14 The Bahia Blanca Estuary, Argentina

G.M.E. Perillo, M.C. Piccolo, E. Parodi, and R.H. Freije

14.1 Introduction

Bahía Blanca is a mesotidal coastal plain estuary in the southwest of the Buenos Aires Province, Argentina. The estuary represents the remaining part of a complex delta, formed by the Desaguadero river (Perillo 1989), which once extended over almost 200 km from the northern coast of Bahía Blanca to Bahía San Blas (Fig. 14.1). The Principal Channel of the modern estuary approximately corresponds to the principal valley of the late Pleistocene-early Holocene delta complex, which was formed by a now vanished river and its tributary, the Colorado River (or one of its arms). The southward migration of the Colorado River subsequently carved the other major channels (i.e., Falsa, Verde, and Brightman bays) of the estuary (Perillo 1989). The modern Bahía Blanca Estuary extends over about 2,300 km² and is formed by several tidal channels (740 km²), extensive tidal flats (1,150 km²) with patches of low salt marshes, and islands (410 km²; Montesarchio and Lizasoain 1981). Owing to marked differences in surface morphology, the area can be divided along the northern shore of Falsa Bay into a funnel-shaped northern part, characterized by the Principal Channel and many small tidal creeks, and a southern part, dominated by the Falsa, Verde, and Brightman bays (Perillo and Piccolo 1999; Fig. 14.1).

14.2 Geomorphology

The Principal Channel of the Bahía Blanca Estuary has a total length of 60 km and varies in width from about 3–4 km at the mouth (22-m depth) to 200 m at the head (3-m depth); both depth and width increase almost exponentially from head to mouth. Like other major channels (bays) that flow towards the inner shelf, the Principal Channel is partly closed by a
modified ebb delta (Cuadrado and Perillo 1997). The channel cross section is steep on the sides, with a U-shaped bottom having a small asymmetry to the right. Upstream of Puerto Galván (Fig. 14.1) the channel narrows and becomes more V-shaped with the asymmetry following the meandering pattern headward (Gómez et al. 1997). At the confluence with the Principal Channel, the funnel-shaped mouth of tributary channels is turned seawards, due to ebb dominance (Perillo et al. 1996), and up to 25-m-deep scour holes may develop (Ginsberg and Perillo 2000).

Most ebb deltas at the mouth of major channels have undergone changes (Gómez and Perillo 1992); however, the original delta shape and south-