Tsunami Model Visualization for Suva, Fiji

© 2003 Pacific Disaster Center

This visualization demonstrates the use of computer modeling, data and information resources, and visualization techniques to simulate the evolution of a tsunami wave on modern-day Suva, Fiji, based on the 1953 tsunamigenic event.

The visualization is intended to demonstrate to decision-makers the use of science and technology in assessing potential risk and vulnerability to the tsunami hazard for population and infrastructure in the Suva Harbour area.

The Method of Splitting Tsunami (MOST) model was used to simulate tsunami wave evolution, and estimate the maximum inundation in Suva Harbour.

Because the model uses the present-day coastline profile and bathymetry data, results will naturally vary somewhat from the actual event. However, the model outcome is consistent with observations made on 14 September 1953 when a 6.8 Magnitude earthquake originating offshore from Suva, Viti Levu triggered a massive slumping of undersea sediments, generating what is considered the most damaging local tsunami to affect Fiji in recorded history. Had the tsunami occurred during high tide, damages would have been more severe.

During the 1953 event, wave heights of up to five meters above mean sea level caused major damage to the wharf and other buildings in Suva Harbour. Five lives were lost.

Tsunami waves were reported at distances up to 180 km from the epicenter, with the most severe effects in southeastern Viti Levu, along the Suva Peninsula, the Rewa River Delta, and along the coastal areas of Kadavu Island to the south.

To gain an understanding of the impact such an event could have on today's built environment, particularly on critical facilities, GIS analysis tools were used to extract buildings from high-resolution imagery, offering a three-dimensional view of the Harbour area.

Preliminary results identify 148 buildings within the area of potential inundation; many of which serve commercial and industrial functions, or provide public services.

Visualizations such as this can be effective tools for communicating risk and identifying potential impacts of the tsunami hazard.

For additional information regarding the model visualization, please contact:

Stanley Goosby, Chief Scientist
Pacific Disaster Center
1305 N. Holopono Street, Suite 2
Kihei, HI 96753
Phone: 808.891.0525

Acknowledgements:
Contributors and collaborators include Vasily Titov, PDC team members Jeff Logan, Stan Goosby, Sharon Mielbrecht, and the South Pacific Applied Geoscience Commission.