

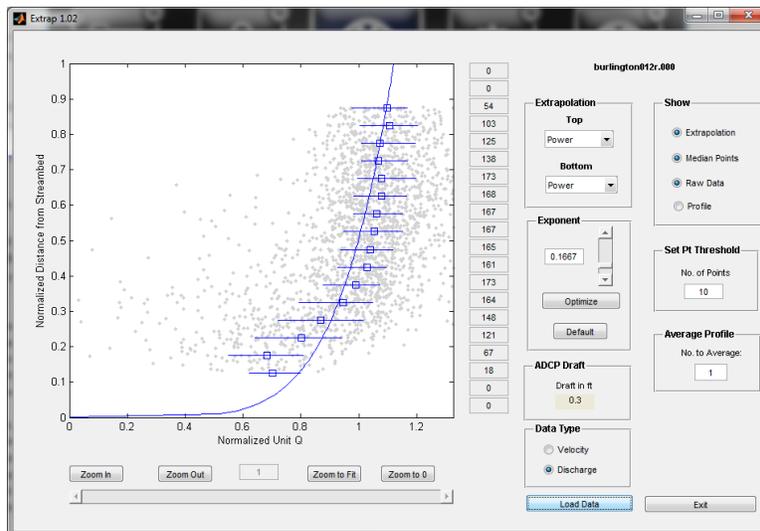
Hydroacoustics UPDATE:

Use of *extrap* for evaluating extrapolation methods for ADCP measurements

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What is *extrap* and Why use it?

extrap is a tool developed by the Office of Surface Water to assist in evaluating and selecting the appropriate top and bottom extrapolation methods for ADCP measurements.



Where can I obtain *extrap*?

The software and documentation may be downloaded from the USGS Hydroacoustics Web pages and the Hydroacoustics forum by going to

<http://hydroacoustics.usgs.gov/movingboat/extrap1.shtml>

What does *extrap* Do?

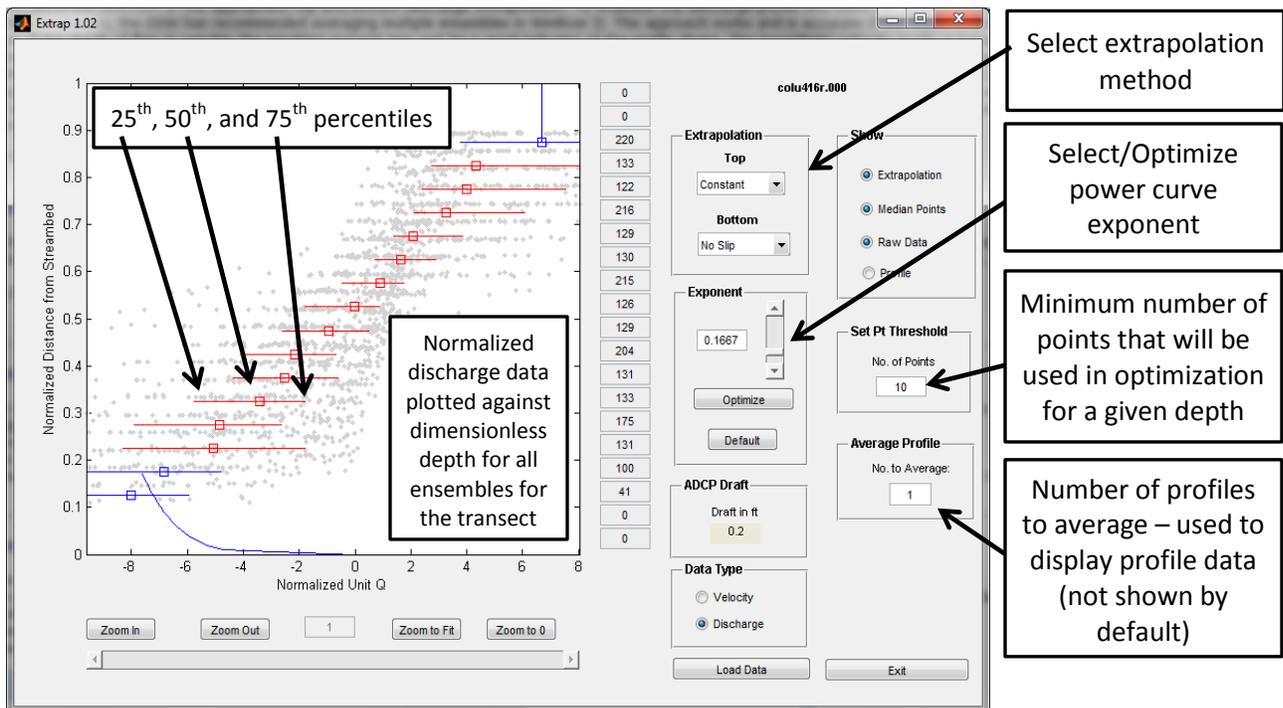
- Imports ADCP files from TRDI ADCPs and SonTek/YSI RiverSurveyors for analyzing extrapolation methods.
- Normalizes data for a given transect so that all ensembles can be plotted on one graph
- Provides an efficient, graphical method of viewing raw data (central tendency and scatter), as well as overlaying plots of the various extrapolation methods

How should *extrap* be used?

- Analyze enough transects for each discharge measurement to determine a trend, but always at least 1 pair of transects. Although two transects are often enough, users may need analyze more until they gain enough experience.
- The extrapolation method that best fits the data for all transects should be selected taking into account factors, such as wind conditions, channel roughness, presence of bi-directional flow, etc. Only measurements of rapidly-varying flows (e.g. tidal flows) may justify changing the extrapolation within the measurement.
- Always consider the random noise (instrument noise and effects of turbulence) found in the raw data. Use the 'whiskers' (extent of 25th and 75th percentiles) to help guide your selection.
- Don't over-analyze extrapolation techniques when the final discharges may not be affected. *extrap* should save you time in evaluating appropriate extrapolation methods rather than increasing the time spent reviewing measurements. When the changes are small (<1%) it is likely that the default extrapolation method (1/6th power law) should be used.
- Use of *extrap* is encouraged for all users, but is more necessary when using RiverSurveyor Live software as there is no functionality in that software for averaging data together.
- Do NOT just select Optimize and use optimized values for individual transects. An average value should be used for all transects.
- *extrap* does NOT interact directly with ADCP software. If the 1/6th power law is not used, users must manually select the appropriate extrapolation changes in WinRiver II or RiverSurveyor Live.

If you have any questions, please contact Dave Mueller (dmueller@usgs.gov) or (502) 493-1935) or email the USGS Hydroacoustics Work Group, hawg@simon.er.usgs.gov.

Sample *extrap* analysis for a transect with bi-directional flow



Documentation is available at <http://hydroacoustics.usgs.gov/movingboat/extrap.pdf>