

## 2013 SATU Joint Research Scheme Project Report – Project B

Project Title	Wave dynamics and sediment transport on adverse and following currents in the estuary and tidal inlet
NCKU PI / Co-PI	Yang-Yih Chen, Ray-Yeng Yang
NCKU Host Unit	International Wave Dynamics Research Center
Foreign Co-PI and Institute	* <sup>1</sup> Vivien Pei Wen Chua, National University of Singapore * <sup>2</sup> Drandreb Earl Juanico, Ateneo de Manila University * <sup>3</sup> Shatirah M Akib, University of Malaya
Visiting date	* <sup>1</sup> 2013/07/25~2013/07/27 * <sup>2</sup> 2013/09/26~2013/09/28 * <sup>3</sup> 2013/09/30~2013/10/2

### I. Objectives

The main objective is to investigate the various dynamic mechanisms of wave-current interactions in the estuary, including the nonlinear wave modulation in the presence of current and the input/redistribution of sediments. The long term goal is to develop large scale broadband numerical models that involve a complex sea state and a combination of sediment transport.

### II. Collaborative Strategy

The specific objectives of the proposed effort are to:

- (1) For the first step, Prof. Vivien will establish an idealized model that can simulate circulation, waves, tidal, variable water depth, freshwater inflows and salt flux. IWDRC will provide data sheet for calibration.
- (2) We are preparing a joint proposal with Prof. Earl and will submit it to National Science Council (NSC, Taiwan) and National Research Council (NRC, Philippines). The project will experimentally and theoretically study nonlinear wave dynamics and morphological response (such as vegetation, sediment and pollutant) in the estuary and tidal inlet. Especially, the sediment trapped by the mangrove will be considered.
- (3) To design a specific experiment and establish a comprehensive dataset for the topics mentioned above. Prof. Akib will send her PhD students to Taiwan and focus on the experiment of sediment transport and scour protection in the presence of bridges.

### III. Summary of Current Progress in Collaborative Research

Prof. Earl has been invited to present the idea of joint proposal to the NRC Board and its president on Oct. 11. The NRC expressed their full support for the research scheme. According to them the proposed study is potentially very useful to the Philippines. Moreover, we are discussing with these abroad Co-PIs about the experimental setup and time table of our researches. Further update will be presented in the oral presentation.

### IV. Future Perspectives

# SATU Presidents' Forum

of Southeast and South Asia and Taiwan Universities  
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<p>The SATU Presidents' Forum provides a platform, which allows the researchers from Taiwan and other countries to exchange their experience and build solid cooperation. It also greatly increases our internationalization and the visibility of NCKU and IWDRC.</p>	