Computing Discharge Using the Index Velocity Method

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Agenda

- Introduction – the index-velocity method
- The gage at SH 35 and a look at the data
- Standard ratings vs. index-velocity ratings
- Rating development at SH 35
Index-Velocity Method

The index velocity method is used to compute discharge based on stream velocity and cross sectional area.

The index velocity method may be used to determine discharge for streams with:

- Variable backwater
- Tidal influence
- Seasonal variation in vegetation or algae
08188810 Guadalupe River at SH 35 near Tivoli, TX
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- Acoustic velocimeter (AVM) installed April 2013
- 8 streamflow measurements made, 24.6 – 3,100 cfs
Streamflow measurements made at Guadalupe River at SH 35 near Tivoli, TX
Streamflows are affected by regulation and diversion... ... and tides
Stream stage and velocity data for Guadalupe River at SH 35 near Tivoli, TX
The index velocity method is especially appropriate when more than one discharge can be measured for a given stage.

- **Standard Rating**
- **“Not-so-Standard” Rating**

![Graphs showing stage vs. discharge for Standard and “Not-so-Standard” ratings.](image-url)
Computing discharge using the index velocity method differs from the traditional stage-discharge method by separating velocity and area into two ratings—the index velocity rating and the stage-area rating.
The outputs from each of these ratings, mean channel velocity (V) and cross-sectional area (A), are then multiplied together to compute discharge.

\[ Q = V \times A \]
Standards and guidance

*Computing Discharge Using the Index Velocity Method, Techniques and Methods 3–A23*
Stage-area ratings, 10 and 35 ft upstream from SH 35
Index-Velocity Relation at SH 35

- Velocity at index section, ft/s
- Velocity at AVM, ft/s

Graph showing the relation between velocity at index section and velocity at AVM.
We are currently investigating index-velocity relations for various cell ranges between 0 and 35 feet from the AVM.
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Questions?