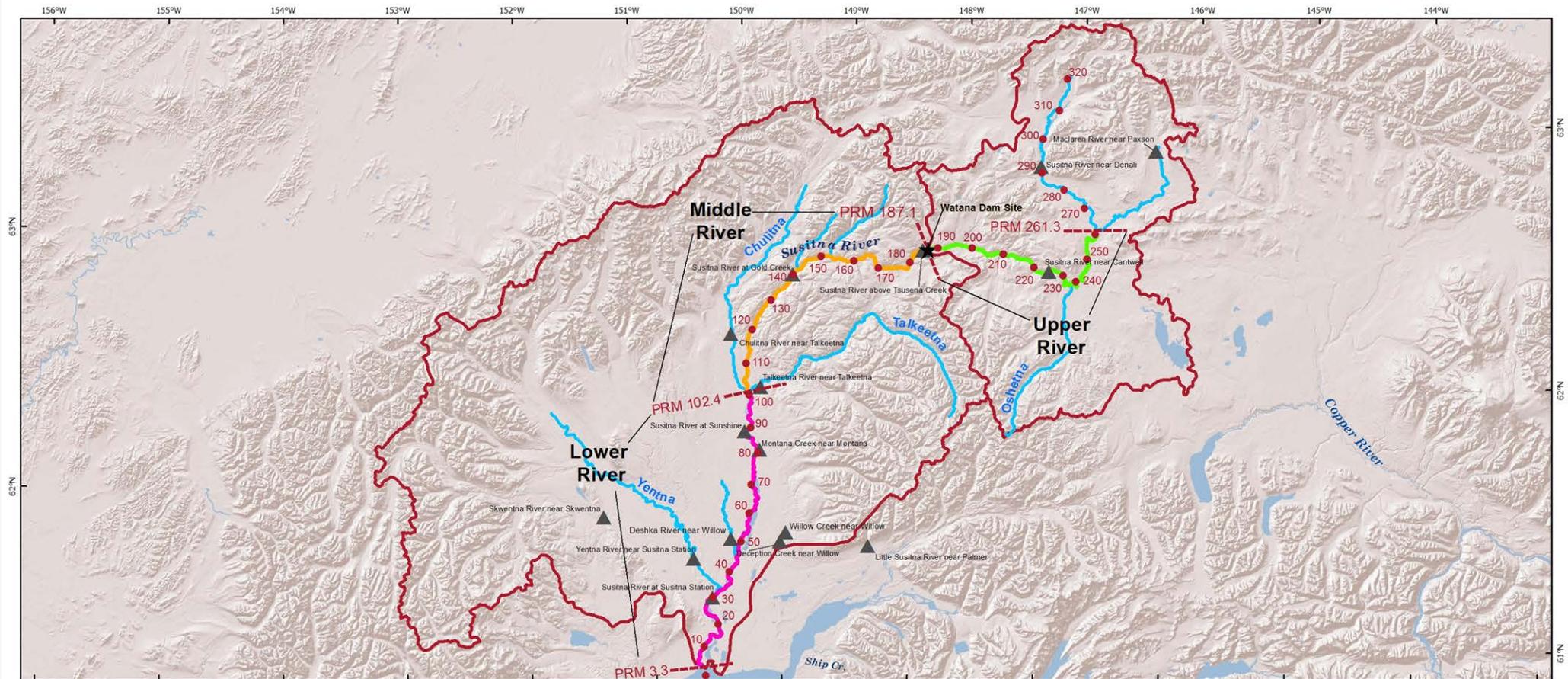


Susitna-Watana Hydro – Geomorphology Studies

- Study 6.5 Geomorphology – Characterize the geomorphology of the Susitna River to evaluate the potential project effects on the geomorphology and dynamics of the river.
- Study 6.6 Fluvial Geomorphology Modeling – Model the fluvial geomorphology of the Susitna River.
 - Develop calibrated models to predict magnitude and trend of geomorphic response
 - Apply the models to estimate potential for channel change compared to existing conditions.

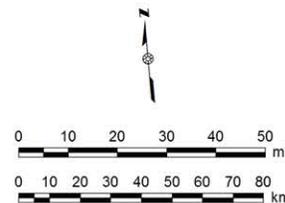
Study Area



Legend

- ★ Watana Dam Site
- ▲ Gaging Stations
- Susitna Project River Mile (10 mile interval)
- Basin Boundary
- River Segment Boundaries:
 - Lower River (PRM 3.3 to PRM 102.4)
 - Middle River (PRM 102.4 to PRM 187.1)
 - Upper River (PRM 187.1 to PRM 261.3)

Data Sources: See Map References



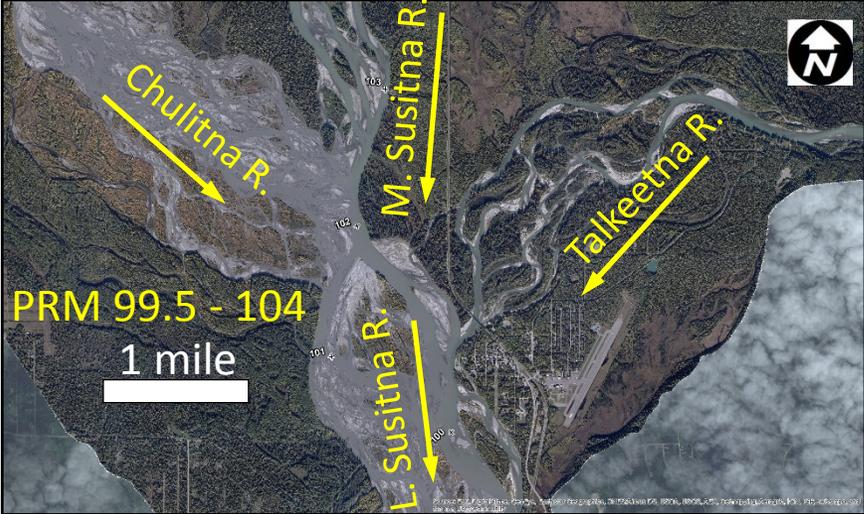
Projection: Alaska Albers NAD 1983
 Date Created: 2/20/2013
 Map Author: Tetra Tech - Whitney Kirkendall/Miguel Guerrero
 File: Susitna_Reaches_overview_v20130219.mxd

Large Tributaries Dominate Downstream

Middle Susitna R. 1-2 primary, stable channels.



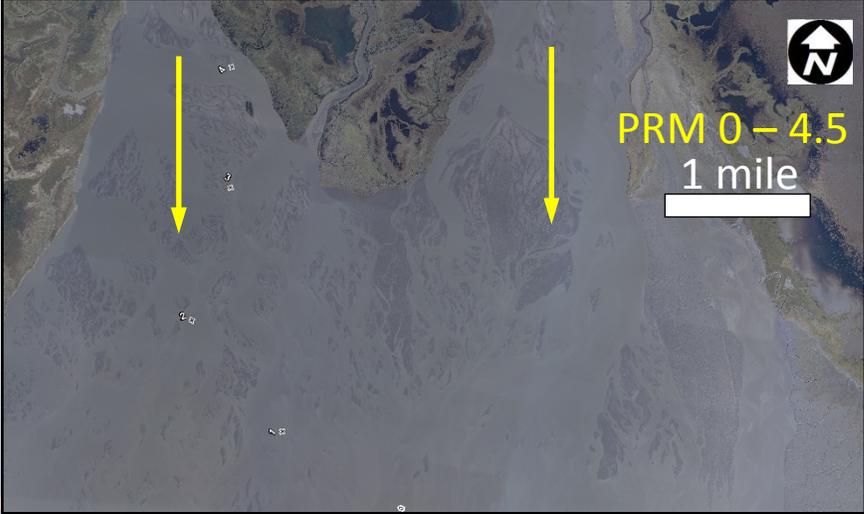
Braided, dynamic channel below Chulitna R.



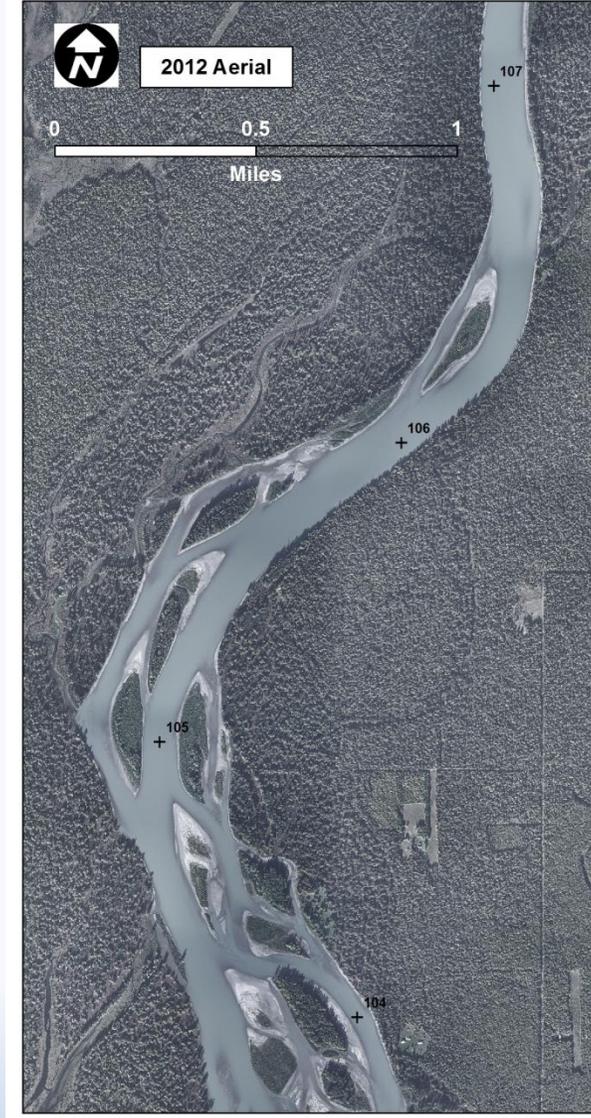
Distributary delta system below Yentna R.



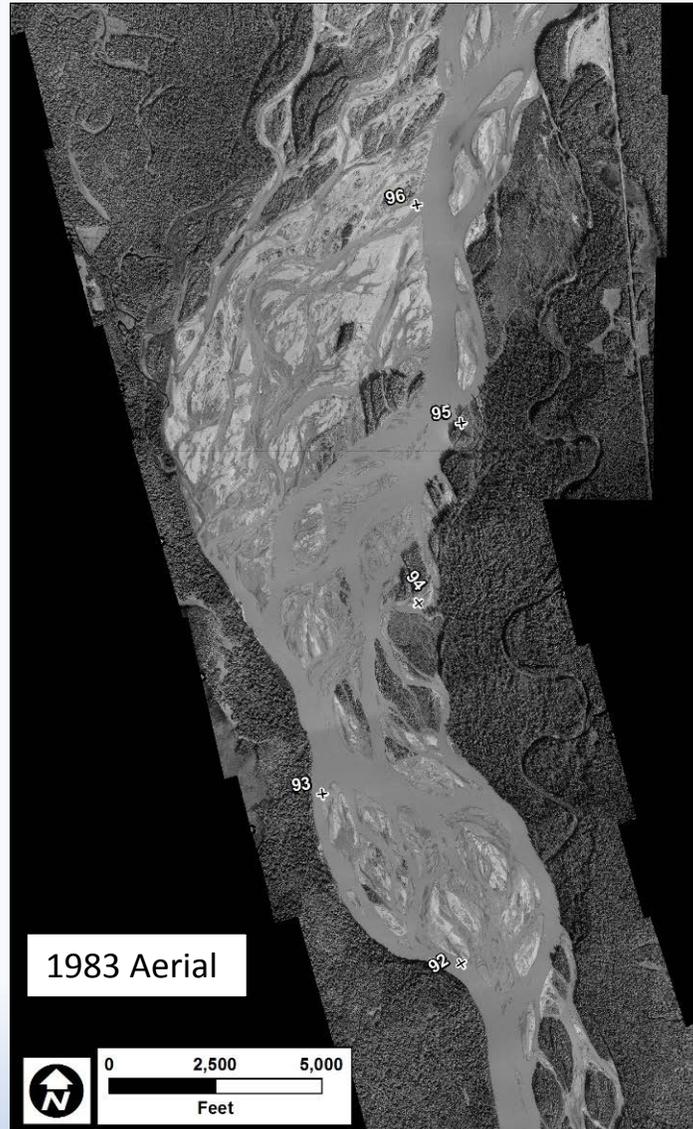
Delta plain expands to over 5 miles wide.



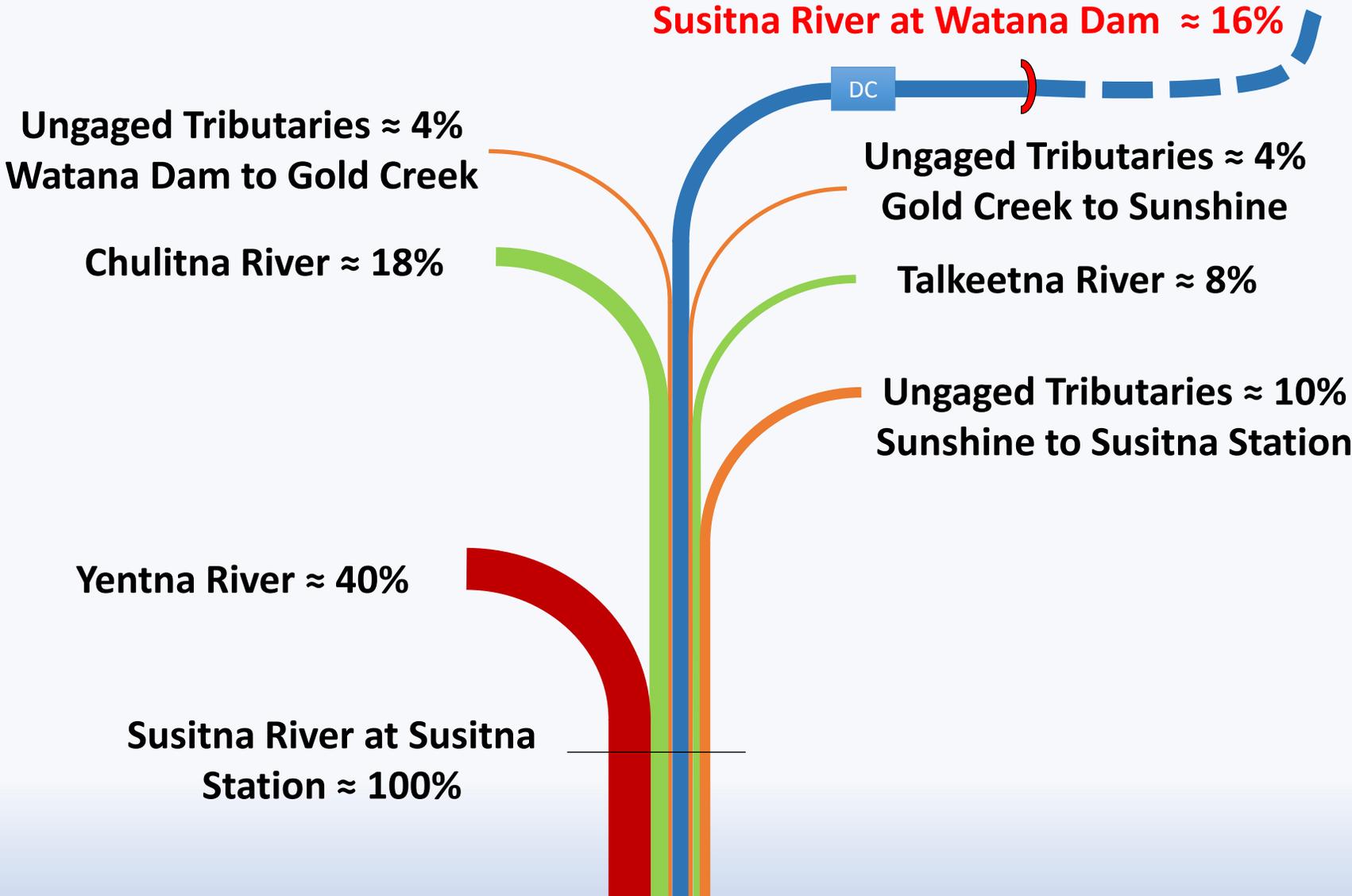
Middle Susitna River is a Stable System



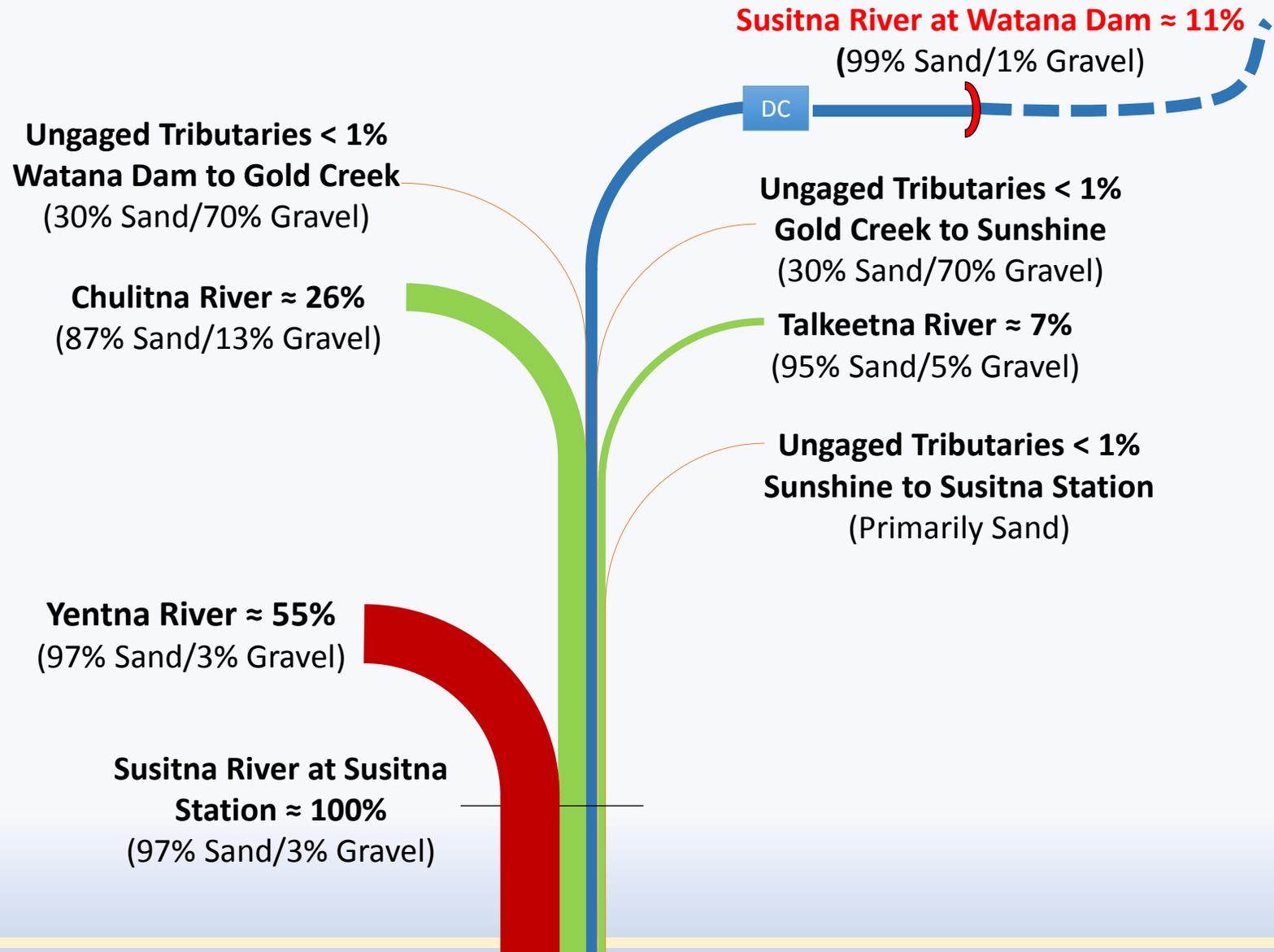
Lower Susitna River is a Dynamic System



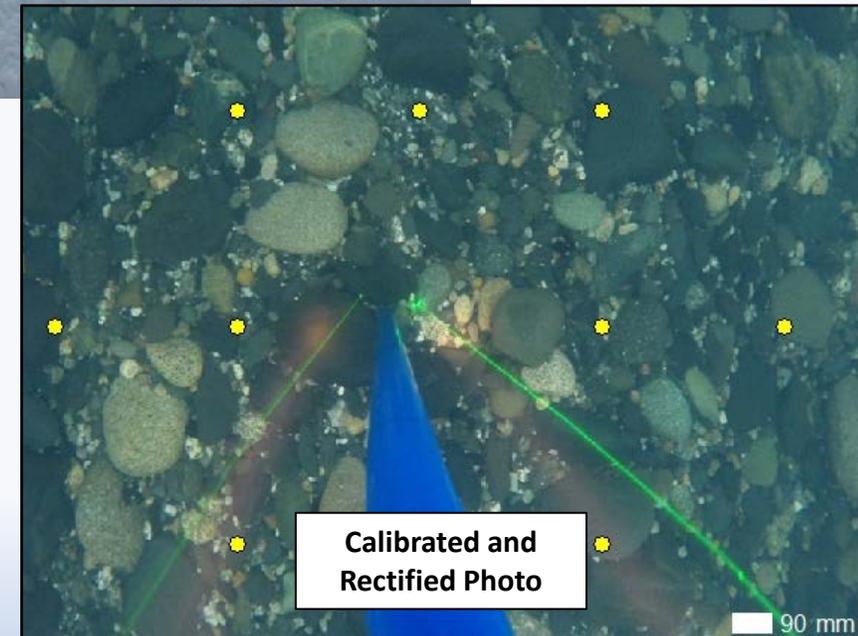
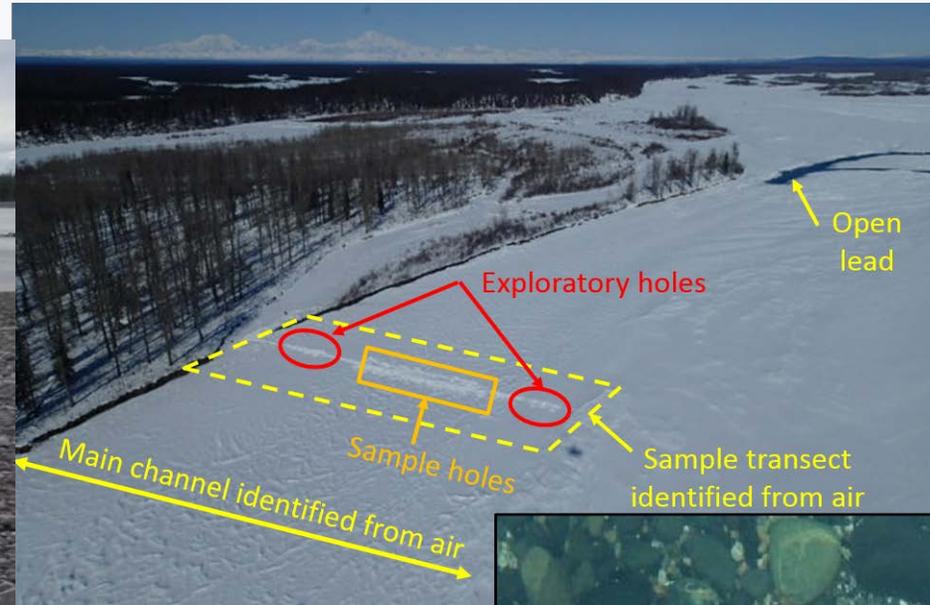
Average Annual Flow Contributions (USGS data)



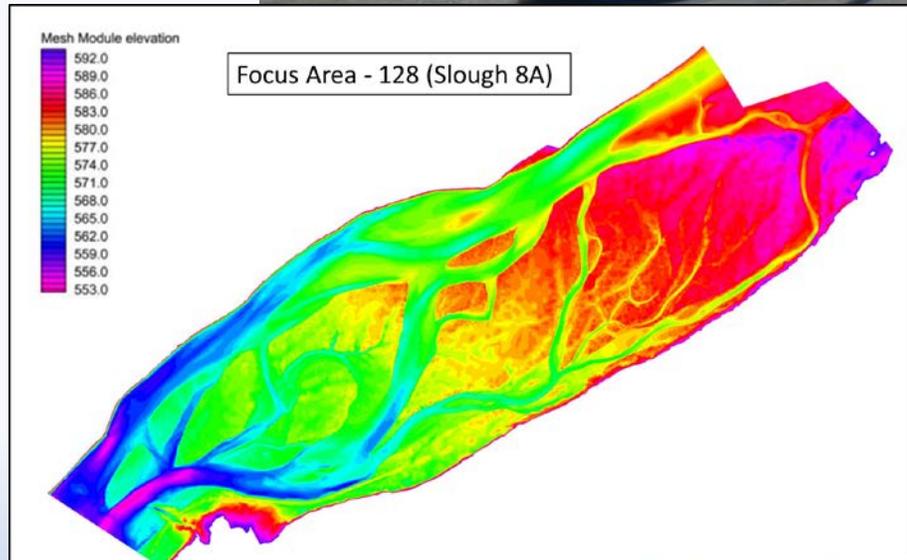
Average Annual Bed Material Load Contributions (USGS data)



Bed Material Sampling (Summer and Winter)

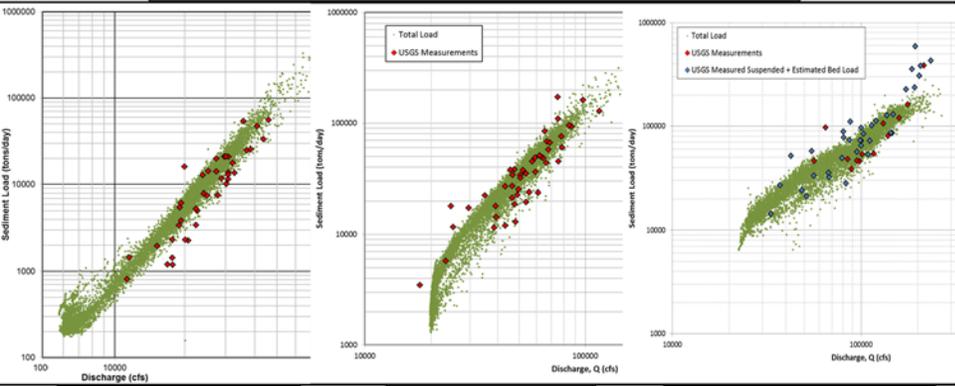


Bathymetric Surveys, LiDAR, and Geomorphic Mapping



Hydraulic and Bed Evolution Modeling (System and Focus Areas)

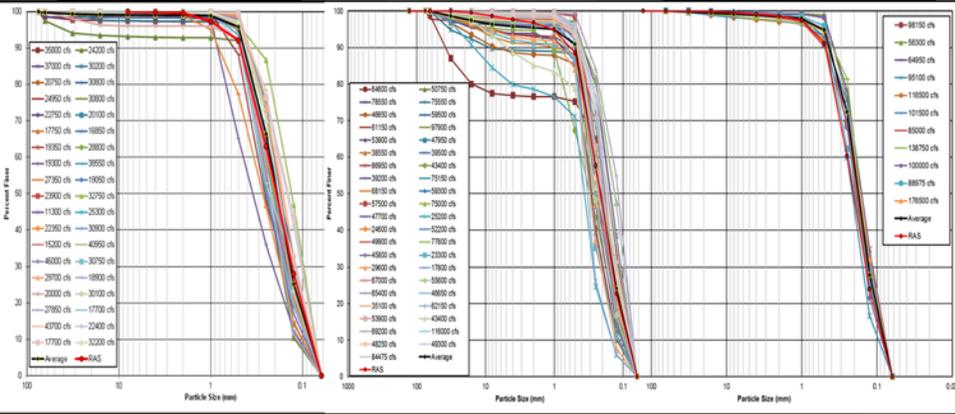
Measured and Simulated Sediment Loads



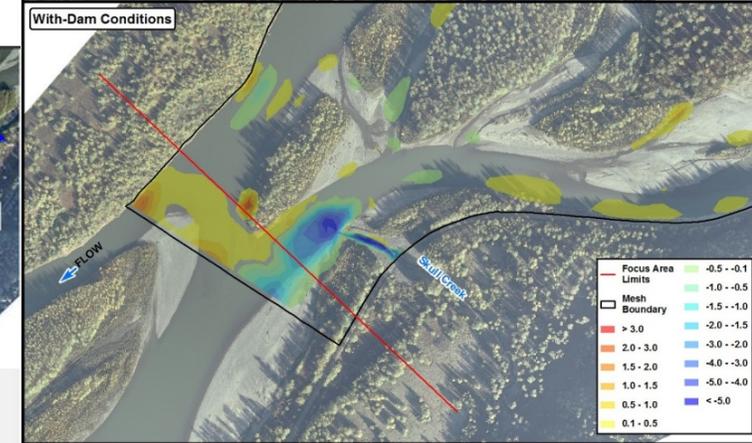
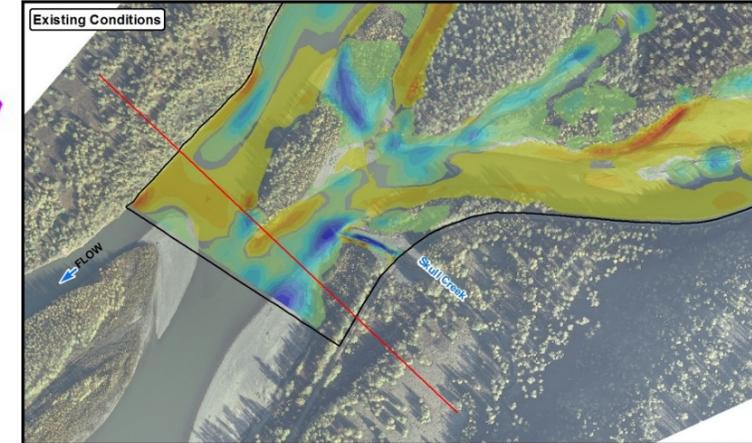
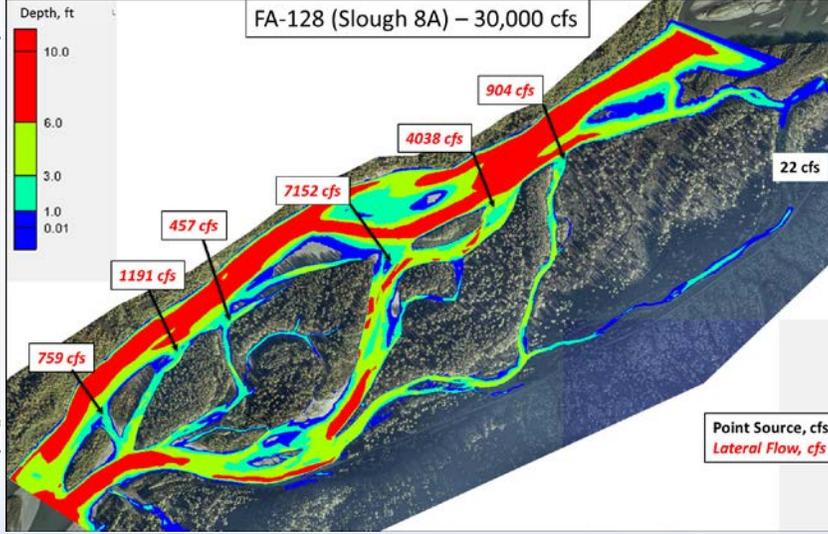
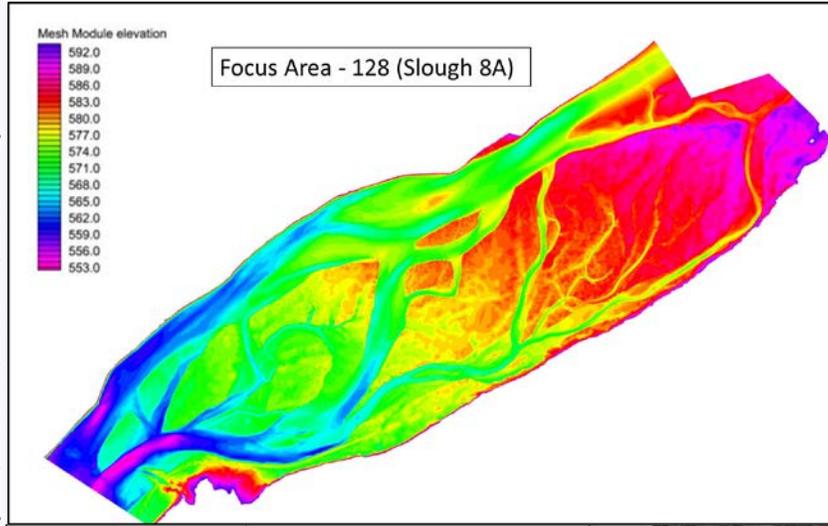
Gold Creek PRM 140

Sunshine PRM 88

Susitna Station PRM 30



Measured and Simulated Transported Gradations



TETRA TECH logo

FA 128 Aggregation/Degradation Skull Creek - Year 8

Scale: 0, 600, 1,200 Feet

FERC Director's Determination

FERC approved without modification AEA's plan forward for the Geomorphology Study (Study 6.5).

Modifications adopted in part for the Fluvial Geomorphology Study (Study 6.6):

- Modeling at Three Rivers Confluence – Detailed Hydraulic Modeling (2-D) to evaluate hydraulics, bank erosion and flooding potential in area of Talkeetna.
- Presentation of Model Results – Annual bed elevation results of 50-year simulation period at the Geomorphic Reach Scale (existing and with-Project)

AEA agrees with and will incorporate FERC's recommendations in the next year of study.