

Tsunami Evacuation Study | Viña del Mar Zone 4

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Introduction

Viña del Mar is a resort town on Chile's central coast with a population of about 325,000. The city lies in a low lying valley surrounded by hills, so is vulnerable to tsunami inundation and damage. The city has developed a tsunami evacuation plan with specified evacuation routes that direct the population with tsunami evacuation signs to assembly points in the hills (see www.vinadelmarchile.cl/seccion/164/informacion-evacuacion-tsunami.html). Figure 1 shows the evacuation routes in red and the assembly points by green circles.



Figure 1. Portion of evacuation map developed by Oficina Nacional de Emergencias del Ministerio del Interior y Seguridad Pública (ONEMI).

In this activity, the team walked the Zone 4 evacuation route to assess the potential effectiveness of the evacuation plan by identifying different elements that may obstruct the evacuation process. Photos of potential obstacles are found in this report and geocoded photos are found at <http://www.eqclearinghouse.org/2015-09-16-chile/maps-and-photos/map/>.

Starting at the casino next to the beach and ending at assembly point 4, the team took the 2 Norte route until they were required to make a left on Ave Los Castanos, and then proceeded to take a right on Subida Sausalito. Walking at an average pace of 16 min/km, the walk took approximately 50 min, was 3.2 km long, and climbed an elevation of 28m. It was a Sunday in summer around 4 pm.

Observations

Starting at the beach there were no clear signs where to head, but using the escape route map the team was able to find 2 Norte, and started walking east. Team members couldn't see any hills from where they started except towards the north, along the beach, so without the map, the team likely would not have gone in the right direction to start with. The team was cautious about needing to walk so close to the river. It is important to note that after completing the evacuation route on 2 Norte, and looking more extensively at the map, the assembly point on the hill on other side of the river (to the south) seemed the closest place to go. The team originally did not choose this route because it was outside of the area marked Zone 4.

2 Norte was calm and relatively obstacle free most of the way. It appeared to be mostly residential, with many old trees, the only objects that could have been considered obstacles. For the first six blocks there was only one sign at the very beginning of the route. This was at 2 Norte and Libertad Ave. After this intersection, the signs were slightly more frequent. At 2 Norte and 5 Oriente it was unclear where to continue, because hills were seen to the north and south, but not straight ahead on the route and no sign was present. Upon reaching Ave Los Castanos, the team came upon a T-intersection, where it was completely unclear where to turn. The team did not see any signs walking on the right side of the road at all. There was a sign at the intersection with 4 Norte; however, a person would only see it turning onto Ave Los Castanos from 4 Norte. The left side of the road was unobstructed; however, the right side was very narrow, with many street signs, lights, and trees blocking the way. The team noticed street lights on this street in case of an evacuation at night (assuming power is still available). This entire way the route appeared relatively flat. It was only when the team turned right on Subida Sausalito that they steeply gained elevation. Again here there were no signs to direct a potential evacuee. Finally, because of the lack of signage team members only knew they were at Assembly Point 4 after consulting with the evacuation map and Google maps.

The following summarizes advantages and disadvantages of the route:

Advantages:

- Appeared the team took the most direct route possible to the evacuation point
- Most of the route was unobstructed
- No/little traffic at time of walk (this is likely to be abnormal, but it is a residential area, so it is hard to definitively say how much traffic there would be on a weekday)
- Ave Los Castanos was very wide, and appeared to be well lit, making it a good evacuation route at night

Disadvantages:

- The first 3 km remained relatively flat, allowing water to travel quickly
- The walk is long in both distance and time
- The route was not well marked with signs
- The routes especially lacks signage at important intersections, the beginning, and at the end
- The hill was not visible for most of the route, so it was unclear to team members if they were traveling in the right direction
- Team members felt uncomfortable/vulnerable being so close to river for most of the walk. In an actual tsunami the river would be a source of inundation.

Several people were interviewed about the evacuation routes and tsunami readiness of Viña del Mar. Here is a summary of themes from the interviews:

Interviews:

- Clearly local people knew where to go, what the evacuation routes were, and where the meeting places were
- Answers varied when asked the amount of time that the route would take
- Residents are notified through yearly drills
- Government constantly informs residents of the plan through schools and businesses
- Two women with children would use vertical evacuation in private residence instead of the evacuation routes due to how long it would take the children to walk
- Someone in the 2014/2015 earthquake stated that it was very congested and chaotic. He tried to vertically evacuate and local law enforcement made him leave.
- Some people got out of their cars to evacuate in those cases as well

Photographs



View at beginning of route, hill visible to the left but not straight ahead where route directed us to go



View of streets on route (in order of walking order), as well as the meeting point at the end



Obstacles on the paths along the way (especially Ave Los Castanos)



Signs present along the evacuation route