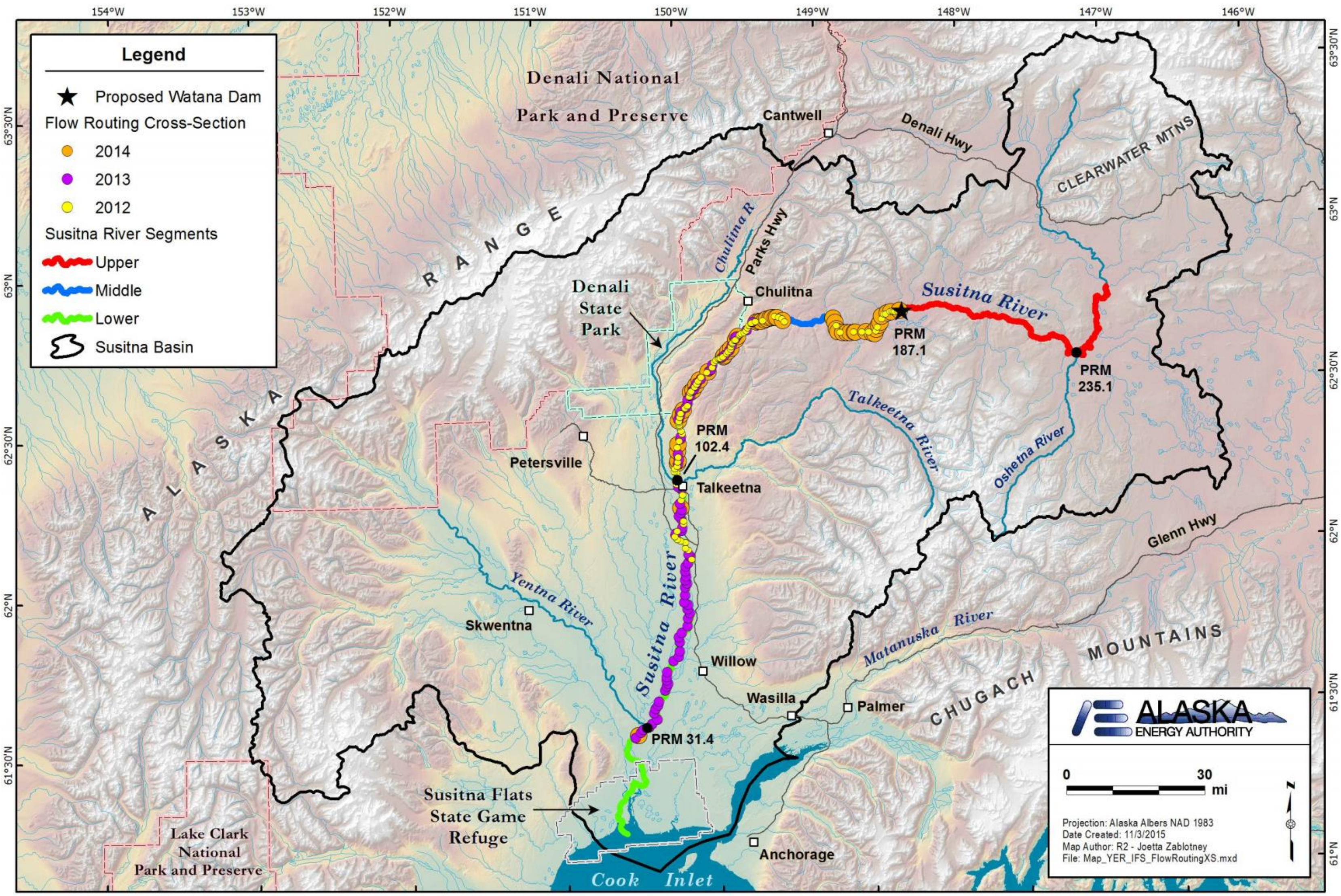

Figure 5.3-1 Location of 2012, 2013, and 2014 measured flow-routing cross-sections. (Source: Modified ISR Study 8.5, Figure 5.3-1.)

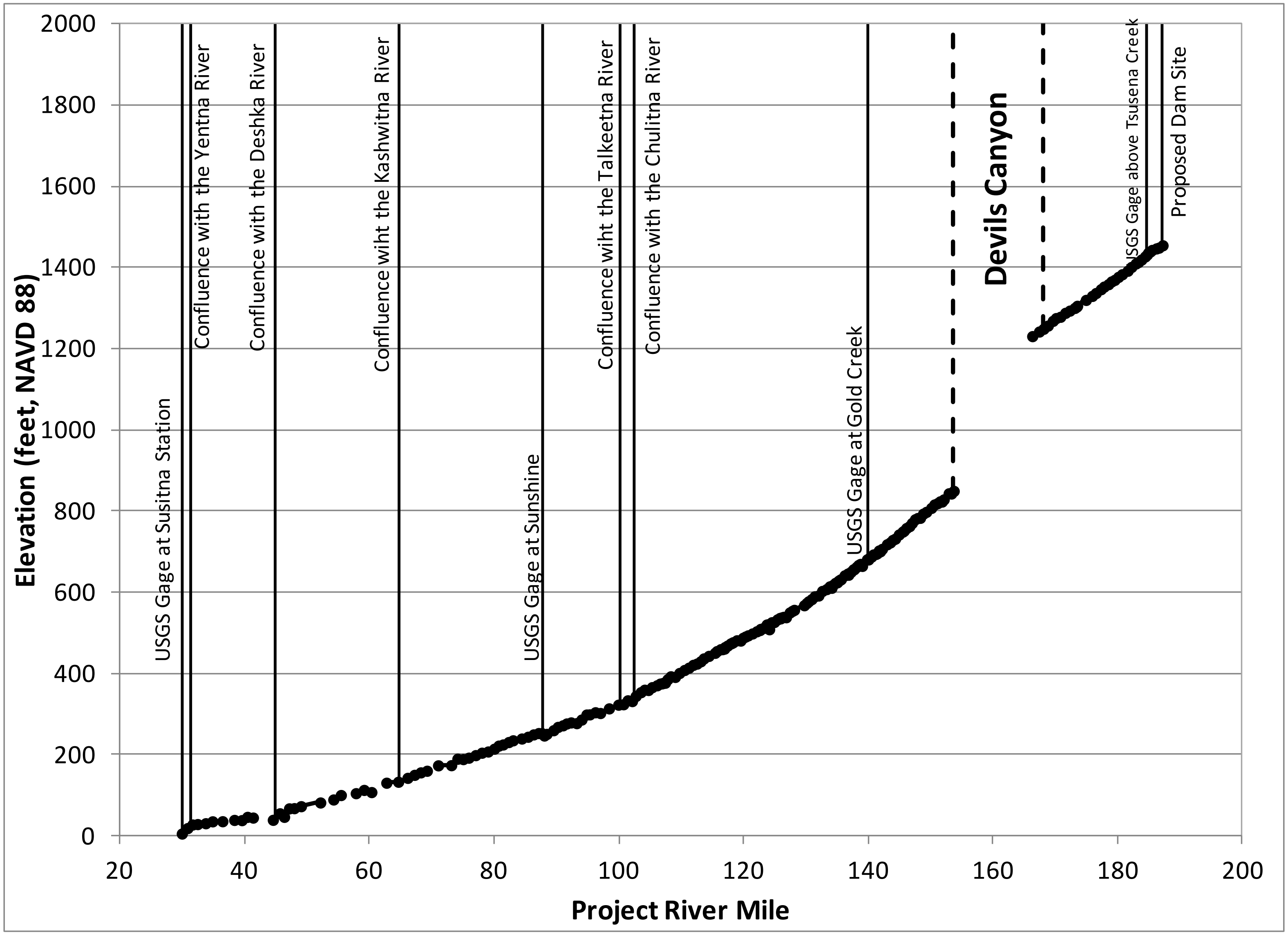

Figure 5.4-1 Longitudinal thalweg profile of the Susitna River extending from PRM 29.9 to PRM 187.2. (Source: SIR Study 8.5, Appendix B, Figure 14.)

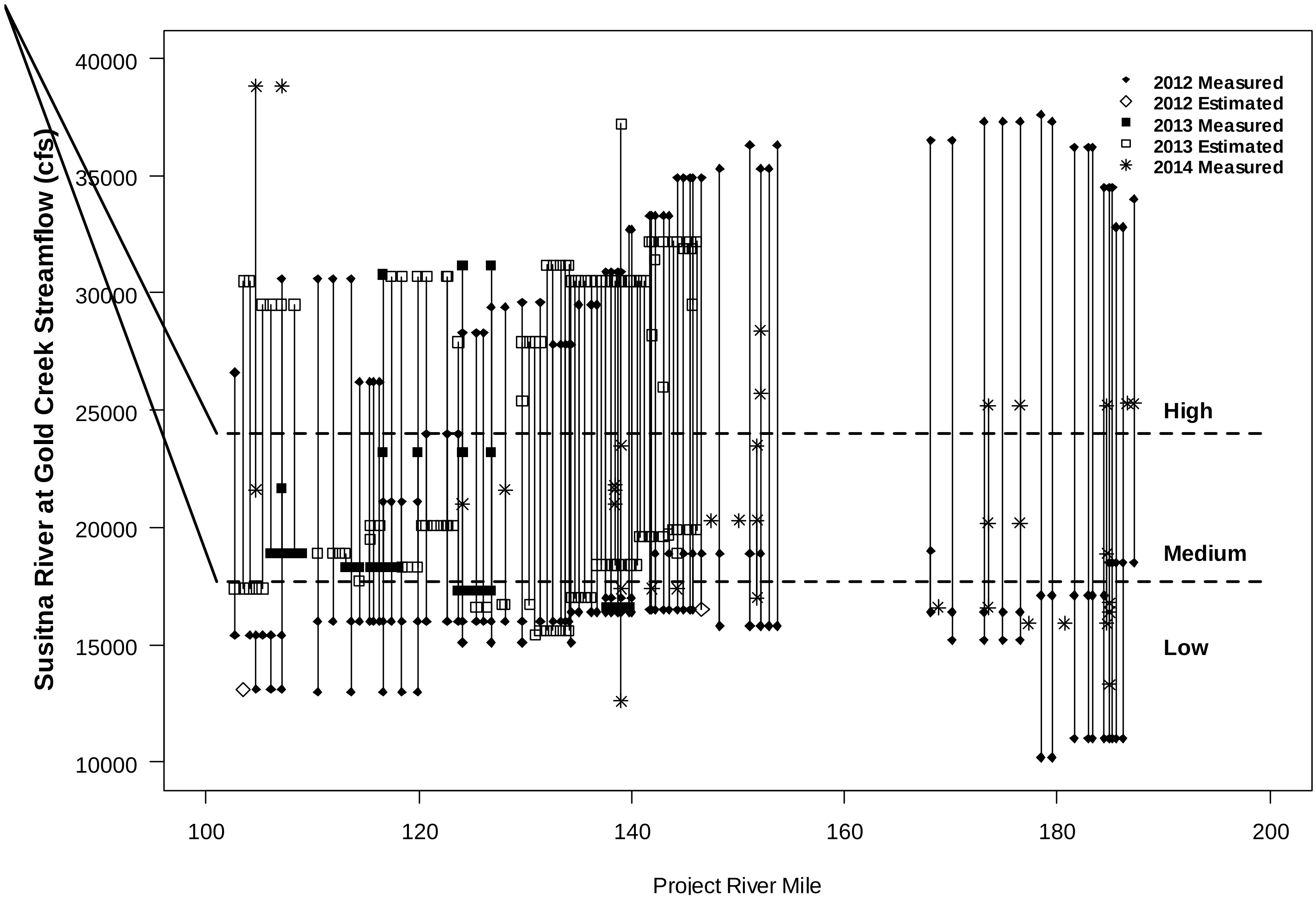

Figure 5.4-2. Locations of flow measurements in the upper Susitna River in 2012-2014, and classification of flows as low, medium, or high based on concurrent measurements in the Susitna River at Gold Creek (USGS No. 15292000). (Source: SIR Study 8.5, Appendix B, Figure 15.)

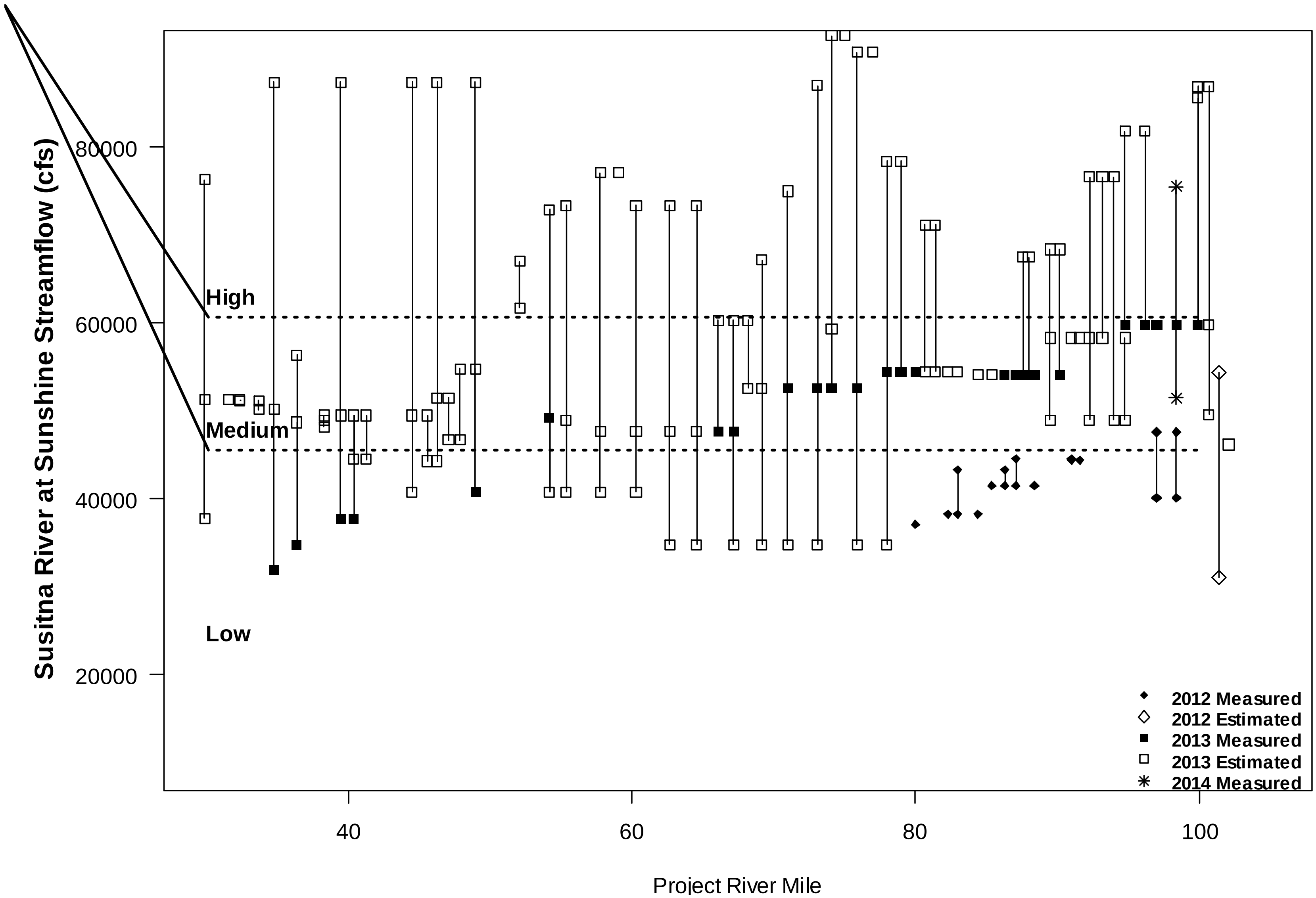

Figure 5.4-3. Locations of flow measurements in the lower Susitna River in 2012-2014, and classification of flows as low, medium, or high based on concurrent measurements in the Susitna River at Sunshine gage (USGS No. 15292780). (Source: SIR Study 8.5, Appendix B, Figure 16.)

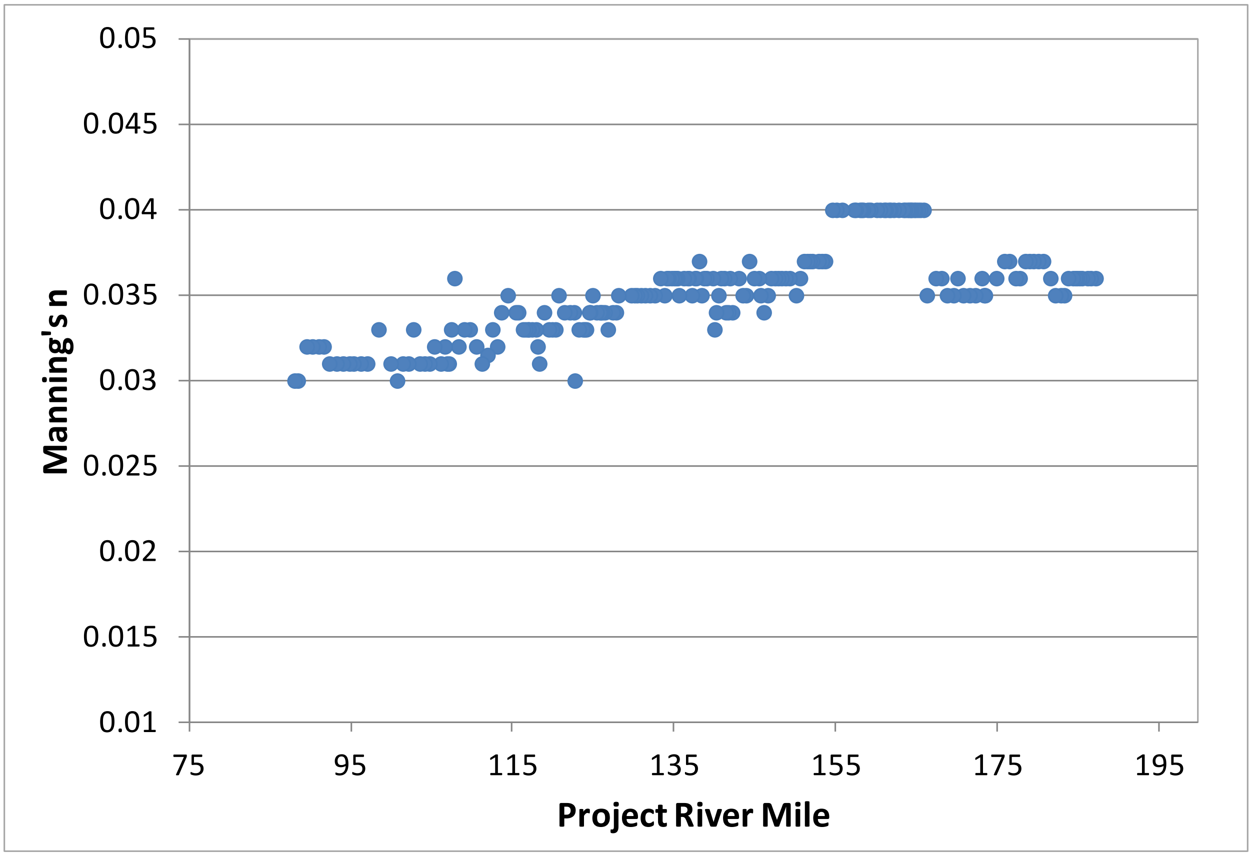

Figure 5.4-4. Manning's *n* channel roughness coefficients derived from steady-state calibration of flow routing model for 216 cross-sections of the Susitna River surveyed between 2012 and 2014. (Source: SIR Study 8.5, Appendix B, Figure 17.)

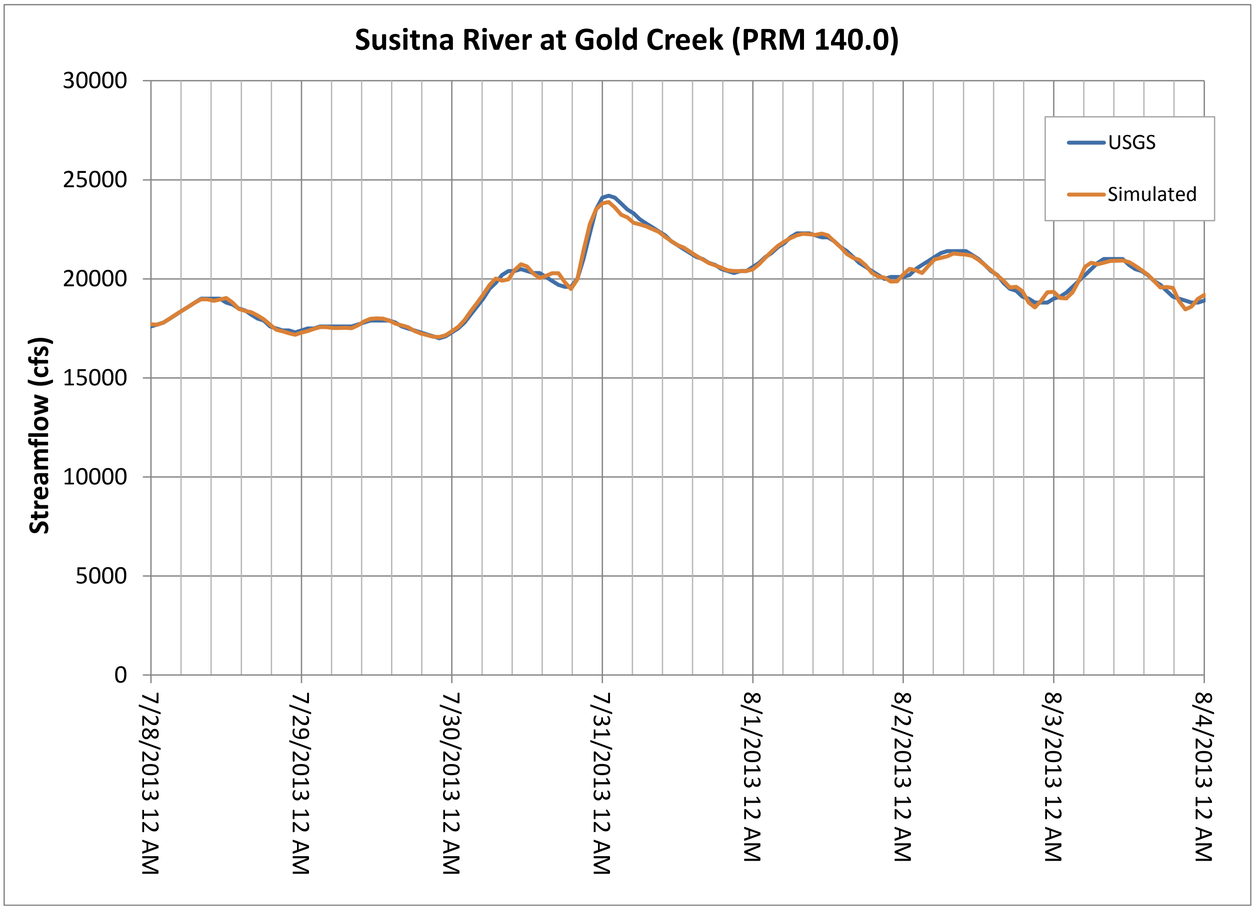

Figure 5.4-5. Comparison of measured versus simulated flow hydrographs in the Susitna River at Gold Creek (USGS No. 15292000) during the period from July 28 to August 3, 2013. (Source: SIR Study 8.5, Appendix B, Figure 18.)

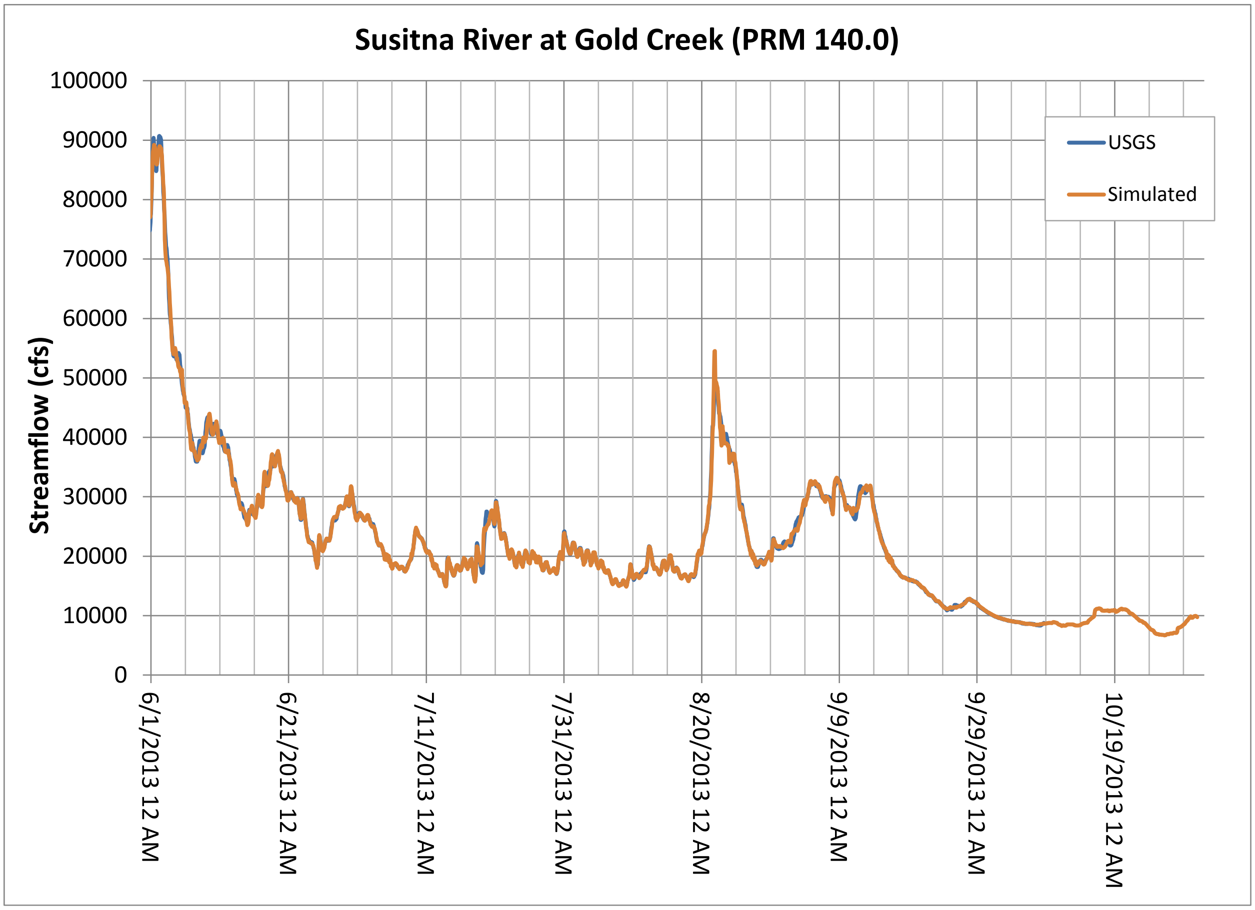

Figure 5.4-6. Comparison of measured versus simulated flow hydrographs in the Susitna River at Gold Creek (USGS No. 15292000) during the 2013 open-water period. (Source: SIR Study 8.5, Appendix B, Figure 19.)

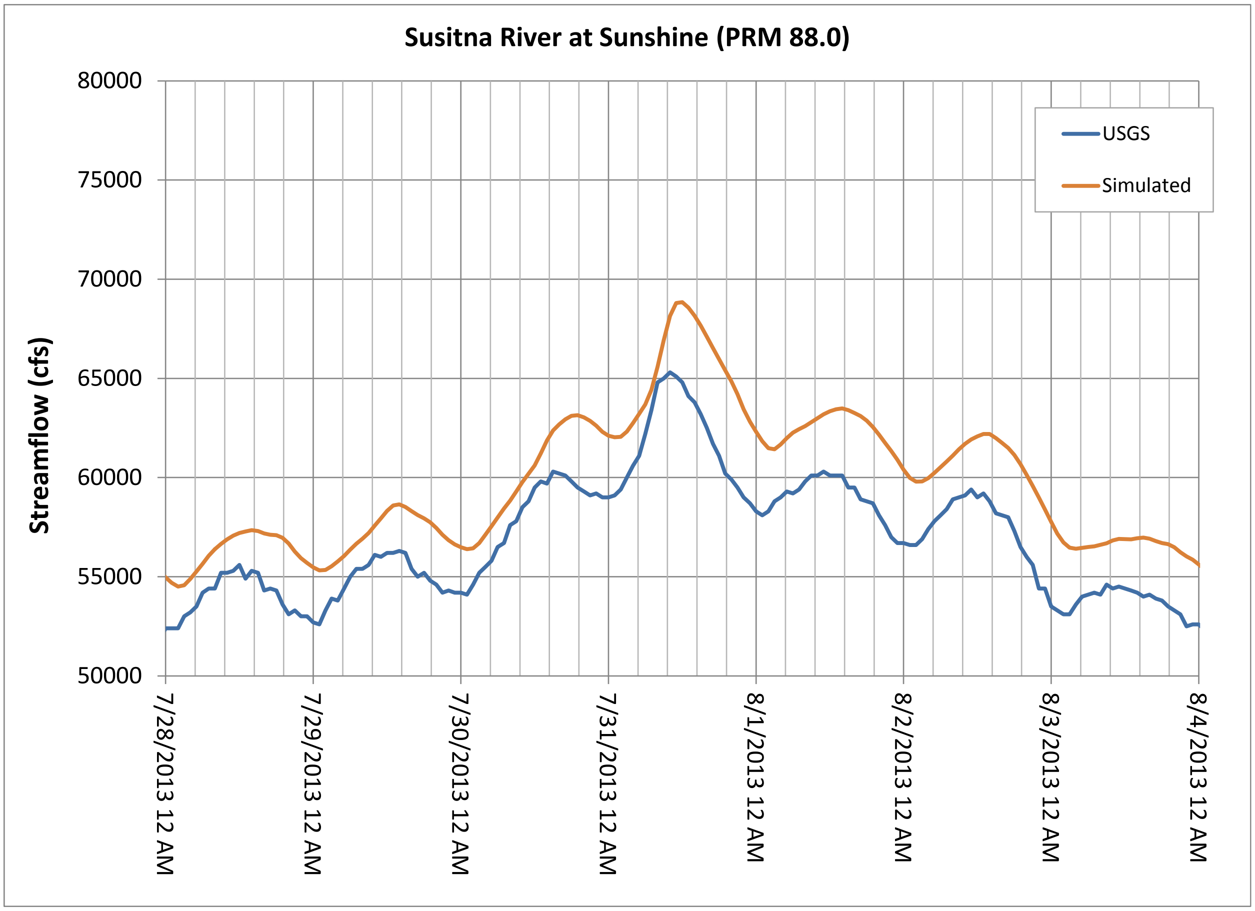

Figure 5.4-7. Comparison of measured versus simulated flow hydrographs in the Susitna River at Sunshine (USGS No. 15292780) during the period from July 28 to August 3, 2013. (Source: SIR Study 8.5, Appendix B, Figure 20.)

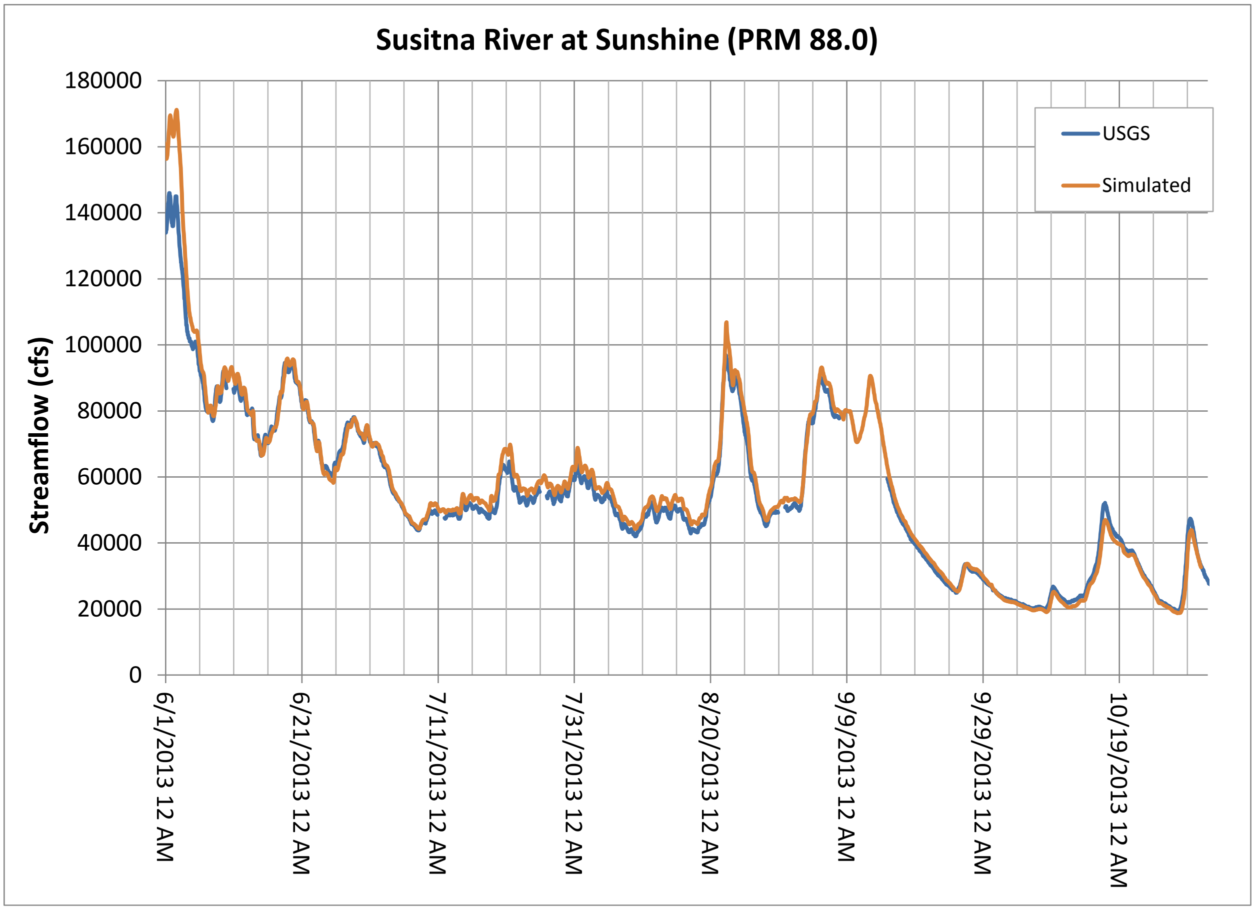

Figure 5.4-8. Comparison of measured versus simulated flow hydrographs in the Susitna River at Sunshine (USGS No. 15292780) during the 2013 open-water period. (Source: SIR Study 8.5, Appendix B, Figure 21.)

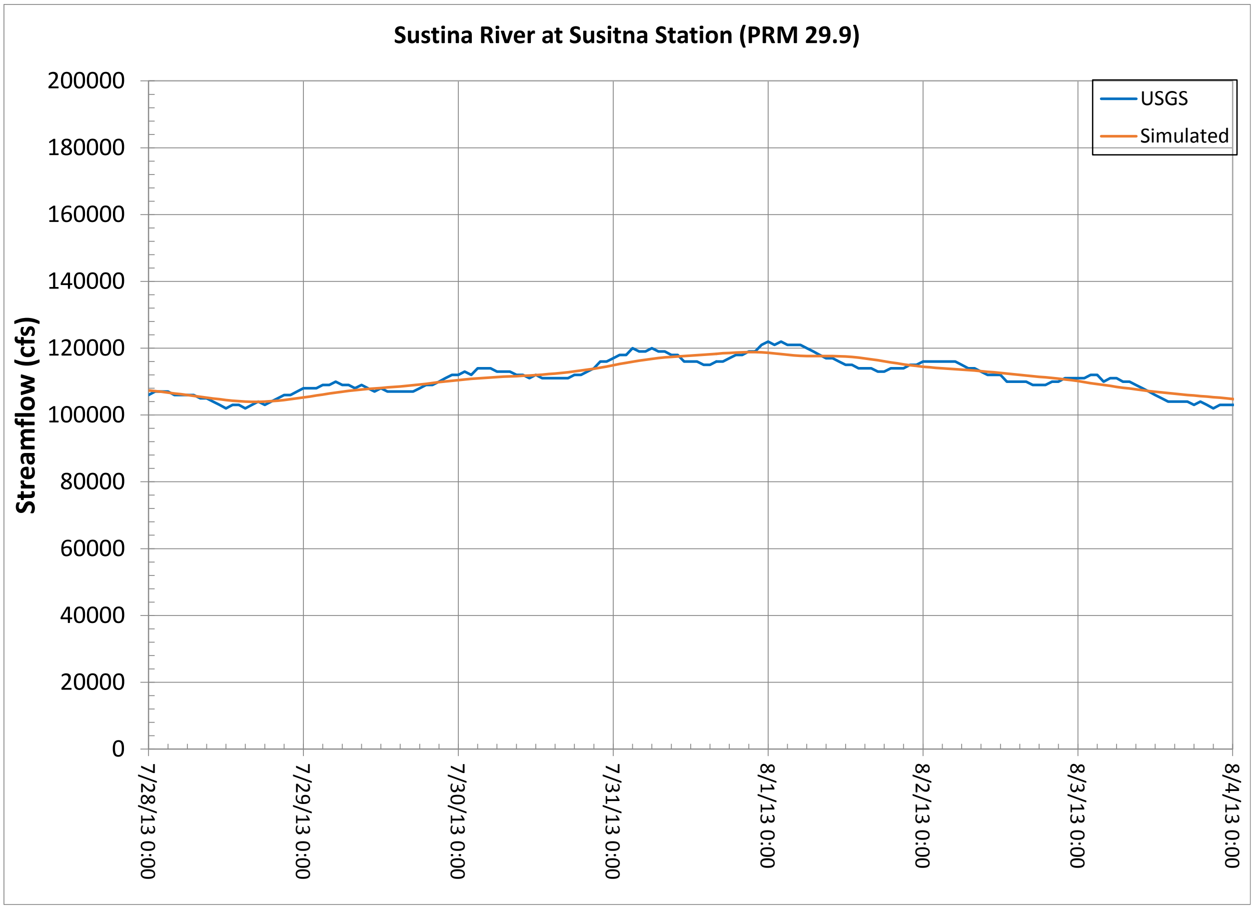

Figure 5.4-9. Comparison of measured versus simulated flow hydrographs in the Susitna River at Susitna Station (USGS No. 15294350) during the period from July 28 to August 3, 2013. (Source: SIR Study 8.5, Appendix B, Figure 22.)

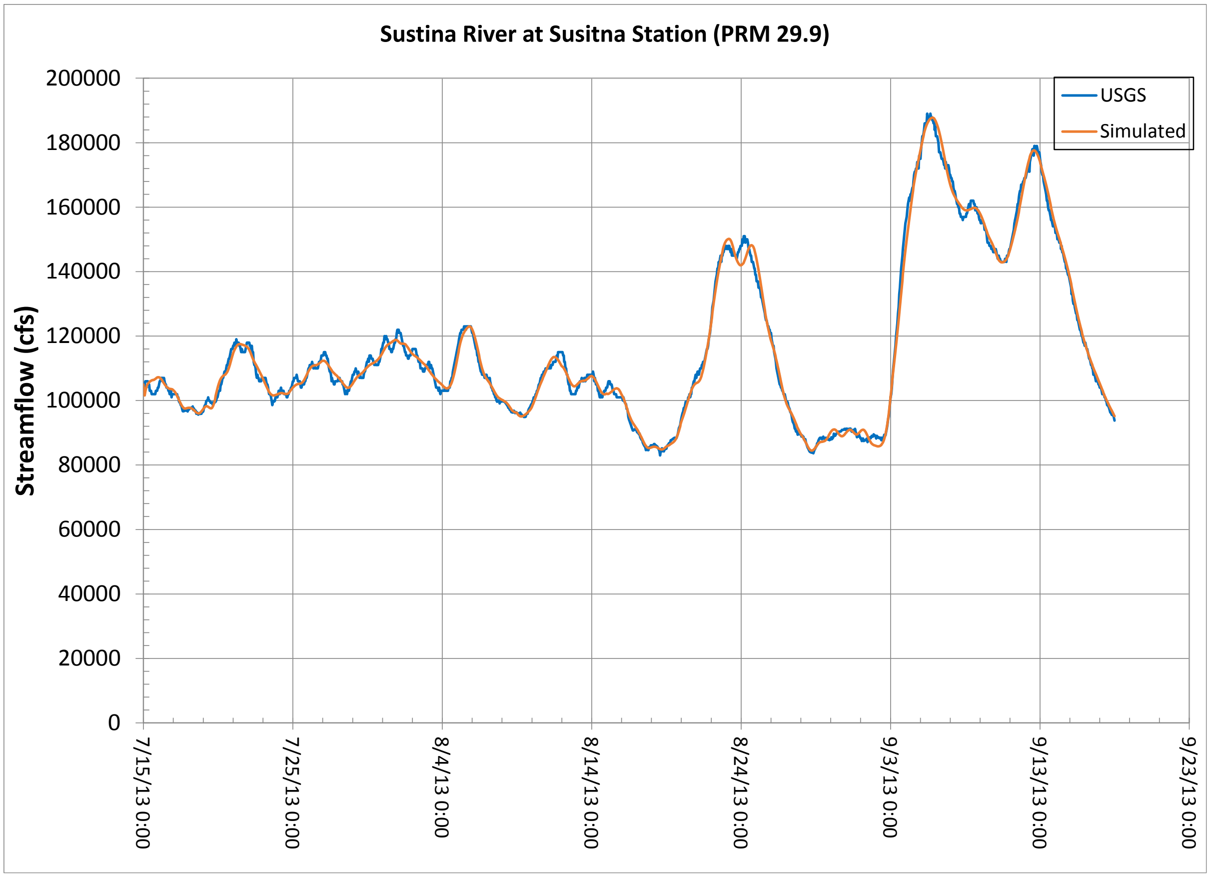

Figure 5.4-10. Comparison of measured versus simulated flow hydrographs in the Susitna River at Susitna Station (USGS No. 15294350) during the 2013 open-water period. (Source: SIR Study 8.5, Appendix B, Figure 23.)

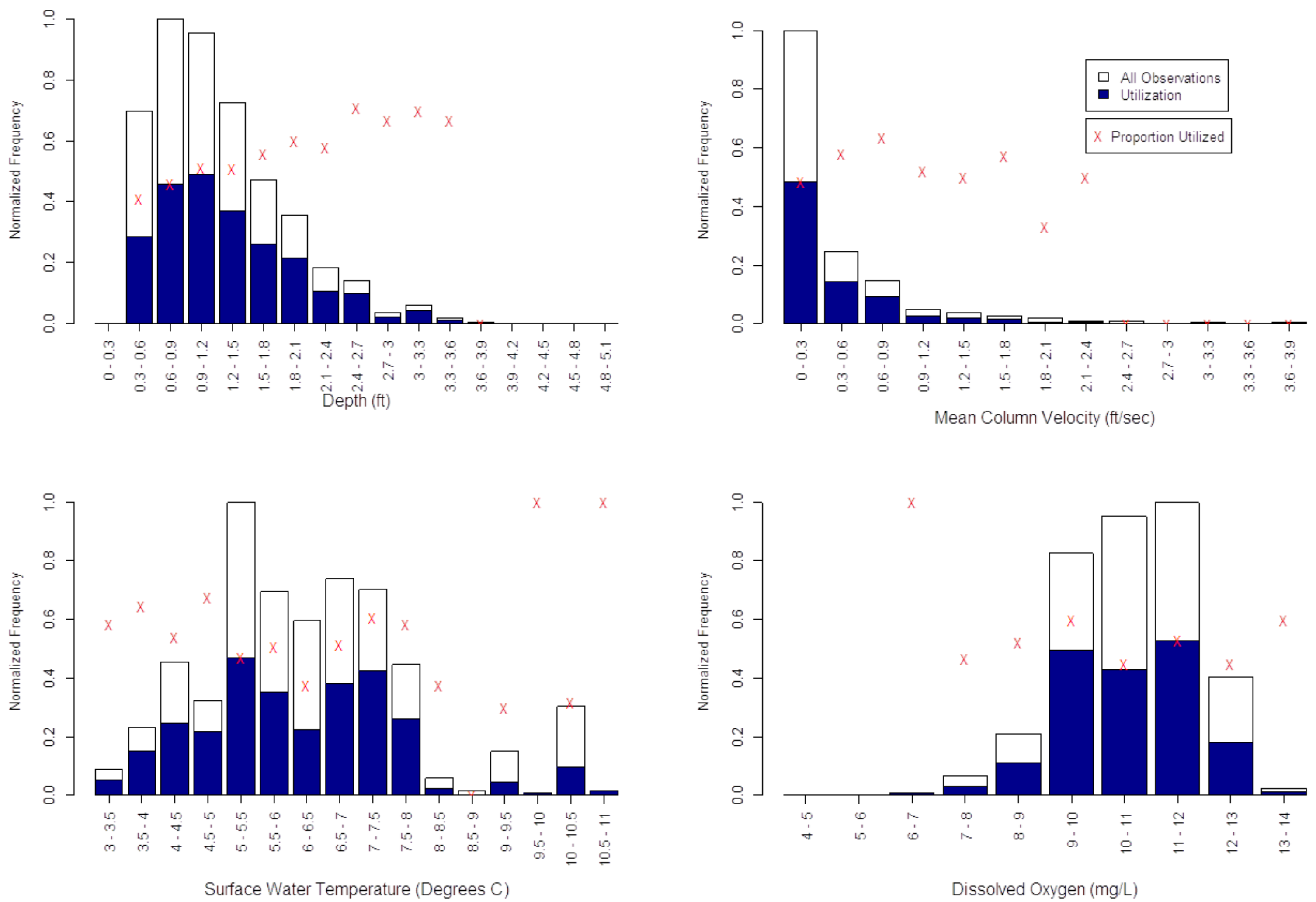

Figure 5.5-1. Normalized utilization for four continuous habitat variables for spawning chum salmon. (Source: SIR Study 8.5, Appendix D, Attachment 5, Figure D5-3.)

Note: Utilization data are normalized to availability of habitat for sites where fish were observed only.

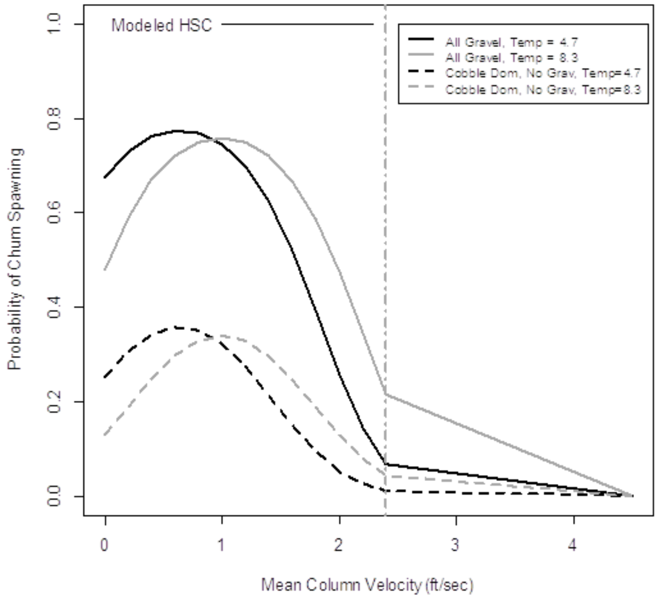

Figure 5.5-2. Chum spawning HSC as a function of velocity for two substrate types and surface water temperatures, with depth fixed at 1.2 feet. (Source: SIR Study 8.5, Appendix D, Figure 5.6-5.)

Note: Estimated preference for velocity > 2.4 fps is based on linear decline to 0 probability at threshold value of 4.5 fps.

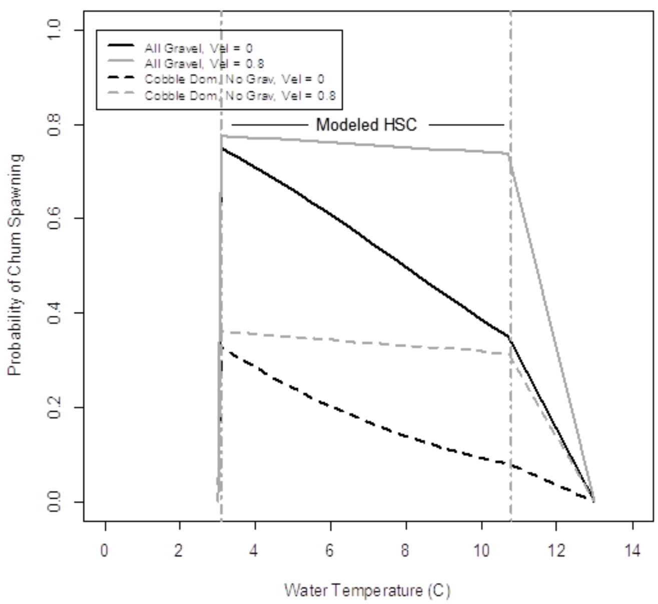

Figure 5.5-3. Chum spawning HSC as a function of surface water temperature for two substrate types and velocities, with depth fixed at 1.2 feet. (Source: SIR Study 8.5, Appendix D, Figure 5.6-6.)

Note: Estimated preference for temperatures less than 3.1 and greater than 9.3 are based on linear decline to 0 probability at threshold values of 3 and 13 degrees C, respectively.

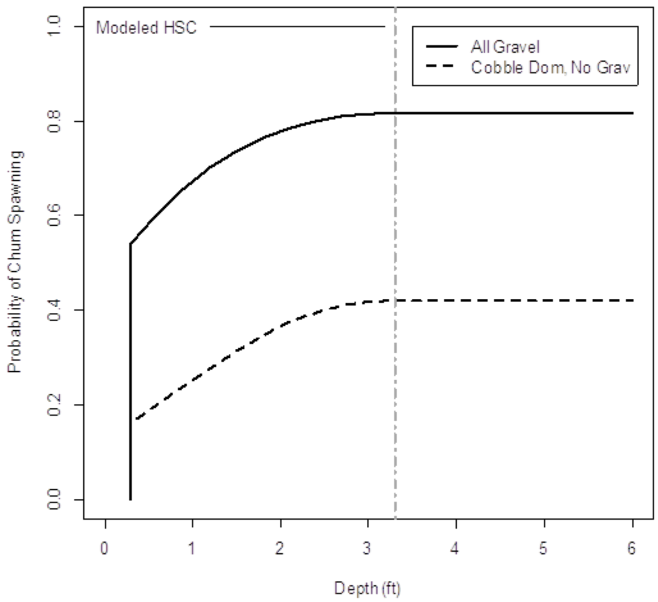

Figure 5.5-4. Chum spawning HSC as a function of depth for two substrate types, with velocity fixed at 0.2 fps, and water temperature fixed at 5.5 degrees C. (Source: SIR Study 8.5, Appendix D, Figure 5.6-7.)

Note: Estimated preference for depth < 0.3 feet is zero, and estimated preference for depth > 3.3 feet is non-limiting (i.e., fixed at the highest modeled value).

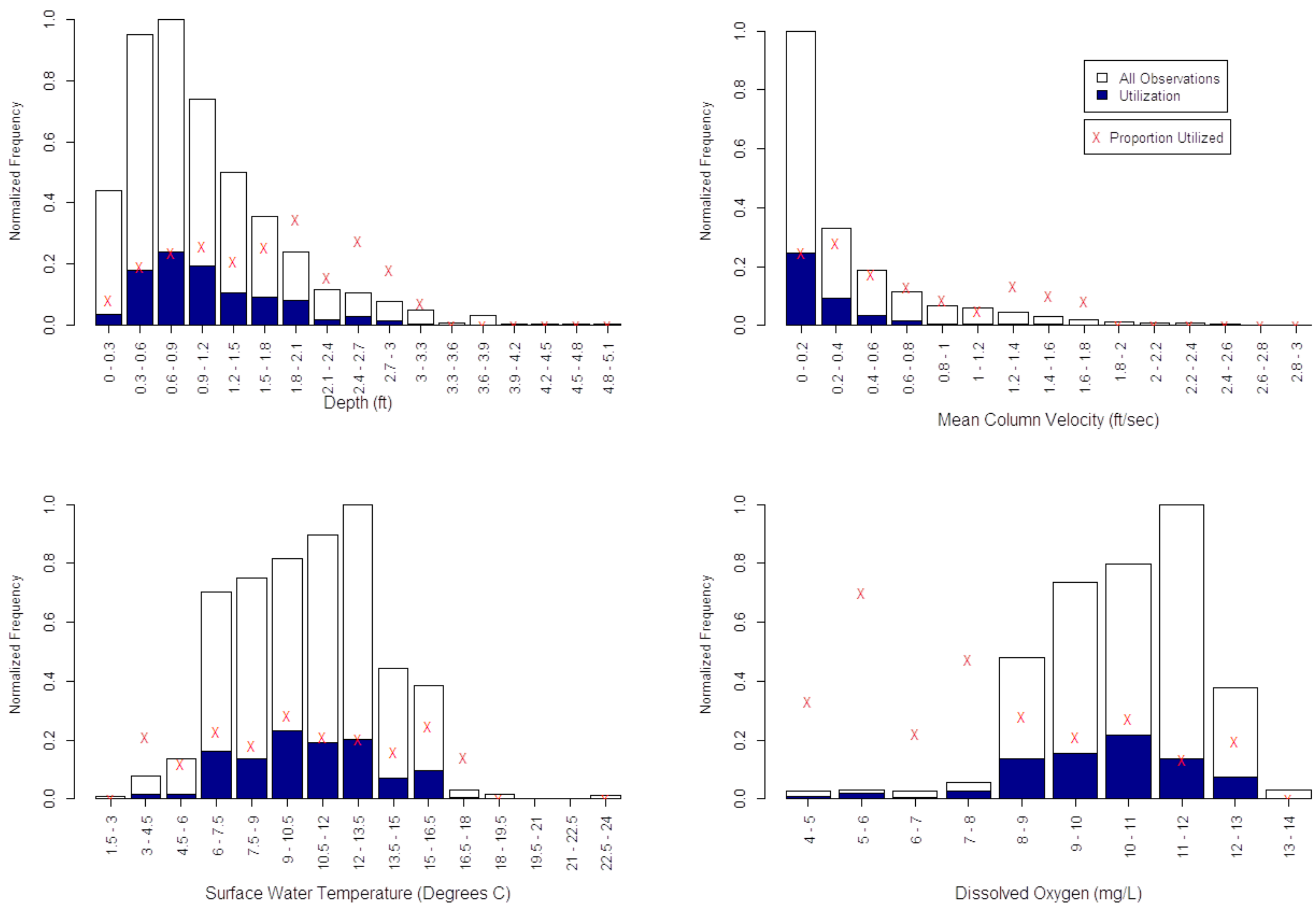

Figure 5.5-5. Normalized utilization for four continuous habitat variables for coho salmon fry. (Source: SIR Study 8.5, Appendix D, Attachment 5, Figure D5-4.)

Note: Utilization data are normalized to availability of habitat for sites where fish were observed only.

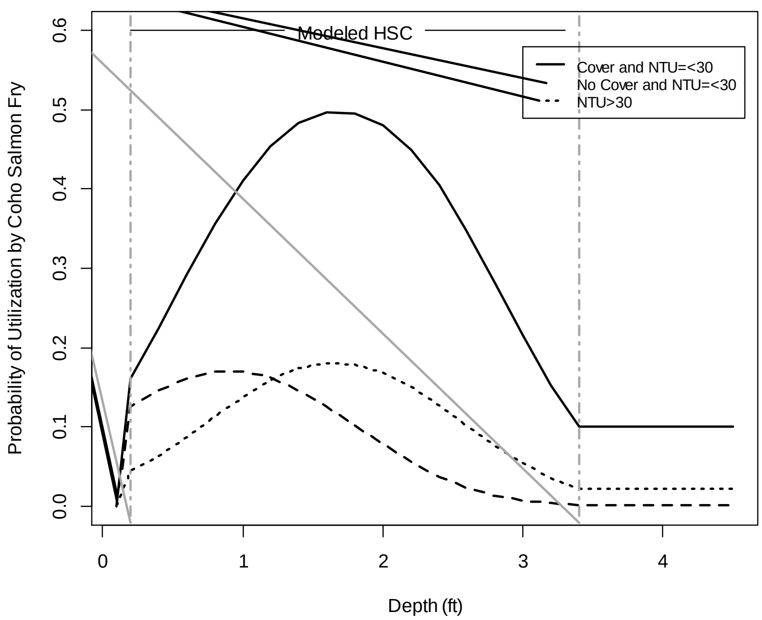

Figure 5.5-6. HSC model for coho salmon fry as a function of depth for fixed velocity of 0.4 fps for three different substrate/turbidity groups. (Source: SIR Study 8.5, Appendix D, Figure 5.6-8.)

Note: Estimated preference for depth < 0.2 feet (first observed fish) is linear decreasing to the threshold of 0.05 feet, and estimated preference for depths > 3.4 feet (last observed fish) is non-limiting (i.e., fixed at the highest modeled value).

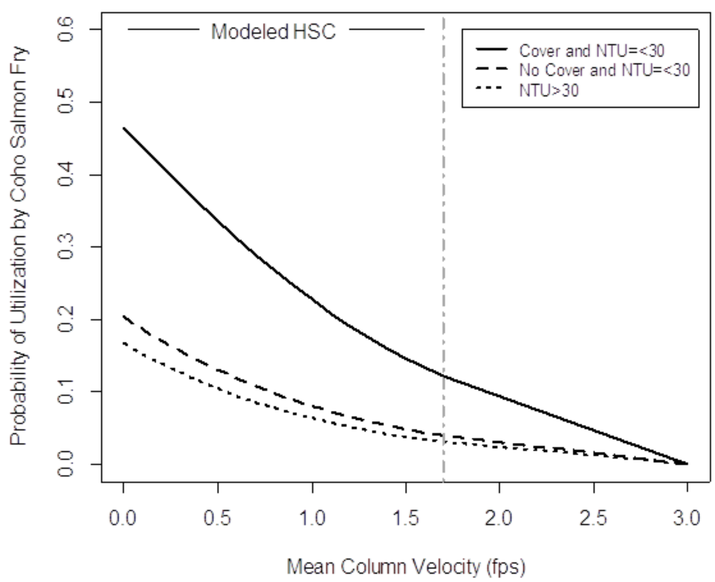

Figure 5.5-7. HSC model for coho salmon fry as a function of velocity for fixed depth of 1 foot for three different substrate/turbidity groups. (Source: SIR Study 8.5, Appendix D, Figure 5.6-9.)

Note: Estimated preference for velocity > 1.7 fps (last observed fish) is based on linear decline to 0 probability at threshold value of 3 fps.

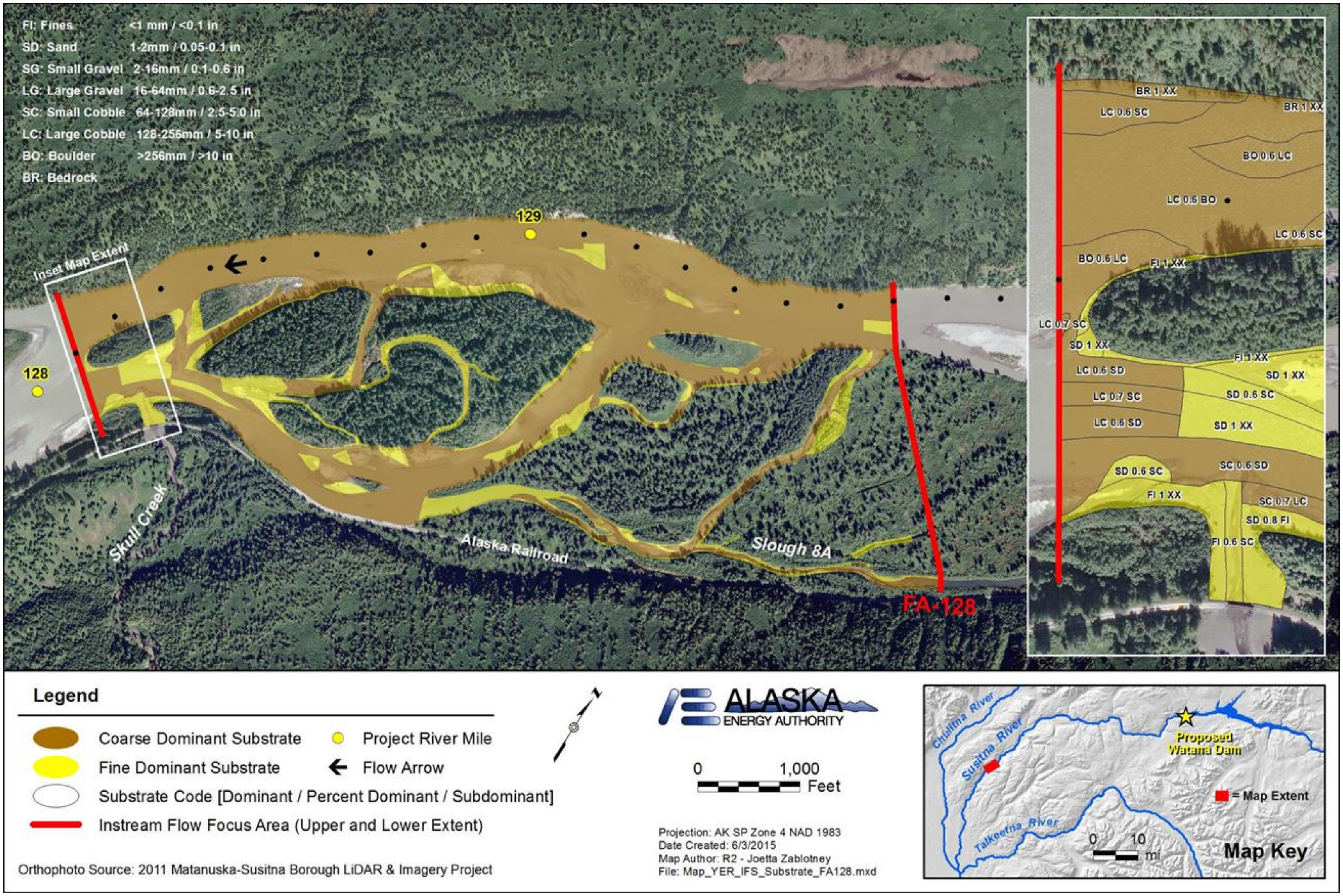

Figure 5.6-1. Substrate characterization mapping in FA-128 (Slough 8A) on September 21, 2013. For display purposes, the figure shows the distribution of coarse and fine substrate within the Focus Area; however, the dominant and subdominant particle size and the percent composition of each substrate polygon is used for habitat modeling purposes (see enlargement of the lower end of the Focus Area). (Source: SIR Study 8.5, Appendix E, Figure 5.)

Figure 5.6-2. Cover polygons in FA-128 (Slough 8A) mapped during September 2013 habitat surveys. (Source: SIR Study 8.5, Appendix E, Figure 13.)

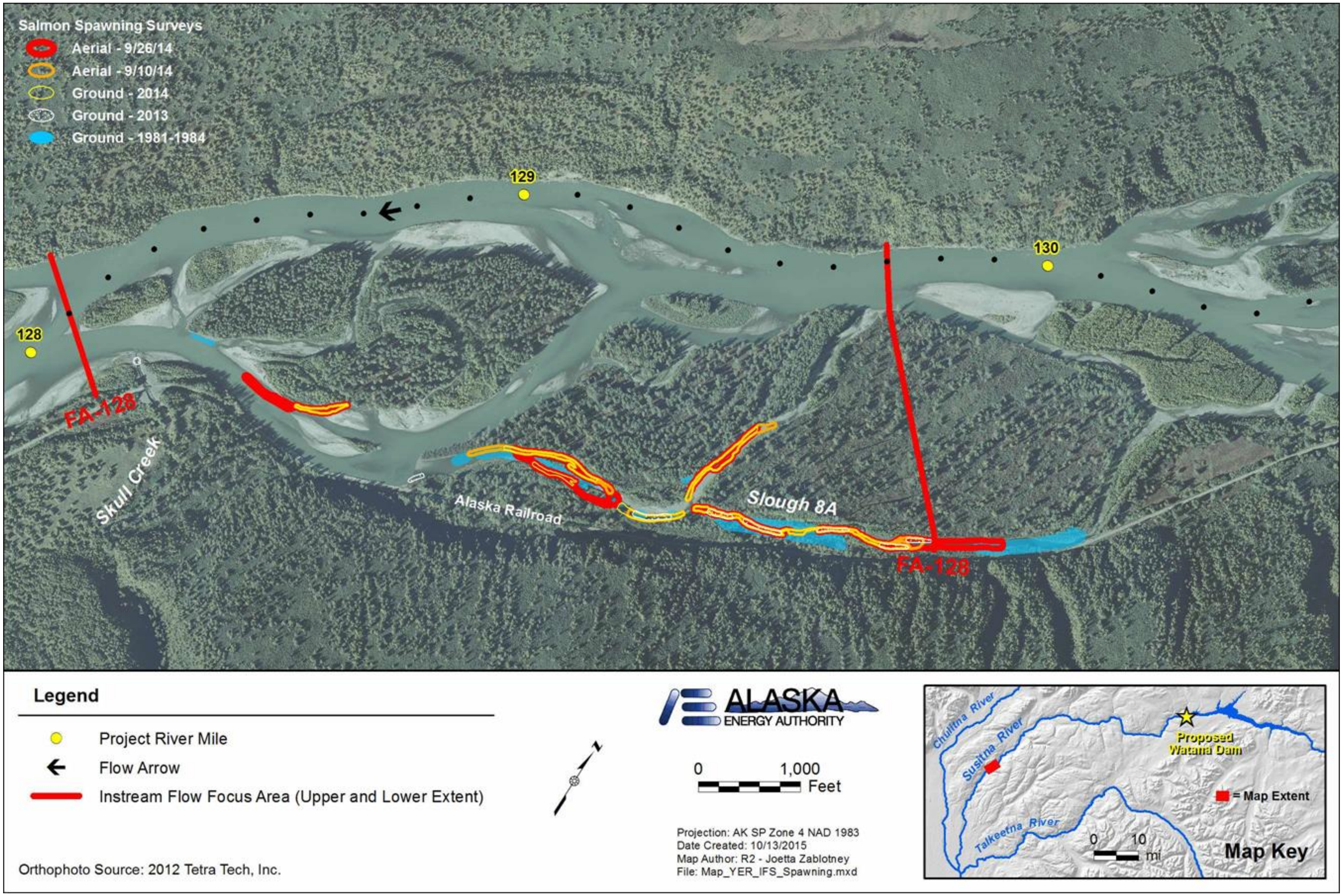

Figure 5.6-3. Salmon spawning areas mapped within FA-128 (Slough 8A) during 2013 and 2014 IFS aerial and ground spawning surveys and in association with 1981-1984 monitoring efforts in the Middle River Segment of the Susitna River. (Source: SIR Study 8.5, Appendix E, Figure 20.)

APPENDIX A: 2014 INSTREAM FLOW WINTER STUDIES

[See separate file for Appendix.]

APPENDIX B: OPEN-WATER HYDROLOGY DATA COLLECTION AND OPEN-WATER FLOW ROUTING MODEL (VERSION 2.8)

[See separate file for Appendix.]

APPENDIX C: 2014 MOVING BOAT ACOUSTIC DOPPLER CURRENT PROFILER (ADCP) MEASUREMENTS

[See separate file for Appendix.]

APPENDIX D: HABITAT SUITABILITY CRITERIA DEVELOPMENT

[See separate file for Appendix.]

APPENDIX E: FISH HABITAT MODELING DATA: SURFICIAL SUBSTRATE AND COVER CHARACTERIZATION AND SALMON SPAWNING OBSERVATIONS BY FOCUS AREA

[See separate file for Appendix.]