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Willamette Valley Project Overview

Eugene Yacht Club
April 2008

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Objectives

- Overview of the Willamette reservoir system
- 2007 water year summary
- Current conditions/2008 flow forecast
- Fern Ridge water control history
- Informal discussion

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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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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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Project History

- 1940 - Corps begins construction of Fern Ridge and Cottage Grove dams
- 1950 and 1962 Flood Control Acts authorize additional structures
- 1968 - 13th dam is completed at Blue River.

Fern Ridge Dam construction

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Willamette Valley Project

13 dams and reservoirs
- 11 multiple-purpose
- 2 re-regulating

Over 100 miles of bank protection works

Navigation channel, mouth to Corvallis (135 miles)

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Authorized Purposes

- Flood Damage Reduction
- Navigation
- Irrigation
- Fish & Wildlife
- Recreation
- Water Quality
- Municipal & Industrial
- Hydropower

Dexter Dam & Powerhouse

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Fern Ridge Authorizations

PL 75-761 (1938) PL 87-874 (1962)	Flood Control
PL75-761 (1938)	Navigation*
PL 78-534 (1944)	Recreation
PL 81-516 (1950)	Irrigation
PL 81-516 (1950)	Fish/Wildlife
PL 81-516 (1950)	Water Quality

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Flood Damage Reduction

- Total project controls 27 percent of the runoff area in the Willamette Basin
- $22 billion in flood damage reduction to date (current estimates more than $1 billion annually)

Lookout Point Dam

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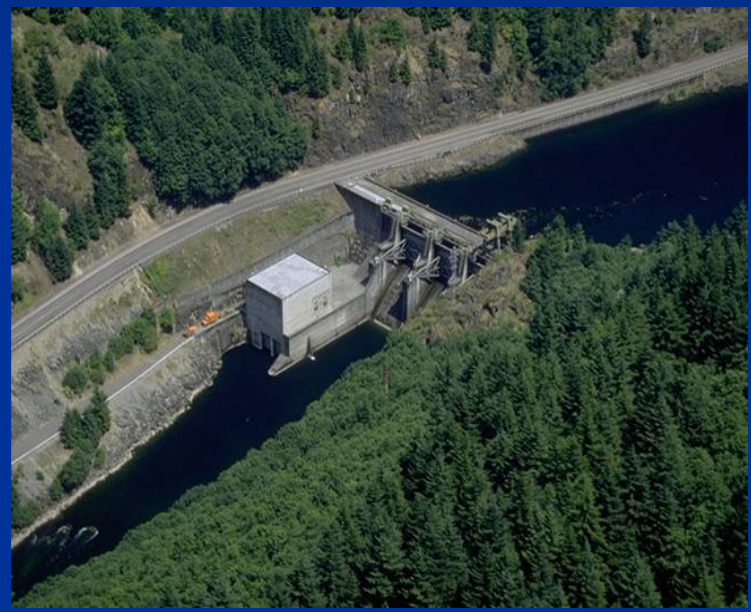
Hydropower

- 8 hydropower plants

  (10.6 percent of Corps' plants in nation)
- 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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Irrigation

- Contracts for over 24,000 acre-feet of stored water
- Bureau of Reclamation manages water sales from federal projects

Farmland below Fern Ridge Dam

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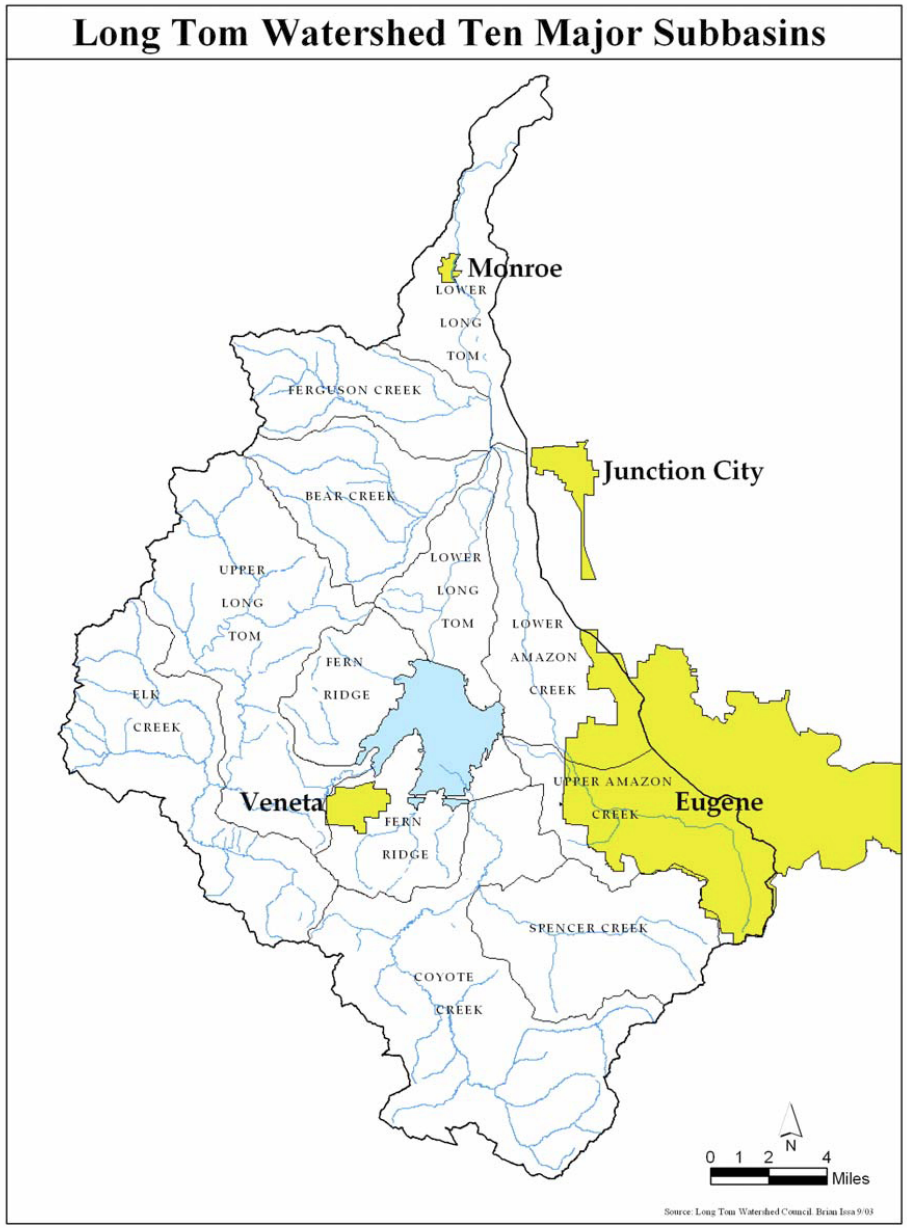
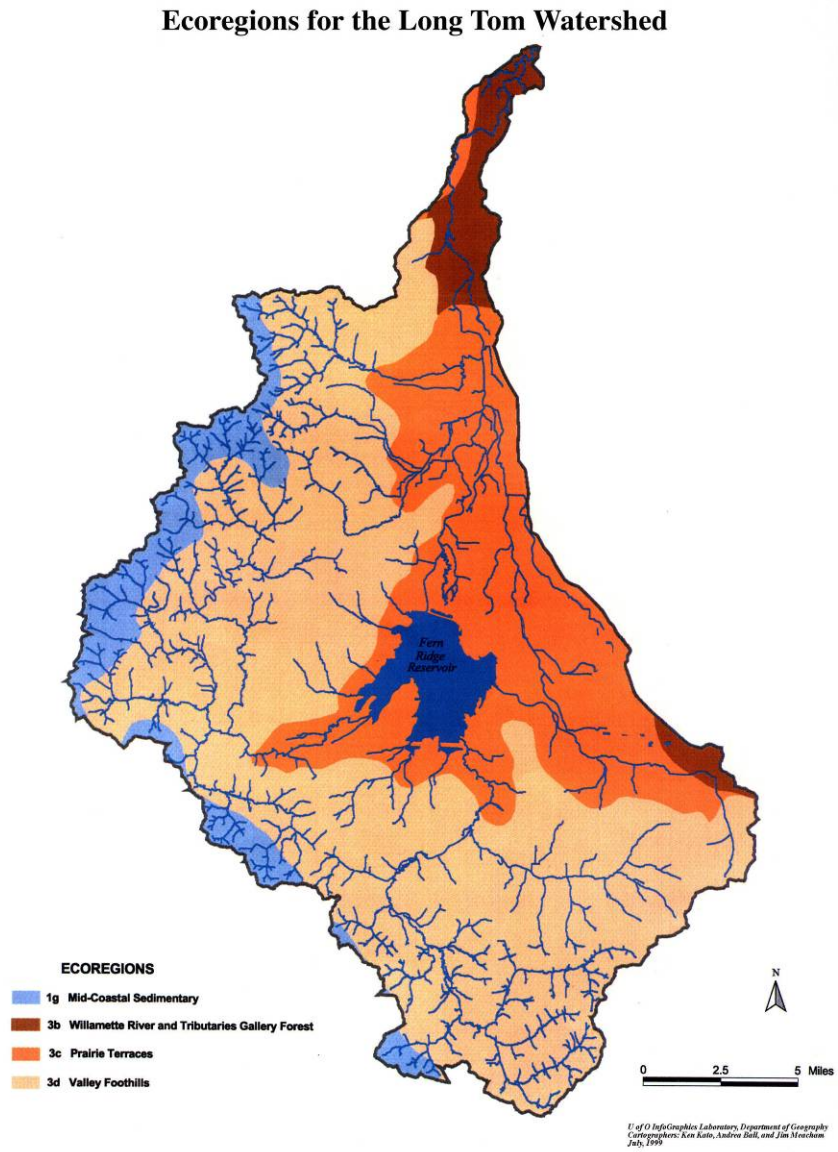
Fish and Wildlife

- 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


Long Tom Watershed Ten Major Subbasins
Monroe
Junction City
Veneta
Eugene
LOWER LONG TOM
FERGUSON CREEK
BEAR CREEK
UPPER LONG TOM
LOWER LONG TOM
FERN RIDGE
ELK CREEK
LOWER AMAZON CREEK
UPPER AMAZON CREEK
FERN RIDGE
SPENCER CREEK
COYOTE CREEK
N
0 1 2 4
Miles
Source: Long Tom Watershed Council. Brian Issa 9/03


Ecoregions for the Long Tom Watershed
Fern Ridge Reservoir
ECOREGIONS
1g Mid-Coastal Sedimentary
3b Willamette River and Tributaries Gallery Forest
3c Prairie Terraces
3d Valley Foothills
N
0 2.5 5 Miles
U of O InfoGraphics Laboratory, Department of Geography
Cartographers: Ken Kato, Andrea Ball, and Jim Meacham
July, 1999

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Basin-wide 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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Fern Ridge Economic Benefits

Recreation (2006)

- $13.8 million in visitor spending
- 64 percent of spending locally captured
- Supported 203 jobs locally

Source: Institute for Water Resources, Value to the Nation www.vtn.iwr.usace.army.mil/recreation

Fern Ridge Reservoir

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Water Management

- 13 dams of the Willamette Valley are operated as a single system
- Corps must balance between competing authorized purposes
- Making regulation decisions is a collaborative effort

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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 government
- 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

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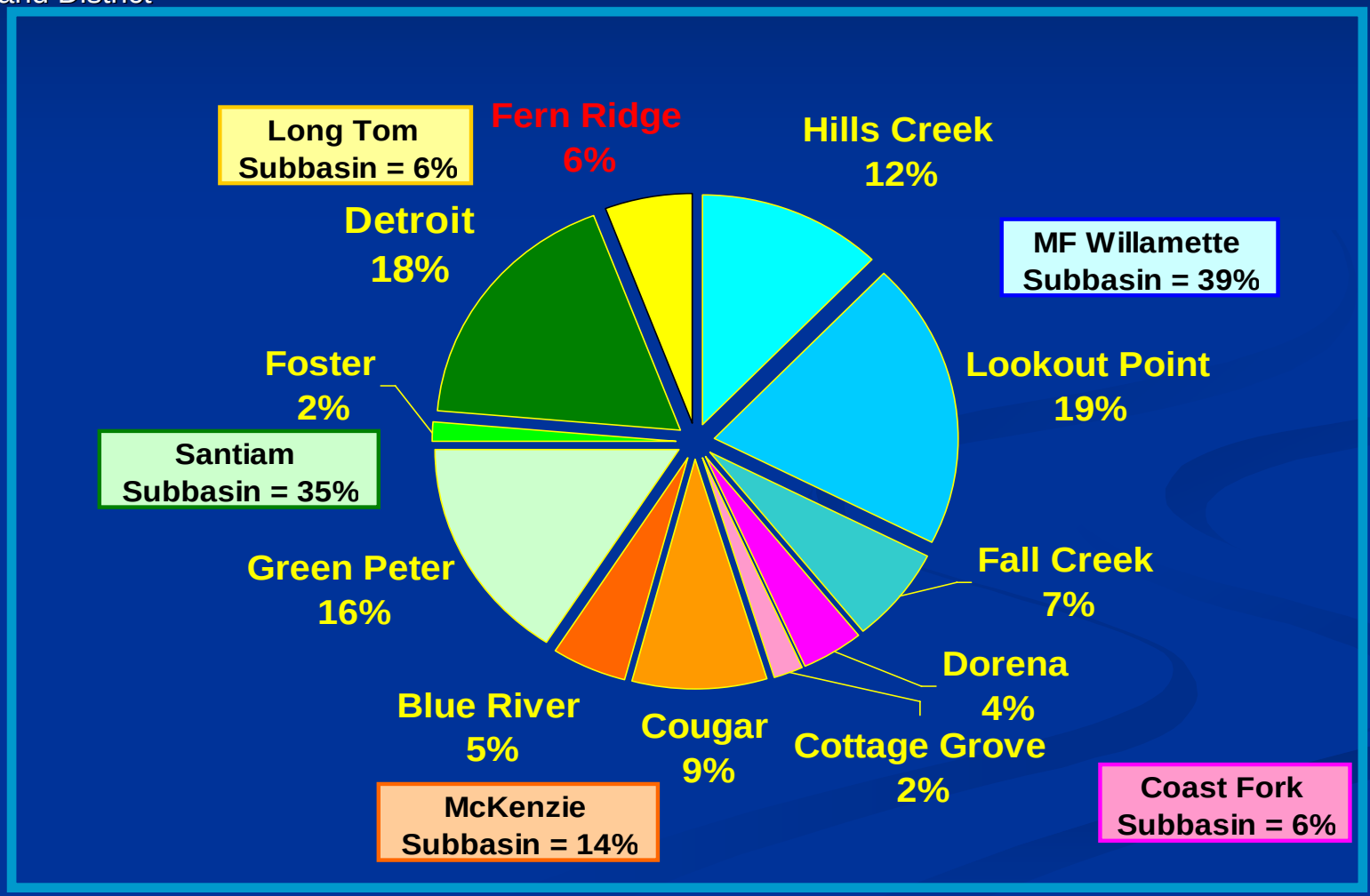
WVP Conservation Storage

Total = 1.6 million Acre-feet



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WVP Conservation Season Operating Criteria

- Minimum instream flows for fish (Apr-Jun)
- Tributary flows for fish (Apr-Oct)
- Mainstem flow augmentation for water quality (July-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
- Lookout Point 1,200 cfs
- Fall Creek 80, 200 cfs
- Cottage Grove 50 cfs
- Dorena 100 cfs
- Cougar 400 cfs
- Blue River 50 cfs
- Fern Ridge 50, 30 cfs
- Green Peter 50 cfs
- Foster 800, 1100, 1500 cfs
- Detroit 1000, 1200, 1500 cfs

Total 4,160 cfs

4,660 cfs

5,480 cfs

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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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Reservoir Drawdown Priorities
(July - October)

First:	Lookout Point
Second:	Cougar
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Fourth:	Green Peter, Blue River
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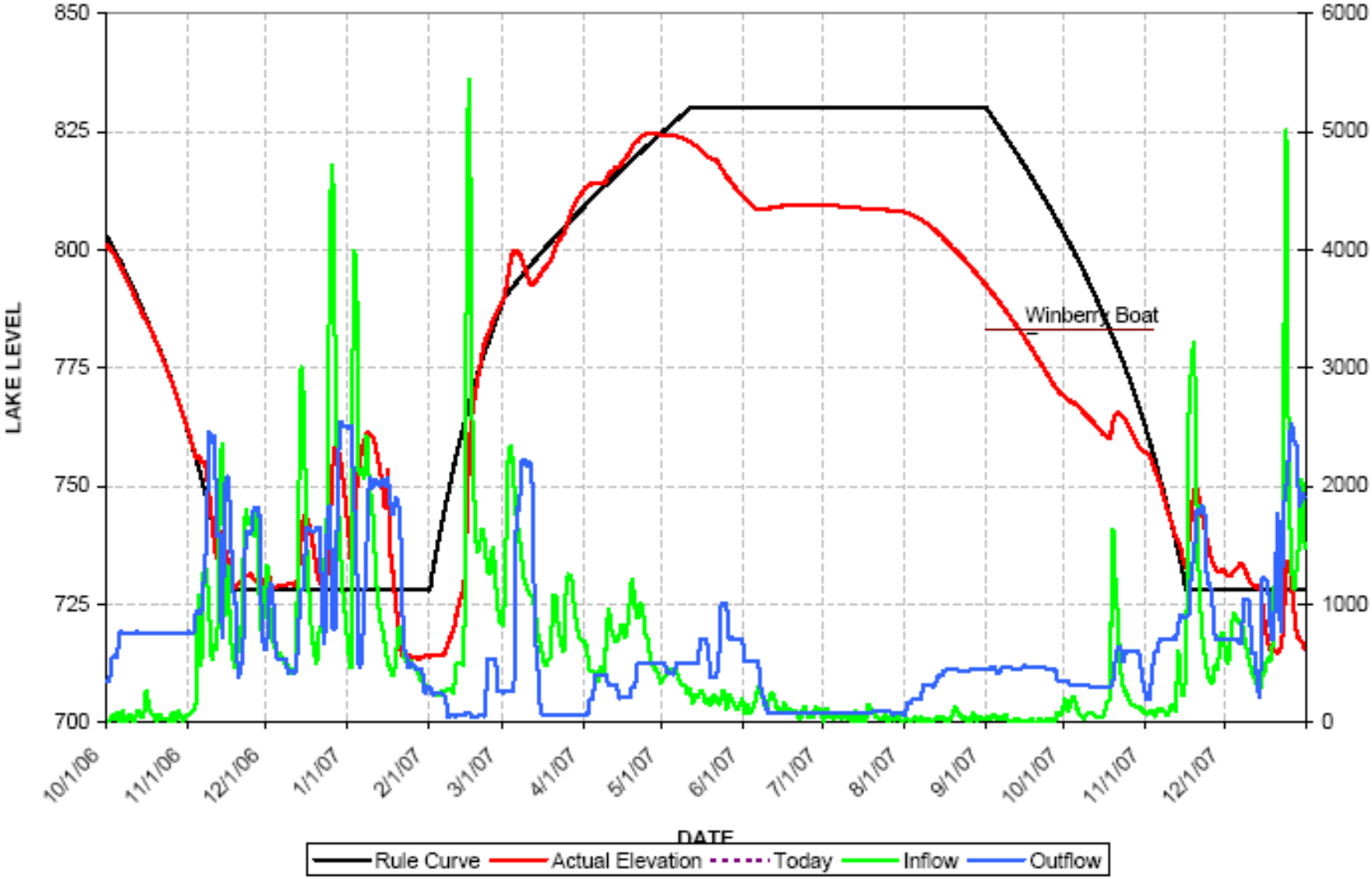
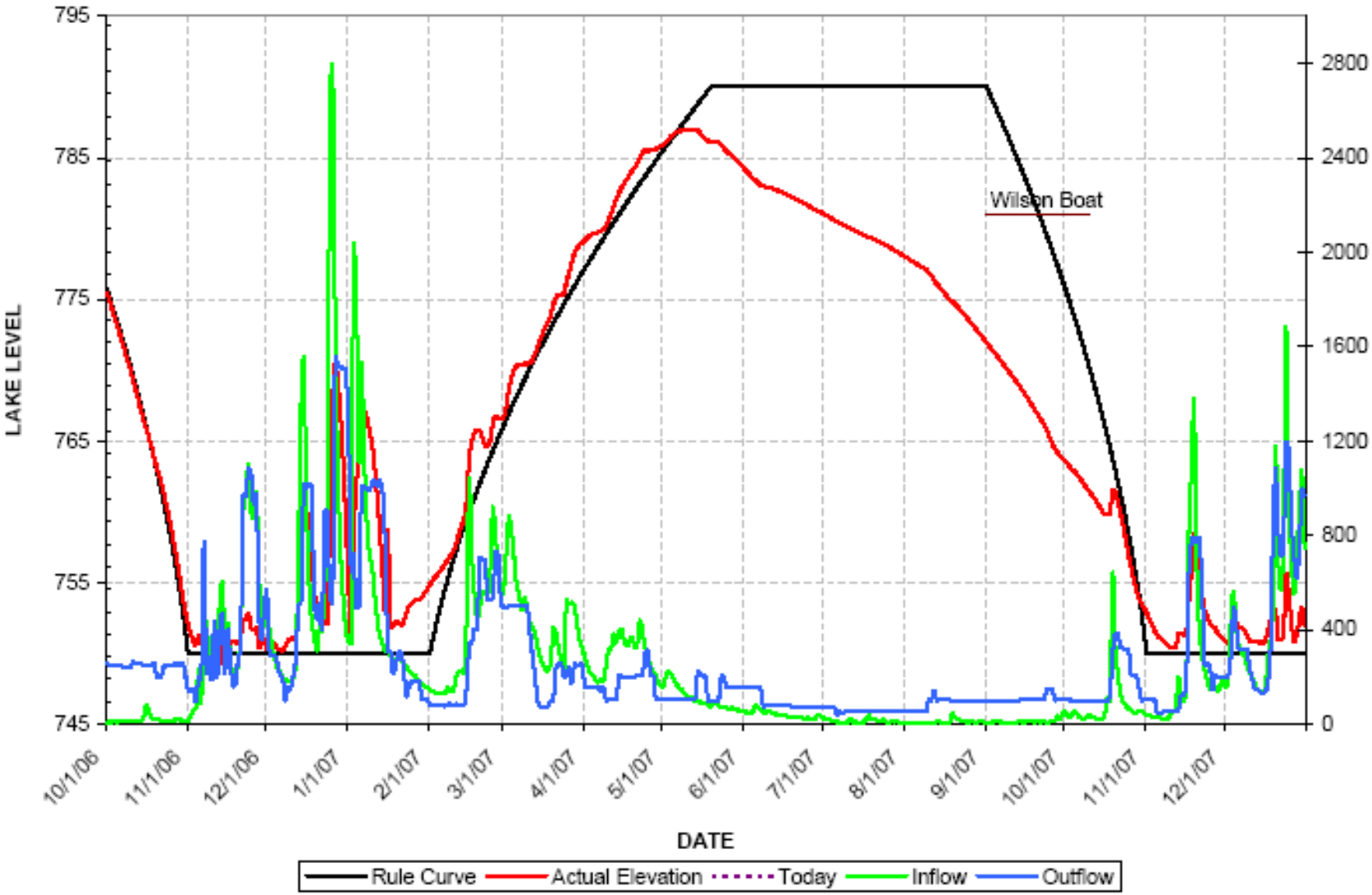
How did Willamette Valley reservoirs fare in 2007?

FALL CREEK



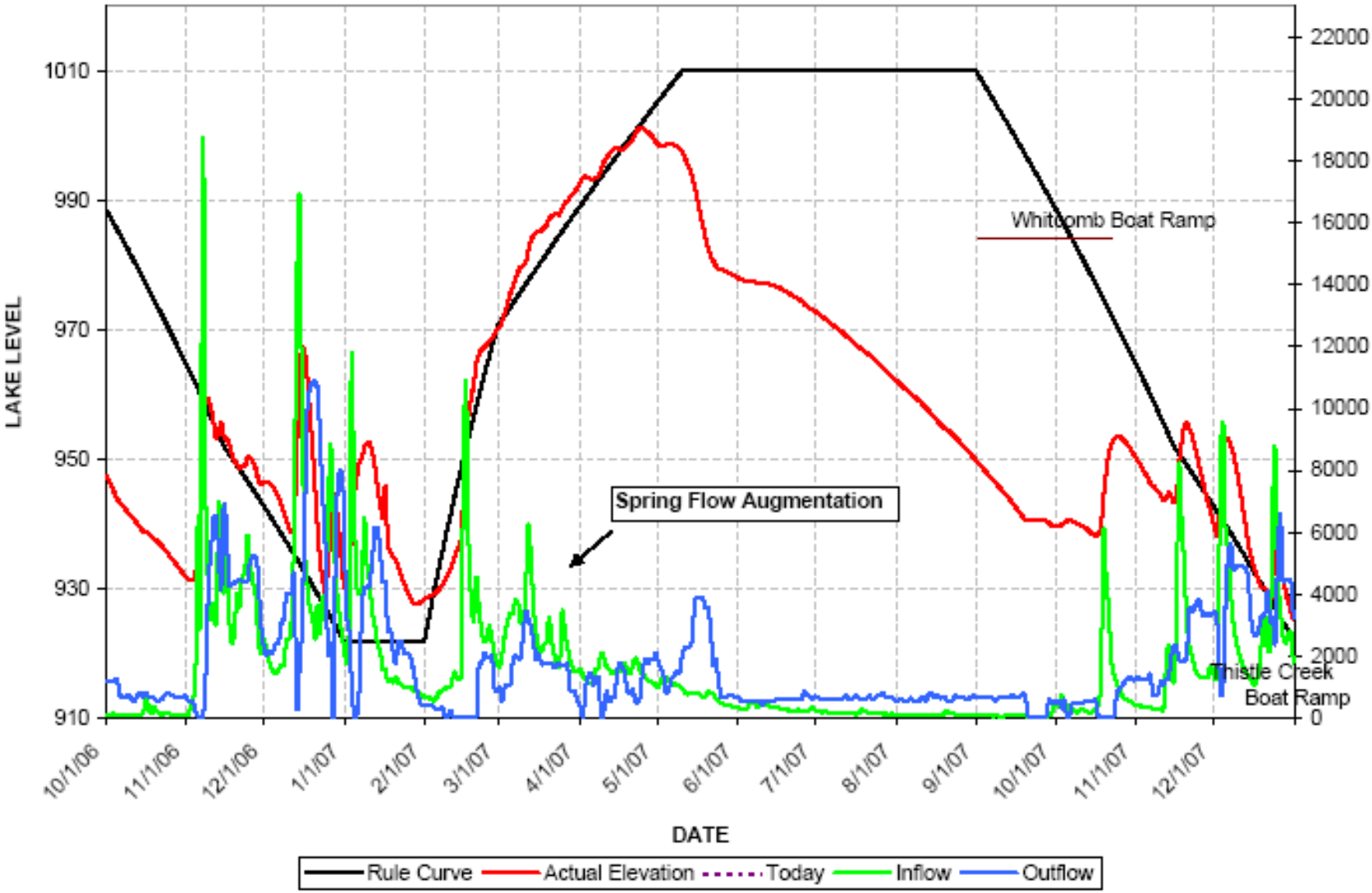
summerblk-graphs-2005

COTTAGE GROVE



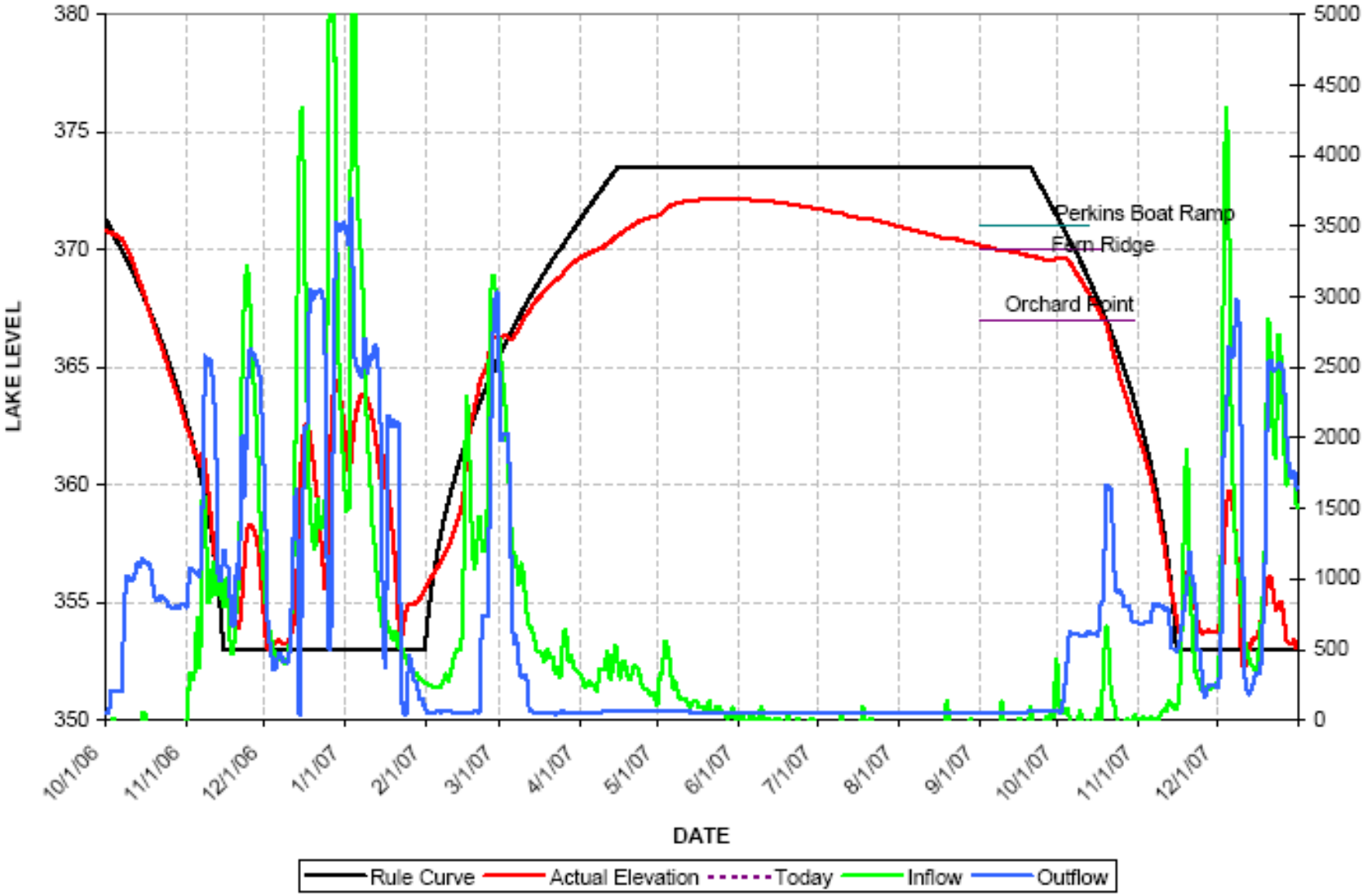
summerblk-graphs-2005

GREEN PETER
2007



summerblk-graphs-2005

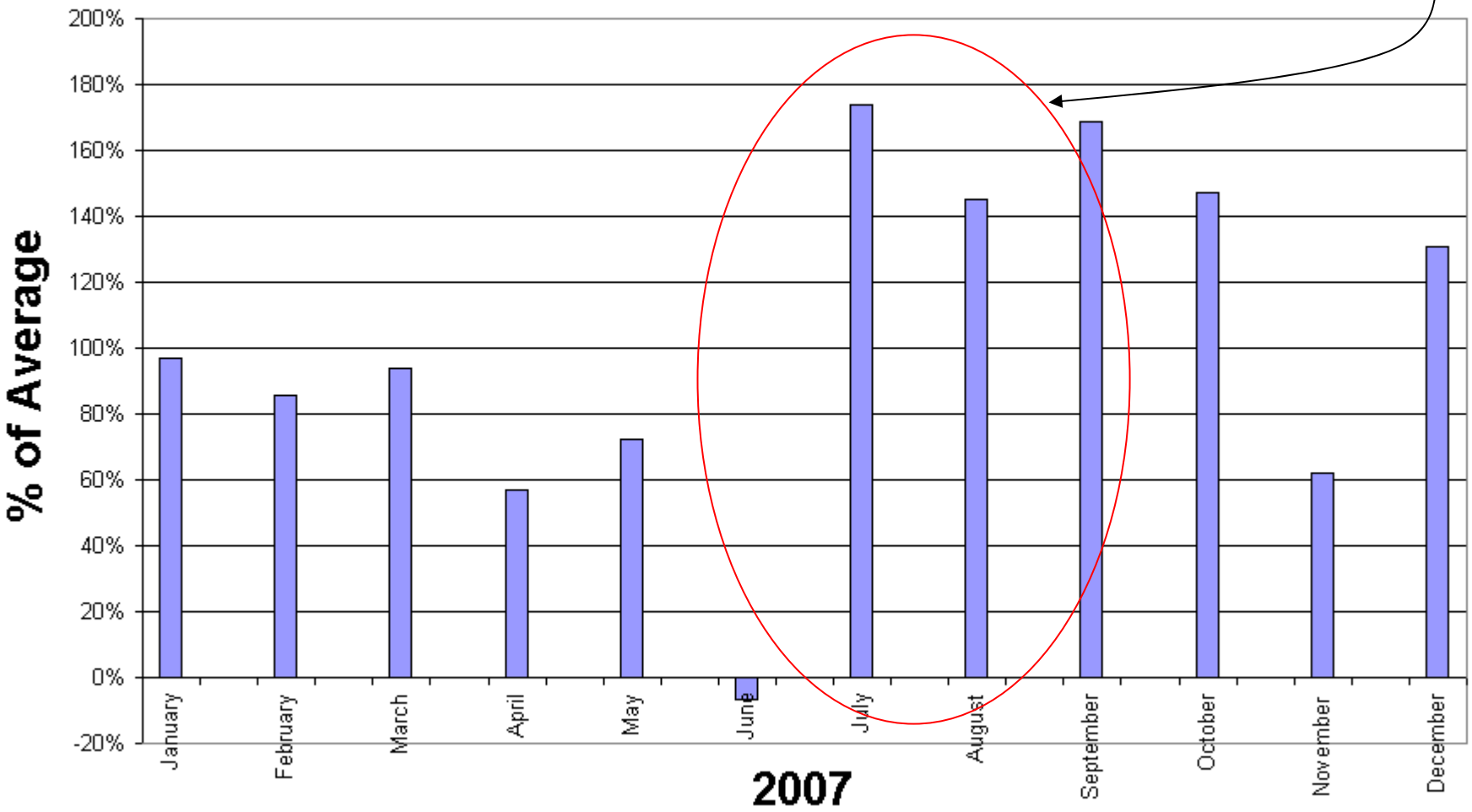
FERN RIDGE



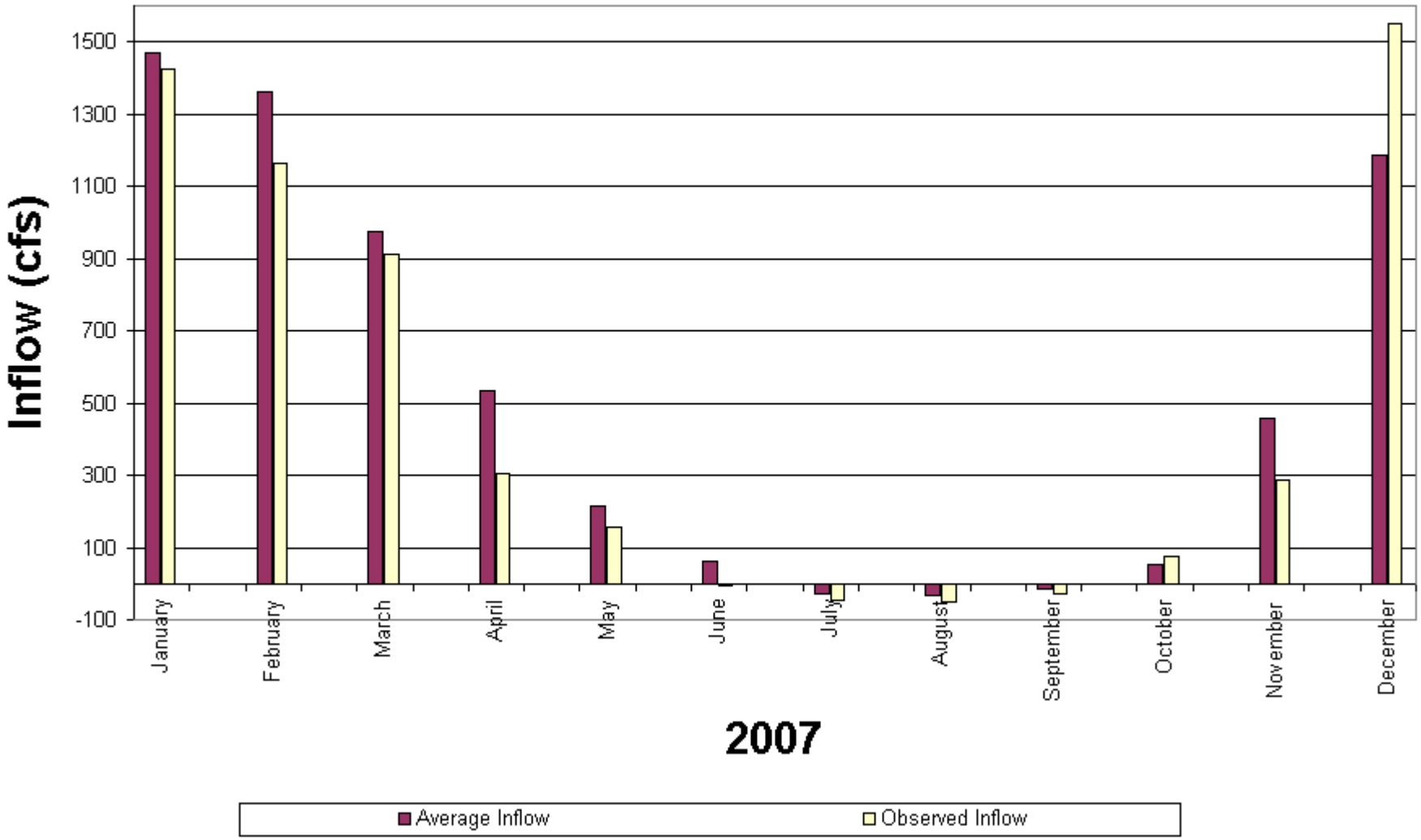
summerblk-graphs-2005

Fern Ridge Inflow

Observed inflow was negative from June - Sept



Fern Ridge Inflow



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2007 Summary

- Fern Ridge storage used to maintain minimum individual tributary flow only; other reservoirs provided flow augmentation for the mainstem Willamette.
- Reservoirs were managed with interim draft limits to ensure storage through October.
- Mid-October rain event helped maintain instream flows.

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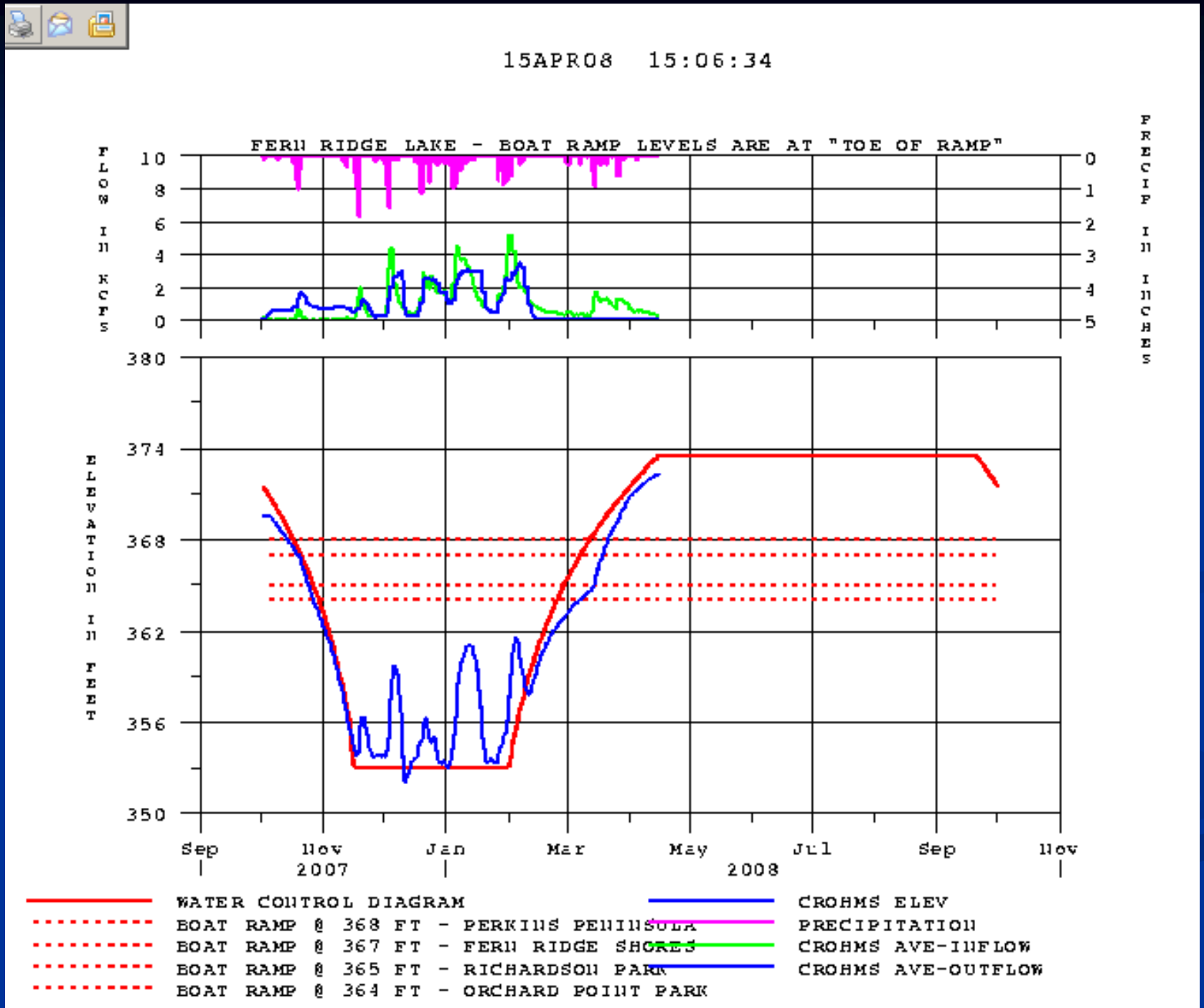
2008 to date

- Current forecast for Fern Ridge inflow is 114 percent of average; refill is probable.
- Snowpack is at record levels in the Cascade Range; typically there is little snow influence to Fern Ridge from the Coast Range.
- Fern Ridge does not provide mainstem flow augmentation.


15APR08 15:06:34
FERN RIDGE LAKE - BOAT RAMP LEVELS ARE AT "TOE OF RAMP"
FLOW IN KCFS
PRECIP IN INCHES
ELEVATION IN FEET
Sep
Nov
2007
Jan
Mar
May
Jul
2008
Sep
Nov
WATER CONTROL DIAGRAM
BOAT RAMP @ 368 FT - PERKINS PENINSULA
BOAT RAMP @ 367 FT - FERN RIDGE SHORES
BOAT RAMP @ 365 FT - RICHARDSON PARK
BOAT RAMP @ 364 FT - ORCHARD POINT PARK
CROHMS ELEV
PRECIPITATION
CROHMS AVE-INFLOW
CROHMS AVE-OUTFLOW

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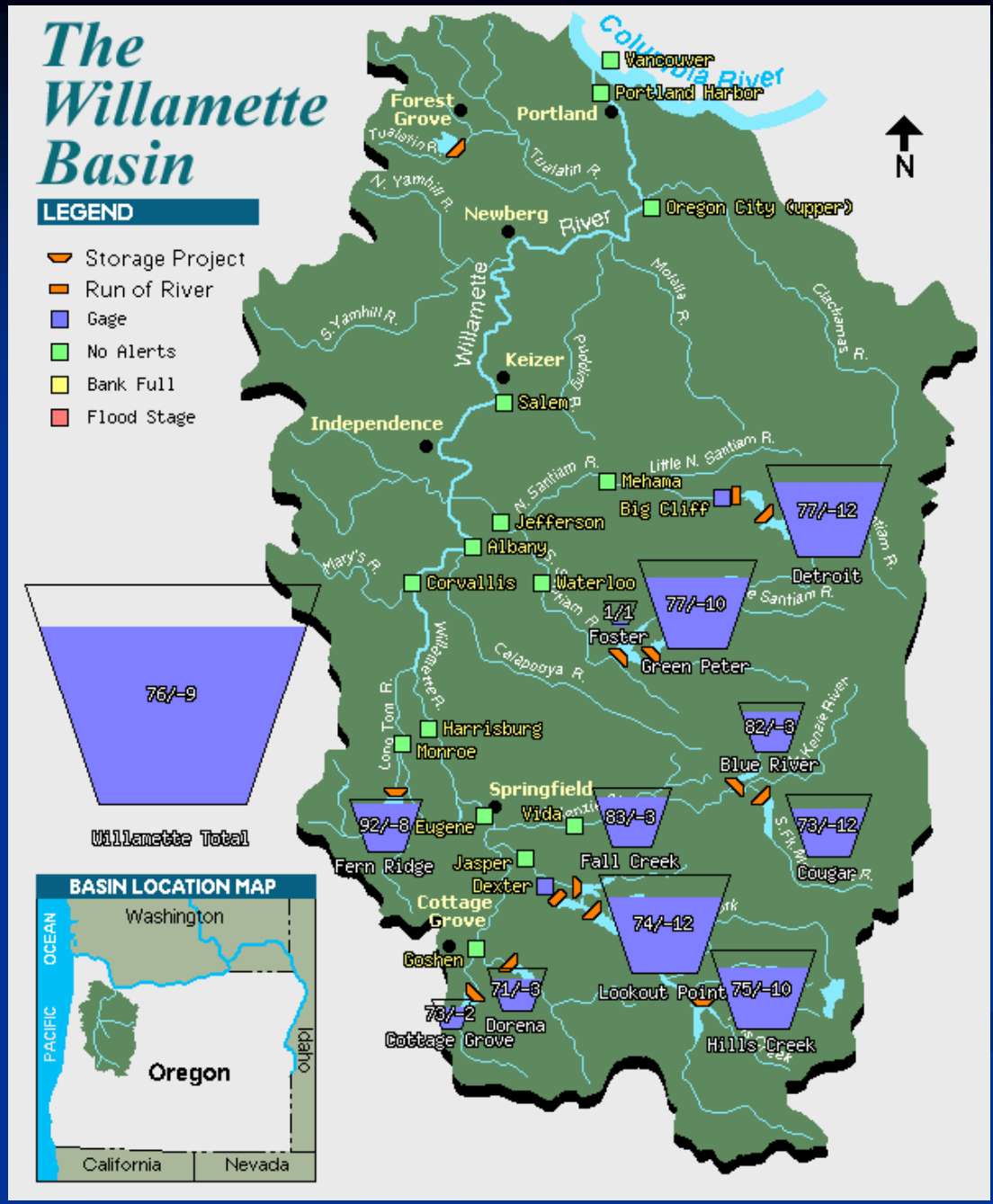
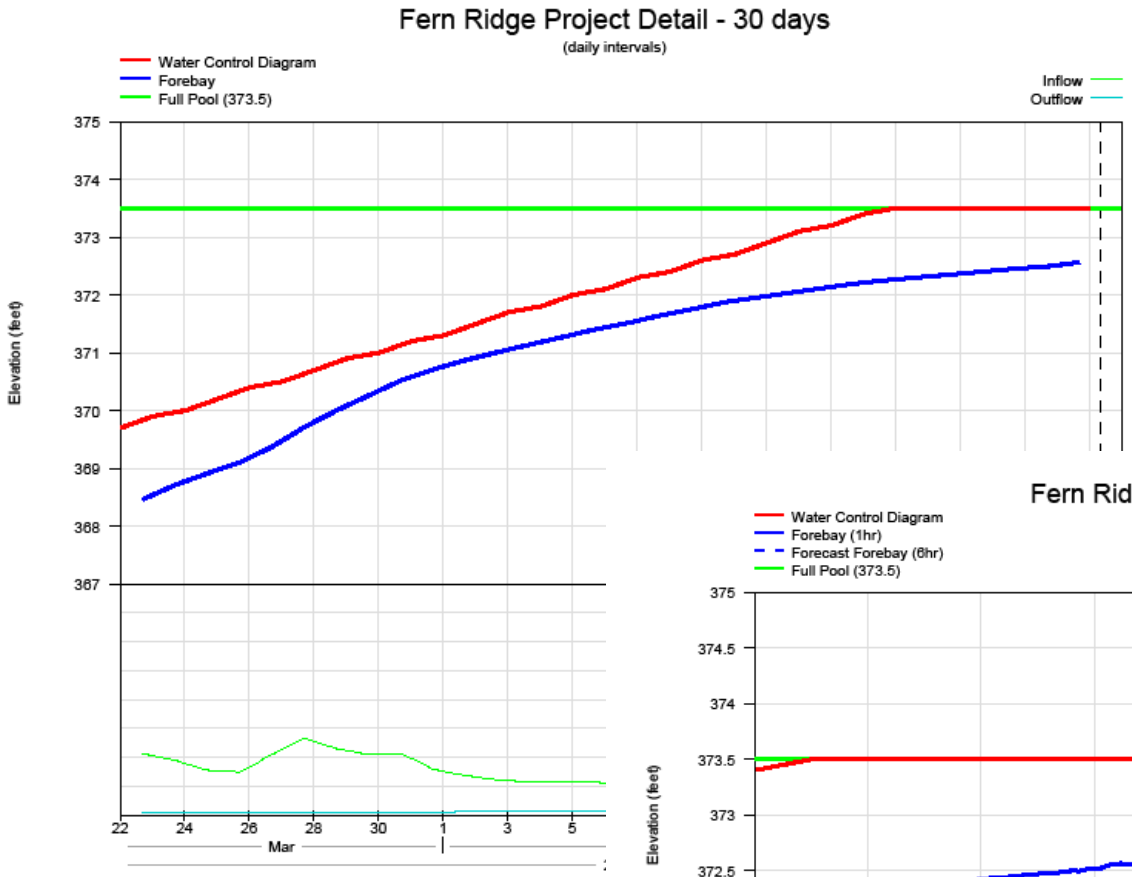
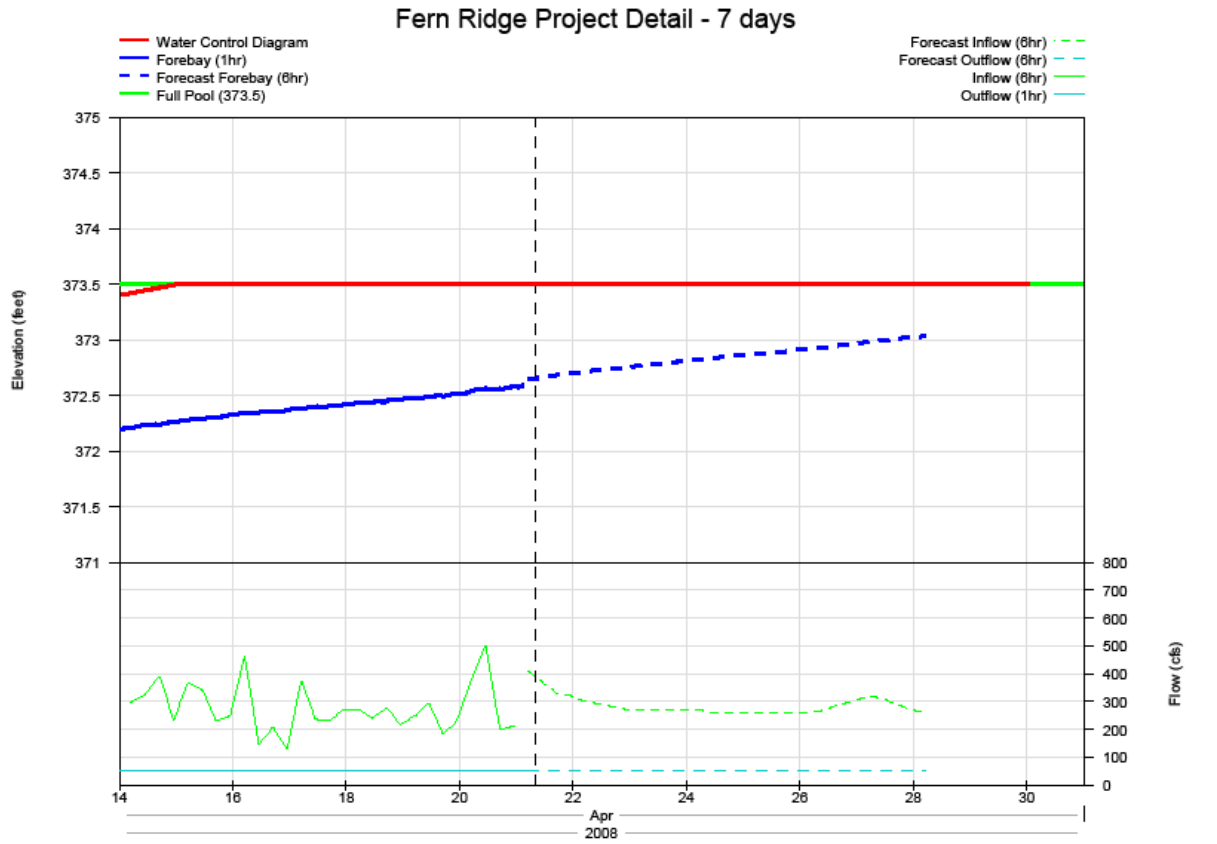
Willamette Teacup Diagram

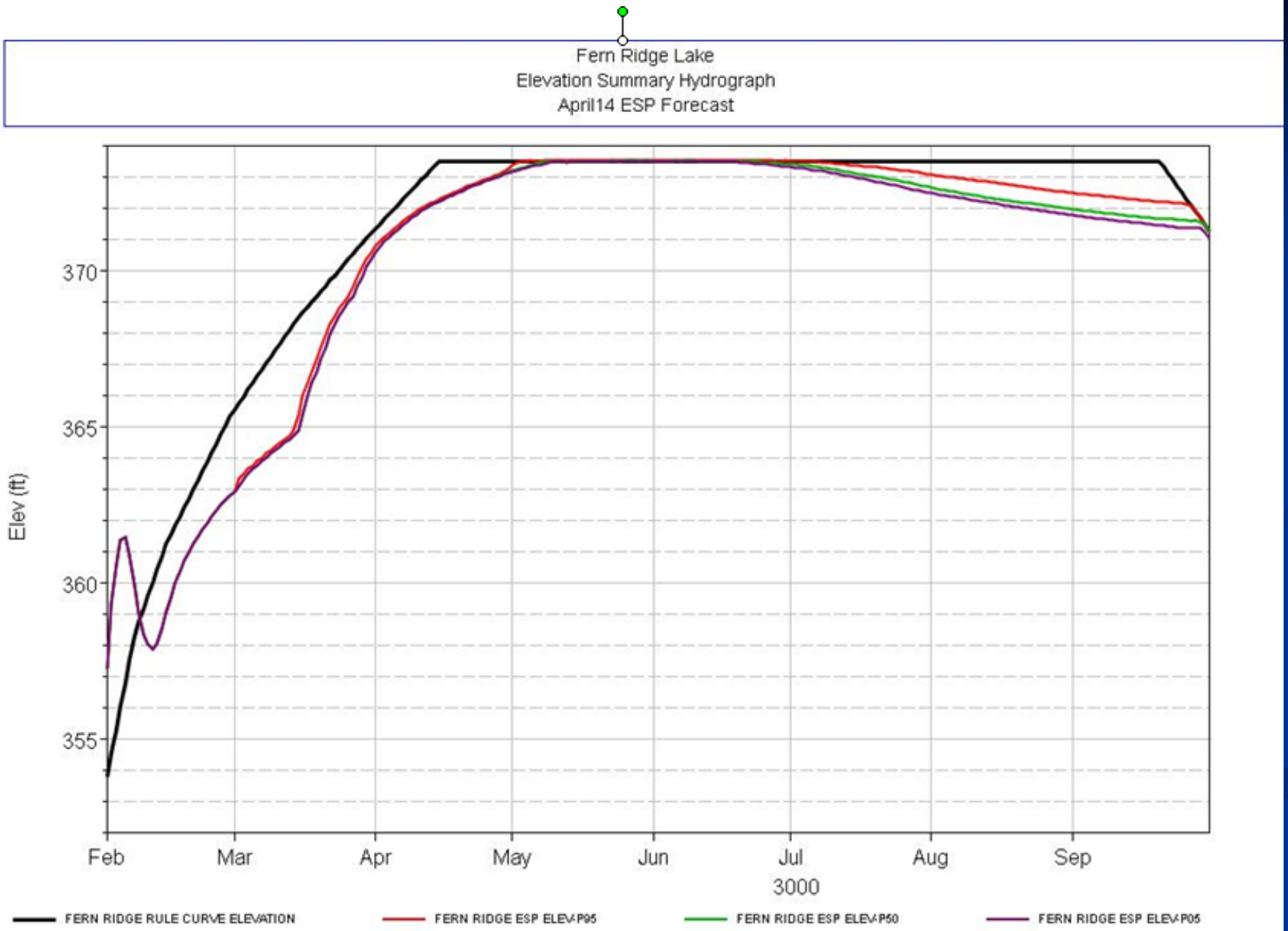


Fern Ridge		
ELEV:	372.6	(0715Apr21)
+/-WCD:	-0.9	(0715Apr21)
OUT:	52	(0400Apr21)
IN:	52	(0400Apr21)

http://www.nwd-wc.usace.army.mil/nwp/teacup/willamette/


Fern Ridge Project Detail - 30 days
(daily intervals)
Water Control Diagram
Forebay
Full Pool (373.5)
Inflow
Outflow
Elevation (feet)
375
374
373
372
371
370
369
368
367
22
24
26
28
30
1
3
5
Mar


Fern Ridge Project Detail - 7 days
Water Control Diagram
Forebay (1hr)
Forecast Forebay (6hr)
Full Pool (373.5)
Forecast Inflow (6hr)
Forecast Outflow (6hr)
Inflow (6hr)
Outflow (1hr)
Elevation (feet)
375
374.5
374
373.5
373
372.5
372
371.5
371
800
700
600
500
400
300
200
100
0
Flow (cfs)
14
16
18
20
22
24
26
28
30
Apr
2008


Fern Ridge Lake
Elevation Summary Hydrograph
April14 ESP Forecast
Elev (ft)
370
365
360
355
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
3000
FERN RIDGE RULE CURVE ELEVATION
FERN RIDGE ESP ELEV-P95
FERN RIDGE ESP ELEV-P50
FERN RIDGE ESP ELEV-P05

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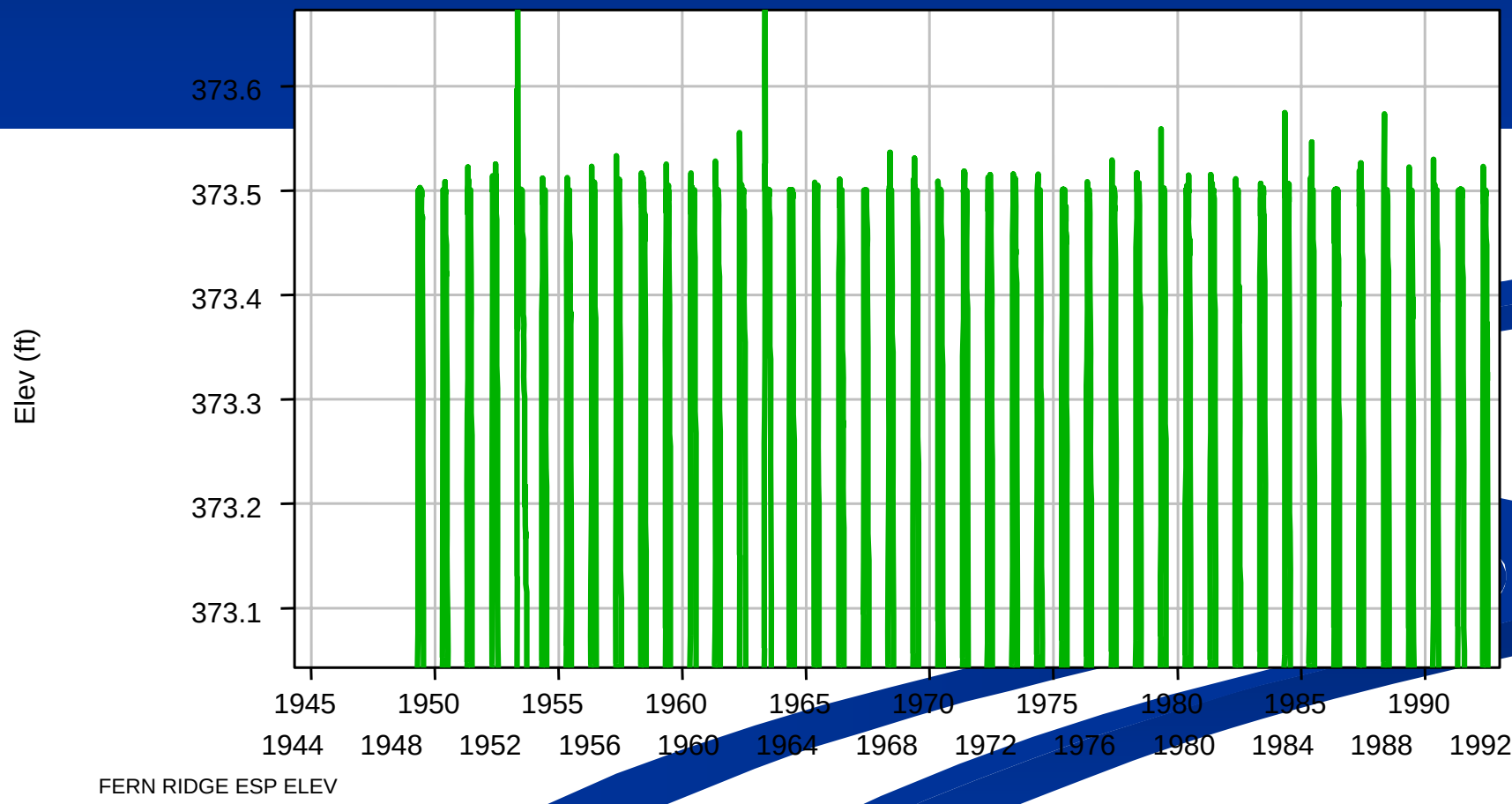
Forecasting Summer Levels



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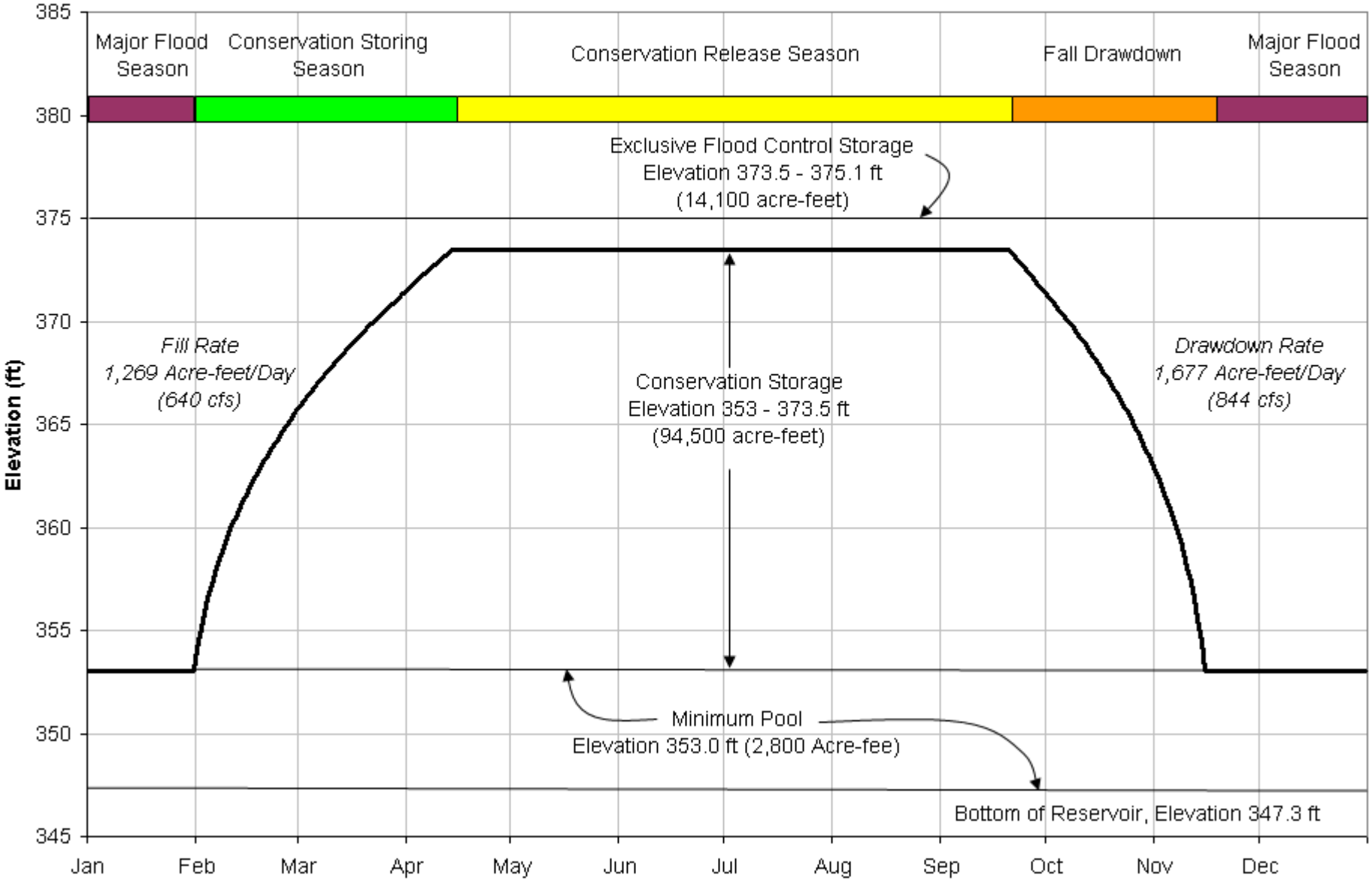
Fern Ridge Rule Curve History

- Originally created in Flood Control Act of 1938
- Modified in 1966 when dam was raised 1.6 feet
- 1992 Rule Curve Modification Study Report
  - In response to public desire to improve probability of filling each year
  - Evaluated increasing the length of conservation season (1 April – 15 October)
  - Projected increase in probability of filling at 10 percent
  - Project was terminated in 1994 citing environmental concerns

Fern Ridge Reservoir
Present Flood Control Rule Curve
In Effect since 1966



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Criteria for filling

- Filling Fern Ridge Reservoir depends on rain from February to mid-April
- How full the reservoir remains depends on continued inflow and rate of evaporation
- Authority to exceed the curve for flood damage reduction

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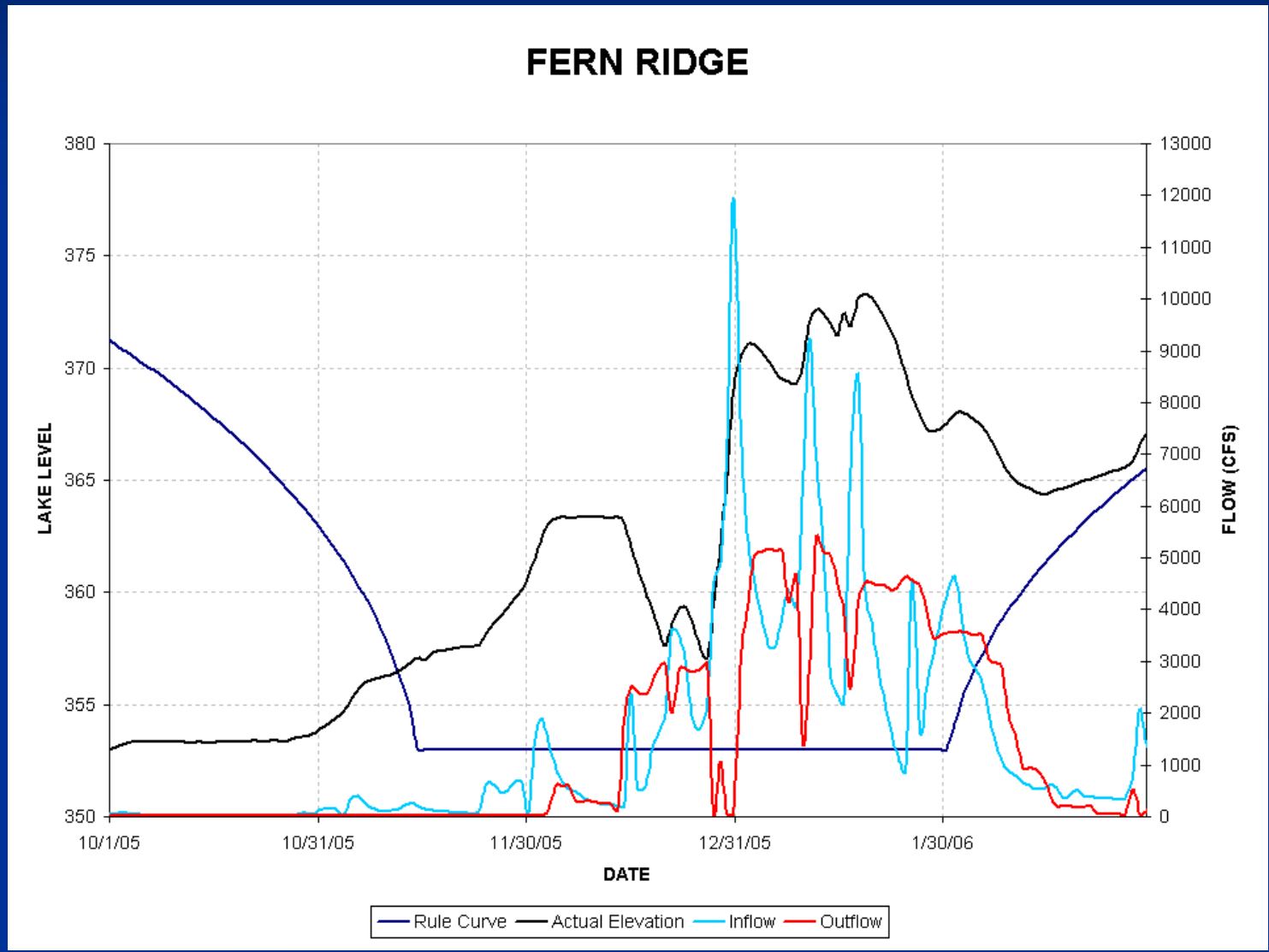
Why does FR need 20 feet of flood storage? (Jan 2006)



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Revising the rule curve

- Requires authority for:
  - Re-evaluation of the 1992 Rule Curve Modification Study
  - Environmental Assessment to evaluate impacts on listed endangered or threatened species (includes public comment opportunity)
  - Operations and maintenance funding

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Fern Ridge Summary

- One component of a dynamic system
- Designed to meet multiple missions with flood damage reduction as the primary purpose
- Value of recreation at Fern Ridge is understood and respected
- Balancing demands is extremely challenging
- Impacts of changing that balance are not clear

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For more information

- About the Corps: (Portland District Web site) www.nwp.usace.army.mil
- Reservoir levels: www.nwd-wc.usace.army.mil/nwp/
- River levels: (NW River Forecast Center) http://www.nwrfc.noaa.gov/
- Willamette Valley Project Office: 541-937-2131

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Corps staff here tonight

- Erik Petersen, WVP Operations Project Manager
- Mary Karen Scullion, Portland District Hydraulic Engineer
- Dustin Bengtson, WVP Recreation Ops Supervisor
- Kat Beal, WVP Terrestrial Environ. Stewardship Supervisor
- Christie Johnson, WVP Education/Outreach Specialist
- Amy Echols, Portland District Public Affairs Specialist