



**Environmental
Protection**

GILBOA DAM

Post-Hurricane Briefing

September 6, 2011

Agenda

- Introductions
- 5-Day EAP Post Incident Report
- Ongoing Actions

Gilboa Dam Post Hurricane Briefing

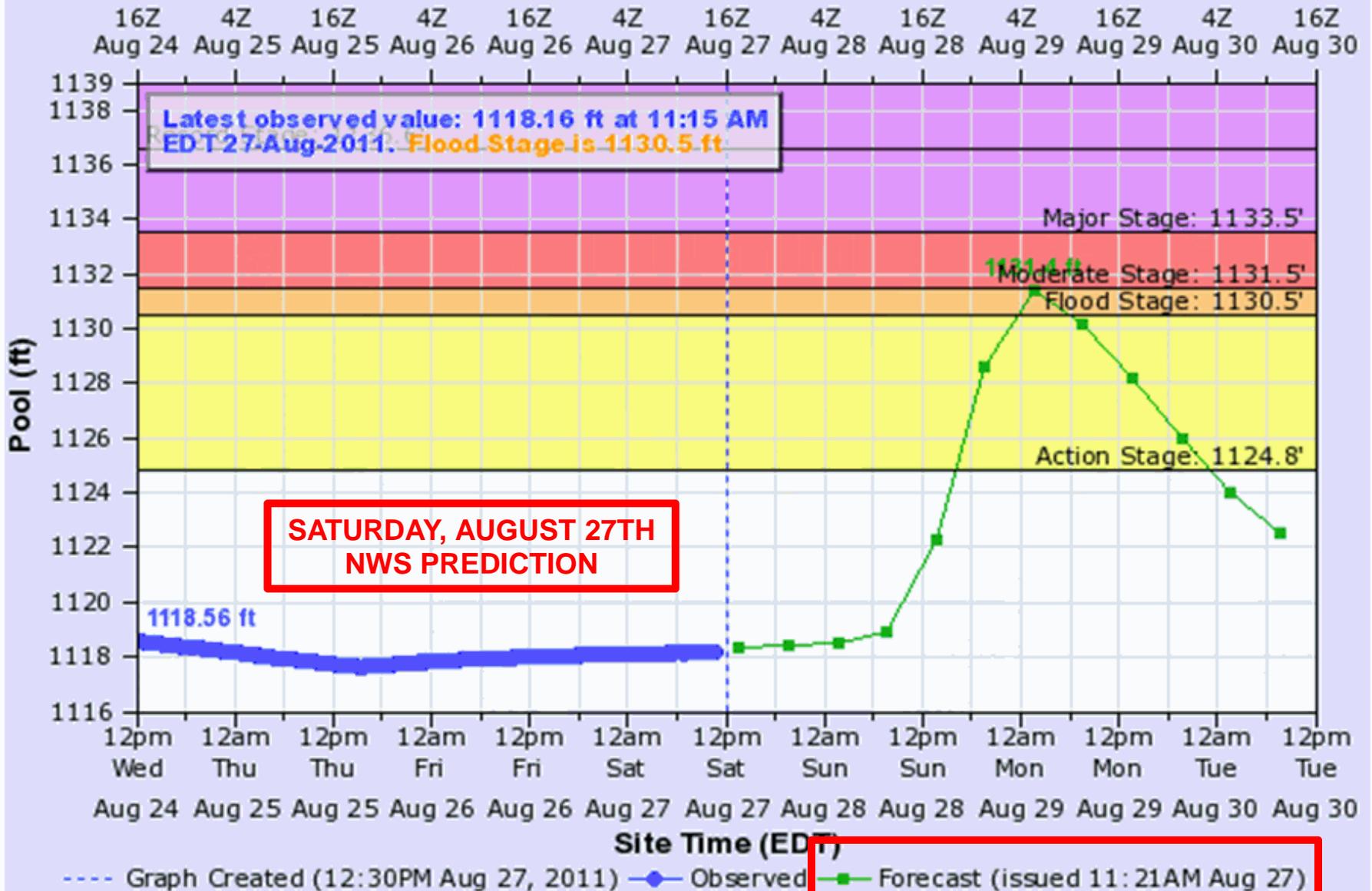
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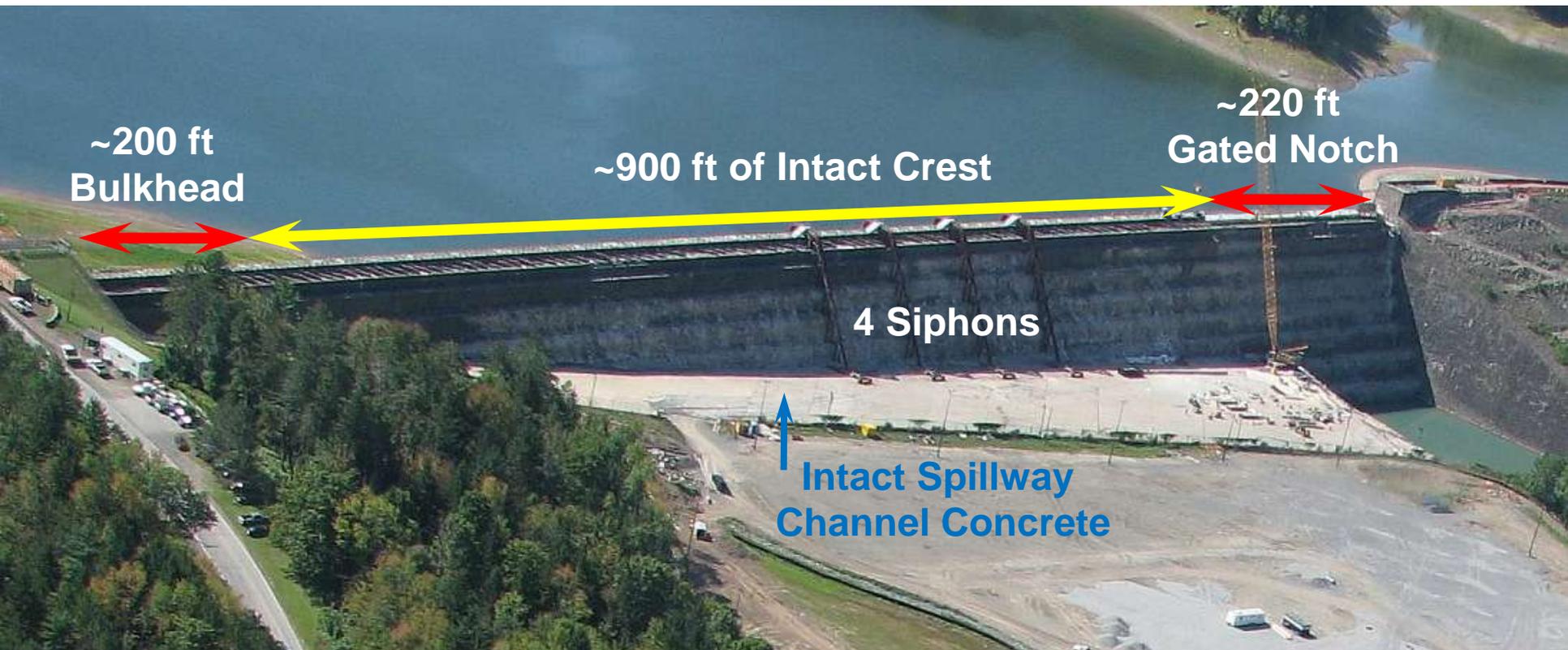
Pre-Storm Forecast

SCHOHARIE CREEK AT GILBOA DAM

Universal Time (UTC)



Pre-Storm Conditions – Saturday, August 27



Key Spillway Control Section and Side Channel Features

Pre-Storm Conditions – Saturday, August 27

- Gates are installed in 220' notch
- Gates maintained in lowered position
- Hydraulic Control Elev. 1125.07 ft (i.e., crest)
- Pre-storm pool elev. 1118.04 ft
- Equipment and materials fully evacuated by Saturday night

Original Crest,
~900' intact



Pre-Storm Conditions – Saturday, August 27

Bulkhead Configuration

- Erected in Monoliths M0-M3, approx. 200' long
- Approx. 4½' high, top Elev. 1130.0 ft
- Upstream fill to ~Elev. 1132 ft
- Upstream rock protection



Pre-Storm Preparations

- All equipment, materials, and debris removed from spillway and channel by Saturday night
- Siphons operation briefly suspended to facilitate demobilization
 - Shut down Friday, August 25th
 - Restarted Saturday, August 27th at 2 p.m.
 - Ahead of storm during August:
 - Released thru siphons – 2.8 BG
 - Diverted thru tunnel – 2.4 BG
- 24-hour dam surveillance ongoing

Storm Overview

Rainfall

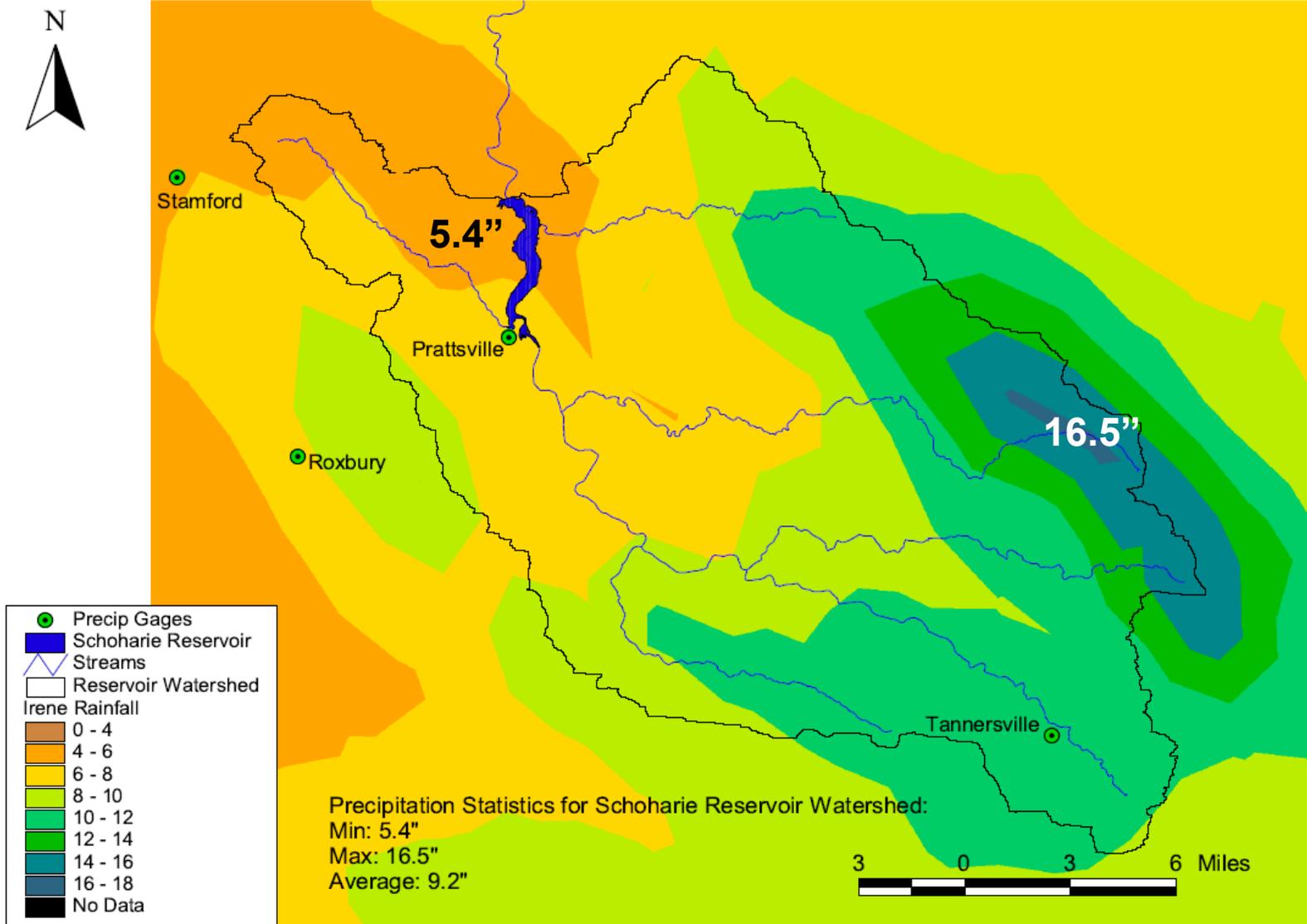
- August 26th 5-day rainfall forecast \approx 4-8 inches
- Actual \approx 5.4-16.5 inches in Schoharie Reservoir Watershed (< 24 hours)

Reservoir Level

- Peak reservoir level predicted \approx 1131.8 ft
- Actual peak reservoir level \approx 1137.97 ft
- Previous record level = 1136.68 ft

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Schoharie Reservoir Watershed
NEXRAD Data
Period 08/25/2011 to 08/31/2011



Precipitation Data Source: NOAA Advanced Hydrologic Prediction Service.

Event Time Line- August 28, 2011

- **0630** DEP Engineer from Ashokan departs for Gilboa
- **0900** DEP Engineer reports that he is unable to reach site, another engineer is dispatched
- **1040** First section of temporary bulkhead fails, reservoir elevation at 1131.75'
- **1200** Reservoir elevation 1136.53'- NWS predicting water surface to exceed record elevation
- **1204** Extensometers go into alarm condition, however deflection indicated is within acceptable range, shortly thereafter communications are lost with equipment

NYC DEP Type "B" Incident Declaration

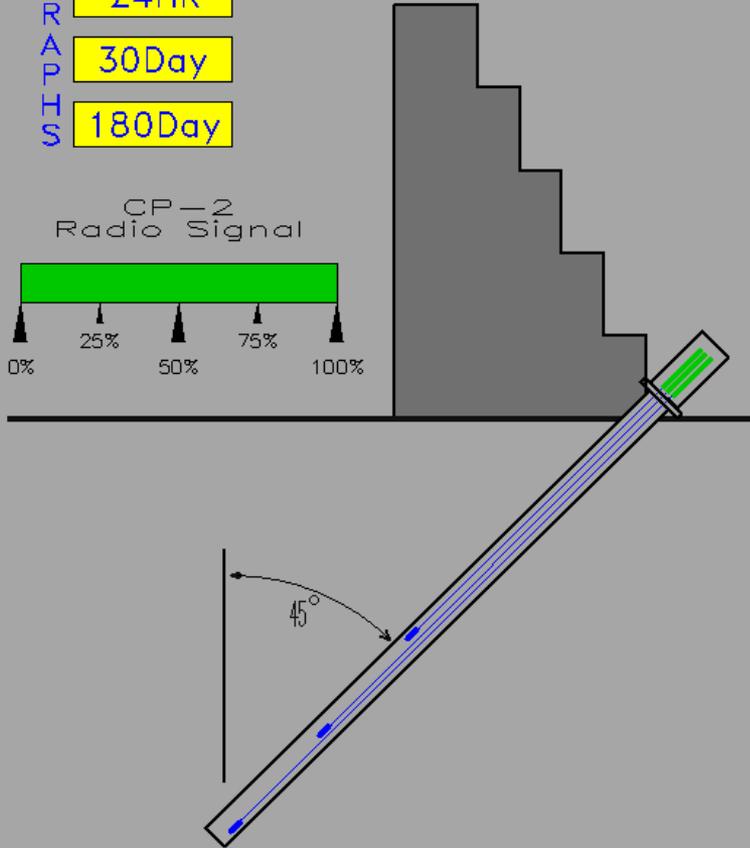
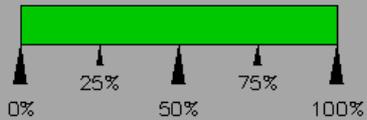


GILBOA DAM EXTENSOMETERS

GRAPHS

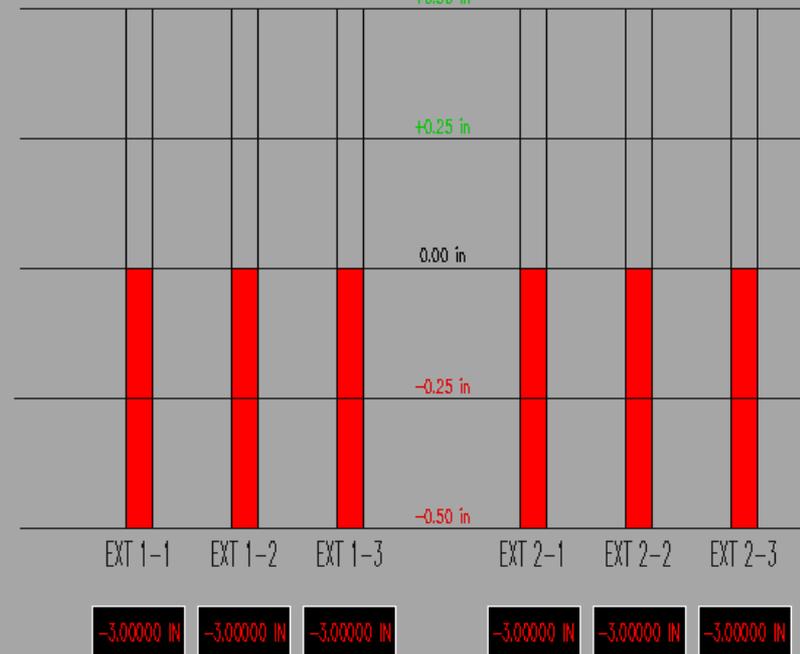
- 24HR
- 30Day
- 180Day

CP-2
Radio Signal



STATION 11+70

STATION 12+20



Wh - 10/16/2016

F4 PREVIOUS GRAPHIC

F5 GRAPHIC INDEX

F6 SYSTEM OVERVIEW

F7 NETWORK OVERVIEW

F8 RESERVOIR LEVELS

F9 PLOG PRINT

F10 PHONE NUMBERS

MAP

Event Time Line- August 28, 2011

- **1205** DEP and consultant engineers conduct conference call regarding developments at the dam
- **1215** DEP activates the EAP as a Type “B” Incident- “a potentially hazardous situation is developing”- the video feed to the site is lost
- **1215** Communications with elevation monitoring equipment remain intact
- **1350** DEP Engineer arrives on site
- **1430** Reservoir crests at 1137.97’
- **2140** Consulting engineers arrive on site

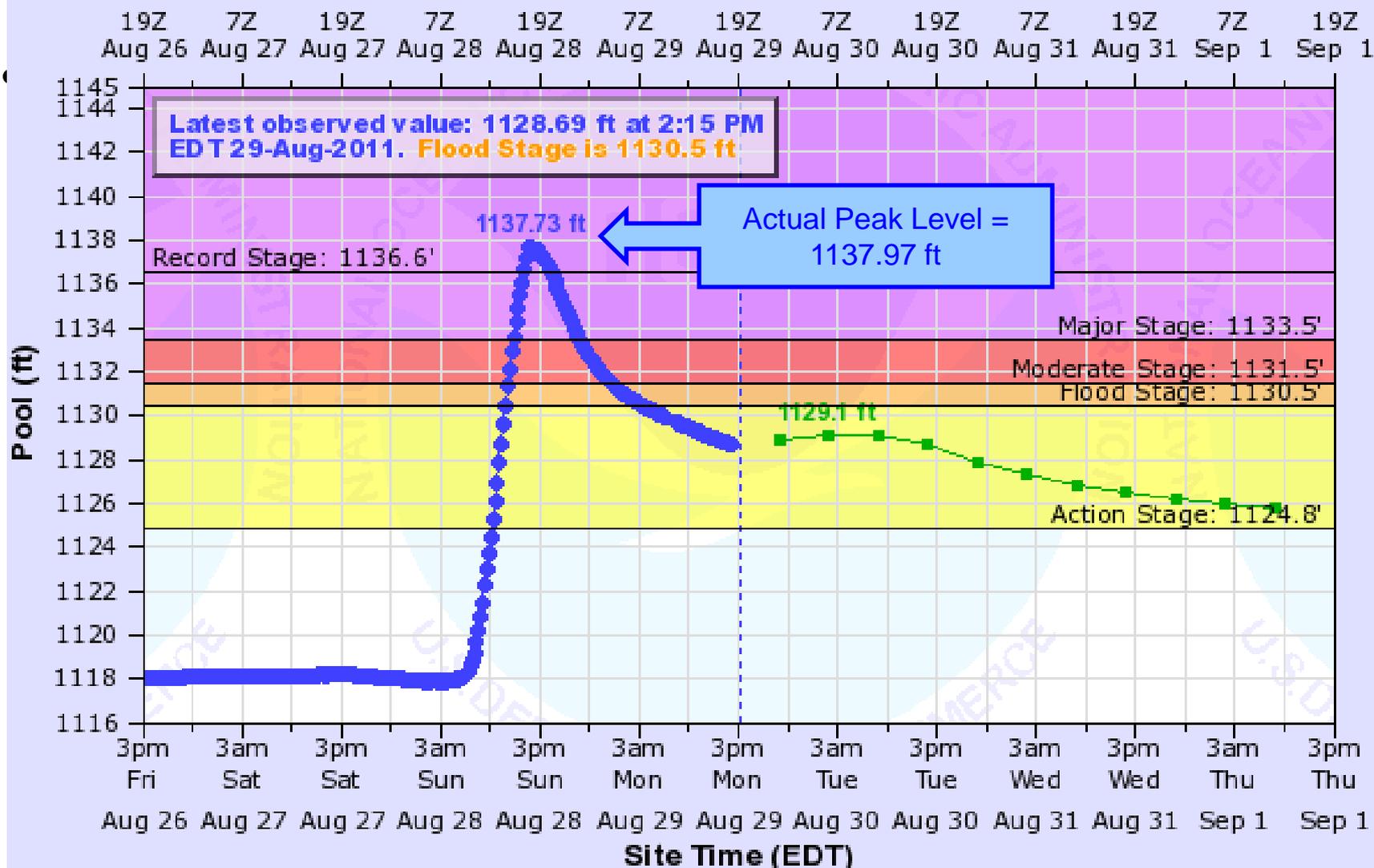
Storm Overview

- Average reservoir basin rainfall = 9.2 inches
- Peak estimated reservoir inflow \approx 120,000 cfs
- Peak estimated reservoir outflow \approx 110,000 cfs
- Estimated storm frequency, 200+ year flood
- Storm far exceeded prior flood of record (Jan 1996)
- Peak reservoir outflow (1996 flood) = 70,800 cfs

Schoharie Reservoir Levels

SCHOHARIE CREEK AT GILBOA DAM

Universal Time (UTC)



--- Graph Created (3:15PM Aug 29, 2011) ● Observed ■ Forecast (issued 10:46AM Aug 29)

Post-Storm Inspection and Conditions

- Inspection of Dam – Sun thru Wed (Aug 28-31)
- Incident Report submitted Friday, September 2nd
- Conditions observed:
 - Loss of power and instrumentation feed at site
 - No apparent damage to spillway control section or embankment
 - Erosion in certain areas of Spillway Channel (3 locations)
 - Significant damage to Contractor work area and temporary on-site facilities
 - Significant stream channel and bank erosion
 - Significant debris accumulation in reservoir

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8/31/11



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8/28/11-1515

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8/31/11



Post-Storm Actions and SOPs

- Initial structural inspection of dam (Aug 28-31)
- Enhanced monitoring plans
- Instrumentation feed damage assessment
- Emergency contract initiation:
 - Spillway Channel and Siphon Repairs
 - Staging Area Debris Removal
 - Staging Area Restoration
- Continued operation of siphons
- Reservoir debris removal

Actions Moving Forward

- Instrumentation feed restoration
- Detailed structural inspection of dam
- Make emergency contract repairs:
 - Spillway Channel and Siphon Repairs
 - Staging Area Debris Removal
 - Staging Area Restoration
- After-Action EAP review with County

Conclusions

- Storm much larger than predicted
- Record inflow and outflow at Schoharie Reservoir
- “Type B” activation out of an abundance of caution
- Post storm analysis indicates dam was and is structurally sound
- Repairs being implemented as soon as possible

QUESTIONS?