



## **Measurement of Flow Discharge in the Downstream of the Zengwen Reservoir in Taiwan**

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Water resource is a very precious natural resource, so how to effectively use and manage water resources is a very important issue. For example, the Zengwen reservoir is the largest storage capacity reservoir in Taiwan which combines the operation with its downstream Wushantou reservoir. The released water from the Zengwen reservoir for generation of electricity is used not only to supply for the Wushantou hydroelectric power station but also to offer the use of agriculture irrigation to the Chianan Plain. However, the water transported by natural channel between two reservoirs that might induce conveyance loss. The variation of flow discharge could affect the stability of electricity generation and agriculture irrigation sources.

To understand the variation of flow discharge at river channel, this study had conducted the measurements of flow discharges in the five cross-sections of the river reach (about 4.4 km long) between the outlet of Zengwen reservoir and the Donkou weir of Wu-Shan-Ling tunnel close to the Wushantou reservoir. These five cross-sections have 10 to 92 m wide, and named as P1 to P5 from the upstream to the downstream of the river reach. The flow discharge in the concerned river can be controlled by the Zengwen hydroelectric power station. The flow velocity profile in each cross sections were measured by using an acoustic doppler current profiler (ADCP). All measurements of flow discharges were conducted in sunny days, the lateral overland land flow from the riversides was ignored.

The flow discharge measurements from these five cross sections were compared and analyzed so as to evaluate the possible riverbed leakage. The measured upper-layer velocity was also compared with its corresponding depth-average flow velocity, so as to discuss the characteristics of velocity distribution and the upper-layer and average velocity ratio at each measured cross sections.