



Using Satellite Altimetry Data to Augment Flow Estimation Techniques on the Mekong River

Philip Moore, Steven Birkinshaw, Christopher Kilsby, Greg O'Donnell, and Meredith Williams

Civil Engineering and Geosciences, Newcastle University, Newcastle, United Kingdom (philip.moore@ncl.ac.uk)

Satellite altimetry has the capability to provide measures of river stage (or level) from space. By utilising retracking schemes designed for inland waters, meaningful river stages can be recovered when standard techniques fail. Utilising retracked waveforms from ERS-2 and ENVISAT along the Mekong comparisons against observed stage measurements show that the altimetric measurements have a Root Mean Square Error accuracy of 0.44 - 0.65 m for ENVISAT and 0.60 – 0.76 m for ERS-2. For many applications discharge rather than stage is the primary requirement. Investigations were undertaken to improve the quality of discharge measurements at a downstream site (Nakhon Phanom) assuming that in situ data are available at Vientiane, some 400km upstream. Two hypothetical but realistic scenarios were considered. Firstly, that Nakhon Phanom was the site of a de-commissioned gauge and, secondly, that the site has never been gauged. The second scenario utilised known river cross-sectional geometries while lateral inflows were inferred from a hydrological model. Results will be presented for the predicted daily discharge using methods with and without altimetric stage data showing that the use of the altimetric stage data improved the estimated discharge.