

## Oklahoma

Oklahoma has 2,105 flood control dams and many of them were built in the 1950s-70s, so a large number of them are 40-50 years old. Conservation districts are local sponsors for most of these projects and have limited resources. Some conservation districts have 100-150 dams for which they have O&M responsibility.

Limited funding for O&M had been provided by the State Legislature annually, but never enough to meet the needs. In 2009, the Legislature approved a \$25 million bond for conservation work, with \$7.1 million of this to go for operation and maintenance of dams. This will allow project sponsors to meet many of the urgent O&M needs.

To provide additional technical support to conservation districts, the Oklahoma Conservation Commission has three full-time watershed technicians who are well equipped and trained in O&M work.

These technicians provide technical assistance and assist districts repair principal spillways and other components of dams. The technicians loan siphons, pumps and other equipment to districts and provide training to district employees on O&M. Several other watershed technicians provide direct assistance to two or more conservation districts by removing trees from dams, obtaining contractors for repair jobs and works with trappers who remove beavers.

Several Oklahoma county commissioners have purchased skid steer machines and made them available to conservation districts for removing trees from dams and repairing erosion caused by cattle trails, animal burrows or weather.



## Emergency Action Plans

Oklahoma watershed project sponsors developed Emergency Action Plans on all 229 high hazard dams in the state with the help of NRCS and the Oklahoma Conservation Commission. These EAPS are updated annually. These EAPS are an important part of the operation of dams.

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## West Virginia

The West Virginia Conservation Agency (WVCA) has taken a proactive approach in its efforts in the management of flood control structures. The WVCA has instituted the Operation, Maintenance, and Repair of Flood Control Structures Program. This program is responsible for 169 flood control structures in the state that were designed and constructed by the Natural Resources Conservation Service through the USDA Watershed Program.

The WVCA employs two inspectors for inspection of the flood control structures. Structures receive a minimum of four inspections per year, with one considered the annual inspection, plus additional inspections following major storm events. NRCS provides assistance to WVCA during the annual inspection.

The WVCA oversees \$4.6 million that is distributed to the state's 14 conservation districts annually for O&M.

## Wisconsin

Wisconsin has 14 counties with operation and maintenance responsibilities for 88 flood control structures.

To help carry out the O&M responsibilities, project sponsors formed a coalition in 1995, to "Advance and protect the interests of PL566 in Wisconsin".

The coalition publishes a newsletter and provides information to local decision makers and educates its members on duties and responsibilities of PL 566 operation. The WI PL566 Coalition is a nonprofit 501(c)(3) organization.



Tile drain being replaced in the West Fork Dam No. 1 (Jersey Valley Dam) in Vernon County as part of operation and maintenance work.

# Operation and Maintenance of Watershed Dams

## Watershed Program Has Provided Multiple Benefits to Communities for Over 60 Years

Congress established the Watershed Program by enacting the Flood Control Act of 1944 (Public Law 78-534) and the Watershed Protection and Flood Prevention Act of 1954 (Public Law 83-566). Under these authorizations, the USDA Natural Resources Conservation Service (NRCS) has assisted watershed project sponsors in the construction of 11,000 flood control dams in over 2,000 watersheds in 47 states since 1948.



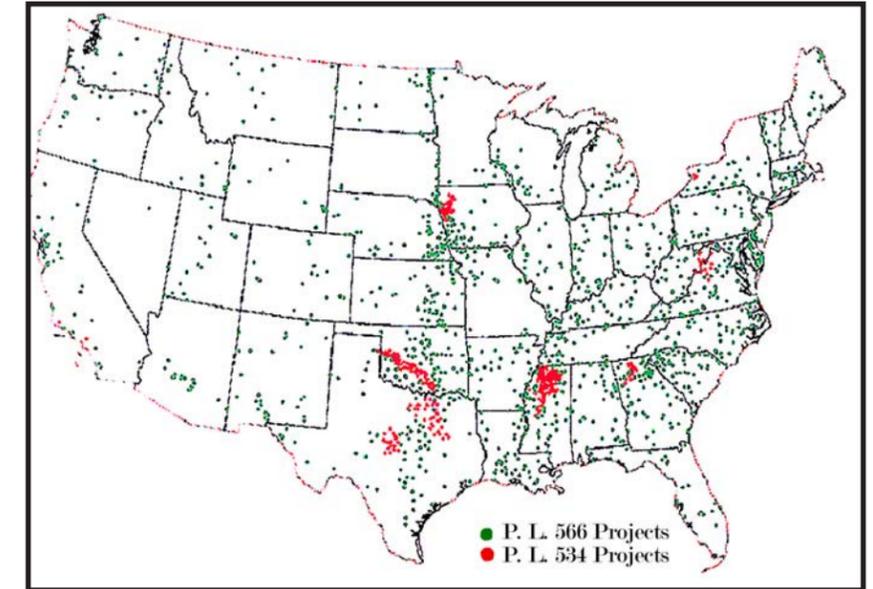
These projects provide an estimated \$2 billion in annual benefits in reduced flooding and erosion damages, recreation, water supplies, and wildlife habitat.

## Operation and Maintenance

Local watershed project sponsors assume responsibility for operation and maintenance of flood control dams constructed under the USDA Watershed Program. These responsibilities are spelled out in operation and maintenance agreements between NRCS and the local project sponsor. This document is reviewed by NRCS and the sponsor at least every five years.

## O&M Agreements Include:

- ◆ Practice covered by the agreement
- ◆ The sponsor(s) who will be responsible for inspecting, performing and financing the O&M of the dam
- ◆ The duration of the agreement
- ◆ A schedule for performing inspections
- ◆ A financial plan
- ◆ Provisions for preparations and review of an Emergency Action Plan if applicable
- ◆ A list of records that the sponsors will provide to NRCS



Eleven thousand watershed dams have been built in 2,000 watershed projects in 47 states and Puerto Rico since 1948.

## Maintenance Needs Increase as Dams Age

Watershed projects have created a \$2 billion infrastructure in the nation that provides \$2 billion in average annual benefits. But like other infrastructures such as roads and bridges, age brings about an increased need for maintenance of the dams and it becomes more expensive.

In the year 2010, 1,855 of the 11,000 dams are 50 years old or older. That number will increase to 6,543 by 2020. Many dams were evaluated for a 50-year return in public benefits on the federal investment. However, maintenance is needed to continue to realize local benefits and to keep the dams safe.

This is a growing concern for local watershed project sponsors, because many have limited funds for this type of work. Examples of how some project sponsors are addressing this issue are included in the following pages.



**National Watershed Coalition**  
[www.watershedcoalition.org](http://www.watershedcoalition.org)

## Operation and Maintenance

The words “operation” and “maintenance” are used together, but just what does each mean?

**Operation-** includes the administration, management, and performance of non-maintenance actions needed to keep a dam or other structure safe and functioning as planned.

**Examples** would be: Being cognizant of changes in watershed conditions, both above and below dams, which alter the overall function of the project, so appropriate actions can be taken.

Ensuring that modifications are not made to the dam or spillways without approval from the sponsors and NRCS.

**Maintenance-** includes routine work required to prevent deterioration of practices, to repair damage, or to replace components. It includes recurring needs, such as fertilizing and managing vegetation for dams and channels and repairing damage caused by normal deterioration, vandalism, or flooding from other than a catastrophic event.

**Examples** would be: repairing erosion on the dam, spillways and channels; keeping debris cleaned out of the principal spillway, keeping trees off the dam; working with landowners to manage grazing of the structure and repairing fences.

## NRCS Technical Assistance

NRCS may provide technical assistance to project sponsors in the O&M of installed measures. The following kinds of assistance are normally considered as O&M technical assistance:

- ◆ Coordination and training of project sponsors on local responsibilities and development of financial methods of assuring availability of funds.
- ◆ Assisting with annual inspections and reports.
- ◆ Preparing or reviewing plans, designs, and specifications for proposed changes. This may include such items as emergency action plans.

## Examples of O&M Challenges



Cattle trails on dams can lead to serious erosion problems if not corrected.



Beavers create problems by damming up areas below the dam and backing water over the outlet pipe restricting flow. They also burrow into the dam which can cause serious erosion problems and they often plug up the inlet tower.

Trees and other unwanted vegetation on the dam and in the auxiliary spillway can create erosion and endanger the integrity of the structure.



## O&M Training is Available

O&M training is available for watershed project sponsors, their employees, NRCS employees and others with O&M responsibilities. The National Watershed Coalition conducts O&M workshops each year in cooperation with NRCS, state conservation agencies and local sponsors. Information about upcoming workshops and other resources concerning O&M is available on the NWC webpage at [www.watershedcoalition.org](http://www.watershedcoalition.org).

The NRCS may assist watershed project sponsors with training on identifying maintenance needs and making dam inspections.

## How States are Meeting the Growing Challenge of Operation and Maintenance

### Virginia

The Virginia NRCS conducted special inspections of all NRCS assisted dams in the state in 2009. The inspections were conducted to assist project sponsors identify O&M needs and the need for training of their employees and to ensure that sponsors were in compliance with O&M agreements.



Inspections were completed on 140 dams. Training was provided to NRCS district conservationists in conducting inspections, which will allow them to better assist in training of local project sponsors.

A formal O&M training session for NRCS employees and project sponsors was held in July 2009, sponsored by the National Watershed Coalition and NRCS to help meet some of the identified training needs.

### Nebraska

The Nemaha Natural Resources District Nebraska operates and maintains over 350 watershed structures in eight counties in southeast Nebraska. The district's annual watershed operation and maintenance budget is \$200,000 for wages/benefits for five full time employees and \$100,000 for maintenance and repairs.

Watershed funds are derived from local property taxes. The maximum levy the district may impose is 45 cents per \$1,000 of assessed value.

Watershed field staff duties range from routine inspections and repairs to hiring private contractors for specialized repair work such as replacing risers and principal spillway conduits.



### Texas

Texas has 1,964 NRCS flood control dams. It cost sponsors an estimated \$11 million for operation and maintenance in 2008. Like many states, soil and water conservation districts serve as local project sponsors and have limited funds. In 2009 the Texas State Legislature appropriated \$15 million to the Texas Soil and Water Conservation Board for grants to local Soil and Water Conservation Districts during 2010-2011 biennium for O&M and structural repairs.

Wise County Texas is a good example of how watershed project sponsors are using local resources to accomplish operation and maintenance. The County Public Works Division, who is responsible for O&M, works with the sheriff's office, county commissioners and others to obtain equipment and labor for O&M work. One source of labor is the use of inmates to remove trees from the dams, clear debris and make minor erosion repairs. Inmates volunteer for the work and while they don't receive compensation for their work, they can receive good time (two days credit for each day worked). Workers give back to the community, learn a labor style trade and save money for local O&M budgets.

The Wise County Public Works Division has purchased several pieces of equipment such as this mower that allows them to mow the slopes of dams.



Private contractors in Texas have recognized the growing need for operation and maintenance of flood control dams and have purchased specialized equipment that can be used to remove trees from dams and make repairs on eroded areas.



Many project sponsors can't afford to purchase large specialized equipment, so use of private contractors makes the O&M costs more feasible.