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Tuckasegee River Project



CHEOPS™

Operations and Planning Model

Developed By:



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Developed For:



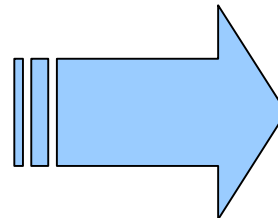
A Duke Energy Company

Meeting Agenda

- Introduction
 - CHEOPS Model - A Brief Description
 - Plants, Routing and Downstream Nodes
 - Tuckasegee River Project -
 CHEOPS Model Scenarios & Output
 - Questions & Answers
-

CHEOPS Model

Computer
Hydro
Electric
Operations and
Planning
Software



Current CHEOPS Clients:

- American River (Sacramento Municipal Utility District)
- Lower & Middle Snake Rivers (Idaho Power)
- Pelton-Round Butte (Portland General Electric)
- Stanislaus River (Pacific Gas & Electric)
- Catawba River (Duke Power)
-
-
-

CHEOPS Model

- East Fork
 - Tanasee Creek, Wolf Creek, Bear Creek and Cedar Cliff Reservoirs
- West Fork
 - Lake Glenville and Tuckasegee Reservoir
- Downstream Nodes
 - Below the confluence of the East Fork and West Fork (5 nodes)



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Interface Screen

DE&S CHEOPS Model

Tuckasegee River Project

Select a Plant

Select a Node

System Setting

Scenario Set-Up

Run Scenario

View CHEOPS Output

Exit CHEOPS

Developed For:

Duke Power
A Duke Energy Company

Node 5

Node 4

Node 3

Dillsboro

Node 2

Node 1

Webster Bridge

Canoy Fork

Tuckasegee Powerhouse

Cedar Cliff Powerhouse

Bear Creek Powerhouse

Thorpe Powerhouse

Tennessee Creek Powerhouse

Lake Glenville

Bear Creek Reservoir

Wolf Creek Reservoir

Tennessee Creek Reservoir

Tuckasegee River



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Plant Conditions

CHEOPS Plant Conditions

Conditions for the Tuckasegee Project

Physical Conditions

Reservoir Curve Reservoir Area Curve

Daily Evaporation Tailwater Curve

Spillway Curve Ramp Rating Curve

Plant Options

Operation Conditions

Flood Elevations Target Elevations

Minimum Elevations Water Withdrawals

Fluctuation Limits Fluctuation Rates

Min Instantaneous Flow Min Daily Average Flow

Bypass Flows Ramping Rates

Flashboards or Fuse Plugs

Generation Conditions

Turbine Generator Maintenance Schedule

Minimum Flow Unit

Plant Settings

Physical Settings Operation Settings

Generation Settings

OK Exit CHEOPS





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Downstream Nodes

Node Data

Node 1

Conditions

- Minimum Flows
- Daytime Min Flows
- Maximum Flows
- Ramping Rates
- Withdrawals

Node Specific Information

Node 1

River Mile Location: 45

Location Description: Located where the bridge for new Hwy 107 crosses the Tuckasegee River downstream of Caney Fork Confluence.

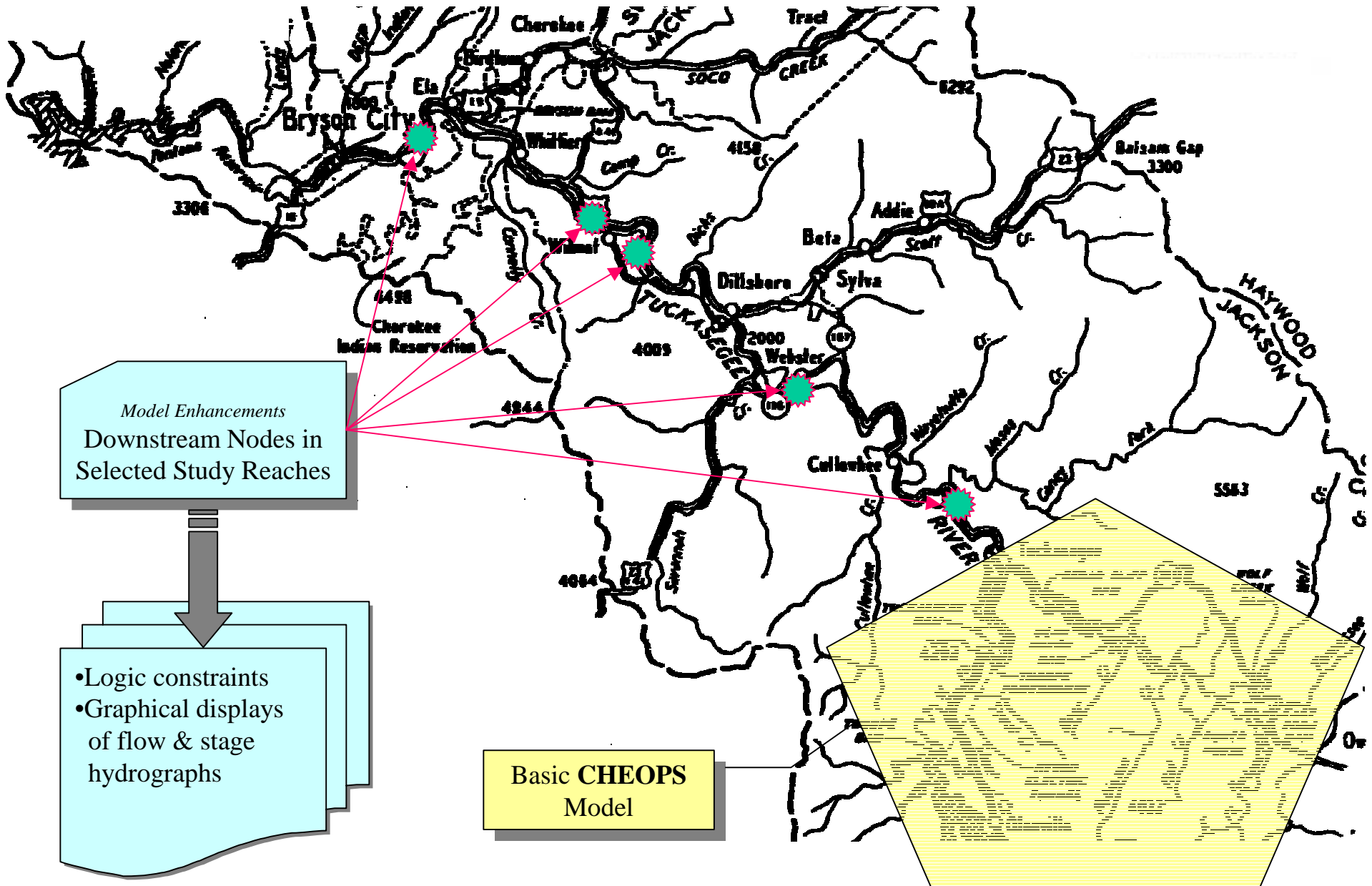
Settings

Configure Settings

OK Exit CHEOPS

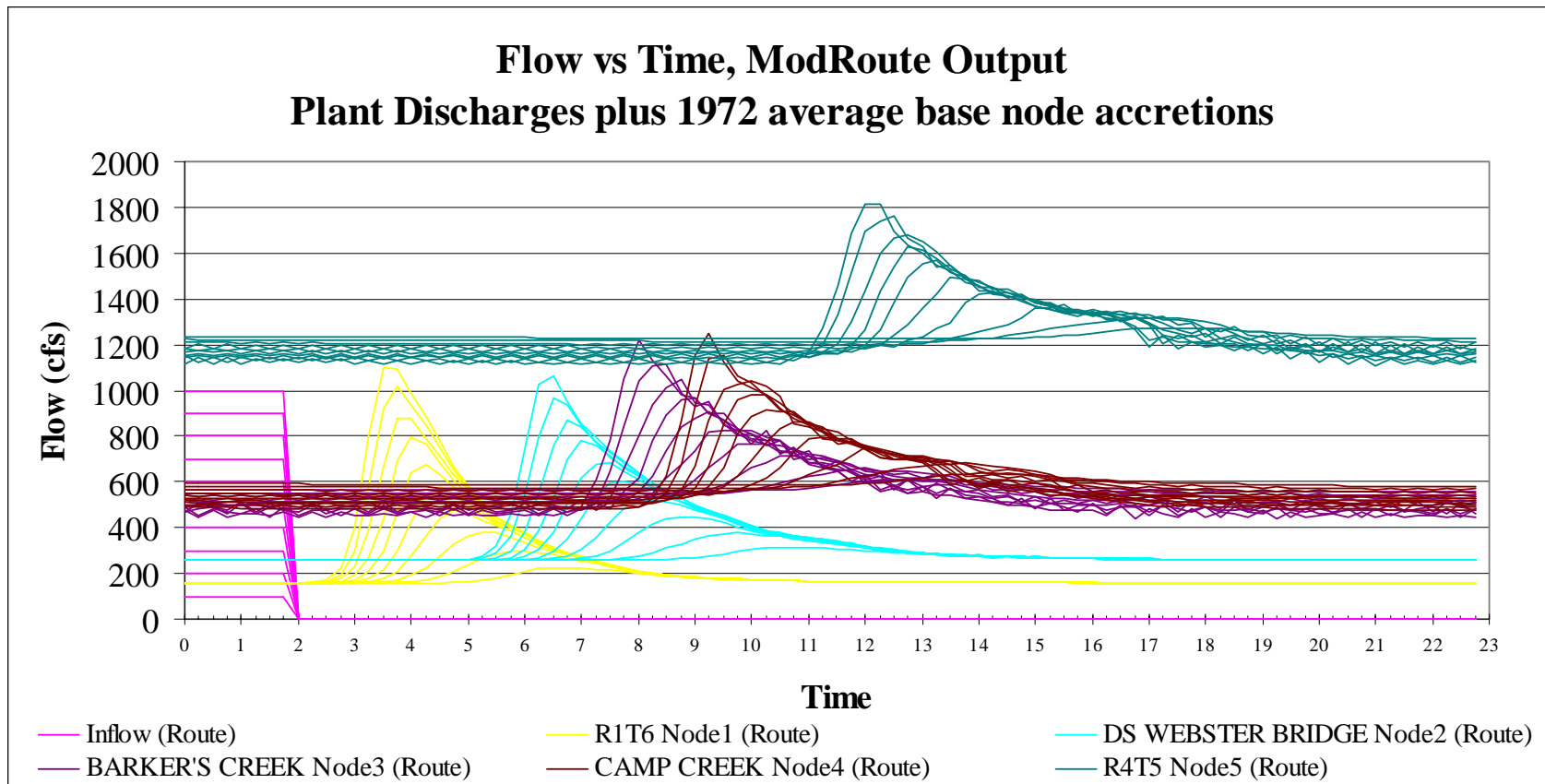
Tuckasegee River CHEOPS Model

Enhancements for Downstream Study Reaches



Reach Routing

Multiple Reaches, Multiple Flows





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CHEOPS Model Scenarios

- Baseline Case - Minimum Flows
(Cedar Cliff 10cfs & Tuckasegee 20cfs)
- Case 2 - Duke Power Trial Balloon (3/21)
- Case 3 - Duke Power Trial Balloon (3/21) with Lake Glenville Homeowners Assoc. Lake Levels
- Case 4 - Duke Power Trial Balloon (3/21) and Lake Glenville Homeowners Assoc. Lake Levels with Wolf Creek Target Modification

Baseline Components

- Minimum Instantaneous Flows
 - Cedar Cliff (10cfs)
 - Tuckasegee (20cfs - bypass flow at the dam)
- Target Elevations
 - Current Target Elevations





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Case 2

Trial Balloon Components

- Minimum Flows
 -
 -
- Target Elevations
 -
 -
- Recreational Flows
 -





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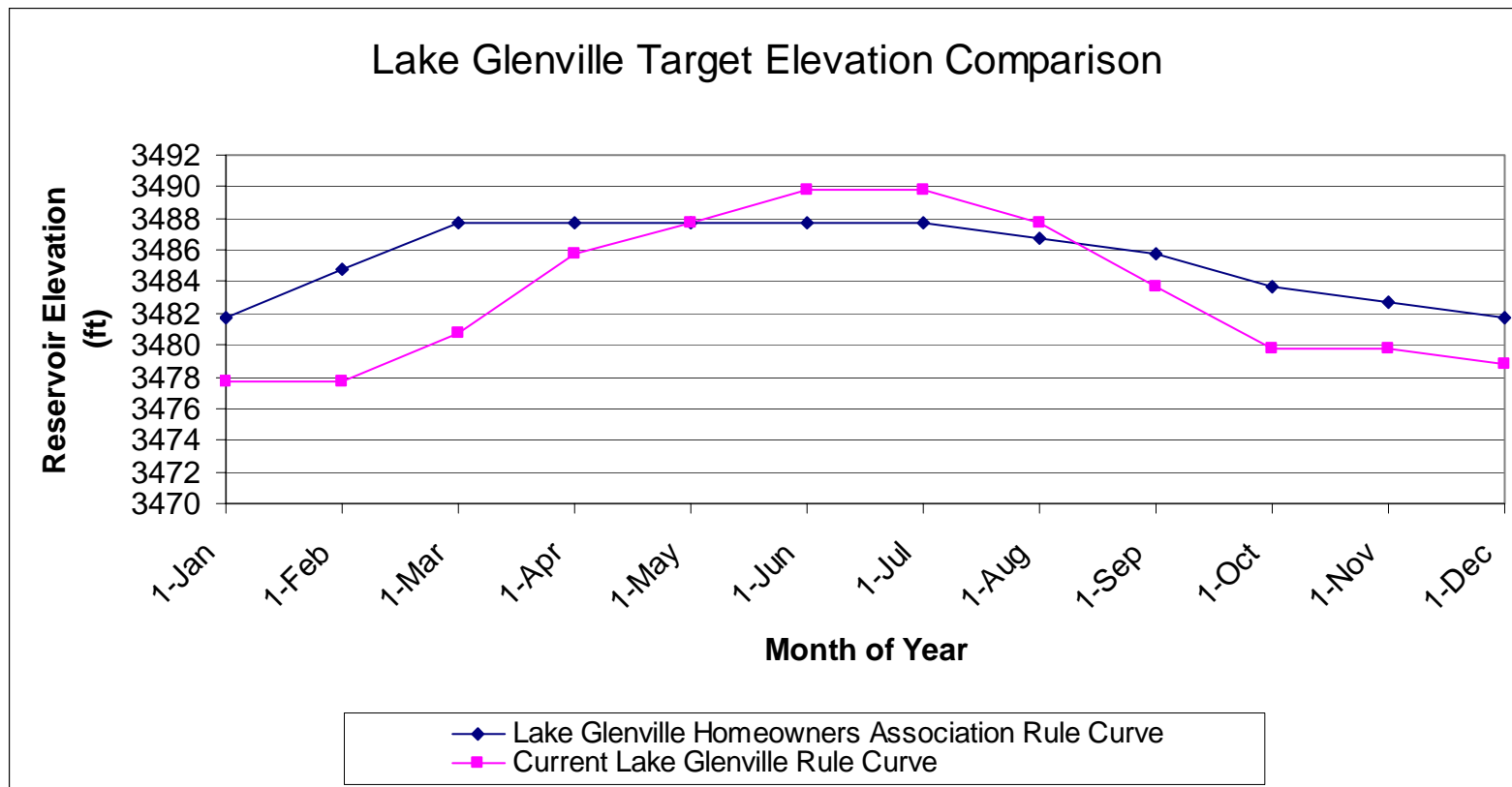


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Case 3

Lake Glenville Homeowners Target Elevations vs. Current Target Elevations





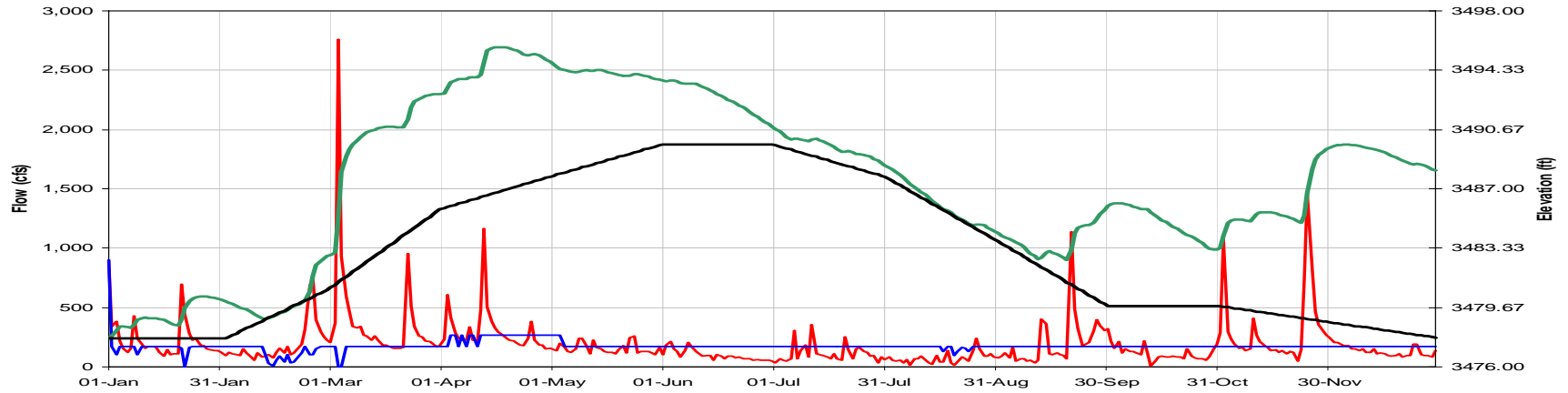
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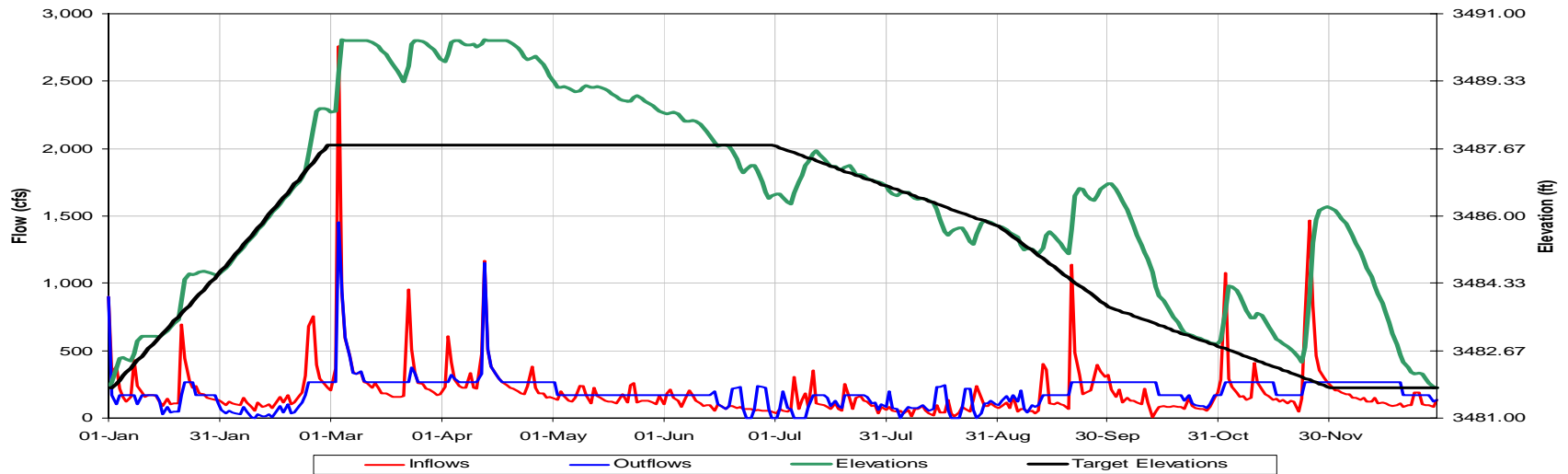
Base Case vs. Case 3



Lake Glenville Operational Details for 1979 Hydrology, Scenario 'Base Case'



Lake Glenville Operational Details for 1979 Hydrology, Scenario 'Case 3'





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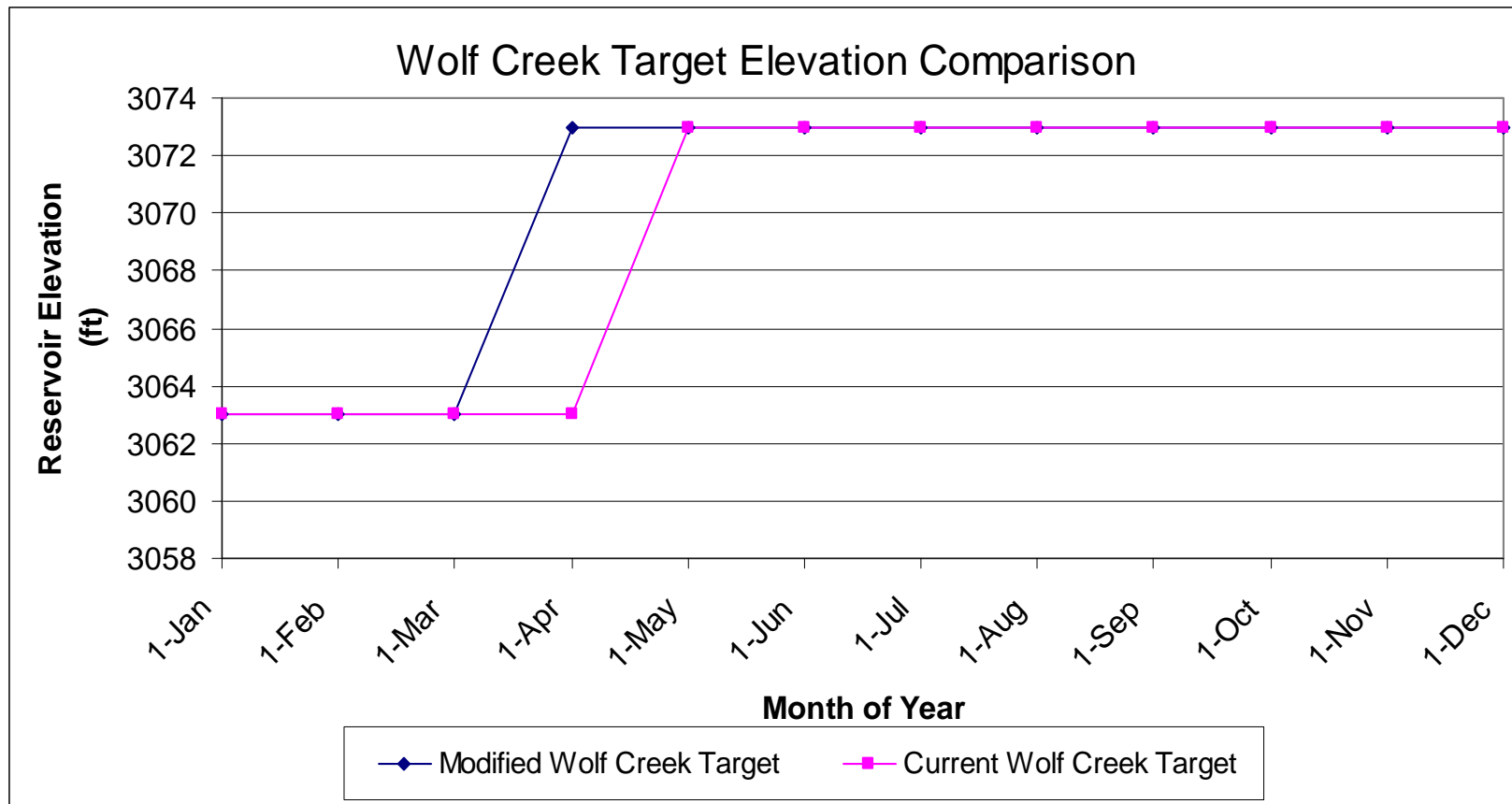


CHEOPS Model Scenarios

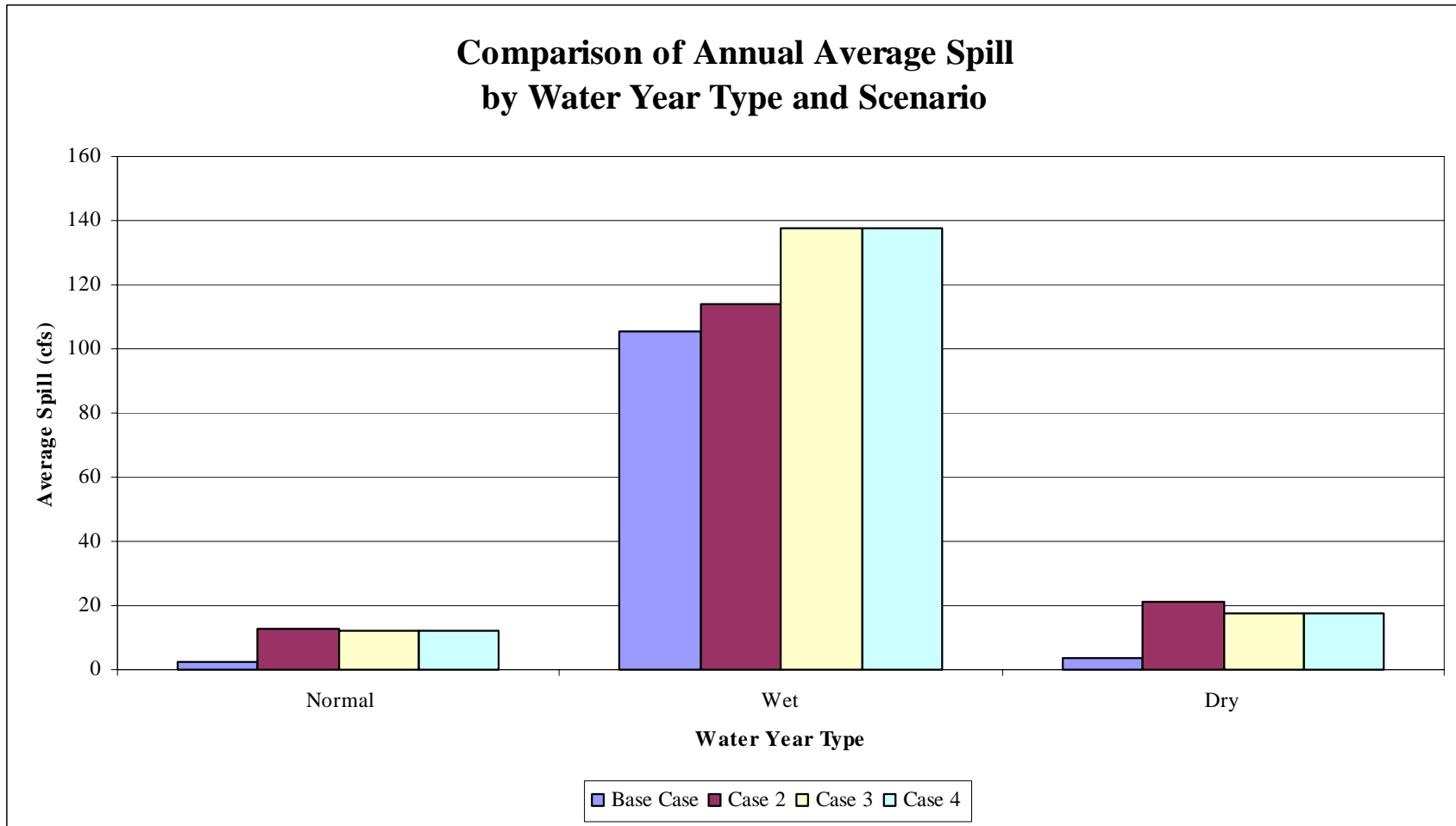
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Case 4

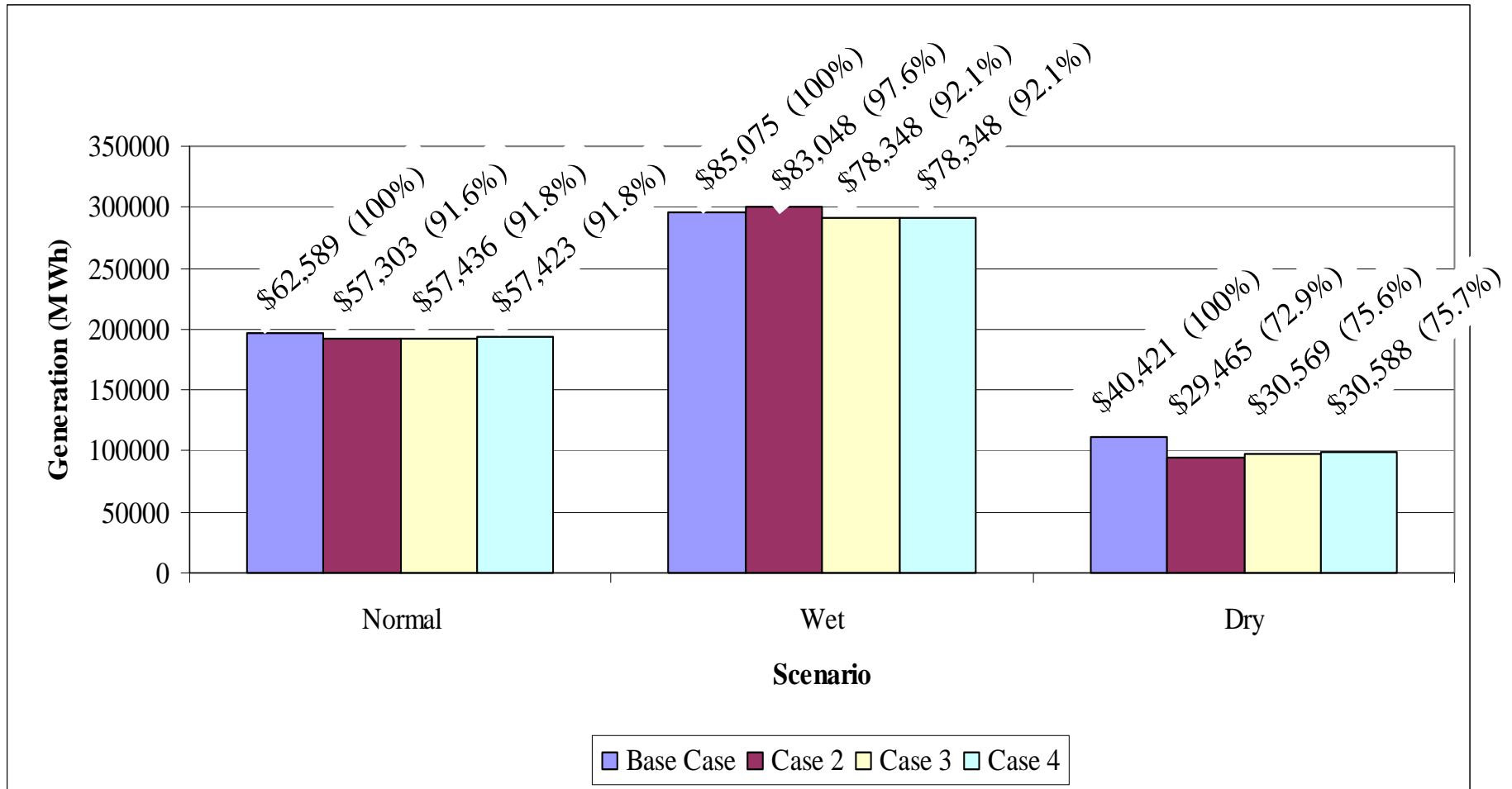
Modified Wolf Creek Target Elevations vs. Current Target Elevations



Spill Output



Generation Output





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Percent Change in Generation Value Compared to Base Case

	Base Case	Case 2	Case 3	Case 4
1972 (Normal)	100%	91.6%	91.8%	91.8%
1979 (Wet)	100%	97.6%	92.1%	92.1%
1981 (Dry)	100%	72.9%	75.6%	75.7%



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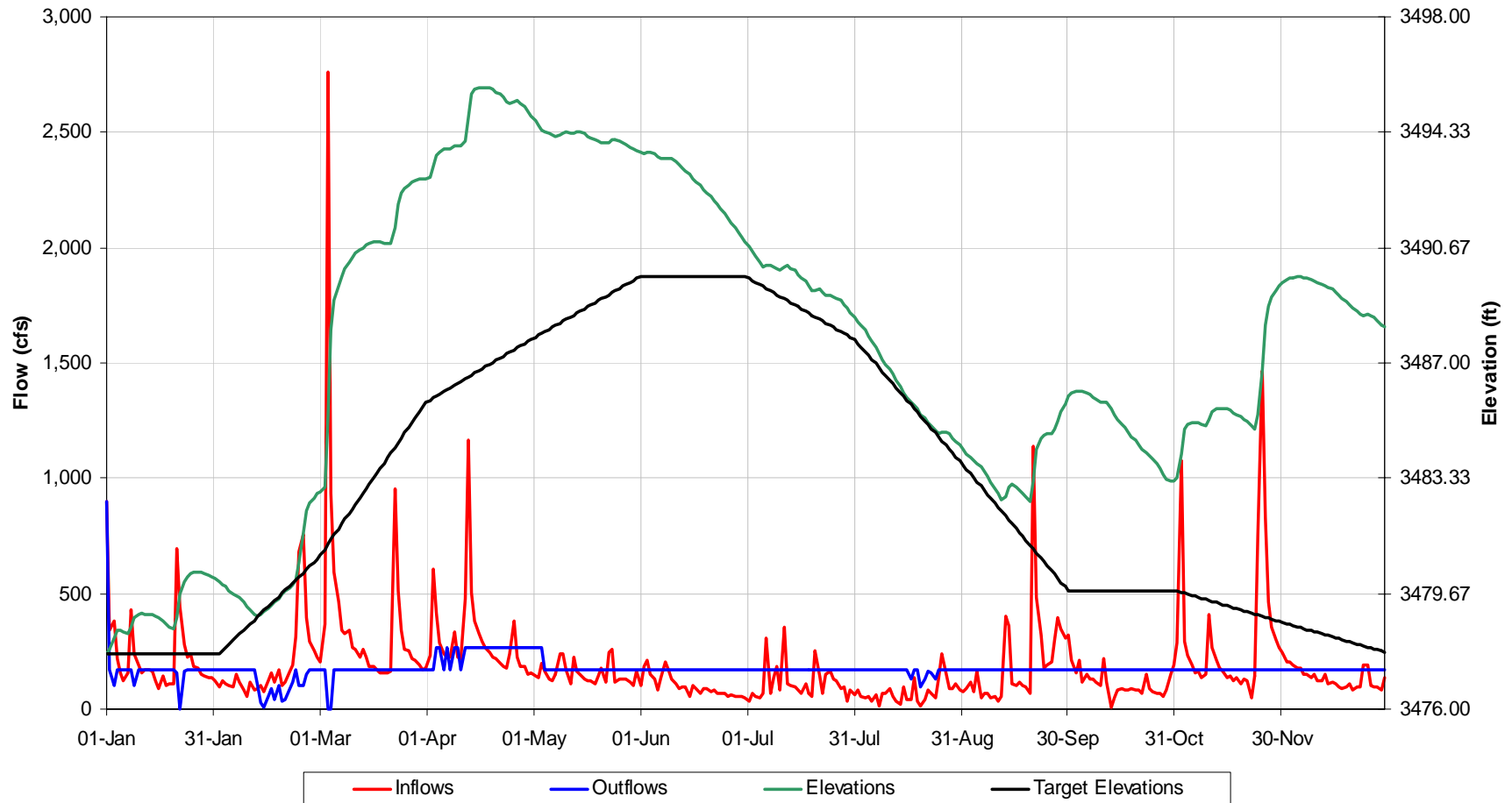


Questions & Answers



Case 3

Lake Glenville Operational Details
 for 1979 Hydrology, Scenario 'Base Case'



Case 3

Lake Glenville Operational Details
 for 1979 Hydrology, Scenario 'Case 3'

