Shoreline Change Analysis Near Itapocú River Inlet, Barra Velha, Santa Catarina, Brazil (1978 to 2002)

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ABSTRACT

Tidal inlets are defined as the local passage between the ocean and the estuary, or adjacent lagoon, including a channel and its associated sedimentary bodies. Occupation of tidal inlets surroundings should be preceded of research to avoid future prejudice. The aim of this research is to determine shoreline variation near Itapocú river inlet. This is located at the central north coast of Santa Catarina State (48°38'24"W, 26°31'48"S and 48°40'48"W, 26°37'48"S). This tidal inlet is located in an unstable sandy spit. The shoreline variation were obtain by two distinct methodologies; (a) shoreline were obtained from aerial photography for the years 1978 and 1995; (b) shoreline was obtained with a Differential Geographic Positioning System (DGPS) survey to the year of 2002. As result, was verified that between the years of 1978 and 1995 a variation of the inlet occurred to southward, this migration was due to antropic intervention in 1983 to make possible better water draining, during the great flood that took place in the area. Between the years of 1995 and 2002 the variation was of approximately 735 meters (media variation 105 m/yr), and occurred to northward.

ADDITIONAL INDEX WORDS: Inlet, Itapocú river, Santa Catarina.
Figure 2. Shoreline Change.
sediments transport.

The aim of this work was to analyze the shoreline change for the inlet of Itapocu River, between the years of 1978 and 2002.

**STUDY AREA**

The Itapocu river inlet is associated with the Barra Velha lagoon. The lagoon has alongshore orientation and the inlet is located at the middle portion. It is formed by a depression behind a sandbar and its mean depth is about 1.5 m. The main estuarine water body is the lower Itapocu River, with mean depth about 7 m. Even with a favourable depth for navigational activities, these activities cannot be developed because the inlet is located in a high-energy coastline. Data from aerophotographs, taken in the 60's, show that the inlet was then located at the lagoon's north end. Today, the inlet is located at the middle part of the lagoon and there are evidences of its migration to the north again (Schettini et al., 1996).

According to Schettini et al. (1996) an interesting feature in this system is the inlet choking which is controlled by the sandbar dynamics. The inlet was up to 4 m deep and up to 30 m wide on average while the main water body is up to 7 m deep and 100 m wide. The surface currents were as low as 0.25 m.s⁻¹ seaward and did not show direction inversions during the flood. The near bottom currents were 0.10 m.s⁻¹ landward during the flood peak and less than 0.01 m.s⁻¹ during the rest of the tidal period. This estuary can be classified as a stratified system without gravitational currents (type 1b of Hansen and Rattray, 1966 classification).

**METODOLOGY**

Shoreline change data was obtained for the years of 1978, 1995 and 2002. For 1978 and 1995 the shoreline position was obtained via vertical aerial photography analysis (1:15,000 and 1:12,500 respectively), and for 2002 a survey with DGPS was conducted. In both analysis the foredune line was used as reference.

**RESULTS**

As result, was verified that between the years of 1978 and 1995 a variation of the inlet occurred to southward, this migration was due to antropic intervention in 1983 to make possible better water draining, during the great flood that took place in the area. Between the years of 1995 and 2002 the variation was of approximately 735 meters (media variation 105 m/yr), and occurred to northward.

The results had shown that the Itapocu River Inlet that presents a migration of 100 meters per year to northward approximately, agreeing to the alongshore current.

**LITERATURE CITED**

