

# Restoration of the sediment longshore drift with a hydraulic bypass



**E.U.C.C. - France**

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Landes

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Between Arcachon and Bayonne, Capbreton is the only seaside resort of the Landes coast to have a port. It is situated at the previous mouth of Adour River. During the Second Empire, the Boucarot channel was confined to fix the river mouth, a coastal dune was built and the backward land drained to allow the birth of a new resort near to the fishing harbour.

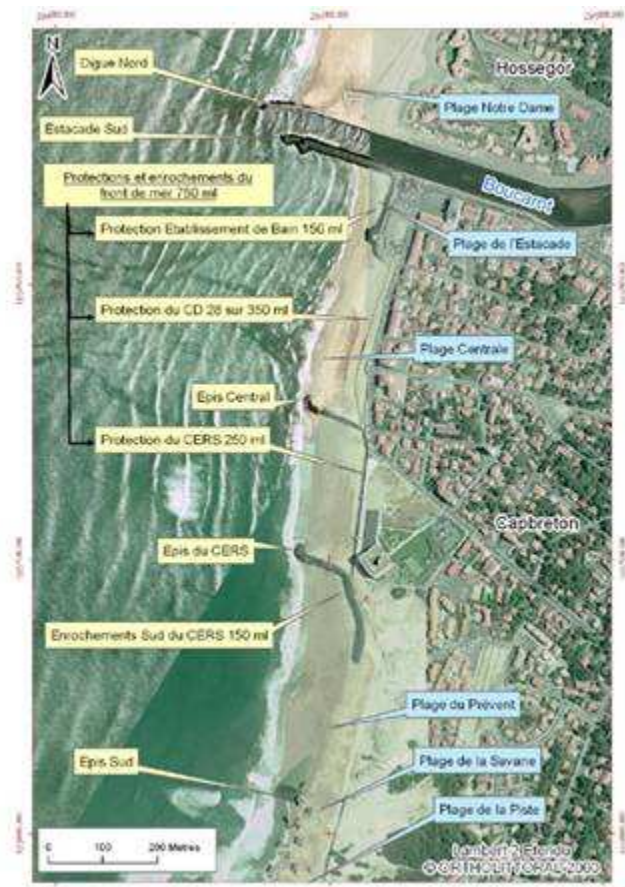
For more than a century, successive improvements have had twin targets: to improve navigation to access the Capbreton fishing and boating harbour, and to protect the urbanized sea-front (dyke, groin, rip-rap, etc...).

## Problems come from the structures built over the last century

The Boucarot mouth was protected with a dyke, which was extended first in 1958, then in 1973-1974, when the boating harbour was built. This **northern dyke** stopped the longshore sand drift to the south, leading in 40 years to an important accumulation on the Notre-Dame and Hossegor beaches, along 200m of shoreline. On the other side, the southern beaches were sediment depleted and strongly eroded all the more as the shoreline was fixed by defence structures in front of the resort.



*Impact of the north dyke:  
strong accretion to the north, erosion to the south*



*Capbreton beaches and defence structures*

Along the 750m long **concrete wall or rip-rap**, the beach level gets lower and lower so that the foundations of these structures might be exposed. So the resort beaches are endangered and could disappear if they are not artificially nourished with sand taken off from the Notre-Dame Beach (north of Boucarot River) and transported by lorries.

The central and Préventorium **groins** which were built in the 50's are in a poor state and the southern groin has never worked.

South of the defence structures, the shoreline is presently indented and continues to move back as beach and dune move eastward, a fact that could threaten buildings which were unwisely set at the rear of the coastal dune.



Since the mid 80's, accumulation behind the north dyke allowed partial restoration of the longshore sediment drift. Therefore, beaches in front of the resort take no advantage of it, because the transported sand accumulates much southward, on the Savane Beach. On the other hand a sand bar has formed in front of the Boucarot River mouth, which is very dangerous for navigation.

**So, the Capbreton city council has to solve two problems: the dredging of the Boucarot channel and the nourishment of the beaches.** The sand which is taken off the river mouth is presently thrown offshore and trucks transport sand from the Notre-Dame Beach to the southern beaches. It is not a good answer: nuisances come from truck traffic; access to the beach gets difficult; sand nourishment is not sufficient.

#### **The search for new solutions**

A study was carried out by SOGREAH at the city council's request. It concludes with the proposition of artificial restoration of the sediment longshore drift: a hydraulic bypass system will allow sand to move through the Boucarot River mouth. It would work with hydro-ejection. Mixed sand and water will be pumped out on the Notre-Dame Beach, and then forced back to the southern beaches in a pipe crossing the Boucarot Channel and passing under the sea-front promenade.

During the workshop the usefulness was discussed of extending and raising the groins to prevent the new sand to be rapidly exported. Owing to strong transversal movements, a great quantity of sand will be lost each year and after the first nourishment operation, transport of an important volume of sand (greatly facilitated by the bypass structure) has to be planned each year.

To face possible submersion of the houses located at the rear of the coastal dune, the Capbreton city has acquired the land between the houses and beach. The ONF will be entrusted with the dune restoration. To reduce the negative effects of aeolian dynamics, the new dune is expected to be lower, aerodynamic and covered with vegetation. The question was discussed of its protection with sand-covered geotextile panels at the foot of the dune. This solution was recommended by SOGREAH: although probably not very efficient, it could raise the alarm in case of heavy storm. When the sand cover is swept away, it means that a nourishment operation will have to be carried out.



*Partially submerged blockhaus on the Savane Beach.*

*Here the dune will be restored by ONF*