



# Total Maximum Daily Load Development (TMDL)

## Puerto Rico and Virgin Islands Watersheds

The Horsley Witten Group, Inc. (HW), under contract with the Battelle Institute and U.S. EPA, Region 2, developed TMDLs for the Rio Cibuco and Rio La Plata Watersheds in Puerto Rico and Vessups Bay, Benner Bay and Mangrove Lagoon in the U.S. Virgin Islands.

Rio Cibuco and Rio La Plata are two rivers with large watersheds that each exceed 100 square miles in area and consist of a mix of agricultural, forest and urban land. The Territory's 303(d) listing of impaired waterbodies identified both rivers as routinely failing the fecal coliform bacteria and dissolved oxygen (DO) water quality standards. The modeling approach developed by HW revealed that large livestock populations in both watersheds delivered the vast majority of fecal coliform load to the rivers. HW developed a management and monitoring plan to prioritize the load reduction to agricultural sources.

The situation was very different in the Virgin Islands. The watersheds to the three coastal bays are relatively small and dominated by urban land uses. Prior monitoring identified the Bays as impaired for high levels of turbidity and low dissolved oxygen. HW employed a dissolved oxygen-biochemical oxygen demand (BOD) modeling approach to develop the TMDL. The results suggested that the major contributor to loading violations was from poorly functioning wastewater treatment plants and accumulated nutrient enriched sediment within the bays. HW developed a management and monitoring plan to prioritize the load reduction from the known sources.

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