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## SEA WATER INTRUSION IN THE KEELUNG RIVER (TAIWAN) (\*\*) A STUDY OF THE TIDAL EFFECT

**Abstract:** CHANG J.C. & SHIH T.-T., *Sea water intrusion in the Keelung River (Taiwan). A study of the tidal effect.*

Based on the water level and conductivity measurements, the Keelung River is affected by tidal action up to 35 km from the confluence with Tanshui River. Actually, sea water intruded into the river only for 12 km, which is one third of the tidal effect segment. Sea water and river water mix well during spring-flood tide but a little salt wedge occurs during neap-ebb tide.

**KEY WORDS:** Tidal effect, Water level change, Conductivity, Spring tide, Neap tide, Keelung river (Taiwan).

**Riassunto:** CHANG J.-C. & SHIH, *Intrusione di acqua marina nel Fiume Keelung (Taiwan). Uno studio sugli effetti della marea.*

Sulla base di misure idrometriche e di conduttività, si è dedotto che il Fiume Keelung è interessato dall'azione della marea fino a 35 Km dalla confluenza con il Tanshui. Attualmente, l'acqua di mare si incunea in quella del fiume per 12 Km, ossia per 1/3 del percorso in cui si risentono gli effetti delle maree. Durante la marea primaverile si ha un buon mescolamento delle acque salata e dolce, ma un piccolo cuneo salino si intrude nel fiume anche durante la marea.

**TERMINI CHIAVE:** Effetti della marea, Intrusione salina, Conduttività, F. Keelung (Taiwan).

### INTRODUCTION

The Keelung River in northern Taiwan is 80 km long and drains an area of 500 km<sup>2</sup> which is characterized by abundant rainfall. It meanders freely through Taipei Basin and flows into Tanshui River which debouches into Taiwan Strait. As industrial development spread rapidly along the

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valley since last century, the problem of water pollution has become a severe one. The proposals to deal with this problem have been made by environmental researchers recently.

Although data on water level and discharge have been collected, the tidal effect on the Keelung River is still not well known. For further understanding of the tidal effect and providing the reference for water pollution control, this work attempts to measure the sea water invasion by studying water level changes and conductivity variation.

### FIELD MEASUREMENTS

In order to understanding the water level fluctuation, six gauge stations (K<sub>1</sub>-K<sub>6</sub>) were set in early July 1986 (fig. 1). The fieldwork was carried out on 24 July (spring tide), 31 July (neap tide), 30 August (neap tide) and 6 September (spring tide). Field measurements include two parts:

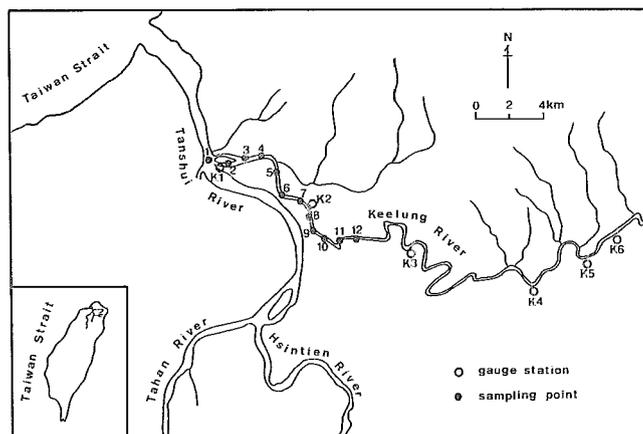


FIG. 1 - Gauge stations and sampling points along the Keelung River.  
K1 Chinese Marine College      K4 Hengko Ferry  
K2 Pailing Bridge                K5 Chiangpei Bridge  
K3 Neihu Bridge                 K6 Changan Bridge