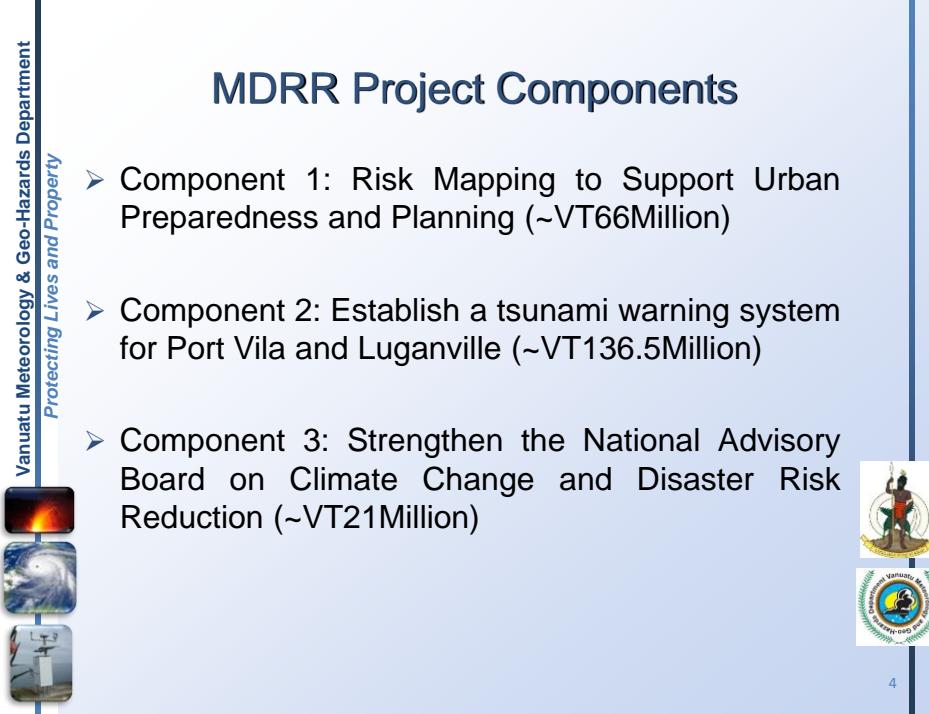
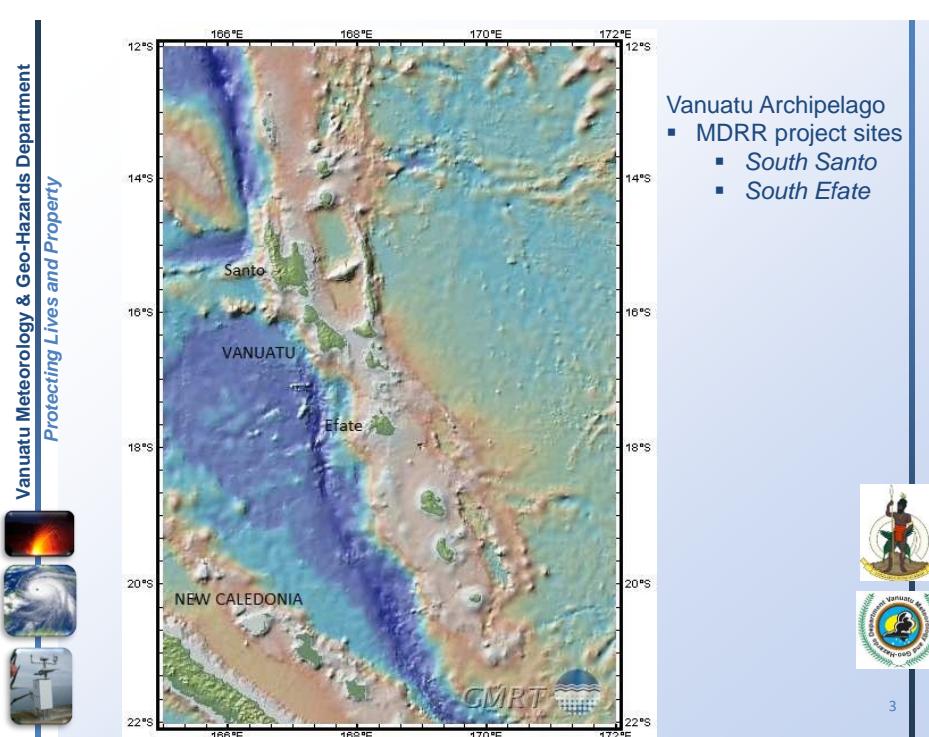
Vanuatu Meteorology & Geo-Hazards Department  
*Protecting Lives and Property*

## Mainstreaming Disaster Risk Reduction (MDRR) Project Project Background

- **Funding Source:** Government of Japan
- **Administered by:** World Bank
- **Total Funding:** VT251 Million
- **Duration:** 2013 to 2016 (4 years)
- **Project Sites:** Port Vila & Greater Port Vila (South Efate) and  
 Luganville & Greater Luganville (South Santo) i.e. pilot sites
- **Implementing agency:** Vanuatu Meteorology and Geo-hazards Department in partnership with the National Disaster Management Office (NDMO)



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## Risk Mapping and Planning for Urban Preparedness Project (RMPUP Project)

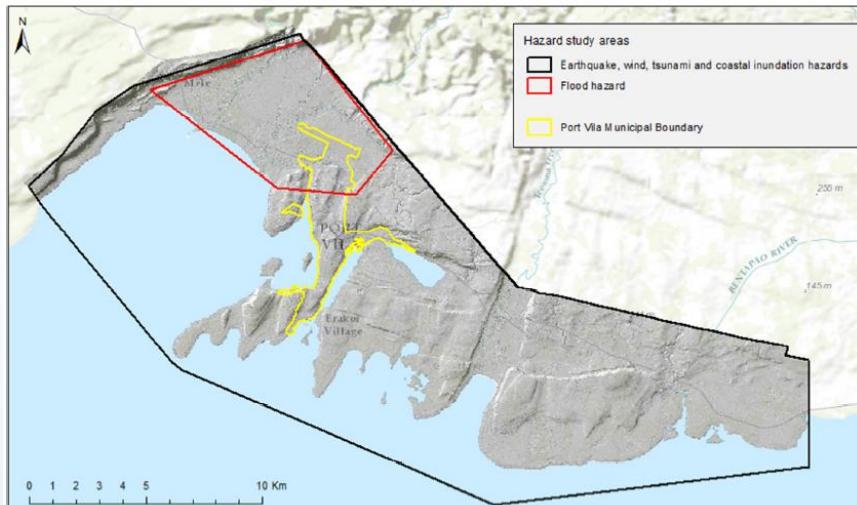
- As part of the MDRR project implemented by VMGD
- LiDAR data were collected by Becca and GNS Science in 2012/13
- LiDAR data used to generate high quality digital elevation models (DEM) of South Efate (Port Vila & Greater Port Vila) and South Santo (Luganville & Greater Luganville) with assistance from Becca and GNS Science
- Stage 3 of the RMPUP Project covers the Urban Risk Management Strategy (Becca, GNS Science, NIWA), and Tsunami Evacuation maps are an integral part of that strategy
- Numeric modelling of 15 tsunami generating earthquake scenarios was undertaken by GNS Science to provide an estimate of maximum credible tsunami amplitude at coast from all possible sources affecting the region



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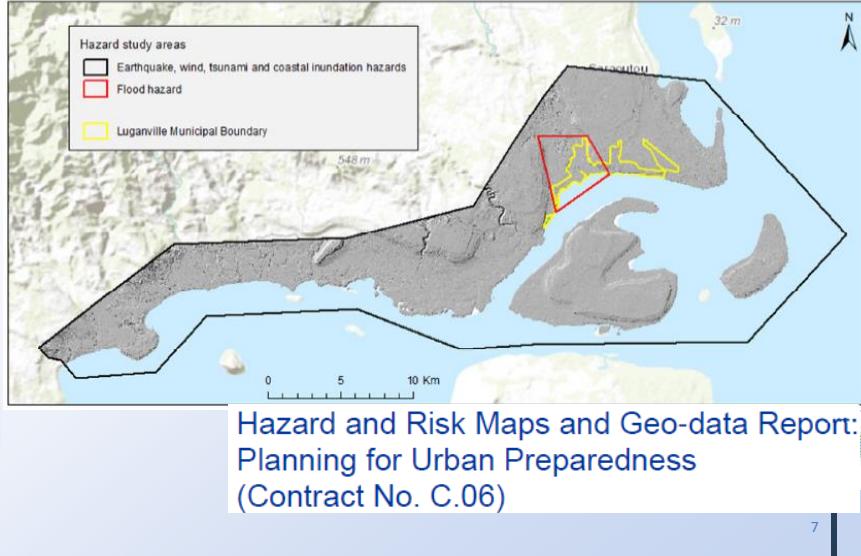


Greater Port Vila Study Area showing the municipality boundary and extend of LiDAR (grey topographic data); South Efate



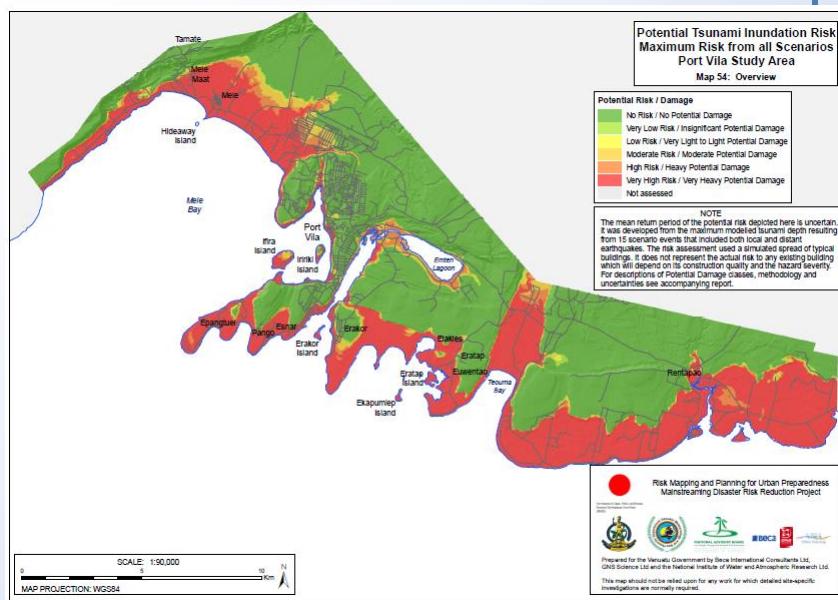
Hazard and Risk Maps and Geo-data Report:  
Planning for Urban Preparedness  
(Contract No. C.06)

Greater Luganville Study Area showing the municipality boundary and extend of LiDAR (grey topographic data); South Santo



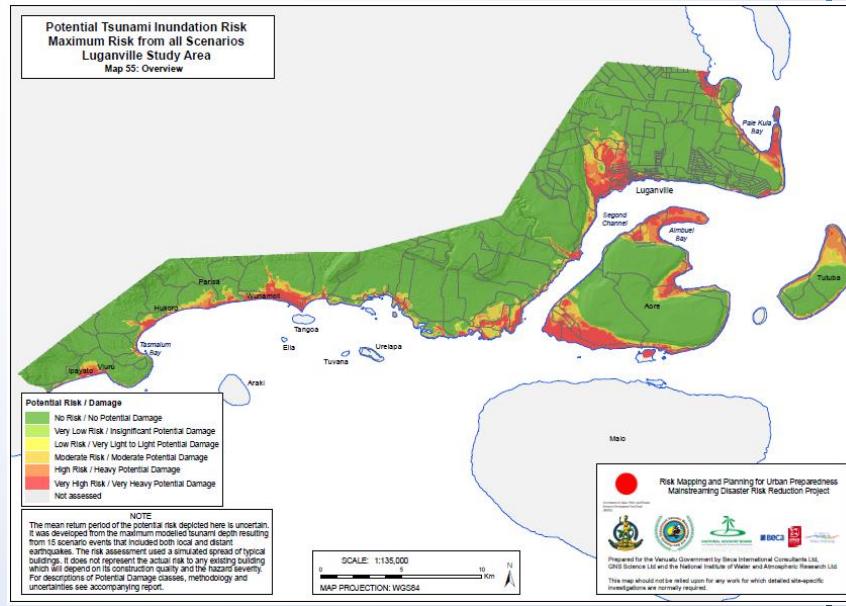
7

## Tsunami Risk (Maximum for all scenarios) for Port Vila and Greater Port Vila; South Efate

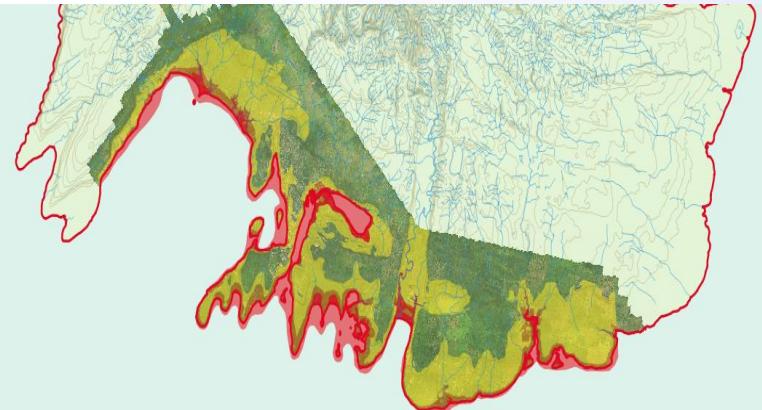




## Tsunami Risk (Maximum for all scenarios) for Luganville and Greater Luganville; South Santo



## South Efate Tsunami Evacuation Zones



Evacuation zone	Intention for use	Potential run-up at coast	High Tide
Red	0.3-1 m tsunami threat warning	2 m	0.45 m
Orange	1-3 m tsunami threat warning	6 m + 20% = 7.2 m	0.45 m
Yellow	Maximum credible tsunami or 'greater than 3 m' tsunami threat warning	35 m	0.45 m





### South Santo Tsunami Evacuation Zones



Evacuation zone	Intention for use	Potential run-up at coast	High Tide
Red	0.3-1 m tsunami threat warning	2 m	0.5 m
Orange	1-3 m tsunami threat warning	$6 \text{ m} + 20\% = 7.2 \text{ m}$	0.5 m
Yellow	Maximum credible tsunami or greater than 3 m tsunami threat warning	25 m for the east part of the coast	0.5 m
		35 m for the remainder of the coast	



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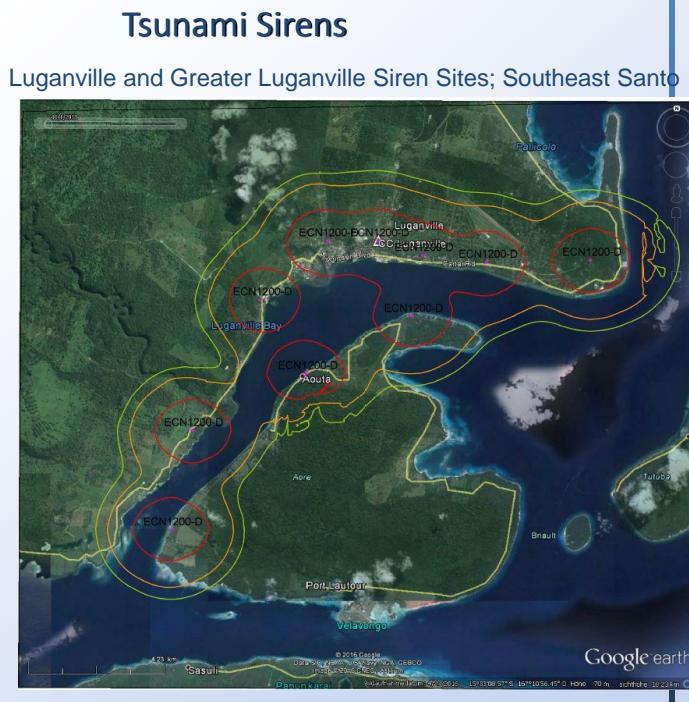
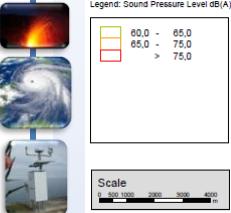


### Tsunami Early Warning

- VMGD issued tsunami information, advisory or warning after significant earthquake (local, regional, trans-Oceanic/Distant)
- MDRR; Sirens, SMS, Website, Email (basically a dissemination platform)
- Natural Warning Signs of pending tsunami:
  - *Strong and/or long earthquake (does not have to be both)*
  - *Change in sea level*
  - *Roaring Sound*



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## Tsunami Sirens

Luganville and Greater Luganville

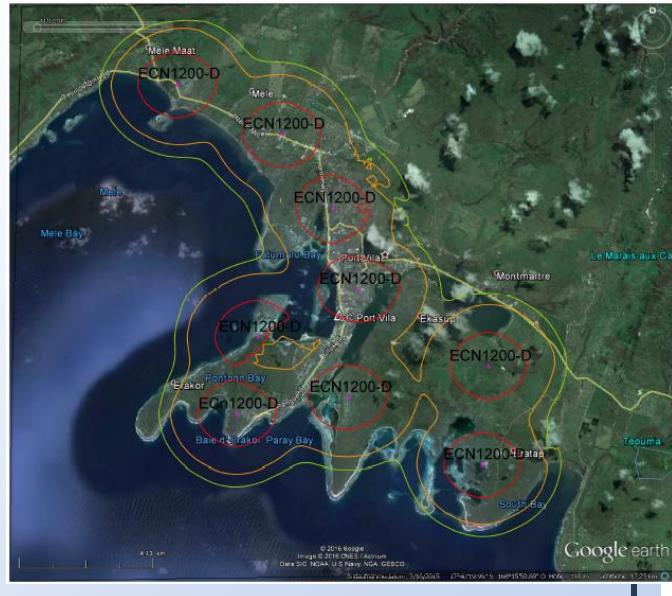
- Environmental and Social Screening Safe (ESSS) guard conducted
- Siren pole foundations under construction since last month





## Tsunami Sirens

Port Vila and Greater Port Vila Siren Sites; South Efate



## Tsunami Response

- Tsunami Response is a life saving activity = **Tsunami Evacuation**
- Products developed to aid evacuation
  - *Tsunami Evacuation Maps (Tsunami Evacuation Plan)*
  - *Tsunami Information Boards (Tsunami Evacuation Plan)*
  - *Tsunami Evacuation Signs*
    - Danger zone sign
    - Safe Route signs
    - Safe Location sign





## Tsunami Evacuation Map

- Draft tsunami evacuation maps are created using QGIS for community consultations and workshops in Greater Port Vila (South Efate) and Greater Luganville (South Santo)
- Tsunami evacuation maps are created using QGIS after community consultations and workshops in Greater Port Vila and Greater Luganville
- The tsunami evacuation map is basically a tsunami evacuation plan to aid communities, general public and visitors to evacuate to a safe location when there is a tsunami threat or a warning is in effect
- Understanding the map is crucial in executing the plan efficiently and calmly during tsunami threats or warnings



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## Tsunami Evacuation Map

- Village/Community consultation process
  - Provincial and Municipality Meetings
  - Facilitator Training
  - Presentation
  - Break-out groups



Example of presentation used during Facilitator Trainings



Example of activity during meeting with provincial and municipality authorities; seen here are Laganville municipality councillors having a go on a draft Laganville evacuation map



Example of presentation used during Community Consultations



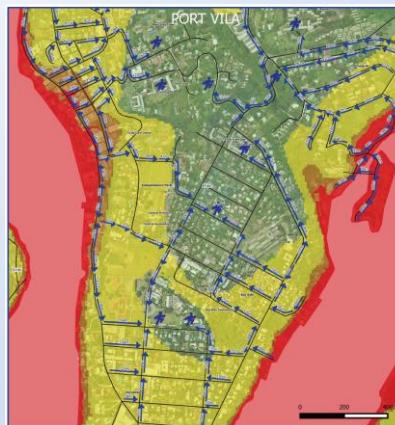
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The main features on the map:

- Land and sea; the sea is pink whilst the land is either red, orange, yellow or just plain vegetation
- There are 3 different evacuation zones on land;
  - Red - coastal low lying areas, areas around an estuary or flood plain. Generally all land areas from 0-2 m above mean sea level.
  - Orange - coastal low lying areas, areas around an estuary or flood plain. Generally all land areas from 2-7.5 m above mean sea level.
  - Yellow - all land areas from 7.5-35 m above mean sea level.
- Vegetation – all land areas located 35 m or more above mean sea level. Generally land areas outside the evacuation zones.

### TSUNAMI EVACUATION MAP

Evacuation Map for Central Ward of Port Vila Municipality



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### Tsunami Evacuation Map

- The map has a scale; usually on the right bottom corner. Generally scale converts centimeter length on map to meter scale on ground. Provides an idea on distance one needs to move during evacuation.
- The map has a title; usually at top center e.g. PORT VILA
- The directions on the map are as follows;
  - Top—the top half of the map is always the North
  - Bottom—the bottom half of the map is always the South
  - Right—the right side of the map is always the East
  - Left—the left side of the map is always the West

Evacuation Map for Central Ward of Port Vila Municipality



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## Tsunami Evacuation Map

- The map has a legend. The legend explains the different evacuation zones and the main map features to aid tsunami evacuation.



Explanation of the 3 different evacuation zones

Language: Bislama, English & French



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## Tsunami Evacuation Plan

- Apart from the map, the tsunami evacuation plan has the following
  - Key Tsunami Message—this is highlighted in yellow. Generally re-emphasizing the natural warning signs of a Local Tsunami.

### Woning - Warning - Alerte

Long taem blong wan strong o longfala etkwel, muv aot hariap long ol evakuesen zone. No wet long wan samting. Tekem moa long wan minit o tekem taem blong muv, bae hemi no tufala step ia.

In a long or strong earthquake if you are in an evacuation zone, immediately go to a safe location. Longer than a minute OR hard to stand up, it doesn't have to be both.

Au moment de grands tremblements de terre ou de tremblements de terre de plus d'une minute, évacuez les zones immédiatement.

N'attendez pas ! Les deux types de tremblement ne peuvent pas se produire en même temps : SOIT celui où il est difficile de se tenir debout SOIT celui de plus d'une minute.

Tsunami Key Message

Language: Bislama, English & French



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## Tsunami Evacuation Plan

- Tsunami Evacuation Message—this provides guides on how to evacuate, facts about tsunamis and some advise on evacuation and official warnings

**Wokbaot o ron long baesikel long ol rod blong evri evakuesen zone**  
If you are in an evacuation zone, walk or ride bicycles quickly following routes to a safe location. Don't use cars.  
**Circulez à pied ou à vélo suivant les voies tracées pour sortir de toutes les zones**

**I posibol se fes wev i no bigfala wev iet. I save tekem plante haoa bifo bigfala wev i kam.**

The first wave may not be the largest. It may take many hours for the largest wave to arrive

La première vague peut ne pas être la plus grande. La vague la plus grande peut prendre plusieurs heures pour arriver.

**No mas entarem ol evakuesen zone kasem taem we NDMO i talem se hemi oraet**

Stay in safe places until all clear from NDMO

Restez hors des zones d'évacuation jusqu'à ce que le BNGC lève l'alerte

**Kamaot long ol zone we oli talemaot long ol ofisol woning**

Evacuate from the zones stated in the official warning

Quitez les zones faisant l'objet d'alerte officielle



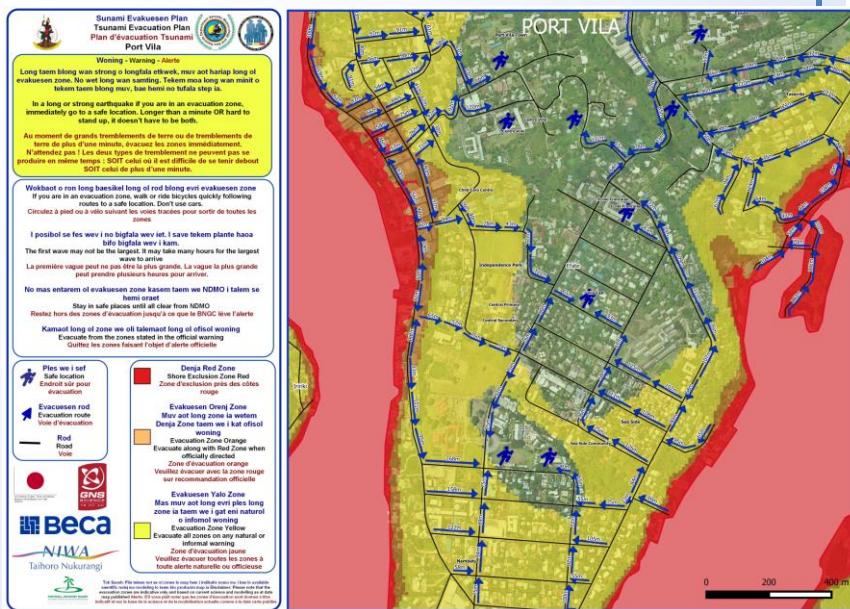
### Tsunami Evacuation Message

Language: Bislama, English & French

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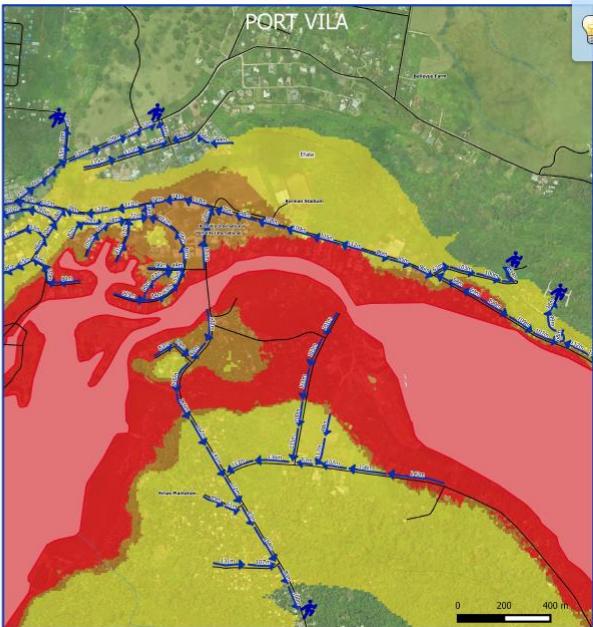


## A complete Tsunami Evacuation Map using QGIS



Port Vila ~15; Greater Port Vila ~25 maps; Luganville 11 maps and Greater Luganville ~24 maps combined total of 75 maps

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- Disclaimer – is a legally-based sentence or a few sentences indicating that the person/company cannot be sued (no “claims” can be made against it, they are not responsible for something)

**Tok Saveh:** Plis tekem not se ol zones lo map hem i indikativ nomo mo i bes lo available saentific nolej mo modeling lo taem blo producim map ia Disclaimer: Please note that the evacuation zones are indicative only and based on current science and modelling as at date map published **Avertissement:** S'il vous plaît noter que les zones d'évacuation sont données à titre indicatif et sont basés sur la science et la modélisation actuelle qu'à la date de la carte publiée

Language: Bislama, English & French



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## Tsunami Evacuation Signs and Information Board



'B'



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- Break-out groups**
  - Drawn on proposed evacuation routes using arrows
  - Draw on sign locations for the sign groups
  - Location names that help people read the map
  - Write or correct English, French and Bislama version of evacuation maps, information boards and signs
  - Each group presented their work in front while others listen and asks questions after each presentation (Discussion)
  - After which all used draft materials were collected



Example (left) a break-out group discussing their ward evacuation map, (routes and locations added), and (right) a break-out group explaining a change in the word and language used on the Danger Zone sign during their presentation up front





## Tsunami Information Board

- Draft tsunami information boards are created using QGIS for community consultations and workshops in Greater Port Vila (South Efate) and Greater Luganville (South Santo)
- The Tsunami Information Board is basically a Tsunami Evacuation Plan to aid communities, general public and visitors to evacuate to a safe location when there is a tsunami threat or a warning is in effect
- The main feature in the plan is the Tsunami Evacuation Map and the Tsunami Evacuation Signs
- Understanding the map and signs is crucial in executing the plan efficiently and calmly during tsunami threats or warnings



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## Tsunami Information Board

Evacuation Map for Central Ward of Port Vila Municipality



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- The map has a scale; usually on the right bottom corner. Generally scale converts centimeter length on map to meter scale on ground. Provides an idea on distance one needs to move during evacuation.
- The map has a title; usually at top center e.g. PORT VILA
- The directions on the map are as follows;
  - Top—the top half of the map is always the North
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  - Left—the left side of the map is always the West



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- The map has a legend. The legend explains the different evacuation zones and the main map features to aid tsunami evacuation.



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Language: Bislama, English & French



### Explanation on Tsunami Warning and Response

Language: Bislama, English & French

- Apart from the map, the information board has the following:
- An explanation on Tsunami Warning and Response

#### Woning mo Respons Warning and Response Alerte et Intervention

Naturol: Long wan strong etkwek (we yu no save stanap gud from kraon i kaseam long tunas), i gat noes long soltau olsem oselem plien i warinem tekoed i. I gat noes long soltau olsem oselem (schwore) i ron olsem riva i kam long so o i ron i go bat long big solwora, o yu filim wan etkwek we i no strong tunas olsem of samting i stap roi moi i las moa lo wan minit: Evakuemet evri eria. Wan wev i save kam sam minit nome i. I save tekem moa long wan haos bida hau kase.

Natural: In a strong earthquake that it is difficult to stand up or the earthquake lasts longer than one minute, jet engine-like sound coming from ocean direction, or ocean rushing in or out like a flowing river: Evacuate all zones. A wave may arrive when the ocean is moving horizontally.

Alerta natural: Au moment de grands tremblements de terre où il est difficile de se tenir debout ou lorsque les tremblements durent plus d'une minute, l'évacuation de toutes les zones est nécessaire à tout bruit ressemblant au moteur d'un jet venant de l'océan, ou à tout bouillonnement de l'océan. Une vague peut arriver d'une minute à l'autre.

Informo: i posibol se i infomeisen blong of fren mo blong ol memba blong publik i tru. No wait blong muv aot i go long ol zone we i sef. Staq jekem sapos yu sef tru long (TBV, Radio Vanuatu, FM107, FM100, NDMO, Municipal or Provincial Gavan). Informo may come from friends or other members of the public may be correct. Evacuate immediately. Verify only once you are safe (via TBV, Radio Vanuatu, FM107, FM100, NDMO, Municipal or Provincial Authority).

Alerte officieuse : Des alertes données par des amis ou d'autres membres du public peuvent être adéquates. L'évacuation doit être immédiate. Une fois à l'abri, veuillez vérifier les informations (via TBV, Radio Vanuatu, FM107, FM100, BNNG, Municipalité ou Province).

Ofisoi: NDMO mo Dipatme blong Meteorologi mo Jeohazard i givim warning. Yu save risi i go waiting for TBV, Radio, SMS, Website, Siren. Yu save kam long woning wan sos nomo o fulap sos. Yu no mas wet. Muv aot long of zone we ol tailemao long ol woning mo stop aotsaed long ol era i kaseam taem we i gat wan ofisoi "evri ting i kilar" kamado. Official: The official source of the NDMO and the Vanuatu Meteorology and Geo-hazards Department via TBV, Radio, SMS, Website and Siren. Don't wait. Evacuate from the zone(s) stated in the warning and stay out until the official "all clear" is issued.

Alerte officielle : Le BNNG et le service de la Météorologie et des Catastrophes naturelles de Vanuatu sont les sources officielles d'alerte. Attendez l'alerte via la radio, les SMS, le site Internet et la sirène. N'attendez pas. Quittez les lieux faisant l'objet de l'alerte et restez à l'abri jusqu'à ce que l'alerte soit officiellement levée.



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### More detailed explanation of the 3 different evacuation zones

Language: Bislama, English & French

- A more detailed explanation of the different evacuation zones on the map

#### Ekspleneisen blong ol Zone Explanation of Zones Que signifient les zones?

Red: Red eria hemi denja zone. Hem i eria we denja i moa bigwan mo fes ples we ol man i mas muv aot long hem team we i gat ol difren sunami woning (naturol, infomol o ofisoi)

Red: The red zone is the highest risk zone and the first place people should evacuate in any warning

Zone rouge: La zone rouge est une zone à très haut risque qui, à toute alerte, est le premier lieu à quitter.

Orenj: Orenj eria hemi eria we bae of man i evakuatem long taem blong ol ofisoi woning. Sunami we i kam longwei tunas olsem long Saqt Amerika bae i no save kaseem ol ples olsem eria ia. Mo tu ol man i mas evakuatem orenj eria ia taem we i gat eni naturol mo infomol woning.

Orange: The orange zone is likely to be evacuated in official warnings. Tsunamis from distant sources will rarely reach beyond this zone. Also evacuate after large strong earthquakes.

Zone orange : La zone orange est une zone susceptible d'être évacuée à toute alerte officielle. Les tsunamis de sources lointaines arrivent rarement au-delà de cette zone. L'évacuation est également nécessaire en cas d'énormes tremblements de terre.

Yalo: Yalo eria hemi soem ples we ol man i mas muv aot long hem long taem blong wan bigfala sunami wantaem, olsem afta long wan bigfala lokoi etkwek. Muv aot long eria ia taem we i gat eni naturol o infomol woning, o sapos no i gat wan instrakeen blong ol man i mas muv aot long eria ia taem i gat wan ofisoi woning.

The yellow zone includes the largest possible tsunami, example from a large local earthquake. Evacuate in any natural or informal warning, or if told to in an official warning.

Zone jaune : La zone jaune est une zone qui peut être atteinte par un plus grand tsunami possible, déclenché par exemple par un grand tremblement de terre local. L'évacuation est nécessaire à toute alerte naturelle, officielle ou officielle.



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- Key Tsunami Message—this is highlighted in yellow. Generally re-emphasizing the natural warning signs of a Local Tsunami.

#### Key Tsunami Message



Language: Bislama, English & French

**Woning - Warning - Alerte**

Long taem blong wan strong o longfala etkwek, muv aot kwik long ol evakuesen zone. Hemi ol etkwek we i stap bitim wan minit o i had tumas blong stanap from kraon i muv muv tumas.

In a long or strong earthquake if you are in an evacuation zone, move immediately to a safe location. Longer than a minute OR difficult to stand up, doesn't have to be both.

Lors d'un tremblement de terre énorme ou d'une durée plus longue, trouvez immédiatement un endroit sûr si vous vous trouvez dans une zone d'évacuation. Un tremblement de terre peut être énorme OU d'une durée plus longue, mais pas les deux à la fois.



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- ❑ The Tsunami Information Board has some basic information on what is a Tsunami, advise on Tsunami Evacuation, Tsunami Signs and a piece of Tsunami History in Vanuatu
- An explanation of “What is a Tsunami”?

#### “What is a Tsunami”?



Language: Bislama, English & French

**Wanem ia Sunami?  
What is a Tsunami?  
Qu'est-ce qu'un tsunami?**

Sunami hemi ol bigfala wev blong solwora we ol etkwek, lanslait o volkenu we i faerap andanit long solwora i kosem  
A tsunami is a series of gigantic waves caused by earthquakes, submarine landslides or underwater volcanic eruptions

Un tsunami est une série de vagues gigantesques provoquées par un tremblement de terre, un glissement de terrain sous-marin ou une éruption de volcans sous-marins.

**HOW AN EARTHQUAKE-GENERATED TSUNAMI FORMS**



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### Tsunami Evacuation Message

**Sunami Evakuesen**  
**Tsunami Evacuation**  
**Evacuation Tsunami**

**Sapos yu risivim eni woning, muv aot mo folem ol rod we i stap long map ia**  
If you get any warning at all, evacuate via the routes drawn on this map  
À toute alerte, évacuez par les voies tracées sur cette carte.

**Wokbaot o ron long basiikel kwiik mo folem ol rod we i stap long map la blong kasem wan ples we i sef. No yusum trak.**  
Walk or ride bicycles quickly following routes drawn on this map to a safe location. Don't use cars.  
Circulez rapidement à pied ou à vélo suivant les voies tracées sur cette carte jusqu'à un endroit sûr. N'y allez pas en voiture.

**Hemi posibol se fes wew i no bigfala wew iet. I save tekem plantehaoa bifo bigfala wew i kam.**  
The first wave may not be the largest. It may take many hours for the largest wave to arrive.  
La première vague peut ne pas être la plus grande. La vague la plus grande peut prendre plusieurs heures pour arriver.

**Muv aot long ol zone we oli talemaot long ofisol woning**  
Evacuate from the zones stated in the official warning  
Quitez les zones faisant l'objet d'alerte officielle.

**Stap long ples we i sef kasem taem we NDMO i talem se hemi oraeat**  
Stay in safe location until the NDMO issued the "all clear"  
Restez dans un endroit sûr jusqu'à ce que le BNCG lève l'alerte.

Language: Bislama, English & French



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An explanation of where you will see the 3 Tsunami Evacuation Signs

**Oi saen we bae yu luk**  
**Signs you will see**  
**Les signes que vous apercevrez**

 <p><b>Saen ia i stap insaad lo denja zone kolosap long sowlora</b> This sign is in the Shore Exclusion Zone near the coast Ce signe sera aperçu dans la zone d'exclusion près des côtes</p>	 <p><b>Saen ia i stap soem ol rod we i ko long ol ples we i sef</b> This sign shows evacuation routes to safe location Ce signe indique les voies d'évacuation vers un endroit sûr</p>	 <p><b>Saen ia i stap long ol ples we i sef</b> This sign indicates safe locations Ce signe indique un endroit sûr</p>
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Language: Bislama, French & English



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- Tsunami History—a piece of Tsunami History in Vanuatu. Generally depicting that it has occurred and history repeats itself, sometimes more disastrous

A piece of Tsunami History in Vanuatu

Language: Bislama, English & French



**Histri blong Sunami long Vanuatu  
Tsunami History in Vanuatu  
Histoire du tsunami au Vanuatu**

Long 24 Januari 1927 i bin gat wan bigfala eikwek aotsaed long Saot Malekula. Etkwek ia i kosem wan sunami we ol wev blong hem i kasem Port Vila haba. Long taem ia ol apu long Ifira oli pikimap ol fis mo totel andanit long ol burao long smol aelan ia. Long Port Vila, sunami i kosem flating long waterfront mo Fatumaru Bay.

On January 24, 1927 a large earthquake off the coast of South Malekula generated a tsunami that struck Port Vila harbor within an hour after. Elders on the offshore island of Ifira collected fish and other marine life among coastal vegetation. On Port Vila, the tsunami inundated all areas of the waterfront including the Fatumaru Bay coastal areas.

Le 24 janvier 1927, un grand tremblement de terre au large de la côte sud de Malicolo a provoqué un tsunami qui a atteint la baie de Port Vila dans moins d'une heure. Les anciens de l'îlot d'Ifira ramassaient des poissons et autres animaux marins dans la végétation côtière. À Port-Vila, le tsunami a inondé toutes les zones du front de mer, y compris les zones côtières de Fatumaru Bay.



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- Disclaimer - is a legally-based sentence or a few sentences indicating that the person/company cannot be sued (no “claims” can be made against it, they are not responsible for something)

The Source: Please note that the evacuation zones are indicative only and based on current science and modelling as at date map published. Avertissement: Si vous faites note que les zones d'évacuation sont données à titre indicatif et sont basées sur la science et la modélisation actuelle qui à la date de la carte publiée

**Disclaimer: Please note that the evacuation zones are indicative only and based on current science and modelling as at date map published**

Language: Bislama, English & French

- Word of thanks – Municipality/Area Council and Residents (Wards/Zones/Communities)

Word of thanks to authority and residents for their contribution



Language: Bislama, English & French

**Bigfala tangkio i go long Port Vila  
Munisipaliti mo ol pipol blong Port Vila long  
kontribibusen blong olgeta long wok ia  
Sincere thanks to the Port Vila Municipality  
and its residents for their contribution in  
this project**

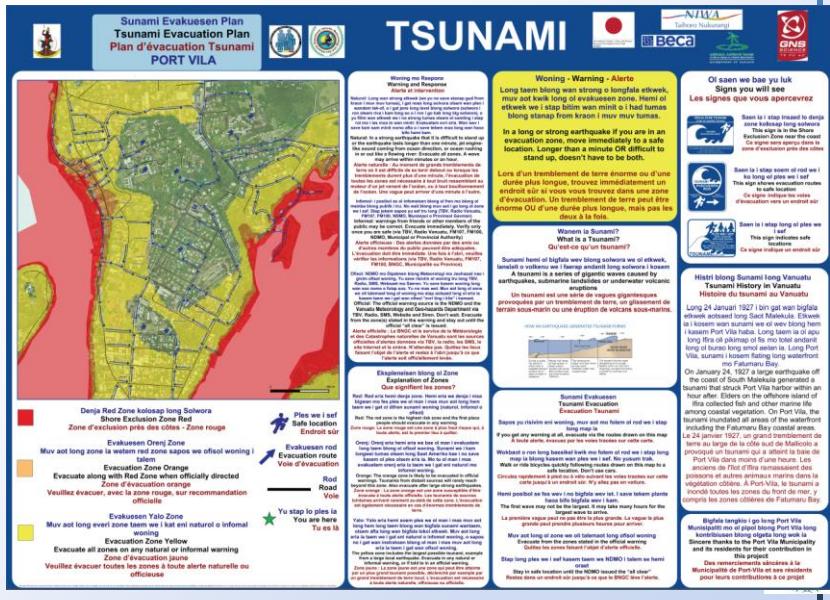
**Des remerciements sincères à la  
Municipalité de Port-Vila et ses résidents  
pour leurs contributions à ce projet**



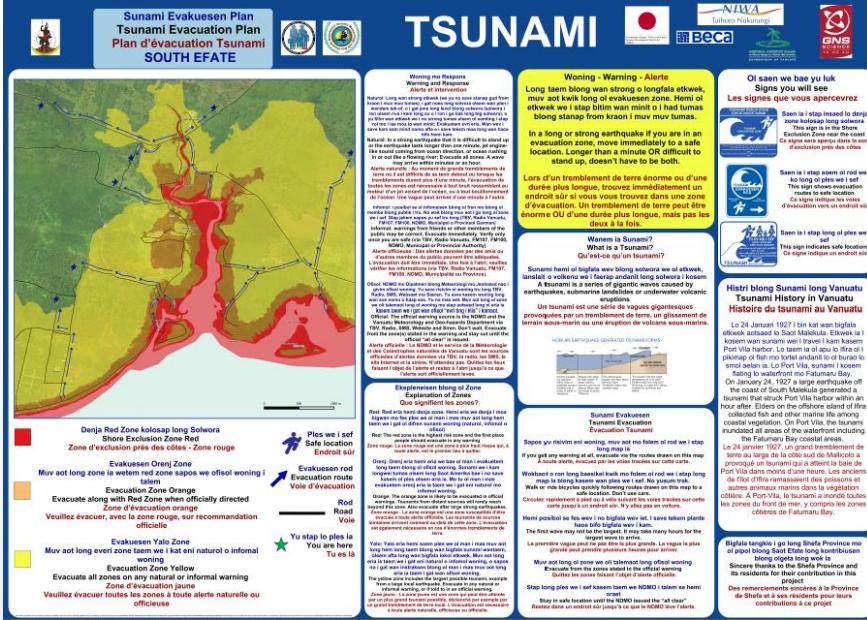
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## A complete Tsunami Information Board using QGIS



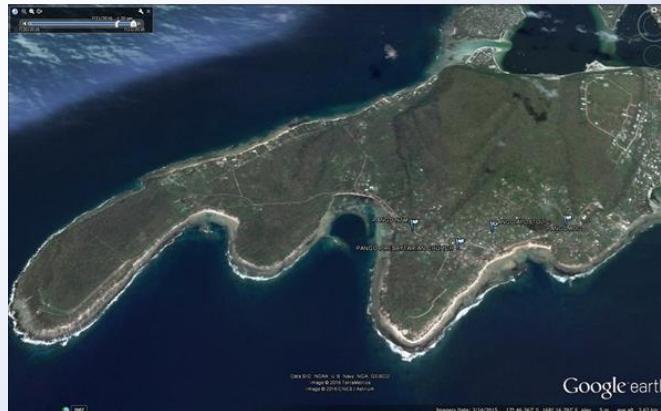
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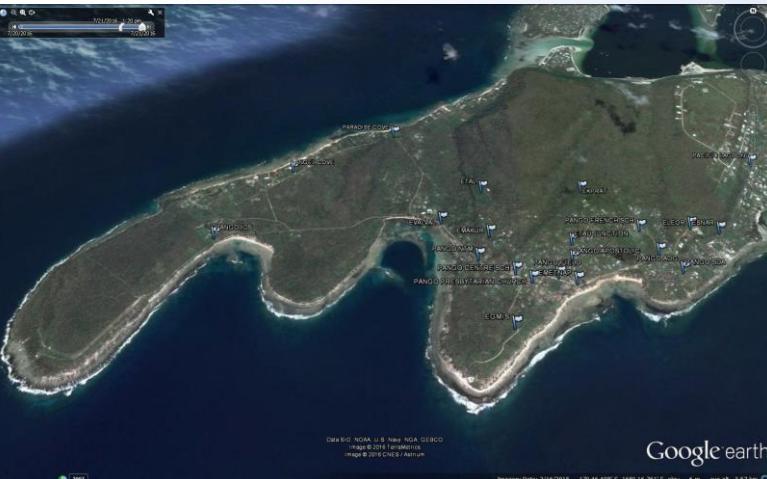


- Mapping and Site Survey
  - Mapping Consultation Sites
  - Site Survey (Mapping Signs & IB Sites)
  - Revisions



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Figure x. Consultation sites for Pango Area Council



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Figure xx. Signs and Information Board sites for Pango Area Council

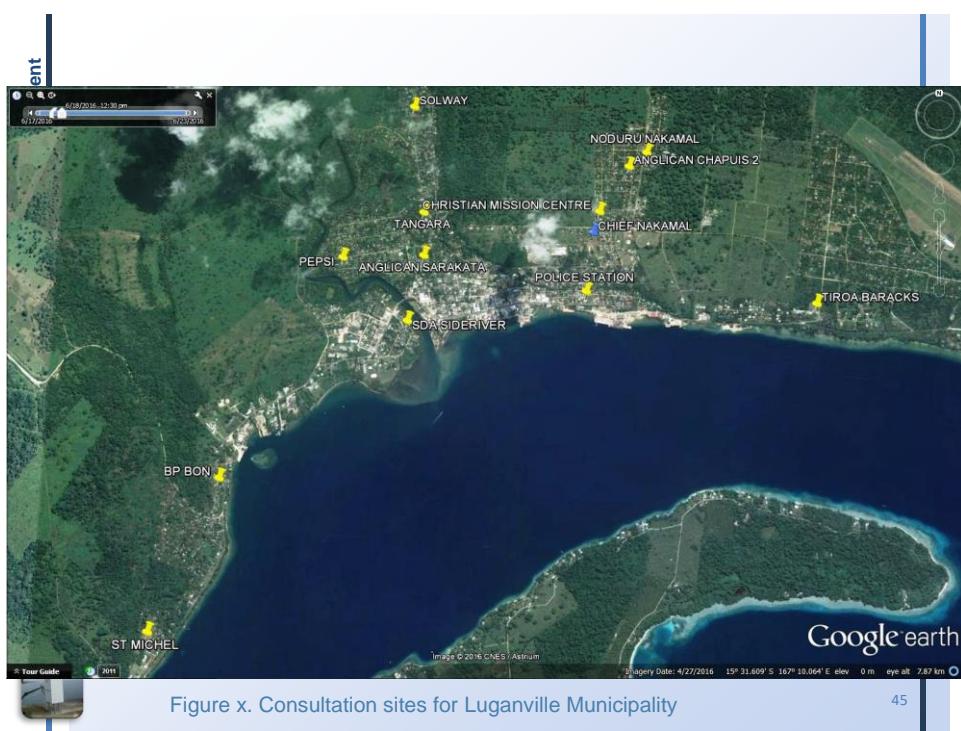
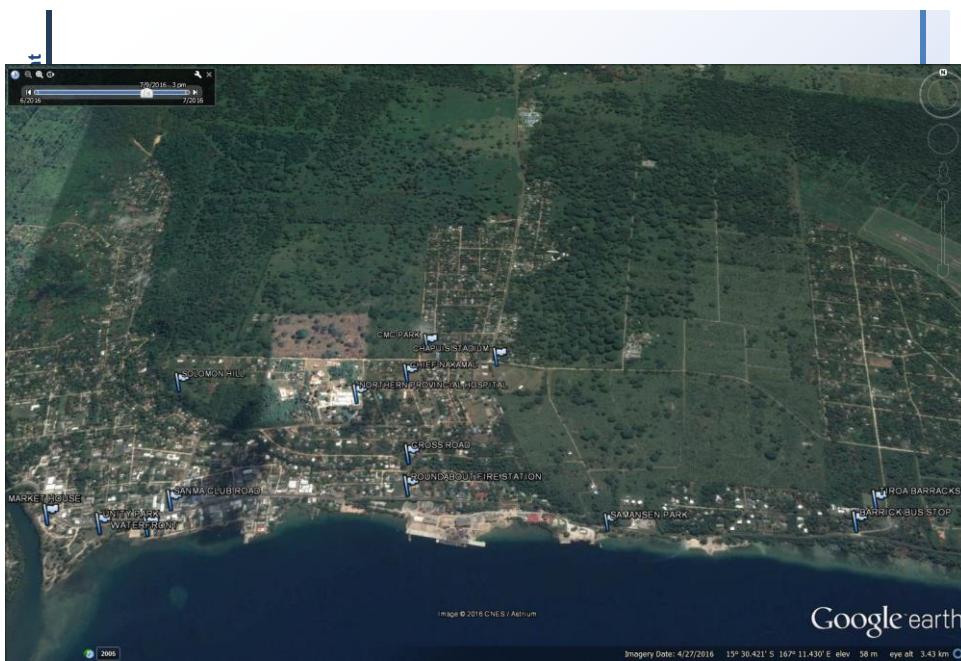


Figure x. Consultation sites for Lagoni Bay, Lautoka, Fiji

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Figure xx. Signs and Information Board sites for Central Ward, Lagoni Bay, Lautoka, Fiji<sup>46</sup>

**Vanuatu Meteorology & Geo-Hazards Department**  
*Protecting Lives and Property*

**Table 1 Location numbers and sign types for each [examples from Central Ward, Port Vila Municipality]**

Location	Name of Site	Danger zone	Safe Route	Safe location	Information Board	Coordinates	Description
1	Fatumaru Bay	DZ			IS	17°43.987'S 168°18.672'E	
2			RL			17°44.170'S 168°18.742'E	
3		DZ				17°44.309'S 168°18.800'E	
4			L			17°44.251'S 168°18.811'E	
5		DZ				17°44.309'S 168°18.800'E	
6			RL			17°44.368'S 168°18.866'E	
7			R			17°44.373'S 168°18.867'E	
8	Market House	DZ			IS	17°44.437'S 168°18.850'E	
9			L			17°44.523'S 168°18.865'E	
10			R			17°44.549'S 168°18.848'E	
11			L			17°44.777'S 168°18.876'E	
12			R			17°44.373'S 168°18.957'E	
13	EST J			SL		17°44.087'S 168°19.038'E	
14	E.CEN.VIL			SL		17°44.189'S 168°19.031'E	
15				SL		17°44.779'S 168°19.110'E	
16			R			17°44.848'S 168°19.148'E	
17			R			17°44.850'S 168°19.146'E	
18	SEASIDE COMM. SCH					17°44.714'S 168°19.157'E	
19		DZ				17°44.700'S 168°19.412'E	
20			R			17°44.668'S 168°19.341'E	
21			L			17°44.570'S 168°19.400'E	
22	VCH				IS	17°44.549'S 168°19.265'E	
23			R			17°44.914'S 168°19.141'E	
24			L			17°44.912'S 168°19.210'E	
25			RL			17°45.029'S 168°19.154'E	



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**Vanuatu Meteorology & Geo-Hazards Department**  
*Protecting Lives and Property*

LEFT (L)	3
RIGHT (R)	5
BACK-TO-BACK (RL)	3

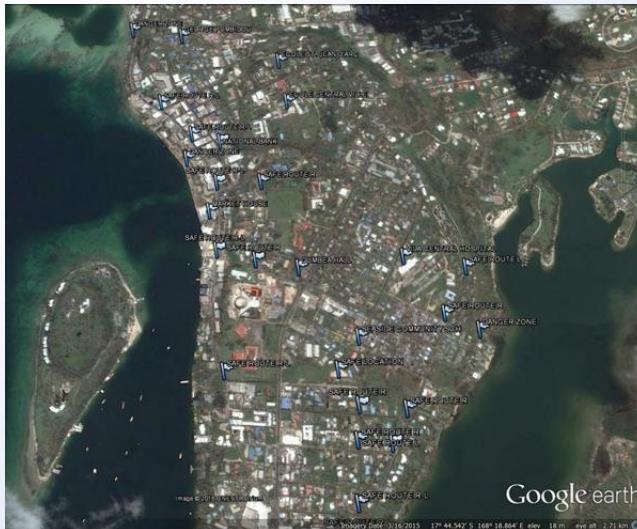
	DANGER ZONE	SAFE ROUTE	SAFE LOCATION	INFORMATION BOARD	
<b>TOTAL</b>	5	11	3	3	



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Map of signs sites [examples from Central Ward, Port Vila Municipality]



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Construction: 126 Information Board poles and frames



Evacuation Signs poles: c. 200+



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**SUMMARY**

- Tsunami Early Warning; Siren, SMS, Website, Email
  - *Natural Warning Signs of pending tsunami:*
    - Strong and/or long earthquake
    - Change in sea level
    - Roaring Sound
- Tsunami Response = Tsunami Evacuation Products
  - *Tsunami Evacuation Maps – Tsunami Evacuation Plan (A3 Prints)*
  - *Tsunami Information Boards – Tsunami Evacuation Plan (outdoor)*
  - *Tsunami Evacuation Signs (outdoor)*
    - Danger Zone Sign
    - Safe Route Signs
    - Safe Location Sign
  - *All Tsunami Evacuation Products are in the 3 official languages; Bislama, English and French*




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**Way forward**

- Tsunami Response Plans
  - Local authority
  - Ward/Area Council
  - Community Disaster Committees (CDCs)
- Review VMGD Tsunami Directive (Early Warning Center Operations; incorporating sirens)
- Tsunami Drill/Simulation
- Standard Operating Procedures (SOPs)
  - *Community-Based Tsunami Evacuation Maps and Signs (SOP 11)*
  - *Creating Tsunami Evacuation Maps and Information Boards in QGIS (SOP 12)*




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## Mainstreaming Disaster Risk Reduction (MDRR) Project

- South Santo and South Efate pilot sites



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## RESPOND EFFECTIVELY TO TSUNAMI THREATS/WARNING IN THE FUTURE



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Thank you

