

ADCP-BASED RIVER DISCHARGE MEASUREMENT

HydroFlow 600 & HydroFlow 1200 with USV-enabled survey workflows

APPLICATION NOTE | IRRIGATION & WATER RESOURCES MANAGEMENT

Reliable flow data for river monitoring, dam-release assessment and irrigation planning.



HydroFlow ADCP product image supplied in Ecoleap's product asset library.

600 kHz	1200 kHz	USV-READY WORKFLOW
Longer-range profiling for suitable sites	Higher-frequency profiling for shallower sections	Remote cross-section surveys with compatible platforms

Prepared by Ecoleap Solutions LLP — Your Technology Partner for Advanced Hydrographic and Water Measurement Solutions.

1. The operational need

Irrigation and water-resources teams rely on dependable discharge data to understand how much water is moving through rivers and channels. Discharge measurements support water-availability assessments, dam-release checks, seasonal monitoring, flood studies and engineering decisions. An Acoustic Doppler Current Profiler (ADCP) measures water-velocity profiles and supporting depth/position information so discharge can be estimated across a measured section.

Discharge is the volume of water passing a cross-section per unit time. ADCP software estimates discharge from measured velocity profiles and section data.

2. Priority applications

River discharge surveys	Measure discharge at selected river cross-sections to assess flow conditions and compare measurements over time.
Dam and barrage release assessment	Measure downstream flow and compare with planned releases, accounting for travel time, tributaries and intervening diversions.
Canal-flow assessment	Investigate flow distribution in suitable canals or channels where depth, geometry and flow conditions match the instrument and method.
Flood-flow studies	Collect measurements under safe, suitable conditions to support hydrological analysis and flood-model calibration.
Seasonal monitoring	Build repeat survey records that help engineers study changes in flow across seasons and operating conditions.

What the department receives

Flow evidence	Field efficiency	Digital records
Discharge estimates and velocity profiles to inform operational decisions.	A suitable USV can reduce the need to put personnel on the water and may simplify deployment at accessible sites.	Survey files and reports for comparison, documentation and future analysis.

3. Model selection guide

Select the ADCP against the site's depth, expected profiling range, flow conditions and required measurement method. Higher frequency generally suits shorter-range/shallow applications; lower frequency generally supports longer profiling range, subject to conditions.

Parameter	HydroFlow 600	HydroFlow 1200
System frequency	600 kHz	1200 kHz
Published profiling range*	0.4–80 m	0.15–35 m
Typical application fit	Longer-range profiling where suitable	Shallower / shorter-range sections
Key selection check	Depth, acoustic range and site conditions	Shallow-water suitability and range needs

*Range figures shown from the HydroFlow 600/1200 product brochure. Actual usable range depends on site and acoustic conditions; confirm current specifications with SatLab before tender submission.

4. USV-enabled survey workflow

01 Site assessment	Choose a suitable cross-section; assess depth, bed conditions, current, access and recovery plan.
02 Configure	Mount the ADCP downward-facing and verify immersion, positioning, communications and data logging.
03 Run transects	Navigate across the section while collecting velocity profiles and supporting position/boat-motion data.
04 Quality control	Repeat transects as required; check consistency and evaluate moving-bed and other measurement effects.
05 Report	Deliver discharge estimates, velocity profiles, survey conditions and quality notes.

PROPOSED PILOT PROJECT	Demonstrate the selected HydroFlow ADCP on a compatible USV at one representative river section. Repeat measurements under suitable conditions, compare with an accepted reference method where feasible, and submit a technical report before recommending wider deployment.
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Important deployment note

A USV can improve access and reduce personnel exposure, but it does not guarantee measurement accuracy or continuous monitoring by itself. Site conditions, suitable positioning, transect procedures, quality control, and safe operating limits remain essential. Fixed real-time monitoring may require additional instrumentation and telemetry.

References: SatLab HydroFlow ADCP product page and HydroFlow 600/1200 product brochure. Product page: <https://www.satlabgeo.com/in/product/hydroflow/> | Brochure: <https://www.satlabgeo.com/wp-content/uploads/2025/04/HydroFlow-Brochure-EN-20250422s.pdf>

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