



Columbia/Snake Rivers

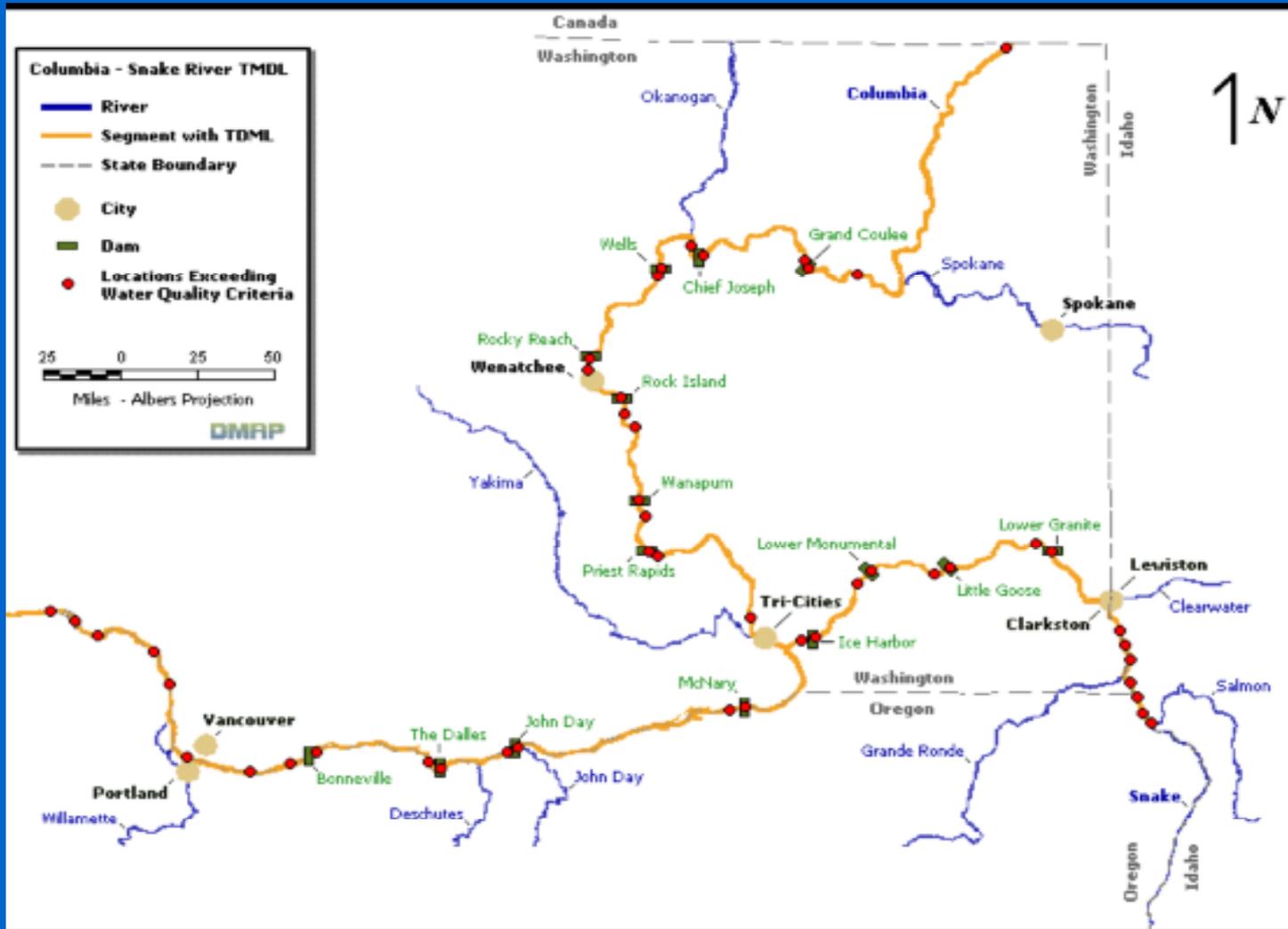


Temperature TMDL

U.S. EPA Region 10



Geographic Scope



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Important Term

Site Potential Temperature (SP):

Temperature that would occur in the main stems if the effects of human activity on temperature within the main stems in the TMDL Project Area is eliminated.

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Summary of Temperature Goals

- At Columbia River Mile 4:
- 0.14 °C over Site Potential Temperature (SP) if SP exceeds 20 °C;
- 1.1 °C over SP if SP is less than 20 °C.

Summary of Temperature Goals

- Where Salmonid Spawning Occurs along the Oregon/Washington Border:
- 0.14 °C over SP if SP exceeds 12.8 °C between October 1 and May 31;
 - The TMDL establishes that salmonid spawning occurs upstream of RM 112 (I 205 bridge).



Summary of the Allocations

- The rivers are divided into 21 reaches;
- Each reach receives an allocation in terms of temperature increase over site potential.



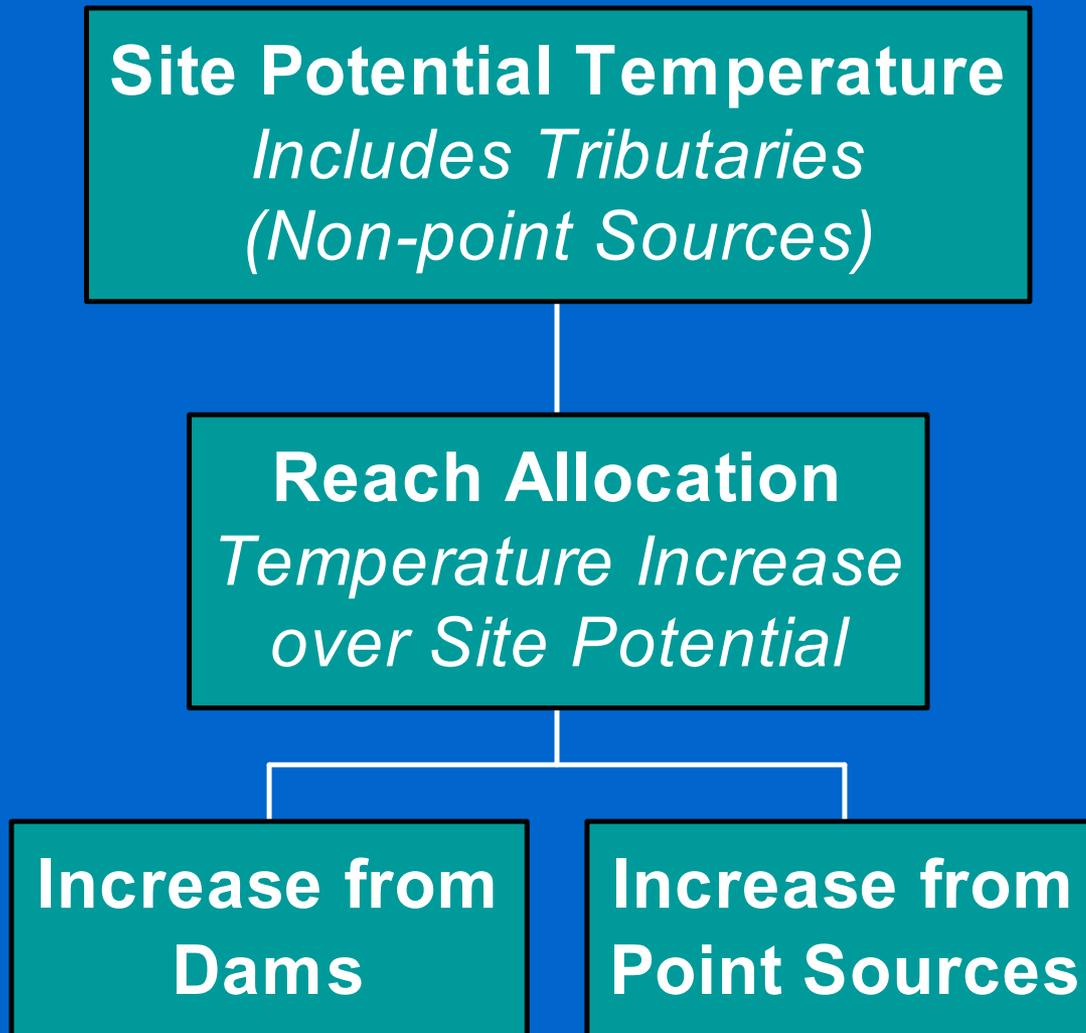


Summary of the Allocations

- That allocation represents the temperature increase allowed to result from human activities in the main stems.
- The allocations are established to meet the temperature goals.



Schematic of Reach Allocations



Summary of Allocations

- The reach allocations are based on:
 - the temperature increase caused by existing point sources;
 - an additional 20 MW of heat energy to account for general NPDES permits and future growth;

Summary of Allocations

- an allocation for the dam in the reach;
- tributaries are allocated their existing loads and are treated as part of the site potential temperature.

Example Allocations by Reach

<u>Site</u>	<u>Increase</u>	<u>WLA</u>	<u>LA</u>
Gr Coulee	0.0109 °C	0.0009 °C	0.01 °C
Ch Joseph	0.0109 °C	0.0009 °C	0.01 °C
Wells	0.0105 °C	0.0005 °C	0.01 °C
Rocky R	0.0106 °C	0.0006 °C	0.01 °C
Rock Is	0.0109 °C	0.0009 °C	0.01 °C
Wanapum	0.0104 °C	0.0004 °C	0.01 °C
Priest R	0.0904 °C	0.0004 °C	0.09 °C

Wasteload Allocations

- 106 point sources with Individual permits:
 - 95 with very little temperature impact are grouped by reach and given group allocations;
 - 11 facilities are given individual allocations.

Wasteload Allocations

- 158 point sources with general permits are accounted for in the group allocations.
- WLA are established in megawatts (MW).

Example of WLA

<u>River Reach/ Facility</u>	<u>Group Allocations</u>	<u>Individual Allocations</u>
Priest R to McNary	244.13 MW	791.4MW
Agrium Bowles Rd		206.8 MW
Agrium GF Rd		384.5 MW
Boise Cascade W		200.1 MW
McNary to John D	59.81 MW	0.0 MW
John D to T Dalles	20.73 MW	0.0 MW

Effects on River Users

- Dams are allowed essentially no increase over site potential:
 - 0.09 °C for Priest Rapids;
 - 0.01 °C for the other dams.

Effects on River Users

- Point Sources with individual permits are generally allowed their existing discharges.
- Point sources with general permits are allowed their existing discharges.

Effects on River Users

- Some future growth is allowed via the group allocations.
- Tributaries are allowed their existing loads.

Effects on River Users

- The majority of the non-point temperature impacts are via the tributaries.
- Therefore they are given their existing loads in this TMDL.
- They may receive different load allocations when the tributary TMDLs are completed.

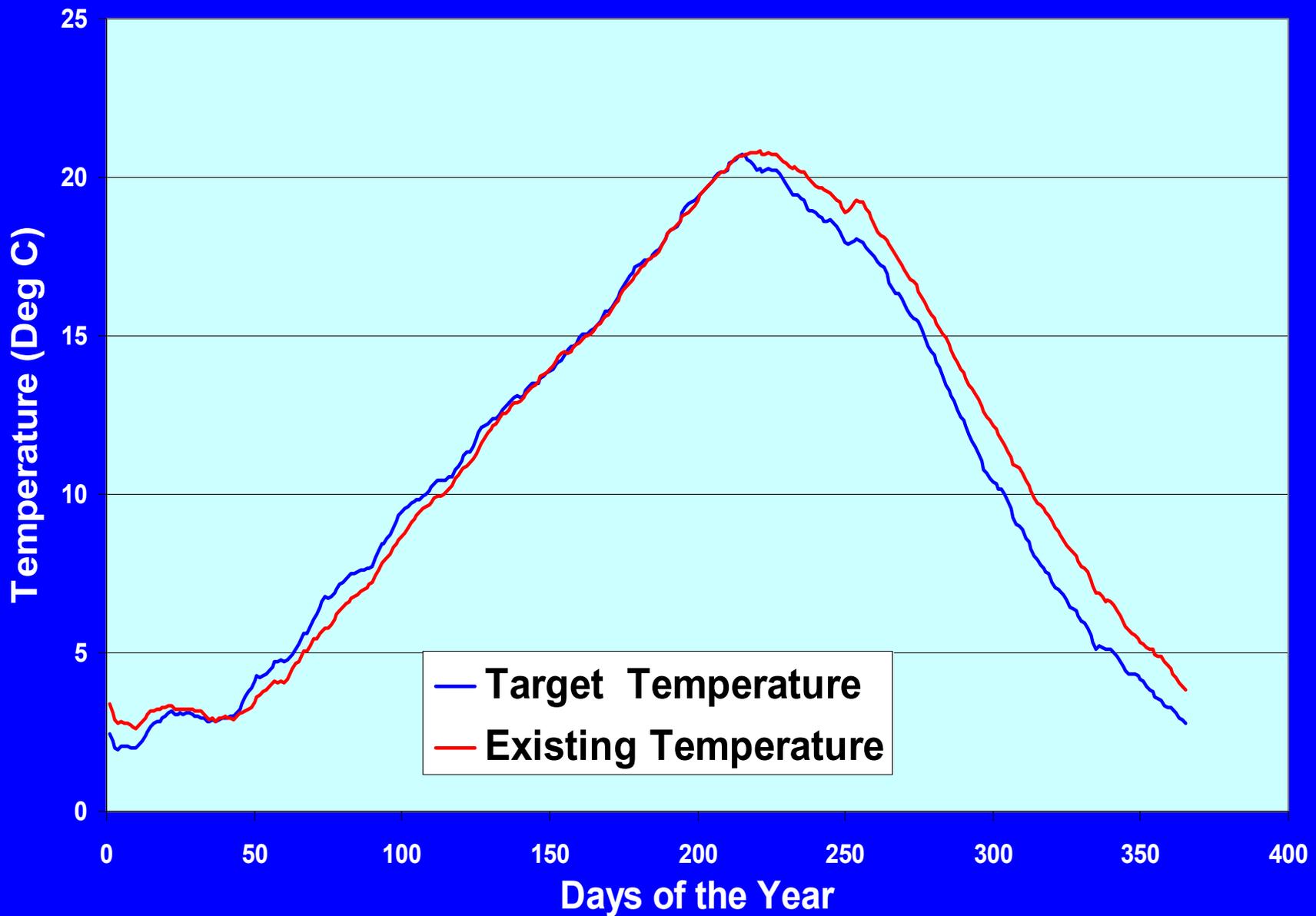
Tributaries

- Why are tributaries loads not established?
 - WQS based on natural conditions;
 - TMDL focus is on the main stem human activities;
 - Changing tributary temperatures would have little effect on the temperature increases allowed.

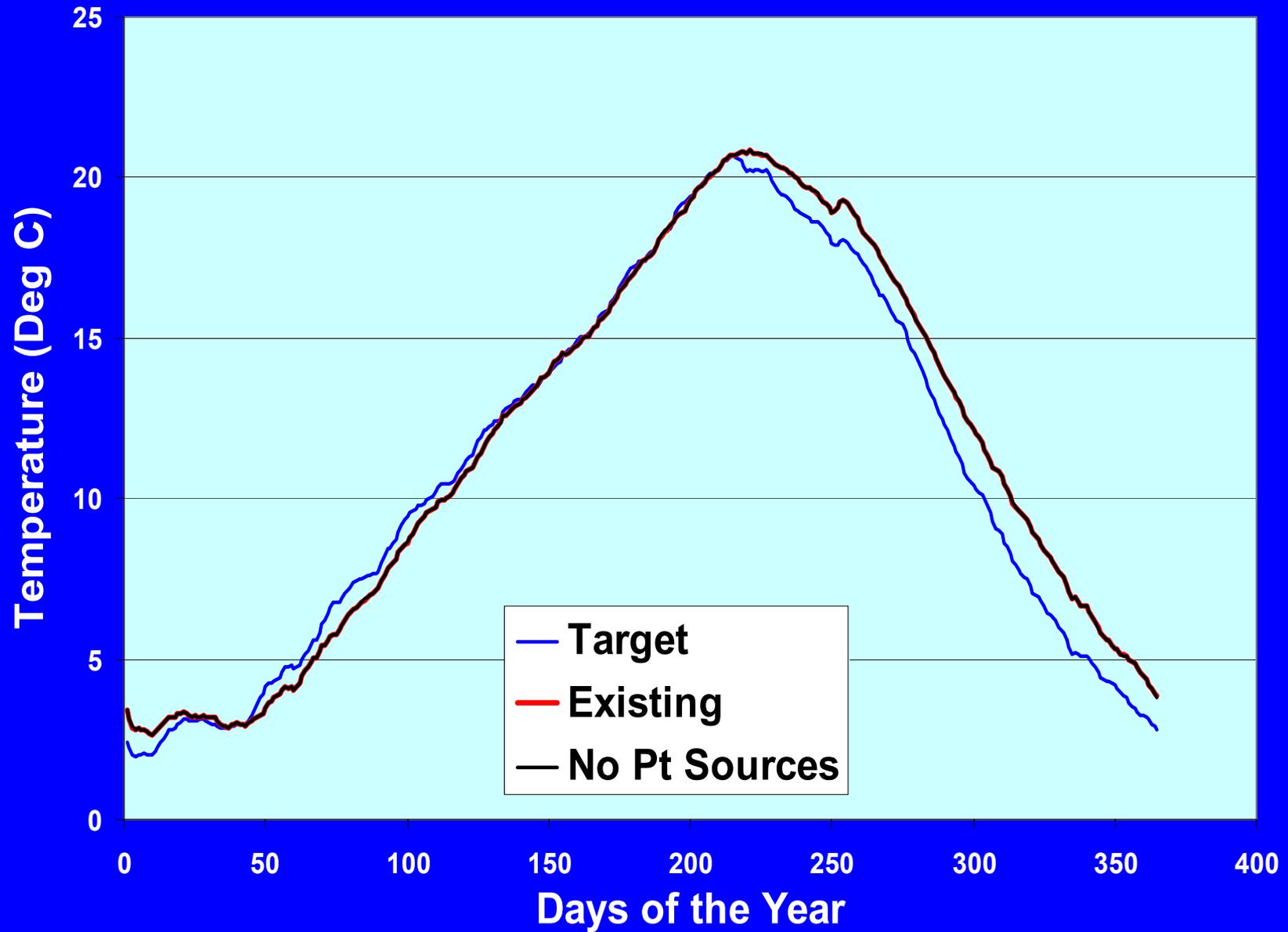
Dams VS Point Sources

- Why no allocation for dams and full allocations for point sources?
 - Dams have much greater impacts on temperature than the point sources;
 - Limiting the point sources would not benefit the dams.

Simulated Mean Temperatures at Columbia River Mile 42



Simulated Mean Temperatures at Columbia River Mile 42



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Potential Effect of this TMDL on Dams

- Varies with the effect of the dams on temperature.
- Three fairly distinct groups of dams.

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Potential Effect of this TMDL on Dams

Dams that clearly increase temperature by more than a degree Centigrade:

Grand Coulee

John Day

Lower Granite

Little Goose

Lower Monumental

Ice Harbor

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Potential Effect of this TMDL on Dams

Dams with highly variable impacts up to
a degree Centigrade:

Chief Joseph

Wanapum

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Potential Effect of this TMDL on Dams

Dams with highly variable impacts from
no impact to 1/2 a degree Centigrade:

Wells

Rocky Reach

Rock Island

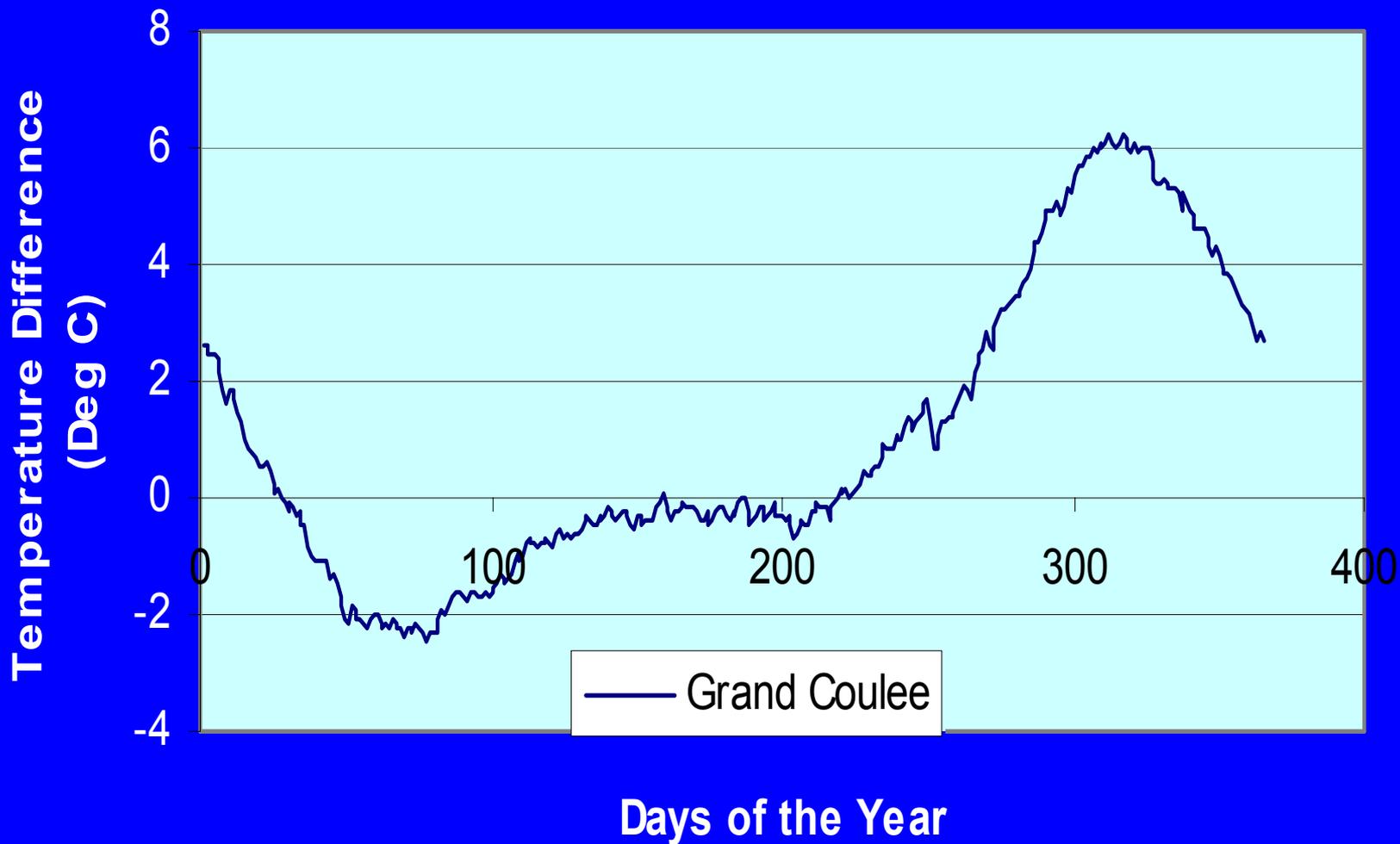
Priest Rapids

McNary

The Dalles

Bonneville

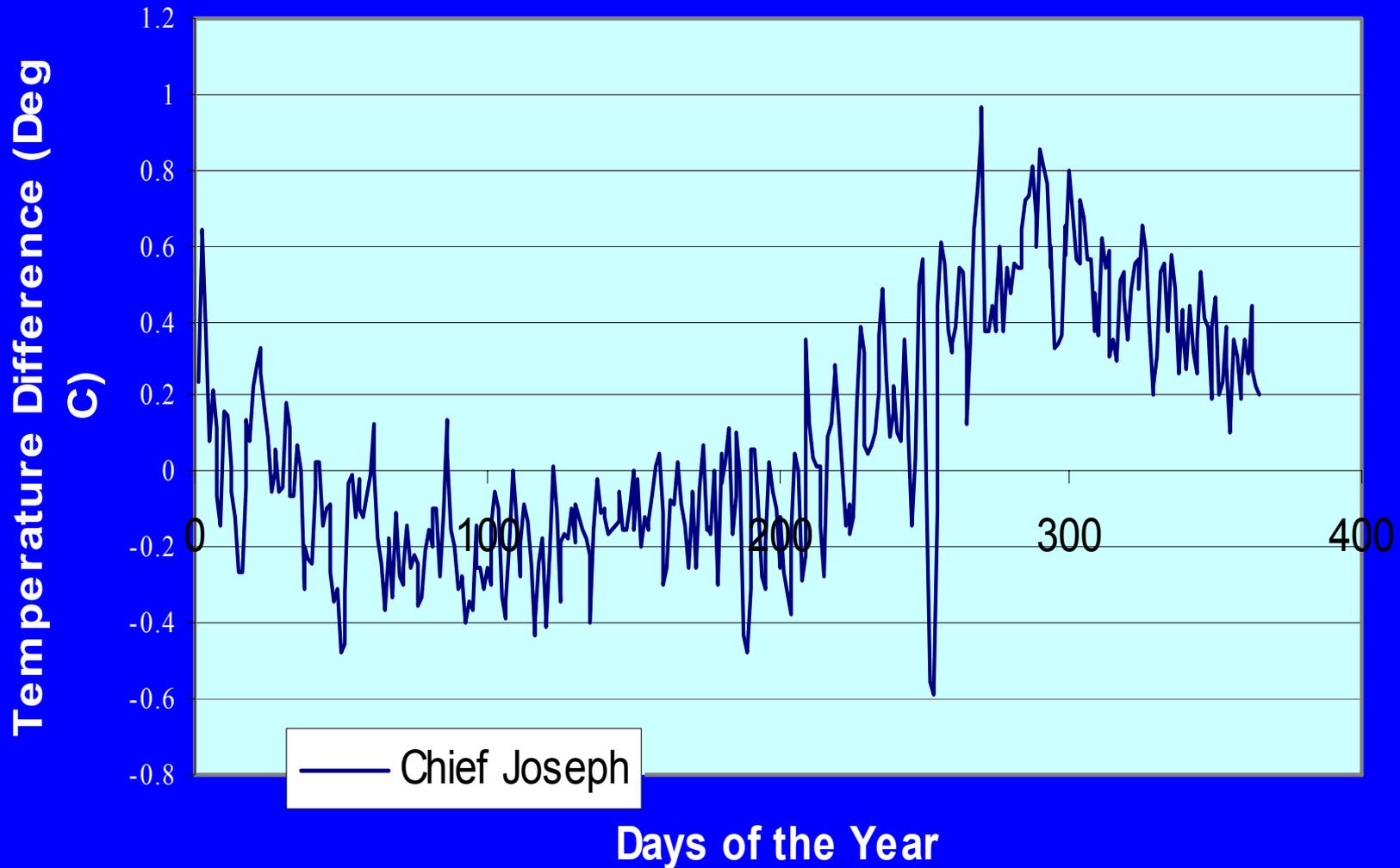
Temperature Difference at Grand Coulee: Existing - Site Potential - 30 Year Mean



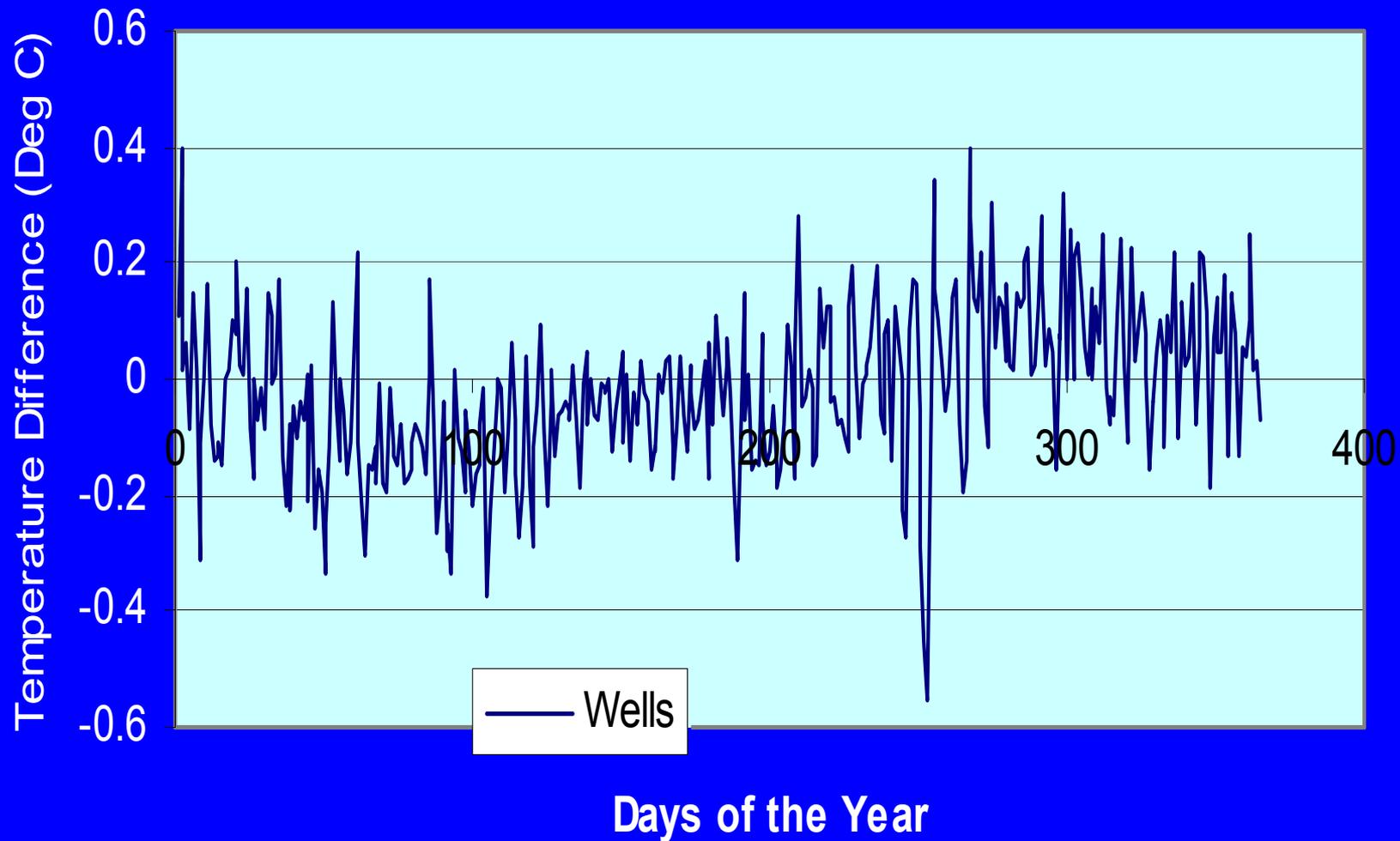
Temperature Difference at Little Goose: Existing - Site Potential : 30 Year Mean



Temperature Difference at Chief Joseph: Existing - Site Potential - 30 Year Mean



Temperature Difference at Wells: Existing - Site Potential : 30 Year Mean





Role of the TMDL

- quantify the temperature problem;
- define the target temperatures;
- determine the level of improvement needed.



Role of the TMDL

- The 2000 FCRPS BIOP includes an RPA for development of a Water Quality Plan to improve TDG and temperature in the main stems.
- The intent of this TMDL was to establish the goals for that water quality plan.



Next Steps

- TMDL implementation plan;
- The BIOP Water Quality Plan;



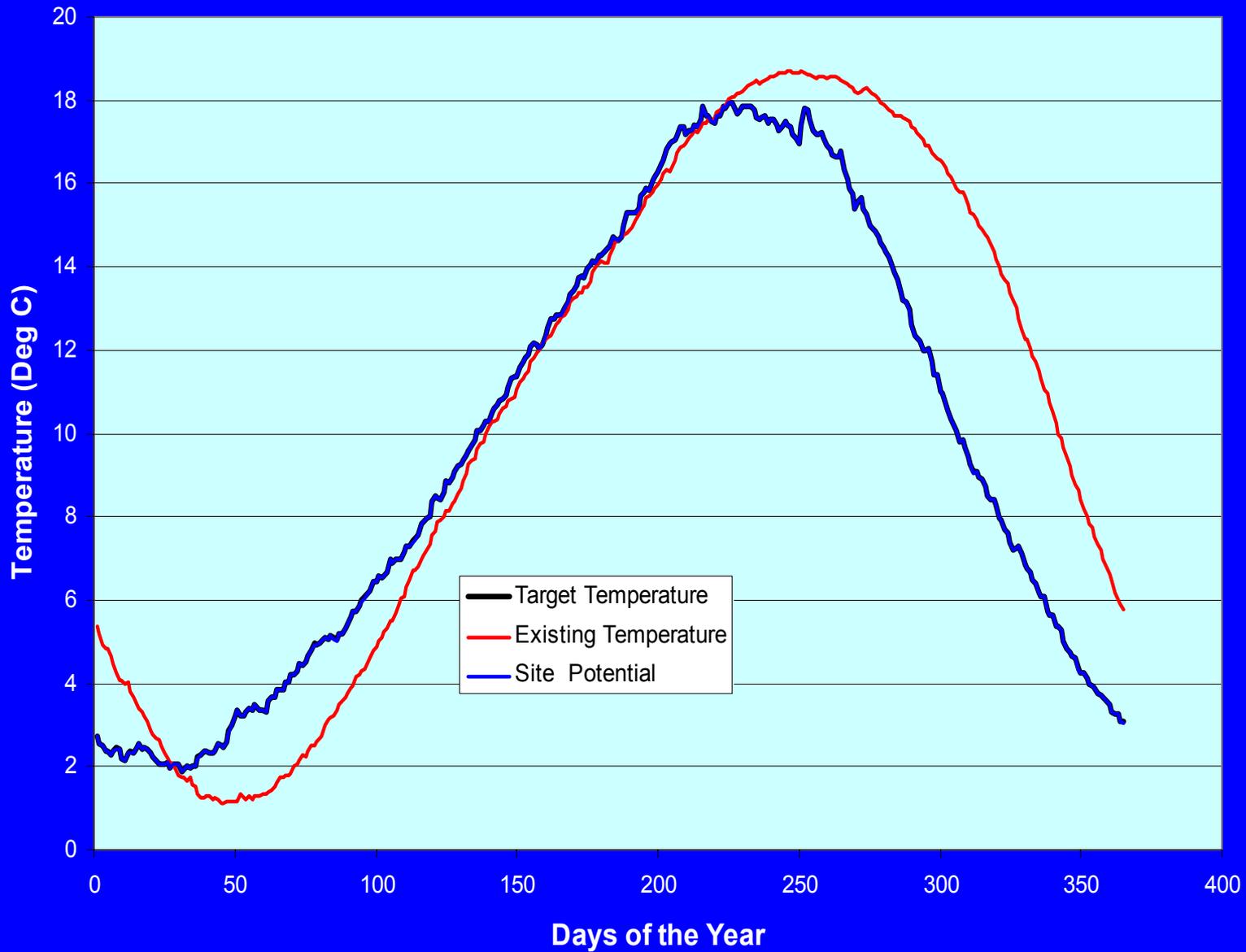


Next Steps

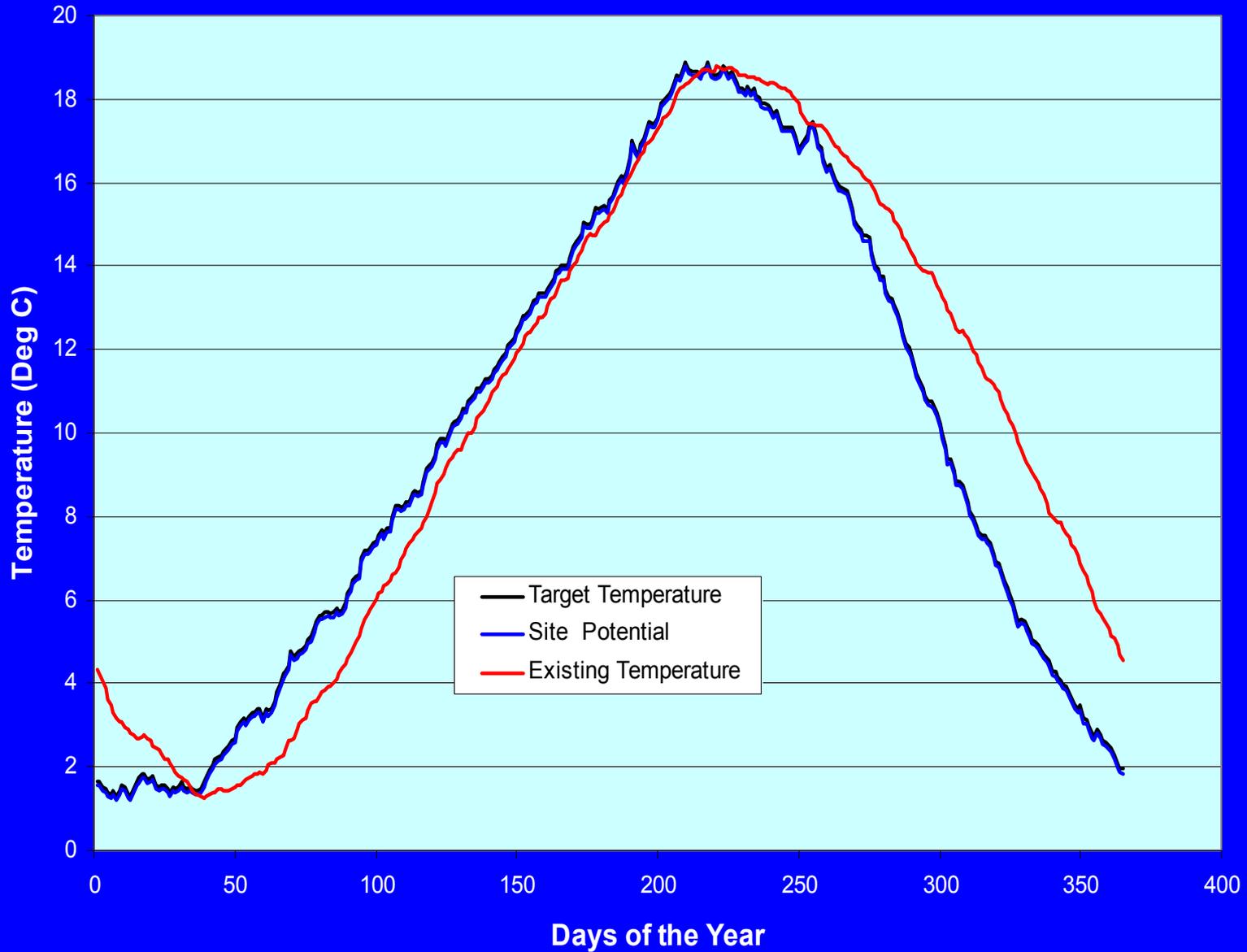
- Determine what can be done at dams to improve temperature;
- Determine the costs;
- Determine the benefits;
- Make a decision to improve the dams or recognize that improvement is not possible and amend the WQS.



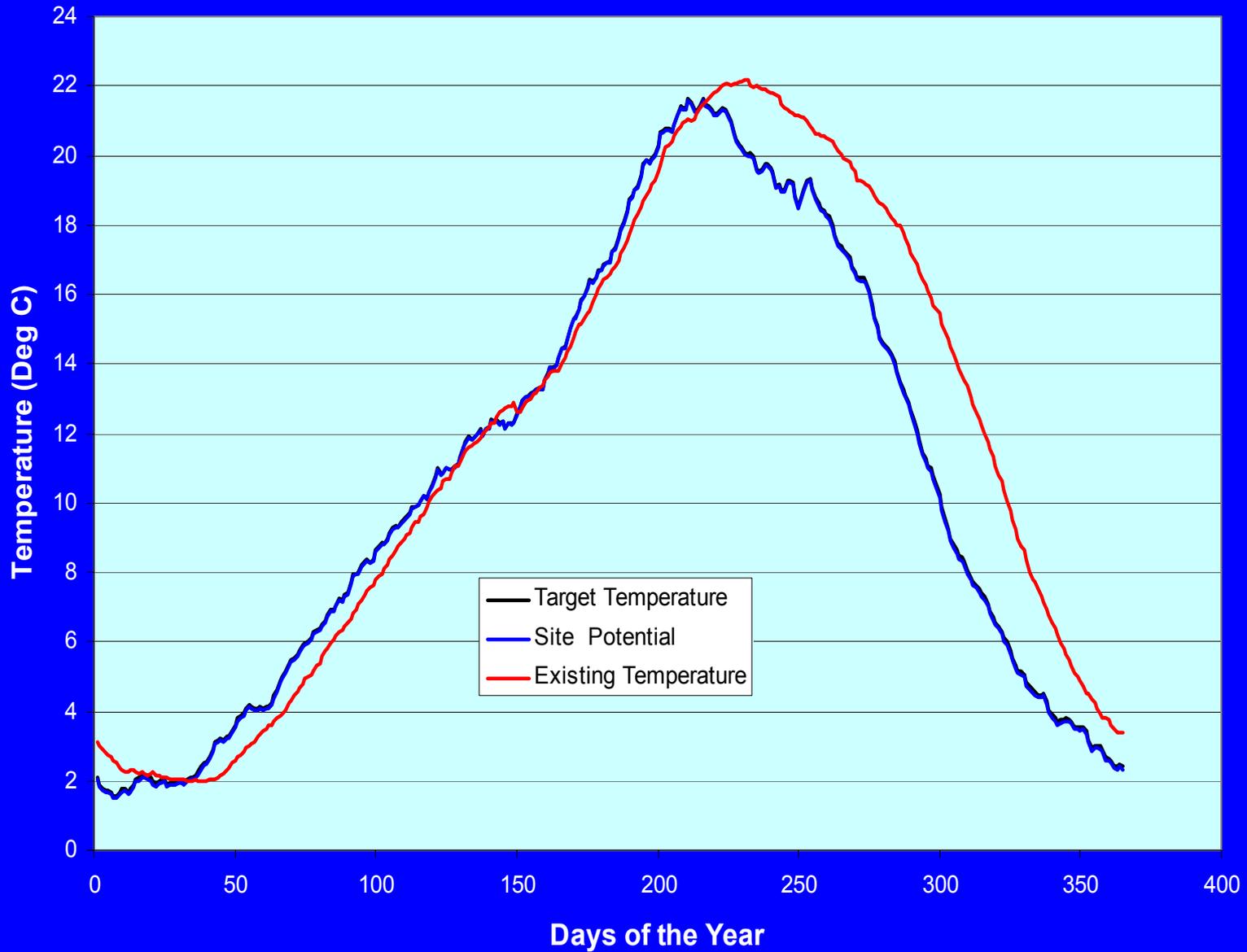
Simulated Site Potential, TMDL Target and Existing Temperatures at Grand Coulee: 30 Year Means



Simulated Site Potential, TMDL Target and Existing Temperatures at Priest Rapids: 30 Year Means



Simulated Site Potential, TMDL Target and Existing Temperatures at Ice Harbor: 30 Year Means



Simulated Site Potential, TMDL Target and Existing Temperatures at Bonneville: 30 Year Means

