

A preliminary approach to community-based bathymetric surveys using affordable single-beam sonar in Chignik, AK

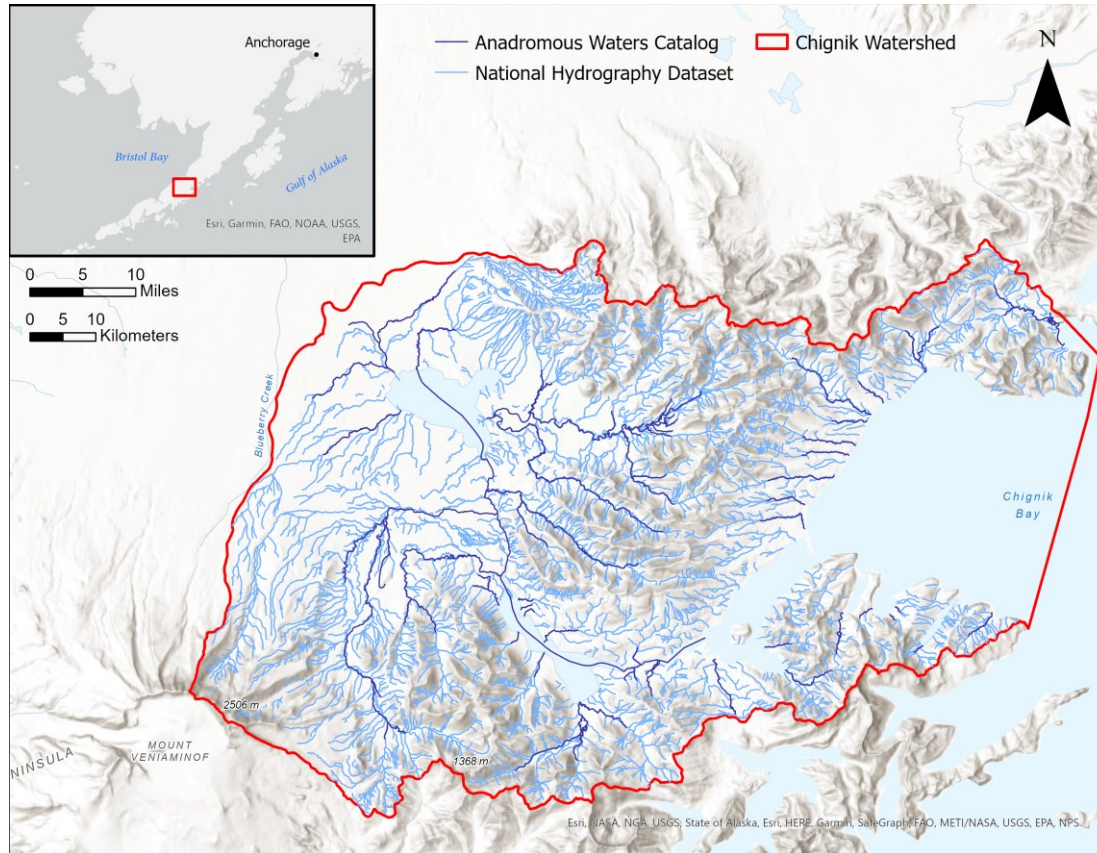
Mike Willis, Master's student

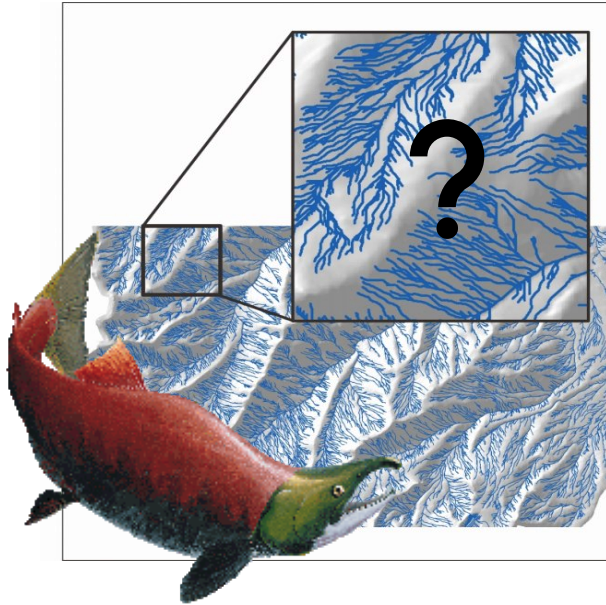
Committee Members: Matthew Balazs, Chris Maio

Project Partners: Jeanette Carlson, George Anderson, Tim Troll, Marcus Geist



Dynamic & Variable Salmon Meta-Ecosystem





Business/Economy

'No fish and no hope': Poor sockeye salmon run takes a toll on Chignik

Business/Economy

2020 salmon returns have been so poor that Alaska communities already are claiming fishery disaster

By Laine Welch | Fish Factor
Updated: August 11, 2020
Published: August 11, 2020



TV RADIO NEWS EDUCATION SUPPORT ABOUT DONOR PORTAL

Third year of abysmal salmon runs leaves Chignik looking for answers



By Sage Smiley, KDLG - Dillingham - August 5, 2020

TV RADIO NEWS EDUCATION SUPPORT ABOUT DONOR PORTAL

While Chignik fishermen wait on 2018 relief funds, some look beyond the fishery to survive

By Isabelle Ross, KDLG - Dillingham - February 15, 2022



Alaska Coastal Cooperative

Advancing resilience in
Indigenous Communities through
community driven science,
technology, and capacity building

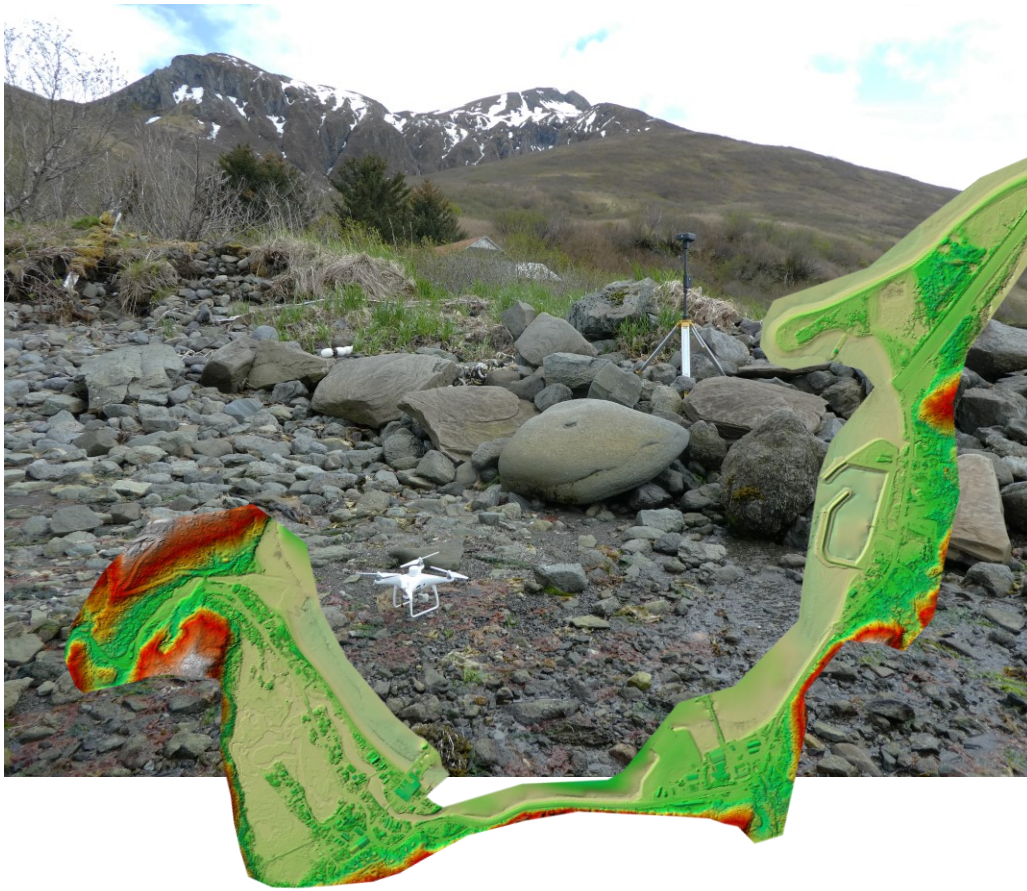


Mapping Initiatives



- ▶ **LiDAR survey**
High-resolution topographic data for DEM construction
- ▶ **Aerial surveys**
- ▶ **Hydrography**

Mapping Initiatives



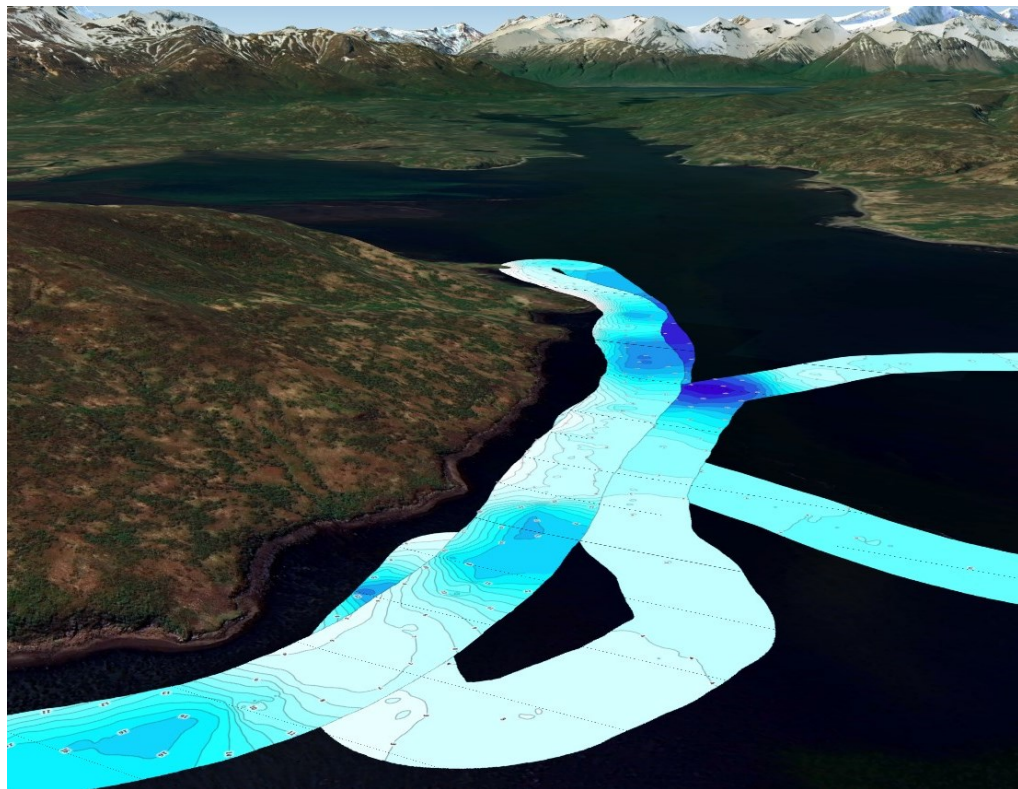
▶ LiDAR survey

▶ **Aerial surveys**

SfM-derived DSMs and orthos
using UAVs

▶ Hydrography

Mapping Initiatives



▶ LiDAR survey

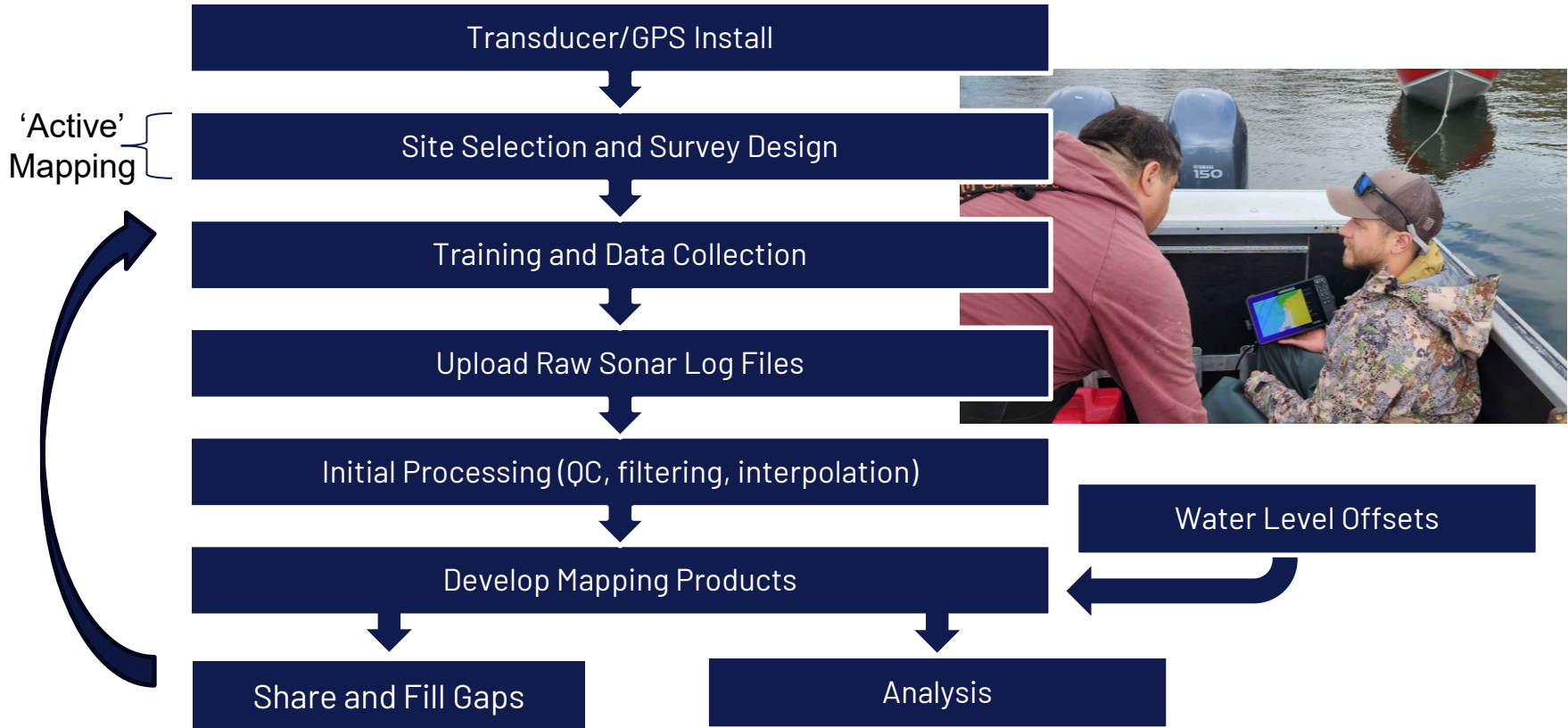
▶ Aerial surveys

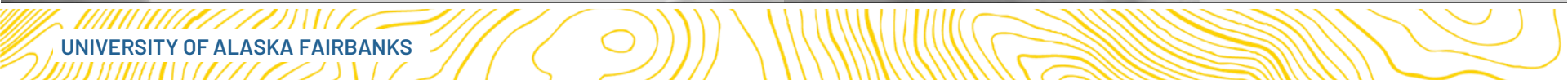
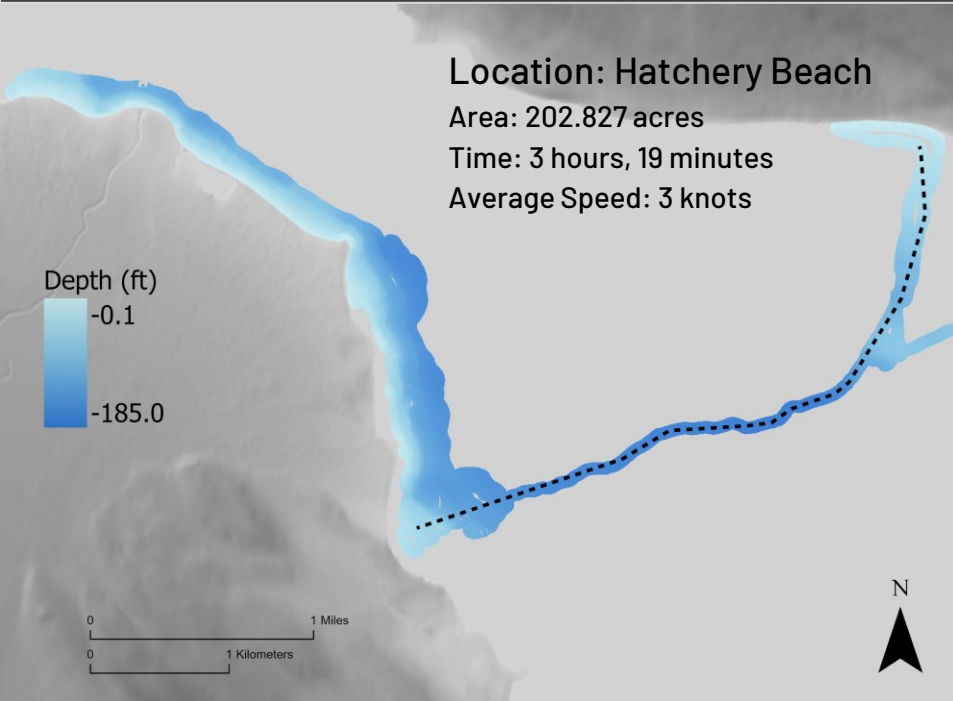
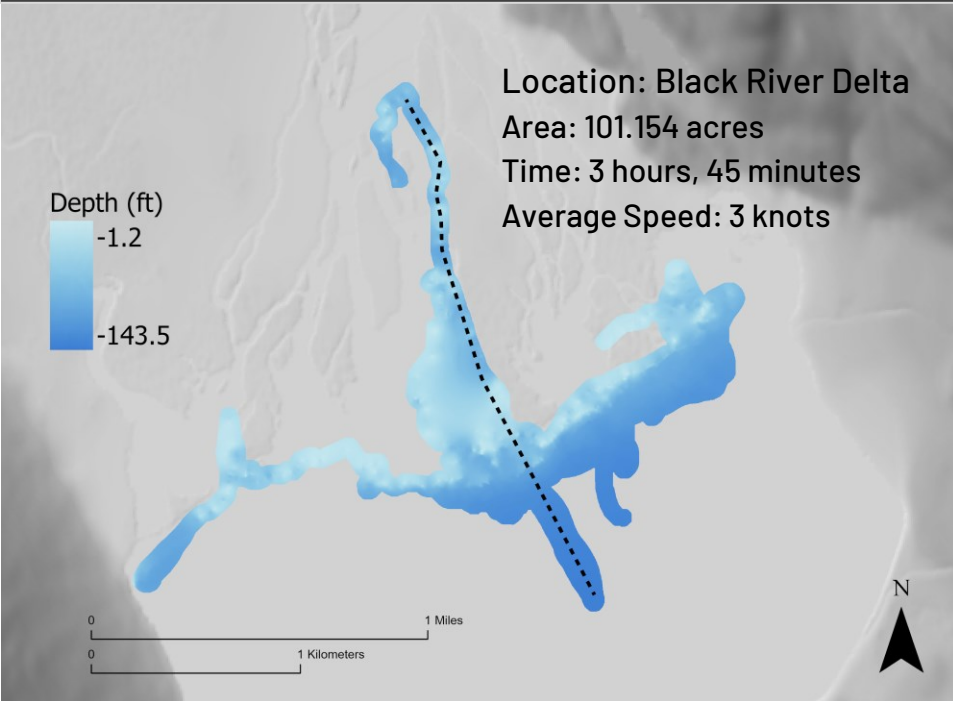
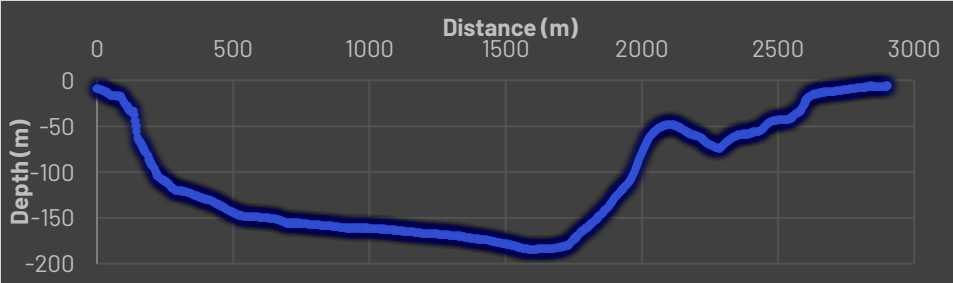
▶ **Hydrography**

Bathymetric surveys

Water level sensors and tide gages

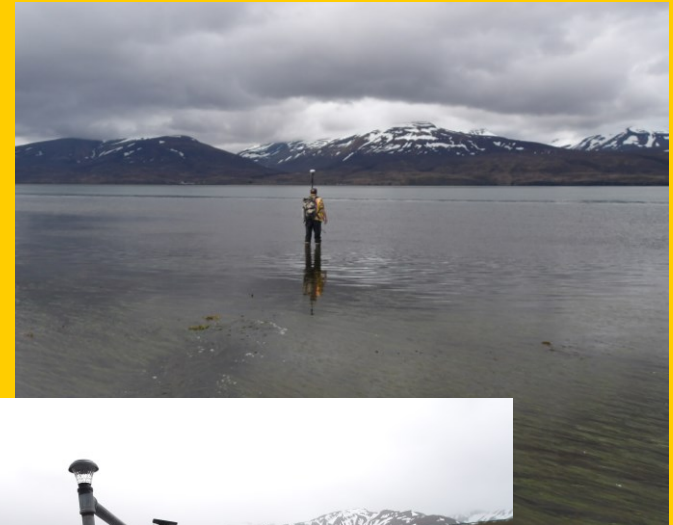
Idealized CBM Protocol for Bathymetric Surveys





Challenges and Lessons Learned

- Water level data and offsets
- Shallow, nearshore surveys
- Transducer installation and GPS alignment
- Communication



The screenshot shows the EcoBASE web application interface. The top navigation bar includes links for Dashboard, Trips & Merges, Social Map, Solutions, Support Resources, Plans, Hardware, Blog, and My Account. Below the navigation bar are three buttons: Web Upload, Desktop Upload Tool, and Plotters. The main content area displays a table of waterbody data under the 'EcoSound Trips (5)' tab. The table has columns for Waterbody, Last Upload, and # of Uploads. The data rows are as follows:

Waterbody	Last Upload	# of Uploads
Black Lake Lake and Peninsula Borough, Alaska	about 4 months ago	6
Chignik Lake Lake and Peninsula Borough, Alaska	about 4 months ago	14
Chignik River Lake and Peninsula Borough, Alaska	about 4 months ago	8

Next Steps and Future Work

Hydrographic Surveys

- Interpolation Methods
- Data Correction
- Accuracy Assessment
- Acquisition

Topobathymetry

- Fusing bathymetric data and elevation data from UAV and LiDAR surveys

Analyses

- Habitat Mapping
- Geomorphic Change Detection



Thank you!