

4.3. Opuia, Bay of Islands

Predicted inundation depths and maximum water speed for Opuia are illustrated in Figures 10-15. The South American tsunami leads to inundation to the south of Opuia, flooding the Paihia Road and Bay of Islands Scenic Railway in three locations, up to depths of 1m. The ferry crossing may also be disrupted by inundation up to 1m at Tapu Point and Waimangaroa Point. Low levels of inundation are also seen along the coast between Waimangaroa Point and English Bay. Water speeds average 1.1 – 2.5 m s⁻¹ in Veronica Channel, reaching up to 5.1 – 7.5 m s⁻¹ between the two points. Although inundation depths increase slightly when sea level rise is included, the extent of the inundation does not appear to increase significantly.

The TKSZ M_w8.5 event with sea level rise sees similar inundation to that of the South American tsunami. Flooding depth and extent is greater when sea level rise is included; Paihia Road and the railway are still inundated at two locations without sea level rise. Current speeds are also very similar. Forecast inundation arising from the TKSZ M_w9.0 event is also similar in extent to that of the South American tsunami. Inundation depths are slightly increased, reaching up to 4 m in depth at the three areas that breach Paihia Road and the railway to the south, and up to 5 m in English Bay and just to the immediate west of the ferry at Waimangaroa Point. Water speeds are also increased in Veronica Channel, reaching up to >7.5 m s⁻¹ directly between the two points. Sea level rise appears to slightly increase inundation depths and speeds.

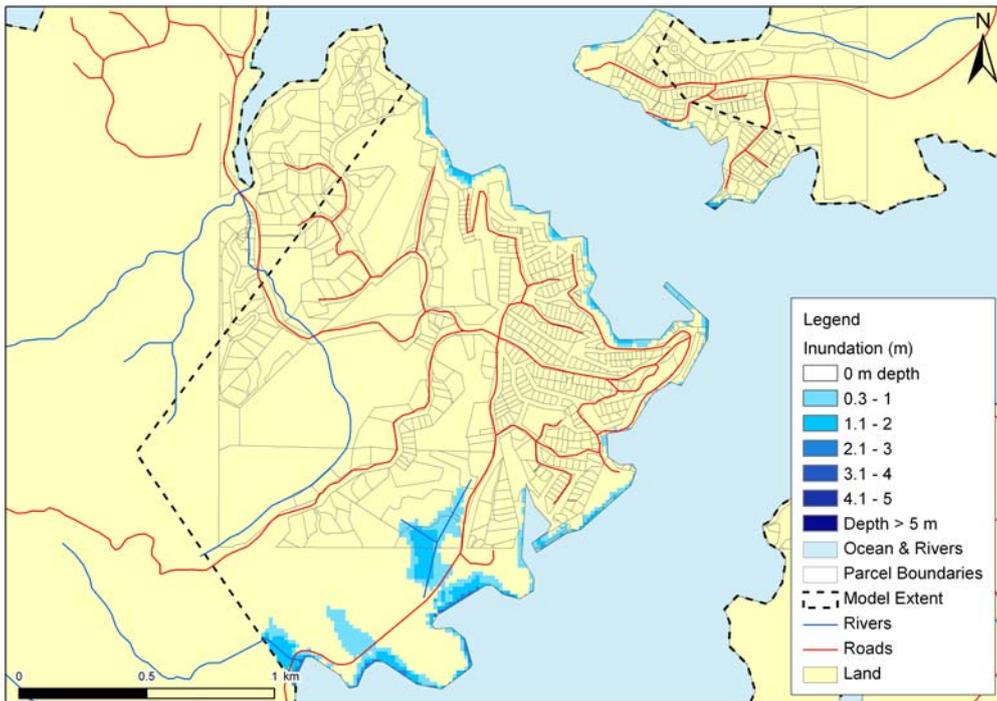
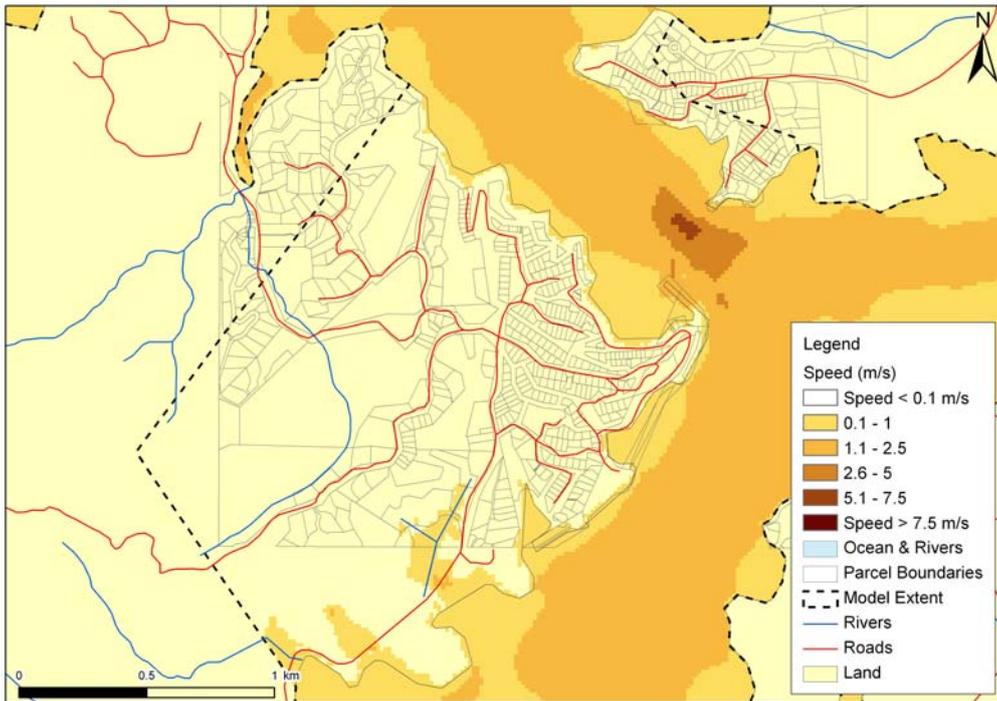


Figure 10: Opua, Bay of Islands: Maximum inundation speed (upper) and depth (lower) plots for the South American tsunami scenario at MHWS (to extent of LiDAR).

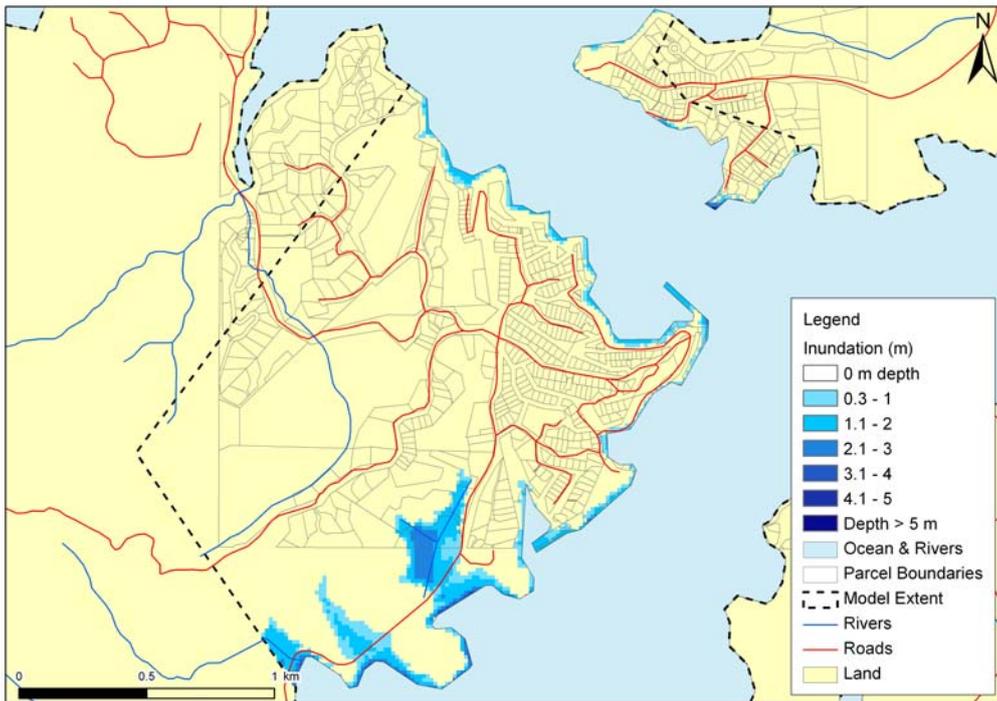
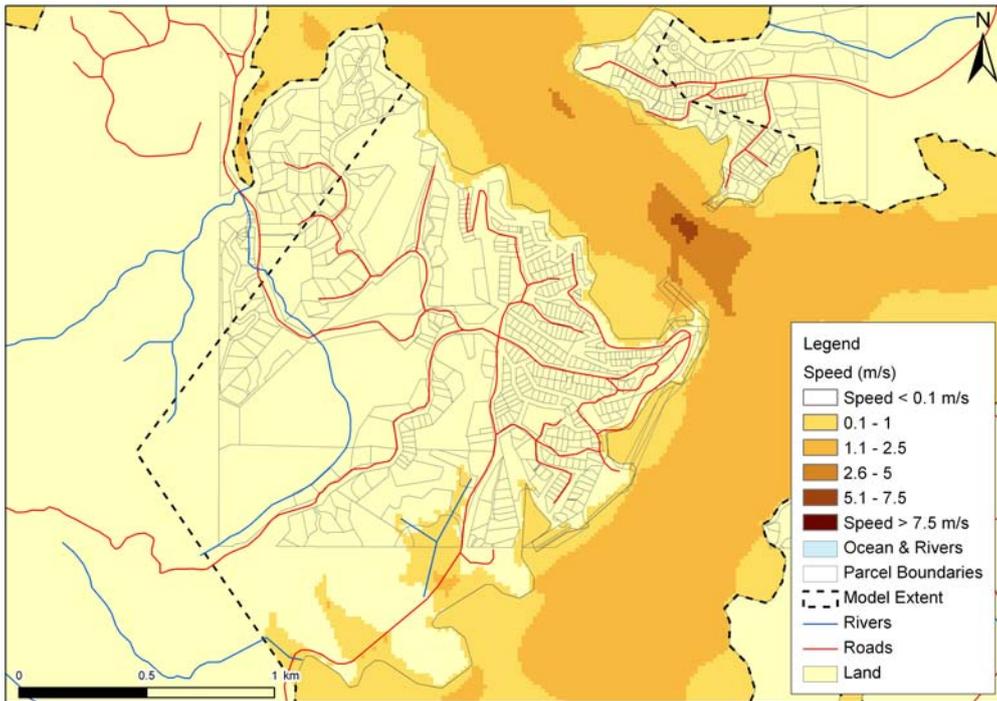


Figure 11: Opua, Bay of Islands: Maximum inundation speed (upper) and depth (lower) plots for the South American tsunami scenario at MHWS + 50cm (to extent of LiDAR).

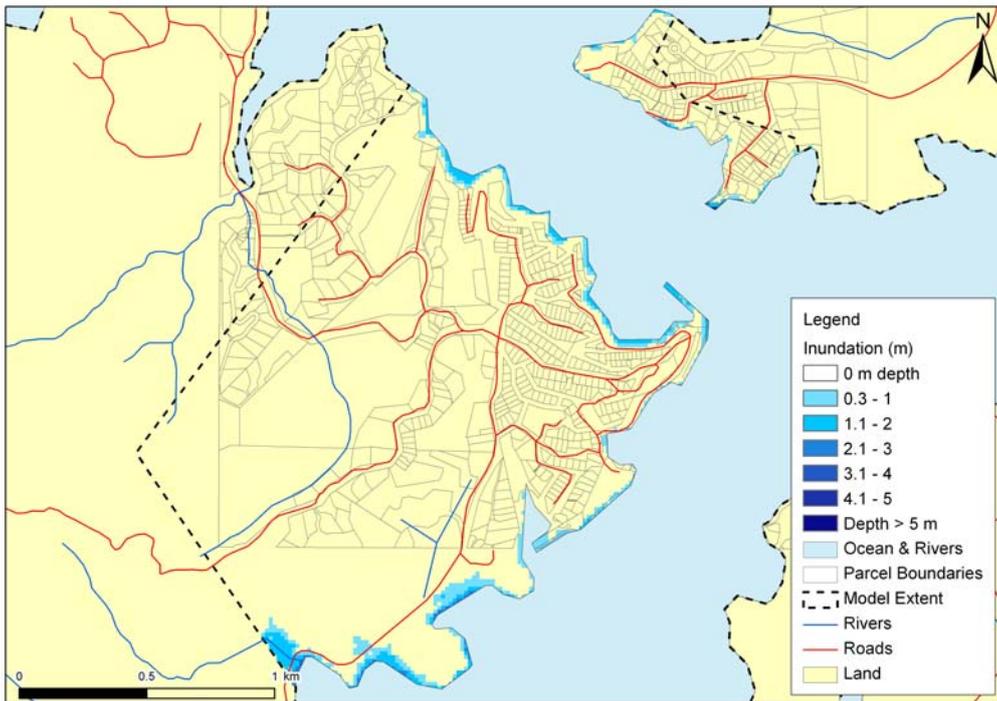
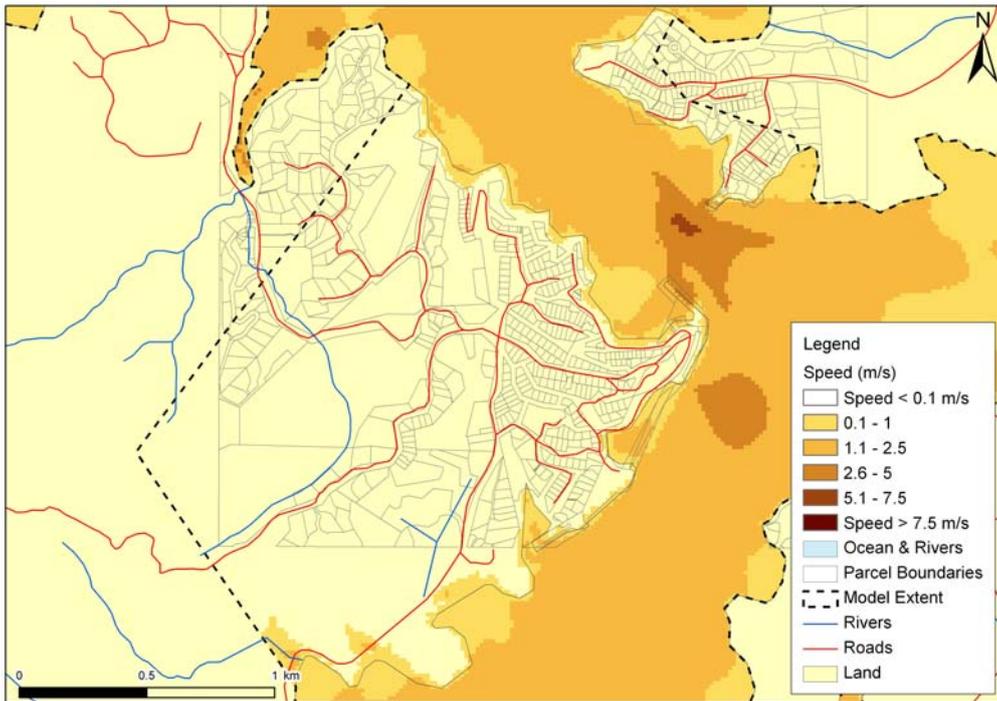


Figure 12: Opua, Bay of Islands: Maximum inundation speed (upper) and depth (lower) plots for the $M_w8.5$ Tonga-Kermadec subduction zone scenario at MHWS (to extent of LiDAR).

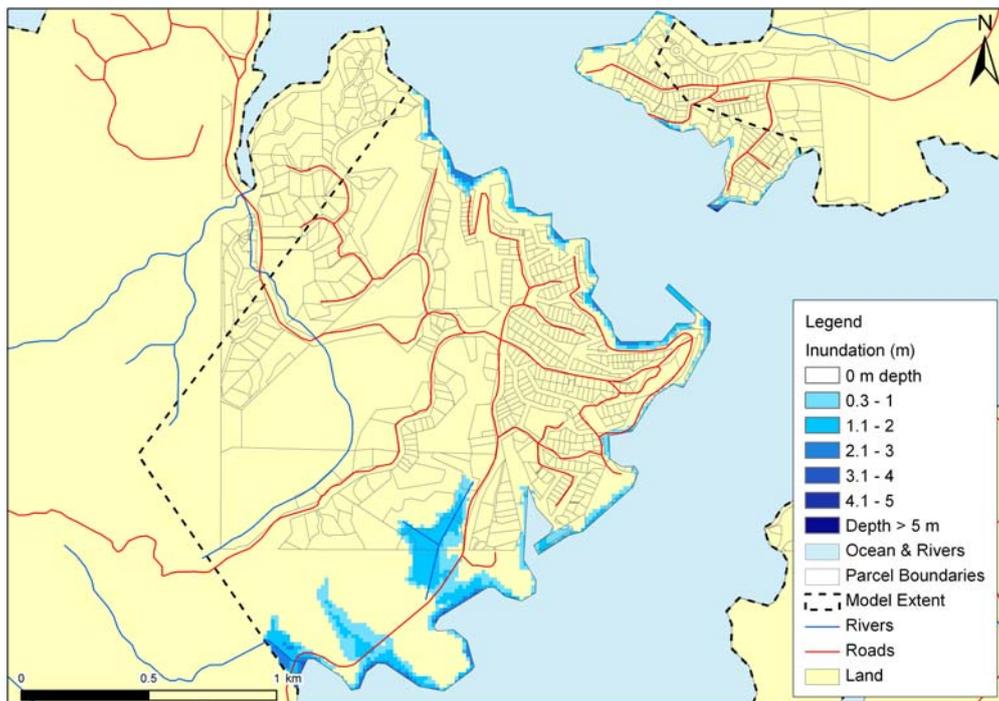
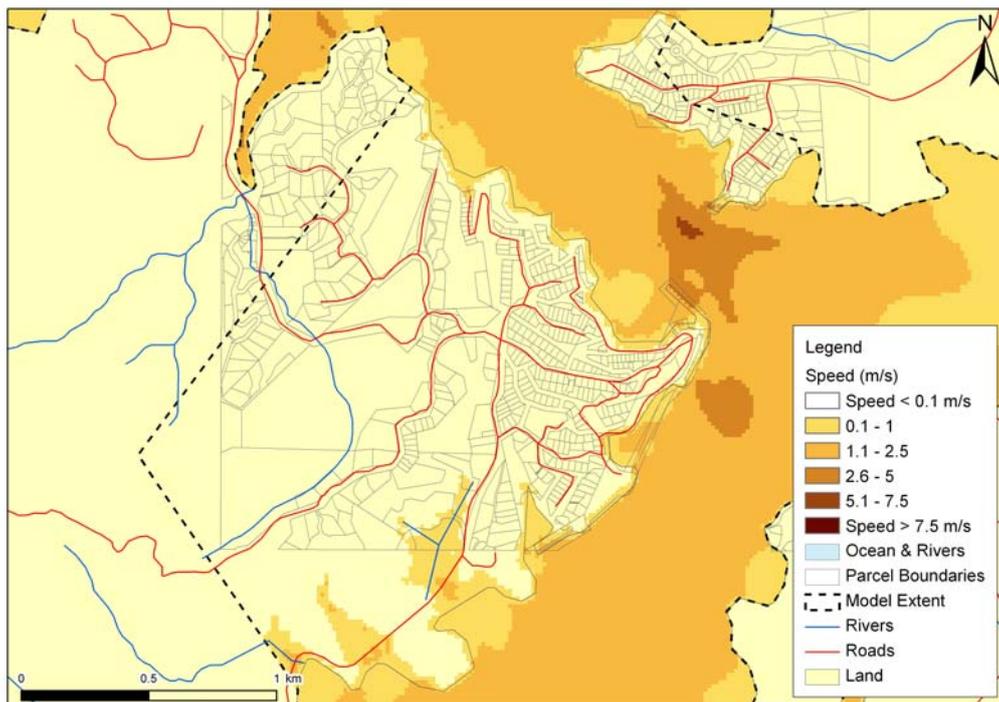


Figure 13: Opua, Bay of Islands: Maximum inundation speed (upper) and depth (lower) plots for the M_w 8.5 Tonga-Kermadec subduction zone scenario at MHWS + 50cm (to extent of LiDAR).

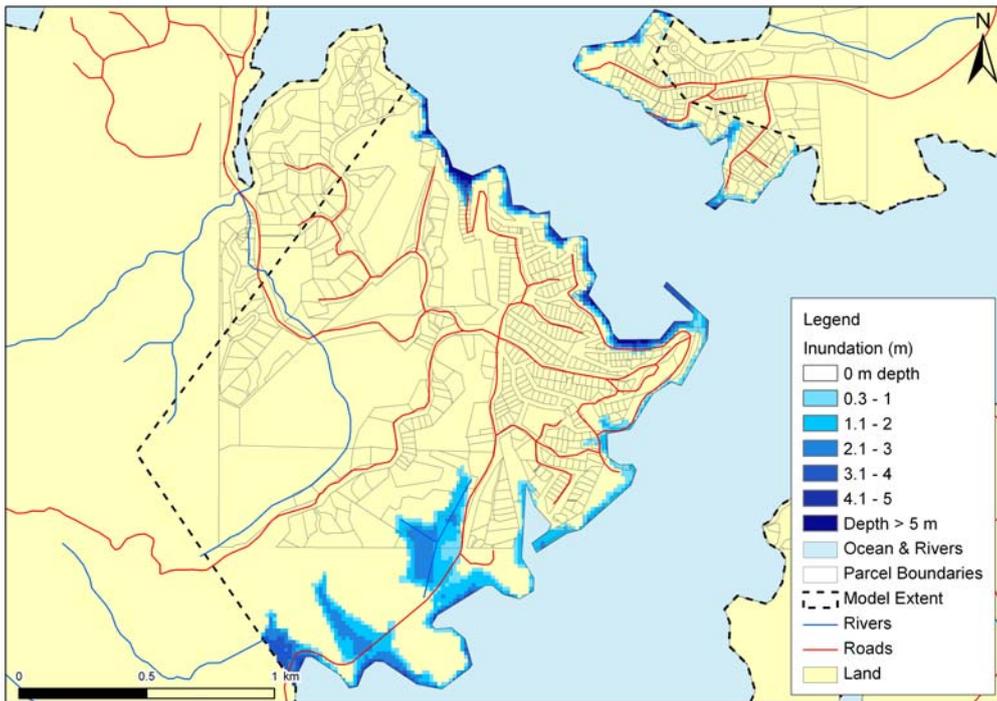
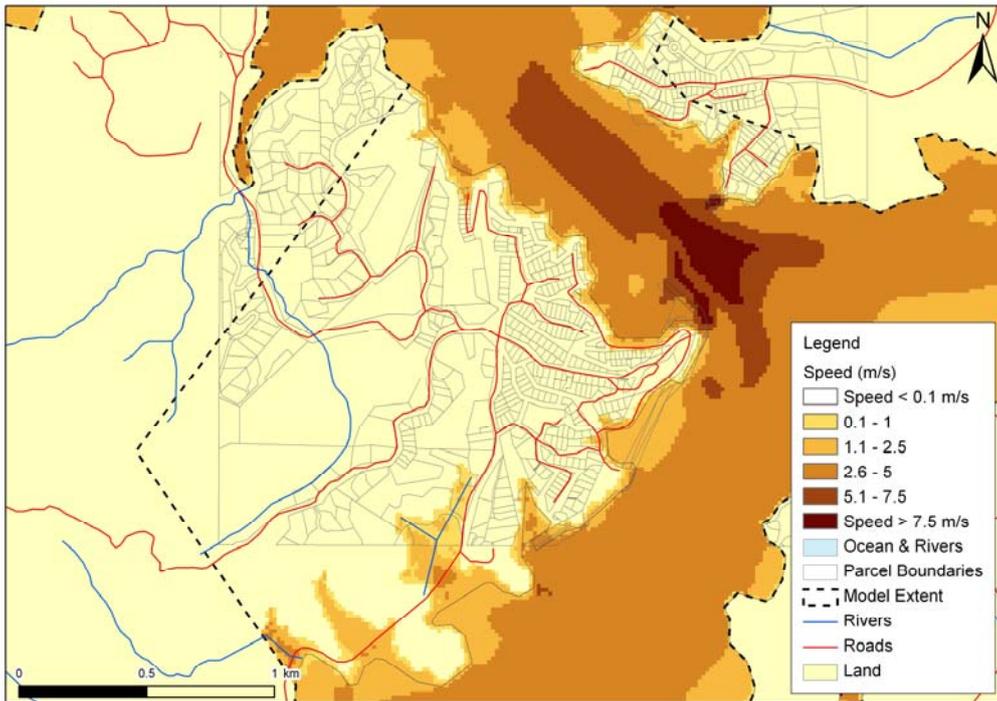


Figure 14: Opua, Bay of Islands: Maximum inundation speed (upper) and depth (lower) plots for the M_w 9.0 Tonga-Kermadec subduction zone scenario at MHWS (to extent of LiDAR).

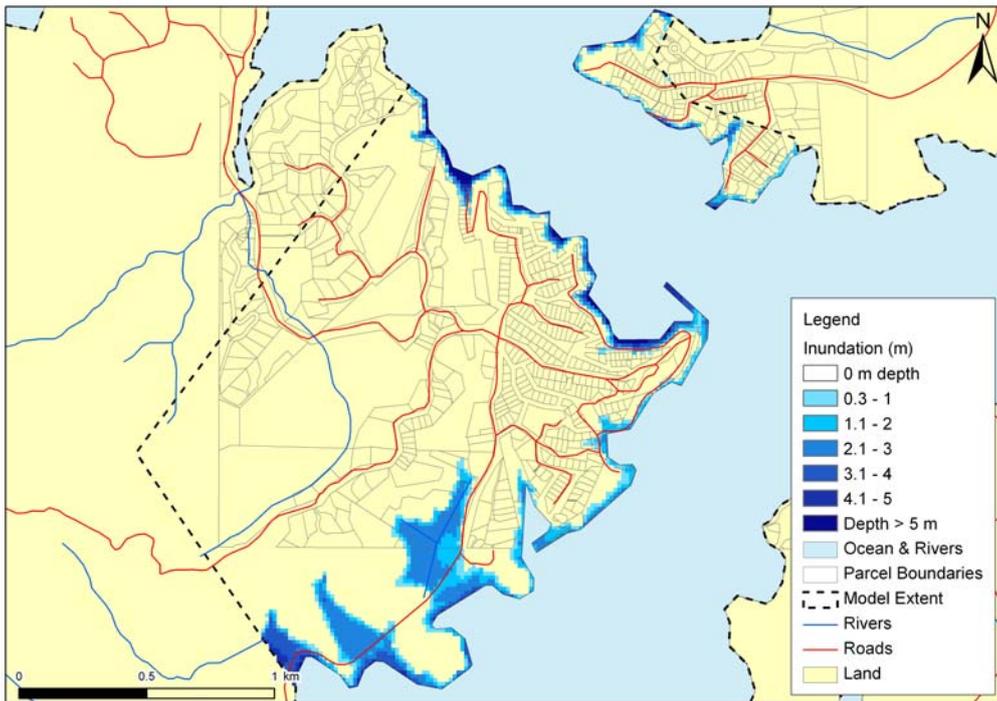
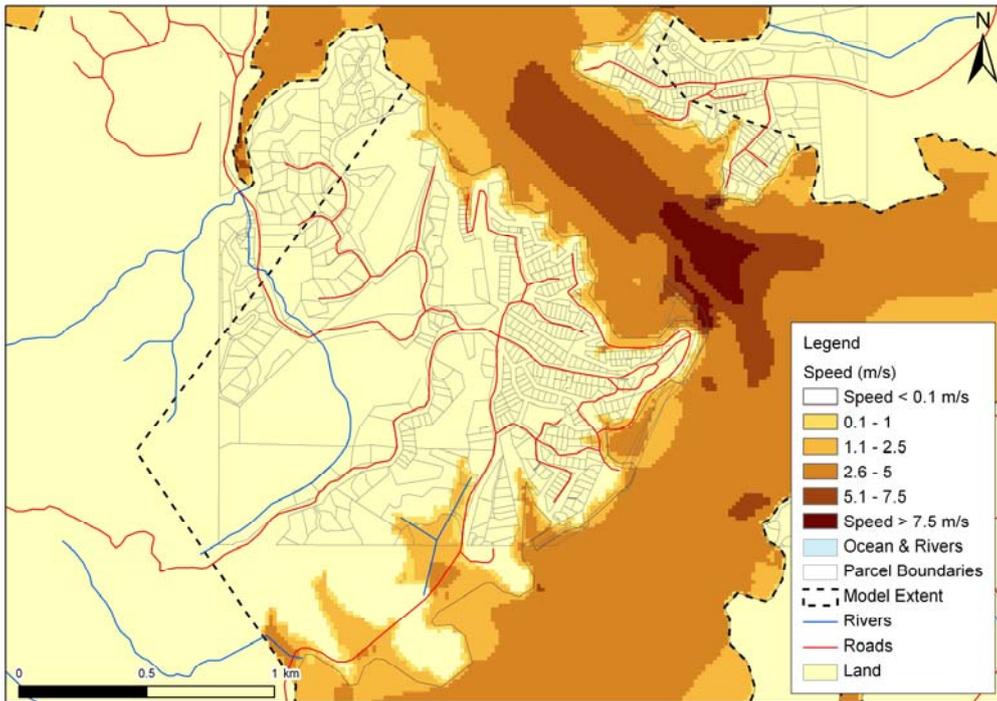


Figure 15: Opua, Bay of Islands: Maximum inundation speed (upper) and depth (lower) plots for the M_w 9.0 Tonga-Kermadec subduction zone scenario at MHWS + 50cm (to extent of LiDAR).