

The role of the U.S. Geological Survey, Grand Canyon Monitoring and Research Center in the Glen Canyon Dam Adaptive Management Program

Introduction

The U.S. Geological Survey, Grand Canyon Monitoring and Research Center (GCMRC) is a key component of the Glen Canyon Dam Adaptive Management Program. Established in 1995, GCMRC is located in Flagstaff, Arizona, and measures the effects of Glen Canyon Dam operations on natural and physical resources along the Colorado River from Glen Canyon Dam to Lake Mead. GCMRC's scientific activities contribute to meeting the statutory requirements placed on the Secretary of the Interior by Congress via the 1992 Grand Canyon Protection Act, the 1995 Glen Canyon Dam Environmental Impact Statement, and the 1996 Record of Decision.

GCMRC Mission

To provide credible, objective scientific information to the Glen Canyon Dam Adaptive Management Program on the effects of operating Glen Canyon Dam under the Record of Decision and other management actions on the downstream resources of the Colorado River ecosystem, utilizing an ecosystem science approach.

The Glen Canyon Dam Adaptive Management Program

The GCMRC operates within the Glen Canyon Dam Adaptive Management Program (AMP) to define research objectives and develop monitoring and research programs to meet information needs of the AMP. The AMP consists of three components that support the Adaptive Management Work Group, chaired by the Secretary of the Interior's Designee to the AMP (**Figure 1**). The AMWG consists of a diverse group of 25 stakeholders, including:

Department of Interior bureaus, Department of Energy (Western Area Power Administration), Colorado River Basin States, Native American Tribes, federal power purchase contractors, recreational users and environmental organizations (**Table 1**). The AMWG is a Federal Advisory Committee Act committee that develops, evaluates and recommends alternative dam operations to the Secretary of the Interior, but does not displace federal agency legal authority and responsibility to

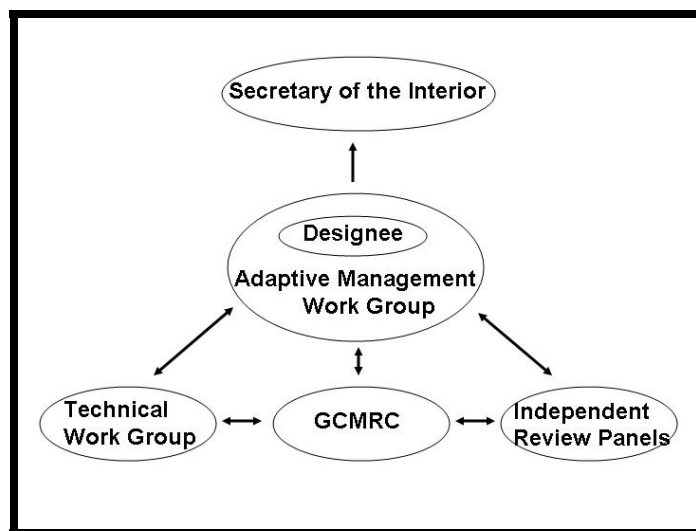


Figure 1. Structure of the Glen Canyon Dam Adaptive Management Program.

manage Glen Canyon Dam. Each AMWG member also has a representative on the Technical Work Group or TWG. The TWG translates AMWG policy and goals into information needs, provides questions that serve as the basis for long-term monitoring and research activities, and interprets research results for their AMWG member. Additionally, a set of Independent Review Panels (IRP) provide independent assessments of program proposals and

accomplishments to ensure scientific objectivity and credibility. Included in the IRP is a Science Advisory Board consisting of some of the top academic experts in fields germane to studies within the scope of the AMP.

Significant antecedents of the Glen Canyon Dam AMP

- 1963** Dam construction completed
- 1970s** concerns over effects of dam operations
- 1989** EIS on dam operations initiated
- 1992** Grand Canyon Protection Act
- 1994** FWS Biological Jeopardy Opinion (*Humpback chub and Kanab ambersnail*)
- 1995** Establishment of GCMRC
- 1996** EIS/ROD on the operations of the dam

GCMRC Programs

GCMRC activities are divided into four major program areas including the Integrated Ecosystem Science Program, Cultural and Socio-Economic Program, Information Program, and the Logistics Program. The Integrated Ecosystem Science Program conducts research and monitoring activities on both physical and biological elements of interest to the AMWG. Examples of physical science research include studies of sediment storage and transport in the regulated river, and integrated downstream water quality monitoring and research. The latter is a critical component of background studies to assess the potential effect of a planned temperature control device on Glen Canyon Dam as part of an effort to elevate water temperatures and favor native fish. Biological research includes studies assessing population status of native and non-native fish, including the federally protected humpback chub, studies of the similarly endangered Kanab ambersnail, and other species affected by dam operations.

The Cultural and Socio-Economic Program focuses on the impact of dam operations on culturally significant sites and artifacts. In addition, program activities address the impact of dam operations on recreation activities based in the Grand Canyon.

The Information Program deals with both external outreach to our stakeholders and clients but also with systems administration related to archiving significant data collected since the 1980s. The

GCMRC library contains a wealth of technical reports and publications from the research and monitoring program, much of it accessible in electronic format on our website (www.gcmrc.gov).

Finally, the Logistics Program supports up to 50 river trips per year and coordinates research permit management for the Center.

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AMWG members

1. Bureau of Reclamation
2. U.S. Fish and Wildlife Service
3. Department of Energy
4. Hopi Tribe
5. Hualapai Tribe
6. Navajo Nation
7. Southern Paiute Consortium
8. San Juan Southern Paiute Tribe
9. Pueblo of Zuni
10. Bureau of Indian Affairs
11. National Park Service
12. Arizona Game & Fish Department
13. Southwest Rivers
14. Grand Canyon Trust
15. Grand Canyon River Guides
16. Federation of Fly Fishers
17. Arizona
18. California
19. Colorado
20. Nevada
21. New Mexico
22. Wyoming
23. Utah
24. Colorado River Energy Distributors Association
25. Utah Associated Municipal Power Systems

Table 1. Membership of the Adaptive Management Work Group.