

Towards Local-Scale Impacts-Based Flood Early Warnings for Samoa: The Vaisigano Pilot Project

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Abstract

The Vaisigano River which flows through the Apia capital of Samoa is in a characteristic short and steep catchment conducive to rapid flash flooding following intense periods of antecedent rainfall. This results in short early warnings and emergency response lead times. Through the Government of Samoa's Vaisigano Catchment Project (VCP) supported by the Green Climate Fund, technological initiatives to improve the forecasting of imminent flooding in the catchment which enables longer early warnings and response lead times were undertaken within a hazard risk context. In this talk we describe a pilot impacts-based flood monitoring, early warnings, and decision support system developed through the VCP and tailored for the Vaisigano River. The system comprises an integrative real-time automated framework involving the ingestion of numerical weather prediction rain intensity forecasts, real-time rainfall, river level and flow monitoring data, precomputed rainfall-runoff and predictive flood peak and magnitude tools, as well as estimates of flood inundation exposure and threat to safety at buildings and on roads for different return period events. Information is ingested into a centralized, web-based, flood decision support system (FDSS) portal that enables hydrometeorological officers to monitor, forecast and alert relevant emergency or humanitarian responders of imminent flooding with adequate lead time. The FDSS was tested in the lead up to the 18 December 2020 flooding in the Vaisigano and was able to alert duty officers of the estimated timing and magnitude of imminent channel-overtopping with up to 24 hours lead time. We discuss some of the key challenges and gaps to guide system improvements, as well as offer recommendations for future work.

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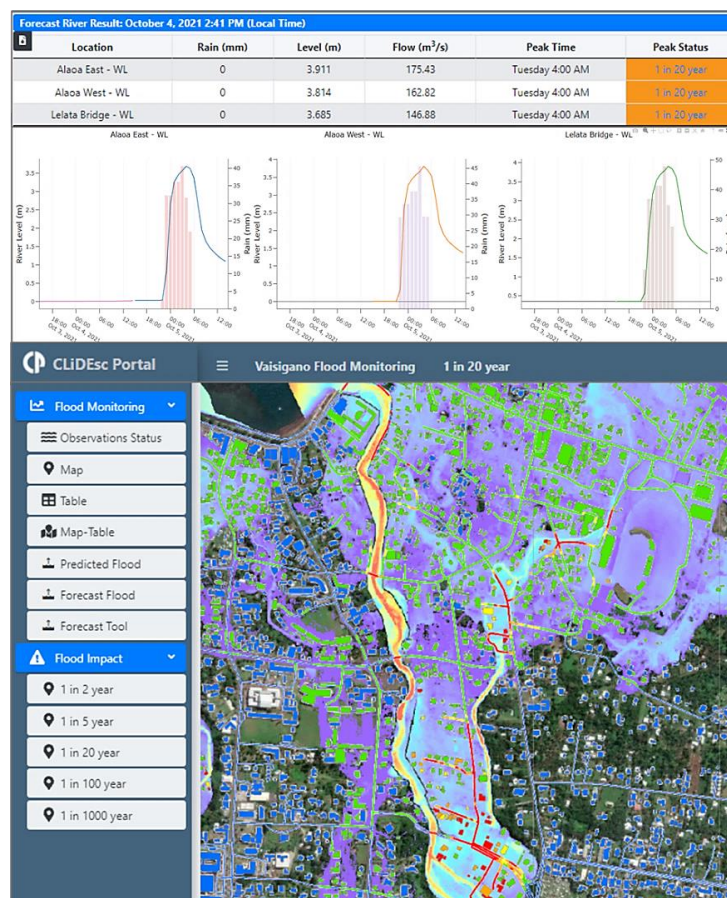


Figure 1: Screenshot of FDSS flood forecast and hazard impacts tools

numerical weather prediction rain intensity forecasts, real-time rainfall, river level and flow monitoring data, precomputed rainfall-runoff and predictive flood peak and magnitude tools, as well as estimates of flood inundation exposure and threat to safety at buildings and on roads for different return period events.

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Through the Government of Samoa's Vaisigano Catchment Project (VCP) supported by the Green Climate Fund, technological initiatives to improve the forecasting of imminent flooding in the catchment which enables longer early warnings and response lead times were undertaken within a hazard risk context.

In this talk we describe a pilot impacts-based flood monitoring, early warnings, and decision support system developed through the VCP and tailored for the Vaisigano River. The system comprises an integrative real-time automated framework involving the ingestion of