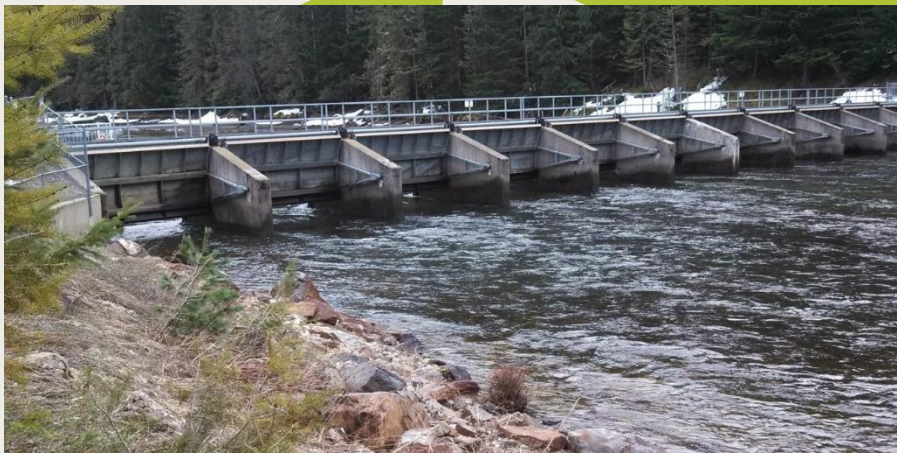
MOTT MACDONALD

Priest Lake Water Management Study

Stakeholder Meeting – 6/08/2017

IDAHO WATER RESOURCE BOARD



Working Document

Study Criteria

1

Lake Level Management:
Maintain Lake Level at 3.0’ during Recreation Season in Dry Years, improve habitat & minimize shoreline impacts

2

Minimum Outlet Structure Flows:
Maintain current minimum 60 cfs discharge flow requirements downstream of the dam

3

Thorofare Sustainability:
Promote self-sustaining improvements to Thorofare access, navigability and water quality

Meeting Purpose & Agenda

1 Provide Update on Work Scope & Status of Study

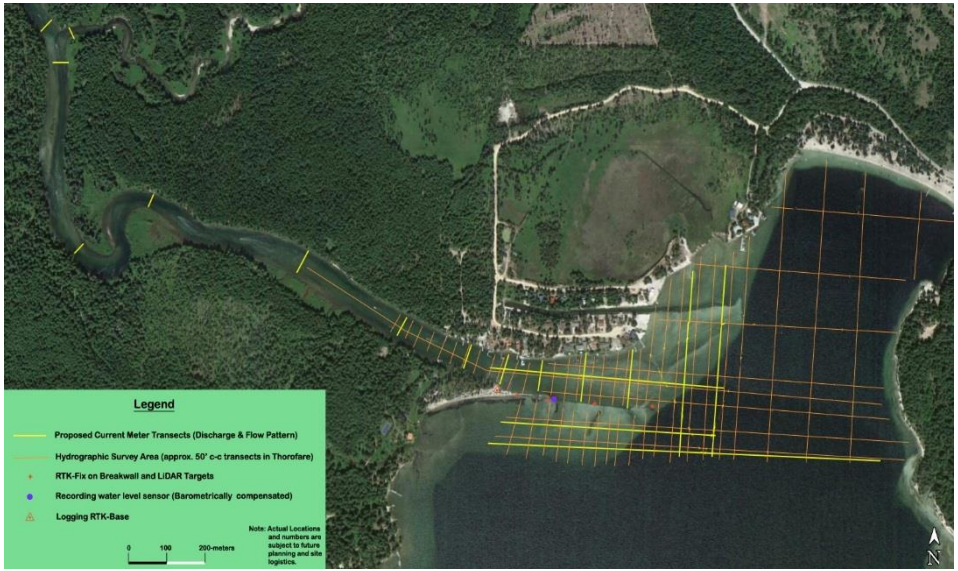
2 Obtain input from Key Stakeholders

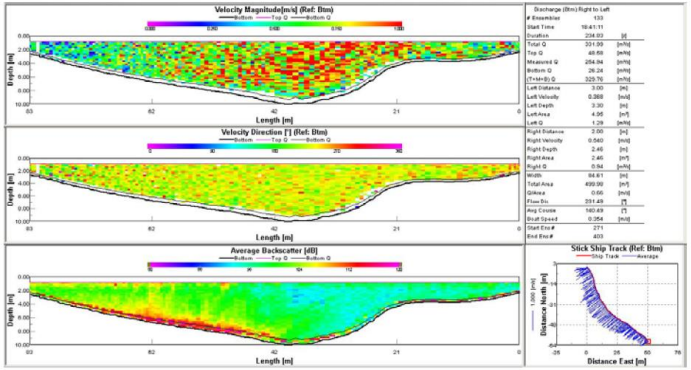
3 Help Facilitate Public Outreach

4 Next Steps

NEW DATA COLLECTION - THOROFARE

- Hydrographic Surveying
- Water Levels
- ADCP Thorofare Currents
- Sediment Grab Samples – sieve analysis

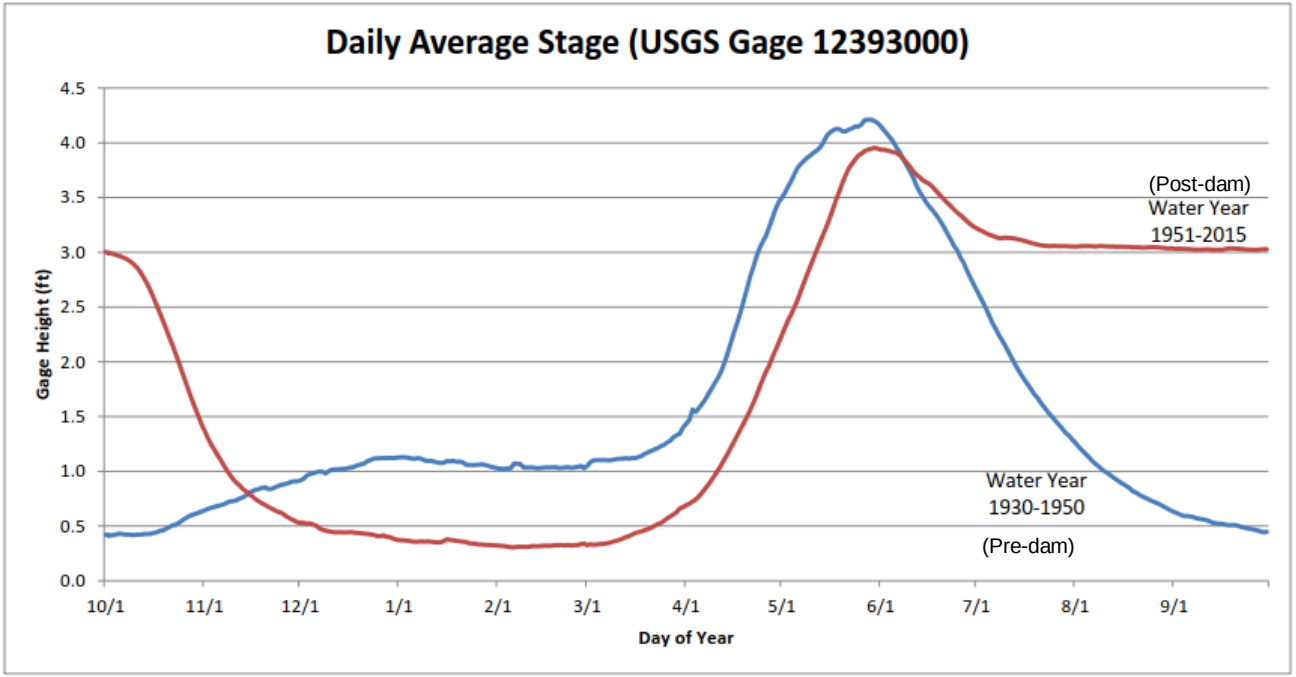




Example of real time display of current profile data across river transect.

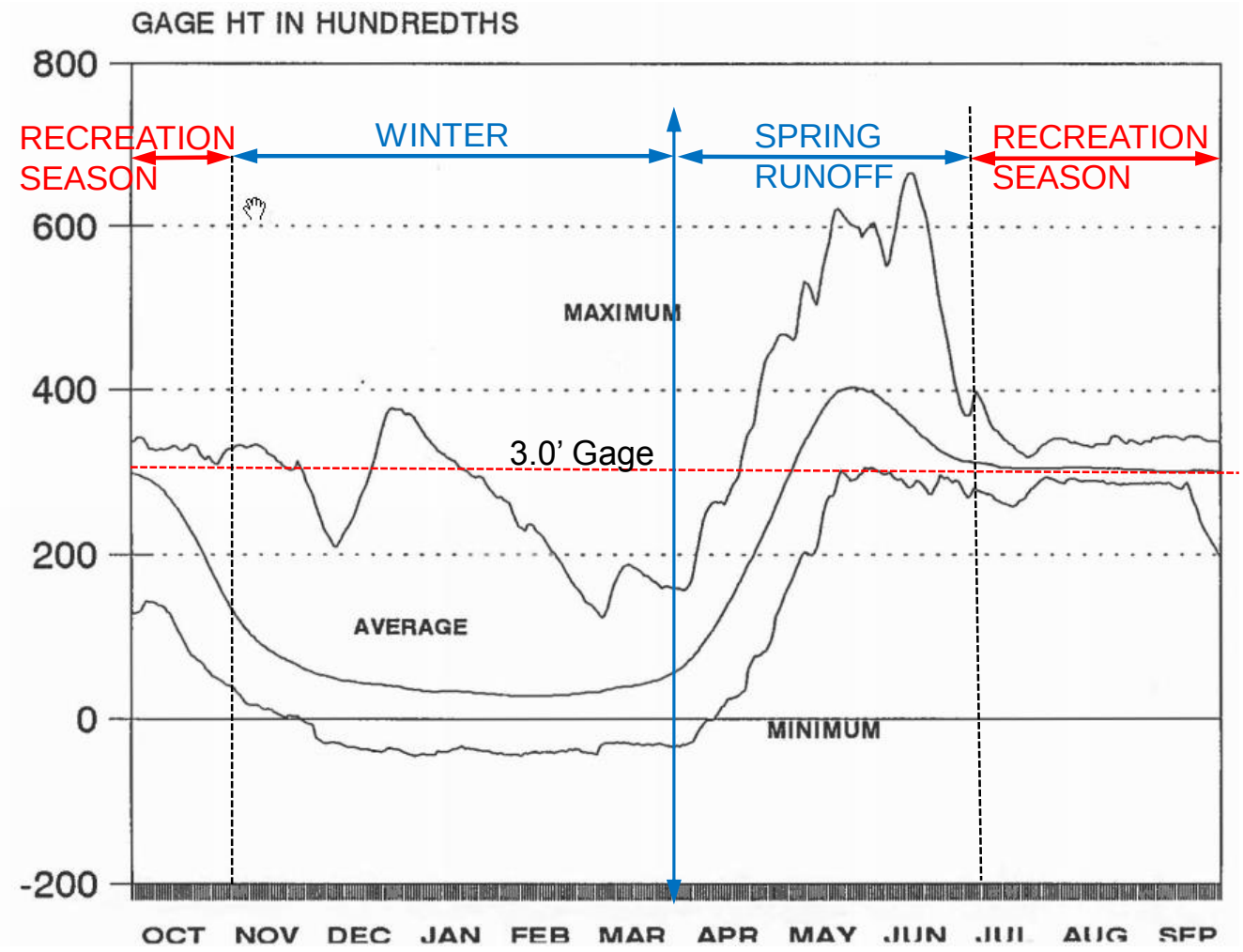
HISTORICAL DATA - LAKE LEVEL (Pre/Post Dam)

- Historical Information provided by IDWR
- 1951 = Outlet Structure Construction



HISTORICAL DATA - LAKE LEVELS

- Chart based on data through 1993.
- Recreational Season = July 1 to October 8.
- Water Level at 3.0’ Gage Level for recreational season



HISTORICAL DATA - PRIEST RIVER FLOWS

- Low discharge in mid summer to early fall
- Min, Median, & Max flows from data record shown
- Data for time period 1951 to 1992.
- 1951 = New Dam Construction

= Low Flow Period, min 60 cfs outlet dam discharge

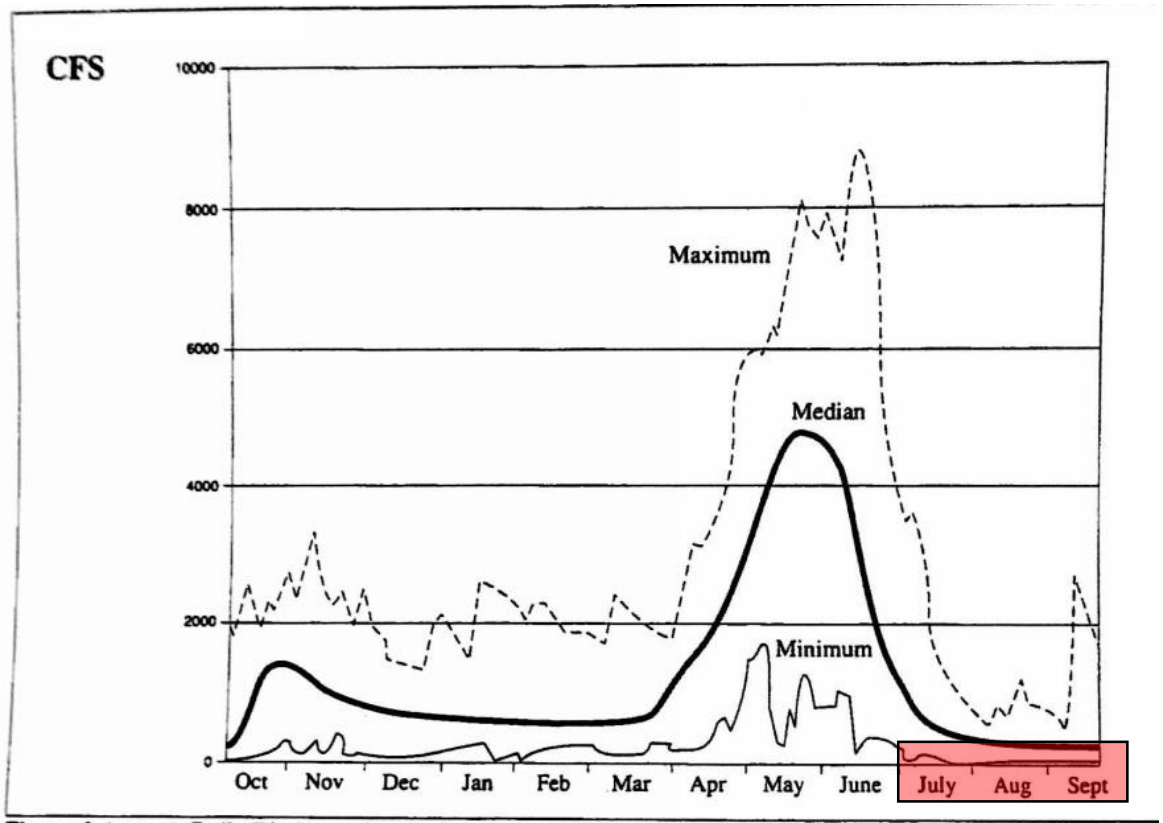
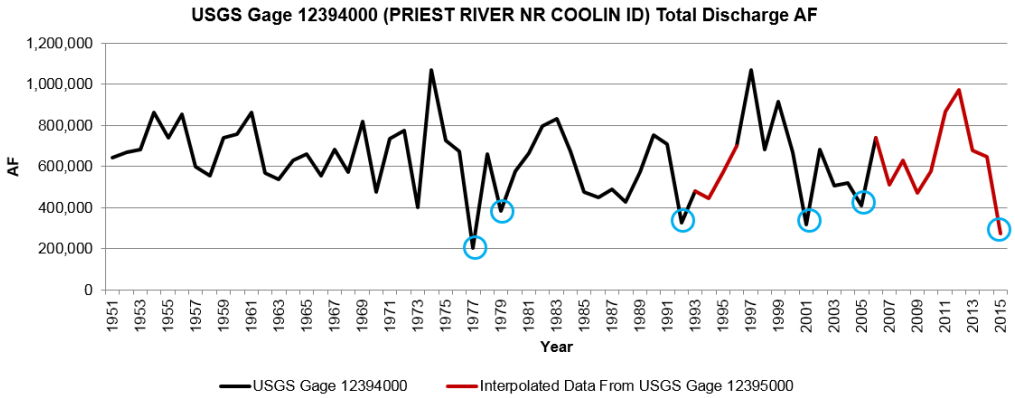


Figure 6. Average Daily Discharge for the Priest River at Dickensheet, 1951-1992 (USGS Station No: 12394000)

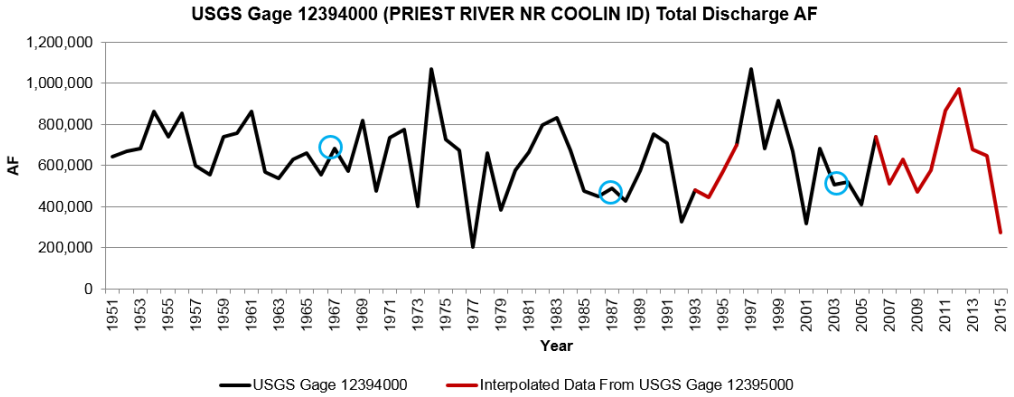
CLIMATE CHANGE CONSIDERATIONS

- More frequent low summer flow & drought conditions
- Develop considerations for climate change into alternative water management plan evaluation.
- Criteria to be developed for low water years

Low Water Years

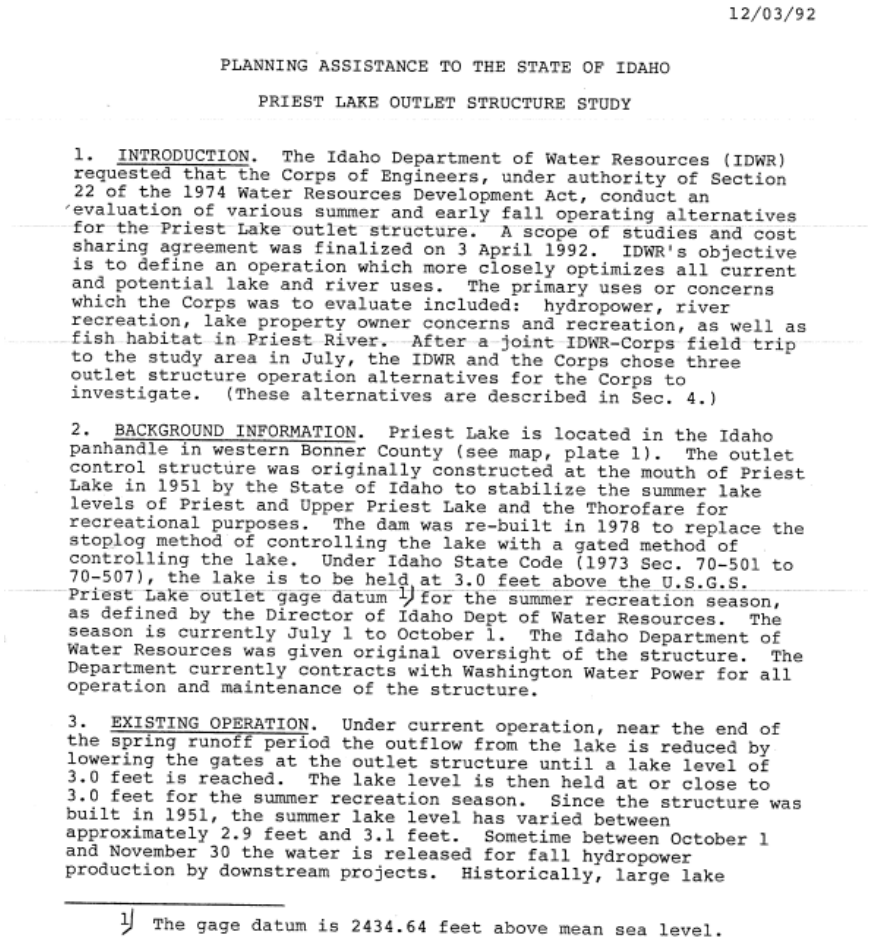


Good Water Years



PRIOR WATER MANAGEMENT STUDY REVIEW

- Purpose: State Water Plan
- Author: U.S. Army Corps of Engineers
- Methodology: Reviewed 42 years of water year data; including 3 drought years and 2 average years
- Alternatives. Looked at 7 alternatives for alternative water management in Priest Lake (water levels and discharges)



12/03/92

PLANNING ASSISTANCE TO THE STATE OF IDAHO

PRIEST LAKE OUTLET STRUCTURE STUDY

1. INTRODUCTION. The Idaho Department of Water Resources (IDWR) requested that the Corps of Engineers, under authority of Section 22 of the 1974 Water Resources Development Act, conduct an evaluation of various summer and early fall operating alternatives for the Priest Lake outlet structure. A scope of studies and cost sharing agreement was finalized on 3 April 1992. IDWR's objective is to define an operation which more closely optimizes all current and potential lake and river uses. The primary uses or concerns which the Corps was to evaluate included: hydropower, river recreation, lake property owner concerns and recreation, as well as fish habitat in Priest River. After a joint IDWR-Corps field trip to the study area in July, the IDWR and the Corps chose three outlet structure operation alternatives for the Corps to investigate. (These alternatives are described in Sec. 4.)

2. BACKGROUND INFORMATION. Priest Lake is located in the Idaho panhandle in western Bonner County (see map, plate 1). The outlet control structure was originally constructed at the mouth of Priest Lake in 1951 by the State of Idaho to stabilize the summer lake levels of Priest and Upper Priest Lake and the Thorofare for recreational purposes. The dam was re-built in 1978 to replace the stoplog method of controlling the lake with a gated method of controlling the lake. Under Idaho State Code (1973 Sec. 70-501 to 70-507), the lake is to be held at 3.0 feet above the U.S.G.S. Priest Lake outlet gage datum [1] for the summer recreation season, as defined by the Director of Idaho Dept of Water Resources. The season is currently July 1 to October 1. The Idaho Department of Water Resources was given original oversight of the structure. The Department currently contracts with Washington Water Power for all operation and maintenance of the structure.

3. EXISTING OPERATION. Under current operation, near the end of the spring runoff period the outflow from the lake is reduced by lowering the gates at the outlet structure until a lake level of 3.0 feet is reached. The lake level is then held at or close to 3.0 feet for the summer recreation season. Since the structure was built in 1951, the summer lake level has varied between approximately 2.9 feet and 3.1 feet. Sometime between October 1 and November 30 the water is released for fall hydropower production by downstream projects. Historically, large lake

[1] The gage datum is 2434.64 feet above mean sea level.

BASIS OF ANALYSIS/CRITERIA

To be developed in coordination with IDWR/Bonner County

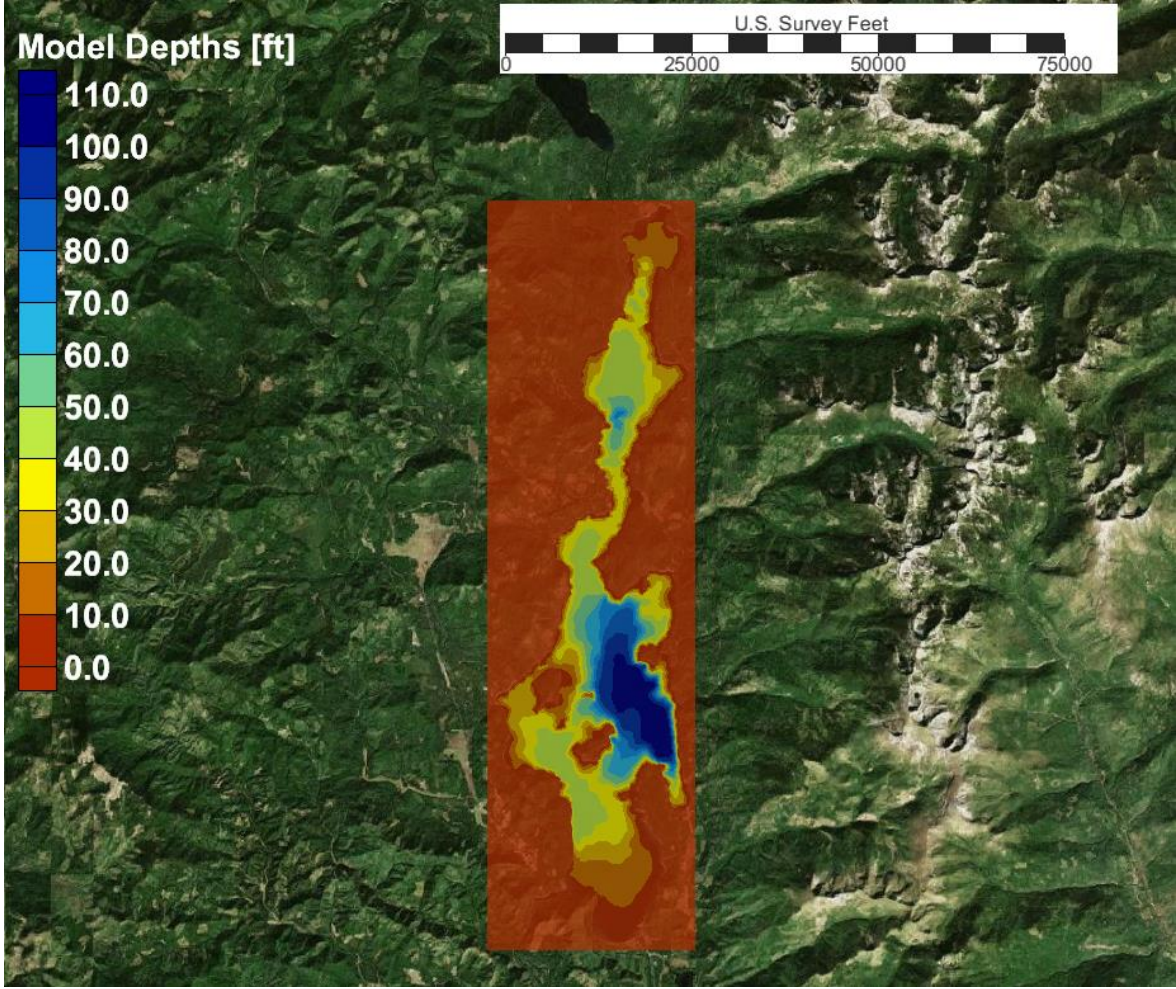
Considerations

- Standards – to be evaluated, dam safety, etc…
- Water Levels – range to be evaluated
- Historical Operations – develop current and historical protocols
- Future Operations – focus on low water year for any alternative water management
- Recreational Period – exact dates for start and end
- Navigation – what is acceptable, required – need to define
- Vessel Size & Thorofare Use – size, alignment, depth, buoy marking
- Species/Habitat Considerations – migration period, work window, spawning
- Climate Change Considerations – low water year definition, statistics
- Outlet Dam Operation Criteria – minimum, maximum discharge, timing
- Property Ownership – improvements on public land; Thorofare
- Water Quality – discharge (minimum during recreational period)
- Dam Safety – current standards or relative to original design condition

WAVE ANALYSIS – BATHYMETRY GRID

- Wave Analysis for wind waves within lake to aid in assessment work

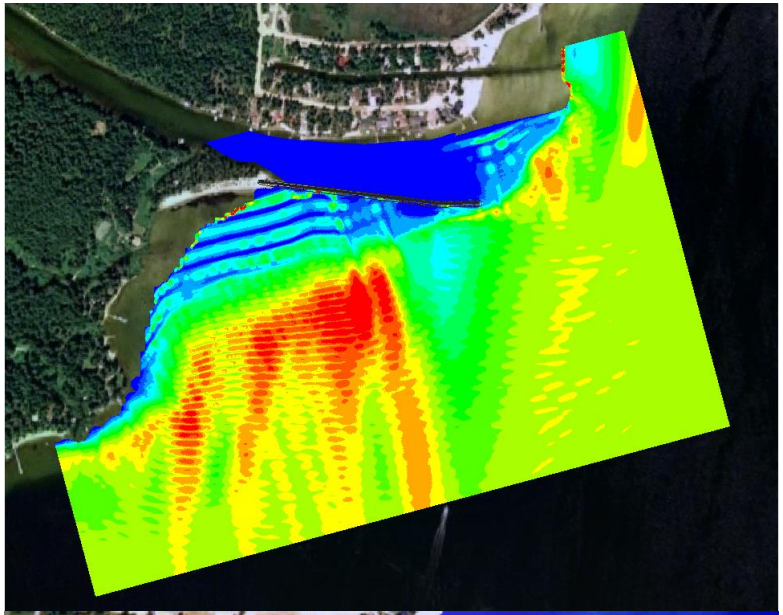
- Source: 1995 Bathymetry survey by DEQ staff



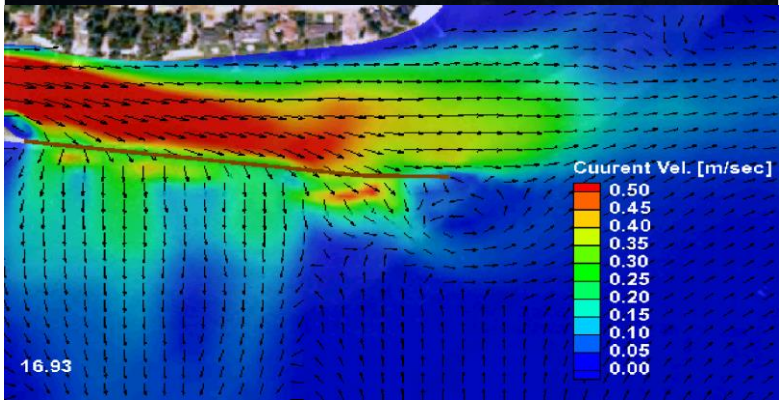
THOROFARE HYDRODYNAMICS - BACKGROUND

- Previously Conducted Hydrodynamics (shown); 2008
- Updated hydrodynamic analysis to be conducted as part of the study to evaluate improvement concepts

Wave Analysis

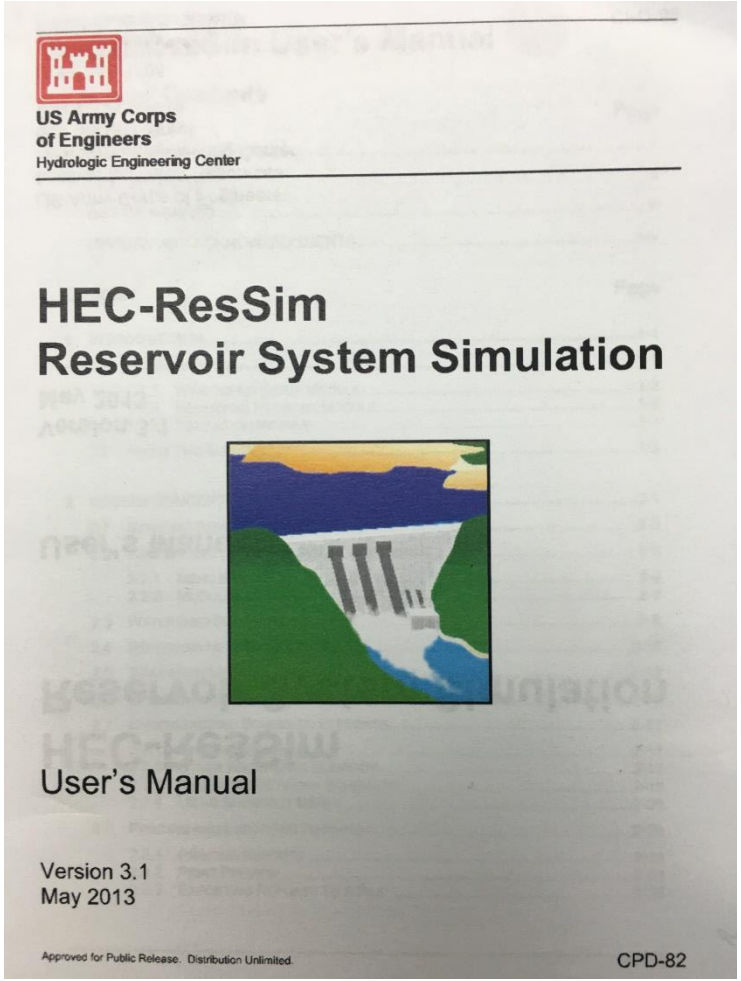


Currents



LAKE MANAGEMENT OPTIONS

- Water Management Analysis
- Evaluation of Outlet Dam operations
- Input Data
- Simulations



OUTLET DAM – STABILITY ASSESSMENT

Outlet Structure Stability

- Evaluate dam stability for a drought year pool raise scenario
- Review sliding & overturning stability in accordance with Idaho code
- Review needed improvements to meet revised operations and criteria.
- Review original design computations and current codes & standards

PUBLIC OUTREACH

- Stakeholder Group Outreach
- Open House – Late July
- Direct Electronic Mailers
- Community Postings
- Websites
- Social Media

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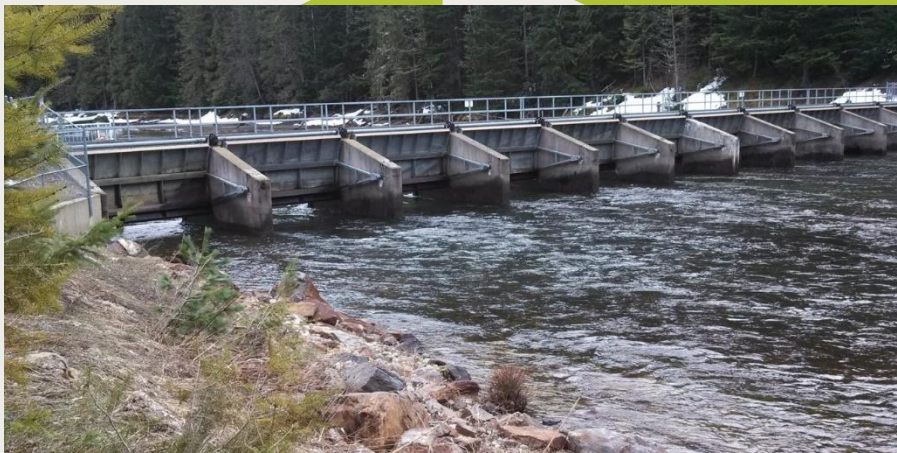

Working Document