5- SUMMARY AND CONCLUSIONS

The aim of this thesis was to characterise the wave climate and the longshore dynamics in the area around Beaduc’s gulf and spit in the coast of the Rhone Delta.

Departing from a wave data record at an intermediate location near Beaduc’s spit, the wave climates offshore, nearshore and at the breaker zone have been determined. A general methodology for the obtention of such data in any other situation has been established, involving the use of SWAN and “shoaling + refraction” propagation methods.

The effects of the waves on the coast’s longshore evolution have been studied by applying CERC and Kamphuis formulations in points along the shore fed with the wave climate data previously acquired. Kamphuis formulation has only partially been applied with a varying grain size.

The most significant conclusions drawn from the study are presented below:

- The offshore wave climate is globally similar to the reference one at the buoy, albeit with an increase in wave height and a scattering of the main directions, most likely to compensate for the lack of energy input while travelling through the study area.

- Both nearshore and breaking zone wave climates show a strong sheltering effect in the gulf area, especially on the lee of the spit. In some breaker zone locations the different wave directions merge into a single group fairly perpendicular to the coast. Along the predominantly E-W coast the wave climate remains fairly constant.

- The differences between the nearshore and the breaker zone wave climates are nearly as significant as those between offshore and nearshore. This points to an incorrect location of the nearshore SWAN output depth, for all except the highest waves.

- The differences in results between using Kamphuis with a uniform unique grain size or not are very small. However, such a conclusion only applies locally.

- CERC and Kamphuis formulations yield qualitatively similar but quantitatively divergent results, with Kamphuis overtly underestimating both longshore transport and the erosive/accretive values.

- CERC propagation fails to account for the effects of the modified coast morphology around Saintes-Maries-de-la-Mer due to coastal protection infrastructure.

- Accretion is concentrated in the lee side of the spit fed by erosion along Faraman’s beach. There is also a transfer of sediment between the western and the eastern ends of Beaduc’s gulf. The western end of the study area (currently
eroding) sees a significant westward transport. All this confirms the sedimentary cells described in literature.