

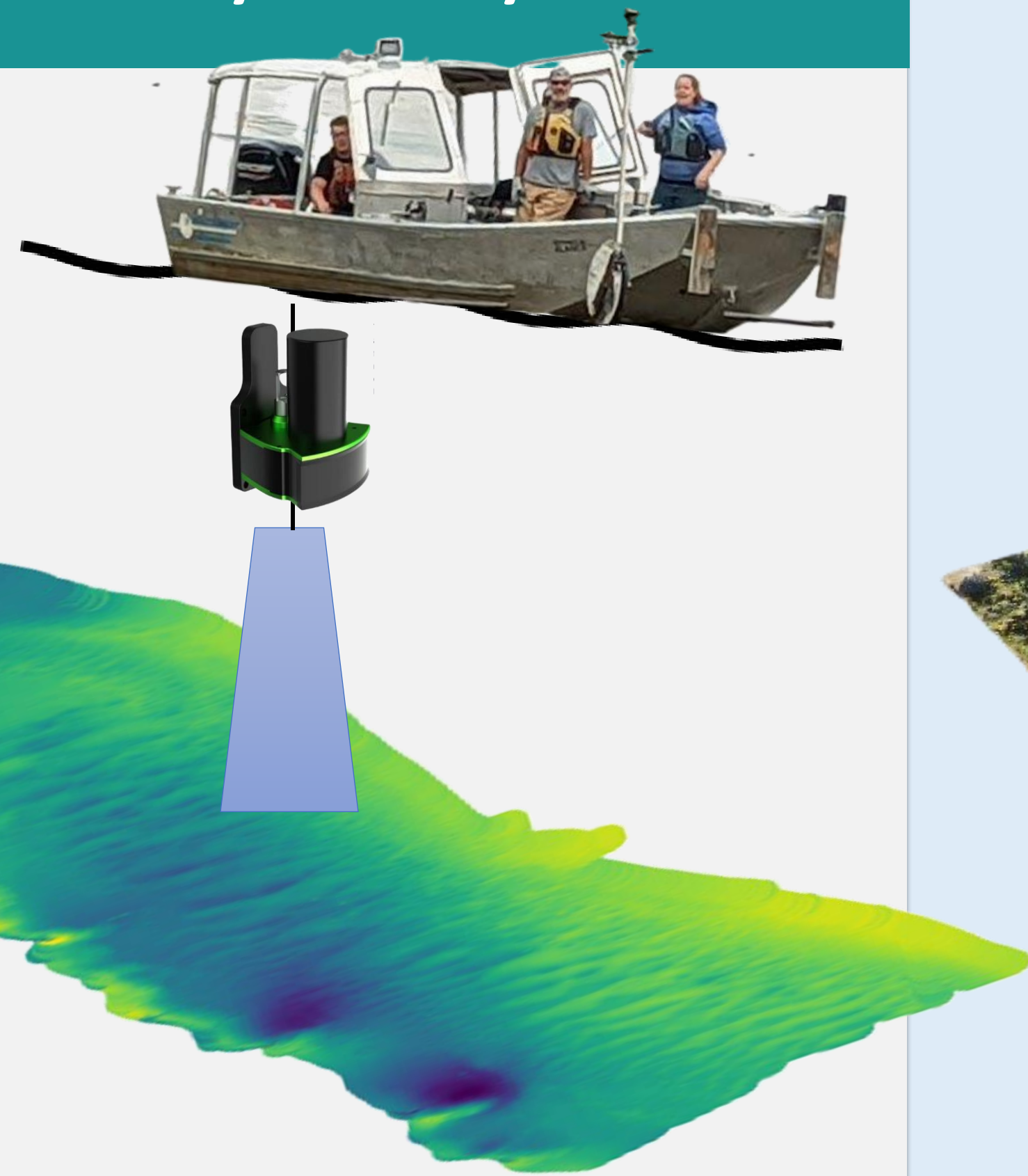
# Modeling the Fluid Dynamics for the Tanana River Test Site in Alaska: A Comparison of Simulated Data and Field Measurements

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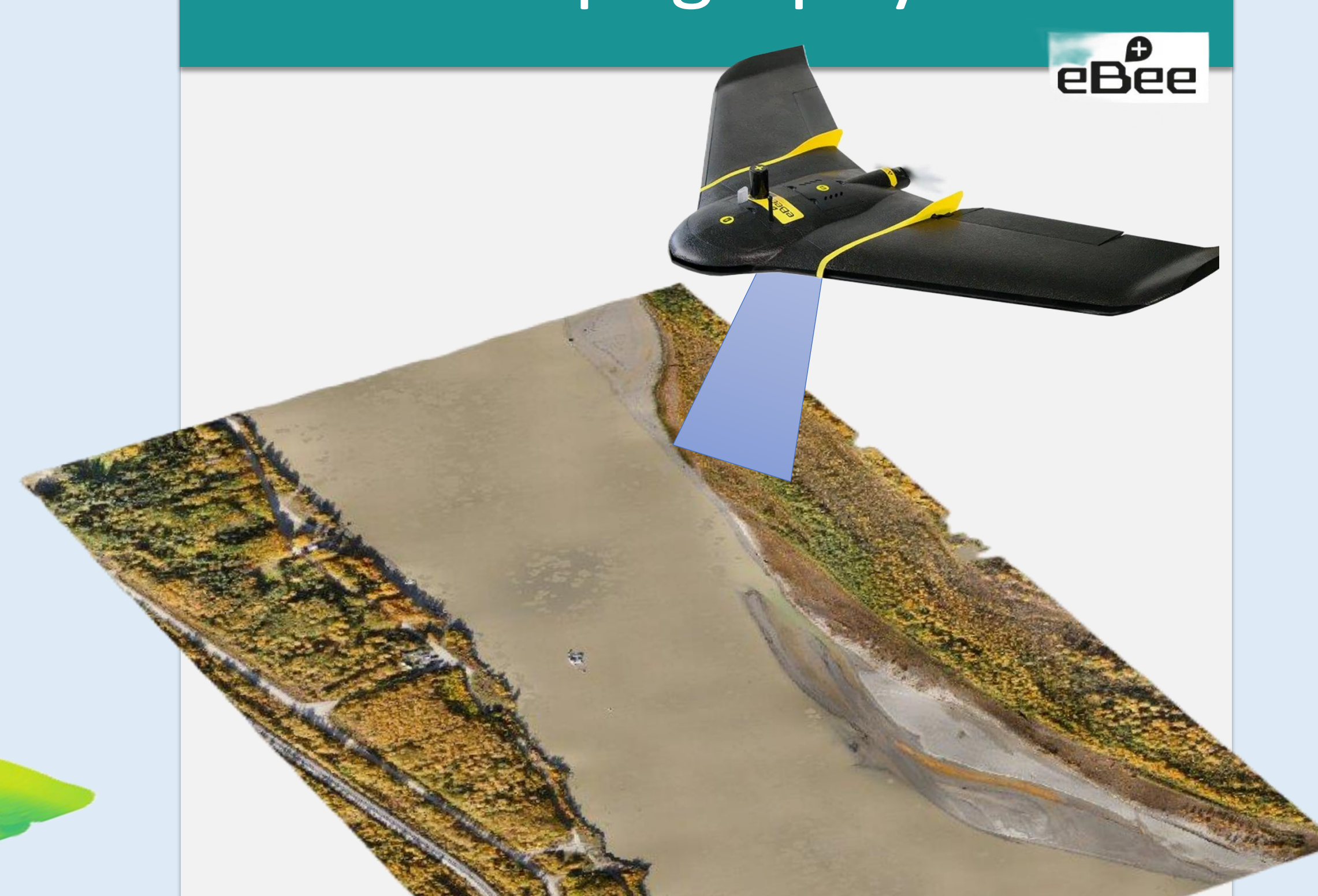
Simulating the impact of CECs in rivers with high seasonal variation requires the collection of topography and bathymetry.

## Bathymetry



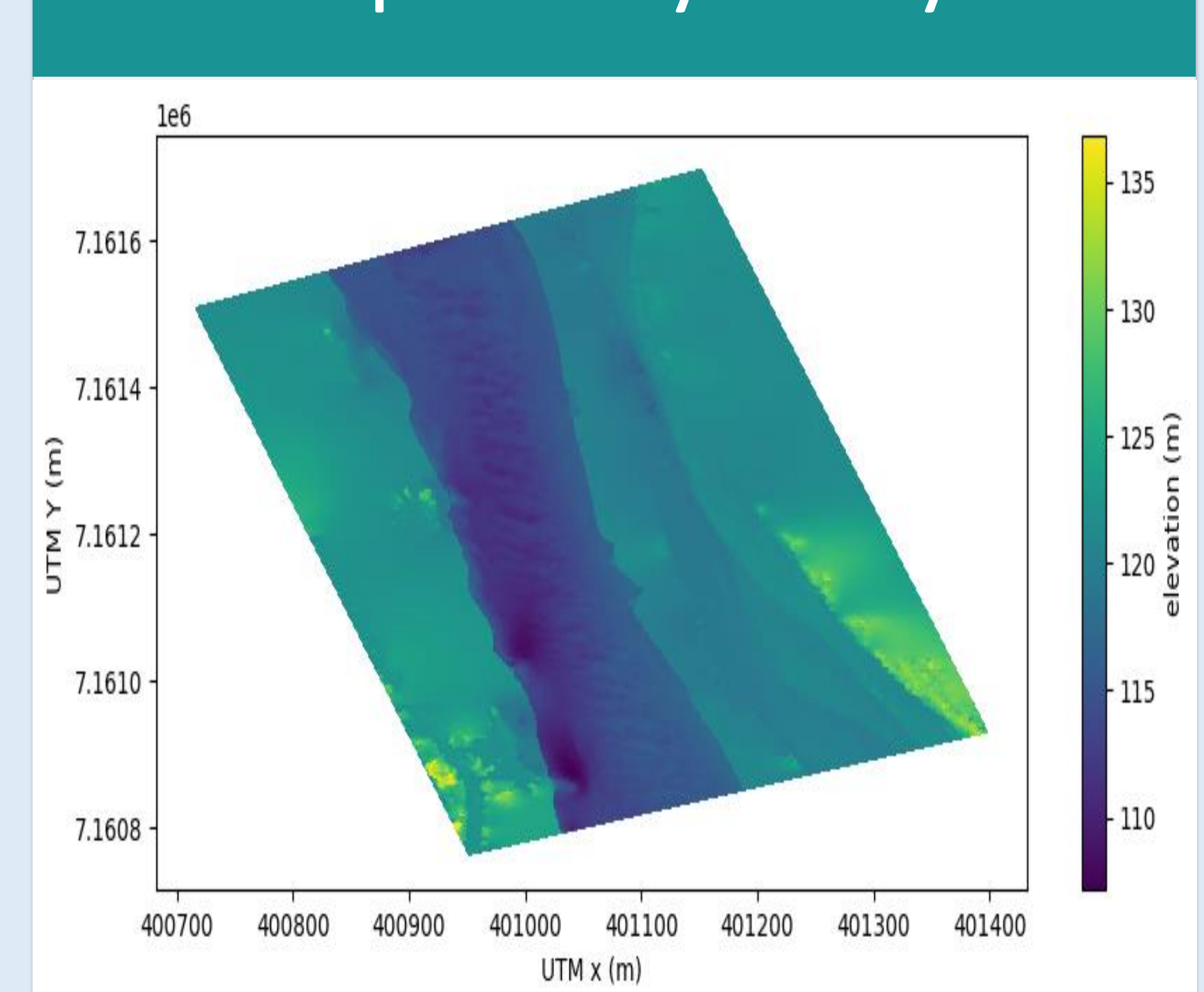
Bathymetric data was collected using a SeaRay multibeam echosounder. This device offers a portable, battery efficient, and robust solution for gathering depth data in remote river settings.

## Topography



The Tanana river has a high sediment concentration making sampling methods such as LIDAR impractical. The eBee X was equipped the S.O.D.A. 3D for Oblique RGB 3D mapping of the Tanana surrounding topography. The eBee x is a portable drone with up to 90 minutes of flight time allowing mapping of 500 hectares in a single flight.

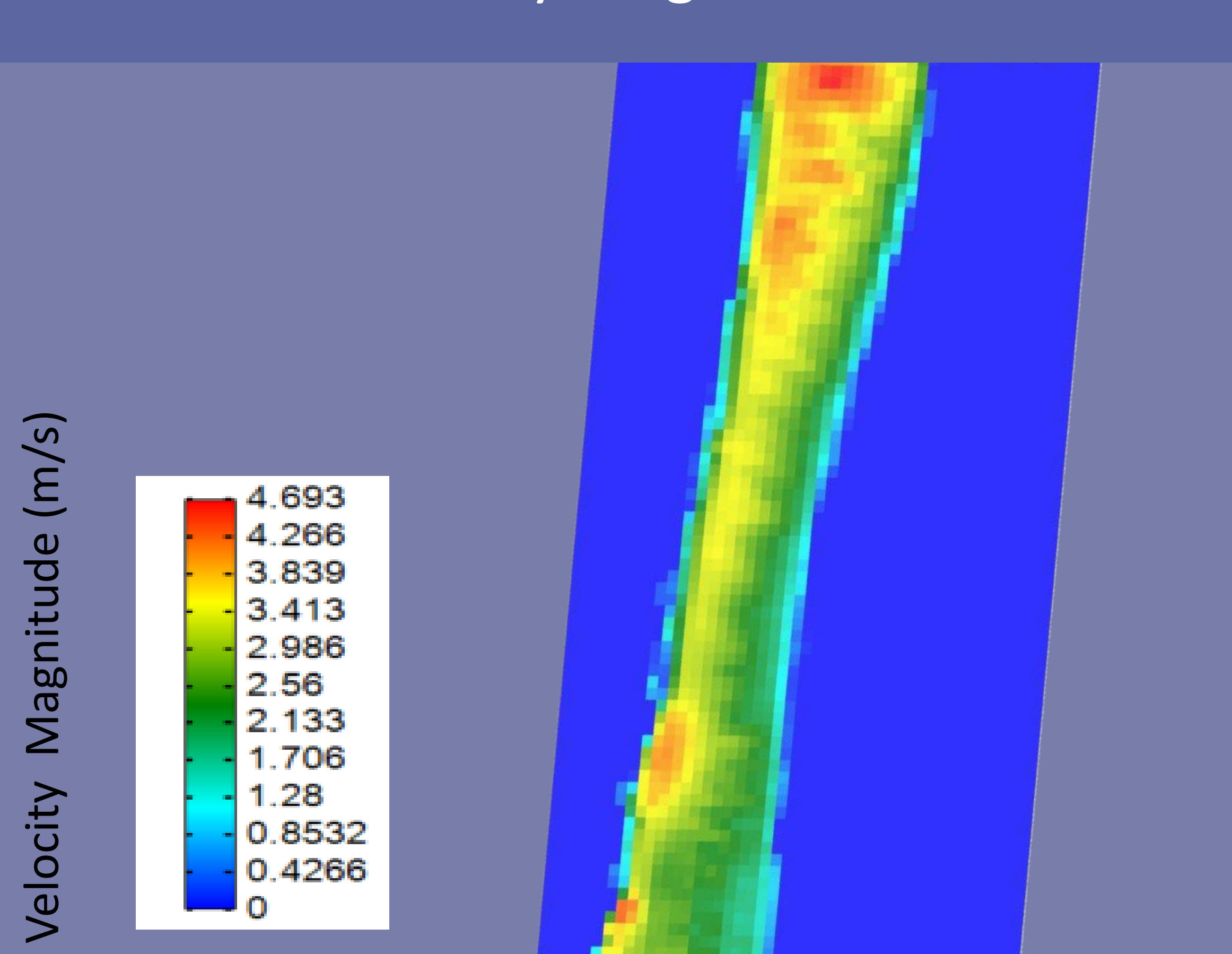
## Topobathymetry



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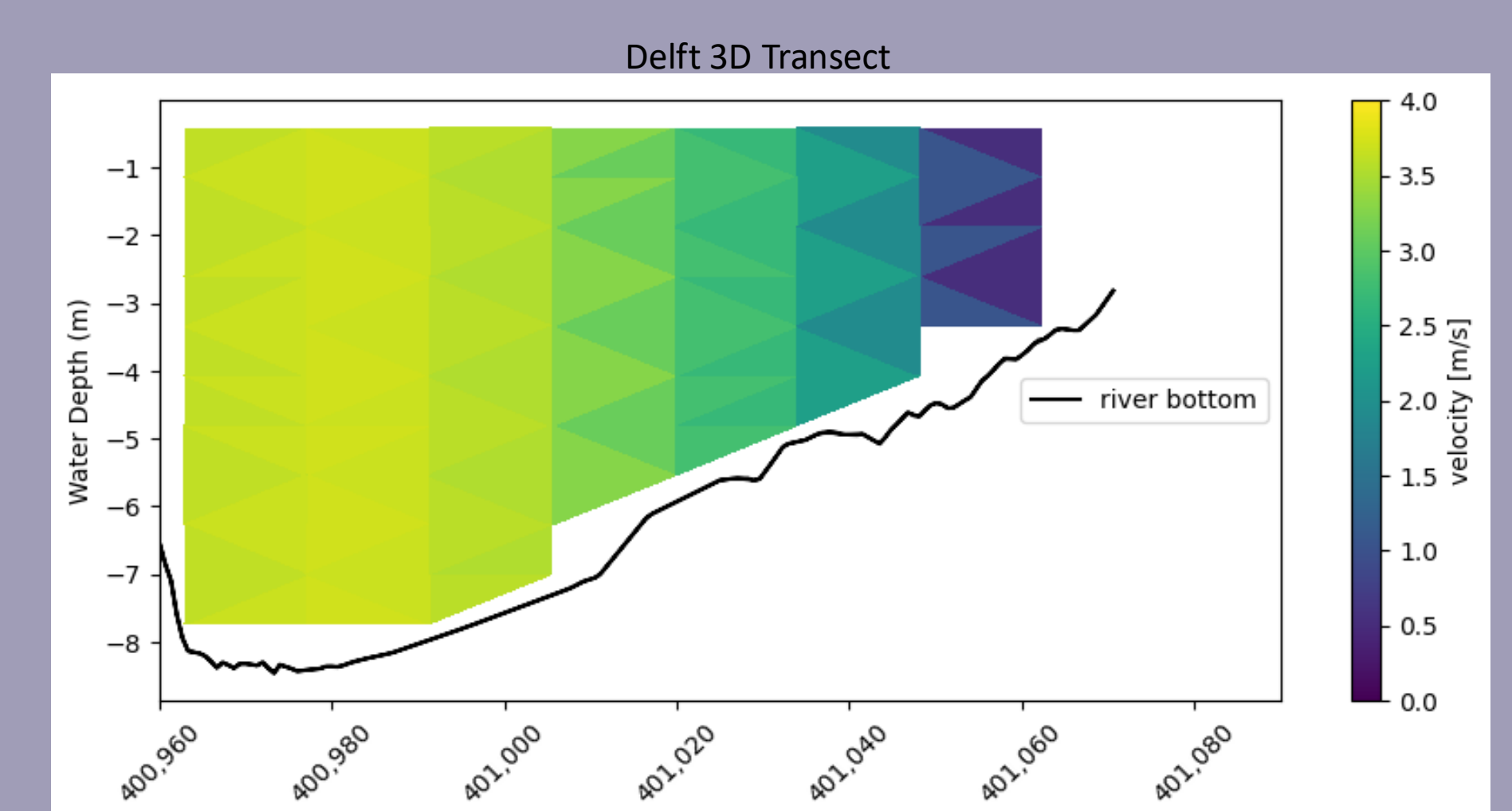
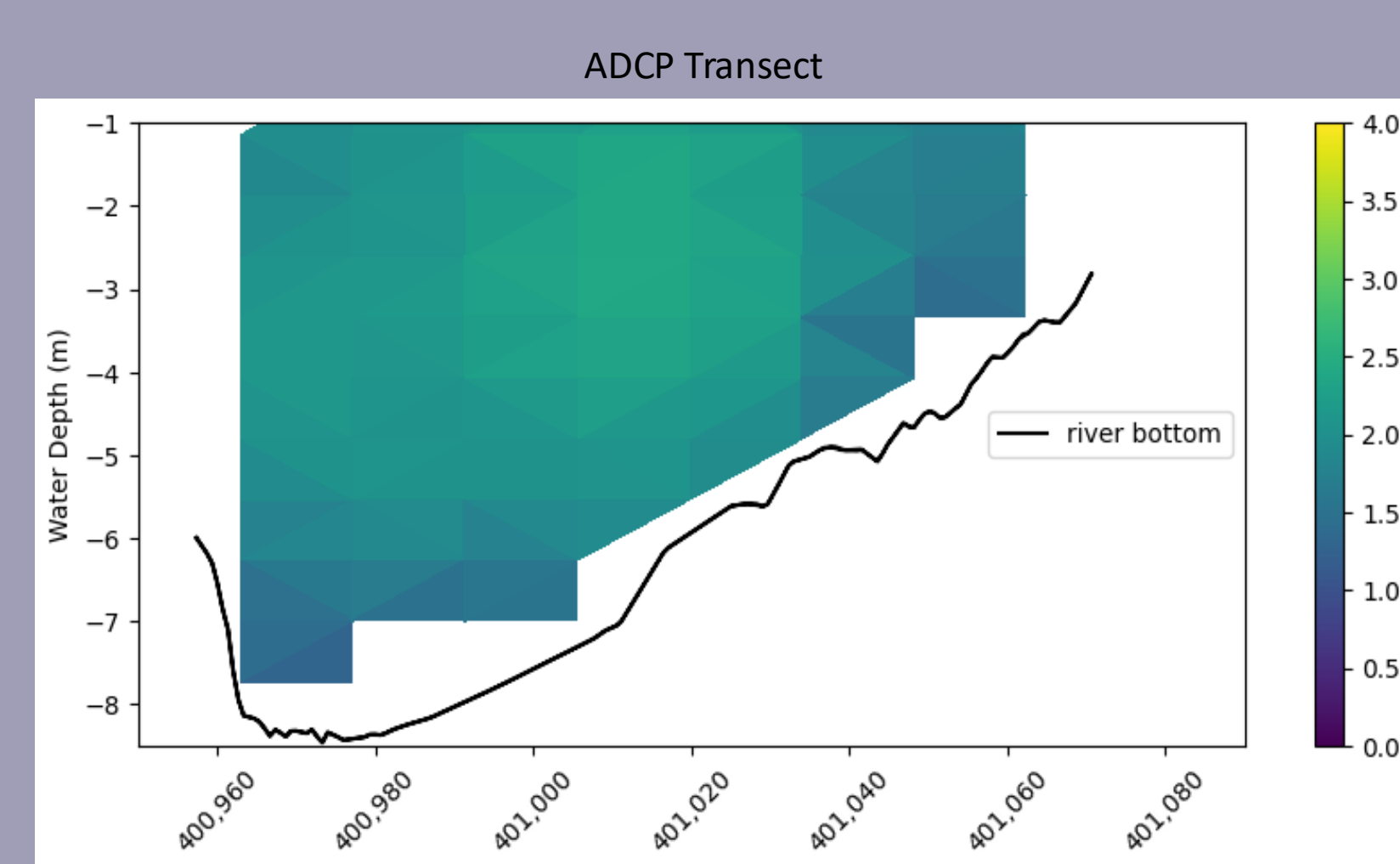
## Delft 3D Results

### Delft 3D Velocity Magnitude Contour



The river was simulated for a steady state discharge using a data point from the USGS monitoring station at Tanana matching the day field transect data was collected using ADCP. . On the left, preliminary results show an arial view of the velocity magnitude returned by the Delft3D simulation. High velocities at the exit show issues with the current modeling that require additional research to correct.

Once the simulation lacks noticeable issues near the boundary conditions, minor tuning of the simulation will occur to match the transect at the Tanana River Test site between the collected field data (below left) and the simulated river (below right). With this data matching future research will investigate the impacts of CECs on the river at multiple discharge levels.



## CONTACT

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