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Benchmarks for Incorporating Adaptive Management into Water Project Designs, Operational Procedures, and Planning Strategies

ALEXANDRIA, VIRGINIA. The U.S. Army Corps of Engineers (USACE) recently issued two reports titled *Benchmarks for Incorporating Adaptive Management into Water Project Designs, Operational Procedures, and Planning Strategies 1 and 2*. The two reports address key action items in the *National Action Plan (NAP) Priorities for Managing Freshwater Resources in a Changing Climate*.

The first of these reports is a summary of current federal agency adaptive management practices and policies for integrated water resources management. The second report provides recommendations for federal agencies to develop benchmarks for incorporating adaptive management into their planning and operations. According to the National Research Council, "Adaptive management promotes flexible decision making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood" (National Research Council, 2004).

USACE is the lead organization for three actions in the *National Action Plan*, which focuses on integrated water resources management. The two published reports discuss adaptive management and address Action 20 of the NAP, which states the following: "Develop benchmarks for incorporating adaptive management into water project designs, operational procedures, and planning strategies."

The federal Water Resources and Climate Change Adaptation workgroup was created to work with stakeholders to develop the NAP. An interagency technical team was formed to assist the workgroup. This team includes staff from USACE, U.S. Geological Survey (USGS), U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) and Forest Service (USFS), U.S. Environmental Protection Agency (EPA), and the National Oceanic and Atmospheric Administration (NOAA).

Report 1, subtitled *Federal Agency Inventory of Adaptive Management Practices and Policies*, explains that a growing number of large-scale resource planning and strategy documents promote the use of adaptive management. These documents view adaptive decision making as a way to mitigate uncertainty and emphasize the need for monitoring to produce data-driven management improvements. The documents characterize adaptive management as an iterative decision making process that is informed each time by a best management practice reflecting current understanding of resources and their responses to management policies, plans, and actions.

The report continues to explain the adaptive management framework, its dominant sources of uncertainty, and the differences between passive and active adaptive management. The report goes on to list and summarize the adaptive management policies and practices of agencies such as the Department of the Interior (DOI), Fish and Wildlife Service, USGS, Bureau of Reclamation, EPA, USDA, USFS, and the USACE.

Report 2, subtitled *Recommendations for Federal Agency Implementation of Adaptive Management for Climate Change Adaptation*, frames the scope of its adaptive management recommendations within several key premises, including climate change variability and the role of science in any climate change adaptation plan.

The second report presents five key benchmarks to incorporate adaptive management into water resource project planning and operations including the following:

- Collaborative governance between local, state, tribal, regional, and federal groups.
- Scientific coordination forums to help build a shared understanding of socio-ecological systems.
- Risk and uncertainty management of those socio-ecological systems.
- Incorporating flexibility into water resource project plans, designs and implementation.
- Focusing on cost-effectiveness in adaptive management strategies.

Report 2 concludes by emphasizing the necessity of collaborative governance and scientific forums for government and stakeholder efforts to truly address the effects of climate change.

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