Enhancing Predictions of Average Flow and Flow Duration Curves at Ungauged Stream Sites in Guam Using the USGS South Guam Streamflow Model

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In order to properly manage a region's water resources, it is important for water managers to know the time variability of flow in the streams of that region. Not only what are the highest flows, such as what would be available from a flood frequency study, but also how the flows vary day to day, season to season, and year to year. Studies such as water supply studies, hydropower studies and those involving sediment transport depend on this kind of long term variability data in order to develop the best management practices for a region's water resources.

Guam is no different than other areas requiring water resources investigations. In order to properly carry out good water resources management, it is necessary to be able to define the variability of flows available in Guam's streams. This is normally done by direct analyses of streamflow data for the stream in question or by applying some sort of inferential techniques from a gauged to an ungauged stream or from a gauged location on a stream to an ungauged location on that same stream. Of course, the most reliable means is to use actual stream flow data measured at the point of interest. The problem in Guam is that stream flow information is not available for all possible sites where information is required.

A recently completed USGS Water Institute Program funded study developed a means of predicting flow duration curves at ungauged sites in South Guam. This proposed study will use a streamflow model (PRMS-IV) recently developed for South Guam by the USGS Pacific Water Science Center to enhance the predictions made by the previous study. The synthetic flows generated by the PRMS-IV model will be analyzed to produce average flows and duration curves at key points along South Guam streams. These average flows and duration curves will be compared to those developed in the previous USGS funded study. It is expected that these comparisons might reveal changes to the PRMS-IV model that could improve model predictions. But more importantly, the vast amount of virtual streamflow data generated by the model should improve on average flows and duration curves generated in the previous study.

Taking crossflow measurements at Toguan River, Umatac.