

### Managing Datasets for Monitoring, Evaluating, and Decisionmaking

*Improving data stewardship processes to meet decisionmaker needs, ensure data quality, and facilitate data sharing*

#### Bottom Line

Data are valuable national assets for Reclamation, its partners, the U.S. Department of the Interior, the Federal Government, and the public. Managing data as assets and making them available, discoverable, and usable (now and in the future)—in a word, open—not only fosters transparency but also promotes institutional efficiency and effectiveness.

#### Better, Faster, Cheaper

Good data management promotes good science and engineering, fosters sound decisionmaking, and ensures that the agency and the public get the greatest return out of the investment in data collection and analysis.

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#### Problem

Stewardship of resources is a core part of Reclamation's mission, including water conservation, river restoration, water reuse, environmental protection, and invasive species control, to name only a few. To manage critical resources such as water and power, Reclamation must also manage the data and information associated with them. The scientific and technical data that Reclamation collects in these areas are also critical resources that require stewardship. These "mission-critical" data are difficult, costly, and/or impossible to recreate, if lost. Data damage or loss can actually compromise Reclamation's ability to accomplish its mission.

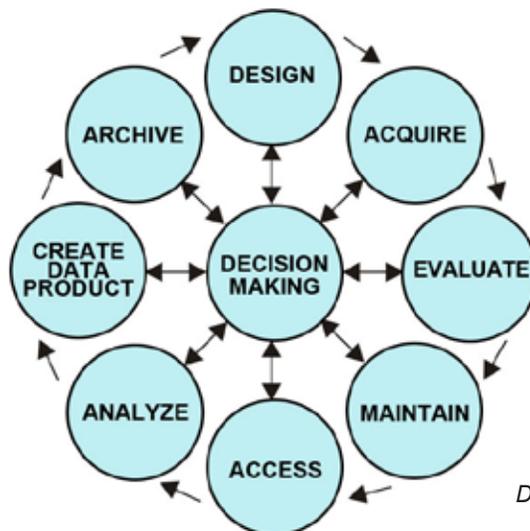
Numerous challenges presently face those charged with managing Reclamation's data assets, including time pressures and the lack of funding, policy, data standards, and efficient data management tools.

#### Solution and Results

To address these challenges, this Reclamation Science and Technology Program research effort assembled an interregional team to investigate the requirements of quality data stewardship. The Reclamation Data Stewardship Team held Reclamation-wide meetings, interviewed data management subject matter experts, took data stewardship training, compared data management systems, and conducted surveys. Among the findings were:

1. Above all, good data stewardship requires comprehensive planning. Data stewardship is the management of data through its entire lifecycle (from design through archiving). The Reclamation data lifecycle is a series of phases through which data progress to inform Reclamation's decisions or provide information to the public. Each phase of the lifecycle is related to, and driven by, the information requirements that pertain to the decision at hand.

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Data lifecycle.

2. In a survey of data stewards for 16 river restoration projects the team learned that collaboration and technology are viewed as being the most important building blocks for successful data stewardship.

Another survey, this one of Reclamation researchers, found that a number of challenges exist:

- Metadata stored with original data is shown to be the exception rather than the rule
- Data are generally not readily discoverable
- Storage redundancy is not always practiced
- Poor speed of access is shown to be a significant drag not only on storage, but on productivity overall
- Data stewardship policy and procedures are rare

### Future Plans

This research helps lay the groundwork for implementing the May 2013 Executive Order 13642 making open and machine readable data the new default for government information. This order declares that federally generated data are valuable national assets whose value is amplified when they are made accessible. In response to that order, the U.S. Department of the Interior is developing related policy documents with the assistance of the Reclamation Data Stewardship Team.

The team is also evaluating a variety of data management initiatives in other agencies to determine best practices. Armed with this information, the team is currently heavily engaged with the Water Data Initiative, organized by the Lower Colorado Regional Director, Terry Fulp, to “establish and implement within Reclamation a process to publish water and other mission-related data, in support of Federal open data policy and making Reclamation resources data more comparable and sharable.”

If the water data initiative is successful, it will be but the first step in rationalizing other mission-critical data assets such as power, lands, infrastructure, and species at risk.



*Data loss can be devastating (top right).*



*Working together to develop and preserve data (bottom left).*

***“Reclamation makes critical decisions based upon the data the agency collects and manages. Data are, therefore, valuable assets. Good data management is essential to ensure the quality, currency, and integrity of these information assets.”***

**Curt Brown**  
Outgoing Chief of Research,  
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### Collaborators (Reclamation Data Stewardship Team)

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### More Information

[www.usbr.gov/research/projects/detail.cfm?id=3760](http://www.usbr.gov/research/projects/detail.cfm?id=3760)