

## **Hydrographic Surveying in Support of Sediment Budget Analysis and Modeling in the Lower Kenai River, Alaska**

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The University is in the early phases of an extended effort to analyze and map sediment budget and transport in the lower Kenai River. (Merkel, et al in preparation) Sediment transport is being modeled with the computer modeling application DYNLET. A considerable amount of data is required to define the geometry and elevation of the flow channel for the model. This information is not readily available. Therefore, detailed hydrographic surveys are being conducted in the lower river.

Approximately twenty-two cross sections have been surveyed during this field season. They are located at major reach transitions. The first is at the mouth of the river. The final transect is located approximately 35 km up stream.

A Ross 950 single beam hydrographic survey system equipped with a 200 kHz transducer and a Trimble DSM 12/212 differential GPS receiver (DGPS) was used to conduct the transect surveys. Real time differential corrections were received from the Kenai (KEN 1) continuously observed reference station (CORS). The survey lines approached the riverbank to the maximum extent permitted by the equipment draft. Differential leveling from the water's edge to the high water line was then used to measure the remaining portion of the channel. A monument was placed at the high water line for future reference and surveys.

The elevations with respect to mean sea level of the cross sections were then determined by means of a static survey network using Trimble 4600 LS receivers. The survey data was post processed with the Trimble Geomatics Office application. Elevation calculations were based on the Alaska Geoid 99 model. The surveyed depth data was indexed to the high water elevation to determine the elevations across the riverbed.

This survey data along with level gauge records from the Nikiski tide station, and two additional gauges located at the Pillars Park and the Soldotna Bridge will be used to do an initial estimate of the tidal zoning for the lower river.

The second phase of the project will include measurements of tidal and river currents with an acoustic Doppler current profiler. (ADCP) The ADCP observations will be used to calibrate and validate the model. Contingent on funding, two level gauges will be installed in the lower river. The data from these gauges will be used to complete development of the tidal zoning. The final results of this study will be documented in a written report and a geospatial information system.

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