

Early Actions Update

YRBWEP Workgroup Meeting
June 5, 2013



Presented by:

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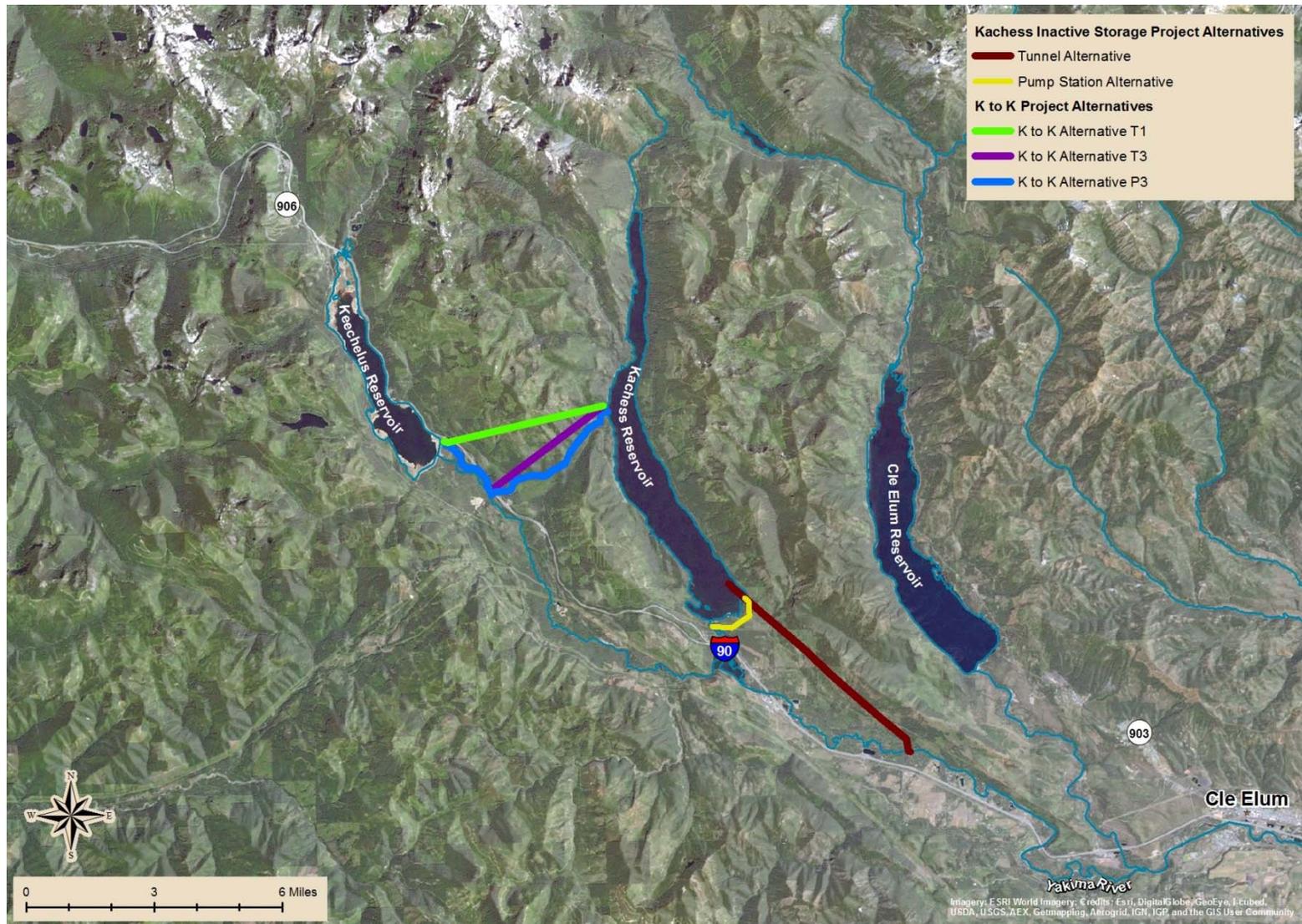


Early Actions (Spring 2013)

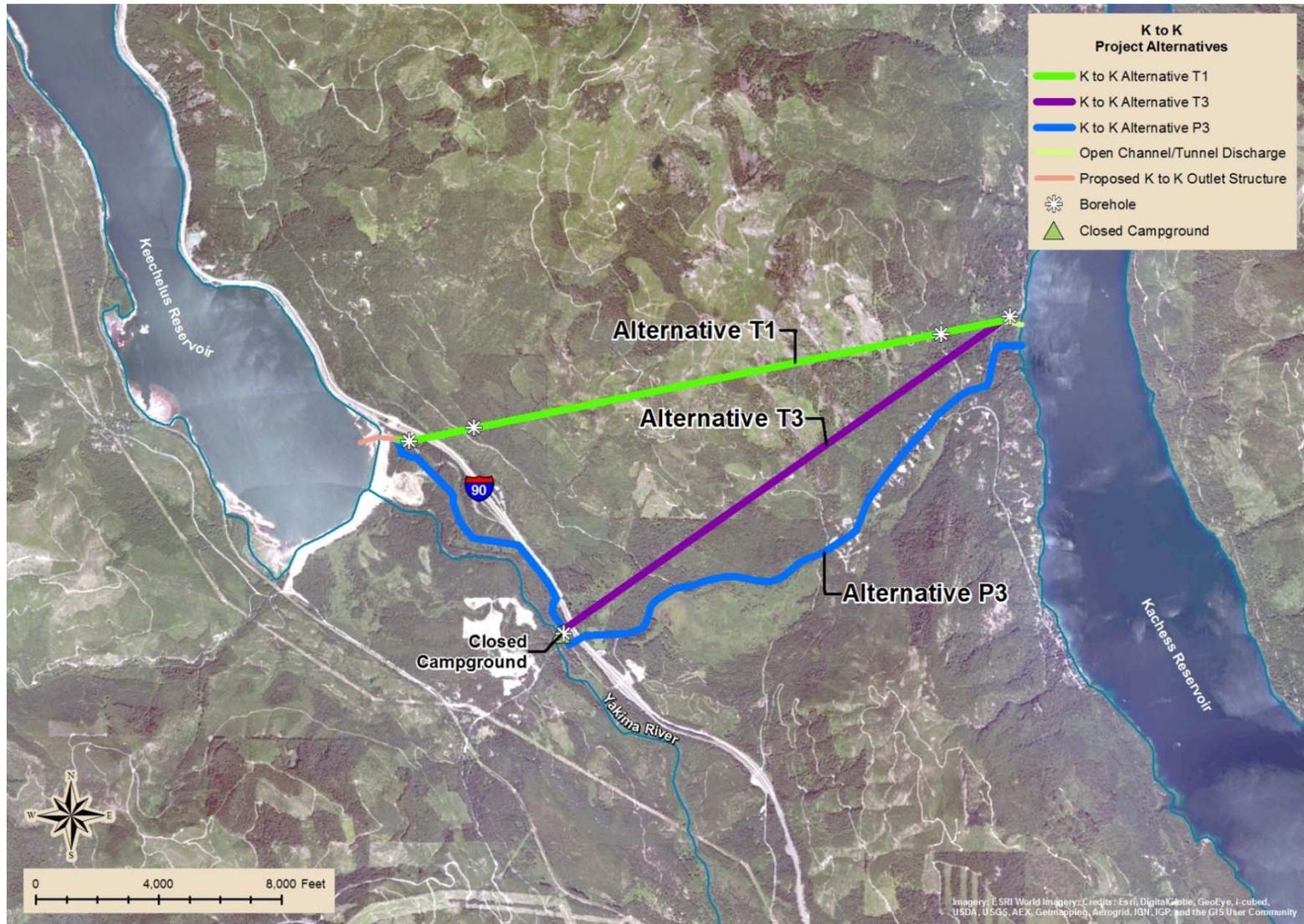
- K-to-K Conveyance
- Kachess Inactive Storage
- Wymer Dam and Reservoir
- Fish Passage at Cle Elum Dam
- Subordinate Power Diversions
- Tributary Habitat Enhancement
- Groundwater Infiltration
- Fish Passage at Clear Lake Dam
- Bumping Reservoir



Area Map: K-to-K and Kachess Projects



K-to-K Route Alternatives



Pipeline Disadvantages

- Engineering/Construction
 - Less operational flexibility
 - 29,000' long versus 18,100' to 21,600' for tunnel
 - Costly high-pressure discharge flow control valves
 - Approximately 70,000 yd³ more excavation
- Cost – approximately 50% more than tunnel
- Other Considerations
 - USFS concerns with surface route impacts
 - More complex permitting
 - Mitigation of stream and wetlands crossings
 - Kachess Lake residents and public access impacts
 - More material hauling and truck trips



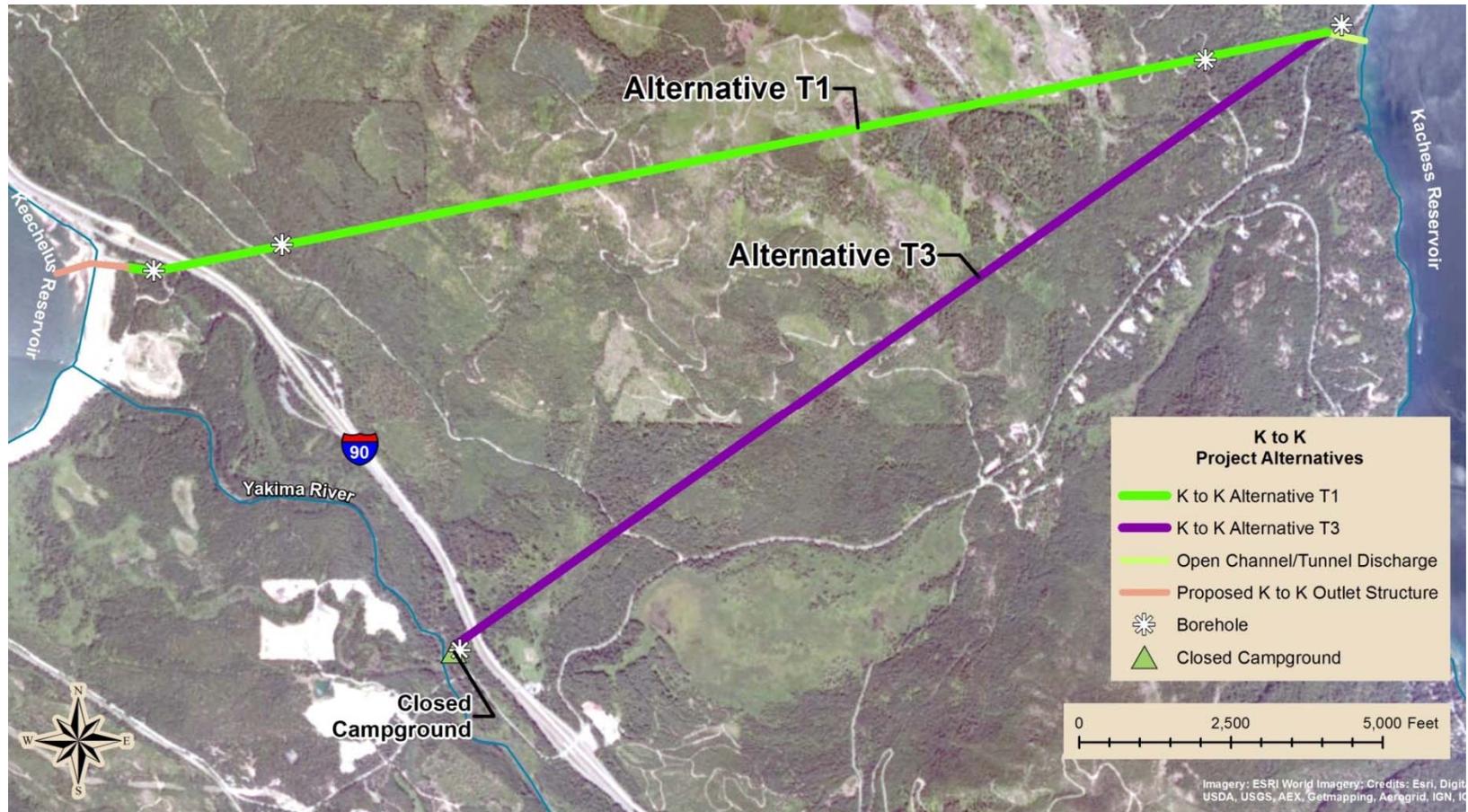
K-to-K Conveyance Conclusion

The pipeline alternative should be eliminated in favor of a tunnel because the pipeline:

- Has less operational flexibility/capacity
- Is much longer route for future maintenance
- Has more impacts
- Causes more local resident and public access impacts during construction
- Has a much higher cost



Next Steps: Geotechnical Explorations



Kachess Inactive Storage Alternatives



Key Differences Between Tunnel and Pump Station

- Range of flow rates
- Release point to Yakima River
- Effect on streamflow below Keechelus
- Irrigation supply limitations or benefits
- Construction risks
- Construction impacts
- Power requirements
- O&M Cost
- Capital cost
- Total 100-year cost (in present value)



Kachess Inactive Storage Comparison

	Tunnel Preferred	Pump Station Preferred
Range of flow rates	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Instream flow below Keechelus	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Irrigation supply	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Construction risks	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Construction impacts	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Power needs	<input checked="" type="checkbox"/>	<input type="checkbox"/>
O&M cost	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Capital cost	<input type="checkbox"/>	<input checked="" type="checkbox"/>
100-year cost	<input type="checkbox"/>	<input checked="" type="checkbox"/>

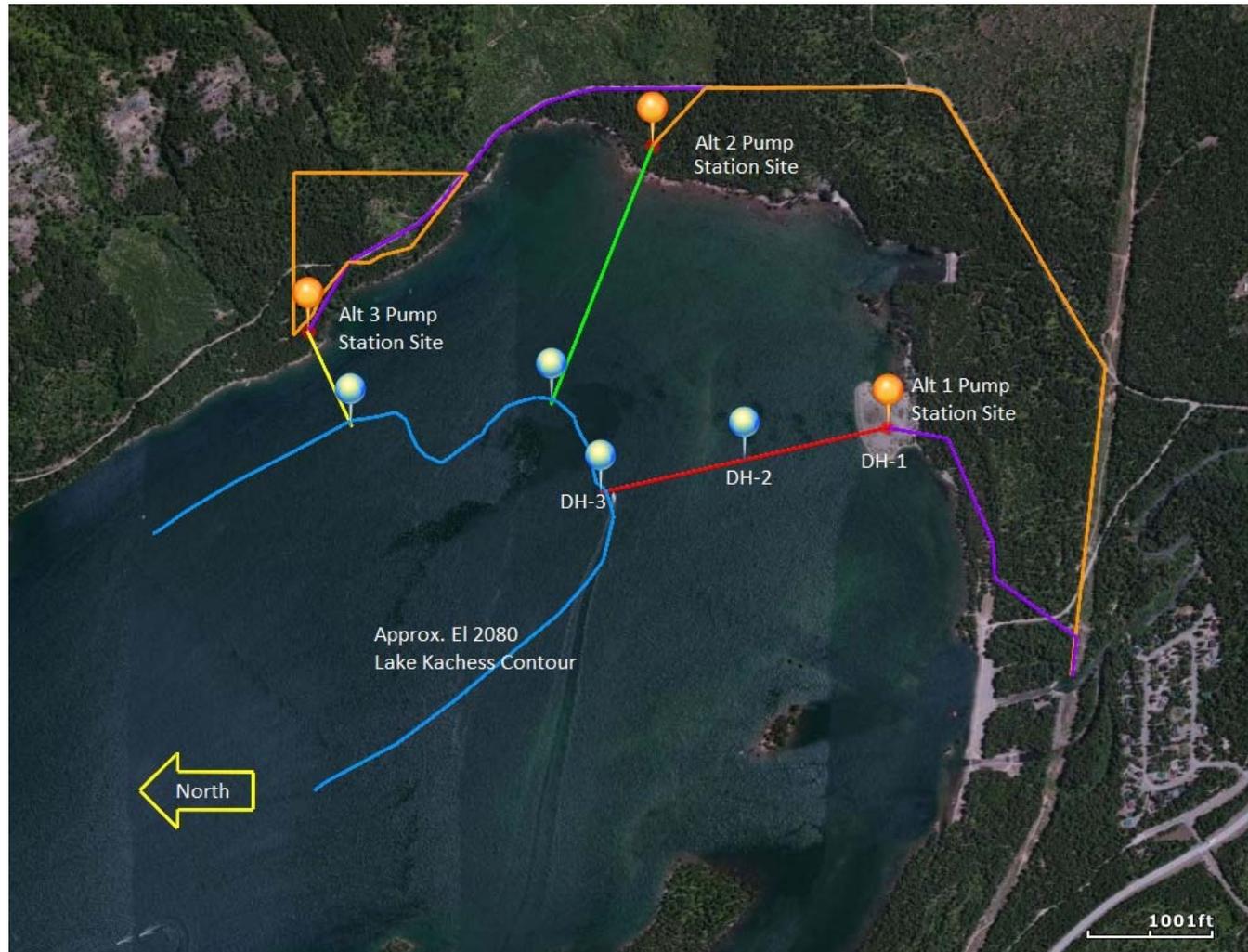


Kachess Inactive Storage Conclusion

- The Pump Station Alternative is recommended for advancement, due to:
 - performance advantages
 - lower construction risk and impacts
 - lower cost



Kachess Inactive Storage: Alternate Pump Station Sites and Borehole Locations



Wymer Temperature Model Update

Overall Approach

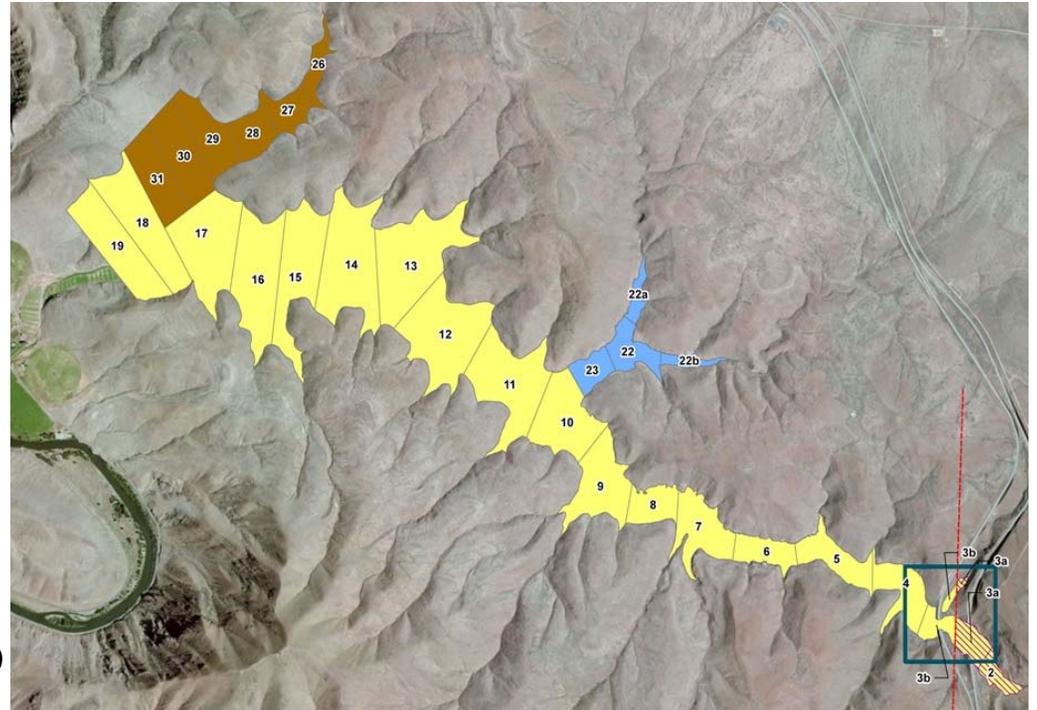
- Prepare reservoir temperature model using CE-QUAL-W2
- Use representative wet and dry years in model
 - 1997 (wet) & 2001 (dry) selected
- Use RiverWare (Yak-RW) model output from Integrated Plan for reservoir inflow/outflow
- Use Yakima River water temperature data at Umtanum and energy budget equation to determine temperature effects on Yakima River from Wymer releases



Wymer Temperature Model Update

Model Segmentation

- Model segments have been developed
 - 32 longitudinal segments
 - 126 vertical segments adjacent to the dam
- Segmentation used
 - USACE LiDAR topographic data (1-m resolution, 2009)
 - USGS topographic data used in a few segments
- Storage and elevation to volume relationship consistent with Wymer Reservoir Appraisal Study



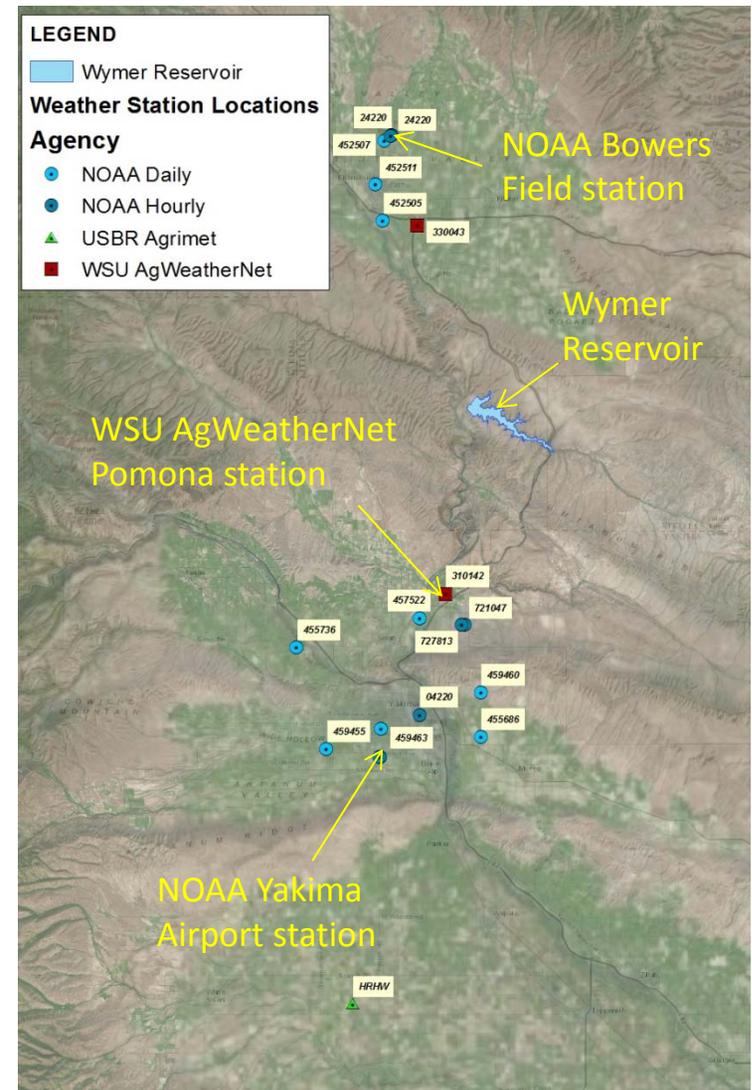
Wymer Temperature Model Segmentation



Wymer Temperature Model Update

Boundary Conditions: Meteorology

- Model requirements:
 - Incident shortwave solar radiation (SR) or cloud cover
 - Wind speed and direction
 - Air temperature
 - Dew point temperature
- Data being used:
 - Full data sets (except cloud cover) for most years from WSU AgWeatherNet station at Pomona
 - Cloud cover from NOAA stations at Yakima Airport or Bowers Field is available for some years



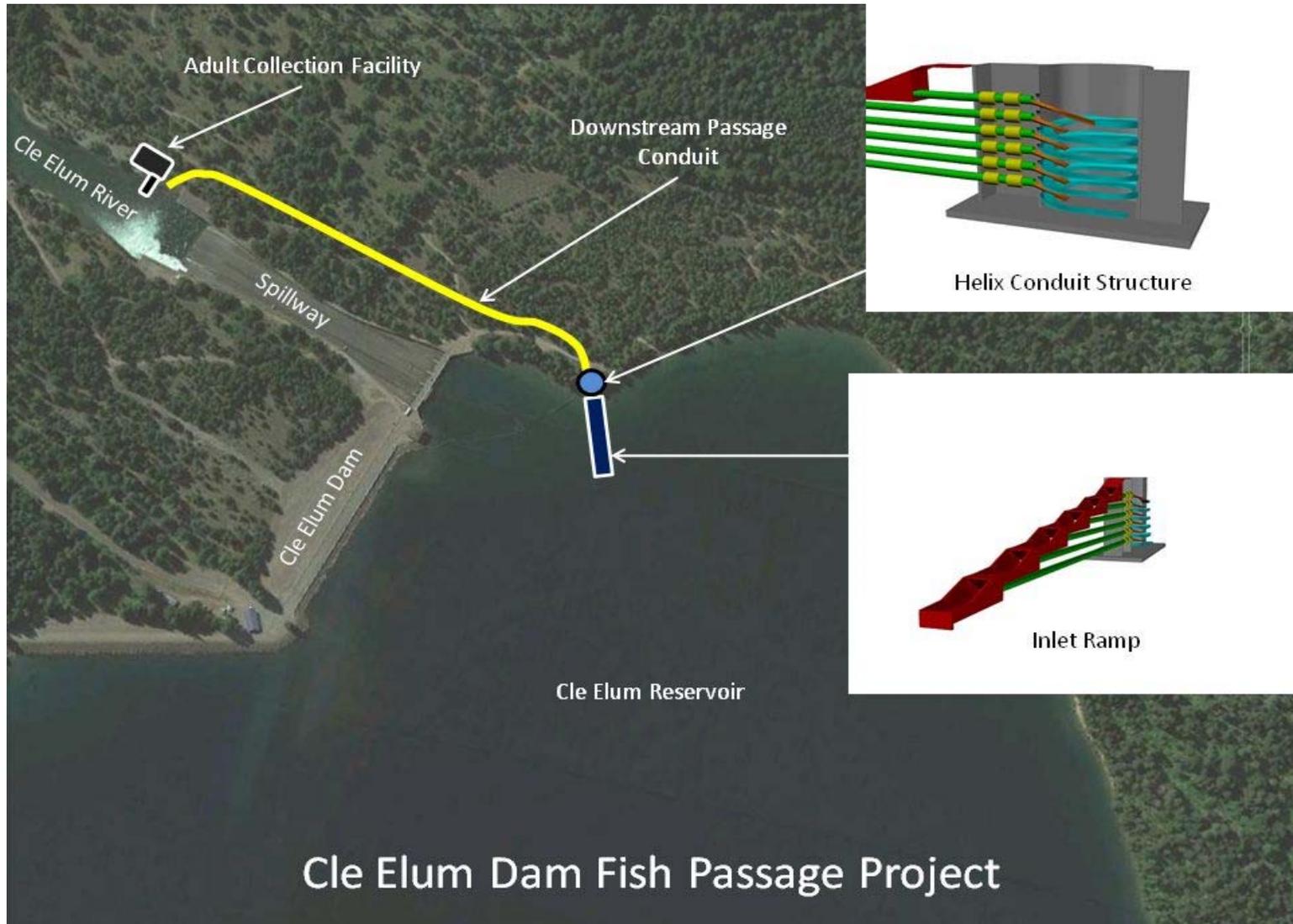
Wymer Temperature Model Update

Next Steps

- Calibrate model
- Select final Wymer operational scenarios with Reclamation and Ecology
- Estimate Yakima River temperatures with Wymer releases
- Evaluate need for operational or structural changes to Wymer to address temperature issues in Yakima River



Fish Passage at Cle Elum Dam



Cle Elum Dam Fish Passage Project



Other Early Action Activities

- Subordinate Power Diversions, Roza
Roza Reach Smolt Survival Study Update
- Tributary Habitat Enhancement – Manastash
Update
- Geotechnical explorations update
- Clear Lake Dam Fish Passage – Progress Report
- Groundwater Infiltration – Data acquisition
continuing in Kittitas Valley

