

Seasonal Climate Prediction and Management of the Panama Canal: Estimating the Benefits of Using Climate Forecast Information

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Hydrologic modeling and a simplified decision support system is used to investigate the benefits of using climate forecast information for the management of the Panama Canal. This two-year study makes use of an existing hydrologic modeling system for the Panama Canal watershed, together with a simplified reservoir-management/decision model to estimate the benefits of seasonal climate forecasts for Canal operations.

The reservoir management model is being developed in close collaboration with Panama Canal Authority (<http://www.pancanal.com/eng/>) operations staff, and embodies the goals and constraints of canal operations in terms of lockage, desired release schedules (for power generation), potable water and flood control.

A control algorithm is used to minimize deviations from the target goals while minimizing violations of the constraints. Various sensitivity analyses are being conducted to compare the benefits using current release targets to those obtained using more flexible adaptive targets depending on seasonal forecasts.

The work aims to increase understanding of the impacts of climate variability and change as conditioned by ongoing processes of decision-making and to provide a basis for more effective applications of climate forecasts.