



Development of Topological Correction Algorithms for ADCP Multibeam Bathymetry Measurements

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Acoustic Doppler Current Profilers (ADCPs) are increasingly popular in the river research and management communities being primarily used for estimation of stream flows. ADCPs capabilities, however, entail additional features that are not fully explored, such as morphologic representation of river or reservoir bed based upon multi-beam depth measurements. In addition to flow velocity, ADCP measurements include river bathymetry information through the depth measurements acquired in individual 4 or 5 beams with a given oblique angle. Such sounding capability indicates that multi-beam ADCPs can be utilized as an efficient depth-sounder to be more capable than the conventional single-beam eco-sounders. The paper introduces the post-processing algorithms required to deal with raw ADCP bathymetry measurements including the following aspects: a) correcting the individual beam depths for tilt (pitch and roll); b) filtering outliers using SMART filters; d) transforming the corrected depths into geographical coordinates by UTM conversion; and, e) tag the beam detecting locations with the concurrent GPS information; f) spatial representation in a GIS package. The developed algorithms are applied for the ADCP bathymetric dataset acquired from Han-Cheon in Juju Island to validate their applicability.