

## ABSTRACT

Measurements of sea level variations due to tides have been used to determine friction coefficients and water exchange in a shallow coastal lagoon in Sri Lanka. The lagoon is connected to the sea through a narrow channel and experience a considerable but strongly variable fresh-water discharge. The results indicate a friction coefficient  $k=0.0041 \pm 0.0002$ . The lagoon is strongly choked with a mean tidal amplitude of 7 cm compared to approx. 25 cm on the oceanic side. The retention time, however is influenced both by fresh-water supply and tides with an average of approx. one week.

## 1. INTRODUCTION

Negombo lagoon (Fig 1) is a shallow coastal lagoon on the west coast of Sri Lanka. The lagoon is 12 km long and 3 km wide. The surface area is 36 km<sup>2</sup>, the mean depth at MSL is approximately 1 m.

The transition to the sea consists of several narrow channels. The main inlet is 2 km in length and has a mean depth of 2 m and a width of 150 m.

The water exchange is driven by tides and fresh water supply. The tide is mixed semi-diurnal. The amplitude on the oceanic side (Colombo) ranges from 10 cm at neap tide to 45 cm at spring tide, while the amplitudes within the lagoon are weak due to choking (see below).

Fresh-water enters in the southern end of the lagoon through the rivers Dadugam Oya and Ja-Ela. The supply of fresh water varies from practically zero during dry seasons to more than 100 m<sup>3</sup>/s during rainy seasons. Accordingly the salinity varies from near 0 to 30 PSU pers.comm. Dr. G.Ranatunga, NARA (National Aquatic Resources Agency).

From October to December, Sri Lanka experiences the NE monsoon with heavy rainfalls on the west coast. The winds are generally