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Tsunami Ready

Preparedness Indicators - How to achieve, challenges and solutions

6.1 Evacuation Map – Guidelines, Map Standards

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International Tsunami Information Center (ITIC)

Prep-1 Easily understood tsunami evacuation maps are approved

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The evacuation map should:

* show evacuation zones, routes, safer areas as higher ground or tsunami shelter, assembly areas, critical and sensitive facilities

* use the tsunami hazard map as a basis for its preparation (deliverable of ASSESS-1)

* The community should be involved in its preparation to incorporate local knowledge

Evacuation map in Praia da Batata, Lagos, Portugal.

TEMPP, and UNESCO IOC Manuals and Guides, 82, 2020: *Preparing for Community Tsunami Evacuations: from inundation to evacuation maps, response plans and exercises*.

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itic.ioc-unesco.org

Steps to develop evacuation maps

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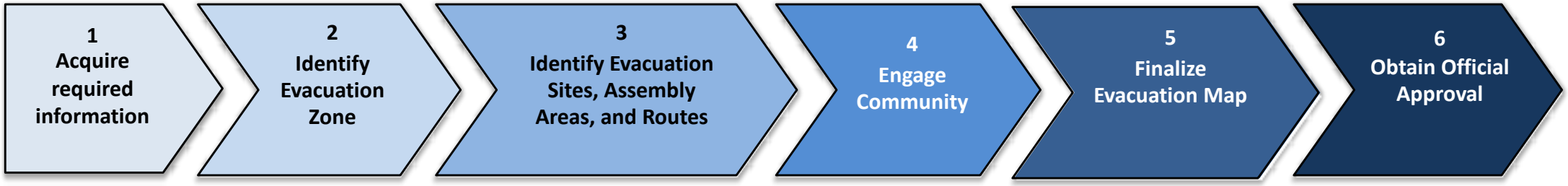
Evacuation maps should be simple and easy to read and should include essential information

The following 6 steps should be followed to develop evacuation maps:



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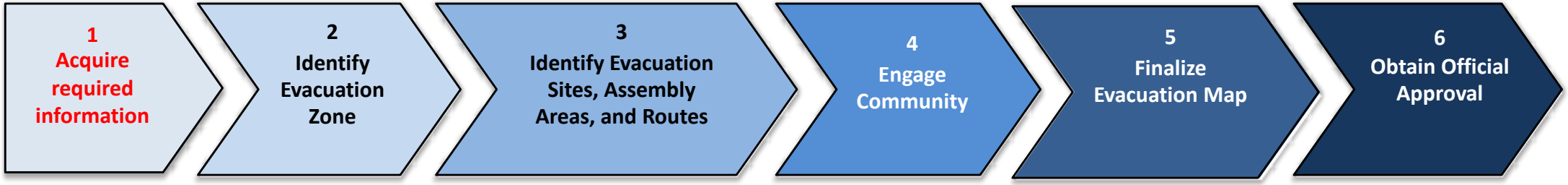

* Tsunami inundation map (gives flooding extent from worst case and credible tsunami scenario)

* Tsunami wave arrival time (useful to do the evacuation planning)

* Geospatial data layers (natural and built environment, population demographics, road systems, infrastructure and critical facilities, houses, etc)

* GIS software (QGIS, ArcGIS) and GIS mapping experts

From inundation map to evacuation map – example from Cedeño, Honduras

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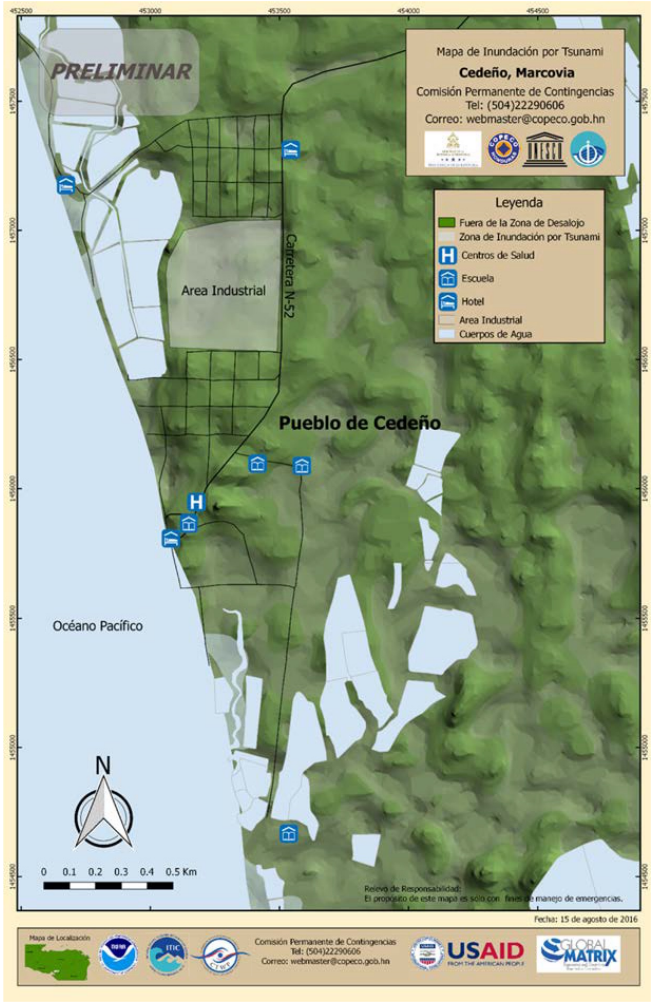

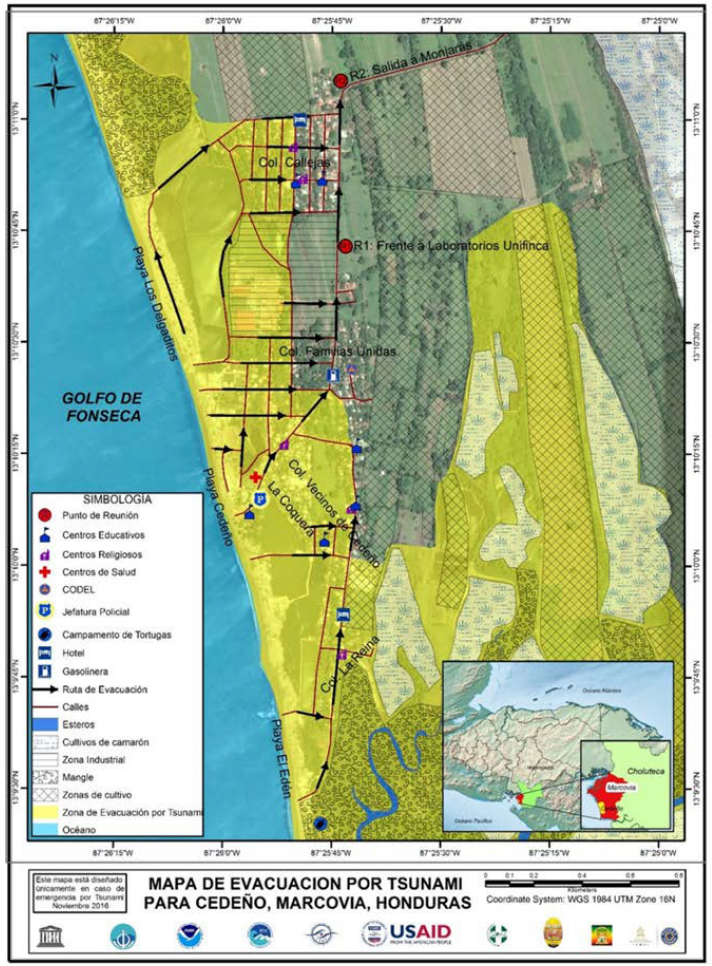

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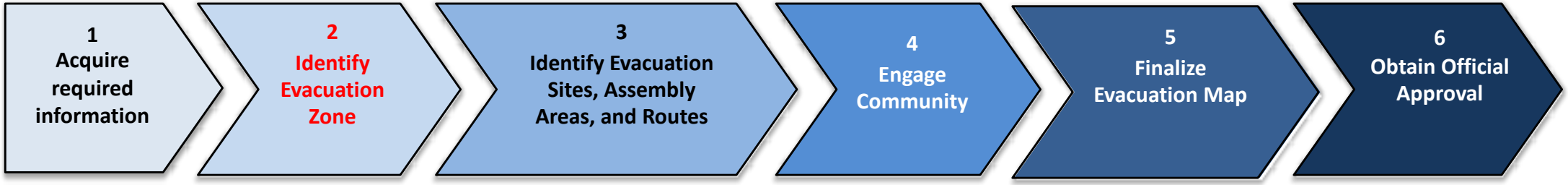
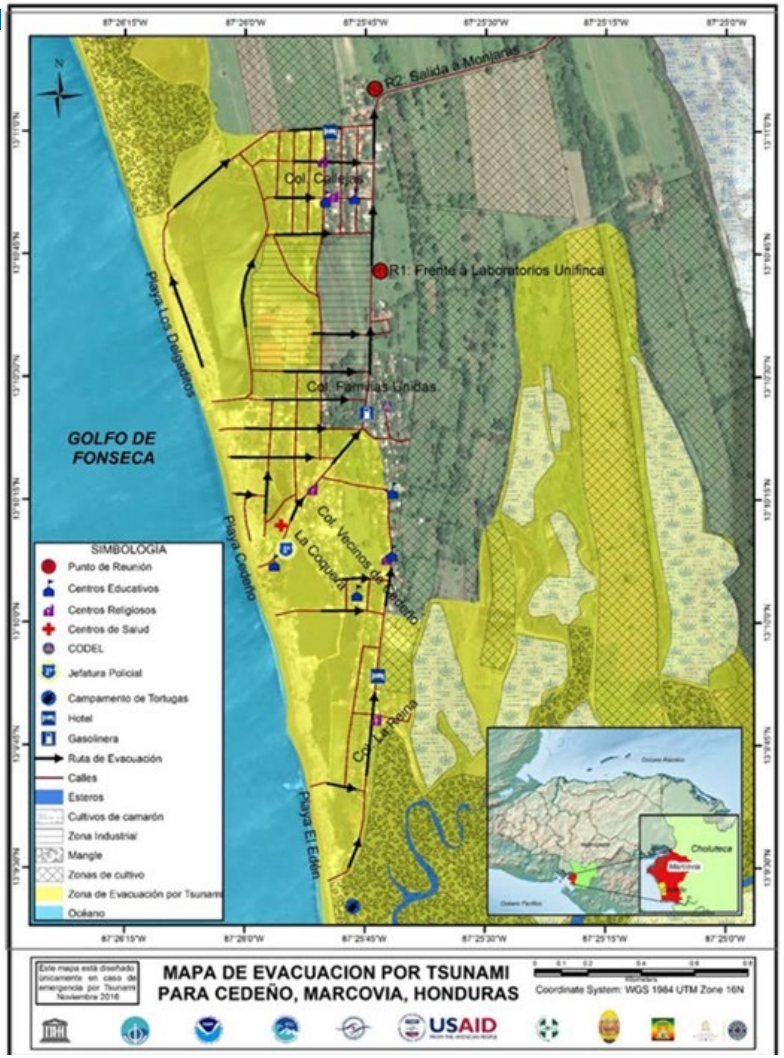


Safety factors to consider when drawing the evacuation zone line are:

* Proximity and location of high ground (hills, cliffs, man-made vertical refuges (berms, tall buildings, etc);
* Safety buffer for potential uncertainties in the inundation map;
* Knowledge of flood zones, types of roadways and locations;
* Availability of identifiable landmark locations for easier evacuation routing;
* Hazardous Materials (HAZMAT) sites and other potential hazards (secured gates or high fences, lumber yards or harbours with potential floating debris etc.) that could cause evacuation problems;
* Locations of special needs population in evacuation zone (i.e. hospitals, elder care or nursing facilities, schools, day care centres, non-English speakers, transient populations, etc.).

Sensitive Facilities – Cedeño, Honduras



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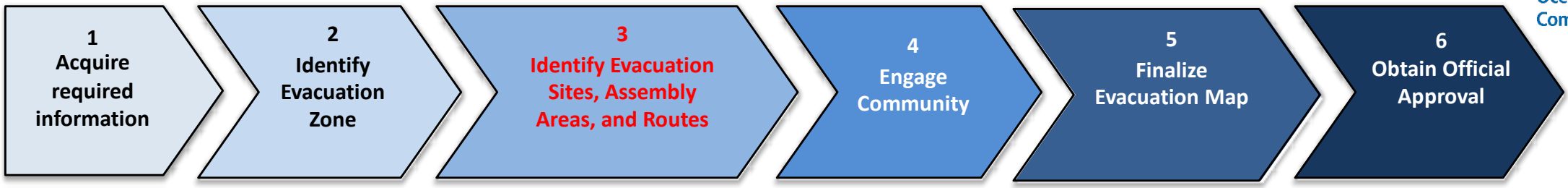

Decide criteria for determining assembly sites and evacuation route. The following are possible bases for selection of the site:

* Site is outside of identified Tsunami Evacuation Zone;
* Site can be reached by foot within the shortest possible time. Ease of egress by foot is the first priority, including for special needs populations;
* The total area of site can hold the expected number of people (or certain percentage of population of the community if several sites are selected);
* Site can be easily identified by residents, for example a prominent hill, a school, an open park among others
* Evacuation routes should avoid areas that could suffer damages from strong earthquakes such as collapsed bridges, buildings, power lines and landslides, which may block routes and cause hazardous conditions.
* Route and site can accommodate special needs populations (portion of the public sector that is willing, yet incapable of leaving the Evacuating Zone).

Working on Evacuation Maps

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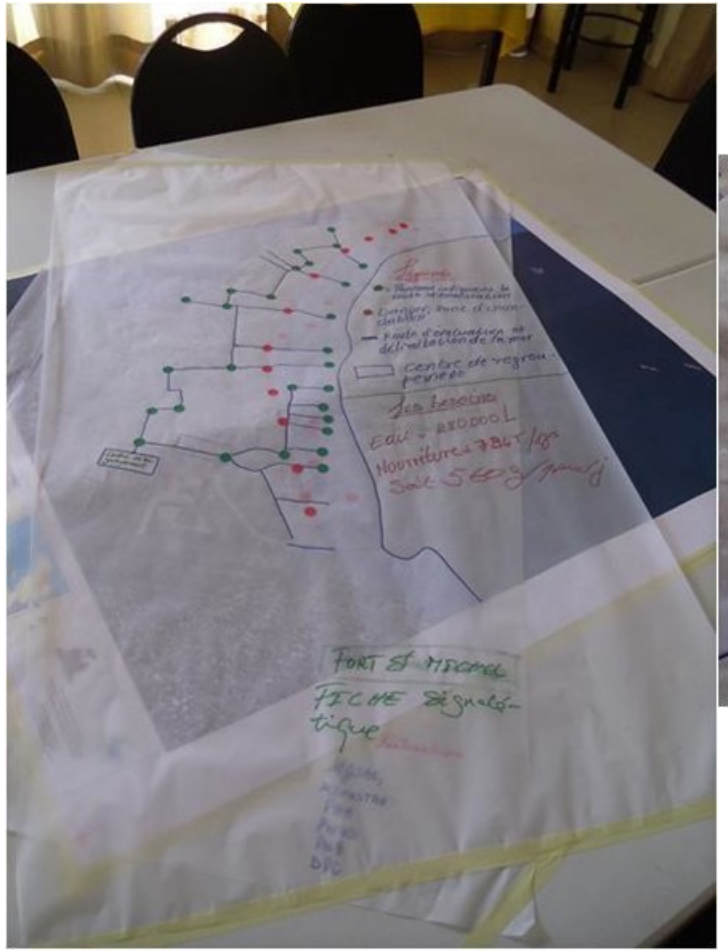
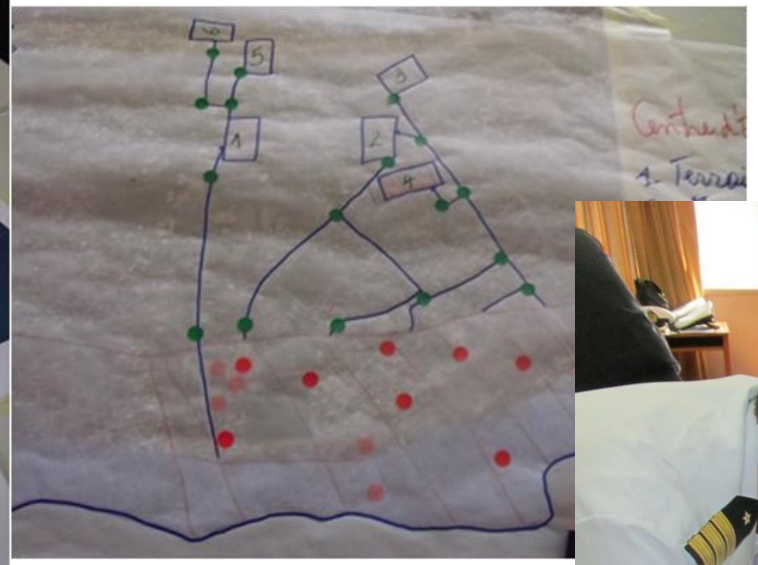
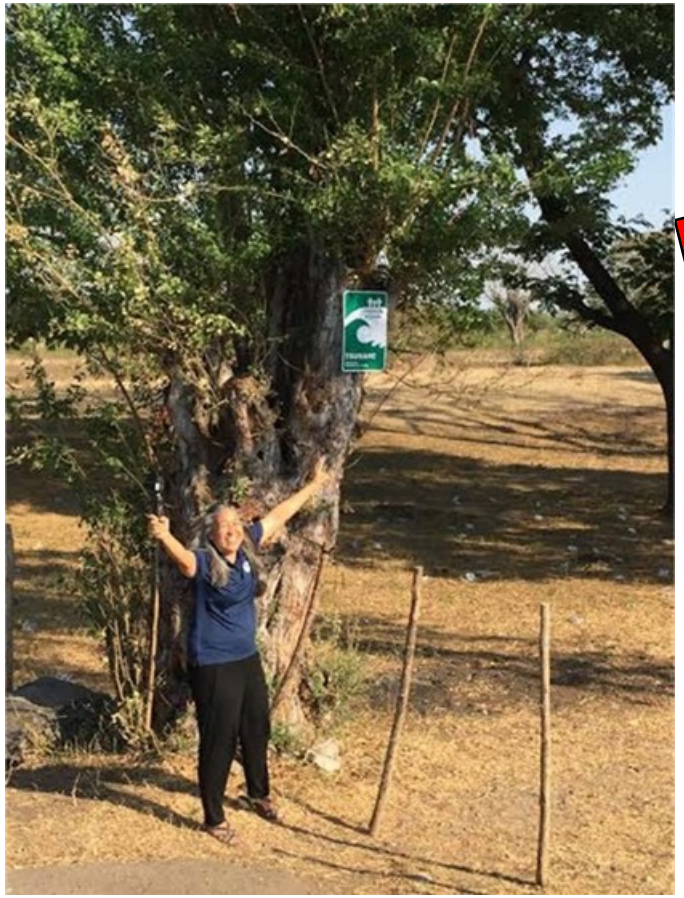
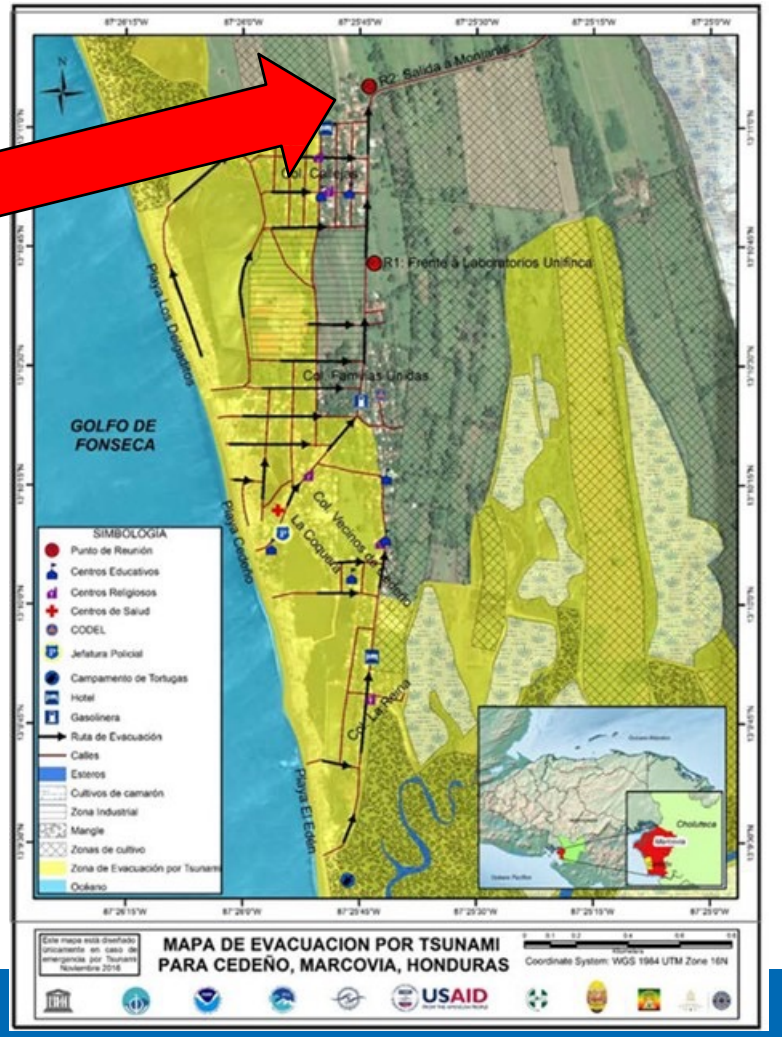




Meeting Point – Cedeño, Honduras example





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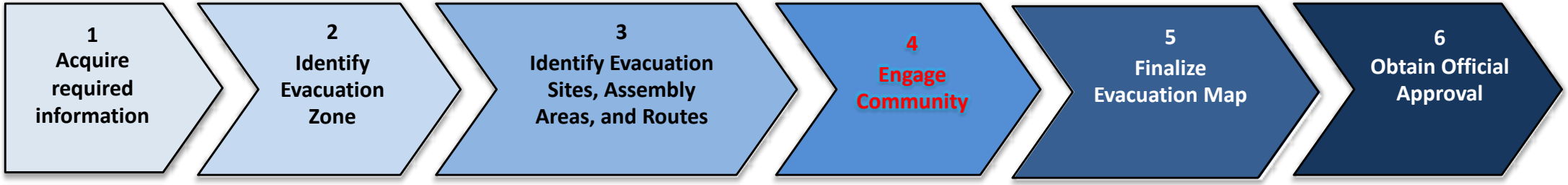

* At least one meeting should be held with the community and its leaders to obtain their input.
* Invite all stakeholders who have a response, coordination, or special needs requirement (e.g., hospitals, schools).
* Engage and explain inundation mapping results and draft evacuation zone, evacuation areas, assembly sites, refuges, or shelters, evacuation routes, and signage.
* Field visits to view topographic and built environment conditions may be needed. Evacuation routes should be walked by the community to confirm ease and timing for successful egress.

Community Engagement – Cedeño, Honduras

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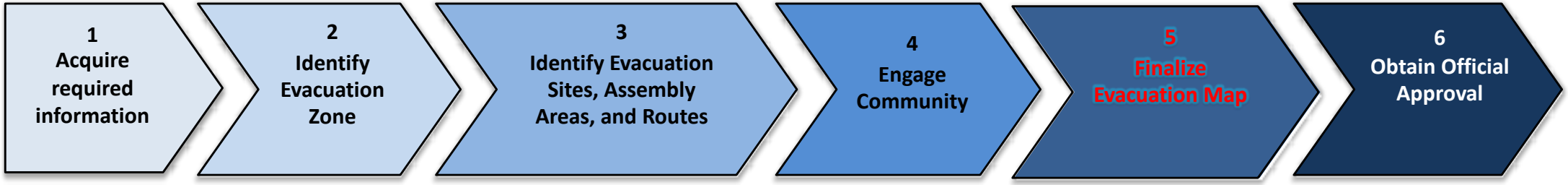


The community input is needed to finalize the drawing of the lines, evacuation/areas and routes, and signage.

* Colours (zones, streets, routes, signage, symbols, topography if shown),
* Legend,
* Inclusion of tsunami warning and safety information (awareness),
* Inclusion of evacuation information (instructions, guidelines).

Indonesia

Tsunami Evacuation Procedure

1. **If you feel an earthquake - protect yourself**
   - Don't panic!
   - Drop, cover and hold!
2. **After an earthquake, be aware that a tsunami may follow**
   - Move away from the beach immediately as a precaution measure!
   - Look for more information through TV and Radio!
3. **After a strong and prolonged earthquake, evacuate immediately!**
   - Don't wait for an official warning, leave the RED ZONE immediately if possible or look for shelter in higher buildings
   - If you are around Pratama Street, look for shelter in one of the hotels with higher floors
   - As a visitor in a hotel, please follow the instructions of hotel staff
4. **The sound of the siren is the official call for evacuation**
   - If the siren sounds, follow the evacuation procedure as indicated above (No. 3)!

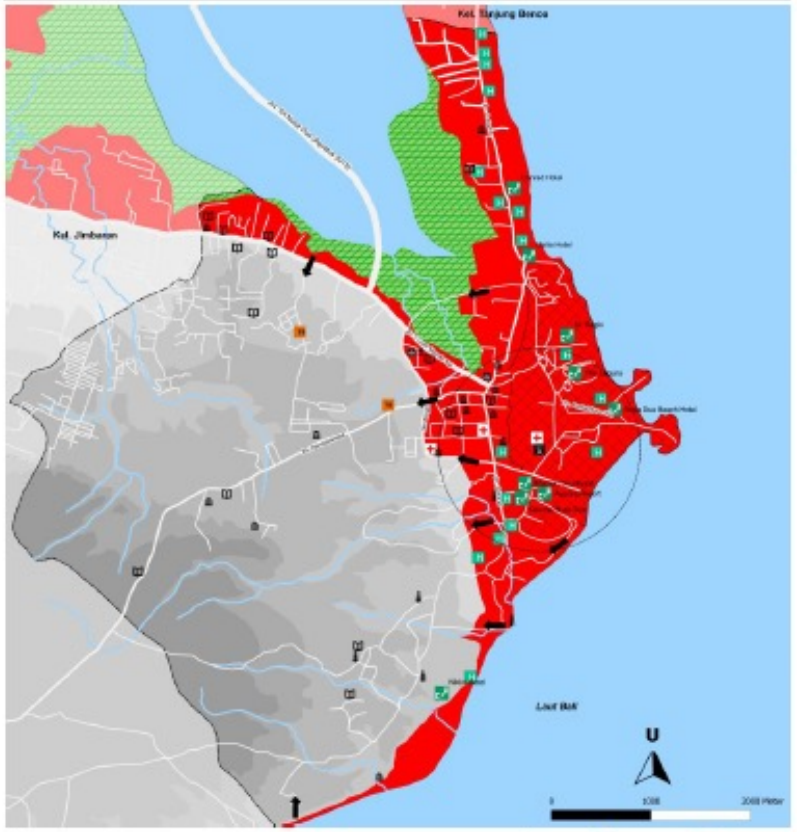
   Be aware that the siren may not be heard in all areas.

After the first tsunami wave, more waves are likely to come!

Wait for an official "All Clear" message before leaving shelter

*Please note that BTDC has its own procedure

Tsunami Evacuation Map for Benoa
Peta Evakuasi Tsunami di Kelurahan Benoa



PMI giz PROTECTS

December / Desember 2012

Further Information / Informasi lebih lanjut:
BPBD Kabupaten Badung
Jln Raya Raya Sempidi, Mengwi
Tel. 0361-7511166

Prosedur Evakuasi Tsunami

1. **Jika merasakan gempabumi - lindungi diri anda**
   - Jangan panik
   - Merunduk, berlindung dan berpegangan
2. **Setelah gempabumi, sadari bahwa tsunami mungkin terjadi**
   - Segera tinggalkan daerah pantai sebagai langkah pencegahan awal
   - Carilah informasi lebih lanjut melalui TV dan Radio
3. **Setelah gempabumi yang kuat dan lama, Segera Evakuasi!**
   - Jangan menunggu peringatan resmi, segera tinggalkan ZONA MERAH jika memungkinkan atau mencari tempat berlindung yang lebih tinggi
   - Jika anda berada di sekitar Jln. Pratama, segera berlindung di bangunan bertingkat 3/lebih
   - Jika anda pengunjung,ikuti arahan dari karyawan hotel
4. **Bunyi sirene adalah panggilan resmi evakuasi**
   - Jika sirene berbunyi, ikuti prosedur evakuasi seperti diatas (No. 3)!

   Sadari bahwa mungkin bunyi sirene tidak terdengar di semua area.

Setelah gelombang pertama datang, gelombang yang lain mungkin akan menyusul.

Tunggu pemberitahuan resmi "Tsunami telah berakhir" sebelum meninggalkan tempat perlindungan

*Catatan: Ada prosedur khusus di area BTDC

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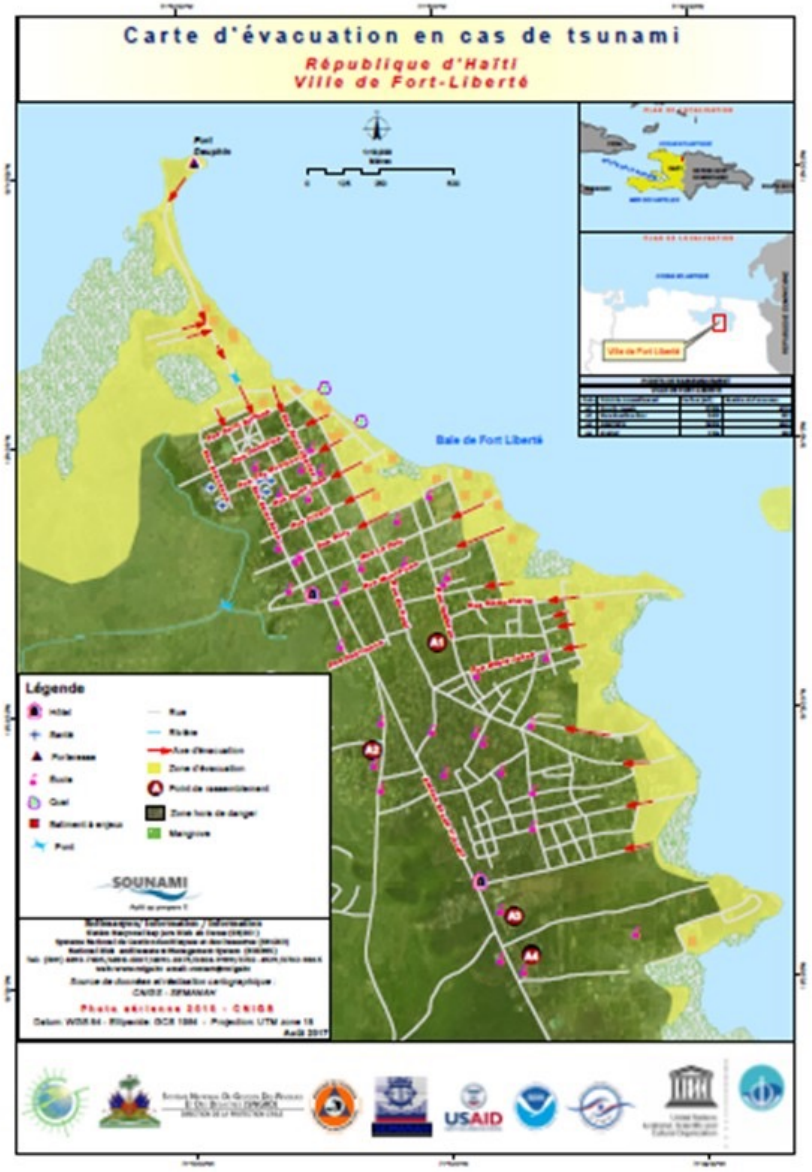
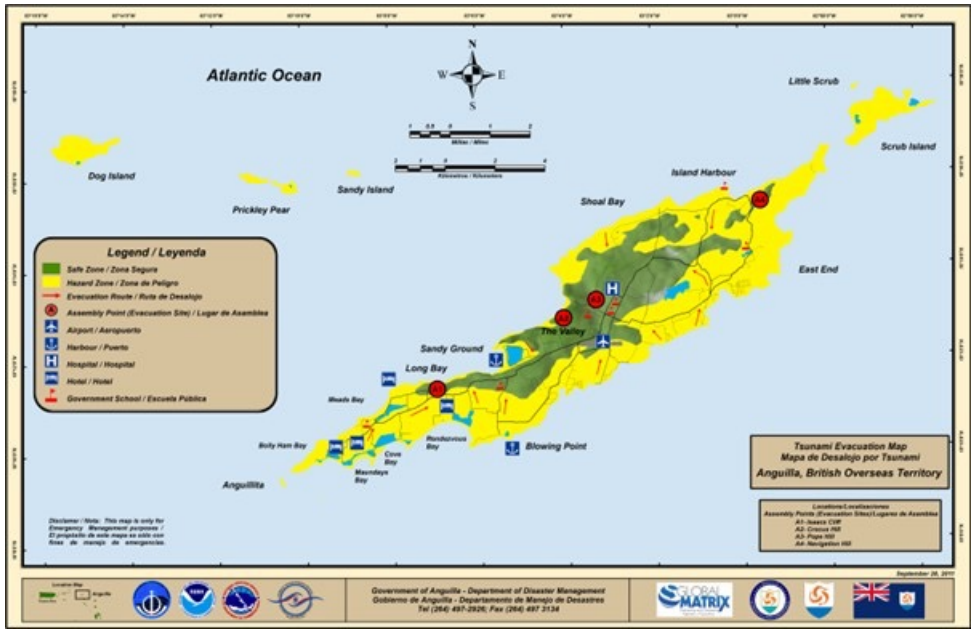
Haiti

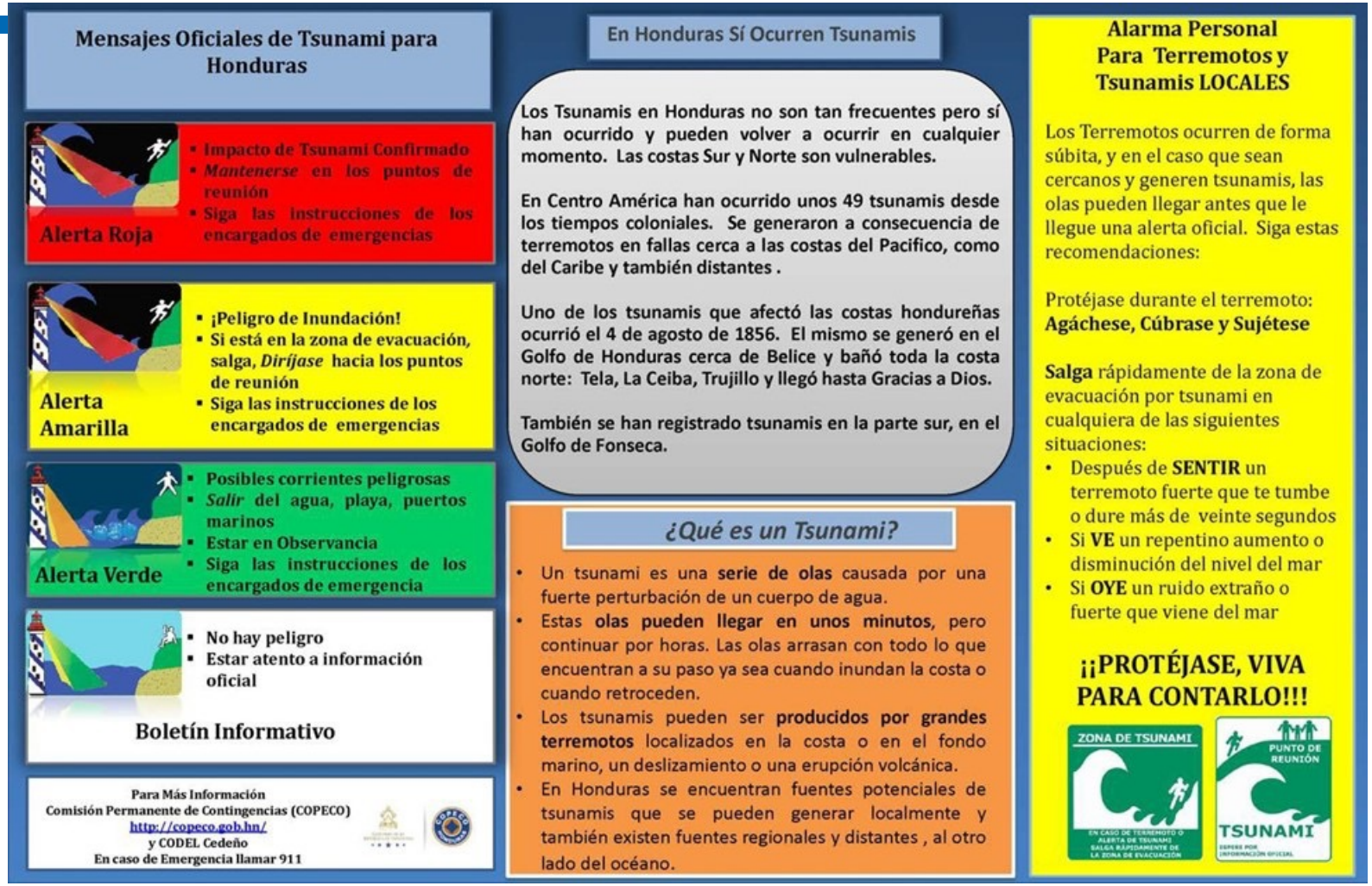


Anguilla



Puerto Rico

Text on the back of an Evacuation Map Cedeño, Honduras



Mensajes Oficiales de Tsunami para Honduras

Alerta Roja
- Impacto de Tsunami Confirmado
- *Mantenerse* en los puntos de reunión
- Siga las instrucciones de los encargados de emergencias

Alerta Amarilla
- ¡Peligro de Inundación!
- Si está en la zona de evacuación, salga, *Diríjase* hacia los puntos de reunión
- Siga las instrucciones de los encargados de emergencias

Alerta Verde
- Posibles corrientes peligrosas
- *Salir* del agua, playa, puertos marinos
- Estar en Observancia
- Siga las instrucciones de los encargados de emergencia

- No hay peligro
- Estar atento a información oficial

Boletín Informativo

Para Más Información
Comisión Permanente de Contingencias (COPECO)
http://copeco.gob.hn/
y CODEL Cedeño
En caso de Emergencia llamar 911

En Honduras Sí Ocurren Tsunamis

Los Tsunamis en Honduras no son tan frecuentes pero sí han ocurrido y pueden volver a ocurrir en cualquier momento. Las costas Sur y Norte son vulnerables.

En Centro América han ocurrido unos 49 tsunamis desde los tiempos coloniales. Se generaron a consecuencia de terremotos en fallas cerca a las costas del Pacifico, como del Caribe y también distantes .

Uno de los tsunamis que afectó las costas hondureñas ocurrió el 4 de agosto de 1856. El mismo se generó en el Golfo de Honduras cerca de Belice y bañó toda la costa norte: Tela, La Ceiba, Trujillo y llegó hasta Gracias a Dios.

También se han registrado tsunamis en la parte sur, en el Golfo de Fonseca.

¿Qué es un Tsunami?

- Un tsunami es una **serie de olas** causada por una fuerte perturbación de un cuerpo de agua.
- Estas **olas pueden llegar en unos minutos**, pero continuar por horas. Las olas arrasan con todo lo que encuentran a su paso ya sea cuando inundan la costa o cuando retroceden.
- Los tsunamis pueden ser **producidos por grandes terremotos** localizados en la costa o en el fondo marino, un deslizamiento o una erupción volcánica.
- En Honduras se encuentran fuentes potenciales de tsunamis que se pueden generar localmente y también existen fuentes regionales y distantes , al otro lado del océano.

Alarma Personal Para Terremotos y Tsunamis LOCALES

Los Terremotos ocurren de forma súbita, y en el caso que sean cercanos y generen tsunamis, las olas pueden llegar antes que le llegue una alerta oficial. Siga estas recomendaciones:

Protéjase durante el terremoto:
Agáchese, Cúbrase y Sujétese

Salga rápidamente de la zona de evacuación por tsunami en cualquiera de las siguientes situaciones:
- Después de **SENTIR** un terremoto fuerte que te tumbe o dure más de veinte segundos
- Si **VE** un repentino aumento o disminución del nivel del mar
- Si **OYE** un ruido extraño o fuerte que viene del mar

¡¡PROTÉJASE, VIVA PARA CONTARLO!!!

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Trinidad & Tobago

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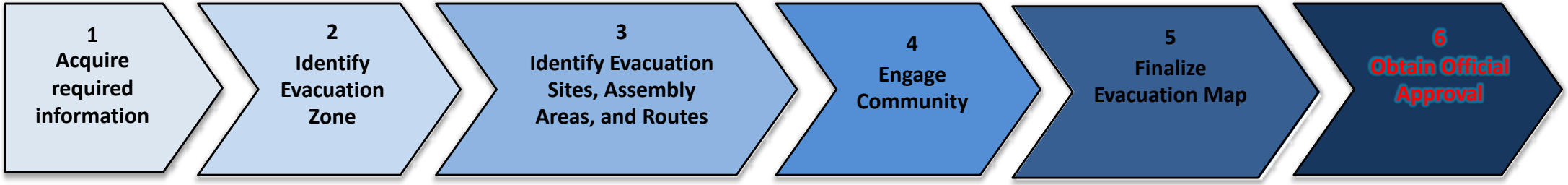

Evacuation maps are public safety products that should be approved by the appropriate local governing authority. The type and placement of signage should also be approved by the appropriate authority.

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Tsunami Ready
2022 - 2026

THANK YOU
Vinaka Vaka Levu

For more information:

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International Tsunami Information Center (ITIC)