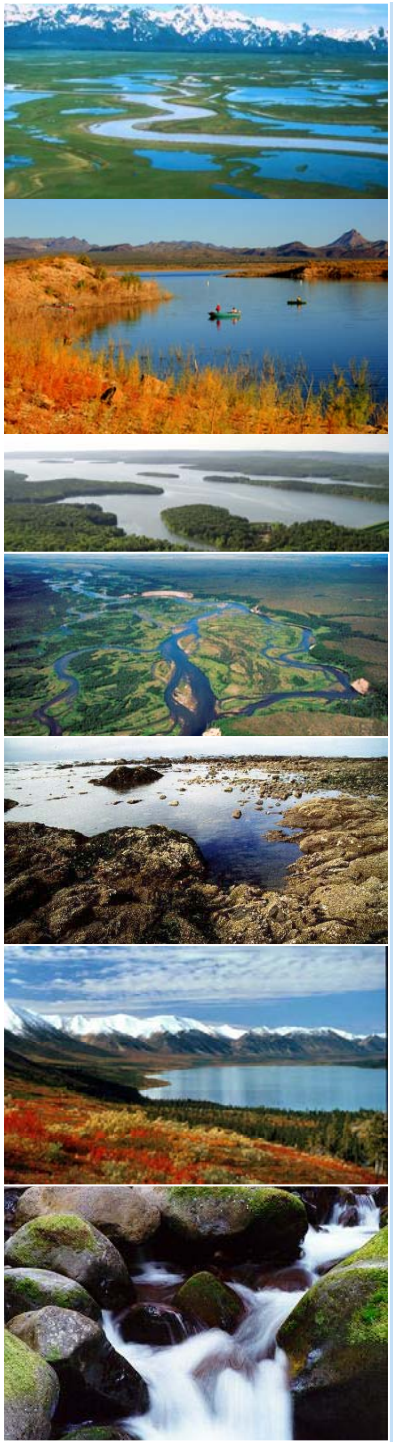
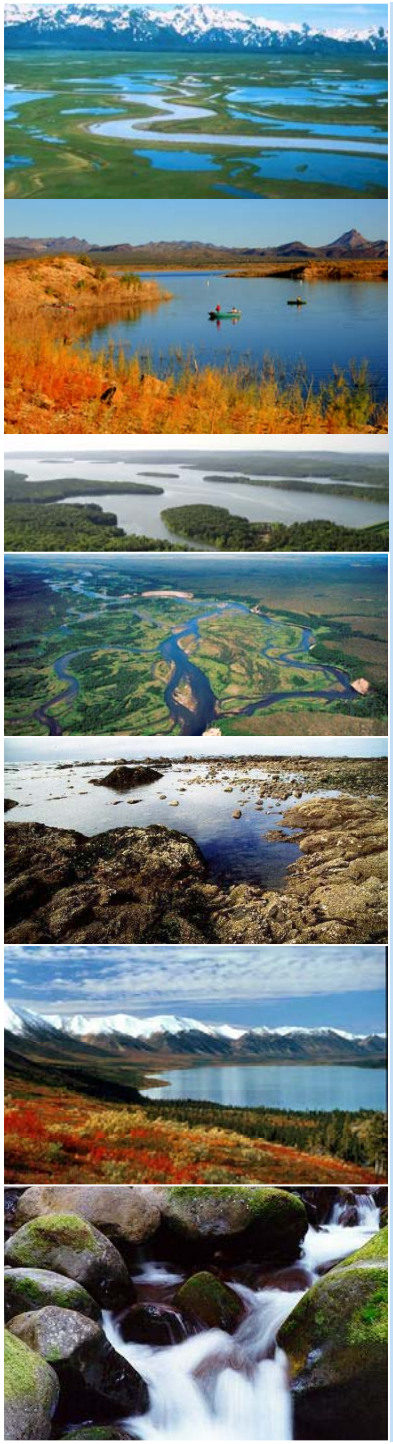


Strategy for Developing the Temperature TMDL Report

Jessica Koenig and Amy King

Tetra Tech

TETRA TECH



Tetra Tech Role

- Under contract to Tri-State Water Quality Council
- Prepare TMDL report
  - Coordinate among the Council, Washington Ecology, Idaho DEQ, and Kalispel Tribe
  - Integrate information, modeling results, TMDLs for all jurisdictions and segments
  - Meet all relevant federal, state and tribal requirements

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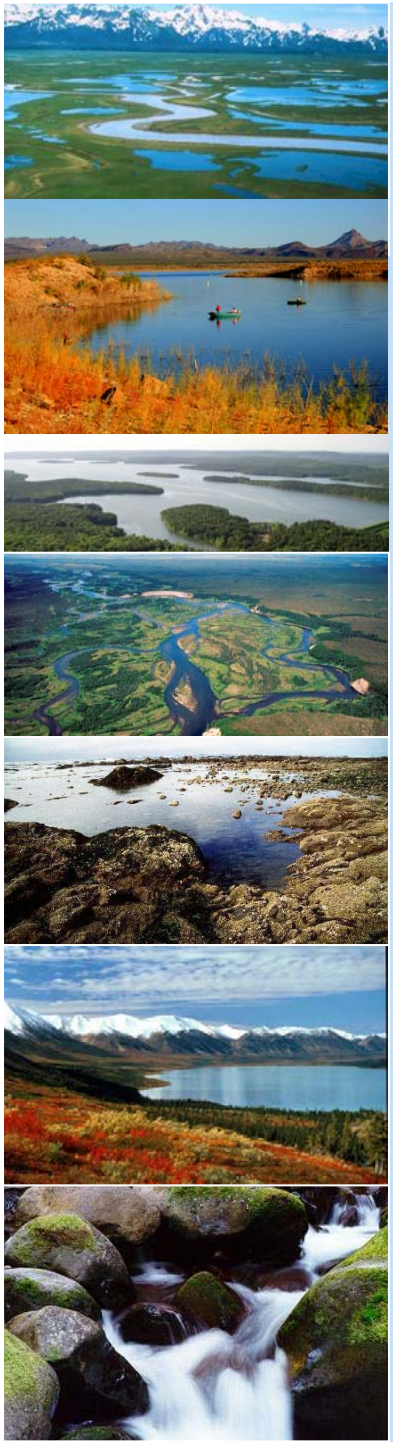

Coordination

- Participated in initial conference call to identify major information needs
- Coordinate as necessary with state and tribal representatives to obtain information
- **Goal:** Efficiently integrate and streamline existing, readily accessible information and supplement with additional information, as necessary

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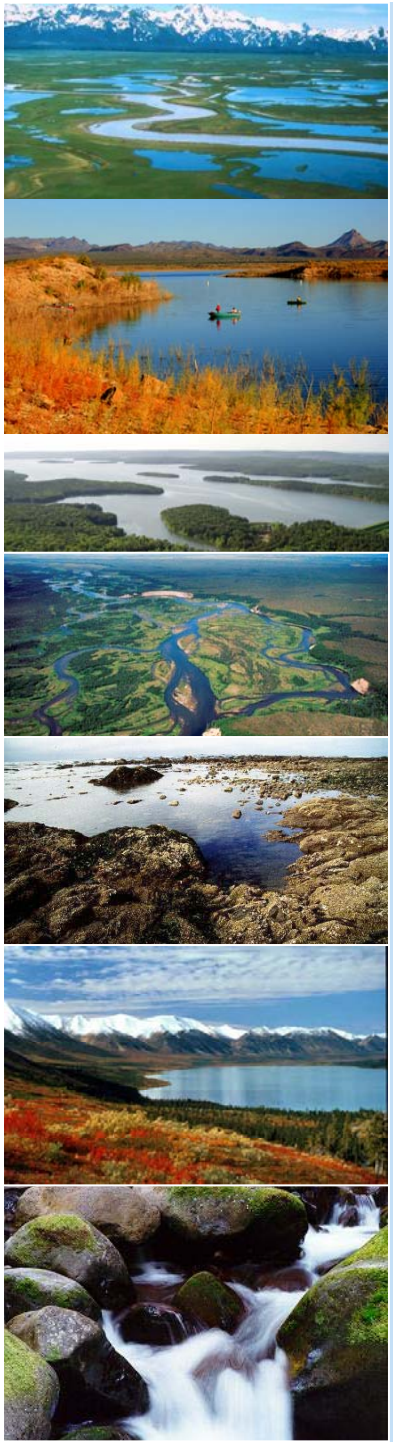
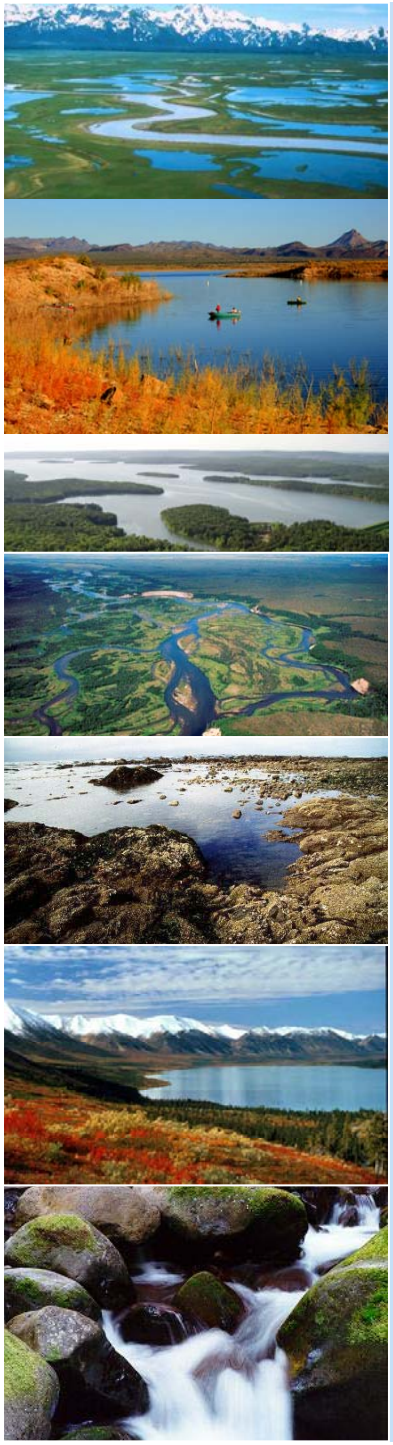


Report Format

- Largely based on IDEQ TMDL Report Template (version 4)
- Incorporate details required for Washington based on Water Quality Improvement Report (Feb. 2007)
- Incorporate additional details required by Kalispel Tribe & EPA

TETRA TECH



First Steps

- Coordinate with states and tribe to obtain readily available information. For example:
  - Modeling reports
  - Existing TMDLs
  - WRIA report
- Provide inventory of reports and data obtained
- Work with states and tribe to identify outstanding information
- Develop “background” sections while modeling continues
- Participate in modeling conference calls, as necessary

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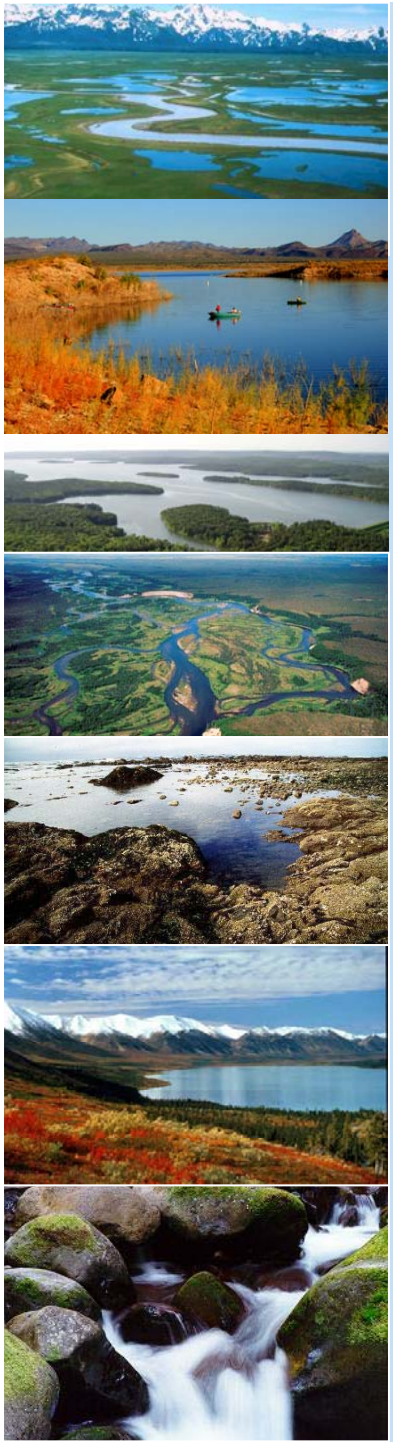

Issues/Challenges

- Evolving TMDL Decisions
  - TMDL targets / TMDL expression (heat-based, temperature-based)
  - Margin of safety
  - Allocation resolution

TETRA TECH

Draft Pend Oreille River Temperature TMDL Outline*

Acknowledgments

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1.2 Physical and Biological Characteristics

1.2.1 Climate

1.2.2 Subbasin Characteristics

1.2.3 Subwatershed Characteristics (*by 5th field HUC*)

1.2.4 Stream Characteristics

Section	Data or Information Needed	Data Type	Source	Received
1.2	General: Location, drainage area, aspect	GIS; previous reports		
1.2.1	Climate: precipitation, temperature, cloudiness	Data; previous reports		
1.2.2	Hydrology: boundaries, drainage network, 303(d) listed segments, wetlands, dams, diversions, waterfalls, gauging stations, etc.	GIS; previous reports		
	Geology: soils, geology	GIS; previous reports		
	Topography: elevation, slope, aspect	GIS; previous reports		
	Vegetation: existing land cover; MRLC	GIS; previous reports		
	Fisheries: distribution (known occurrence) of sensitive, threatened, or endangered aquatic species	GIS; data; previous reports		
1.2.3	For each subwatershed draining to POR: subwatershed area, land form, dominant aspect, relief ratio, mean elevation, dominant slope, hydrologic regimes, annual or unit area runoff	GIS; data; previous reports		
1.2.4	Source, transport, and response segments; Rosgen channel types; gradients; width/depth ratios; bed sediment; riparian characteristics (floodplain, vegetation)	GIS; data; previous reports		

* Based on IDEQ TMDL Report Template (Version 4); references in the template to Idaho will be updated to include State of Washington & Kalispel Tribe information and references throughout.

1.3 Cultural Characteristics

1.3.1 Land Use

1.3.2 Land Ownership, Cultural Features, and Population

1.3.3 History and Economics

Section	Data or Information Needed	Data Type	Source	Received
1.3.1	Existing land use; previous land use (to indicate trends)	GIS; data; previous reports		
1.3.2	County boundaries; cities; land ownership; dams and dischargers; existing and historical population data	GIS; data; previous reports		
1.3.3	Principal economic activities; main industries; dates of major activities; existing groups addressing water quality issues	Data; previous reports		

2. Subbasin Assessment – Water Quality Concerns and Status

2.1 Water Quality Limited Segments Occurring in the Subbasin

2.1.1 About Assessment Units

2.1.2 Listed Waters

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2.4.1 Flow Characteristics

2.4.2 Water Column Data

2.4.3 Biological and Other Data

2.4.4 Status of Beneficial Uses

2.4.5 Conclusions

2.5 Data Gaps

Section	Data or Information Needed	Data Type	Source	Received
2.1	For DEQ, DOE, & Tribe: water body name and Assessment Unit, boundaries of listed segments, listed pollutants, when the pollutants were first listed, and data sources	GIS; data; previous reports		
2.2	For DEQ, DOE, & Tribe: designated and existing beneficial uses for the water bodies; temperature water quality criteria	Data; previous reports		
2.4	All applicable stations: description of monitoring, flow data, water temperature data, biological data	Data; previous reports		

3. Subbasin Assessment–Pollutant Source Inventory

3.1 Sources of Pollutants of Concern

3.1.1 Point Sources

3.1.2 Nonpoint Sources

3.1.3 Pollutant Transport

3.2 Data Gaps

3.2.1 Point Sources

3.2.2 Nonpoint Sources

Section	Data or Information Needed	Data Type	Source	Received
3.1	Inventory of point sources, nonpoint sources	GIS; data; previous reports		
	Discussion of modeling & scenario results	Model results; previous reports		
3.2	Discussion of any data gaps identified during modeling (assumptions, etc.)	Model results; previous reports		

4. Subbasin Assessment – Summary of Past and Present Pollution Control Efforts

Section	Data or Information Needed	Data Type	Source	Received
4	Details on past or present pollution control efforts (description, size, dates, goal, expectations, effectiveness, etc.)	Data; previous reports; others		

5. Total Maximum Daily Load(s)

5.1 In-stream Water Quality Targets

5.1.1 Design Conditions

5.1.2 Target Selection

5.1.3 Monitoring Points

5.2 Load Capacity

5.3 Estimates of Existing Pollutant Loads

Section	Data or Information Needed	Data Type	Source	Received
5.1.1	Design conditions: critical conditions, shading under natural conditions, critical segments, modeling scenarios and results	Model results; previous reports; others		
5.1.2	Targets (shade-, heat-, or temperature-based targets); modeling scenarios	Model results; previous reports		
5.1.3	Selection of monitoring points, key parameters (stream temperature, shade, others), etc.	Model results; previous reports; others		
5.2	Determination of load capacity based on model scenarios; model assumptions	Model results; GIS		
5.3	Describe model methods and assumptions; sources and degree of uncertainty in estimates; existing loading rates (point source, non-point source, background)	Model results; previous reports; GIS		

5.4 Load Allocation

5.4.1 Margin of Safety

5.4.2 Seasonal Variation

5.4.3 Reasonable Assurance

5.4.4 Background

5.4.5 Reserve

5.4.6 Remaining Available Load

5.5 Summary Implementation Strategy

5.5.1 Activities that Support this TMDL

5.5.2 Supporting Regulations and Land Management Practices

5.5.3 Time Frame

5.5.4 Approach

5.5.5 Responsible Parties

5.5.6 Monitoring Strategy

5.5.7 Potential Funding Sources

5.5.8 Public Participation

5.6 Conclusions

Section	Data or Information Needed	Data Type	Source	Received
5.4	Allocations: background, non-point source, point source (determination depends on targets used); time frames; model results	Model results; previous reports		
5.4.1	Determination of implicit or explicit MOS (sources of uncertainty, especially in the modeling; identify conservative assumptions in target selection or modeling; critical design conditions)	Model results; previous reports; others		
5.4.2	Model results and previous studies to describe seasonal variation & influences	Model results; previous reports; others		
5.4.3	Description of implementation measures or incentive programs to insure reductions (link to Summary Implementation Strategy)	Previous reports; others		
5.4.4	Model results regarding background load (background temperatures, shading, thermal loads)	Model results; previous reports		
5.4.5	Inclusion of allowance for future growth, if applicable; model results of future scenarios, if applicable	Model results; previous reports		
5.5	Activities that support TMDL; supporting regulations and land management plans; time frame; implementation approach/strategies; responsible parties; monitoring strategy to measure implementation and progress; funding sources; public participation process	Previous reports; others		

References Cited

GIS Coverages

Other Related Documents

Glossary

Appendices

- Unit Conversion Chart
- State and Site-Specific Standards and Criteria
- Data Sources
- Distribution List
- Public Comments
- Others