二重疏洪道塭仔圳全潮水文特性之研究

Research on the hydrological characteristics of the tide at the exit weir of Yuanzaizhen of the Erchong Floodway

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摘要

本研究為了解二重疏洪道出口堰內外之塭仔圳水文變化，以作為水文水理分析、鹽度模擬及五股濕地棲地特性分析之參考，故於 2022 年 1 月至 4 月進行四次全潮量測。量測位置位於塭仔圳之出口堰閘門外、舊成子寮橋、北便橋及南便橋，測量頻率為每小時 1 次，每次施測 13 小時，且於 4 個斷面同時進行觀測，逐次量測各站時間間距不超過 30 分鐘。量測內容包含隨時間變化之斷面積、剖面流速、流量、鹽度及泥砂濃度等。其中水文流量量測主要利用聲波都普勒流速剖面儀(Acoustic Doppler Current Profile, 簡稱 ADCP)進行作業，鹽度及泥砂濃度則進行取樣，並帶回實驗室進行鹽度量測及烘乾分析。

由四次全潮量測成果，可知潮量測時最快流速、最大流量、最大鹽度及最高泥砂濃度皆發生於退潮時，其中四次全潮量測之最高水位為 1.5m；最低水位為-1.0m；漲潮時最大流速為 0.31m/s，退潮時最大流速為 0.57m/s；漲潮時最大流量為 32.8 m^3/s，退潮時最大流量為 59.5m^3/s；最大鹽度為 24.8ppt，最小鹽度為 0.1ppt；最高泥砂濃度約為 1859PPM，最低泥砂濃度則約為 5PPM，鹽度第一次及第四次皆較第二次及第三次大，可能是第二次及第三次量測前皆有降雨所致。

關鍵詞：全潮量測，ADCP，流速，流量，鹽度，泥砂濃度

Abstract

In this study, in order to understand the hydrological changes inside and outside of the exit weir of Yuanzaizhen of the Erchong Floodway, as a reference for hydrological analysis, and salinity simulation and analysis of the habitat characteristics of Wugu Wetland. Four tide measurements were conducted from January to April 2022. The measurement locations are located outside the gate of the exit weir of Yuanzaizhen, the old Chengziliao Bridge, the Beibian Bridge, and the Nanbian Bridge. The measurement frequency is one time per hour, and each measurement is 13 hours in total the observation is carried out in four sections at the same time. The time interval between each station shall not exceed 30 minutes for successive measurements. The measures include the sectional area, profile velocity, flow rate, salinity, and sediment concentration that change with time. Among them, the hydrological flow measurement mainly uses the Acoustic Doppler Current Profile (ADCP) for operation. The salinity and sediment concentration are sampled and brought back to the laboratory for salinity measurement and drying analysis.

The results of the four tide measurements show the variation of tide speed, flow rate, salinity, and sediment concentration. Among them, the highest water level is 1.5 m, and the lowest water level is -1.0 m. The maximum flow velocity during high tide is 0.31 m/s, and 0.57m/s during low tide. The maximum flow rate during high tide is 32.8 m^3/s, and 59.5m^3/s during low tide. The maximum salinity is 24.8ppt, and the minimum salinity is 0.1ppt. The highest sediment concentration is about 1859 ppm, and the lowest sediment concentration is about 5ppm. The salinity of the first and fourth measurements was higher than that of the second and third measurements, which result may have been caused by the rainfall effect.

Key words: tide measurement, hydrological flow measurement, flow rate, salinity, sediment concentration