



LAKE WALLENPAUPACK



Lake Wallenpaupack Operations during the April 2005 Flood

Lake Performance Summary

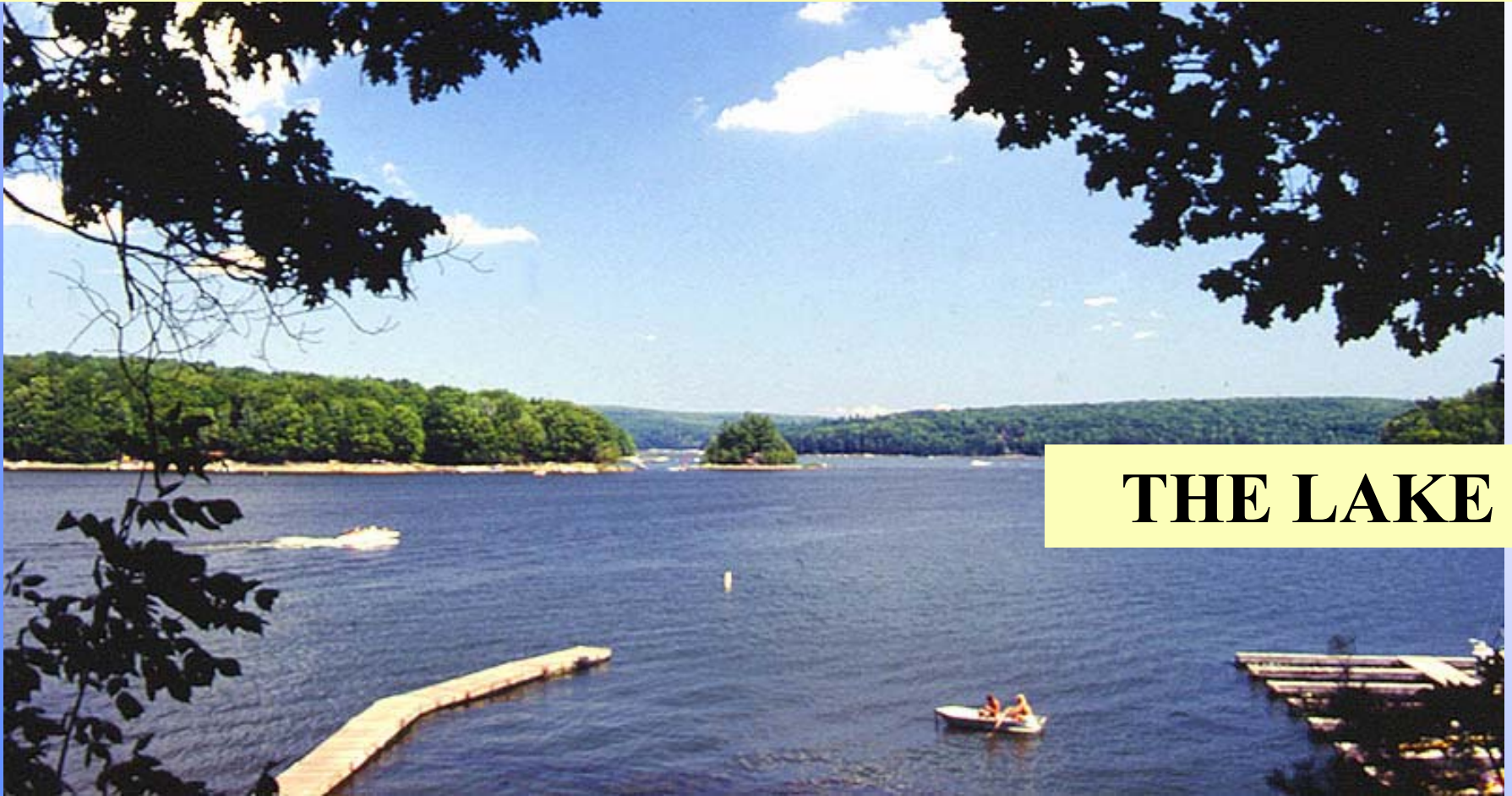
March-April Storm Event



- Over 14 BG of water stored between March 28 and April 3 including approximately 6.7 BG of water stored between April 2 and 3.
- Maximum water release of 8,000 cfs (6,300 cfs spill and 1,700 cfs plant release) - Approximately 13,000 cfs less than the peak inflow into the lake.
- Effect on Flood Levels.
 - Lackawaxen River - Approximately 4.5 foot reduction to flood stage.
 - Delaware River - slight reduction to flood stage at Port Jervis and no measurable effect at points further south along the river.



- **Project constructed in 1926**
- **228 Square Mile watershed (Approx. 6.5% of the watershed at Port Jervis)**
 - **5700 Acre Lake at Normal pool level -- 13 miles long**
- **Approx. 38 BG of water stored between El 1165 and normal maximum El 1187**
- **Approximately 5.5 BG of flood storage between El 1187 and El 1190 (Point at which spills must begin)**
 - **Approximately 19.5 BG of flood storage space above El 1190**



THE LAKE

THE MAIN DAM & PIPELINE

Dam

Concrete non-overflow and an adjacent earthen embankment.
Concrete sections Top - El 1200
Earthen Dam Top - El 1203
Combined length 1272 feet
135' Spillway section with 2 roller gates (Top El = 1190)
Designed for PMF hydrology - relies on spills to ensure dam safety

Pipeline

3.5 mile, 14 foot diameter, 1700 cfs capacity --All releases, except spills, are diverted through the pipeline



Surge Tank

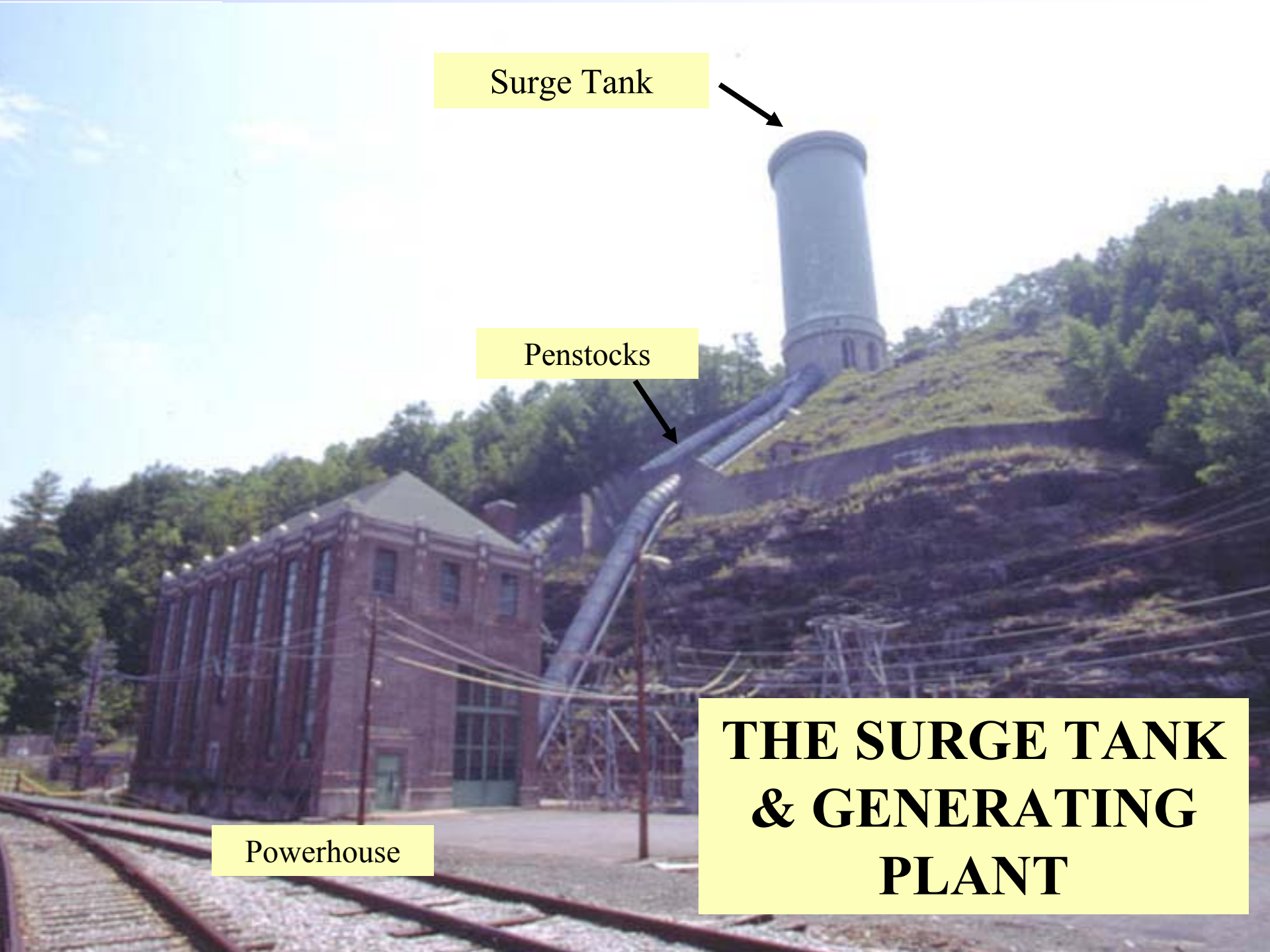


Penstocks



Powerhouse

**THE SURGE TANK
& GENERATING
PLANT**





Project Operations - Lake Management

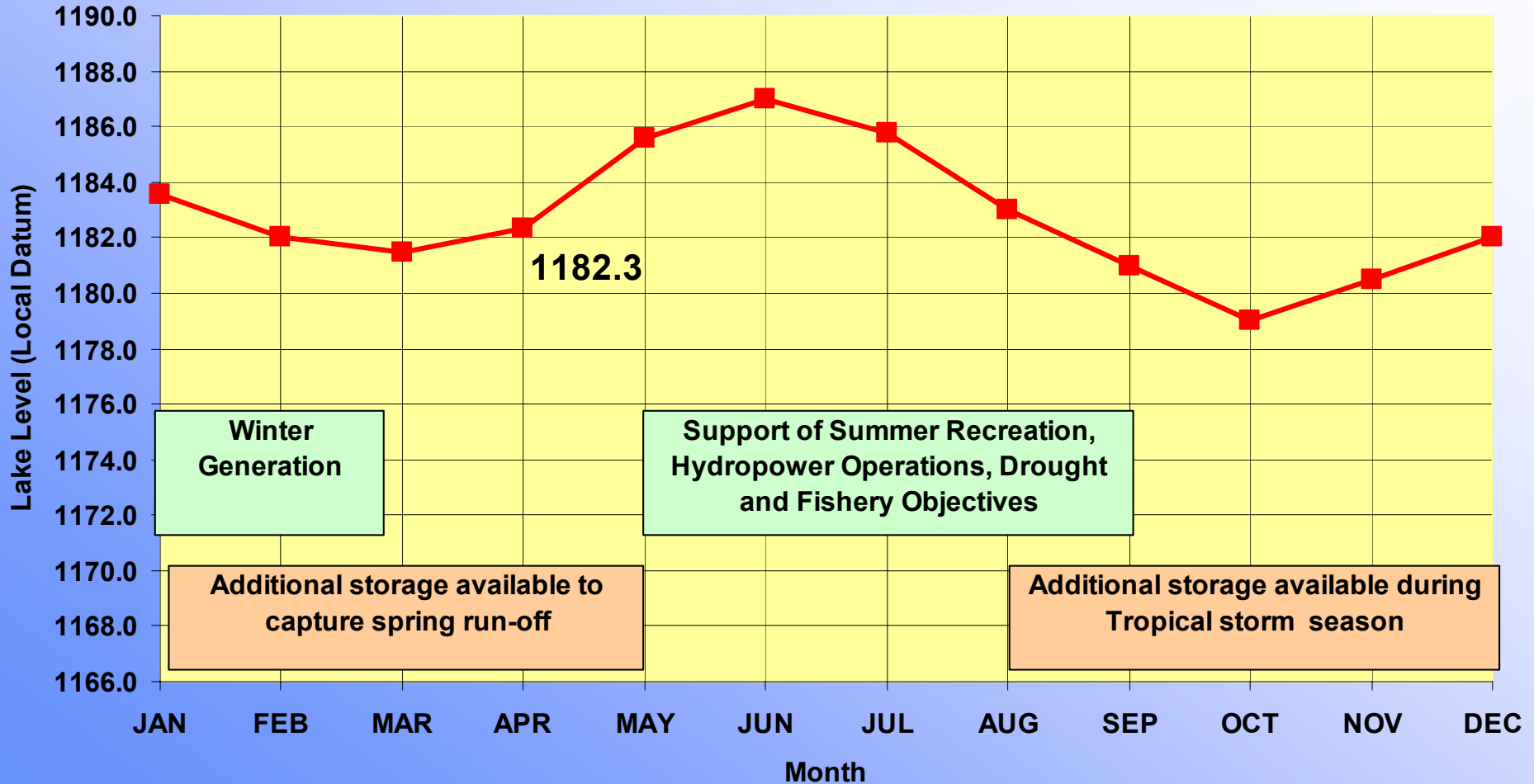


- **Lake is managed to monthly lake level targets (rule curve - historically variable) for multiple and “balanced” objectives**
- **Hydroelectric Power Generation**
 - **Peaking - System Reliability**
- **Lake & Downstream Recreation**
- **Fisheries Management**
- **Delaware Basin Drought Assistance**
- **Seasonal Flood Control**



LAKE WALLENPAUPACK

FIRST OF MONTH NORMAL LAKE LEVEL TARGETS



Lake Target Elevations debated and established or reconfirmed during three years of relicensing studies (1999-2002) and supported by a “consensus” of federal, state and local stakeholders.

Designed to support multiple-purposes and needs.

All uses and needs were equally considered (“Balanced” Operations).

Greater Use for one purpose (Ex: flood control) will impact or eliminate other important uses.

FLOOD OPERATIONS

Project Spills



- **Design Spill under Probable Maximum Flood (PMF) = 80,000 cfs**
- **Flood of Record (1955) = 24,000 cfs**
- **Flood Insurance Study (FIS) 100 year flood = 12,000 cfs assumed**
- **On average spills have occurred approximately once every ten years in 79 year project history**
- **PPL operates where feasible not to spill (Ex: Hurricane Ivan - No spill)**

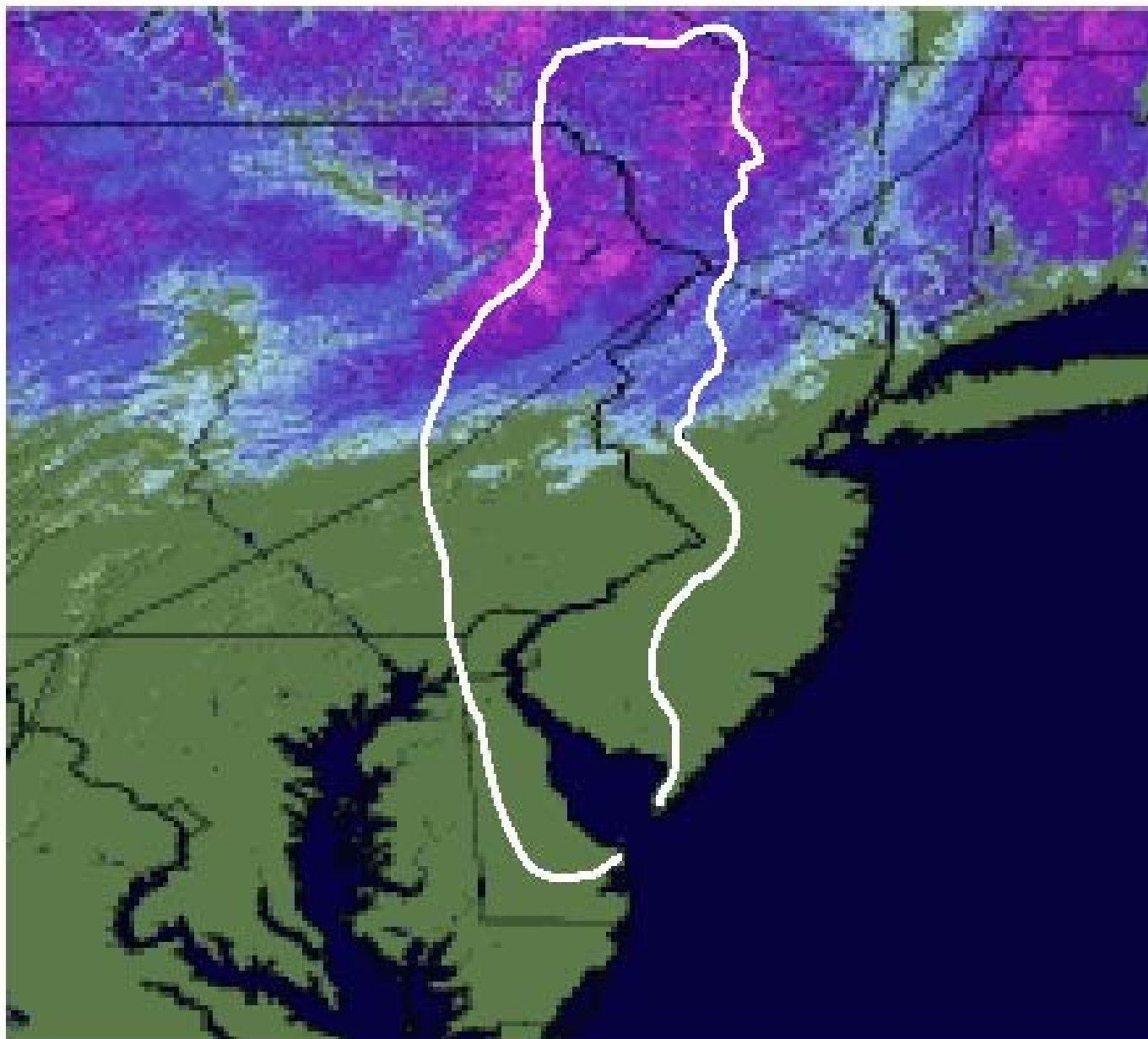


MARCH - APRIL 2005 Event

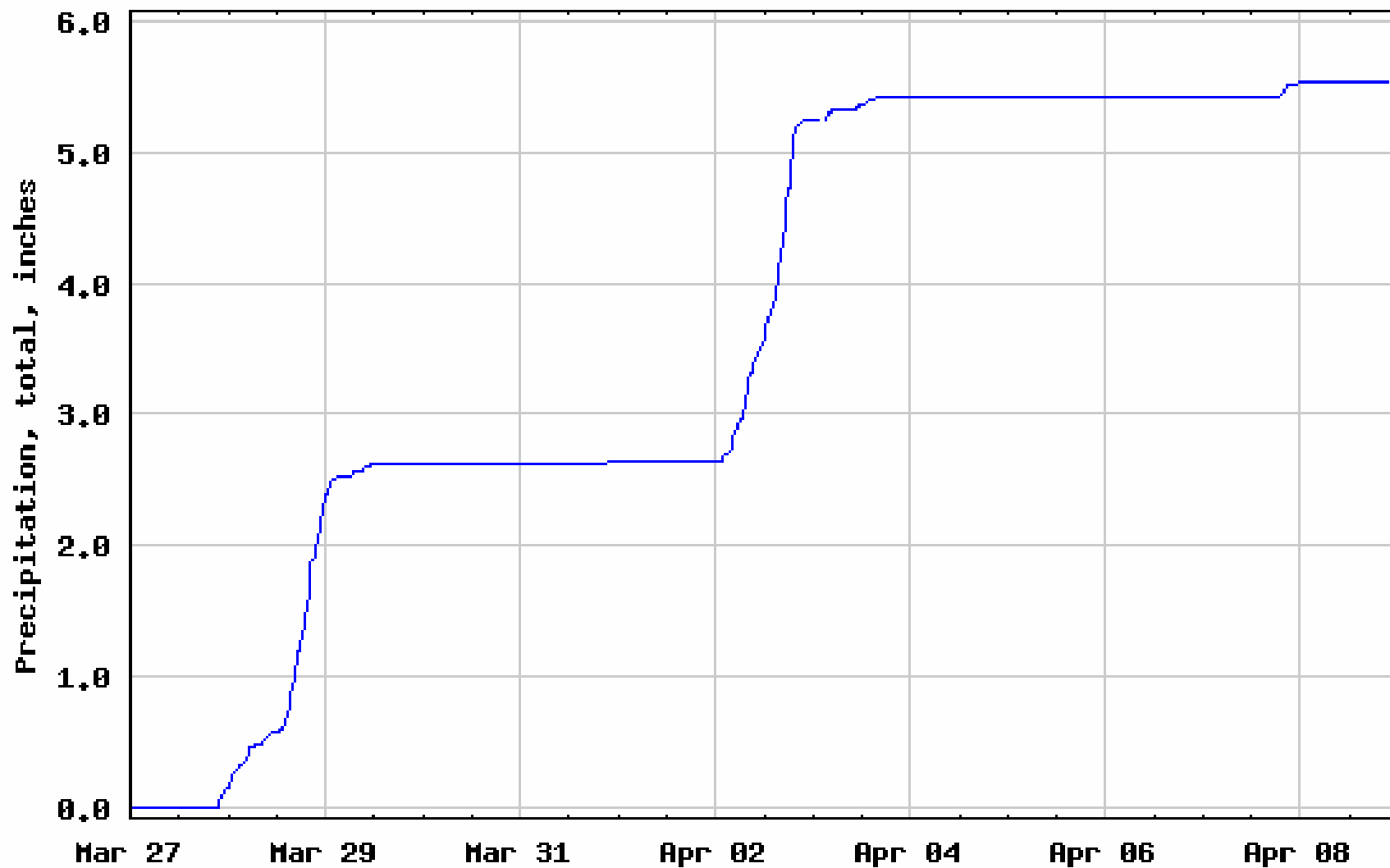
Snowpack Water Equivalent

March 27, 2005

Heavy March
snowfall
dramatically
increased
snowpack
conditions in
the Lake
Wallenpaupack
watershed

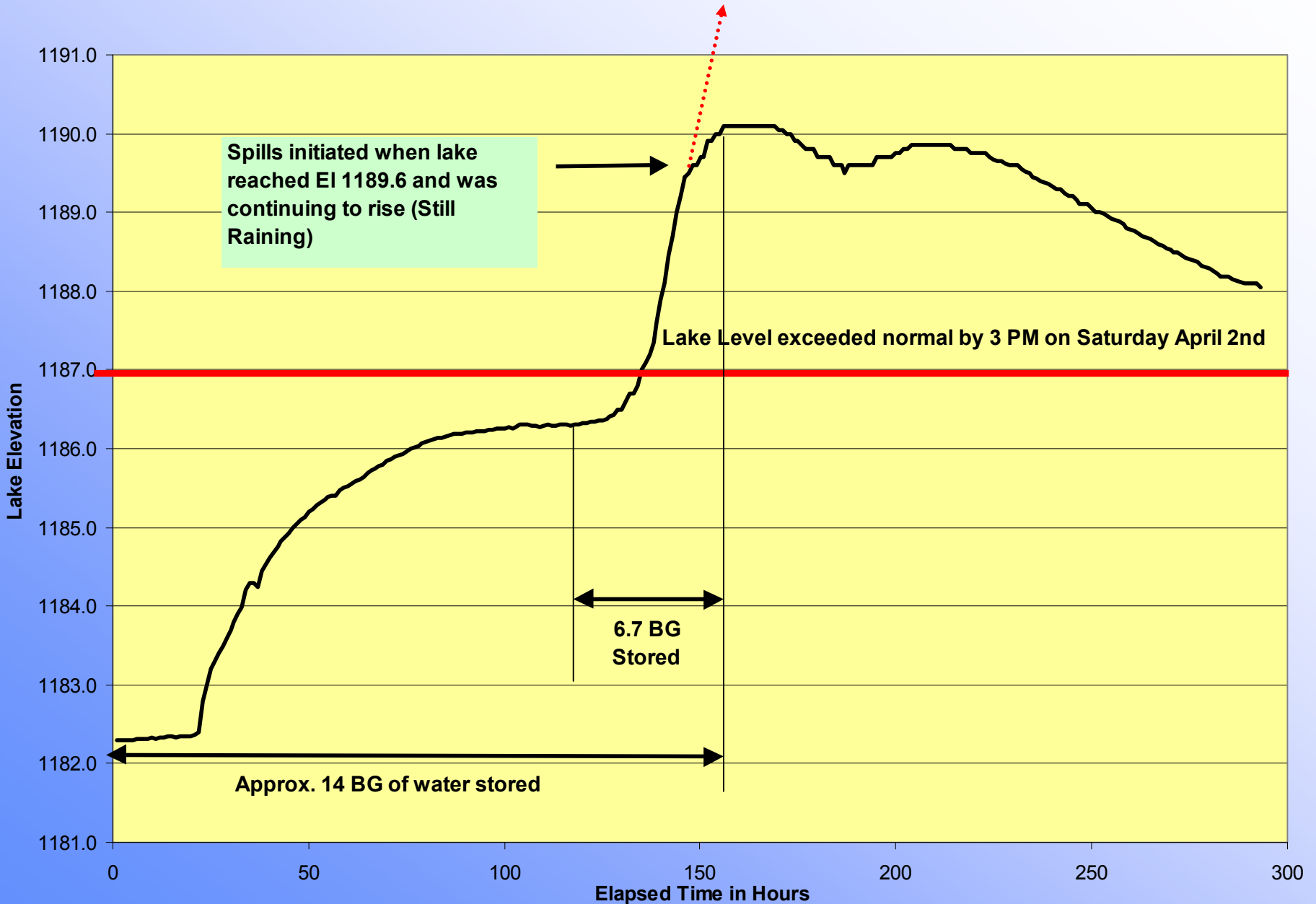


USGS 01431500 Lackawaxen River at Hawley, PA

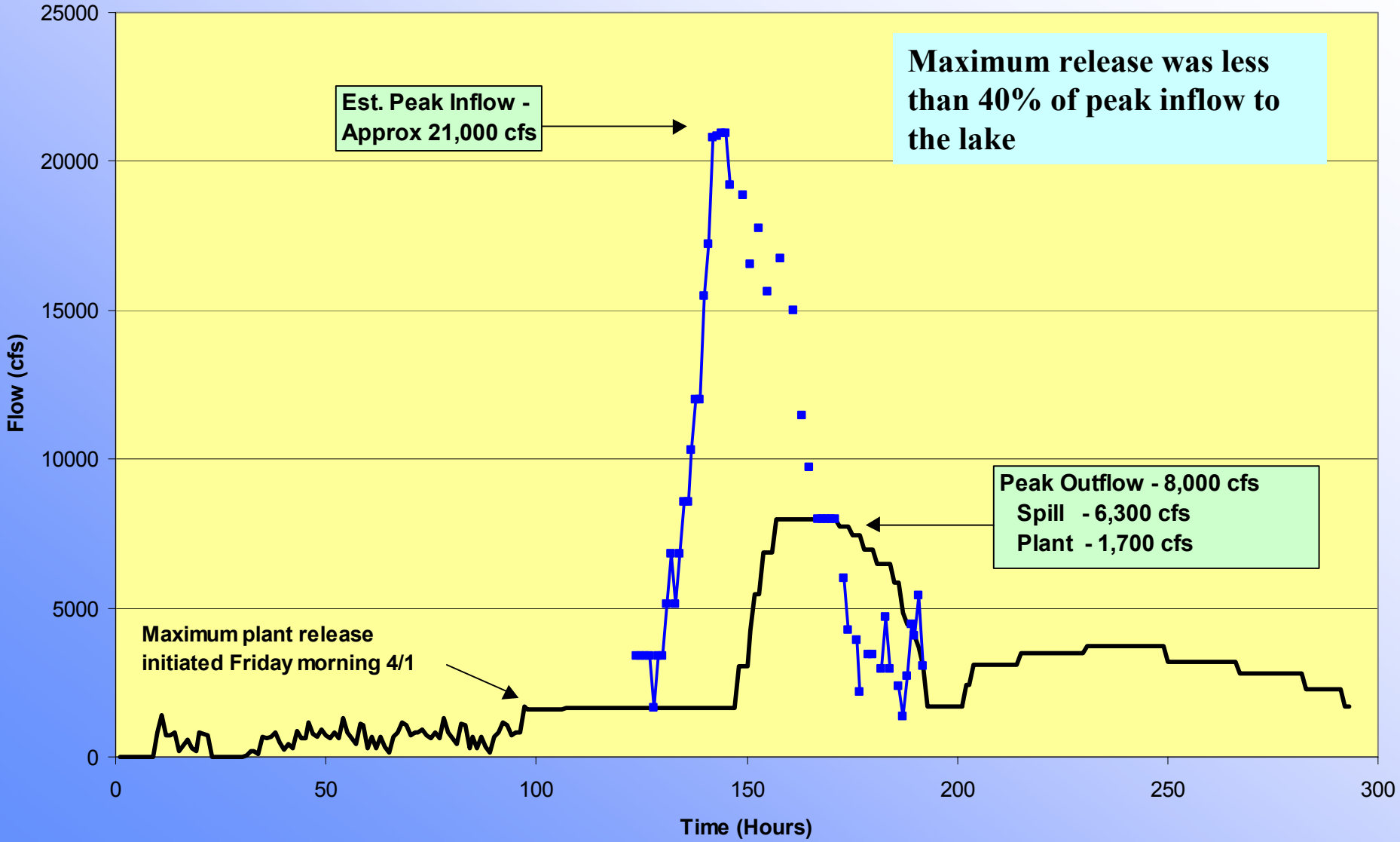




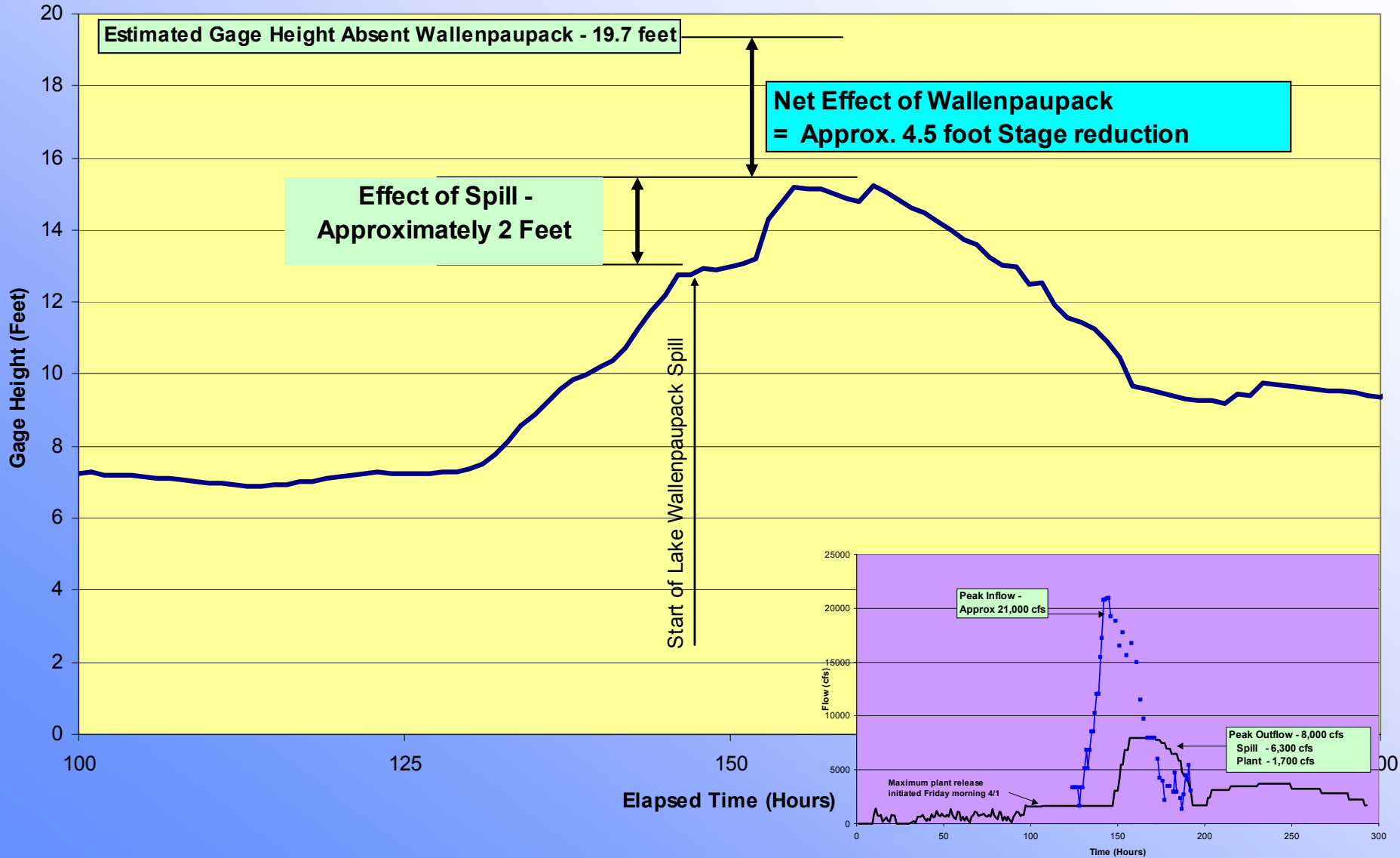
Lake Wallenpaupack Elevation March 27 to April 8



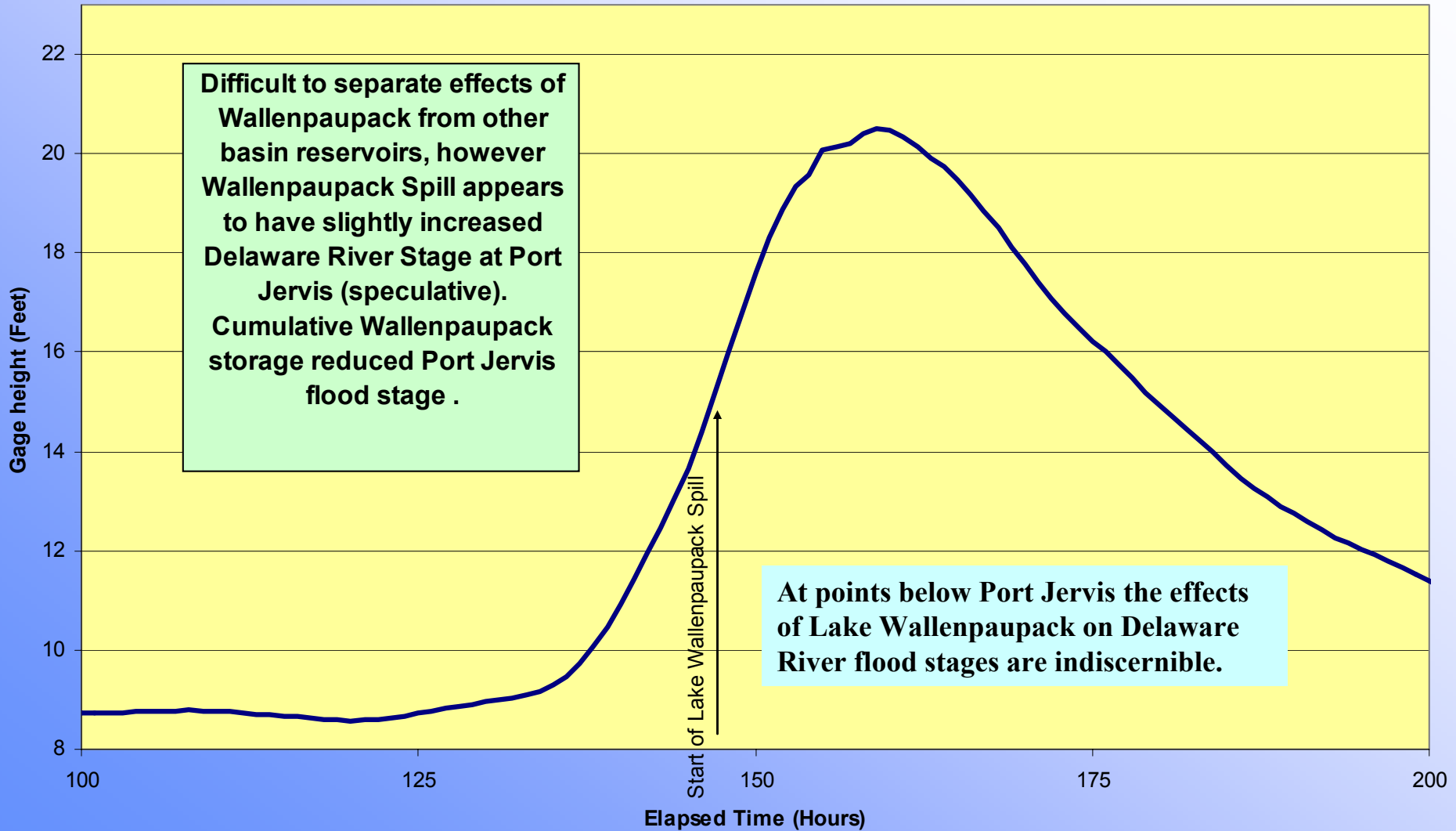
Lake Wallenpaupack Routing of March-April 2005 Flood



Hawley Gage Data 01431500 - Gage Height, feet



Port Jervis Gage Data 01434000 Gage height, feet



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Lessons Learned



- **Public Notification under our spill procedure has been modified and improved in consultation with local EMA officials.**
- **Storm forecast accuracy improvements and improved data availability (Ex. experimental snowpack data) provide the opportunity for enhanced flood control operations going forward.**

