

USDA Watershed Program Resource Packet

The enclosed materials were developed for watershed project sponsors, NRCS employees and others that use the USDA Watershed Program to meet local resource and conservation needs to utilize in developing informational materials, making presentations and providing facts to the news media, opinion leaders, and decision makers.

Additional resources about the Watershed Program are available on the National Watershed Coalition webpage: www.watershedcoalition.org



April 2020



Brief Watershed Program History

Severe flooding occurred across the nation in the early part the 20th century resulted in millions of dollars in damages annually. This flooding resulted in loss of lives and damage to homes, businesses, roads, and bridges. It also resulted in severe erosion, damage to crops, loss of livestock and sediment deposition in streams and rivers. It was a national problem that needed a national solution.

There was much discussion about what would be the best solution to the problem. The discussion revolved around what approach would work the best. There were two primary schools of thought. The Army Corps of Engineers led with the concept of large dams while out in the country side a concept developed by the USDA Soil Conservation Service (SCS) caught hold. The SCS idea was a series of smaller dams coupled with land treatment in a smaller watershed that would trap water from storms and slowly release it over a period of days or weeks reducing the flooding of streams, rivers and lands downstream.

The SCS method with its smaller footprint on the land was favored by many. Congress passed the Flood Control Act of 1936 and directed SCS to develop their small watershed concept. In 1944 Congress passed Public Law 76-534 that authorized eleven watershed projects in the nation and the construction of the small watershed dams began along with the establishment of land treatment with conservation practices in the watershed. The success in these eleven watershed projects convinced Congress to pass Public Law 83-566 Watershed Protection and Flood Prevention Act of 1954. This Act extended the Soil Conservation Service's authorization to work with local watershed project sponsors to implement the Watershed Program in all states. The Soil Conservation Service was renamed the Natural Resources Conservation Service (NRCS) in 1994.

Local sponsors were required to be local units of government. Conservation districts often took on this responsibility and sometimes partnered with city and county governmental units. More than 11,800 dams have been constructed by NRCS and project sponsors with assistance from the NRCS Watershed Program. These dams make up an estimated \$15 billion infrastructure that provides \$2.3 billion nationally in annual benefits.

The program is far more than just dams. Congress provided authorization in the Program to address a myriad of complex natural resource issues. Project objectives can include flood prevention, agricultural water management, fish and wildlife habitat development, groundwater recharge, water quality conservation, proper utilization of land, municipal and industrial water supply and public recreation area development.

A primary component from the beginning of the program has been land treatment and land management with attention to both erosion control and agricultural economics. Many of the activities that must occur prior to structural measures being installed in the watershed require a high percentage of the watershed to be under a land treatment plan with a significant percentage of the planned practices completed.

Today there are 2,100 watershed projects in 50 states, Puerto Rico and the Pacific Basin and while many provide flood control there are also many projects that do not have dams that are addressing other natural resource issues. Even projects with dams that have a primary objective of flood control often provide other benefits such as municipal water supply, recreational areas, fish and wildlife habitat and irrigation.

The Watershed Program has existed for more than 70 years and a tremendous amount of work has been completed with a great deal of success in solving complex natural resource issues. There are still natural resource issues that exist today which can be addressed by utilizing the Program's authorities.

National Watershed Facts:

The USDA Watershed Programs were authorized by The Flood Control Act of 1944 (Public Law 78-534), the Pilot Watershed Program (Public Law 83-156), the Watershed Protection and Flood Prevention Act of 1954 (Public Law 83-566), and the Resource Conservation and Development Act which was first enacted by Public Law 87-703. Since 1948, NRCS has assisted project sponsors to plan and implement 2,118 watershed projects in all fifty states and three territories. Of these projects, 1,278 included 11,788 dams built to date. Flood control is a primary purpose of many of the authorized watershed projects

Watershed projects were based on the conservation principal of holding the raindrop high in the watershed as close to where it strikes the ground as possible. This involved installation of a complete set of soil and water conservation practices on the landscape. Many projects included flood control dams to protect downstream areas. At least fifty percent of the upstream drainage areas of the dams had to be adequately treated with conservation practices before the dams were installed.

The watershed programs are authorized to address a wide range of natural resource concerns including erosion and sediment control, flood damage reduction, irrigation, drainage, municipal and industrial water supply, groundwater recharge, water quality improvement, recreation, fish and wetland and wildlife habitat creation, improvement and restoration.

The 11,788 watershed dams are almost one third of the 29,251 NRCS-assisted dams that are contained in the National Inventory of Dams (NID) which contains a total of 85,000 dams nation-wide. This demonstrates the significant role USDA has had on dam building in America.

These watershed projects represent a \$15 billion public infrastructure (like roads, bridges, interstates, water systems, etc.)

Average annual benefits from watershed projects = \$2.3 billion each year

Starting in the mid-1950's, an average of 1 dam was constructed every day for two decades. Now, 60+ years later, an average of 1 dam each day will reach the end of their design life (this will continue for the next decade).

Number of watershed dams that will reach the end of their evaluated life in 2019 = 6,216 (most of the dams were designed for a 50-year life, although many have exceeded this and are still safe functioning dams)

2018 was a milestone year in the watershed program as over half of the watershed dams in the nation reached the end of their evaluated service life (5,845)

Number of high hazard watershed dams in the nation = 2,200. A high hazard classification of a dam means there is a risk for loss of life and property if the dam were to breach.

How the Watershed Program is funded:

The USDA Watershed Program is funded through Congressional Appropriations. There are several categories for funding:

Watershed and Flood Prevention Operations (WFPO) Program provides technical and financial assistance to entities of State and local governments and Tribes (project sponsors) for planning and installing watershed projects.

Watershed Surveys and Planning (WSP) authorizes NRCS to cooperate with Federal, State, and local agencies and Tribal governments to protect watersheds from damage caused by erosion, floodwater, and sediment and to conserve and develop water and land resources.

Watershed Rehabilitation Program offers financial and technical assistance to rehabilitate dams constructed through NRCS Watershed Programs. This program extends the service life of dams to meet applicable safety and performance standards or decommission the dams so they no longer pose a threat to life and property.

Emergency Watershed Protection (EWP) safeguards lives and property from floods, drought, and the products of erosion on any watershed whenever fire, flood or any other natural occurrence is causing or has caused a sudden impairment of the watershed.

Regional Conservation Partnership Program (RCPP)

The Watershed Protection and Flood Prevention Program authority can be utilized by NRCS to implement the Regional Conservation Partnership Program (RCPP) to assist local people solve natural resource issues.

The Regional Conservation Partnership Program was authorized in the Agricultural Act of 2014. RCPP is a comprehensive and flexible program that uses partnerships to stretch and multiply conservation investments and reach conservation goals on a regional or watershed scale with the goal to leverage 1:1 funding.

NRCS implements the Regional Conservation Partnership Program (RCPP) through several conservation authorities, including Public Law 83- 566 Watershed Protection and Flood Prevention Act. RCPP projects in CCAs may use all PL 83-566 authorized purposes except watershed rehabilitation.

The Watershed and Flood Prevention Operation Program Authorizes NRCS to Provide Technical and Financial Assistance to Local Watershed Project Sponsors to Solve a Large Variety of Resource Issues

The Watershed Protection and Flood Prevention Program helps units of federal, state, local and tribal of government (project sponsors) protect and restore watersheds up to 250,000 acres.

This program provides for cooperation between the Federal government and the states and their political subdivisions to work together to prevent erosion; floodwater and sediment damage; to further the conservation development, use and disposal of water; and to further the conservation and proper use of land in authorized watersheds.

There are 2,100 active or completed watershed projects in the 50 states, the Commonwealth of Puerto Rico and the Pacific Basin. Dams are included in 1,271 of those projects.

USDA's Natural Resources Conservation Service (NRCS) offers financial and technical assistance through this program for the following purposes:

- **Flood prevention** – Flood prevention measures reduce flooding and damage caused by floodwater, including reducing runoff, erosion and sediment. These measures may include structural measures, such as dams or levees; nonstructural measures, such as easements, flood proofing, or infrastructure relocation; or a combination of both types of measures.
- **Watershed protection** – Watershed protection includes onsite treatment of watershed natural resource concerns, such as water quality or water quantity. Project measures may target controls for offsite floodwater, erosion, sediment and agriculture related pollutants.
- **Agricultural water management** – Agricultural water management includes measures that help to manage water supply for agriculture and rural communities. Measures such as drainage management, groundwater recharge, irrigation management, water conservation, water quality improvement, and rural water supply are included.
- **Municipal and industrial water supply** – Municipal and industrial water supply includes measures necessary to provide storage capacity in reservoirs to increase the availability of water for present and future use.
- **Fish and wildlife habitat and public recreation development** – Fish and wildlife habitat and public recreation development are often companion purposes in watershed projects. These project purposes may be included in a watershed plan when the sponsor agrees to operate and maintain a reservoir or other area for public recreation or fish and wildlife access

Watershed projects vary across the country from constructing flood control dams in states like Oklahoma and Texas, to constructing debris basins in California, to developing irrigation water distribution systems in Hawaii, to implementing water quality projects in Oregon. The program was designed to address the different kinds of resources issues across the country.

Local Watershed Solutions

Project sponsors access program assistance through the Watershed and Flood Prevention “**Operations**” component of this program. Project sponsors can use land treatment solutions or structural solutions, which require construction. An approved watershed plan must be in place prior to initiation of any corrective land treatment or structural solutions.

Once the watershed plan is approved, the project sponsor helps landowners install planned land treatment measures if that is the appropriate solution. For structural solutions, project sponsors ensure surveys and investigations are completed. They also acquire detailed designs, specifications and engineering cost estimates for construction projects. If needed, project sponsors will outline areas where land rights, easements, and right-of-ways are needed.

Eligibility for Authorized Watershed Projects

Statutory and regulatory criteria include:

- Public sponsorship
- Watershed Projects up to 250,000 acres
- Benefits that are directly related to agriculture, including rural communities, must be at least 20 percent of the total benefits for the project.

Accessing the Watershed Protection and Flood Prevention Program

Project sponsors can access help through this program in the following ways:

- Project sponsors can request funding to carry out an existing NRCS authorized plan. Assistance can include design and construction.
- Project sponsors can request the Chief of NRCS to authorize a plan developed with USDA Watershed Operations funding;
- Watershed plans that require \$5 million or more in federal funding for construction require Congressional approval.

Once the watershed plan is authorized, project sponsors can access NRCS’s financial and technical help to implement their plan.

Watershed Operations Funding

Watershed and Flood Prevention Operations funding is available pending the following:

- Annual Congressional appropriations
- State and national priorities
- Acquisition of land and water rights
- Obtaining required permits
- Availability of local funding for specific project solutions
- Completion of structural, agronomic and vegetative designs for project measures
- An approved operation and maintenance agreement between NRCS and the project sponsor that ensures the project land treatment and/or structural solutions will be installed and maintained as specified in the agreement.

No money was appropriated for the NRCS Watershed Program for construction of new projects from 2010 to 2018.

Recent Watershed Program Funding

The 2018 appropriation bill provided \$150 million to NRCS for Watershed Operations.

The 2019 appropriations bill provided \$150 million for Watershed Operations and \$50 million for rehabilitation.

2018 Farm Bill

The 2018 Farm Bill makes one-half billion dollars available to NRCS for Watershed Operations and or Rehabilitation at a rate of \$50 million in mandatory funds per year for ten years.

The bill makes this mandatory Watershed Program funding permanent.

These mandatory funds are outside of the annual appropriations process i.e. any watershed funds secured through the normal appropriations process are in addition to these mandatory funds.

Using Watershed Program Authorities in the RCPP Program – Changes in the 2018 Farm Bill

- ❖ The Farm Bill allows PL-566 to be used across the country and not in just Critical Conservation Areas (CCAs).
- ❖ The bill makes PL-566 a “covered program” allowing the program regulatory flexibility.
- ❖ The bill provides funding flexibility.
- ❖ The bill directs the Secretary to offer a more simplified application process.
- ❖ The bill gives RCPP \$300 million in mandatory funds and these funds are no longer linked to certain programs which should make it easier for projects to get funded through RCPP.

Dam Hazard Classification Numbers

State	Current High Hazard July 2019
Alabama	25
Arizona	24
Arkansas	47
California	14
Colorado	32
Connecticut	28
Florida	0
Georgia	192
Hawaii	8
Idaho	2
Illinois	17
Indiana	39
Iowa	26
Kansas	120
Kentucky	45
Louisiana	5
Maine	11
Maryland	12
Massachusetts	27
Michigan	6
Minnesota	17
Mississippi	77
Missouri	27
Montana	16
Nebraska	46
Nevada	7
New Hampshire	18
New Jersey	11
New Mexico	70
New York	54
North Carolina	42
North Dakota	9
Ohio	26
Oklahoma	260
Oregon	5
Pennsylvania	90
Puerto Rico	2
South Carolina	19
South Dakota	0
Tennessee	44
Texas	392
Utah	29
Vermont	4
Virginia	52
Washington	0
West Virginia	169
Wisconsin	27
Wyoming	3
Totals	2,196

Hazard Classification for Dams

LOW HAZARD POTENTIAL - Dams assigned the low hazard potential classification are those where failure or misoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property

SIGNIFICANT HAZARD POTENTIAL - Dams assigned the significant hazard potential classification are those dams where failure or mis-operation results in no probable loss of human life, but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.

HIGH HAZARD POTENTIAL - Dams assigned the high hazard potential classification are those where failure or mis-operation will probably cause loss of human life.

Number of dams that will exceed their 50-year life expectancy by year

Year	No. of Dams that Exceed 50 Years	Year	No. of Dams that Exceed 50 Years
2013	3,307	2023	7,496
2014	3,828	2024	7,757
2015	4,423	2025	8,024
2016	4,944	2026	8,325
2017	5,439	2027	8,526
2018	5,845	2028	8,771
2019	6,216	2029	8,972
2020	6,548	2030	9,158
2021	6,859	2031	9,282
2022	7,179	2032	9,383
		2033	9,492

Most of the flood control dams constructed with assistance from NRCS Watershed Program from 1948 -2000 were designed with a 50-year planned life span. This doesn't mean that the dams won't be safe or not functioning as design after 50 years. It means that the dam will have returned the planned benefits that justified constructing the dam and that the planned sediment storage area is expected to be filled with sediment. The amount of flood storage may be reduced but the dam will still provide flood protection and other benefits.

Some of the dams after 50 years may need rehabilitating to replace concrete and metal components and have other improvements to meet the current state dam safety standards.



Watershed Projects in Every State

There are over 2,100 Natural Resources Conservation Service (NRCS) assisted watershed projects in the United States. Most projects provide flood control, while others provide conservation practices that address a myriad of natural resource needs such as water quality improvement, soil erosion control, animal waste management, irrigation, water supply development, and recreation enhancement.

Whatever the primary purpose, watershed projects provide multiple community benefits. Many projects have provided benefits for decades, but people are often unaware that the projects even exist.

Local, State, Federal Conservation Partnership

Watershed projects are planned and implemented by local people who serve as project sponsors with assistance from NRCS. The projects are authorized and funded through the Watershed Protection and Flood Prevention Act of 1954 (Public Law 83-566) and the Flood Control Act of 1944 (Public Law 78-534). The program is a partnership between local units of government, state government, the federal government, and landowners.



There are over 2,100 completed or active projects in 47 states.

The Watershed Program has been utilized by communities for over 70 years and the success stories can be found on the landscapes across 47 states and Puerto Rico. The authorizing legislation has been amended several times to address a broader range of natural resource and environmental issues and today the program offers communities the tools and assistance to address almost any kind of environmental and natural resource issue.



Over 11,800 watershed dams have been constructed by local project sponsors with assistance from NRCS since 1948.

Annual Watershed Program Benefits of the 11,800 Watershed Dams	
Agricultural flood damage reduction	\$385,824,825
Non-agricultural flood damage reduction	\$479,824,325
Agricultural benefits (non-flood)	\$458,202,325
Non-agricultural benefits (non-flood)	\$994,044,928
Total monetary benefits	\$2,297,896,224
Number of bridges benefited	61,702
Number of farms and ranches benefited	181,551
Number of businesses benefited	46,586
Number of homes benefited	611,093
Number of public facilities benefited	3,663
Acres of wetlands created or enhanced	282,037
Miles of streams with improved water quality	47,770
Number of domestic water supplies benefited	27,874
Reduced soil erosion (tons/year)	92,341,221
Water conserved (acre feet/year)	1,851,387

Managing Agricultural Water in Hawaii



The Lower Hamakua Ditch Watershed Project on the island of Hawaii help rebuild and repair a water distribution system that had been built by sugar companies from 1900 to 1910. The 15 miles of open ditch and 10 miles of tunnel provide irrigation water distribution to 8,000 acres of agricultural lands. This flume replaced an existing one that had deteriorated.

Managing Animal Waste



The Middle Suwannee River Watershed Project in Florida has helped dairy and poultry farmers apply conservation practices that has reduced the amount of animal nutrients that flows into the river. Financial incentives were offered to landowners in the watershed project to help them build animal waste storage facilities and properly apply the waste to the land, thus improving water quality.

Controlling Soil Erosion and Sedimentation



Conservation practices are a vital part of watershed projects. Practices such as terraces, waterways, grass buffers and grass plantings in the Tama County, Iowa watershed are preventing soil erosion, reducing sediment in streams and rivers, improving water quality and providing wildlife habitat.

Flood Control, Water Supply, Recreational Areas



Communities are using watershed projects to help create and manage agricultural, municipal and industrial water supplies. The lake formed by this dam in the Deer Creek Watershed in Pottawatomie County, Oklahoma, provides municipal water for thousands of people, in addition to providing flood control and recreational areas.

Watershed Rehabilitation Amendments of 2000



Some high hazard dams are being rehabilitated to bring them up to current dam safety criteria. This will ensure that the dams remain safe and continue to provide benefits for another 50 to 100 years.

Many dams today are in a far different setting than when they were constructed. Population has grown; residential and commercial development has occurred upstream and downstream from the dams; land uses have changed; sediment pools have filled; and concrete and metal components have deteriorated.

Some dams do not meet current state dam safety regulations that have been enacted and revised with more stringent requirements than when the dams were built. Congress passed the Watershed Rehabilitation Amendments of 2000 that amended the Watershed Protection and Flood Prevention Act (Public Law 83-566) and authorized the Natural Resources Conservation Service to provide technical and financial assistance to watershed project sponsors in rehabilitating their aging dams.

The NRCS provides technical assistance and 65 percent cost share on approved rehabilitation projects. This funding comes from Congressional appropriations as authorized through the Farm Bills.



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Status of Rehabilitation Projects

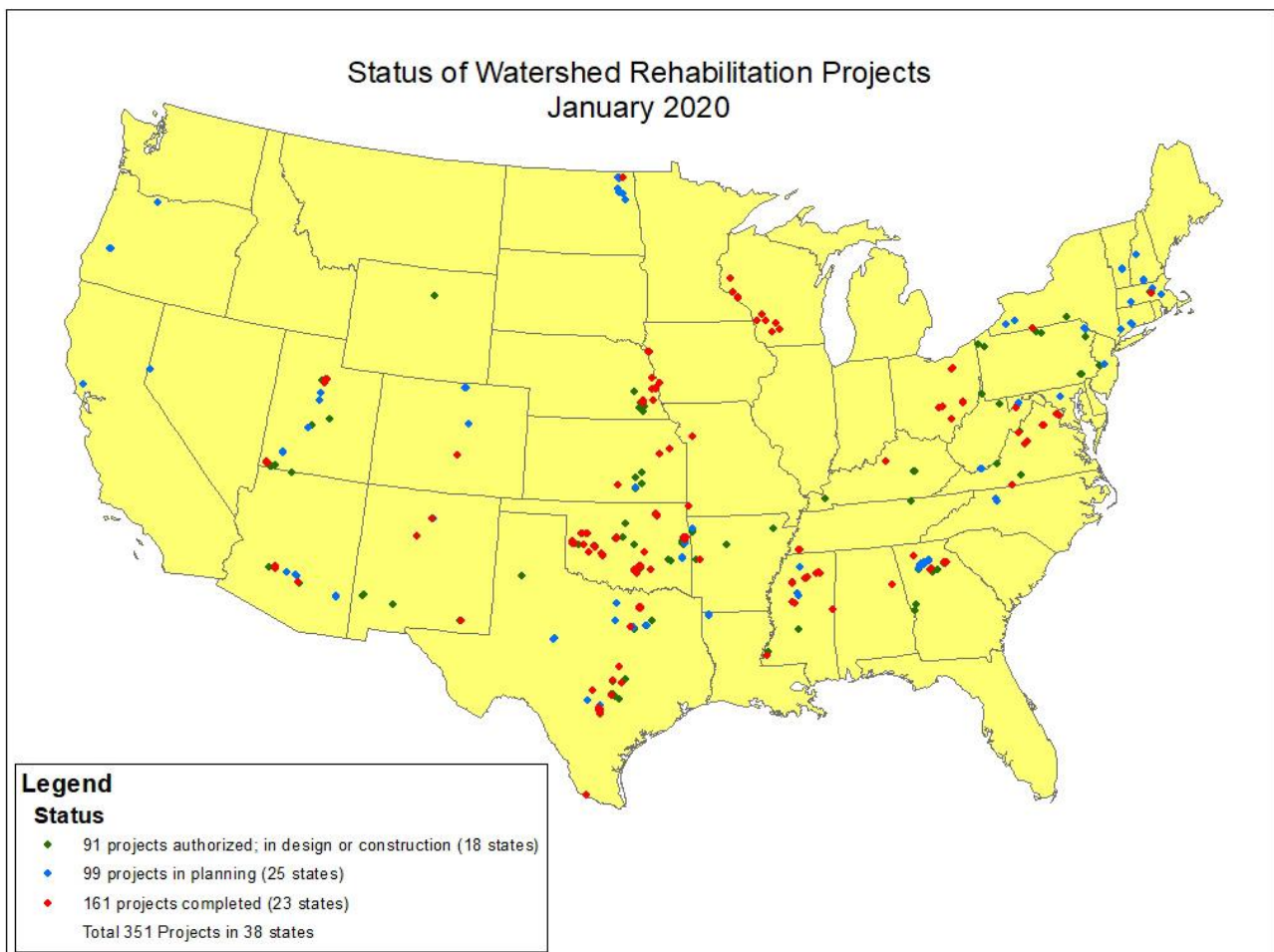
Many dams today are in a far different setting than when they were constructed. Population has increased; residential and commercial development has occurred upstream and downstream from the dams; land uses have changed; sediment pools have filled; and concrete and metal components have deteriorated.

Many dams do not meet current State dam safety standards that have more stringent requirements than when the dams were built.

Many of these dams are also nearing the end of their planned service life of 50 years. These need rehabilitating to ensure they remain safe, continue to function as designed and continue providing benefits.

In the year 2000 Congress passed The Watershed Rehabilitation Amendments to the Watershed Protection and Flood Prevention Act (PL 83-566). The amendments authorize the USDA Natural Resources Conservation Service (NRCS) to work with local communities and watershed project sponsors to address public health and safety concerns and potential adverse environmental impacts of aging dams. The Amendments authorized NRCS to provide technical and financial assistance to watershed project sponsors in rehabilitating dams that were originally constructed with assistance of the NRCS Watershed Program.

As of January 2020, there are 351 approved rehabilitation projects in 38 States. One hundred and sixty-one of these projects in 23 States have been completed; 91 projects in 18 States are being implemented (either in design or construction phase); and 99 projects in 25 States are in the planning stage.





How a Watershed Dam Works

Flood Control and More

The Watershed Program (Watershed Protection and Flood Prevention Act, Public Law 83-566) and Flood Control Act of 1944, Public Law 78-534) helps communities and rural areas reduce flooding and sedimentation, provides water supplies and recreational areas and creates thousands of acres of wildlife habitat. There are watershed projects in all 50 states and the Caribbean. Since 1948, 2,000 watershed projects, covering 160 million acres, have been organized by local project sponsors with assistance from the USDA Natural Resources Conservation Service.

Eleven thousand watershed dams have been built in 47 states. Watershed projects make up a \$15 billion national infrastructure that provides \$2 billion in annual benefits to over 47 million people.



Watershed lakes average from about 5 to 25 acres in surface area. A few are larger, up to several hundred acres and some are designed as dry structures with no permanent water.

How Watershed Dams Reduce Flooding

The concept of watershed projects is simple. A series of watershed dams are built across small tributaries to larger streams. The dams temporarily store flood water after rain storms and slowly release it over a period of several days through a pipe in the dam. This reduces the amount of water that reaches the main water course after a rain, reducing flooding.

Land treatment programs in the watershed help control erosion, which reduces the sediment that flows into the streams and lakes.

Watershed projects usually consist of earthen dams constructed on tributaries to a river. The number of dams in a watershed varies depending on the size of the watershed. Some projects do not have dams, but use other conservation methods to meet the needs in a watershed such as erosion control, animal waste management, and water quality practices.

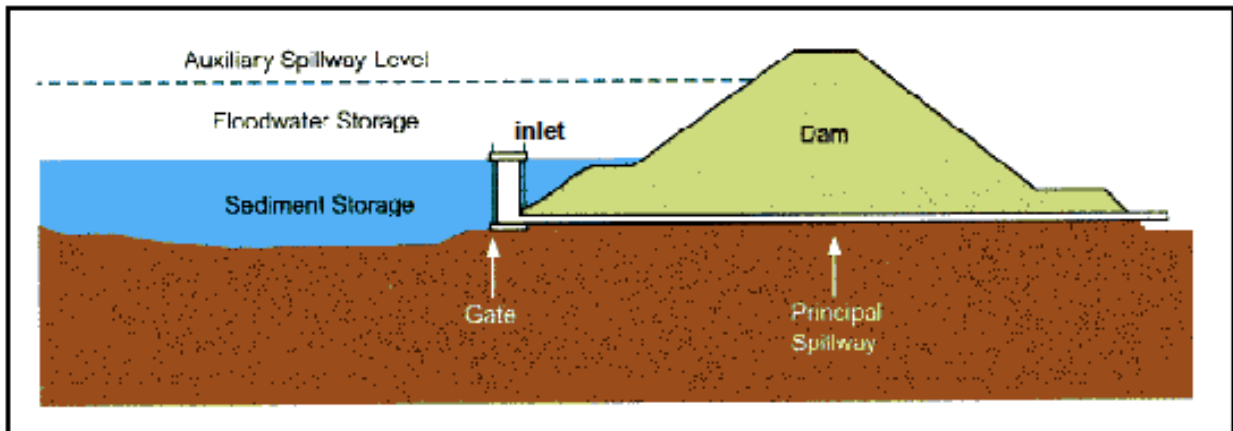


A concrete inlet tower (might be metal on older dams) connected to a pipe extending through the dam serves as a principal spillway for dams, controlling the water level. A slide gate at the bottom of the inlet can be opened to lower the water level for maintenance and repair.



Water is released through a pipe in the dam for several days after a heavy rainstorm.

Cross Section of a Watershed Dam



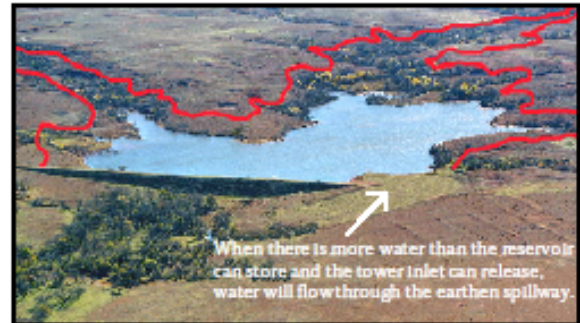
This cross section of a dam shows the concrete inlet in front of the dam connected to the principal spillway pipe (extending through the dam). When water reaches the opening at the top of the inlet it spills over and goes through the pipe controlling the level of water in the lake. Some inlets also have openings in the side of the tower.

A slide gate, located at the bottom of the inlet tower, can be open to lower the water level for maintenance and repairs.

The diagram also shows the auxiliary spillway level. Water will flow through the earthen spillway at the end of the dam to safely convey large flows to avoid water going over the top of the dam, which could dam failure.

The sediment storage area on the cross section is what makes up the permanent pool of water. Over the life time of the dam this area will usually fill with sediment (usually 50 to 100 years).

Flood Storage



The red line on this photo indicates the extent that water can back up in the flood pool upstream before it starts flowing through the earthen spillway. This is where flood water is stored while it is slowly released through the principal spillway pipe.

It is important to keep the inlet tower clear of debris and to keep the earthen spillway clear of any structures such as fences and buildings. Disrupting the flow of the spillway could result in dam failure.

National Watershed Coalition

The National Watershed Coalition is a nonprofit organization composed of national, regional, state and local associations, organizations and individuals who advocate using watersheds as the planning and implementation unit when dealing with natural resource problems. Visit our website at: www.watershedcoalition.org