



MODELACIÓN DE TSUNAMI EN EL CARIBE

(CASO DE EJEMPLO: BAHÍA DE OCOA)

Octavio Hinojoza

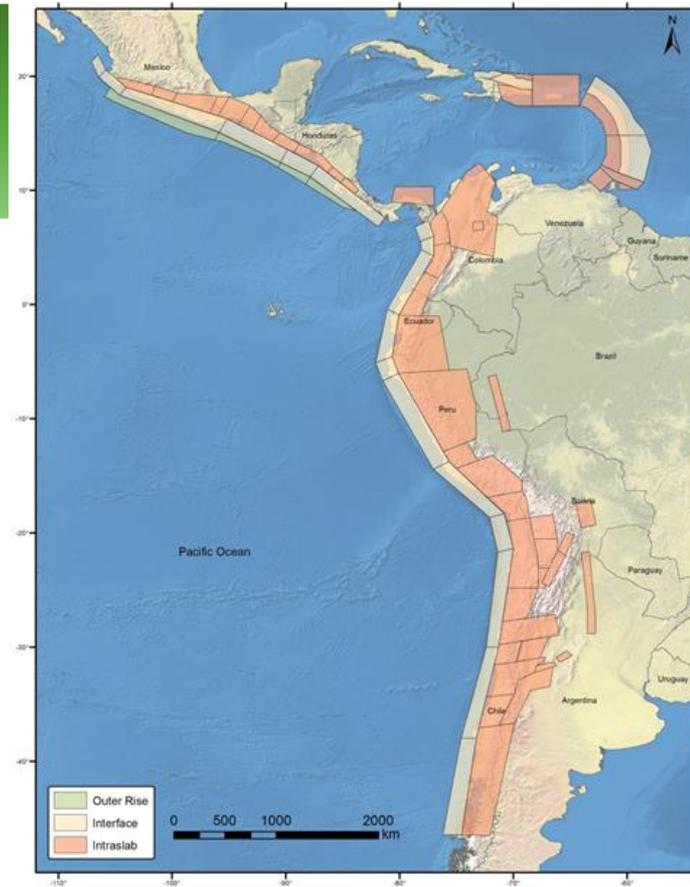
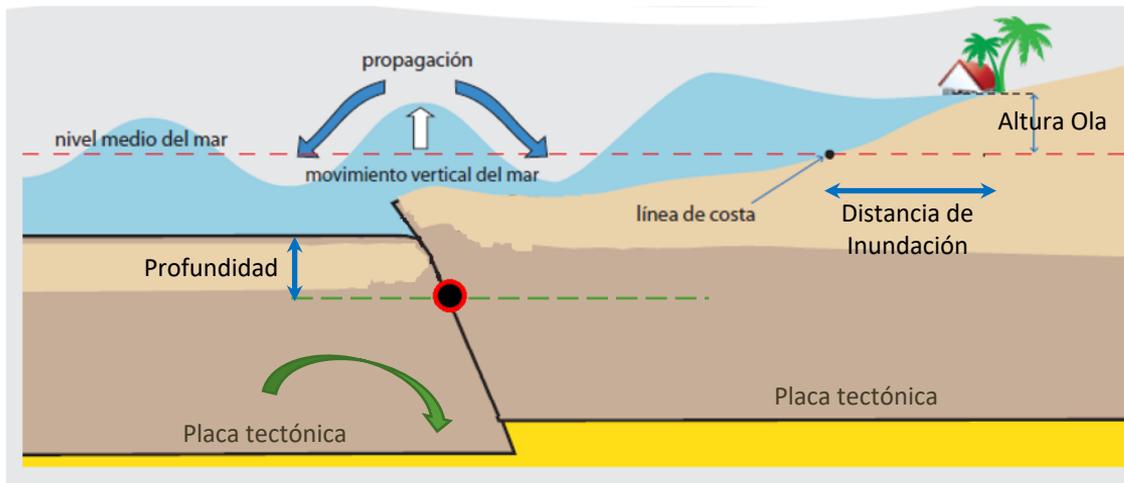


Evaluación de Riesgos Naturales

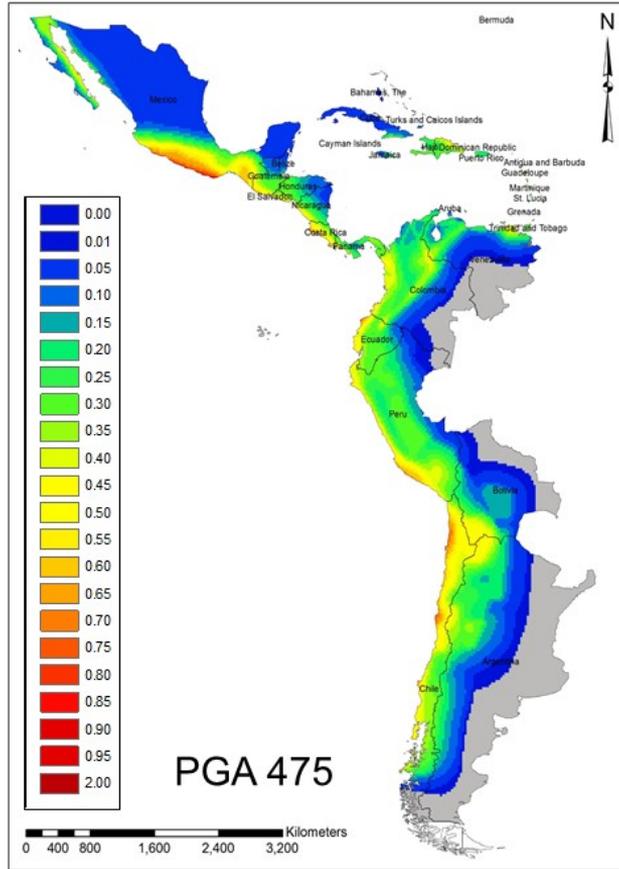
Fuentes intraplaca y de subducción

Modelo de Tsunami

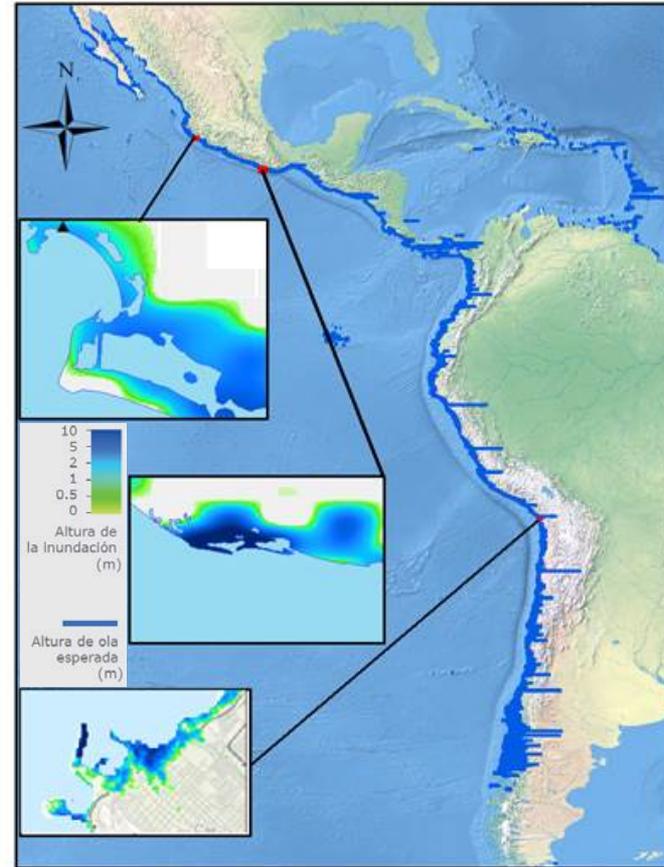
- Eventos Tsunamigénicos
- Sismos de subducción
- Bajo el mar a profundidades menores de 60 Km
- Área de ruptura grande ($M \geq 7$)



Introducción

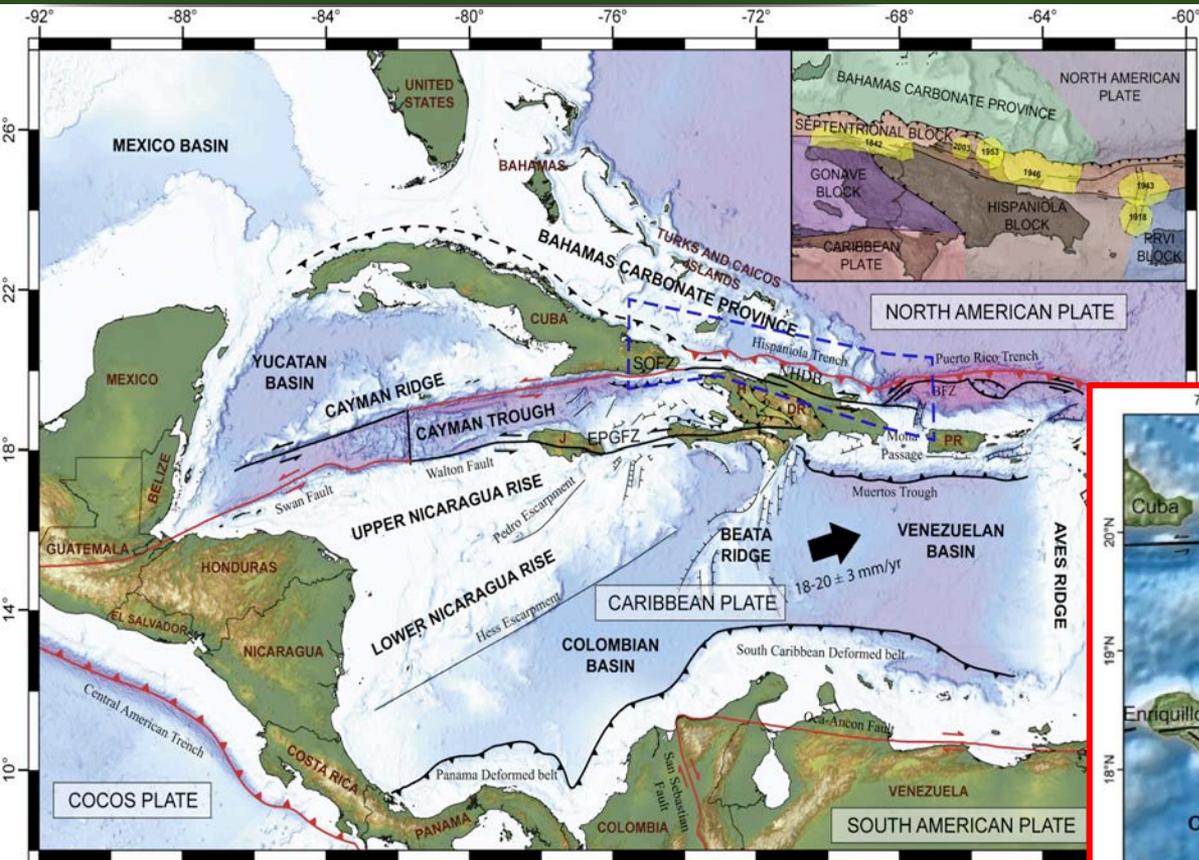


Modelo LAC Sismo

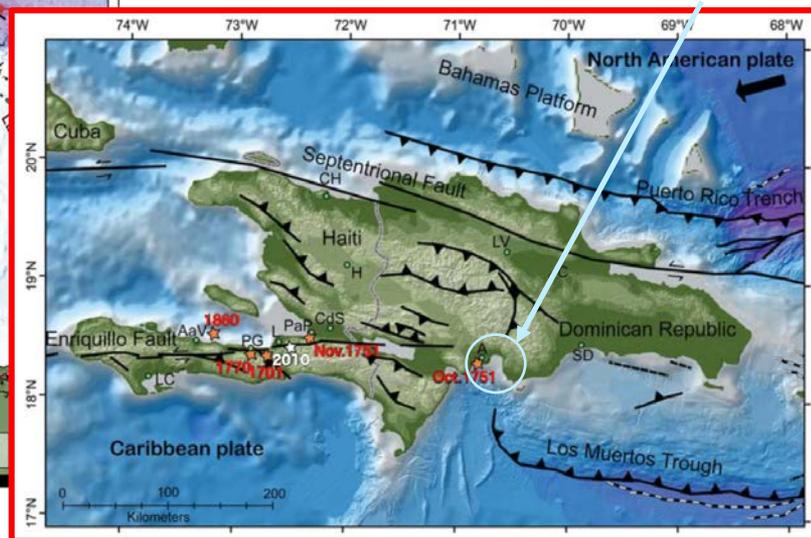


Modelo LAC Tsunami

Zona de estudio



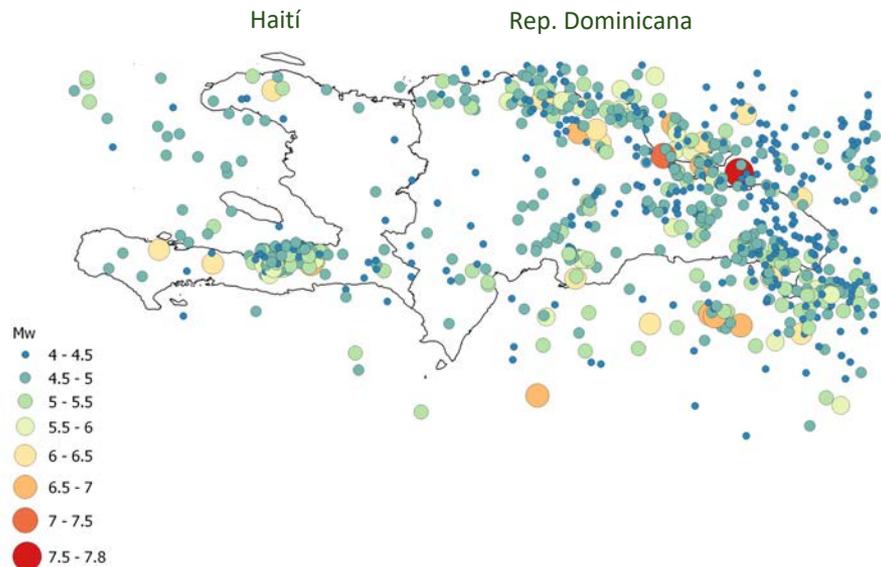
Bahía de Ocoa



Ref: A. Rodríguez-Zurrunero, *et al.*, Tectonophysics(2018),

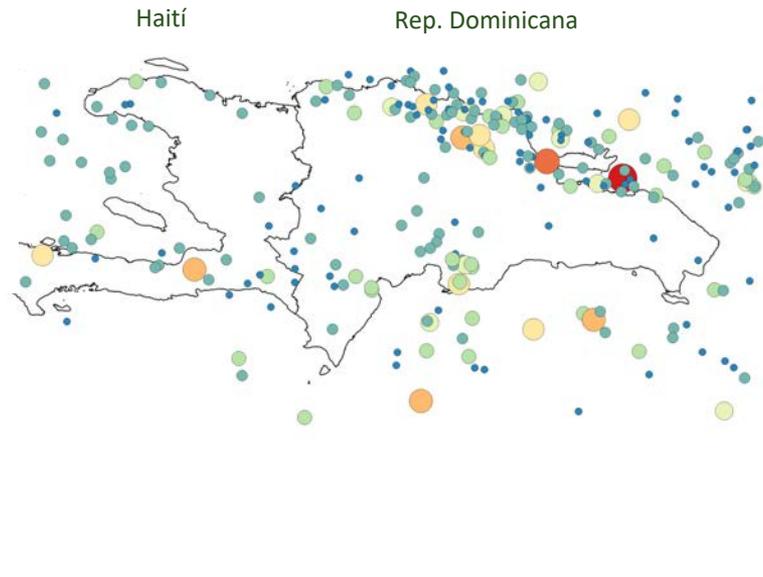
Along-strike segmentation in the northern Caribbean plate boundary zone (Hispaniola sector): Tectonic implications,

Catálogo sísmico (eventos históricos)



Con réplicas y premonitorios

Depurado



Pocos eventos con $M \geq 7$

Modelación de las fuentes

Los componentes de tectónica (geometría) y sismicidad se incorporaron al sistema:

R-CRISIS

GEOMETRY OF THE SEISMIC SOURCES - R-CRISIS Ver 20.0.0; 768/692

Name: **DOM_SUB_Muertos_W_TC**

Active source: **3** | Draw options: Trian Grid Active Selection | Sources to draw: Draw, Exit

Total sources: **4** | Cities Map | Range Start: **1** End: **4**

Plane: XY XZ YZ | Ruptures: Show Ruptures Hypo Mmin: **7**

Vertex: **16** Source is alive

Area: Line SSG Grid Area Planes EQ Ruptures RectFault Slab

Behavior: **Normal**

Vertex in counter-clockwise order

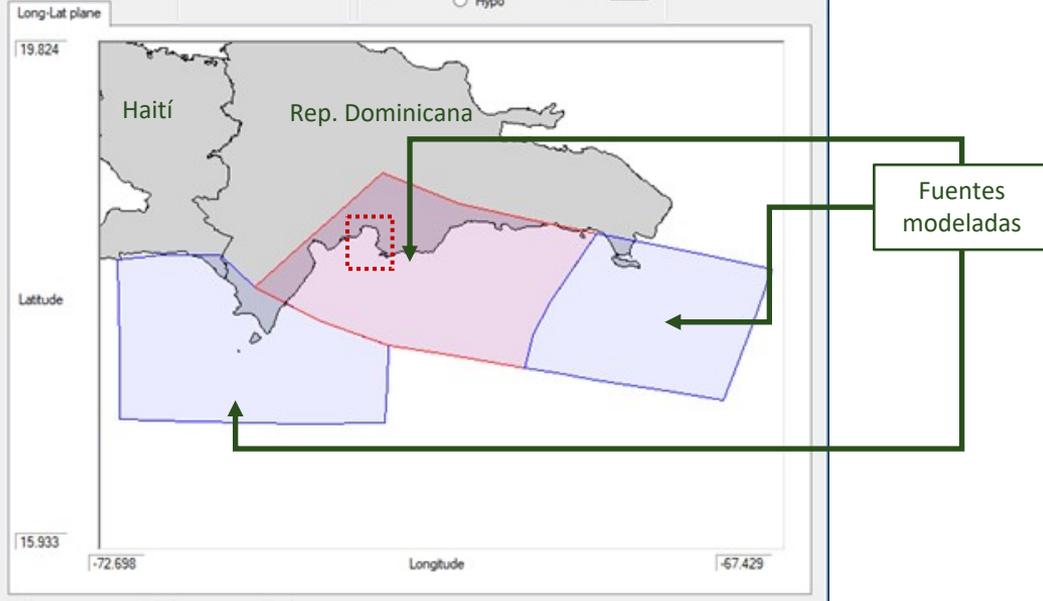
Longitude	Latitude	Depth
-70.4900639590231	17.5205623078454	5
-70.7511847381011	17.6131505688927	5
-71.0311517786839	17.7124213413286	5
-71.2215848345496	17.8131091056988	5
-71.5150344667413	17.968264875217	5
-71.1716384253298	18.2719914761737	10
-70.8707371209733	18.5398922518309	25
-70.5432821681955	18.8340771197593	40
-69.9499962871348	18.6029833270317	40

Thickness (Km): **0** | R=K1*exp(K2*M) | K1: **0.005642** | K2: **1.1513** | Choose

Slices: **1**

Fault aspect ratio: **0.5**

Strike: **270**

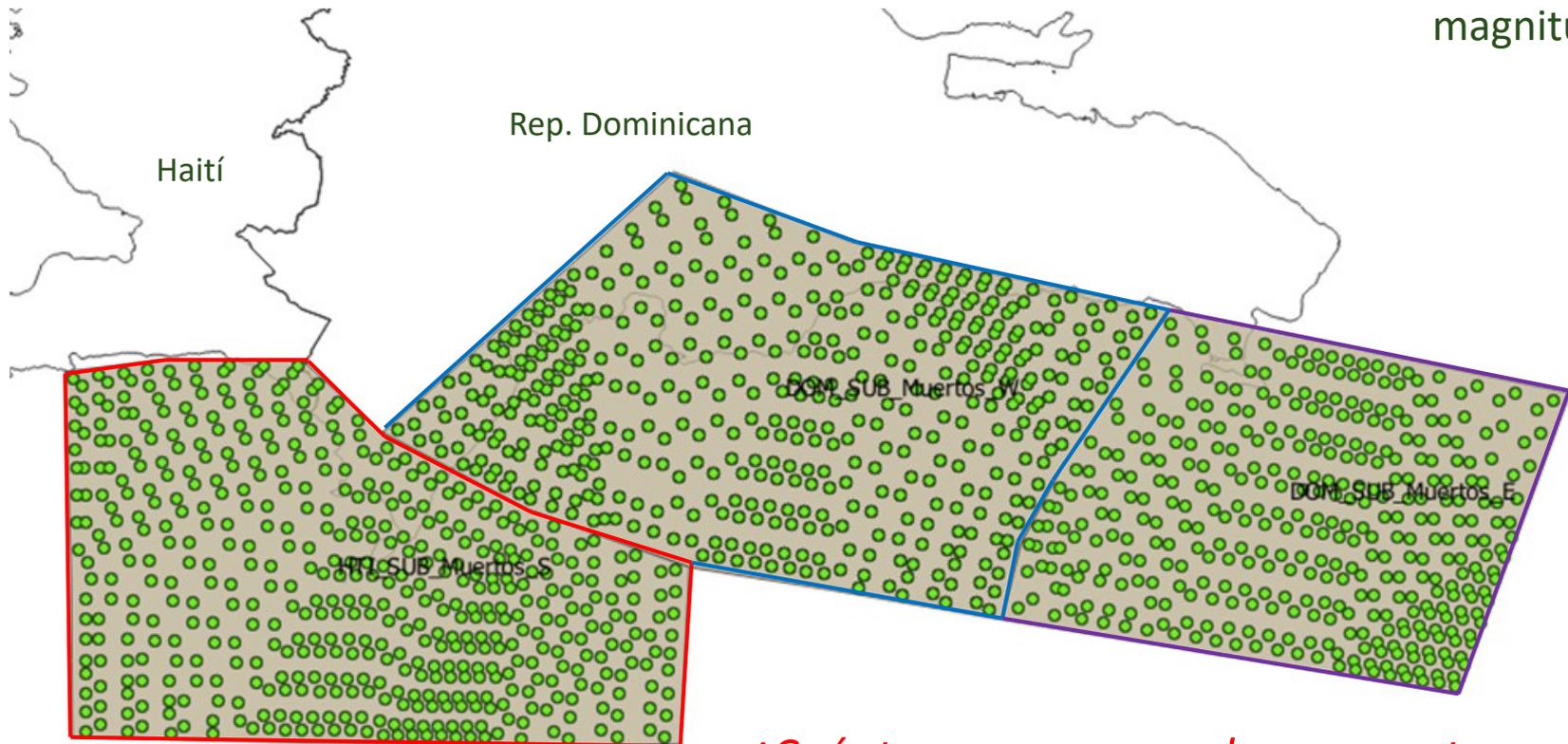


Map labels: **Haití**, **Rep. Dominicana**, **Latitude**, **Longitude**

Coordinates: 19.824, 15.933, -72.698, -67.429

Catálogo sísmico (eventos estocásticos)

Catálogo con 12,760 terremotos
Con diferentes localizaciones y
magnitudes

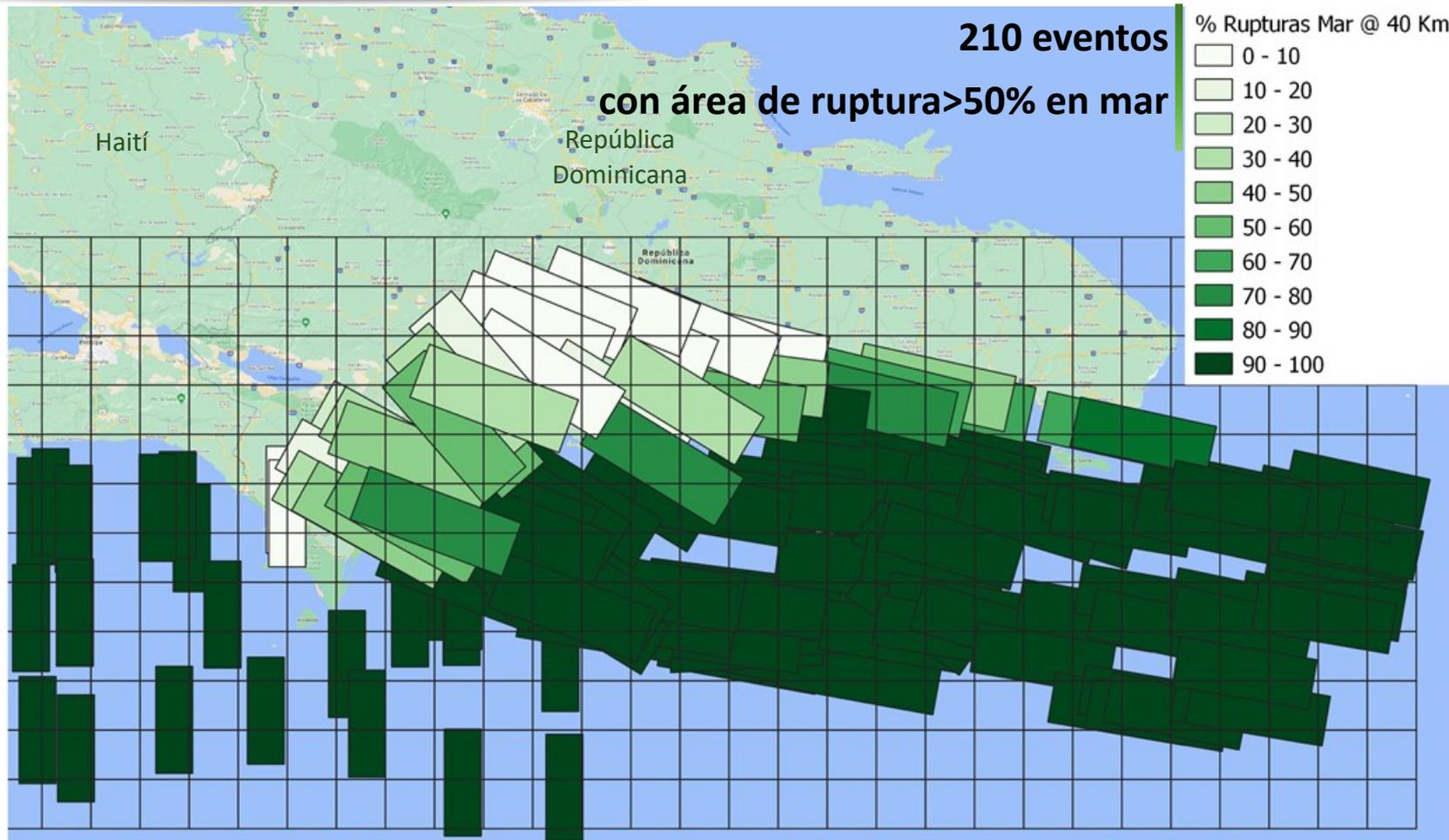


¿Cuántos son capaces de generar tsunamis?

Áreas de rupturas que cumplen las condiciones

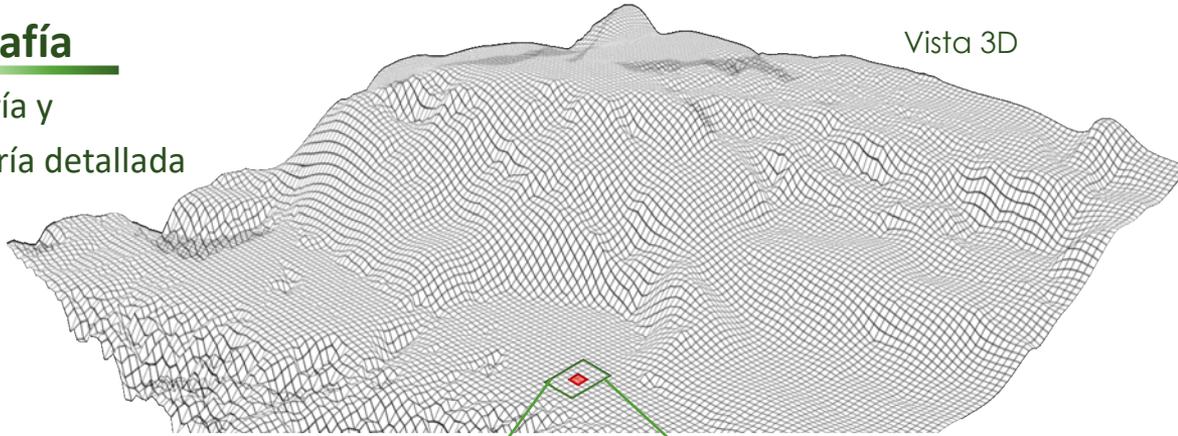
210 eventos

con área de ruptura >50% en mar



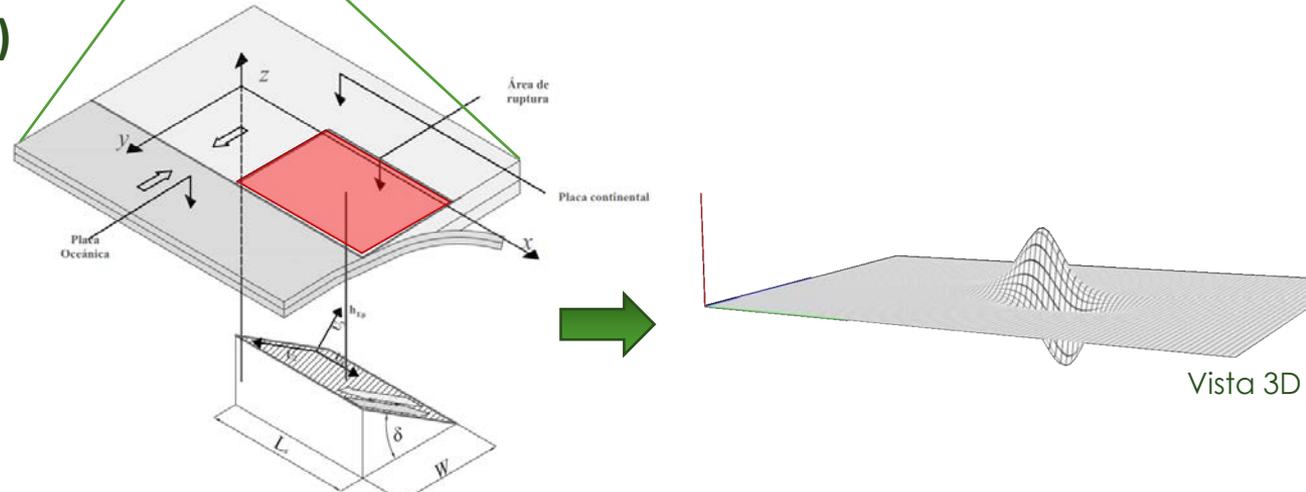
Topografía

Altimetría y
Batimetría detallada

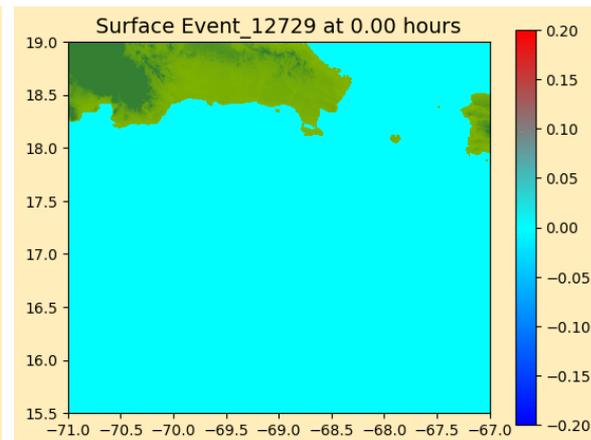
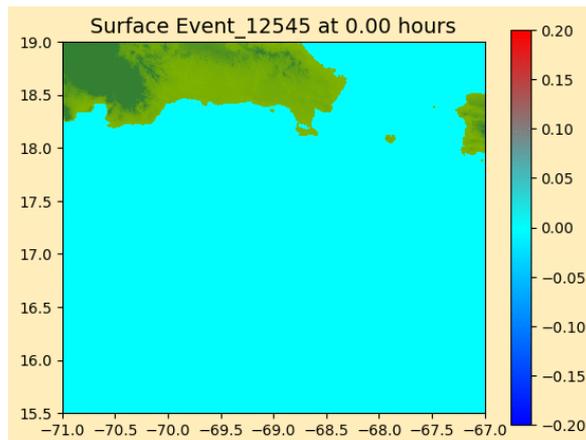
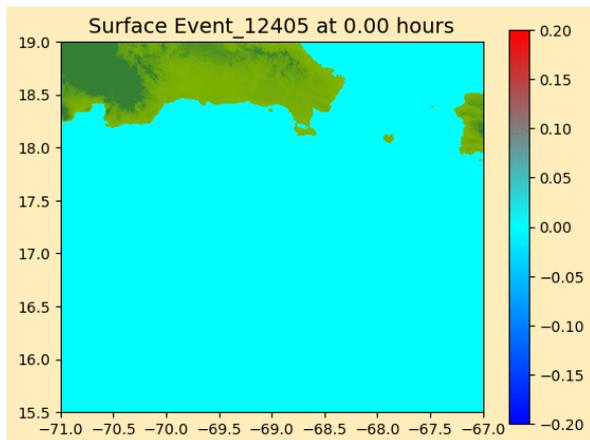
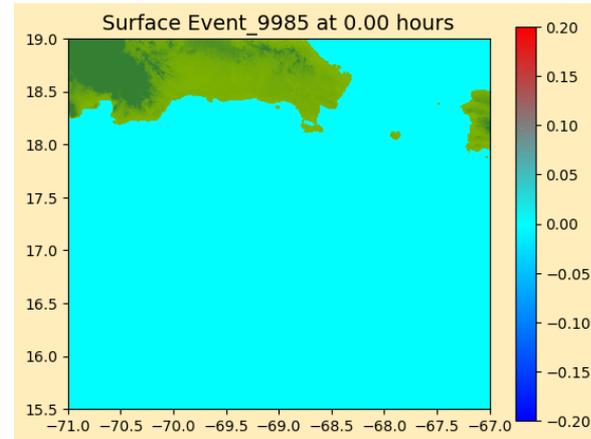
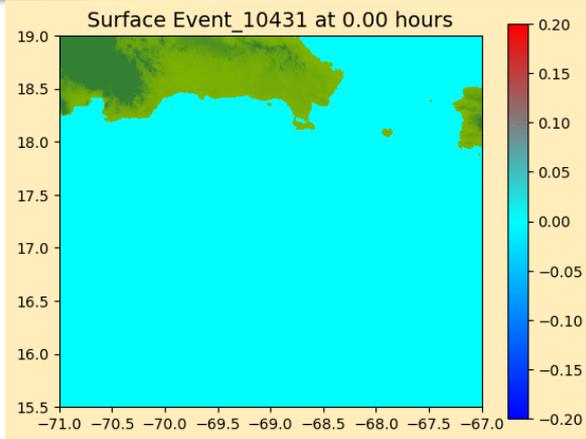
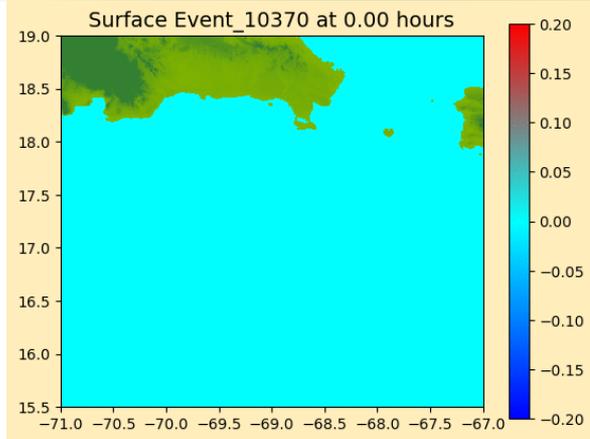


Modelo de Okada (1985)

Modelo de deformación
vertical en el lecho marino

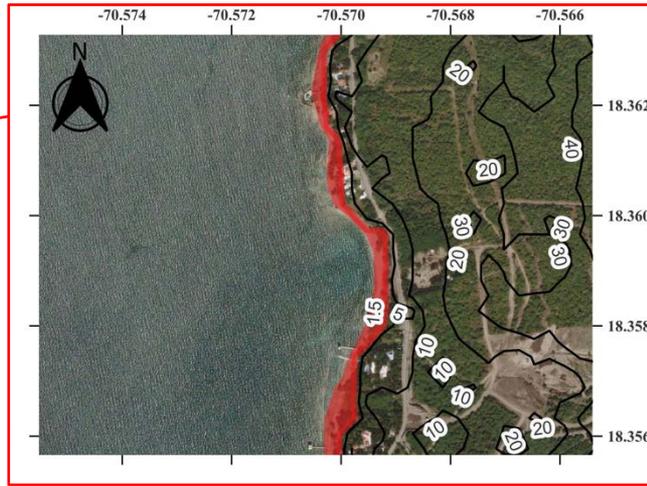


Modelo de propagación

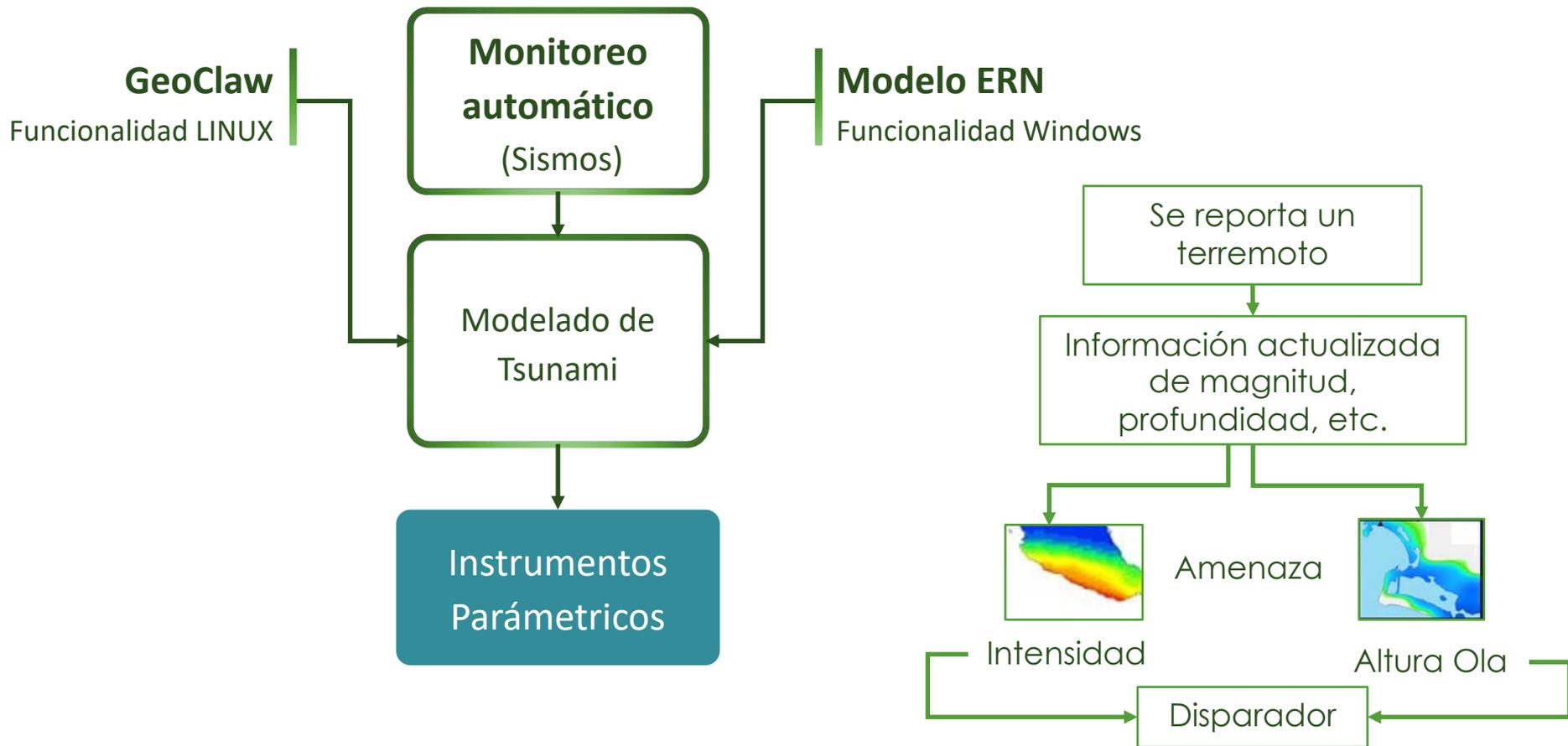


GeoClaw: Software para la modelación de propagación de ondas en mar

Mapas



Periodo de retorno
1,000 años





Gracias

Evaluación de Riesgos Naturales