

Aquatic Resources Data Gap Analysis

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August 18, 2011



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Overview

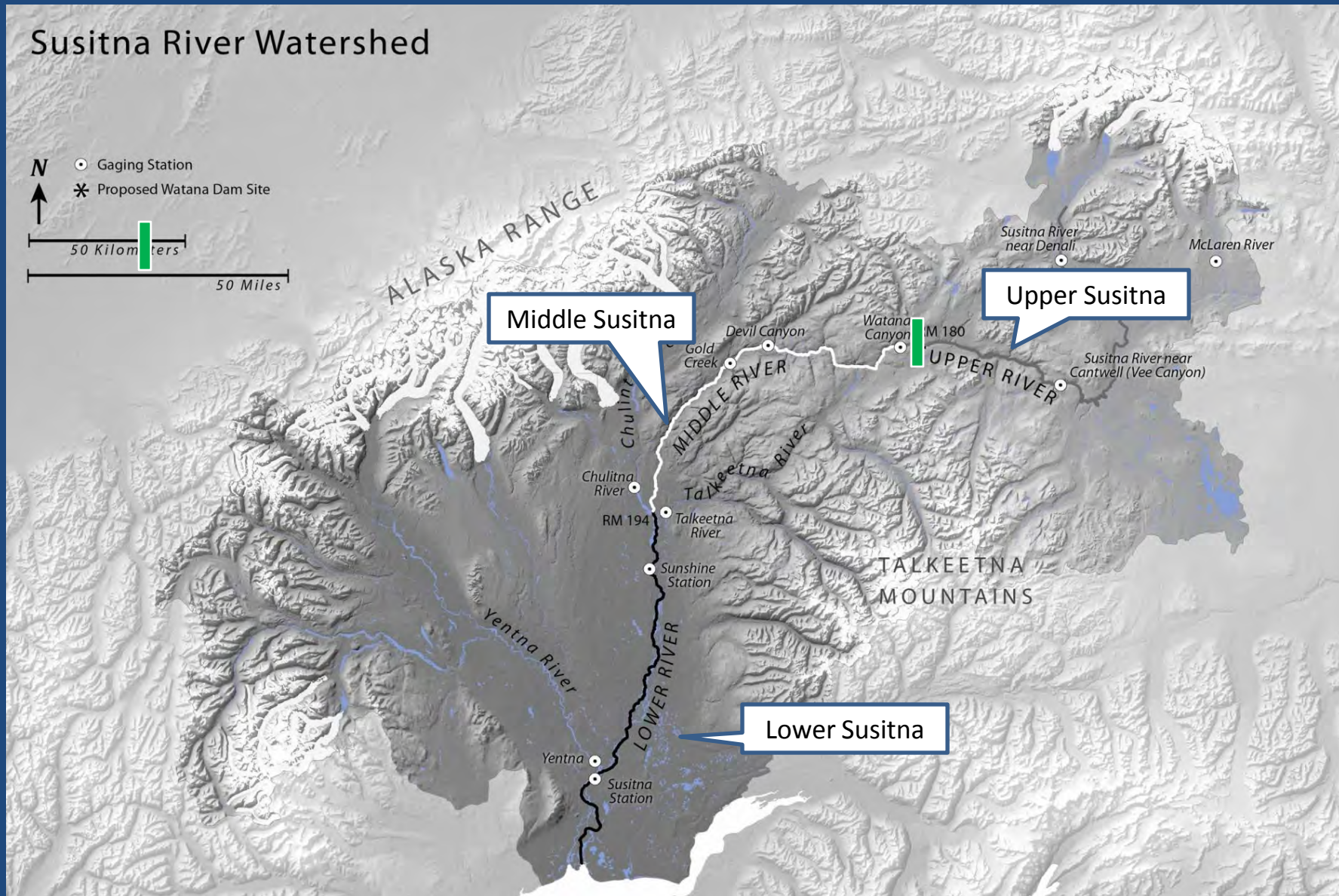
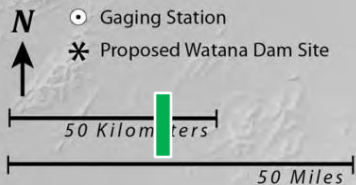
- Background
- Purpose / Objective
- Methods / Approach
- Findings by Topic Area



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Susitna River Watershed



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Purpose/Objective

- Evaluate available information for its relevance and applicability to the Project
- Assumptions
 - the 1980s Low Watana phase approximates the proposed Susitna – Watana Dam project



Approach

Navigation of 1980s literature

- 3,500 documents in the records database

Key documents

- 1984 Revised Draft license application – Exhibit E
- 1983 Draft Environmental Impact Statement
- FY-1985 Aquatic Resources Plan of Study

Contemporary literature

- Agency document libraries
- ARLIS
- Agency contacts



Findings

Report Organization

AS – Adult Salmon

RR – Resident & Rearing Anadromous Fish

MP – Macroinvertebrates and Periphyton

WQ – Water Quality

HG – Hydrology, Geomorphology, and Climate

IS – Instream Flow

MM – Marine Mammals



Instream Flow

- The 1980s APA Project instream flow study efforts focused on establishing the relationships between physical variables, fluvial processes and fish resources in the Middle River.



Instream Flow



	Potential Data Gap Topics
IF-1	Updated Instream flow study

Susitna Watershed

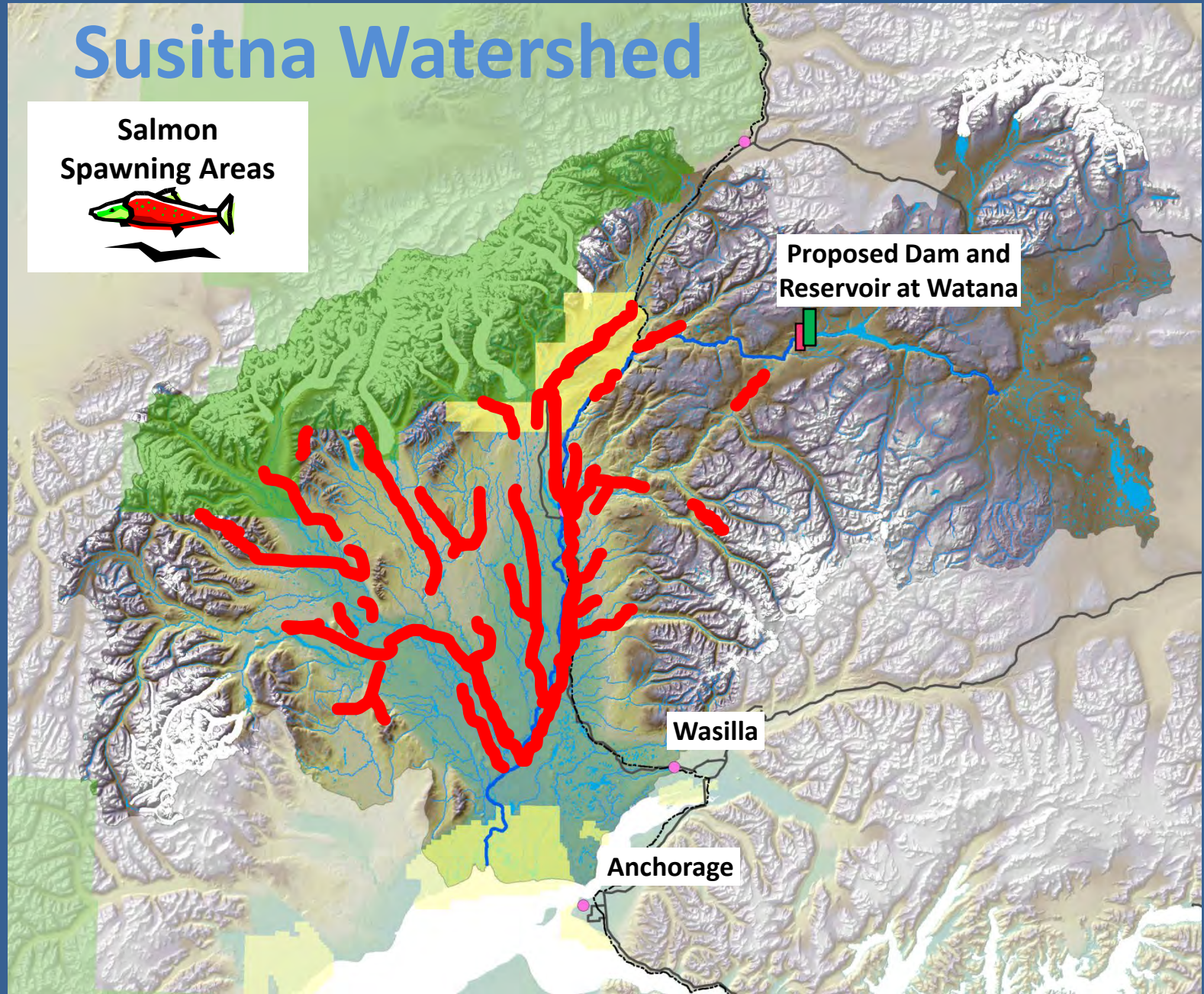
Salmon
Spawning Areas



Proposed Dam and
Reservoir at Watana

Wasilla

Anchorage



Adult Salmon

- migration and spawn timing has been documented
- slough escapements above RM 98.6 was estimated in 1980s
- relative abundance in tributaries above RM 98.6 was estimated in 1980s
- biological characteristics (i.e., sex ratio, fecundity, age, and length) are well quantified
- population size and relative abundance in select major tributaries is currently estimated



Adult Salmon



	Potential Data Gap Topics
AS-1	Synthesis of existing information for adult salmon
AS-2	Habitat change analysis
AS-3	Sockeye spawning distribution and habitat utilization
AS-4	Chinook abundance and distribution in the upper Susitna
AS-5	Chinook salmon spawning distribution and habitat utilization in the middle Susitna
AS-6	Coho salmon spawning distribution and habitat
AS-7	Chum salmon spawning distribution and habitat
AS-8	Pink salmon spawning distribution and habitat
AS-9	Genetic baselines for middle Susitna Chinook

Resident and Rearing Anadromous Fish

- Relative abundance and distribution of 19 species was estimated
- Age class and sex ratio estimated for key species
- Arctic grayling population estimate was completed in Upper River tributaries
- Outmigration timing for most species of juvenile salmon was documented
- Movements of selected species of resident adult fish in the Susitna River
- Critical habitats (spawning and overwinter) were Identified for some species



Resident & Rearing Anadromous Fish



	Potential Data Gap Topics
RR-1	Resident and rearing fish within the proposed impoundment zone
RR-2	Resident and rearing fish along the access and transmission corridor
RR-3	Resident fish movement within the middle Susitna River
RR-4	Eulachon synthesis document
RR-5	Northern pike
RR-6	Middle river YOY sockeye from outmigration and rearing
RR-7	Juvenile salmon density in mainstem and tributaries of Susitna River
RR-8	Peak outmigration timing for salmon
RR-9	Water quality parameters, substrate size, and water velocity of active redds
RR-10	Requirements of rearing juvenile coho salmon in the Susitna River
RR-11	Resident and rearing fish habitat requirements in middle Susitna

Macroinvertebrates and Periphyton

- Previous studies limited in geographic extent
- Temporal extent and methods (drift and benthic) were robust



Macroinvertebrates and Periphyton



	Potential Data Gap Topics
MP-1	Update baseline macroinvertebrate datasets
MP-2	Updated baseline information on primary productivity, transported, and benthic organic matter

Water Quality

- Water quality conditions influenced by high velocity, cool temperatures, and high turbidity resulting from upstream glacial meltwater
- Water quality and hydrologic conditions are naturally different upstream of Tri Rivers
- Sediment loads from the Chulitna River upto 15 times greater than Susitna River although both contribute similar amounts of flow below the confluence.



Water Quality



	Potential Data Gap Topics
WQ-1	Update baseline for turbidity, TSS, TDS, pH dissolved oxygen, temperature, metals, nutrients, organics, bacteria, and other parameters
WQ-2	Temperature, TSS, and dissolved gas model for middle and lower Susitna River

Hydrology, Ice, Sediment, Geomorphology, and Climate

- 14 gages operated at different times, especially during 1980s
- Ice observations on Lower and Middle River during 1980s
- Slough hydrology studies to determine the sources of slough inflow at different river discharges during 1980s
- River morphology analysis from Devil Canyon to Cook Inlet in 1982
- USGS sediment transport studies along the Susitna River, Chulitna River, Talkeetna River, and Yentna River between 1980 and 1985
- Climate trend data is available although no studies have specifically been completed for the Susitna River
- UAF glacial studies for the 1980s APA Project
- Aerial imagery available for since 1982 will be useful in characterizing channel morphology changes



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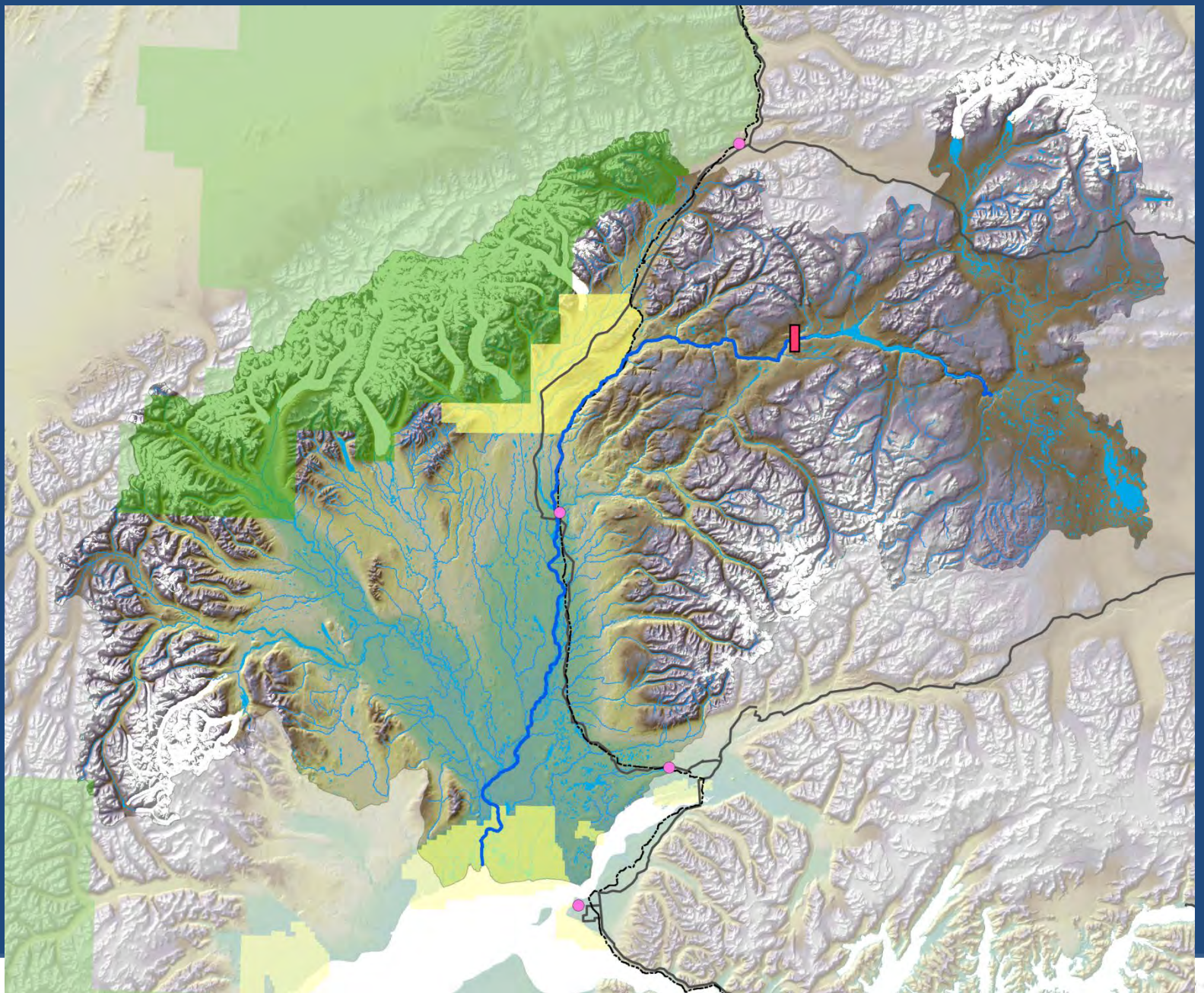
	Potential Data Gap Topics
HG-1	Streamflow synthesis (USGS)
HG-2	Middle and lower river ice studies
HG-3	Slough groundwater/ surface water studies
HG-4	Middle and lower river change analysis
HG-5	Chulitna confluence and lower river sediment transport and aggradation study
HG-6	Large woody debris recruitment and transport
HG-7	Climate change and variability
HG-8	Glacial contribution to streamflow in the Susitna Basin
HG-9	Hydrology and geomorphology data rescue

Marine Mammals

- Aerial surveys of CIBWs in 1982 and 1983 confirming the summer aggregation of belugas at the Susitna Delta
- No studies were conducted on other marine mammals







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