

Surface image velocimetry – Data collection from drones and helicopters – Field Checklist

Site Selection:

- Straight channel (if possible).
- Suitable surface tracers & lighting.
- Static points at water's edge on banks and mid-channel for wide channels recorded in sections (Figure 1).
- No significant sources of upstream turbulence (i.e., bridge piers).
- Access to safely measure water level, static points, and cross section (now or after the flood event).

Camera Selection:

- Resolution at least 1080p, or 4K.
- Framerate of >24 FPS.
- Rectilinear lens (i.e., not fisheye).

Suitable: Cell phones, drones & most digital cameras

Drone flights:

- Drone flights conform to CAA regulations.
- Weather conditions are suitable for drone and camera hardware.
- Pre-flight checks and safe to fly.

Recording videos:

- Camera down looking. Closest to 90° (i.e., nadir) is best.
- Handheld camera 'locked' to same viewpoint for helicopter.
- Recording platform is stable (i.e., not moving XYZ, or rotating).
- Videos recorded for 60 seconds.
- Static/survey points are visible.

Imagery rectification & other info:

- Create or identify all survey points before video (water level, scaling points, cross section LB/RB, GCPs).
- Oblique imagery requires 4x GCPs at water level, or 6+ on channel banks).
- Take still photos from video location and at LB/RB water's edge* of cross section (if wide river).
- Measure survey points (now or after).
 - Scaling points (tape measure, survey, or drone GPS at water's edge*).
 - Oblique – 4x GCPs requires survey in XY, 6+ GCPs require surveying in XYZ.

**With a drone, hover at low altitude, with a down looking camera, and LB/RB water's edge in image center. GPS data is stored in the images.*

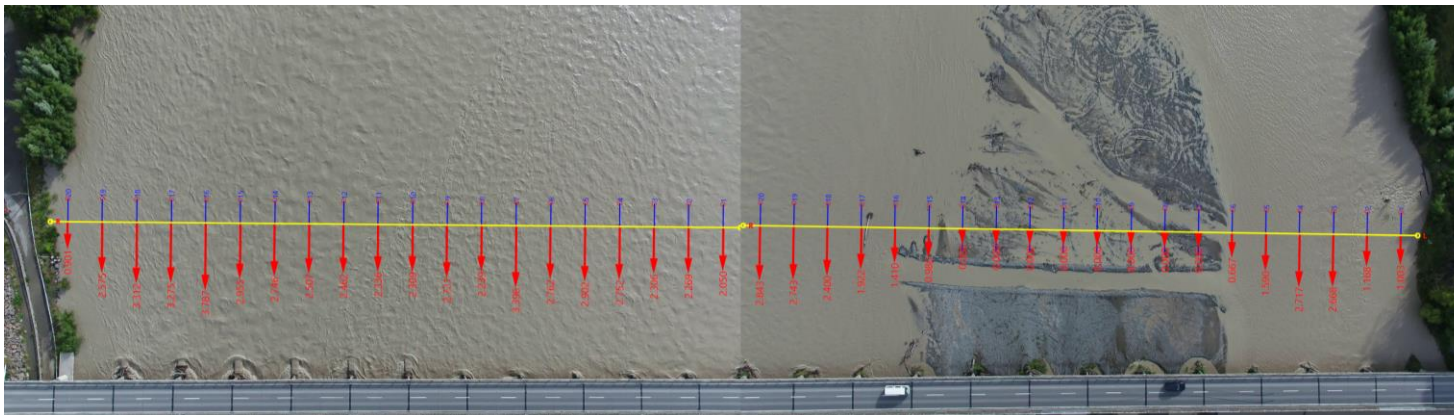


Figure 1: Surface image velocimetry in the Waimakariri River. Measurements are upstream from the bridge to avoid bridge pier wakes. Wide channel, with two videos captured and static reference points visible.

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