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Numerical modeling of tsunamis originated at Colombia-Ecuador Trench for Costa Rica.

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Costa Rica is exposed to tsunamis at both Pacific and Caribbean coasts. Costa Rica has experienced 41 tsunamis since 1746 with moderated impact (Chacón-Barrantes et al., 2021), but the coastal population has increased exponentially in the past decades. Chacón-Barrantes and ArozarenaLlopis (2021) performed a first estimation of tsunami hazard for the Pacific coast of Costa Rica using local and distant seismic sources. For distant tsunamis they used combinations of unitary sources with a standard Mw=9.3 around the Pacific basin. They found that tsunamis originated at the Colombia-Ecuador Subduction Zone represent one of the highest threats for Costa Rica. In 2019, IOC/UNESCO organized the Experts Meeting on Tsunami Sources, Hazards, Risk and Uncertainties Associated with the Colombia-Ecuador Subduction Zone (IOC-UNESCO, 2021). At this meeting, seven worst-case scenarios were proposed along the 1220-km-length trench. Six scenarios have magnitudes from Mw=7.9 to Mw=8.7 with high probability of occurrence and one multi-segment scenario was considered possible but less likely to occur, rupturing along 560 km with a Mw=8.9. (IOC-UNESCO, 2020). Here, we model the tsunami inundation caused by these scenarios at Bahía Culebra, Potrero, Tamarindo, Sámara, Tambor, Puntarenas, Jacó, Quepos and Coco's Island. The inundation areas and flow depths obtained with these scenarios were smaller than those obtained previously with Mw=9.3 unitary sources, as expected. Still, the arrival times are between 90 minutes and 2.5 hours, which requires a strong community preparedness and a prompt response by local authorities to ensure a timely evacuation.

Chacón-Barrantes, S. and Arozarena-Llopis, I.: A first estimation of Tsunami Hazard of the Pacific Coast of Costa Rica from Local and Distant Seismogenic Sources, Ocean Dynamics, 71(8), 793–810, doi:10.1007/s10236-021-01467-8, 2021.

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IOC-UNESCO: Experts Meeting on Tsunami Sources, Hazards, Risk and Uncertainties Associated with the Tonga-Kermadec Subduction Zone, (289), 49 [online] Available from: http://www.ioctsunami.org/index.php?option=com_oe&task=viewDocumentRecord&docID=26988, 2020

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