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of Engineers
Portland District

Water Management Update FLRCDL

April 2008

Willamette Valley Project



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Vision

- The Willamette Valley Project provides reliable flood damage reduction and hydropower production, effective natural resources stewardship and quality public recreation opportunities while balancing competing demands, fostering sustainability, and meeting the needs of customers.



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Objectives

- Overview of the Willamette Valley Project
- 2007 water year summary
- Current conditions/flow forecast
- Current issues update
- Questions and answers



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Project History

- **1936** - Congress passes Flood Control Act authorizing Corps to survey flood problems in Willamette Basin
- **1938** - Flood Control Act provides for first seven storage reservoirs



1894 flood, downtown Portland,
Willamette River



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Authorized Purposes

- Flood damage reduction
- Hydropower
- Navigation
- Irrigation
- Fish & wildlife
- Recreation
- Water quality
- Municipal & industrial



Dexter Dam



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Flood Damage Reduction

- Total project controls 27% of the runoff area in the Willamette Basin
- \$20 billion in flood damage reduction to date (current estimates more than \$1 billion annually)



Lookout Point Dam



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Hydropower

- 8 hydropower plants
(10.6% of Corps plants)
- 16 power generating units
with 429 megawatt capacity
- 1.2 million MWH produced in
2007 at a market value of over
\$82.8 million



Big Cliff Dam & Powerhouse



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Fish and Wildlife

- Nationally recognized stewardship for critical habitat and threatened, endangered and sensitive species including:

- Fender's blue butterflies
- Kincaid's lupine
- Western pond turtles
- Red-legged frogs
- Bald eagles
- Migratory songbirds
- Oregon chub
- Winter steelhead
- Spring Chinook salmon
- Bull trout





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Recreation

- Over 3 million annual visitors
- \$86.3 million in economic benefits annually
- 4 campgrounds, 19 day-use areas, and 6 boat ramps managed by Corps
- 19 campgrounds, 32 day-use areas, 27 boat ramps, and 8 marinas managed by lease agreements



Detroit Lake



Pine Meadows CG



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Water Management

- 13 dams in the Willamette Basin are operated as a single system
- Corps must balance between competing authorized purposes
- Regulation decisions include collaboration with partners





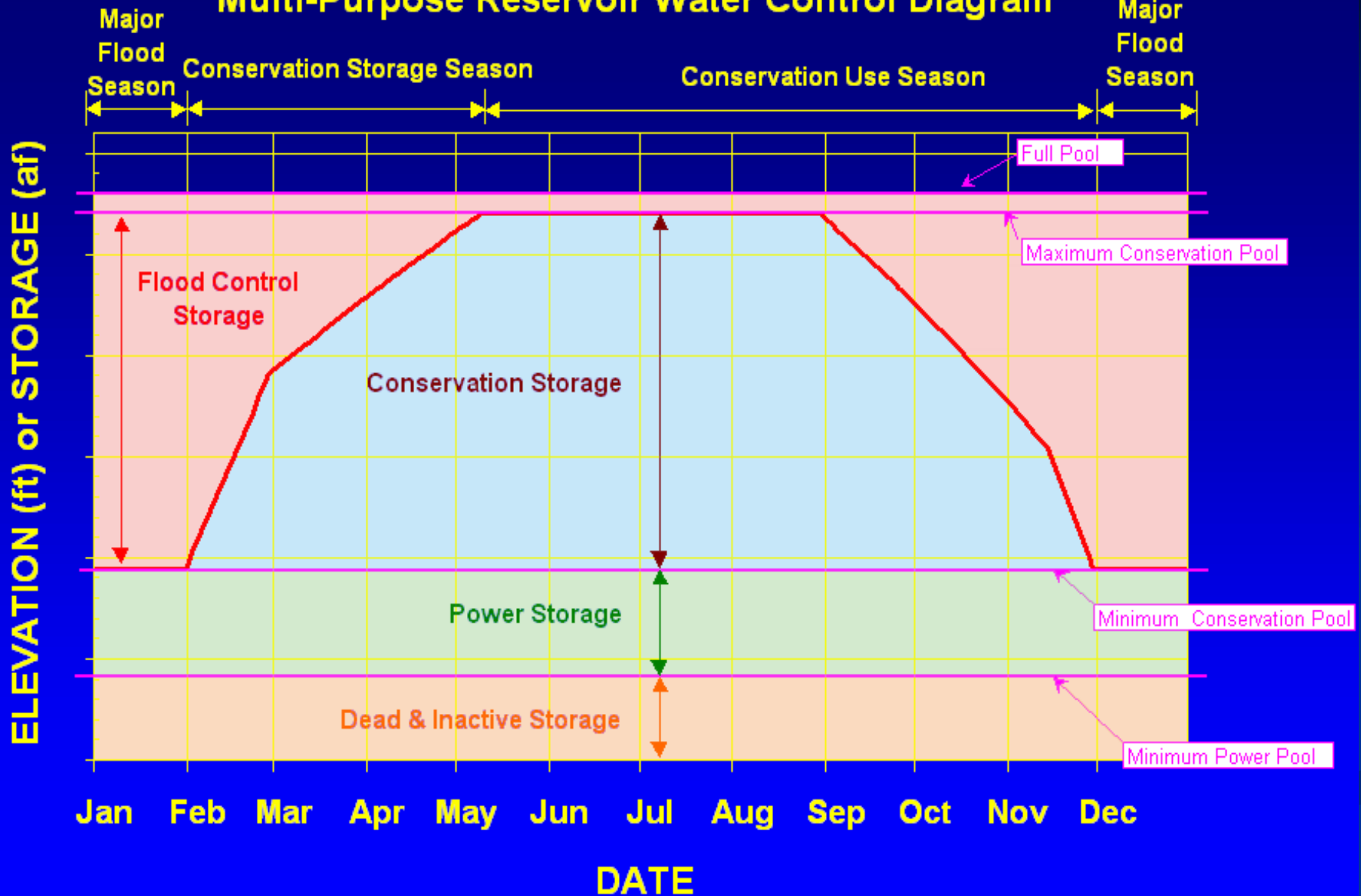
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Water Management Partners

- Corps
- NOAA
- Bonneville Power Admin.
- US Bureau of Reclamation
- US Fish & Wildlife
- US Forest Service
- OR Dept. of Fish & Wildlife
- OR Water Resources Dept.
- OR Dept. of Env. Quality
- OR Dept. of Agriculture
- The Nature Conservancy
- County/local authorities
- Elected officials
- Hatcheries
- OR State Marine Board
- OR State University
- City of Corvallis
- City of Eugene
- City of Salem
- City of Springfield
- City of Cottage Grove
- City of Oakridge
- USGS

Multi-Purpose Reservoir Water Control Diagram

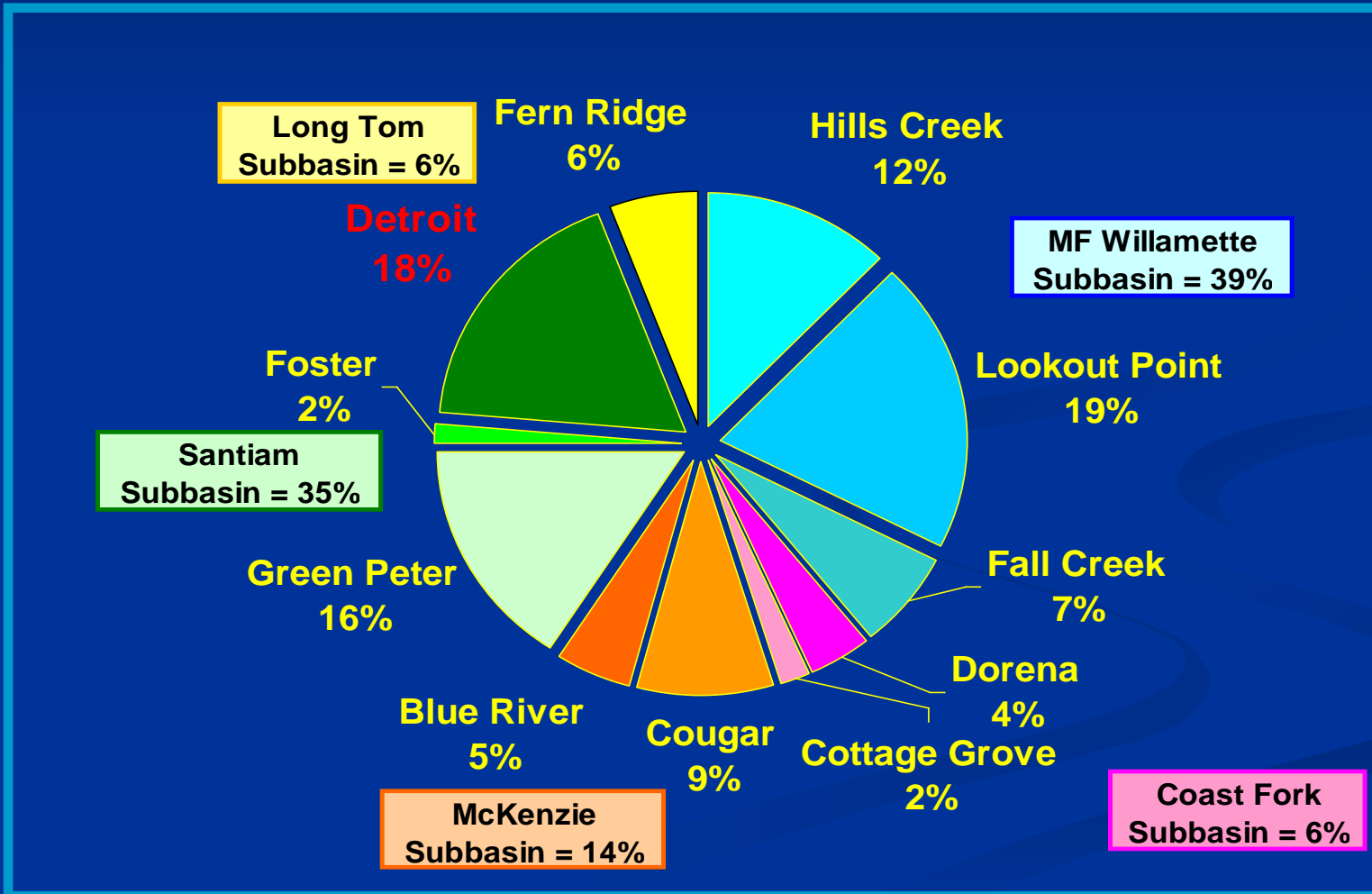




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WVP Conservation Storage

Total = 1.6 million acre-feet





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WVP Conservation Season Operating Criteria

- Minimum instream flows for fish and water quality
- Tributary flows for fish (Apr-Oct)
- Mainstem flow augmentation for fish and water quality (Apr-Oct)
- Water for out-of-stream needs
- Refill and drawdown priorities
- Special operations



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Minimum Tributary Flows for Instream Water Rights, Fish, Water Quality & Recreation

(April - October)

■ Hills Creek	400 cfs	■ Blue River	50 cfs
■ Lookout Point	1,200 cfs	■ Fern Ridge	50, 30 cfs
■ Fall Creek	80, 200 cfs	■ Green Peter	50 cfs
■ Cottage Grove	50 cfs	■ Foster	800, 1100, 1500 cfs
■ Dorena	100 cfs	■ Detroit	1000, 1200, 1500 cfs
■ Cougar	400 cfs		

Total 4,160 cfs

4,660 cfs

5,480 cfs



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Current Reservoir Drawdown Priorities (April -June)

- | | |
|----------------|--|
| First: | Green Peter |
| Second: | Cougar |
| Third: | Lookout Point, Hills Creek |
| Fourth: | Blue River |
| Fifth: | Fall Creek, Dorena, Cottage Grove |
| Last: | Fern Ridge, Detroit, Foster |



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Current Reservoir Drawdown

Priorities

(July - October)

- | | |
|----------------|--|
| First: | Lookout Point |
| Second: | Cougar |
| Third: | Hills Creek |
| Fourth: | Green Peter, Blue River |
| Fifth: | Fall Creek, Dorena, Cottage Grove |
| Last: | Fern Ridge, Detroit, Foster |



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2007 Water Management

- Oct 1 – May 1 SWSI* ranged from -1 to +1
 - Indicating normal conditions
- June 1 – Sep 1 SWSI ranged from -1 to -2
 - Indicating mild to moderate drought
- Detroit inflow 70% avg. May & June;
85-90% avg. July – September
- Green Peter inflow 30-50% avg. May – Sept
- Forecast inflow well below average

* Surface water supply index



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How dry was it? (from POR 1929 – 1999)

2007

vs.

2001

January – 36th

January – 9th

February – 34th

February – 3rd

March – 56th

March – 6th

April – 16th

April – 16th

May – 10th

May – 1st

June – 7th

June – 2nd

July – 16th

July – 2nd

August – 12th

August – 3rd

September – 4th

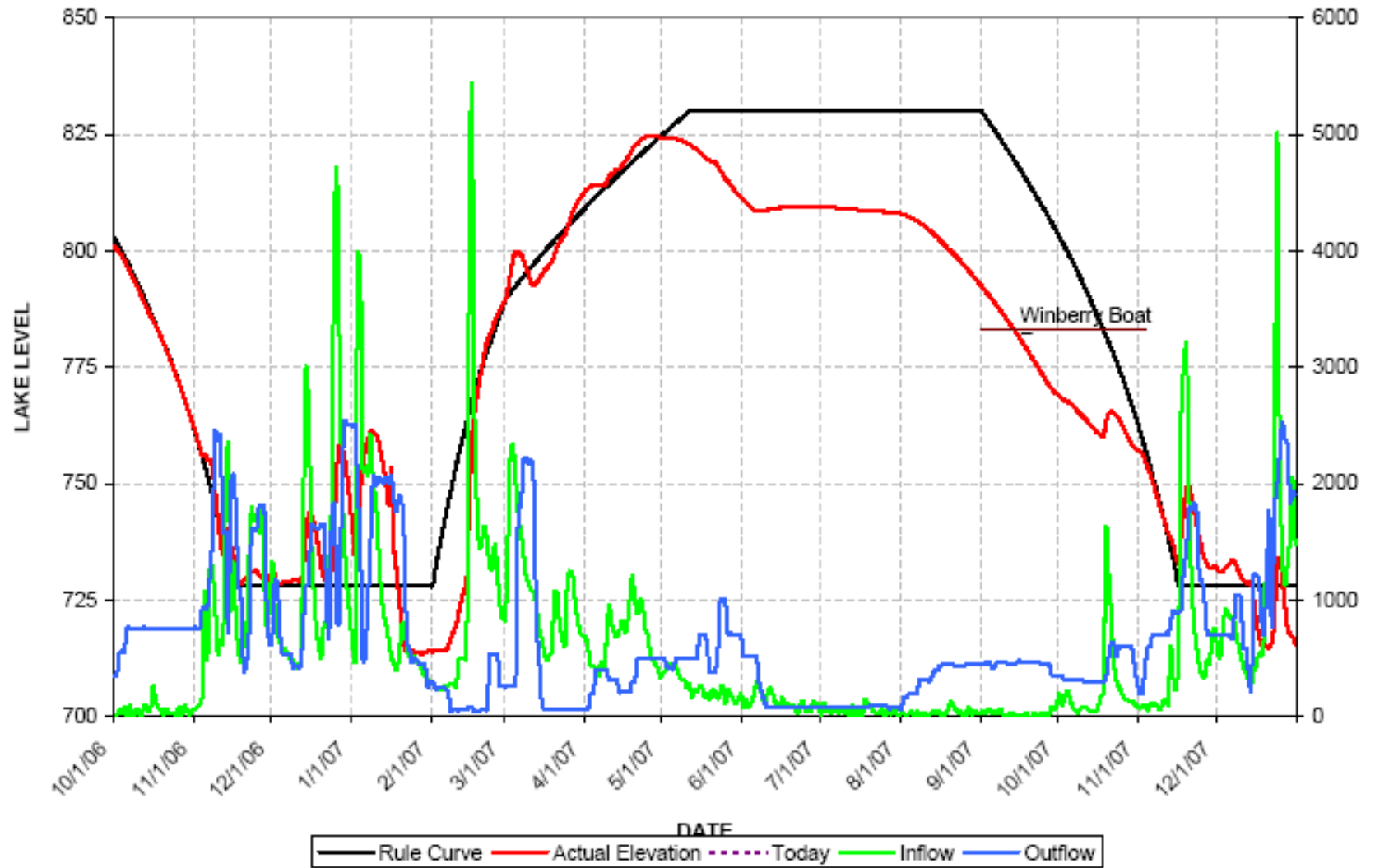
September – 26th



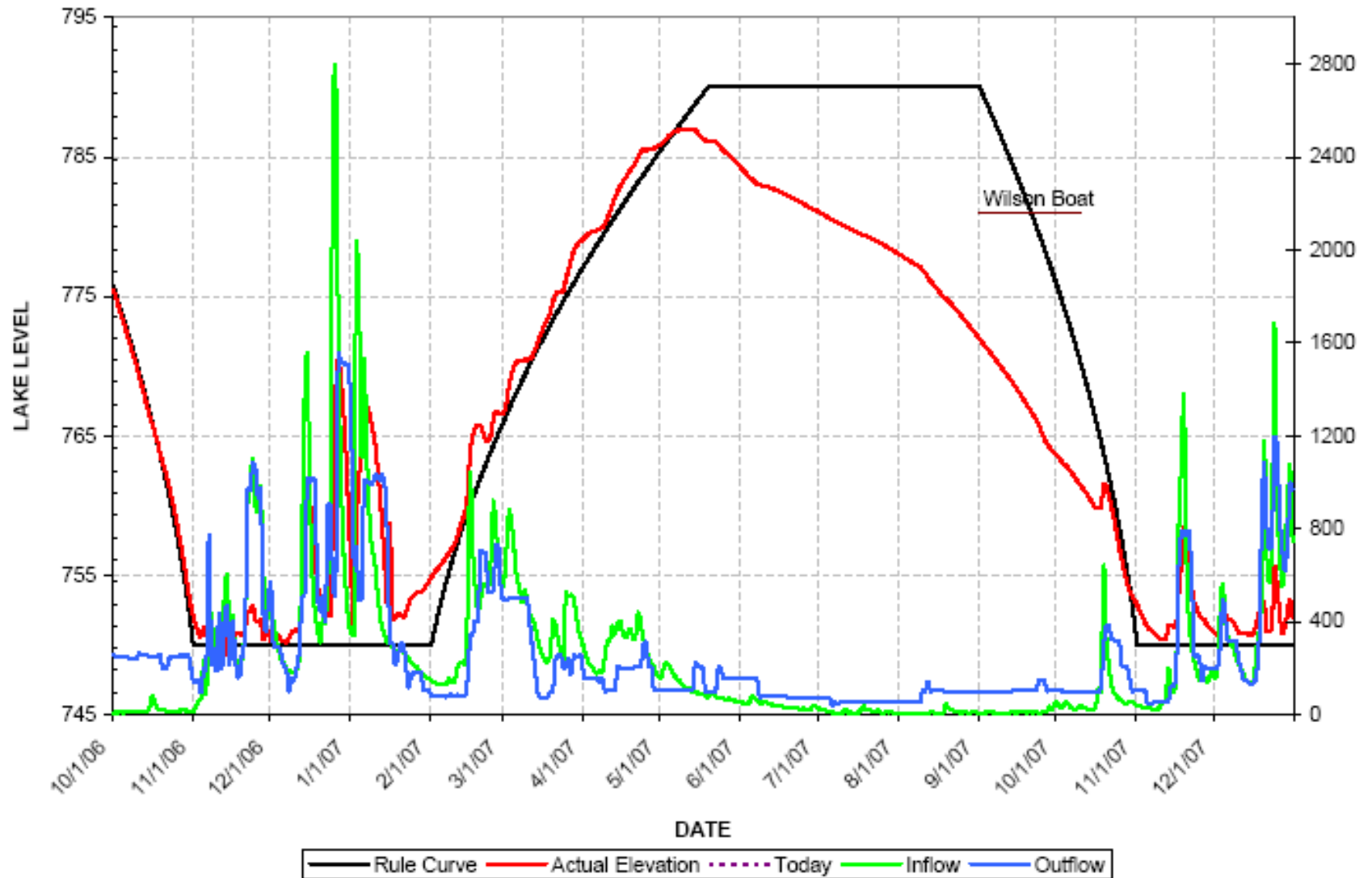
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How did Willamette Valley Reservoirs fair in 2007?

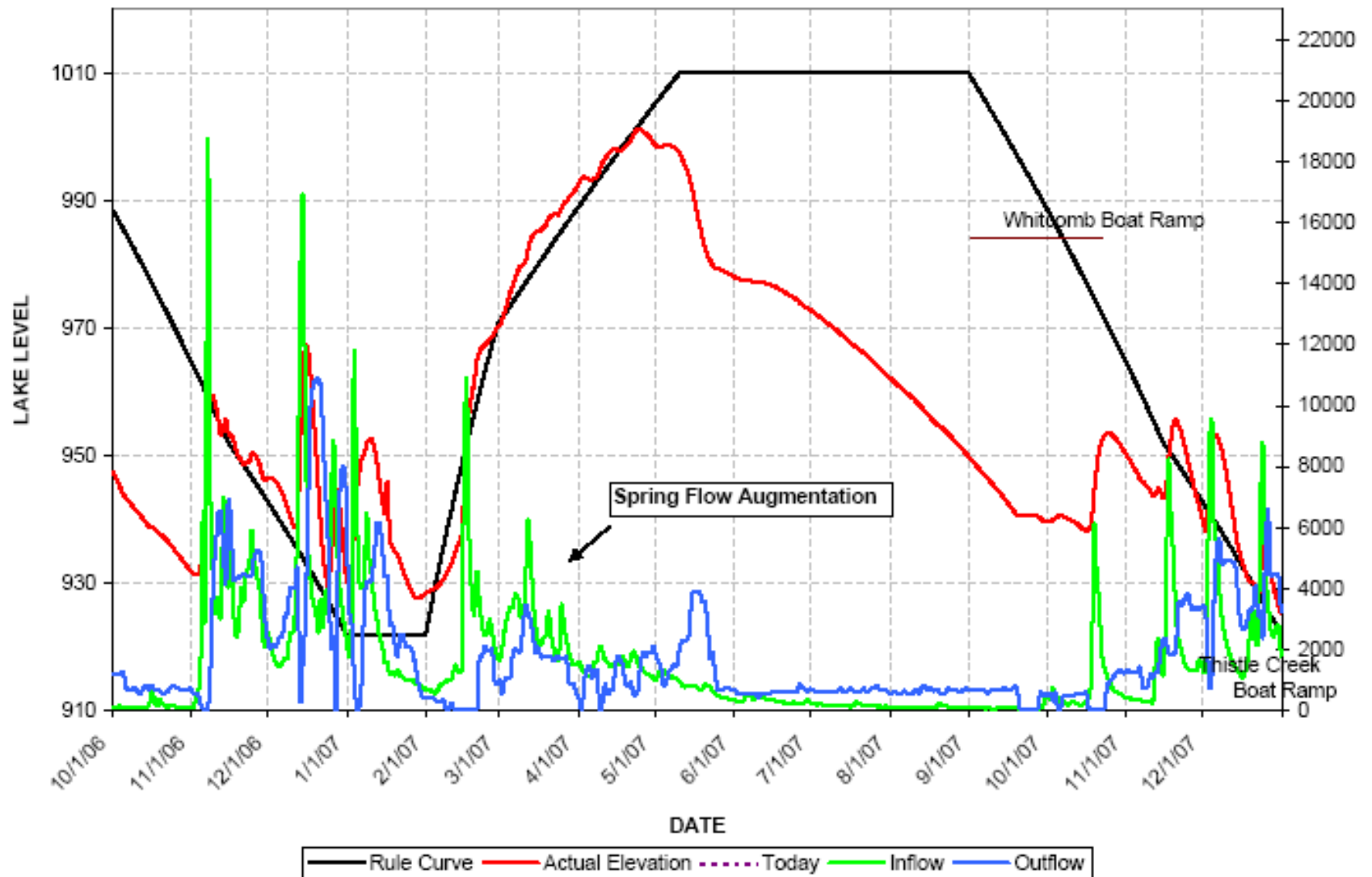
FALL CREEK



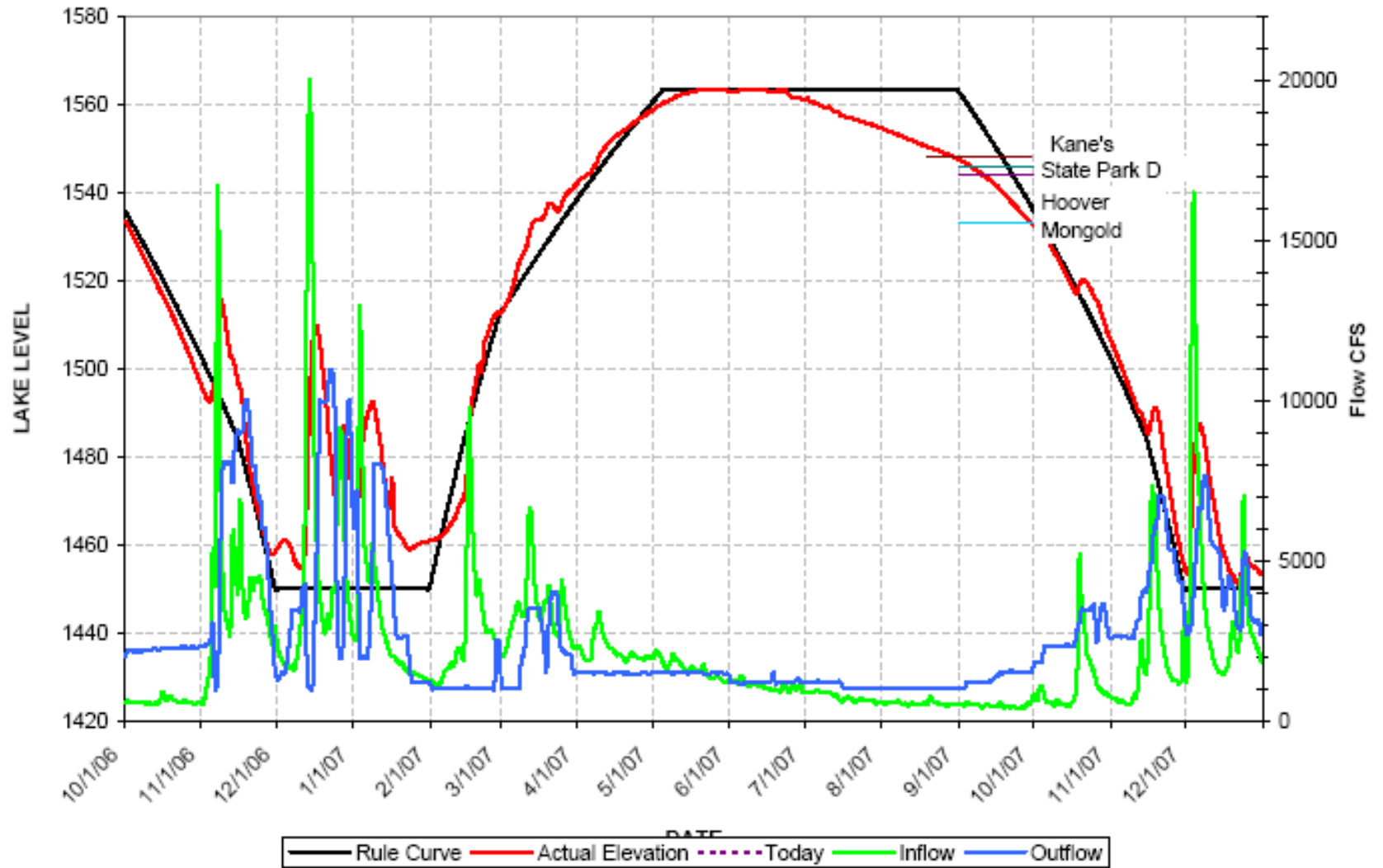
COTTAGE GROVE



GREEN PETER 2007



DETROIT





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2007 Summary

- Reservoir storage was used to maintain minimum individual tributary flow and provide flow augmentation for the mainstem.
- Reservoirs were managed with interim draft limits to ensure storage through October
- Mid-October rain event helped to maintain instream flows.



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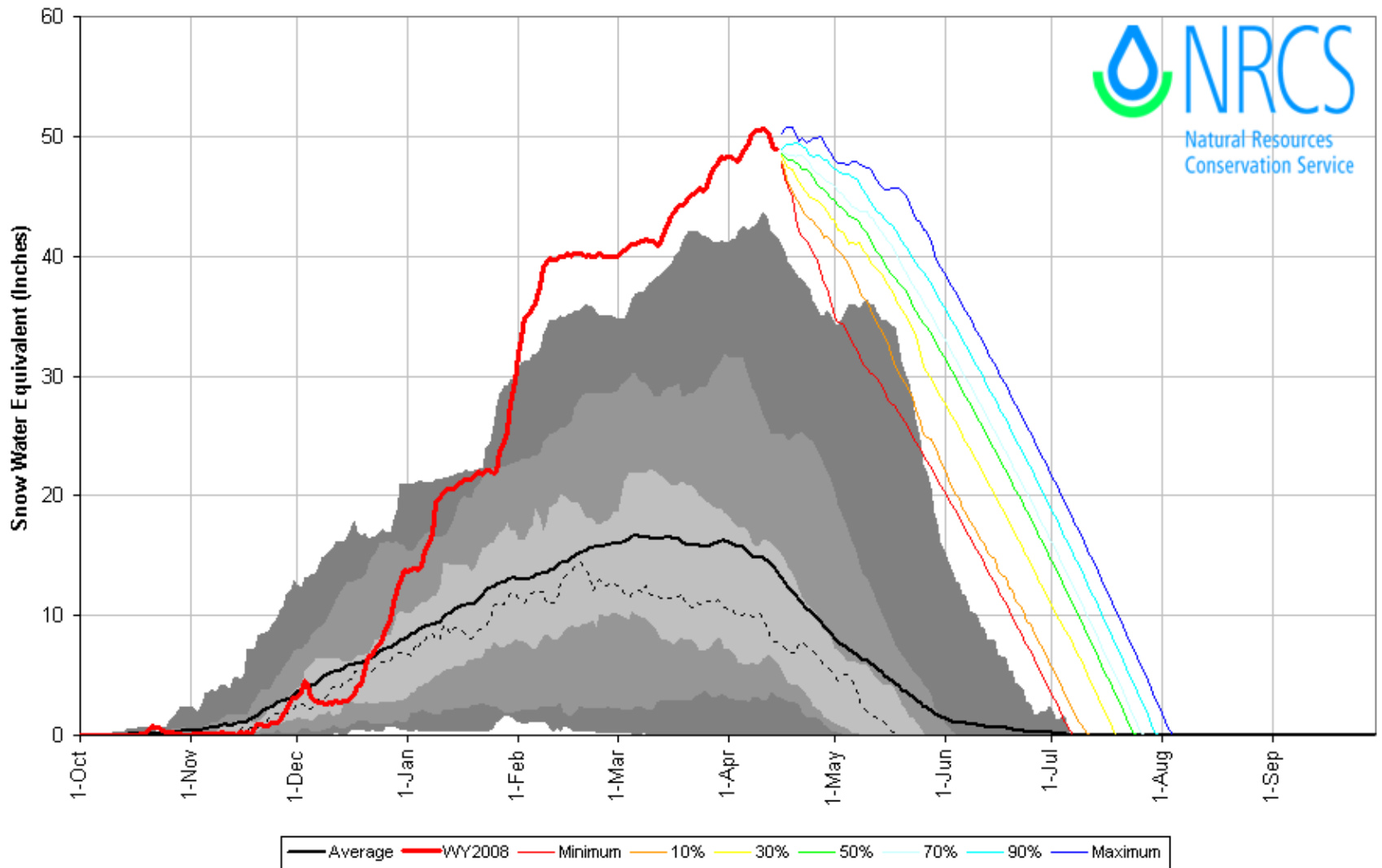
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2008 to date

- Current forecast for April – September reservoir inflow is above average
- Snowpack is at record levels-mainstem flow targets are being augmented by runoff into undammed rivers as well as Corps minimum tributary releases (400% avg. in N Santiam)
- Forecasts indicate a high probability of reservoir refill across the basin

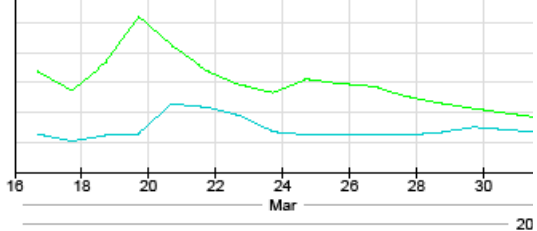
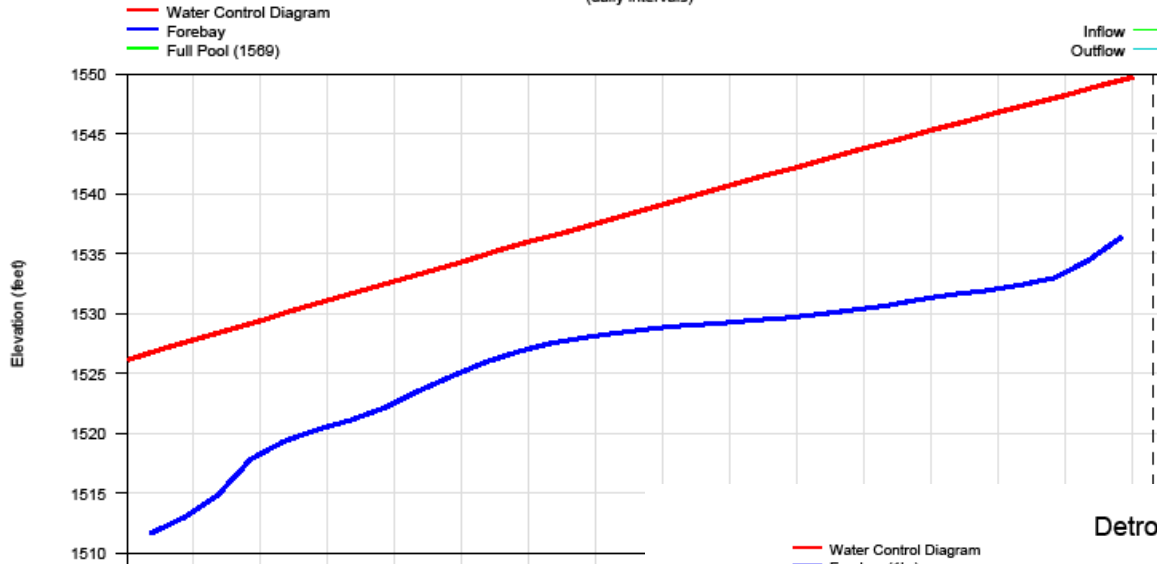
North Santiam Basin with Non-Exceedence Projections

Based on Provisional SNOTEL Data as of Apr 15, 2008

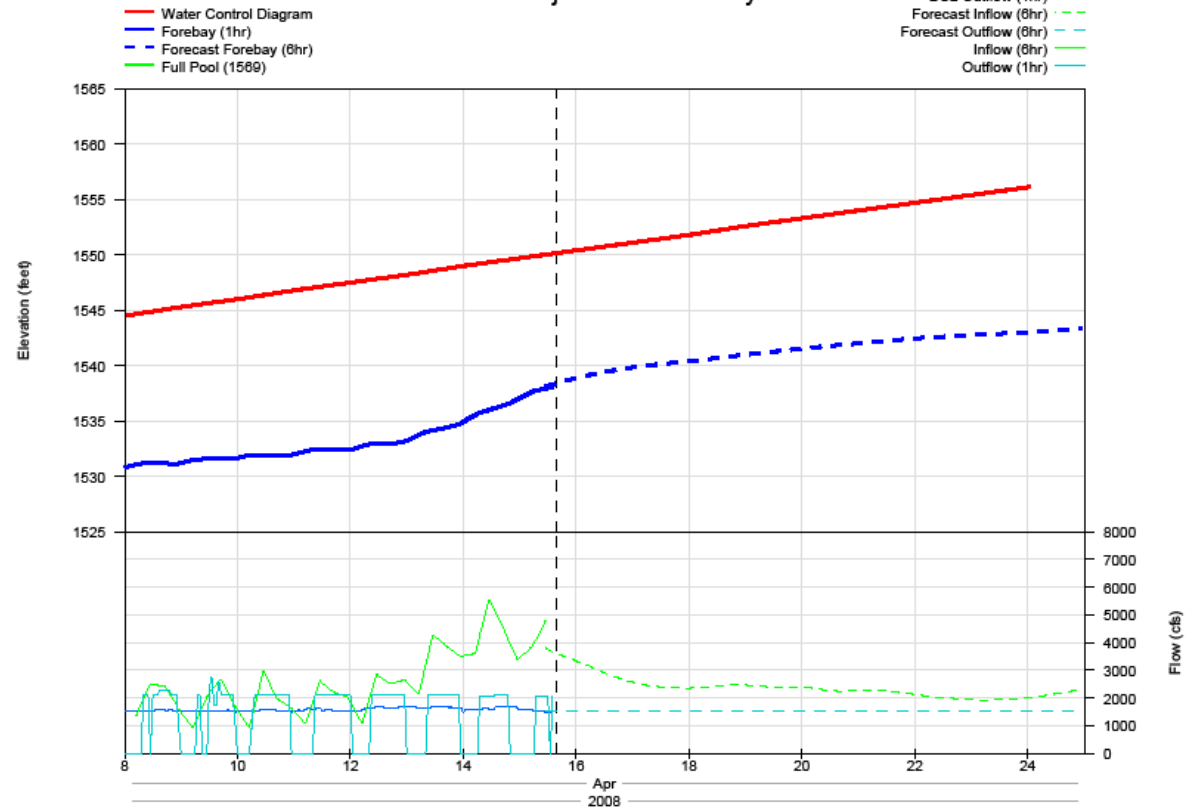


Detroit Project Detail - 30 days

(daily intervals)



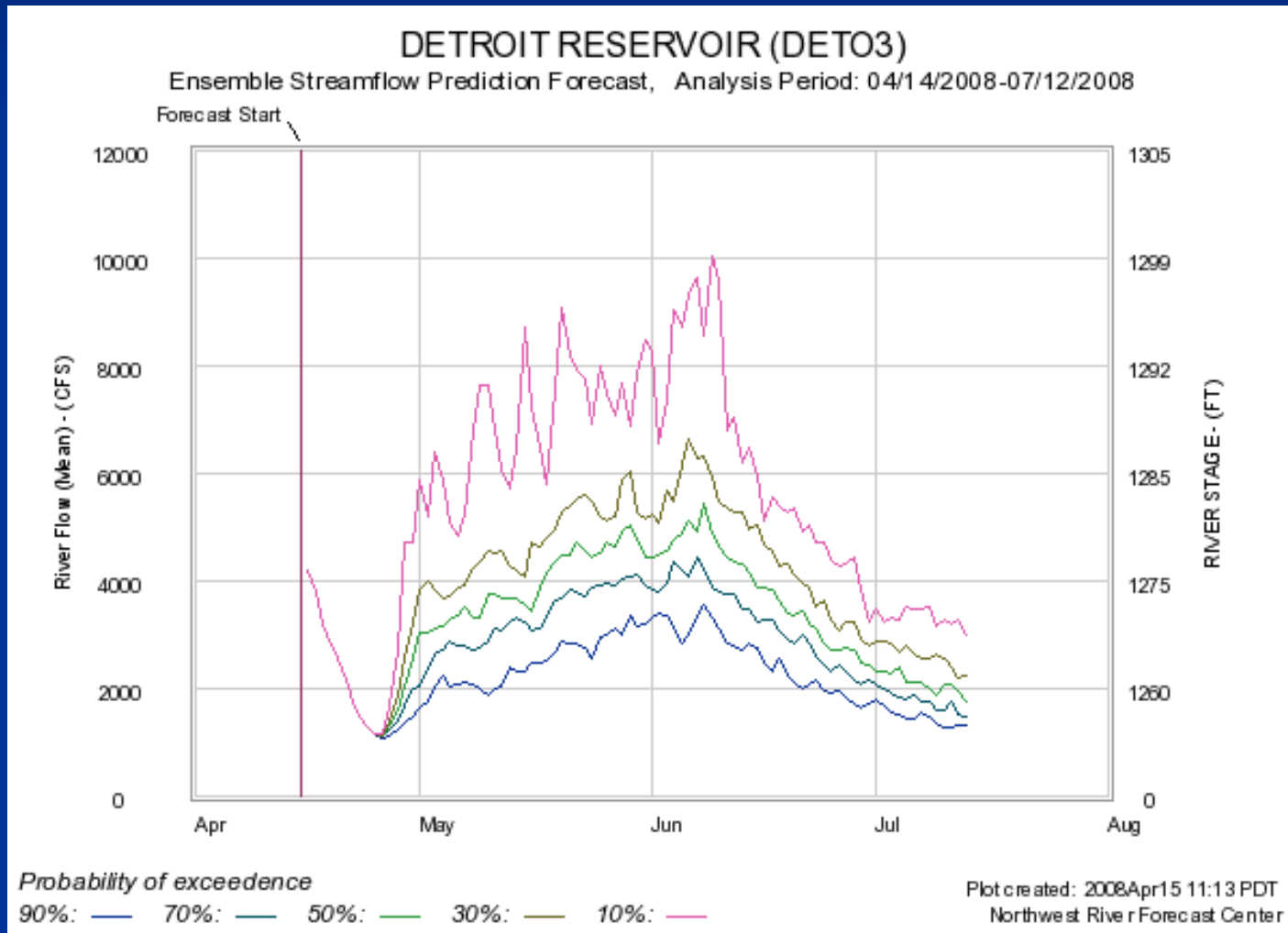
Detroit Project Detail - 7 days





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Detroit Inflow Statistics

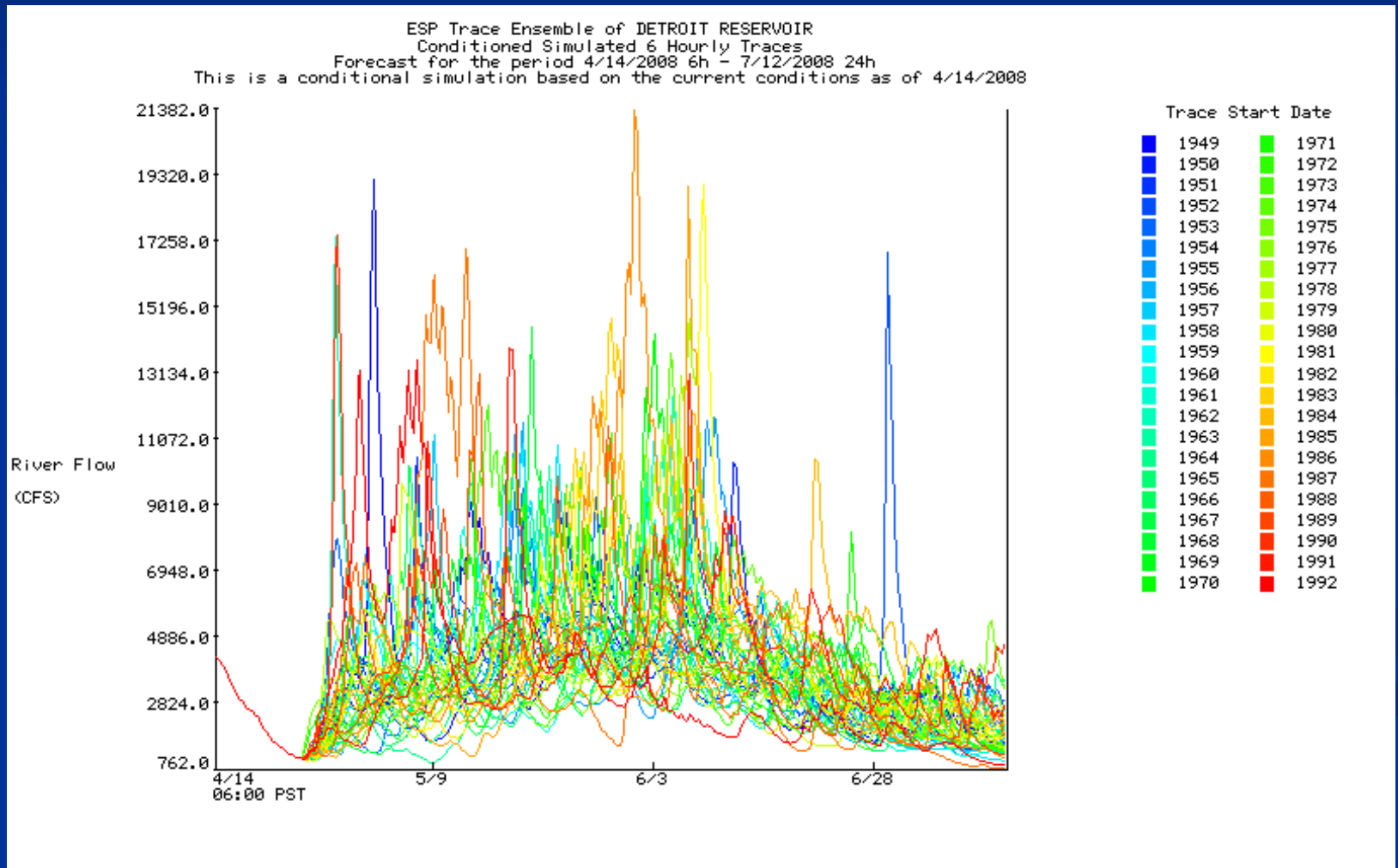




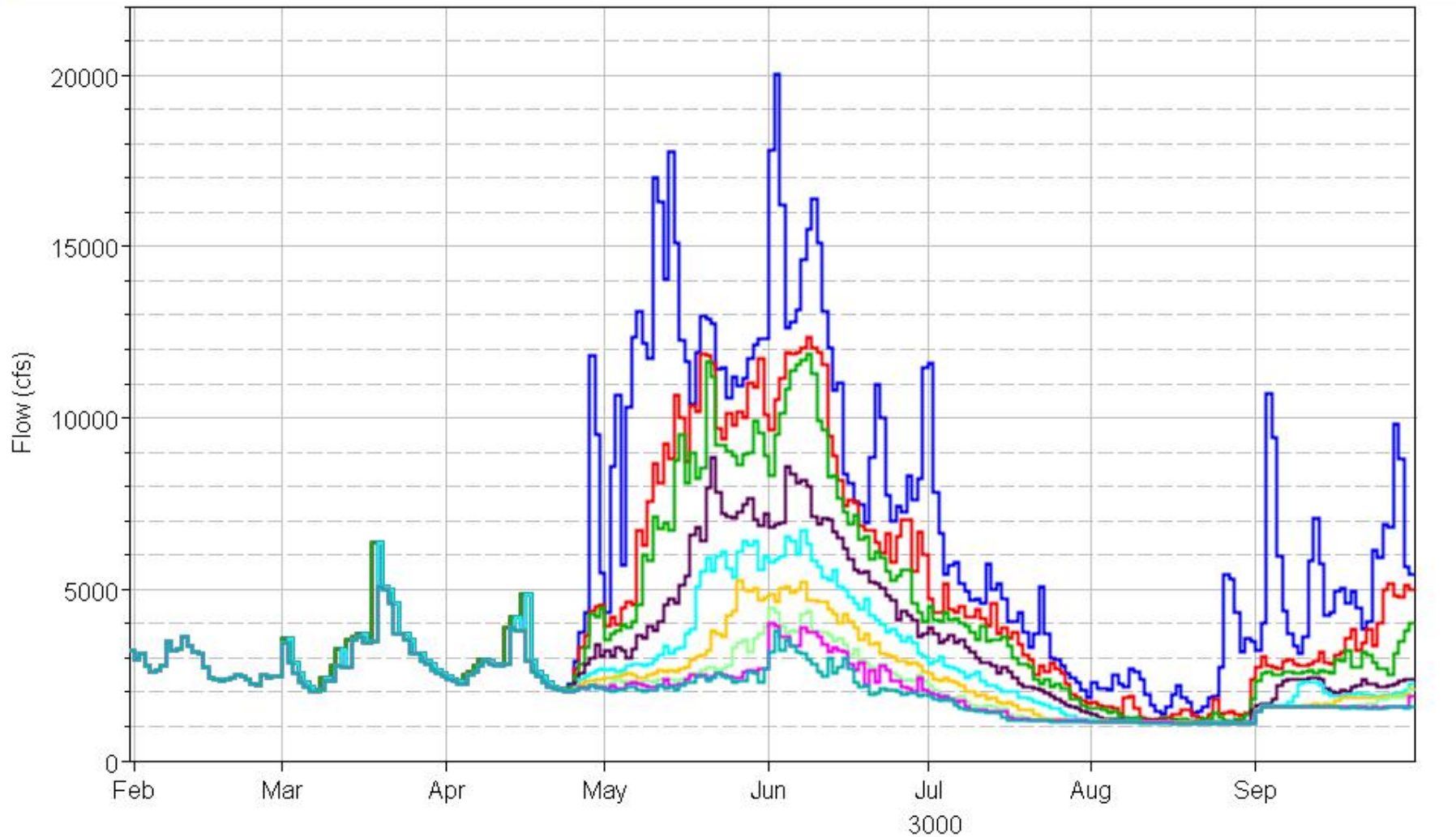
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Detroit Inflow Forecasts

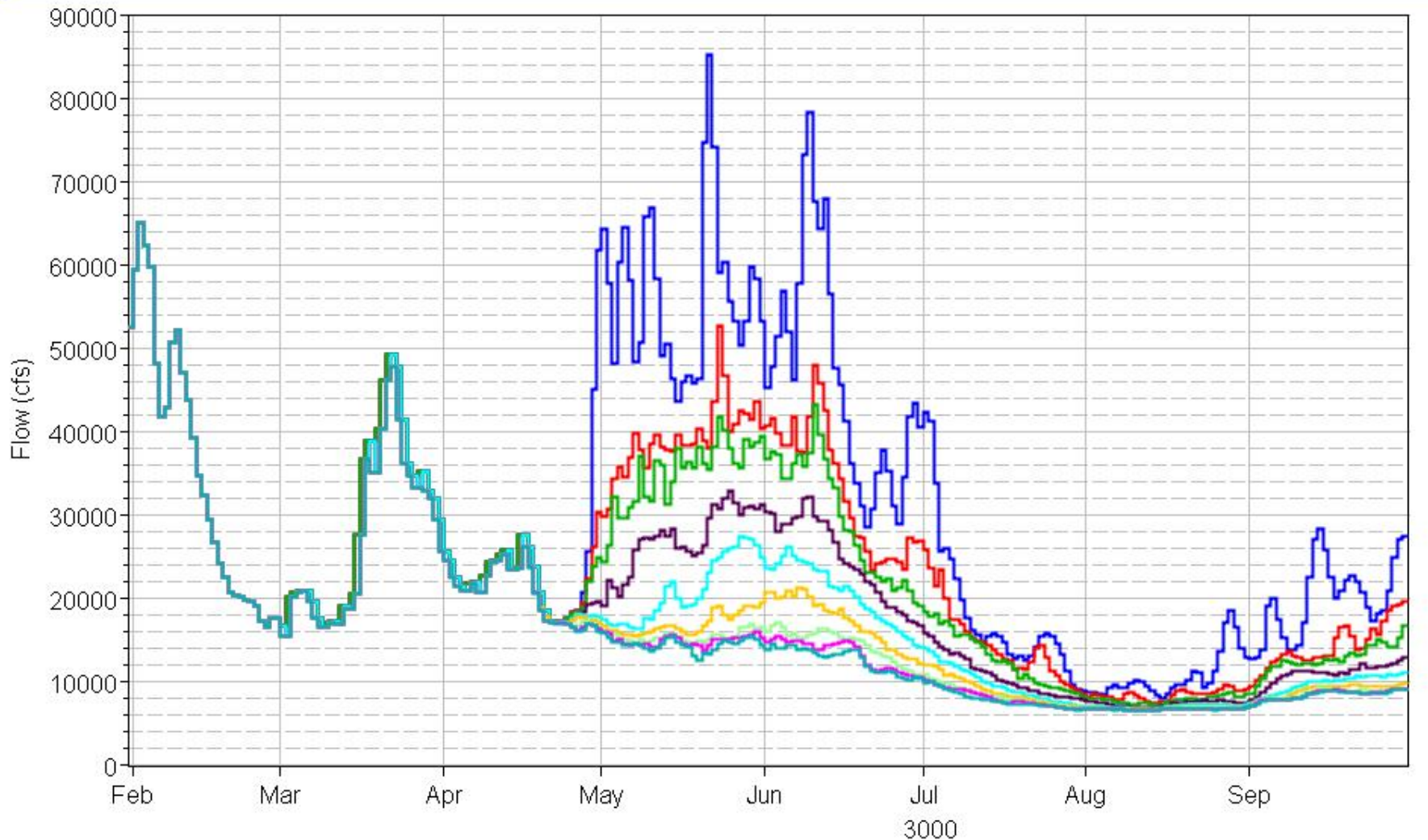


North Santiam at Mehama
Flow Summary Hydrograph
April 14 ESP Flows



NO SANTIAM_AT MEHAMA ESP FLOOD ROC FLOW-MAX
NO SANTIAM_AT MEHAMA ESP FLOOD ROC FLOW-P95
NO SANTIAM_AT MEHAMA ESP FLOOD ROC FLOW-P75
NO SANTIAM_AT MEHAMA ESP FLOOD ROC FLOW-P50
NO SANTIAM_AT MEHAMA ESP FLOOD ROC FLOW-P25
NO SANTIAM_AT MEHAMA ESP FLOOD ROC FLOW-P10
NO SANTIAM_AT MEHAMA ESP FLOOD ROC FLOW-P05
NO SANTIAM_AT MEHAMA ESP FLOOD ROC FLOW-MIN

Willamette River at Salem
Flow Summary Hydrograph
April 14 ESP Flows



- WILLAMETTE_AT_SALEM_ESP_FLOOD_ROC_FLOW-MAX
- WILLAMETTE_AT_SALEM_ESP_FLOOD_ROC_FLOW-P95
- WILLAMETTE_AT_SALEM_ESP_FLOOD_ROC_FLOW-P90
- WILLAMETTE_AT_SALEM_ESP_FLOOD_ROC_FLOW-P75
- WILLAMETTE_AT_SALEM_ESP_FLOOD_ROC_FLOW-P50
- WILLAMETTE_AT_SALEM_ESP_FLOOD_ROC_FLOW-P25
- WILLAMETTE_AT_SALEM_ESP_FLOOD_ROC_FLOW-P10
- WILLAMETTE_AT_SALEM_ESP_FLOOD_ROC_FLOW-P05
- WILLAMETTE_AT_SALEM_ESP_FLOOD_ROC_FLOW-MIN



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Current Issues

- Detroit Powerhouse rehabilitation
- Endangered Species Act consultation for Willamette Project
 - NOAA and U.S. Fish and Wildlife Service issue Biological Opinions July 2008



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What is the Biological Opinion?

- USFWS and/or NMFS determine whether a federal action (continued operation of WVP) is likely to jeopardize the continued existence of listed species.
- Summary of information on which this opinion is based.
- Identifies effects of the action on listed species or critical habitat.



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Reasonable and Prudent Alternatives (RPA's)

- Recommended alternative actions that would avoid the likelihood of jeopardizing the continued existence of the listed species
 - Habitat – water quality, flow, gravel & wood
 - Hatchery
 - Fish Passage



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Minimum Releases

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Big Cliff	1,200	1,000	1,000 1,500	1,500	1,500	1,200	1,200 1,000	1,000	1,500	1,500 1,200	1,200	1,200
Foster	1,100	800	800 1,500	1,500	1,500 1,100	1,100	1,100 800	800	1,500 1,100	1,500 1,100	1,100	1,100



Minto Fish
Facility

3 Stw Redds
≥1 Ft Depth

3 Stw Redds
≥1 Ft Depth

2 Stw Redds
≥1 Ft Depth

Stilling Basin-B. Cliff
TDG=123% @ >13 ft Depth
1350 hrs-06/20/07

Big Cliff
Dam

N Santiam River

OR Hwy-22

2 Stw Redds
≥1 Ft Depth

6 Stw Redds
≥1 Ft Depth

1 Stw Redd
≥1 Ft Depth

2 Stw Redds
≥1 Ft Depth

8 Stw Redds
≥1 Ft Depth

2 Stw Redds
≥1 Ft Depth

Just Upstream
Minto Fish Facility
TDG=102% @5-10 in Depth
1530hrs-06/20/07

Niagara Gage Location
#14181500
TDG=110.5% @5-10 in Depth
1440hrs-06/20/07

Forebay-B. Cliff
TDG=110% @ >13 ft Depth
1310 hrs-06/20/07

0.5
Miles



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For more information:

- About the Corps (Portland District):
www.nwp.usace.army.mil
- Reservoir levels:
www.nwd-wc.usace.army.mil/nwp/
- River levels: (NW River Forecast Center)
<http://www.nwrffc.noaa.gov/>
- Willamette Valley Project Office:
541-937-2131
- Updated Proposed Action
https://www.nwp.usace.army.mil/pm/e/reports/environmental/ba/Final_Will_Supp'l_BA.pdf



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Questions?