Afulilo Water Storage Outlook Module (AWSOM)

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Abstract

In consultation with the Samoa Electric Power Corporation (EPC) and the Samoa Meteorology Division (SMD), the Afulilo Water Storage Outlook Module (AWSOM) that was developed as a manually operated spreadsheet application during COSPPac-1, has now been redeveloped as an automated web application (AWSOM-2). The Afulilo Hydropower Scheme is the largest renewable power scheme in Samoa and is central to Samoa’s goal of becoming 100% renewable in the energy sector by 2025. AWSOM-2 draws on weekly, monthly, and seasonal rainfall forecast products from the ACCESS-S forecasting system, as well as weather and climate forecasts from global models. Additionally, AWSOM-2 draws on rainfall observations from the dam, dam level measurements conducted by EPC and the Samoa Water Resource Division, and power generation rates being operated by EPC. The model incorporates physical relationships derived from studies of how the reservoir responds to rainfall, water runoff from the upper catchment, and losses from evapotranspiration and seepage. Samoan Met staff operationally review model outputs, add interpretive commentary from local knowledge and perspectives, and then forward the reservoir storage outlook report to EPC. This enables EPC to consider options for water use for power generation and optimise water use while maintaining a guaranteed electricity supply. AWSOM-2 has been coded in python by NIWA, through funding from the NZ Ministry of Foreign Affairs and Trade. The application is run on the CliDEsc server at SMD.
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