Pompton Lake Dam Post-Flood Report

April 15-17, 2007 Nor'easter

USACE ROLES

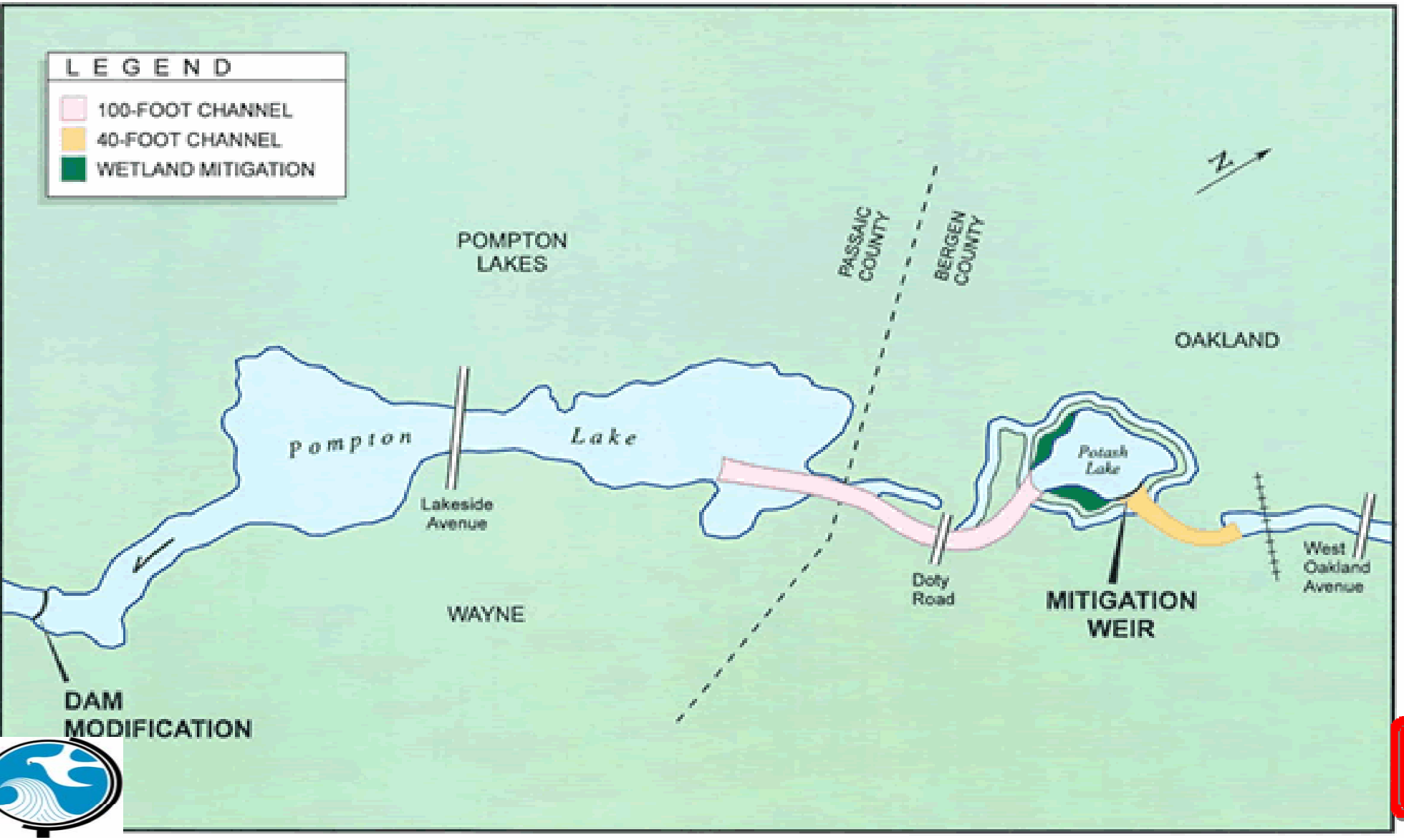
Provide the planning, design and construction services for the flood damage reduction project.

NJDEP ROLES

Provide the lands, easements and right of ways for project. Operate and Maintain facilities. Perform technical review of post flood report, insured dam integrity, and cost shared the project.

US Army Corps of Engineers
New York District

RAMAPO RIVER AT OAKLAND, NEW JERSEY
FLOOD PROTECTION PROJECT



Gate Operations

- The Pompton Lake reservoir is regulated to provide flood damage reduction benefits to the reach immediately upstream of the lake as well as to satisfy the existing water supply operation.
- Reservoir regulation to prevent upstream damages is a unique situation.
- The Pompton Dam is not used for detention of floodwaters.

Gate Operations

- The gate operation is defined as a function of lake level.
- As the lake level rises (inflow increases) gates are opened. Similarly, as the lake level drops (inflow decreasing), the gates are closed.
- The gates can be adjusted every 15 minutes.

Timing of Peak Flood Events

- The Ramapo River historically peaks prior to Pompton River.
- For the April ’07 Nor-Easter the Ramapo peaked 5 hours and 45 minutes ahead of the Pompton River.
- With gate operation, the peak flow on the Ramapo occurs 15 to 60 minutes earlier than it would under preconstruction conditions.

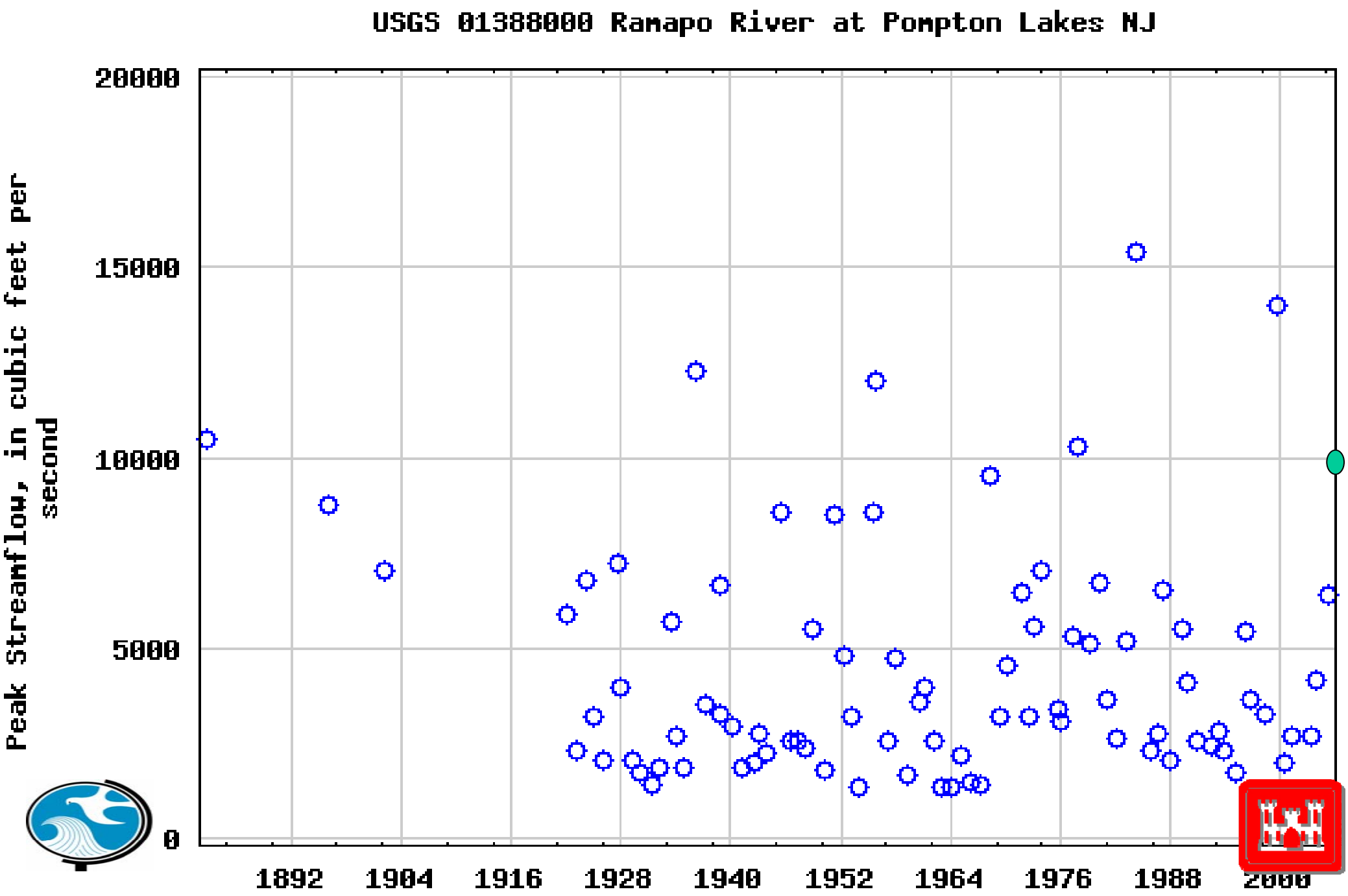
NEW YORK
NEW JERSEY
RAMAPO RIVER
WANAQUE RIVER
PEQUANNOCK RIVER
POMPTON RIVER
ROCKAWAY RIVER
WHIPPANY RIVER
PASSAIC RIVER
PASSAIC RIVER
NEW YORK CITY

WHAT IS A POST-FLOOD REPORT AND WHY WAS IT PREPARED?

- A post flood report documents the hydrologic, hydraulic, and meteorlogic aspects of flooding.
- For the April 2007 Nor'easter the post flood report was utilized as a tool to determine if gate operations at the Pompton Dam caused downstream flooding.

Comparison to other historical Events

- Flood data from the April 15-17, 2007 Nor'easter flood was compared to:
- pre-project conditions
- and recent past floods of
  - April 1984
  - Tropical Storm Floyd (September 1999)
  - April 2005 and October 2005.

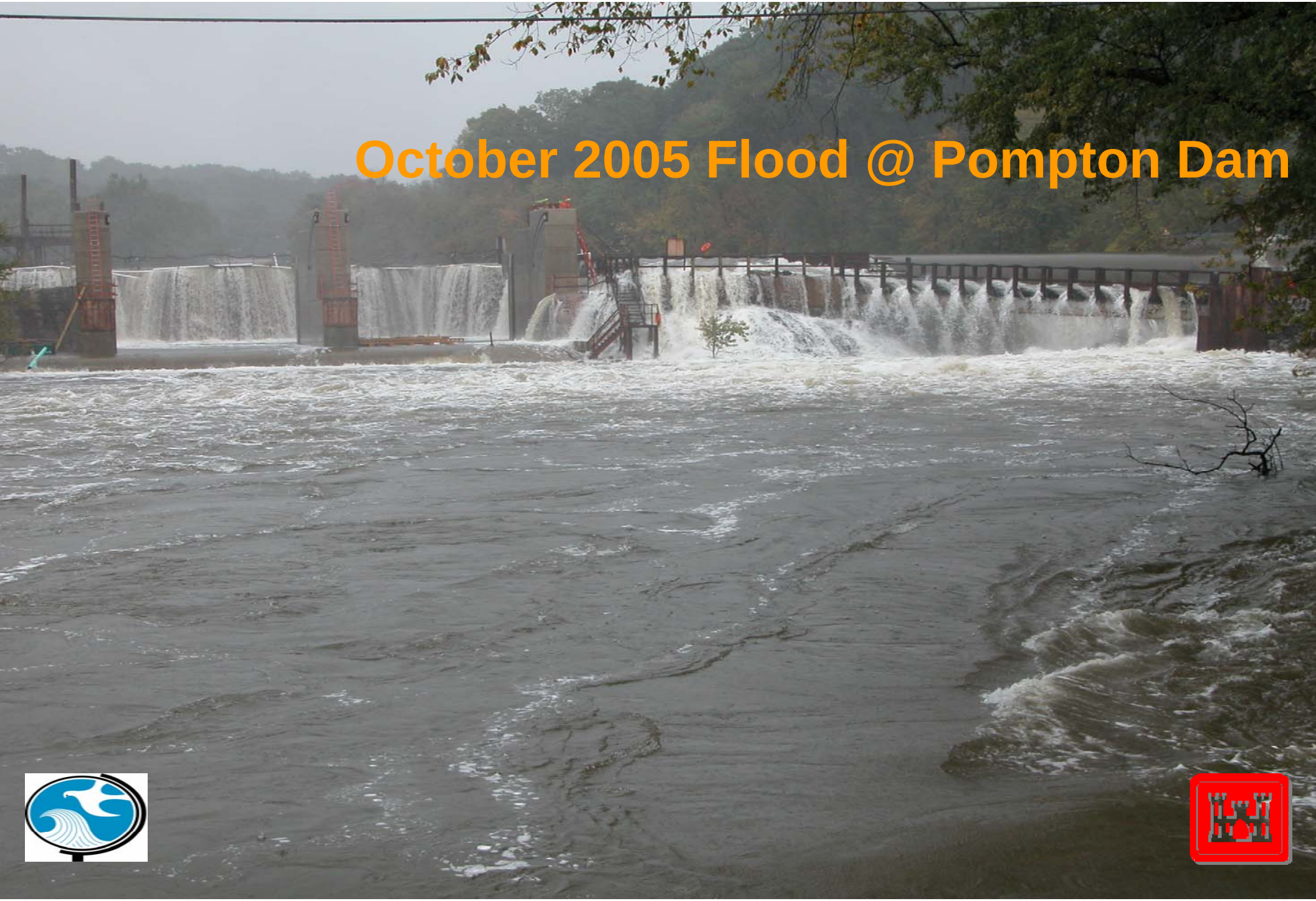

USGS 01388000 Ramapo River at Pompton Lakes NJ
Peak Streamflow, in cubic feet per second
20000
15000
10000
5000
0
1892
1904
1916
1928
1940
1952
1964
1976
1988
2000

April 1984 Flood @ Pompton Dam

POMPTON RIVER - WAYNE BACKGROUND
LINCOLN PARK - FOREGROUND

Tropical Storm Floyd Wayne NJ

Tropical Storm Floyd
Arial Rt 23 Wayne NJ Flood Wayne NJ


October 2005 Flood @ Pompton Dam

April 2007 Flood @ Pompton Dam

April 2007 Flood Paterson Hamburg Bridge

Residents Observations

"residents reported seeing [flood] water rise faster and sooner [during this most recent April 15-17, 2007 nor'easter flood] than during past floods."

Flood Rate of Rise Comparison Ramapo River at Pompton Lakes

- The average rate of rise:
- April 15-17, 2007, 0.27 feet per hour
- April 1984 flood, 0.40 feet per hour
- Floyd (September 1999), 0.31 feet per hour.
- April 2005 flood, 0.16 feet per hour
- October 2005 flood, 0.25 feet per hour.

Flood Rate of Rise Comparison Pompton River at Pompton Plains

- The average rate of rise
- April 15-17, 2007, 0.29 feet per hour
- April 1984 flood, 0.37 feet per hour,
- Floyd (September 1999), 0.29 feet per hour
- April 2005 flood, 0.25 feet per hour
- October 2005 flood, 0.31 feet per hour.

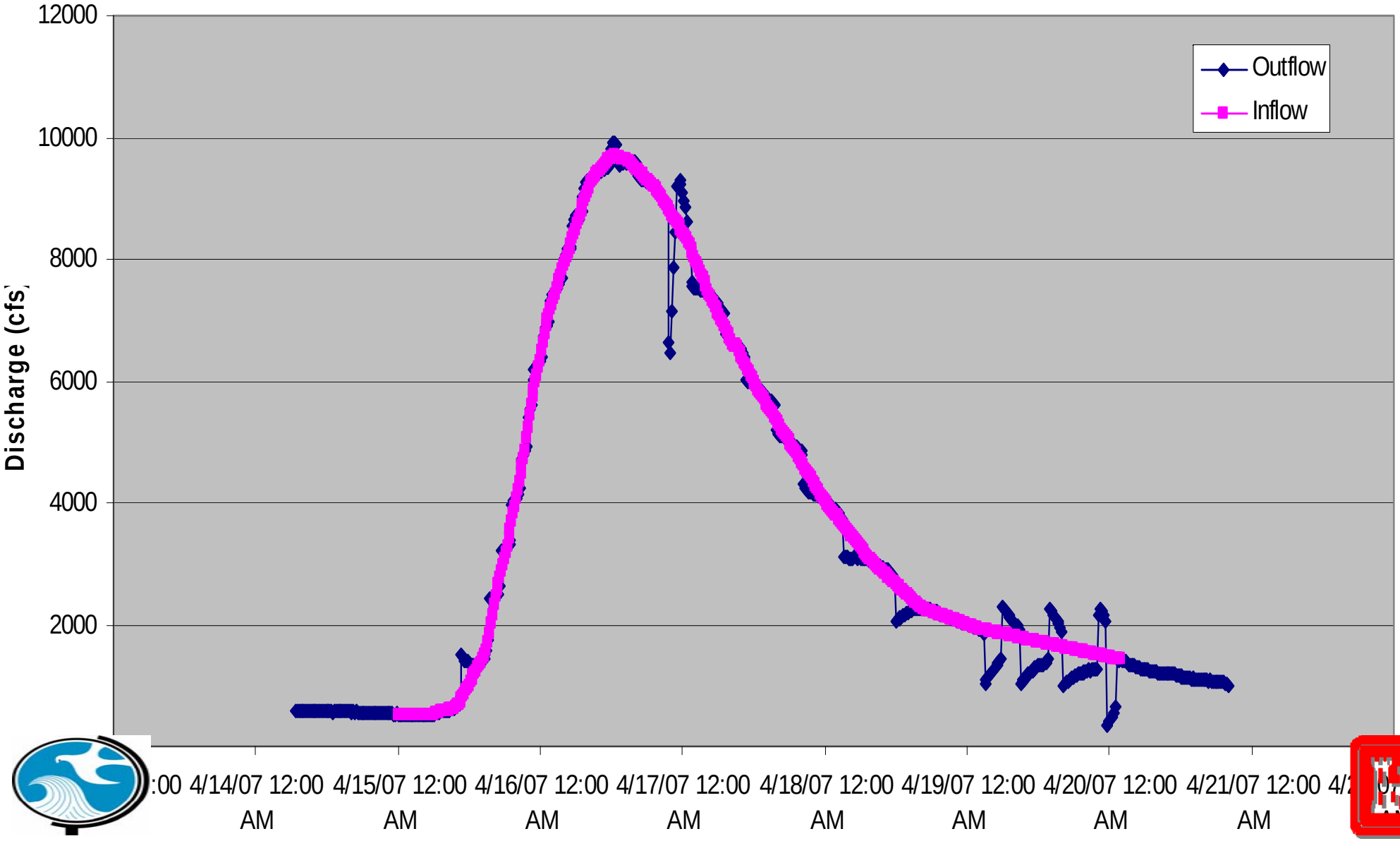
Residents Observations

"The water started to recede and then the gates were opened and we were flooded again."

Manual Gate Operations

- In response to local officials concerns regarding the gate operation and inundation of the Paterson-Hamburg Turnpike Bridge, once the peak of the flood had passed, manual operations were initiated.
- However, upon resumption of automatic operations, a programming safety feature caused the gates to reinitialize back to zero opening and reopen in steps every 15 minutes thereafter.
- The abrupt closing and opening of the gates resulted in a brief perturbation in the outflow hydrograph at Pompton Lake, but did not increase peak flood levels.

Ramapo River at Pompton Lake Dam

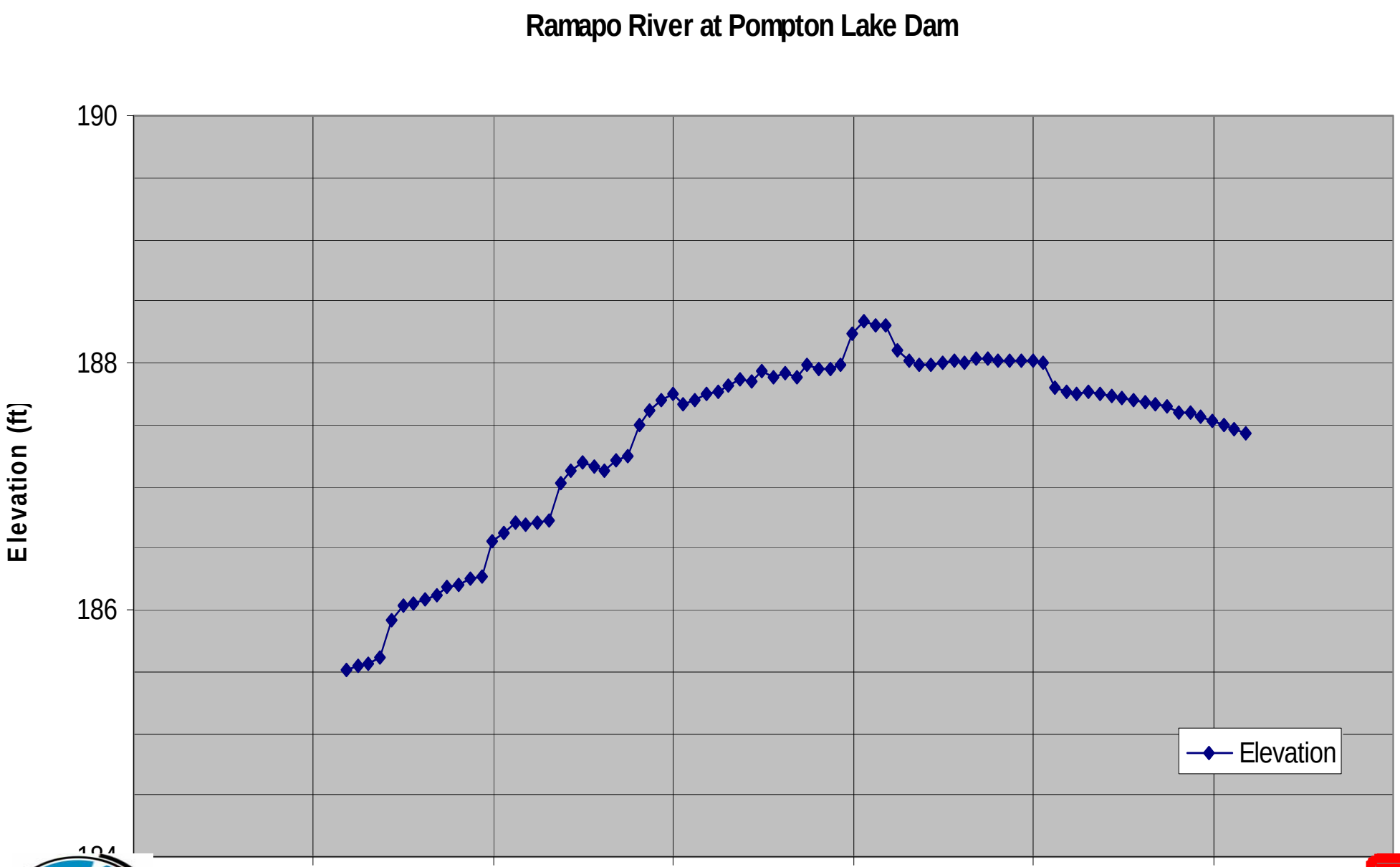


Residents Observations

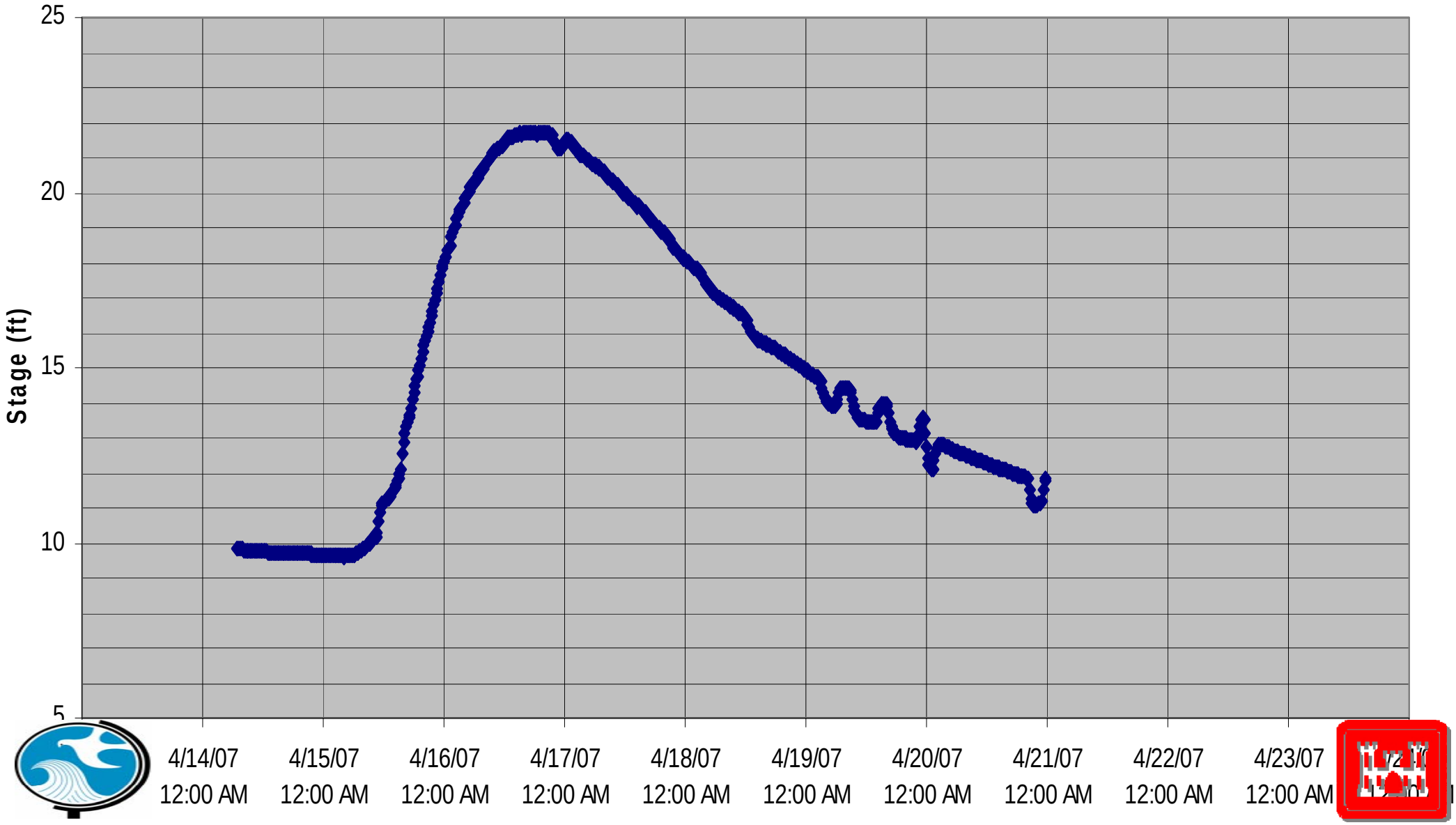
“The gates are sending more water downstream.”

Peak Flow Comparison to Preconstruction conditions

- A comparison yields an increase of 290 cfs out of 9,930 cfs.
- Above the Paterson-Hamburg Turnpike Bridge this resulted in an increase in water level of 0.26 ft, approximately 3 inches.
- At Dawes Ave, approximately 3000 ft downstream of the gates this resulted in an increase in water level of 0.13 ft, approximately one and a half inches.
- Pompton River at Pompton Plains shows no increase in water level due to the gate opening.


Ramapo River at Pompton Lake Dam
Elevation (ft)
190
188
186
Elevation
8:01
4/16/07 12:01 AM
4/16/07 4:01 AM
4/16/07 8:01 AM
4/16/07 12:01 PM
4/16/07 4:01 PM
4/16/07 8:01 PM
4/17

Pompton River at Pompton Plains



Residents Observations

- “There is a better way to operate the gates and would like the corps to study different options.”
- “Dredging is needed on the Wanaque, Pequannock, Ramapo and Pompton Rivers.”
- “Suggest that the gates be used to lower the water levels before a major storm.”

POST FLOOD REPORT FINDINGS:

- Operation of the gates during the April 2007 nor'easter had no measurable impact downstream.
- Areas that were flooded downstream during the storm would have been flooded to the same levels whether the project had been operating or not.