



# Passaic River Mainstem and Tributaries, New Jersey

## Flood Damage Reduction and Restoration Projects

As of: March 2011

**U.S. ARMY CORPS OF ENGINEERS**

**BUILDING STRONG®**

### **DESCRIPTION**

Flooding has long been a problem in the Passaic River Basin. Since colonial times, floods have claimed lives and damaged property. The growth of residential and industrial development in recent years has multiplied the threat of serious damages and loss of life from flooding. More than 2.5 million people live in the basin (2000 census), and about 20,000 homes and places of business lie in the Passaic River floodplain.

Since 1900, at least 26 lives have been lost in floods and the total losses are over \$4.5 billion dollars. In addition to the flood damages that occur in over thirty-five municipalities in the basin, environmental damage from flooding has also occurred. Significant interruption to businesses and transportation has also resulted in hardship in the basin and region after each flood event.

The most severe flood, the "flood of record," occurred in 1903, and more recent floods in 1968, 1971, 1972, 1973, two in 1975, 1984, 1992, 1999, 2005, 2007 and 2010 were sufficiently devastating to warrant Federal Disaster declarations. The flood of 1984 resulted in the loss of three lives and caused \$642 million in damages (October 2006 dollars). Tropical Storm Floyd in September 1999 caused over \$261 million in flood damages (October 2006 dollars). The April 2005 flood caused over \$100 million dollars in damages in the basin. The recent April 2007 flood resulted in over 5,000 people being evacuated and caused \$686 hundred million (October 2006 dollars) in damages.

### **HISTORY OF PROJECT PLANS AND AUTHORIZATION**

The U.S. Army Corps of Engineers has been working on plans to reduce flooding in the basin since 1936, but no comprehensive plan has yet been implemented due to the lack of support, costs, and environmental concerns. The most recent comprehensive action was a new study of the Passaic River Basin for the State of New Jersey authorized by Congress in the Water Resources Development Act of 1976 (Public Law 94-587).

The Corps evaluated more than 150 plans in cooperation with the State of New Jersey, municipalities, and local groups, including a full range of non-structural alternatives such as buying out flood prone homes to provide protection on the Main Stem Passaic River and its major basin tributaries. Plans were also developed for several smaller projects on tributaries that are independent from the Mainstem plans and they were advanced as separate projects.

The array of comprehensive Main Stem plans was formally presented to the State of New Jersey. After a series of public hearings, the State selected a dual inlet water diversion tunnel system as the centerpiece of an environmentally sound and a comprehensive flood damage reduction program for the basin. On May 8, 1987, the State formally announced its intention to act as the Passaic River Flood Damage Reduction Project's non-Federal sponsor. The Corps recommended the project in its 1988 Report to Congress. Congress authorized construction of the project in the Water Resources Development Act (WRDA) of 1990 and amended it in WRDA of 1992, WRDA of 1996, and WRDA of 2000.

The subsequent Water Resources Development Acts that amended the project included modifications to the plan originally selected by the State. The modifications extended the tunnel to an outlet in Newark Bay and eliminated the need for nine levee/floodwall systems in eastern Essex and southern Bergen counties. The Acts also authorized a stream bank restoration project (Joseph G. Minish Passaic River Waterfront Park and Historic Area) for the City of Newark and made cost changes to the stream bank project. The WRDA 1996 Act also authorized a buyout of the Floodway in the Central Passaic River Basin. The WRDA 2000 Act further recommended the additional study and implementation of non-structural measures and environmental restoration as companion efforts to the already

authorized features. The Acts together along with the independent plans that were developed and subsequently authorized created a series of alternatives and plans that if implemented can provide flood damage reduction and environmental restoration ranging from limited areas to comprehensive protection throughout the basin.

The major elements of the Main Stem flood damage reduction project are two underground tunnels, a 20.4 mile-long main tunnel 42-foot diameter and a 1.3 mile-long 23-foot diameter spur tunnel. The main tunnel would carry floodwaters from an inlet on the upper Pompton River in Wayne, New Jersey down to an outlet in Newark Bay. The spur tunnel would convey Central Basin floodwaters from an inlet just downstream of Two Bridges in Wayne, New Jersey to an underground connection with the main tunnel. The tunnels would cause minimal disruption to development and the environment along the Pompton River and Passaic River

Channel modifications would be required to direct the flows into the tunnel inlets and levees and floodwalls would reduce flood damage in those urban pockets not protected by the tunnel. The diversion tunnels and associated surface works are generally designed to protect against floods, ranging up to the 100-year event and reduce the impact of even larger floods. The project has a benefit-to-cost ratio of 1.4 to 1 based upon the analysis in the most recent report in 1995. The fully funded cost of the project as presented in the 1995 report is \$1.87 billion (October 1994 price level) of which the Federal share is 75% or \$1.39 billion. The State's share of the project cost is 25% or \$480 million, which can be reduced significantly if the state takes advantage of credits for purchases of wetlands and watershed lands as outlined in the legislation. The cost of the project would need to be updated to reflect current price levels and any changes that have occurred in the project area.

The project also includes the acquisition of 5,350 acres of natural flood storage areas, 5,200 acres of which are wetlands and could conceivably be developed, worsening existing flood problems. The State also agreed to continue to protect 6,300 Floodway acres, thus avoiding any secondary development. About 9,500 acres of the Central Basin are already protected as designated parkland, bringing the total of natural flood storage areas that would be permanently protected with the project to 21,000 acres. In addition, the project includes preservation measures for fish and wildlife, provision for wetlands mitigation and also expands the opportunities for recreation along the river.

In response to Congressional and State interest in a review of alternatives, specifically "buyout" options, the Corps updated the evacuation analysis of the 100-year floodplain developed in 1988 in coordination with the State of New Jersey. This updated information was used to support analyses of a Floodway, 10-year, 25-year, 50-year, and 100-year floodplain evacuation plans. It should be noted that none of the buyout plans were economically justified.

The planning and design efforts for the Main Stem are presented in documents dated September 1995 as follows: (1) a Draft General Design Memorandum, (2) a Draft Supplemental Environmental Impact Statement and (3) a Draft Buyout Analysis. The formal public comment and review period was completed in January 1996 and all relevant comments and questions have been addressed by the Corps of Engineers, compiled into a report and furnished to the non-Federal sponsor to help further the decision-making process. These documents have been reviewed by the State and provide information for decision making by the State and the Federal government regarding flood damage reduction efforts for the Passaic River Basin.

Since 1996, the State has requested that the Corps proceed with three elements of the Main Stem project. They are the Preservation of Natural Flood Storage Areas, the Joseph G. Minish Waterfront Park, and the Harrison Levee/Floodwall Project. Work has proceeded on these elements and they are further described in separate fact sheets. The State has indicated that it may select additional project elements in the future and the Corps will be

prepared to advance these elements if requested and funds are appropriated. The State also independently initiated implementation of the limited Floodway buy-out developed by the Corps and authorized in WRDA 1996. Funds were also provided by the Congress in Fiscal Year 2003, 2004, and 2005 to partner with the State on the Floodway Buy-out (see separate fact sheet).

In addition, as noted earlier, other independent projects authorized in the Passaic River Basin under the original project authority or other authorities are currently underway. They include the Ramapo River at Oakland and the Molly Ann's Brook projects. Molly Ann's Brook's construction is completed and is being managed by the Philadelphia District. The Ramapo River at Oakland project was completed in March 2007 and prevented \$2,600,000 in damages in Oakland in the April 2007 flood less than two months after project completion.

Other basin projects are currently underway or recently completed as reconnaissance studies, planning or feasibility studies, design efforts, or continuing authority projects (CAP). CAP projects are small projects that are implemented under general authorities for limited dollar amounts. These projects are described in separate fact sheets and are listed below.

<u>Project</u>	<u>Phase</u>
Ramapo and Mahwah Rivers at Mahwah and Suffern	Design/Construction
Lower Saddle River	Design
Upper Passaic River and Tributaries, Long Hill Township	CAP – Plans & Specs
Upper Rockaway River, Morris County (Study suspended at NJDEP request in 2006)	Feasibility
Mckeel Brook, Morris County (Construction completed January 2005)	CAP - Construction
Jackson Brook, Morris County	CAP - Design
Acid Brook, Pompton Lakes (No Federal interest finding in June 2004)	CAP - Feasibility
Malapardis Brook, Hanover	CAP - Design
Passaic River Basin Environmental Restoration (Awaiting NJDEP or local sponsorship)	Feasibility
Lower Passaic River Restoration (Hudson Raritan Estuary Restoration Program)	Feasibility
Goffle Brook, Hawthorne (No non-Federal sponsor, study suspended November 2004)	Pre-feasibility
Peckman River	Feasibility
Passaic River Flood Management (Floodway Buy-out)	Construction
Great Piece Meadows Clearing & Snagging (No Federal interest finding in 2007)	CAP – Feasibility
Passaic & Pompton Rivers Clearing & Snagging (No Federal interest finding in 2007)	CAP - Feasibility

**RECENT ACTIVITIES:** In the fall of 2005, a group of Central Basin communities began a series of meetings to form a formal Passaic River Basin Flood Commission. The purpose is to have an organized group pursue both short and long term flood damage reduction goals in the basin. The Corps of Engineers has been asked to advise the group addressing the flood problem. The group is considering all approaches including non-structural and structural projects to address the flood problem on the Main Stem Passaic River and its major tributaries. The group has continued to meet as of winter 2009. In January 2009, the NJDEP asked the Corps of Engineers to initiate a reevaluation of the authorized Passaic River Basin Project. On April 23, 2010 Governor Chris Christie signed an Executive Order creating the Passaic River Flood Advisory Commission, chaired by Commissioner of the NJDEP, Bob Martin. The 7 member Commission will identify short and long term recommendations to improve flood-mitigation efforts, emergency response planning and improving post-flood recovery response and efforts and present the findings to Governor Christie by Dec 31, 2010. The USACE provided input as requested due to our long history with the Passaic River Basin.

**CONTACT:** Alicia F. Gould, Project Manager, U.S. Army Corps of Engineers  
Phone: (917) 790-8327  
New York District, Programs and Project Management Division  
26 Federal Plaza, Room 2119, New York, NY 10278  
alicia.gould@usace.army.mil

**Congressional Districts:** NJ-05, NJ-08, NJ-09, NJ-10, NJ-11, NJ-13