Near Source Tsunami Hazard Assessment: Colombian Pacific Case

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Where is Colombia located?

This region has the 75% of the world’s active volcanoes and the 90% of the earthquakes.

Ring of fire is extend along more than 40,000 km from New Zealand to west coast of South America.
Where is Colombia located?

Earthquake from 1906 to 2017 with magnitude more than 6.5 Mw
Principal coast populations on Colombian Pacific

Juanchaco, Valle del Cauca
Principal coast populations on Colombian Pacific

Buenaventura, Valle del Cauca
Principal coast populations on Colombian Pacific

- Tumaco, Nariño
- Curay, Nariño
- Salahonda, Nariño
Classification of tsunami Generating Sources

Conditions for the occurrence of tsunamis
- $\sim$Mw > 7.0
- Depth
- Epicenter
¿What does DIMAR do to help make decisions?

- DEM
- Orthophotographs
- Base cartography
- Flood Layer
- Tsunami Flood Maps
do we do it?

Digital elevation Model Construction

LiDAR Data

Correction and reassignment of classes with inadequate classification

Input data to script
- Geodatabase
- Cell size
- .LAS file with return of ground
- Coordinate system

Calculation of mean spacing between Lidar points.

Conversion of .LAS file to point shapefile type

Conversion from terrain to raster assigning the cell size

Height calculation for the point layer

Creation and construction of terrain

Export

DEM
do we do it?

Construction of the flood layer

<table>
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<th>Point Shapefile</th>
<th>Nodes definition</th>
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<td>Bathymetry.</td>
<td>• Coordinate system.</td>
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<td>LiDAR data.</td>
<td>• Spacing.</td>
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<td>Coast Line.</td>
<td>• Interpolation.</td>
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Data Management tools

- Calculation grid of Buenaventura
- Calculation grid of Tumaco
- COMCOT Numerical Model (Cornell Multi-grid Coupled Tsunami Model)

Cubic Interpolation

Extraction of boundaries and construction of polygons
do we do it?

Construction of Orthophotomosaics

Orthophotos with 25 cm of resolution per pixel. The capture was made with a digital metric camera in parallel to the capture of LiDAR data.
Construction of Base Cartography

The geodatabase of base cartography was constructed from the digitalization of every one of features over the regions of interest.
¿QUESTIONS?
THANKS !!