

Index-velocity Quick Sheet

Site Selection and Reconnaissance Tips

The best sites are well-mixed flows with uniform horizontal and vertical flow distributions. Stratified (layered), unmixed flows can cause ray bending and unstable vertical velocity profiles, and that might result in unstable index-velocity ratings.

Select a site so that the index-velocity instrument is sampling velocities away from the stream edges and in a region of maximum velocity (V_{\max}).

- The region of V_{\max} can be located using reconnaissance velocity measurements
- Channel sides have little influence on stream interior for channel widths 5 to 10 times the depth

Research historic stage range and flow range if data exists. You will want to mount the index velocity instrument in an appropriate location.

Determine the channel bed type. Bedrock or concrete is best, while sand or silt may be ok, but may shift around. Changes in channel geometry can change the stage-area rating and index-velocity relation.

Look for obstructions where your index-velocity instrument will be sampling. Look upstream and downstream for possible sources of flow disturbance.

Assess potential for aquatic vegetative growth and look for areas clear of aquatic vegetation. Aquatic vegetation will block acoustic signals.

Don't be close to the upstream or downstream side of a dam or lock. Gate setting changes can change flow patterns wreaking havoc with your index-velocity ratings. Excessive turbulence and or entrained air below a dam can also be trouble. Use an ADCP to determine where gate changes no longer have a significant effect on the horizontal flow distribution.

Other considerations: mounting the instrument, power considerations, protection from vandals, telemetry (i.e. for GOES, a clear shot to the satellite).

Useful Reconnaissance tools:

- ADCPs: to obtain flow patterns, vertical and horizontal velocity profiles
- Temperature probes: look for sudden changes in temperature that could indicate stratified flow
- Temporarily mounted ADVMs or profilers: log data for a month or more to analyze flow characteristics
- Aerial photographs, digital terrain and quad maps