US Army Corps
of Engineers®

North Atlantic Division

Water Control Management Annual Report

January 2002

North Atlantic Division
Annual Water Control Management Report
Fiscal Year 2001

Table of Contents

List of Tables

North Atlantic Division
Water Control Management Report
Fiscal Year 2001

1 Introduction

1.1 Background and Organization

Water Control Management is the responsibility of the Water Resources Management Team, Engineering and Construction Division, Military and Technical Directorate. Division and District water control staffing is summarized in Table 1-1. In general, one FTE is dedicated to water control at the Division Office.

1.2 Purpose of Report

This report was prepared in conformance with the requirements of ER 1110-2-240, dated 8 October 1982. This report is the twentieth such Annual Division Water Control Management Report for the North Atlantic Division. This report summarizes the significant water control activities for the Division during the past fiscal year and outlines anticipated future activities.

1.3 Scope

This report provides a general Division-wide summary of North Atlantic Division Water Control Management Activities and Accomplishments for Fiscal Year 2001 and current and future water management programs. Additional information is available at the respective district office.

1.4 Division and District Responsibilities

The Districts are responsible for the operation, maintenance and regulation of all Corps projects within their respective Civil Works Boundaries in accordance with governing Engineering Regulations and related guidance. As major river basins in the North Atlantic Division are totally within assigned District Civil Works boundaries, no inter-district coordination is required for the regulation of projects. Districts prepare and implement water control plans and manuals, and regulate Corps projects to meet all project purposes. The Division Office is responsible for the review and approval of water control plans and manuals and associated activities. Detailed responsibilities are provided in the North Atlantic Division Water Control Center Guidance Memorandum dated 28 September 1994.

2 Hydrometorologic Summary

2.1 Baltimore District

2.1.1 Flood Control

Two minor flood events occurred in the Baltimore District during Fiscal Year 2001. Both events were concentrated in the Susquehanna River Basin along the northern tier of Pennsylvania and the southern tier of New York. Table 3-1 provides breakdowns of the flood damages prevented at District projects by State. Table 3-2 shows flood damages prevented by reservoir projects for these two events.

15-22 December 2000. Runoff from 2 to 3 inches of rain, combined with a small amount of snowmelt runoff, produced minor flooding along the Upper Susquehanna and Lackawanna Rivers. Rivers crested just over NWS flood stage at several locations. The outlet gates at Whitney Point, East Sidney, and Stillwater Lakes were closed overnight (late 17 to early 18 Dec), reducing peak downstream stages by ½ to 1 foot. District reservoir and local protection projects prevented about $4.9 million in damages during this event.

07-16 April 2001. Runoff from ½ to 1 inch of rainfall, combined with 2 to 2½ inches of snowmelt runoff resulted in minor sustained flooding throughout much of the Chemung, Upper Susquehanna, and Lackawanna River Basins in northern Pennsylvania and southern New York. Peak stages in New York were 2 to 4 feet above flood stage at several locations. Reservoir regulation provided peak stage reductions of about 1 to 2 feet. The outlet gates at Whitney Point and East Sidney Lakes were closed for 5 and 6 days respectively. The outlet gate at Stillwater Lake was closed for about one day. Gate openings at Tioga-Hammond and Cowanesque Lakes were reduced to impound excess runoff. Almost 60% of the available flood storage was used at East Sidney and Whitney Point Lakes, about 25% was used at Stillwater Lake, and about 5% was used at Tioga-Hammond and Cowanesque Lakes. District local flood protection projects also played a significant role during this flood, accounting for about 80 percent of the almost $18.9 million in damages prevented by flood control structures.

2.1.2 Low Flow Regulation

There were no drought declarations in effect in the Baltimore District at the beginning of Fiscal Year 2001, but growing rainfall deficits were beginning to impact stream flow conditions early in Fiscal Year 2001. At Raystown Lake, low inflows, combined with the annual mid-November increase in the minimum release requirement (from 200 to 480 cfs), caused the lake level to fall about 3 feet below normal during the first half of Fiscal Year 2001. Since this draw down occurred after the normal recreation season, there were no significant adverse impacts. Several small storms during the first half of Feb 2001 were adequate to produce the ½ inch of runoff required to refill the lake.

Extremely dry conditions impacted most of the District during the critical recharge period from mid-April to mid-May, 2001. Only one to two-tenths of an inch of rain fell at many locations during this period. By mid-May, 6-month rainfall totals were generally 25-35% below normal and stream flows at some locations in the District, were near record lows for that time of year. These conditions prompted the District to implement Drought Contingency Plans at District reservoirs on 16 May. The plans allowed lake levels to be raised about ½ to 1 foot above normal to provide some additional water that could be utilized later, if necessary, to help sustain minimum desired

releases from the projects. The plans remained in effect through the end of Fiscal Year 2001.

Despite steadily growing rainfall deficits and the normal summer decline in project inflows, most District reservoirs were able to maintain their normal pool levels through the remainder of Fiscal Year 2001, while releasing minimum desired or required outflows. The only exceptions were at Raystown Lake and East Sidney, which experienced some very minor impacts to in-lake recreation in August and September 2001 as lake levels fell about two feet below normal.

Stream flows on the main stem Susquehanna and Potomac Rivers remained above the target flows at which additional reservoir releases would have been required from the three District projects that contain contracted water supply storage.

WCQS staff was actively involved in monthly, drought conference calls with the Susquehanna River Basin Commission and New York, Pennsylvania, and Maryland resource agencies during much of Fiscal Year 2001. The calls were initiated by SRBC to discuss general drought and water supply conditions in each State, Corps reservoir conditions and planned reservoir operations, and to provide recommendations for establishing or changing State and/or SRBC drought declarations. In August 2001, “drought watch” declarations were issued by the Commonwealth of Pennsylvania for most of the Pennsylvania counties in the Susquehanna River Basin. This declaration called for voluntary restrictions for domestic water usage and had no impact on Corps reservoirs. Although drought conditions continued to worsen, no additional drought declarations were issued through the end of Fiscal Year 2001.

2.1.3 Water Supply

There were no requests for releases or withdrawals from the contracted water supply storage in Cowanesque Lake, Curwensville Lake, or Jennings Randolph Lake during Fiscal Year 2001.

2.1.4 Recreation

Baltimore District recreation areas logged 13.7 million visitor hours during Fiscal Year 2001, or about 0.3 million hours less than the Fiscal Year 2000 estimate. The proportion, by project, was also similar to Fiscal Year 2000 estimates. Raystown Lake accounted for just over 50 percent of the total, followed by F.J. Sayers Lake and Tioga-Hammond lakes with just over 10 percent. Almond Lake, Alvin R. Bush Dam, Cowanesque Lake, and Whitney Point Lake each accounted for about 5 percent of the total, and each of the remaining projects accounted for 1 to 2 percent of the total.

At Jennings Randolph Lake, scheduled whitewater releases were made on 14,15,28,29 April and 12,13,26,27 May 2001. Whitewater interests also benefited from scheduled releases from Jennings Randolph Lake on 7,8 Oct 2000 and 1-3 September 2001.

2.1.5 Sedimentation

Reservoir sedimentation surveys were performed infrequently in the past due to high cost and their inability to provide conclusive evidence regarding changes in reservoir storage capacity. However, newer techniques for surveying and mapping have made it feasible to perform detailed surveys at reasonable costs.

Beginning in FY 96 and continuing through FY 00, the Baltimore District began applying these newer techniques to collect data about current reservoir conditions. Aerial photos were obtained, hydrographic surveys were conducted, and horizontal and vertical control surveys were performed at most of the Baltimore District reservoir projects. During Fiscal Year 2001, new

hydrographic and topographic maps were prepared and existing elevation-area-capacity relationships were revised for Tioga, Hammond, Bush, East Sidney, Aylesworth, and Stillwater Lakes.

2.2 Norfolk District

2.2.1 Flood Control

During Water Year (WY) 2001, there was no major flooding in the James River Basin. During March and May 2001, small flood releases were made from the Gathright Dam and Lake Moomaw Project but no damages were prevented. No damages were prevented by any other Norfolk District constructed projects during WY 2001.

2.2.2 Low Flow Regulation

Gathright Dam is regulated to maintain Lake Moomaw at the maximum conservation pool (elevation 1582.0 ft., N.G.V.D.). Low flow augmentation releases are made during periods of low flows to improve downstream water quality. Monthly downstream flow requirements vary on a seasonal basis from a minimum of 158 c.f.s. in December and January to a maximum of 283 c.f.s. in July. When inflows to the reservoir are less than required to provide the low flow augmentation releases, conservation storage from Lake Moomaw is used to provide the required release and the reservoir pool elevation drops. On average, the project experiences conditions that draw down the reservoir pool from June through January.

At the start of FY 2001, Lake Moomaw project was 3.2 feet below the maximum conservation pool. This is 10 feet above the average level of the reservoir for this date. The reservoir dropped to elevation 1573.5 ft., N.G.V.D. in mid December 2000 before returning to maximum conservation pool in late February 2001. The reservoir remained near the maximum conservation pool through mid June 2001. Subsequently a steady drop in the pool occurred due to low flow augmentation releases through July. A rise of over 4 feet occurred from the end of July through the first week of August due to 4.67 inches of rainfall at the project over a nine-day period. During mid August and September the pool declined as inflows dropped below low flow augmentation releases. The pool elevation on 30 September 2001 was 1572.4 ft., N.G.V.D. and declining. At this level, approximately 61.9% of the low flow augmentation storage remained available. This level was over 2 feet higher than the average level recorded at the project on 30 September.

No requests were received in FY 2001 to provide additional low-flow augmentation above the flows specified in the Regulation Manual

2.3 New York District

2.3.1 Flood Control

The New York District has no has water control functional unit as this District has no water control operational responsibility for any projects in the District. The District prepares water control manuals for three federally funded, state owned reservoir projects in the District, Waterbury, Wrightsville and East Barre Dams. These projects were built by the Civilian Conservation Corps in the 1930's, and redesigned and modified by the Corps of Engineers in the 1950's. The State of Vermont is responsible for project operations.

Two flood events of note occurred in the New York District during Fiscal Year 2001.

17-19 December 2000**.** On the afternoon of Sunday 17 December 2000, an intensifying low-pressure center across the Eastern Great Lakes strengthened as it moved northeastward. It swung a strong cold front through the Tri-state region that same afternoon. Rinfall caused flooding and closing of part of the Bronx River Parkway in the City of Yonkers in lower Westchester County, and NY State Route 209 at the Ulster-Sullivan County line. Minor small stream flooding occurred in Northern New Jersey, with the Rahway and Mahwah Rivers rising to or above flood stage. The Peckman River, Molly Ann's Brook, Saddle River and Ramapo River crested within a foot of flood stage.

The City of Mechanicville, New York, near Albany, experienced extensive flooding. The Hudson River rose to bankfull capacity. The Hudson River, however, did not rise above flood stage at either Lock 1 near Waterford or at Fort Edward, NY.

Esopus Creek rose to well over flood stage, cresting at 16.04 ft, 5.04 ft above flood stage. at Coldbrook, NY, on 17 December 17th, and at 16.25 ft at Mount Tremper, 5.25 ft. above flood stage. Rainfall in the Esopus Creek watershed exceeded 4 inches in places, with 4.6 inches at Boiceville. Rain began to taper off at mid-afternoon of 17 December 2000. High water on the Saw Kill, a tributary to Esopus Creek, caused road closure in the town of Woodstock.

Three to five inches of rain fell over the Rondout Creek watershed on Sunday 17 December 2000. Rondout Creek at Rosendale, NY, crested at a gage height of 20.19 ft. 2.19 ft above flood stage causing moderate flooding. Minor flooding occurred on Schoharie Creek, near Prattsville, NY crested at a gage height of 13.67 ft. on Sunday 17 December, 1.67 feet above flood stage.

Two to four inches of rain fell over eastern New York, southwestern Vermont, and northwestern Massachusetts. This rain, falling on frozen ground combined with melting snow, resulted in rivers rising rapidly to bankfull levels. The National Weather Service issued flood warnings for the Mettawee River, the Batten Kill, the Hoosic River, the Walloomsac River, and the Little Hoosic River.

The worst flooding occurred on the Mettawee River at Granville NY, which crested at a gage height of 13.5 feet on 17 December, 5.5 feet above flood stage. The crest of 13.5 feet is about two feet above the previous peak of record of January 1999. At Whitehall, NY, the water level in the canal connecting the Hudson River and Lake Champlain (above the dam) had a peak elevation of 117.2 ft. NGVD on 18 December, about 5.5 feet above normal. Below the dam, Lake Champlain had a peak elevation of 101.5 ft. NGVD, 1.5 feet above flood stage.

Minor flooding occurred on the Great Chazy River, Batten Kill at Battenville, NY, the Hoosic River at Williamstown, Massachussets and. Eagle Bridge, NY. The Great Chazy River receded below

flood stage on 20 December but rose above flood stage to a nearly constant stage of 7.9 feet for the rest of the 20th, due to an ice jam, and did not recede back down to below flood stage until about 12 noon on Thursday December 21st.

Southern Vermont received between two and three inches of rain, and northeast and north-central Vermont received between one and a half and three inches of rain, on Sunday December 17th 2000. There was some flooding in downtown Barre, Vermont.

Waterbury Reservoir rose from a pre-flood low of 550.07 ft. NGVD on 17 December at on 18 December. The volume impounded (3,639.9 acre-feet) was 5.6 percent of the available flood control space, and is equivalent depth of 0.63 inch over the 109 square mile watershed tributary to the reservoir.

Wrightsville Reservoir rose from a pre-flood low of 633.49 on 17 December to a peak elevation of 649.37 ft. NGVD on 18 December. The volume impounded (3,555.4 acre-feet) was, equal to 18.0 percent of available flood control space, an equivalent depth of 0.98 inch over the 68.1 square mile watershed tributary to the reservoir.

East Barre Reservoir rose from a pre-flood low of 1130.20 ft. NGVD on 17 December to a peak elevation of 1147.14 ft. NGVD on 18 December. The volume impounded (2,615.8 acre-feet) was 21.7 percent of available flood control space, and an equivalent depth of 1.27 inches over the 38.7 square mile watershed tributary to the reservoir.

Minor flooding occurred on the Winooski River near Essex Junction, Vermont. On 18 December portions of Route 2 near Richmond, other low-lying roads in Jonesville, and fields from Essex Junction up to Williston, were flooded.

Minor flooding occurred on the Lamoille River near Johnson, Vermont.

17 June 2001 Flooding occurred in lower Westchester County and northern New Jersey, as a result of about four inches of rain that fell on lower Westchester County, and of about five to five and a half inches of rain that fell on northern New Jersey, between midnight and 3 p.m. on Sunday June 17 2001. In the Saw Mill River Basin the Yonkers Local Protection Project performed well. The estimated peak flood flow of 800 cfs has about a 19 % annual exceedence probability. Much of the Saw Mill River Parkway, from Exit 10 at Hearst Street in Yonkers to Exit 30 in Pleasantville, was closed on Sunday 17 June 2001 as a result of this flood. The Nepera Park project performed well.

Minor flooding occurred in Northern New Jersey in the Rahway, Mahwah, Saddle, and Passaic River Basins.

2.4 Philadelphia District

2.4.1 Flood Control

During FY01 one storm occurred that resulted in flooding in the Philadelphia District.

16-18 December 2000 Heavy rain fell in the Schuylkill and Lehigh River basins. Runoff impounded by Blue Marsh Lake and Francis E. Walter Reservoir prevented an estimated $51,000 and $307,000 in damages respectively. Table 3-2 shows the cumulative damages prevented by individual flood control projects since they became operational. All damages prevented by District reservoir projects are in Pennsylvania.

2.4.2 Low Flow Regulation

The Delaware River Basin Commission (DRBC) made no request for low-flow releases from CENAP reservoirs for the purpose of water quality enhancements in FY01.

2.4.3 Water Supply

Two Philadelphia District projects have dedicated water supply storage allocations, Blue Marsh Lake and Beltzville Lake. The water supply storage at each Project is contracted to the Delaware River Basin Commission. The Commission utilizes the Beltzville Water Supply Storage to supplement flows along the Lehigh and Delaware Rivers and for salinity repulsion in the Delaware Estuary. Similarly, the Commission utilizes water supply storage at Blue Marsh Lake to supplement flows along the Schuylkill and Delaware Rivers and for salinity repulsion in the Delaware Estuary. Additionally, the Commission has contracted to provide water from Blue Marsh Lake to the Western Berks Water Authority (9 cfs). The DRBC directed releases from water supply storage at Beltzville Lake on 3-6 August and 19-20 September to augment flows downstream during Fiscal Year 2001. The Commission made no releases from Blue Marsh Lake.

During drought emergencies, as declared by the Delaware River Basin Commission, additional storage may be requested by the Commission at F.E. Walter Reservoir. There is no long-term water supply allocation at F. E. Walter Reservoir, however, the project drought contingency plan provides for temporary storage during drought emergencies. Previously, a Memorandum of Agreement was in effect that allowed for the temporary drought emergency storage of up to 34,665 acre-feet for water supply between elevations 1300 ft. NGVD and 1392 ft. NGVD. This temporary impoundment infringes on the project's flood control storage. The Corps would evacuate this storage as required to insure proper flood control regulation. Although no contact is currently in place, on October 29, 2001 the Commission made a request for drought emergency storage at F. E. Walter reservoir. No storage has been provided to DRBC.

During Fiscal Year 2001, storage levels in the New York City Reservoirs remained in the normal range. There were no serious problems with salinity intrusion in the Delaware Estuary.

2.4.4 **Recreation**

Attendance at Philadelphia District Reservoir projects during Fiscal Year 2001 is listed in Table 2-1. In addition, the District, in coordination with the Pennsylvania Department of Environmental Resources, U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, Delaware River Basin Commission, organized canoeing clubs and commercial whitewater organizations, scheduled five whitewater events on the Lehigh River below the F.E. Walter Reservoir. Two 2-day events were held during the weekends of 9-10 and 23-24 June. Three one-day events were scheduled for 15 September, 6 October, and 20 October. Dam Operators were on duty 4 hours each day on weekends from mid April to mid October in an effort to provide releases if possible for whitewater trips in the Lehigh Gorge or float trips in the lower basin. Unscheduled weekend releases may occur if unanticipated storage and natural inflows allow.

Table 2-1
FY 2001 CENAP Reservoir Visitation

Project	Attendance
Beltzville Lake	296,741
Blue Marsh Lake	628,648
Walter Reservoir	211,444
Prompton Reservoir	33,317

2.5 New England District

2.5.1 Flood Control

During Fiscal Year 2001, the New England region experienced variable weather patterns characterized by a wetter than normal first half and a dryer than normal second half of the fiscal year. Annual precipitation was considered below normal throughout the region. Precipitation recorded at District dams in central and northern watersheds averaged between 80 and 100 percent of normal with deficits averaging 3 to 5 inches with some approaching 8 to 10 inches. In southern watersheds, precipitation recorded at District dams averaged 75 to 100 percent of normal with deficits ranging from 4 to 7 inches with some approaching 10 to 12 inches. The winter snowfall started out somewhat varied across the region. Watersheds in southern New England experienced consistent above normal snowfall throughout the winter. The northern, mountainous watersheds experienced less than normal snowfall through mid February followed by higher than normal snowfall continuing into April. Water equivalent of the snow pack in southern watersheds peaked between 5 and 7 inches in March; Northern watersheds peaked between 9 and 12 inches in April. The entire region was characterized as a high potential flood threat during the March/April time as a result of these water equivalents. Considerable runoff occurred in southern watersheds during the month of March when warmer temperatures caused rapid snowmelt coincident with 2 to 4 inches of rainfall. In northern watersheds spring runoff was delayed until late April when warm temperatures also produced rapid snowmelt. However, with southern watersheds relatively snow-free at this time, widespread significant flooding did not occur. During the hurricane season (June through November) fifteen named tropical storms/hurricanes formed in the Caribbean and Atlantic Oceans. Of the 15 storms, 9 were hurricanes of which 4 reached the intensity of category 3 and greater. None of the tropical storms/hurricanes affected the New England Coastline. The Stamford Hurricane Barrier was operated on fourteen occasions and the New Bedford Hurricane Barrier on eleven occasions.

Three significant flood events required reservoir regulation activities during Fiscal Year 2001, 17-18 December, 22-23 March, and 21-25 April. Cumulative damages prevented due to these regulation activities resulted in a total of $89,058,000, of which about 55 percent were attributed to flood control reservoirs and 44 percent to local protection projects.

17-18 December 2000. A total of about 2-4 inches of wind swept rain fell over New England watersheds, during an 18-hour period. The highest rainfall occurred over southern New England, with a little over 4 inches occurring at West Hill Dam in the Blackstone River Basin and Black Rock Lake in the Naugatuck River Basin. Most southern New England rivers experienced rises in stage; however, none approached or exceeded flood stage below District dams. The northern New England watersheds experienced some snowmelt flooding, which caused parts of the main stem Connecticut River to rise above flood stage. The upper reaches of the Merrimack River also experienced rainfall and snowmelt but the main stem peaked below flood stage.

Reductions in flood flows downstream from Corps reservoirs in the Connecticut River Basin averaged about 10 percent. Flood control storage utilized at Corps reservoirs range from 5 to 22 percent in the Connecticut River Basin, with Ball Mountain Lake having the largest impoundment. Total damages prevented during this event were $21,800,000, of which 83 percent were attributed to New England District dams and 17 percent to local protection projects in the Connecticut River Basin.

22-23 March 2001. A widespread storm hit the New England producing about 2 to 4 inches of rainfall. Antecedent conditions resulted in fully saturated grounds and above normal snow pack in most areas. Southern New England watersheds experienced the heaviest rainfall with some

eastern Massachusetts watershed receiving over 6 inches. Many uncontrolled, small watersheds experienced substantial flooding as the rainfall augmented with melting snow caused streams to rise above flood stage. Runoff from Corps controlled watersheds was regulated in the Naugatuck, Thames and Blackstone Rivers, with only the Blackstone River exceeding flood stage. Flood control storage utilized at Corps reservoirs ranged from 14 to 20 percent storage in the Thames River Basin and 27 percent at West Hill Dam in the Blackstone River Basin.

Benefits associated with reservoir regulation activities were computed for damage zones downstream of Corps reservoirs and Corps constructed local protection projects in the Thames and the Blackstone River Basins. Total damages prevented during this runoff event were $17,854,000 million, of which 52 percent were attributed to NAE dams and 48 percent to local protection projects.

21-25 April 2001. Extremely warm temperatures migrated into the New England region initiating significant melting of the remaining snow pack in northern New England watersheds. While the upper headwaters of the Merrimack River also experienced snowmelt conditions, it was in the Connecticut River basin where significant rises in river levels occurred. Flood control storage utilized at Corps reservoirs ranged from 21 to 57 percent in the Connecticut River Basin to 16 to 30 percent storage in the Merrimack River Basin. Maximum reservoir storage used was at Ball Mountain Lake, Townshend, and Otter Brook Lakes utilizing about 57 percent of their total flood control storage.

Benefits associated with reservoir regulation activities were computed for damage zones downstream of Corps reservoirs and Corps constructed local protection projects within the Connecticut River Basin. Total damages prevented during this event were $48,789,000, of which 44 percent were attributed to district dams and 56 percent to local protection projects.

Regulation of Hurricane Barriers. During fiscal year 2001 the Stamford Hurricane barrier was operated on 14 occasions for total damages prevented of $230,000. The New Bedford Hurricane barrier was operated on 11 occasions for total damages prevented of $385,000. The locally operated hurricane barriers in: Providence, Rhode Island (Fox Point); New London, CT; and Pawcatuck (Stonington) CT, did not experience damaging tide levels and, therefore, no damages prevented were computed in Fiscal Year 2001.

Flood damages prevented from 1 October 2000 through 30 September 2001 including reservoirs, hurricane barriers and local protection projects totaled $89,058,000.

2.5.2 Low Flow Regulation

Persistent dry conditions throughout New England were prevalent during the second part of Fiscal Year 2001. The first months of the year were significantly wet. The fiscal year ended with total precipitation lower than normal for most of New England with some areas such as northern New Hampshire and the state of Maine, reporting moderate to severe drought conditions. Drought contingency measures were not requested nor implemented during the fiscal year.

2.5.3 Water Supply

Three New England District reservoirs, Littleville Lake, Colebrook River Lake, and East Brimfield Lake have municipal and industrial water supply storage allocations. During Fiscal Year 2001, low flow conditions along the Farmington River initiated fishery storage releases at Colebrook River Lake. A spring and fall fishery pool, each with a maximum storage of 5,000 acre-feet, is maintained at Colebrook River Lake, to release a minimum flow for fish life in the Farmington River. Releases are coordinated with the Connecticut DEP and the Metropolitan District,

Hartford, Connecticut. Releases from spring fisheries storage were made during the months of December 2000, January, May, July, and September 2001. East Brimfield Lake made water supply releases for industrial processes in accordance with contractual obligations with the downstream American Optical, Inc. The American Optical Company of Southbridge, MA owns 1,140 acre-feet of storage between the stages of 9 and 13 feet at East Brimfield Lake. Small releases were requested and provided from this storage during the months of June, July, and August.

2.5.4 Recreation

Through Fiscal Year 2001 the following recreational releases were made from District reservoirs in support of downstream white water canoeing and kayaking.

Ball Mountain Lake. Releases of 1,500 cfs were provided by temporarily raising the pool level at Ball Mountain Lake for downstream canoe/kayak recreational activities on the weekend of April 28-29 and for one day on September 22.

Townshend Lake. Discharges from Ball Mountain Lake were released through Townshend Lake, on the same dates as Ball Mountain Lake.

Otter Brook Lake. Releases of 250 cfs were provided for downstream canoeing on the weekends of March 17-18 and April 14-15.

Surry Mountain Lake. Releases of 275 cfs were provided for downstream canoeing on the weekend of May 5-6.

Birch Hill Dam and Tully Lake. Releases of 1,200 cfs at Birch Hill Dam and 400 cfs at Tully Lake were provided by temporarily raising the pool levels at both projects for the weekends of April 7-8 and April 14-15. The 38th Annual River Rat Race was held on April 14.

Knightville Dam and Littleville Lake. Releases of 1,000 cfs at Knightville Dam and 700 cfs at Littleville Lake were provided by temporarily raising the pool levels at both projects for the 47th Annual Westfield River Wildwater Race, on the weekend of April 21-22.

Blackwater Dam. Releases of 600 cfs were provided for whitewater recreation by temporarily raising the pool level for the Blackwater Slalom Race on April 27, 28, and 29.

East Brimfield Lake. On April 29 a release of 350 cfs was made by temporarily raising the pool level at East Brimfield Lake for the Sturbridge Lions Club All American River Race.

Mansfield Hollow Lake. Releases of 900 to 1200 cfs were provided by temporarily raising the pool level at Mansfield Hollow Lake for the Shetucket River Days Canoe Cruise event on June 17.

3 Activities and Accomplishments

3.1 General Summary

The North Atlantic Division had significant accomplishments in the areas of flood control and fielding of the Corps Water Management System (CWMS). North Atlantic Division water control projects prevented approximately $56 million in flood damages, as shown on Table 3-1. Table 3-2 shows current and cumulative damages prevented by individual projects in the Division.

3.2 Water Control Data System – Corps Water Management System

The North Atlantic Division is the first Major Subordinate Command (MSC) to deploy CWMS. All water control offices in the Division installed CWMS in Fiscal Year 2001 and participated in both the Deployment Working Session and Deployment On Site Training.

3.2.1 Baltimore District

The Water Control Data System (WCDS) is implemented on the Baltimore District LAN and presently includes the following networked equipment:

- Three UNIX workstations (two SUN SPARC ULTRA 1's and one SUN SPARC ULTRA 60)
- Integral Systems DOMSAT Receive Station (Satellite dish, Comstream receiver, Gateway PC and a Dell PC)
- HP Laser Jet 5M printer
- HP Scan Jet IIc desktop scanner

In addition, two DELL Latitude laptop PC's are used for remote access to the WCDS.

Significant WCDS activities in the Baltimore District include the following:

- Initiated migration to the Corps Water Management System (CWMS). Most of the data processing activities are now done on the Ultra 60 workstation using both DSS and Oracle databases.
- Improved methods for displaying water control data and information, using both web server capabilities and CWMS Control and Visualization Interface (CAVI) capabilities.
- Added SUN SPARC ULTRA 60 as the main WCDS server and retired the Sun Sparcstation 20 workstations.
- Successfully tested the Continuity of Operations Plan (COOP) with CENAP in November 2001. The COOP was not used during Fiscal Year 2001.
- A critical component of the WCDS, the Integral Systems DOMSAT Receive Station (DRS), was out of service for about three weeks in May 2001 due to the failure of the Franklin communications board. During the outage GOES satellite data was successfully retrieved from the Philadelphia District DOMSAT Receive Station via the CEEIS. New Local Receive Ground Station (LRGS) software, which runs in Linux, was installed on a Dell PC to serve as a backup to, and eventual replacement for, the DRS.
- Data Management and Analysis System for Lakes, Estuaries, and Rivers (DASLER) software was installed in May 2000. During Fiscal Year 2001, DASLER was primarily used to populate an Access database with station description data and physical, chemical and biological data for reservoir sampling sites.

NWS hydrometeorologic products are obtained via Internet or transmitted by the Middle Atlantic River Forecast Center in State College, PA via a dedicated telephone circuit. Real-time Doppler radar images and other meteorological products are obtained via satellite from DTN Weather.

Motient satellite telephone systems were acquired to replace the HF radio systems used by WCQS and reservoir project staff to provide backup communications. The satellite phone systems were in the process of being installed at the time of the terrorist attacks on 11 Sep 01. To help fulfill a critical need for emergency communications following the attacks, most of the satellite phones were made available to the North Atlantic Division Office until normal telephone service was re-established.

Baltimore District actively participated in the on-going development of the new Corps Water Management System (CWMS). The Baltimore District continued its efforts as one of four initial test sites for CWMS. The District accomplished the following:

- Loaded CWMS Test Version 3 (TV-3) in April 01 and tested throughout the remainder of the fiscal year.
- Continued working with HEC to further develop and refine the CWMS prototype model for the Bald Eagle Creek watershed. The model was enhanced to include new capabilities provided in TV-3, and is being used as the sample watershed for CWMS deployment activities at all Corps districts.
- Continued participating in the Corps Users Review Group (CURG) and in monthly conference calls with HQUSACE, HEC, and personnel from other Corps districts.
- Conducted numerous CWMS demonstrations at request of HQUSACE and HEC for Corps senior leaders, other North Atlantic Division water control staff, CWMS Advisory Group (AG) and a delegation visiting from Mozambique.

3.2.2 Norfolk District

The data acquisition portion of the Water Control Data System (WCDS) is operational and functioning well. The primary hardware, consisting of a Sun Ultra 170E workstation and Direct Read-Only Terminal (DROT) for DOMSAT, was installed in Fiscal Year 1997.

CWMS was deployed at Norfolk District in late September 2001 with the assistance of personnel from the Hydrologic Engineering Center (HEC). The primary hardware for CWMS consisting of a Sun Blade 1000 workstation was obtained and is functioning well.

3.2.3 Philadelphia District

Two Sun Workstations collect, process, and present near real time water control data. A Unix PC (DROT) dedicated to this single purpose performs DCP data collection. Three Windows NT PC's with X terminal software emulation complete the system. The WCDS continuously provides hydrometeorologic and project data. Laptop computers allow off site and off duty hour access to the two Unix computers via the CEAP network.
The District deployed CWMS in September and initiated data collection and modeling.

3.2.4 New England District

The Water Control Data System is implemented on the New England District LAN and presently includes the following equipment:

- Two UNIX Sun workstations (one Sun Blade1000 and one Sun Ultra60),
- Integral Systems DOMSAT Receive Station,
- Marta Systems NOAAPORT Receive Station,
- Five Dell Pentium II PCs running Hummingbird Exceed software. Other networked equipment includes
- HP Color LaserJet printer,
- Microtek desktop scanner with a Dell Pentium III PC,
- EMWIN system for real time weather images and NWS bulletins.

Significant Fiscal Year 2001 activities regarding the WCDS are as follows:

- Upgraded backup water control workstation from a Sun Ultra1 to a Sun Blade1000. This platform is currently being configured to be the primary workstation, with the Ultra60 becoming the backup.
- Deployed CWMS began in late Fiscal Year 2001. The Sun Blade1000 serves as the primary CWMS workstation for data collection, product development, and modeling applications. The CWMS suite of software was installed and data is now being entered into Oracle via DOMSAT and NOOAPORT real-time, continuous data streams.
- RRT continued updating and revising the existing website. The format of the pages was completely revised in "Frames" format. Data presented includes real-time hydrologic plots and tables, REPGEN summaries, historic pool stage, outflow, and frequency data, RRT administrative information, and links to other web sites frequently used in reservoir regulation activities. All Project Managers at Corps Dams have access to our site and use the data frequently. There are currently interactive links between Project web sites and RRT's web site.

- RRT added a suite of ESRI software to the Sun Blade1000 workstation. Software directly loaded onto the workstation consists of Arcview with the Spatial Analyst extension, and ArcInfo 8.1. ESRI software loaded onto a networked PC includes Arcview with the Spatial Analyst and 3-D Analyst extensions. The software loaded on the PC is needed to work with HEC Geo-HMS and Geo-RAS software. Using Arcview and Spatial Analyst a product was developed showing real-time pool stage inundation at Edward MacDowell Dam. The data is available for viewing on the District's Web Page.

3.3 Status of Water Control Plans and Manuals

The status of Water Control Manuals for all North Atlantic Division reservoirs and reservoirs subject to Corps prescribed regulations per ER1110-2-241 is summarized on Table 3-3.

3.4 Deviations from Water Control Plans

3.4.1 New England District

West Hill Dam: pool elevation restrictions were in place for Fiscal Year 2001 due to seepage problems.

3.5 Constraints on Water Control Plans

3.5.1 General

Constraints on individual project Water Control Plans are encountered at some Division projects. These constraints are usually relatively minor, and usually entail limitations to the magnitude of reservoir releases, gate openings, or time to close gates. There are several instances where the planned bankfull capacity reservoir release causes some nuisance or minor flooding to downstream encroachments. This type of problem is presently resolved by limiting reservoir releases to below bankfull capacity, where necessary, during regulation of most flood events. During future major flood events, the full bankfull release will be made when necessary with the acceptance of some minor damages caused by the necessary floodwater releases. Perceived constraints are being studied and eliminated where possible.

3.5.2 Baltimore District

3.5.2.1 Jennings Randolph Lake

Early operating experience at this project revealed the need for some restrictions regarding the operation of the selective withdrawal system. Certain combinations of intake ports and quality control (QC) gate settings created noticeable vibrations in the tower. Operation of the selective withdrawal system is restricted to eliminate these vibrations at certain combinations of intake port and water quality control gate settings.

Slug flow problem occurs for large releases under low-head conditions, this should not be a problem under normal reservoir operations. Non-emergency releases of up to 9,000 cfs will be permitted, provided project personnel can monitor downstream conditions closely.

The impact of gas super saturation on the tail water trout population is a concern that also needs to be addressed whenever outflows exceed 2,500 cfs. The establishment of a trout rearing facility in the stilling basin has resulted in a thriving trout population both inside and outside of the facility's net pens. Increased fish mortality can be expected as the degree of gas super saturation increases with increasing outflows.

3.5.2.2 Tioga-Hammond Lakes

The Crooked Creek outlet from Hammond Lake is closed when the pool is forecast to reach elevation 1089. All subsequent releases are made through the Hammond outlet works in the connecting channel.

In an effort to reduce occasional debris problems at the Tioga Lake intake tower, the highest port (Port 4), of the selective withdrawal system or QC2 (the outlet gate associated with Port 4) is being closed during high flow conditions if it is not required for water quality operations. Observations by project staff indicate that this scheme appears to have been effective in reducing the accumulation of debris at the intake tower.

3.5.2.3 Foster Joseph Sayers Dam

Regulation constraints are in place due to increased year-round utilization of low lying flood plains downstream of the project.

3.5.3 Norfolk District

3.5.3.1 Gathright Dam and Lake Moomaw

The capacity of the water quality outlet works is less than rated.

3.5.4 Philadelphia District

3.5.4.1 Blue Marsh Lake

There are some release restraints due to down stream nuisance flooding.

3.5.4.2 F.E. Walter Dam

The bypass system is inoperable due to the threat of cavitation and partial collapse of an access ladder. The inability to use this system results only in minor problems related to temperature.

3.5.5 New England District

3.5.5.1 West Hill Dam

The project is regulated to keep the pool level below 15 feet during minor to moderate floods, if possible. When the pool level approaches or exceeds 12 feet, geotechnical engineering personnel are dispatched to the dam to perform visual inspections. Reservoir regulation is based on existing seepage conditions and the extent of downstream flooding. Releases from the project were made to stabilize the reservoir level as downstream river flooding begins to recede.

3.6 New Water Control Projects

There are no new Corps water control projects under construction in the North Atlantic Division.

3.7 Cooperative Hydrologic Programs

No significant changes were made in the Fiscal Year 2002 Cooperative Stream Gauging Program with the U.S. Geological Survey (USGS) and National Weather Service (NWS). Water quality monitoring is being reduced downstream of Gathright Dam. The program has been successful to date. NWS AFOS and DOMSAT costs are being funded by HQUSACE. Table 3-5 summarizes the cooperative programs with the USGS and NWS.

4 Current and Future Programs

4.1 General Summary

All current programs and activities will continue. Version 1.0 of CWMS will be deployed in the North Atlantic Division during Fiscal Year 2002. Reservoir sedimentation studies and the revision and updating of water control manuals will continue. Water control plans will need to address increased environmental concerns, improvements in water quality, the increasing importance of water-related recreation to local economies, and other localized problems. Reservoir regulation manuals and water control plans need to be revised at some District projects to address these issues and optimize project benefits.

On-going interagency programs such as the Coordination of Water Data Collection Activities and the Cooperative Stream Gauging Program with the United States Geological Survey will be continued on an annual basis. Training of Water Control Management personnel will continue on an annual basis as courses are made available, and new personnel are hired to fill vacancies.

Efforts to bring water control manuals online in either hypertext format or portable document format will continue. The annual North Atlantic Division Water Control Managers Meeting was held in August 2000, and the annual meeting will be continued in the spring of each year.

Baltimore District will assist the Interstate Commission for the Potomac River Basin (ICPRB) with modeling joint water control operations at Savage River Dam and Jennings Randolph Lake. Model results are also likely to be utilized by WCQS staff to optimize water quality operations and address water supply issues in Jennings Randolph Lake. These models will provide ICPRB with a tool to comprehensively evaluate the ability of the existing water resources in the North Branch Potomac River Basin to meet present and anticipated water quality, water supply, flood control, and recreation needs in the basin.

4.2 Water Control Data System – Corps Water Management System

The North Atlantic Division is the first MSC to field CWMS. Deployment is complete and initial modeling efforts are underway and will continue until all significant watersheds are modeled, this will be a significant ongoing effort. All offices are working to fully implementing CWMS and make CWMS the primary decision support tool for water management.

CWMS Version 1.0 is scheduled for deployment in Fiscal Year 2002. Existing Baltimore District models for the North Branch Potomac River and Bald Eagle Creek will upgraded be take advantage of the new capabilities of Version 1.0. All other districts are preparing and calibrating initial CWMS models. Initial modeling of the Ware River Watershed by New England District, Gathright Dam and Lake Moomaw by the Norfolk District, and Blue Marsh Lake by the Philadelphia District will be completed in Fiscal Year 2002.

Table 1-1

North Atlantic Division
Water Control Staffing

OFFICE SYMBOL	POSITION	NAME	TELEPHONE
NORTH ATLANTIC DIVISION			
CENAD-MT-EC-W	Hydraulic Engineer	Andrew Petallides	(718) 491-8750
CENAD-MT-EC-W	Hydraulic Engineer	Alfred K. Tai	(718) 491-8748
CENAD-MT-EC-W	Hydraulic Engineer	Ralph LaMoglia	(718) 491-8746
BALTIMORE DISTRICT			
CENAB-EN-GW	Supv. Hydraulic Engr.	Richard Olin	(410) 962-6769
CENAB-EN-GW	Hydraulic Engineer	Stan A. Brua	(410) 962-4894
CENAB-EN-GW	Hydraulic Engineer	Barry N. Flickinger	(410) 962-6777
CENAB-EN-GW	Hydraulic Engineer	James W. Haines	(410) 962-6768
CENAB-EN-GW	Hydraulic Engineer	Donald B. Lambrechts	(410) 962-6770
CENAB-EN-GW	Hydraulic Engineer	Julia A. Fritz	(410) 962-4895
CENAB-EN-GW	Computer Specialist	Thomas S. Ressin	(410) 962-6814
CENAB-EN-GW	Hydraulic Engineer	Debra Strickland	(410) 962-6772
CENAB-EN-GW	Hydrologic Technician	Michael D. Barlock	(410) 962-5124
CENAB-EN-GW	Hydrologist	Kenneth Kulp	(410) 962-6775
CENAB-EN-GW	Secretary	Maureen Jordan	(410) 962-4893
NORFOLK DISTRICT			
CENAO-TS-EW	Supv. Hydraulic Engr.	Larry E. Holland	(757) 441-7774
CENAO-TS-EW	Hydraulic Engineer	Mark Hudgins	(757) 441-7107
CENAO-TS-EW	Hydraulic Engineer	Owen R. Reece, Jr.	(757) 441-7772
CENAO-TS-EW	Hydraulic Engineer	Robin M. Williams	(757) 441-7104
CENAO-TS-EW	Engineering Technician	Ellen Moore	(757) 441-7771
PHILADELPHIA DISTRICT			
CENAP-EN-H	Supv. Hydraulic Engr.	George A. Sauls	(215) 656-6678
CENAP-EN-H	Hydraulic Engineer	Francis P. Cook	(215) 656-6680
CENAP-EN-H	Hydraulic Engineer	Christine Tingle	(215) 656-6679
CENAP-EN-H	Hydrologic Engr. Tech.	Yvette Boggs	(215) 656-6685
NEW ENGLAND DISTRICT			
CENAE-EP-GW	Hydraulic Engineer	Paul Marinelli	(978) 318-8630
CENAE-EP-GW	Hydraulic Engineer	Greg Hanlon	(978) 318-8632
CENAE-EP-GW	Hydraulic Engineer	Carmen Suarez	(978) 318-8629
CENAE-EP-GW	Hydraulic Engineer	Steven Simmer	(978) 318-8524

Table 3-1

North Atlantic Division

Summary of Flood Damages Prevented
Fiscal Year 2001

FLOOD DAMAGES PREVENTED BY WATER CONTROL PROJECTS
(In thousands of dollars)

STATE	NAB	NAE	NAN	NAO	NAP	TOTAL
CT		19,726				19,726
DC						0
DE						0
MA		26,009				26,009
MD						0
ME						0
NH		703				703
NJ						0
NY	1,659					1,659
PA	3,447				358	3,805
RI		2,399				2,399
VA				0		0
VT		192	1,415			1,607
WV						0
TOTAL	5,106	49,029	1,415	0	358	55,908

Table 3-2

North Atlantic Division

Damages Prevented by Water Control Projects

Fiscal Year 2001

DISTRICT	PROJECT	FY 2001 ($1,000)	CUMULATIVE INCLUDING FY 2001 ($1,000)	
NAB	EAST SIDNEY LAKE, NY	666	150,698	
NAB	WHITNEY POINT LAKE, NY	1,173	518,095	
NAB	ARKPORT DAM, NY	18	44,117	
NAB	ALMOND LAKE, NY	22	120,347	
NAB	TIOGA-HAMMOND LAKES, PA	465	278,758	
NAB	COWANESQUE LAKE, PA	337	157,472	
NAB	CURWENSVILLE LAKE, PA	0	118,171	
NAB	ALVIN R. BUSH DAM, PA	0	163,829	
NAB	FOSTER JOSEPH SAYERS LAKE, PA	0	110,665	
NAB	RAYSTOWN LAKE, PA	0	163,133	
NAB	STILLWATER LAKE, PA	2,412	85,215	
NAB	ALESWORTH CREEK LAKE, PA	13	5,096	
NAB	INDIAN ROCK, PA	------	------	(1)
NAB	JENNINGS RANDOLPH LAKE, MD & WV	0	356,333	
NAB	SAVAGE RIVER DAM, MD	0	96,793	
NAO	GATHRIGHT DAM & LAKE MOOMAW, VA	0	198,624	
NAN	EAST BARRE DAM (Sect 7)	488		(2)
NAN	WATERBURY DAM (SECT 7)	877		(2)
NAN	WRIGHTSVILLE DAM (SECT 7)	51		(2)
NAE	UNION VILLAGE DAM	2,283	32,621	
NAE	NORTH HARTLAND LAKE	7,980	88,443	
NAE	NORTH SPRINGFIELD LAKE	5,077	89,514	
NAE	BALL MOUNTAIN LAKE	6,902	103,925	
NAE	TOWNSHEND LAKE	6,548	69,107	
NAE	SURRY MOUNTAIN LAKE	3,013	63,882	
NAE	OTTER BROOK LAKE	1,158	28,713	
NAE	BIRCH HILL DAM	1,414	60,138	
NAE	TULLY LAKE	569	22,333	
NAE	BARRE FALLS DAM	152	23,473	
NAE	CONANT BROOK DAM	23	2,319	
NAE	KNIGHTVILLE DAM	2,855	146,317	
NAE	LITTLEVILLE LAKE	1,048	55,172	
NAE	COLEBROOK RIVER LAKE	570	37,726	

Table 3-2 (Con't)

North Atlantic Division

Damages Prevented by Water Control Projects

Fiscal Year 200

DISTRICT	PROJECT	FY 2001 ($1,000)	CUMULATIVE INCLUDING FY 2001 ($1,000)	
NAE	MAD RIVER DAM	86	2,795	(4)
NAE	SUCKER BROOK DAM	27	172	(4)
NAE	EAST BRANCH DAM	0	10,512	(4)
NAE	HALL MEADOW BROOK DAM	0	9,596	(4)
NAE	THOMASTON DAM	0	242,362	
NAE	NORTHFIELD BROOK LAKE	0	22,420	
NAE	BLACK ROCK LAKE	0	65,060	
NAE	HANCOCK BROOK LAKE	0	29,894	
NAE	HOP BROOK LAKE	0	31,076	
NAE	FRANKLIN FALLS DAM	0	69,135	
NAE	BLACKWATER DAM	0	19,852	
NAE	EDWARD MACDOWELL LAKE	0	7,846	
NAE	HOPKINTON-EVERETT LAKES	0	63,301	
NAE	BUFFUMVILLE LAKE	51	54,684	
NAE	HODGES VILLAGE DAM	135	52,218	
NAE	EAST BRIMFIELD LAKE	1,467	46,474	
NAE	WESTVILLE LAKE	2,562	25,521	
NAE	WEST THOMPSON LAKE	299	18,708	
NAE	MANSFIELD HOLLOW LAKE	402	43,611	
NAE	WEST HILL DAM	4,407	34,471	
NAE	NEW BEDFORD HURRICANE BARRIER	385	17,596	
NAE	STAMFORD HURRICANE BARRIER	230	25,269	
NAP	PROMPTON RESERVOIR, PA	0	8,683	
NAP	JADWIN RESERVOIR, PA	0	5,689	
NAP	F.E. WALTER RESERVOIR, PA	307	105,537	
NAP	BELTZVILLE LAKE, PA	0	10,232	
NAP	BLUE MARSH LAKE, PA	51	35,897	

NOTES:

(1) Flood damages prevented by the Indian Rock Dam, York, PA are not included. The economic data requied to compute these estimates in not avilable at this time.

(2) Cumulative flood damages prevented since FY 1996

(3) The table does not include flood damages prevented by Stevenson Dam which is owned by the Commonwealth of Pennsylvania. But regulated by Baltimore District for flood control.

(4) Owned & Maintained by CT Dept. of Environmental Protection. Operated for flood control by the New England District

Table 3-3

North Atlantic Division
Water Control Manuals

Project	Stream	District	Owner	Last Submission	Approval Date	Approved By	Revision Schedule
Almond Lake & Arkport Reservoir	Canacadea Cr./Canisteo R.	NAB	CE	Sep 1987	Dec 1987	NAD	FY 02
East Sidney Lake	Ouleout Cr.	NAB	CE	Aug 1996	Oct 1996	NAD	FY 06
Whitney Point Reservoir	Otselic R.	NAB	CE	Sep 1996	Dec 1996	NAD	FY 03
Alvin R. Bush Dam & Kettle Creek Lake	Kettle Cr.	NAB	CE	Nov 1997	Feb 1998	NAD	FY 08
Cowanesque Lake	Cowanesque R.	NAB	CE	Sep 1990	Nov 1990	NAD	FY 04
Curwensville Lake	West Branch Susquehanna R.	NAB	CE	Dec 1997	Feb 1998	NAD	FY 08
F.J. Sayers Dam & Reservoir	Bald Eagle Cr.	NAB	CE	Sep 1996	Oct 1996	NAD	FY 06
G.B. Stevenson Dam	First Fork Sinneahoning Cr	NAB	PA	Jul 1999	Jan 2000	NAD	FY 10
Raystown Lake	Raystown Branch Juniata R.	NAB	CE	Sep 1989	Dec 1989	NAD	FY 03
Stillwater & Aylesworth Creeks Resevoirs	Lackawanna R / Aylesworth Cr.	NAB	CE	Sep-00	Feb-01	NAD	FY 01
Tioga-Hammond Lake	Tioga R / Crooked Cr	NAB	CE	Sep 1988	Oct 1988	NAD	FY 03
York - Indian Rock	South Branch Codurus Cr.	NAB	CE	May 1987	May 1987	NAD	FY 03
Jennings Randolph Lake	North Branch Potomac R.	NAB	CE	Dec 1996	Jul 1997	NAD	FY 07
Savage River	Savage R.	NAB	MD	Sep 1997	Apr 1999	NAD	FY 09
Master Manual	Upper Susquehanna R.	NAB		Dec 1984	Jan 1985	NAD	FY 04
Master Manual	Lower Susquehanna R.	NAB		Dec 1984	Jan 1985	NAD	FY 04
Master Manual	North Branch Potomac R.	NAB		Sep 1986	Oct 1986	NAD	FY 03
Gathright Dam & Lake Moomaw	Jackson R.	NAO	CE	Jan 1985	Jan 1985	NAD	FY 03
Waterbury Dam & Reservoir	Little R.	NAN	VT	Oct 1970	Nov 1970	OCE	FY 02
General Edgar Jadwin Dam & Reservoir	Dyberry Ck.	NAP	CE	Oct 1997	Dec 1997	NAD	FY 07
Prompton Dam & Reservoir	West Branch Lackawaxen R.	NAP	CE	Sep 1997	Dec 1997	NAD	FY 07
Francis E. Walter Reservoir	Lehigh R.	NAP	CE	Oct 1994	Dec 1994	NAD	FY 05
Beltzville Dam & Reservoir	Pohopoco Cr,	NAP	CE	Jun 1996	Aug 1996	NAD	FY 06
Blue Marsh Dam & Reservoir	Tulpehocken Cr.	NAP	CE	Nov 1996	Jan 1997	NAD	FY 06
Master Manual	Conneticut River Basein	NAE		Jan 1984	Jan 1984	NED	FY 03
Union Village Dam	Ompompansoosuc R.	NAE	CE	Apr 1994	Apr 1994	NED	-

Table 3-3 (Con't)

North Atlantic Division
Water Control Manuals

Project	Stream	District	Owner	Last Submission	Approval Date	Approved By	Revision Schedule
Birch Hill Dam	Miller R.	NAE	CE	Jun 2000	Sep 2000	NAD	FY 10
Tully Lake	East Branch Tully R.	NAE	CE	Jun 2000	Sep 2000	NAD	FY 10
Barre Falls Dam	Ware River	NAE	CE	Feb 1979	Feb 1979	NED	FY 03
Conant Brook Dam	Conant Bk.	NAE	CE	Feb 1979	Feb 1979	NED	FY 03
Knightville Dam	Westfield R.	NAE	CE	Jan 1978	Jan 1978	NED	FY 02
Littleville Lake	Westfield R.	NAE	CE	Jan 1978	Jan 1978	NED	FY 02
Colebrook River Lake	West Branch Farmington R.	NAE	CE	Mar 1990	Mar 1990	NED	FY 05
Mad River Dam	Mad River	NAE	CE	Mar 1990	Mar 1990	NED	FY 05
Sucker Brook Dam	Sucker Bk.	NAE	CE	Mar 1990	Mar 1990	NED	FY 05
Master Manual	Merrimack River Basin	NAE		May 1999	Sep 1999	NAD	FY 09
Franklin Falls Dam	Pemigewaset R.	NAE	CE	May 1999	Sep 1999	NAD	FY 09
Blackwater Dam	Blackwater R.	NAE	CE	May 1999	Sep 1999	NAD	FY 09
Edward MacDowell Dam	Nubanusil Bk.	NAE	CE	May 1999	Sep 1999	NAD	FY 09
Hopkinton-Everett Lakes	Contoockook R.	NAE	CE	May 1999	Sep 1999	NAD	FY 09
Master Manual	Thames River Basin	NAE		Jul 1980	Jul 1980	NED	FY 02
Mansfield Hollow Lake	Nachaug R.	NAE	CE	Jul 1980	Jul 1980	NED	FY 02
Buffumville Lake	Little R.	NAE	CE	Jul 1980	Jul 1980	NED	FY 02
Hodges Village Dam	French R.	NAE	CE	Jul 1980	Jul 1980	NED	FY 02
East Brimfield Lake	Quinebaug R.	NAE	CE	Jul 1980	Jul 1980	NED	FY 02
Westville Lake	Quinebaug R.	NAE	CE	Jul 1980	Jul 1980	NED	FY 02
West Thompson Lake	Quinebaug R.	NAE	CE	Jul 1980	Jul 1980	NED	FY 02
Master Manual	Blackstone River Basin	NAE		Jul 1980	Jul 1980	NED	FY 03
West Hill Dam	West R.	NAE	CE	Jul 1980	Jul 1980	NED	FY 03
Master Manual	Housatonic River Basin	NAE		Oct 1976	Oct 1976	NED	FY 02
Hall Meadow Brook	Hall Meadow Brook	NAE	CE	Oct 1976	Oct 1976	NED	FY 02
East Branch Dam	East Branch Naugatuck R.	NAE	CE	Oct 1976	Oct 1976	NED	FY 02

Table 3-3 (Con't)

North Atlantic Division
Water Control Manuals

Project	Stream	District	Owner	Last Submission	Approval Date	Approved By	Revision Schedule
Thomaston Dam	Naugatuck R.	NAE	CE	Oct 1976	Oct 1976	NED	FY 02
Black Rock Lake	Branch Bk.	NAE	CE	Oct 1976	Oct 1976	NED	FY 02
Northfield Brook Lake	Northfield Bk.	NAE	CE	Oct 1976	Oct 1976	NED	FY 02
Hancock Brook Lake	Hancock Bk.	NAE	CE	Oct 1976	Oct 1976	NED	FY 02
Hop Brook Lake	Hop Bk.	NAE	CE	Oct 1976	Oct 1976	NED	FY 02
New Bedford Hurricane Barrier	N/A	NAE	CE	Aug 1983	Aug 1983	NED	FY03
Stamford - Fairhaven Hurricane Barrier	N/A	NAE	CT	Sep 1998	Oct 99	NAD	FY 08

Table 3-4

North Atlantic Division

Water Control Deviations
Fiscal Year 2001

Date	Project	District	Description	Major/Minor	Time Period
FY 01	West Hill Dam	New England	Pool elevation restrictions due to seepage problems continue from last year	Major	Oct 2000 - Sep 2001

Table 3-5

North Atlantic Division

USGS and NWS Cooperative Program Summary
Fiscal Year 2001

Division & District Office	NWS Cooperative Gauging Program	NWS AFOS	NWS DOMSTAT	USGS Cooperative Gauging Program	Total
Divison HQ	0	0	0	0	0
Baltimore	0	0	0	922,515	922,515
Norfolk	3,647	0	0	212,229	215,876
New York	0	0	0	20,600	20,600
New England	0	0	0	274,805	274,805
Philadelphia	3,929	0	0	311,950	315,879
Total	7,576	0	0	1,742,099	1,749,675