

A method for automatic water body detection and estimation the water levels in small reservoirs from SAR images

Yoon-Kyung Lee (1), Boram Lee (1), Sang-Wan Kim (1)

¹ Sejong Univ., 209, Neungdong-ro, Gwangjin-gu, Seoul, Republic of Korea

Email: ykeunicelee@sju.ac.kr; brlee@sju.ac.kr; swkim@sejong.edu

Abstract: Recent research indicated that river basins that are impacted by dams or by extensive development will experience greater changes in discharge and water stress than unimpacted, free-flowing rivers within 50 years (Palmer et al., 2008). Once waver volume is determined and combined with precipitation, evaporation and inflow, the water balance of lakes and reservoirs can be used to estimate outflow (Duan and Bastiaanssen, 2013). However, the large uncertainties of projected precipitation changes make the responsible agencies difficult for water management such as water allocation and water release strategies. Therefore, accurate measuring of water storage and monitoring its variations in lakes and reservoirs are essential for equitable water allocation to water management, ecosystem services and for a better understanding of the climate changing impacts (Birkett, 1995; Crétaus & Birkett, 2006; Crétaux et al., 2011). The main objective of this paper is to apply the automated algorithm for water surface mapping and apply more accurate dynamics of water levels using only X-band SAR data in a dam and small reservoirs with a steep slope where water level changes do not appear as horizontal changes and with a gentle slope where detailed DEM does not exist.

Keywords: water body detection, water level estimation, SAR, reservoirs