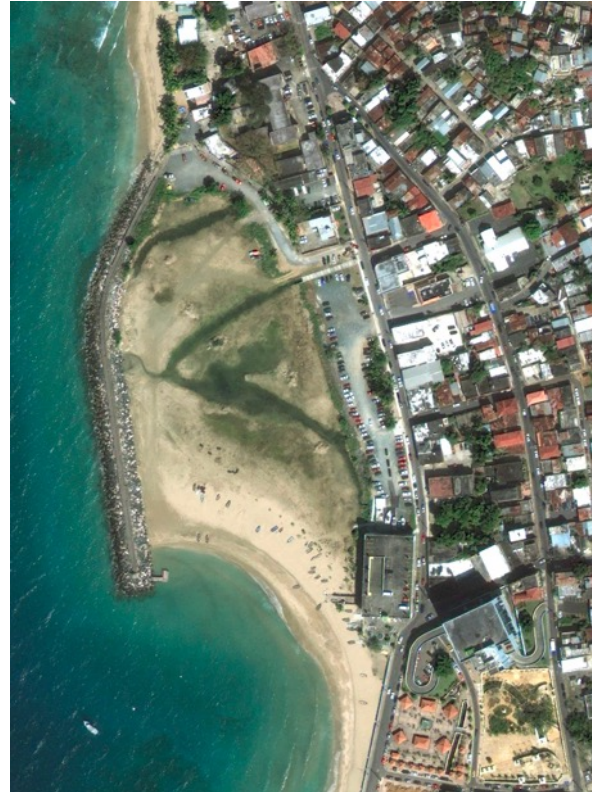


Field Trip Guide
Coastal Structures & Erosion Western Puerto Rico
Symposium # 34
Marsh 9-12, 2023

by: Wilson R. Ramírez-Martínez, BS, MS, PhD, PG



Aguadilla 1993



Aguadilla 2009

We will visit several beaches located in the western coast of the island. These sites have been impacted by coastal structures build with different purposes. We will observe and discuss the different aspects involved in each case.

Respuestas del hombre a la EROSIÓN

3 respuestas posibles:

1. Intento de Estabilización Costera usando estructuras
2. Intento de Estabilización Costera alimentando la playa
3. Traslado (*abandono y re-localización*)

Stop 1: Aguadilla, “Marina”

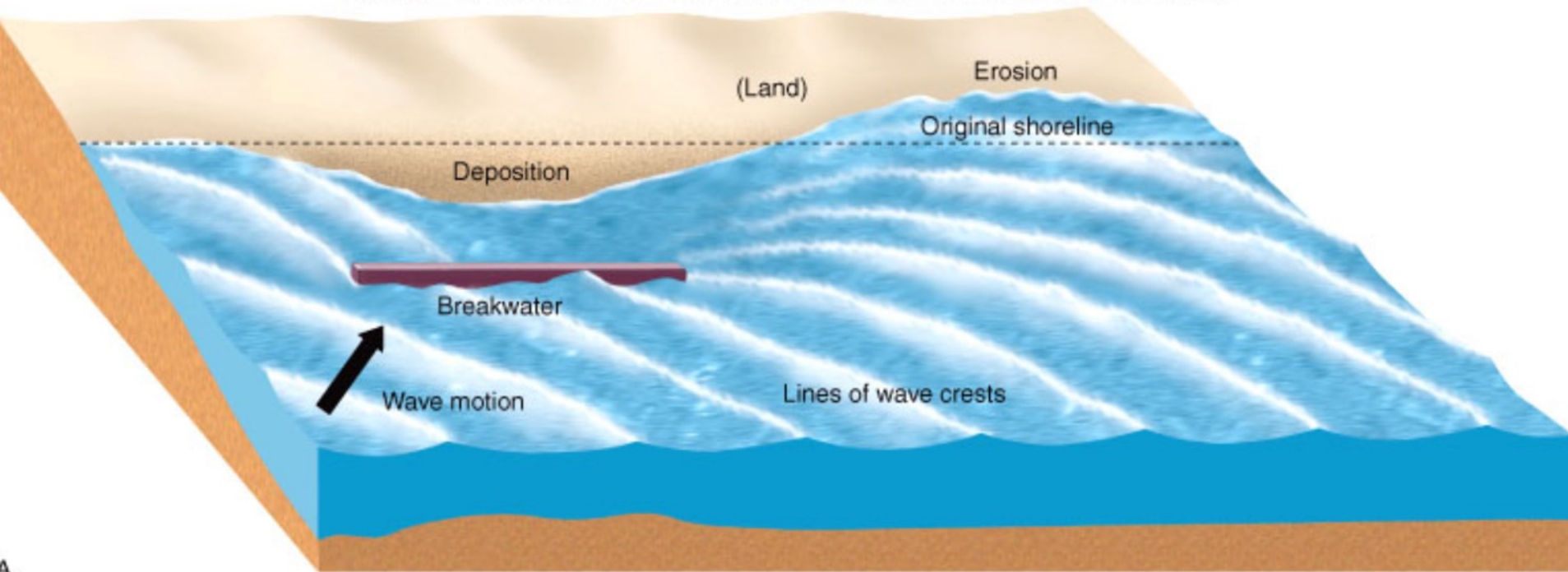
Wave refraction influenced by the marina breakwater and bathymetric features to the south of the marina has created beach across the entrance to the marina making it useless.



Rompeolas - Muro de Rocas dentro del agua o pared o pared

- Barrera paralela a la costa fuera de la orilla / en el mar
- Protege de la fuerza de olas, creando una zona de menor energía detrás de el muro

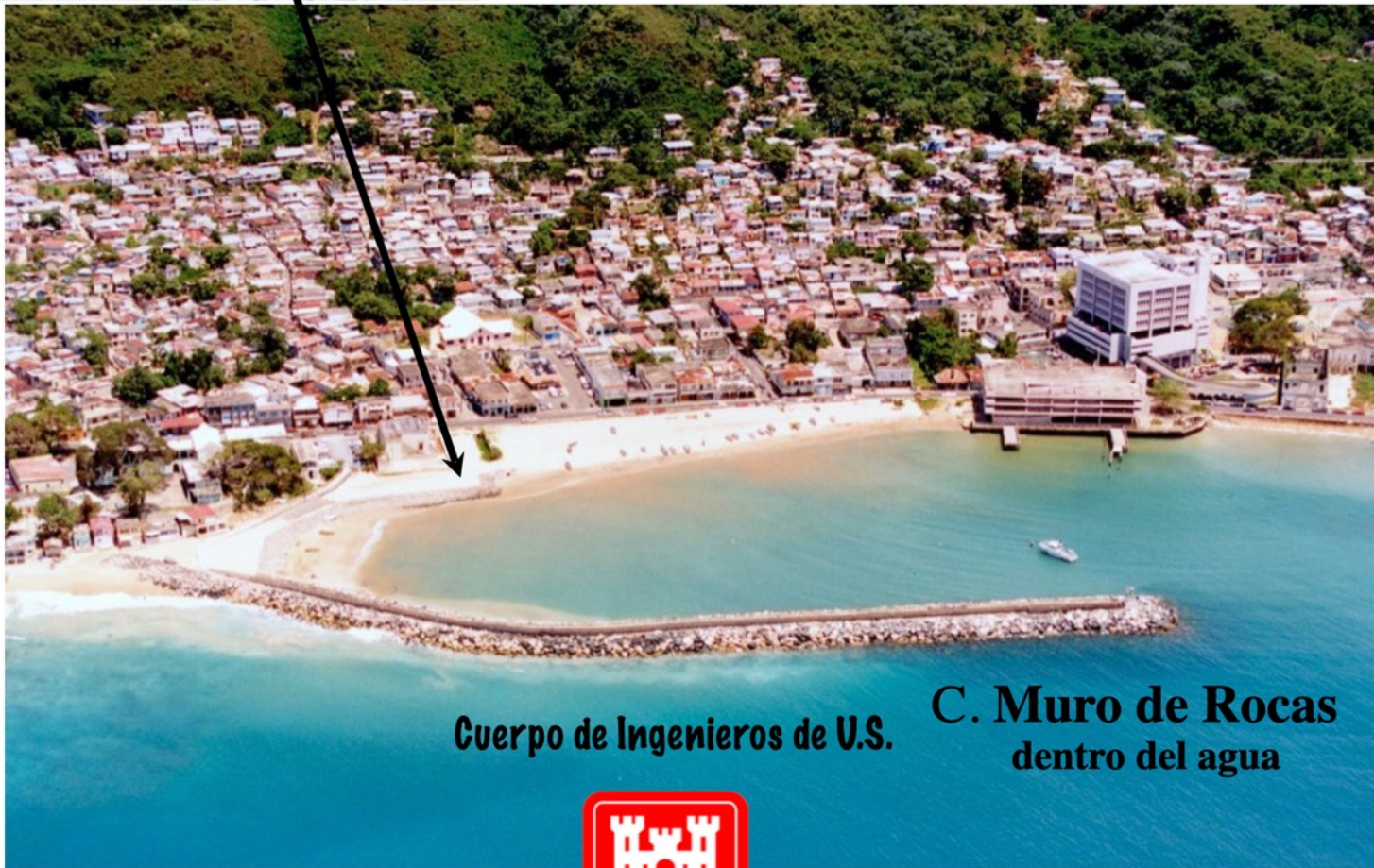
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**B. Muro de Rocas
fuera del agua
Rip Rap**

“La Marina” de Aguadilla 1995



Cuerpo de Ingenieros de U.S.

**C. Muro de Rocas
dentro del agua**



“La Marina” se convirtió en...*La Playa de Aguadilla*



Playa Chica



Aguadilla tiene otra playa gracias al



Cuerpo de Ingenieros de U.S.



Pero...

el dinero se invirtió para una marina ?



Stop 2: Aguadilla, Parque Colón

Breakwater connected to land was constructed to develop a marina in Aguadilla. Storm and longshore sand drift have rendered the intended marina useless. Lack of maintenance of the structure has aggravated the situation producing a hazardous structure.







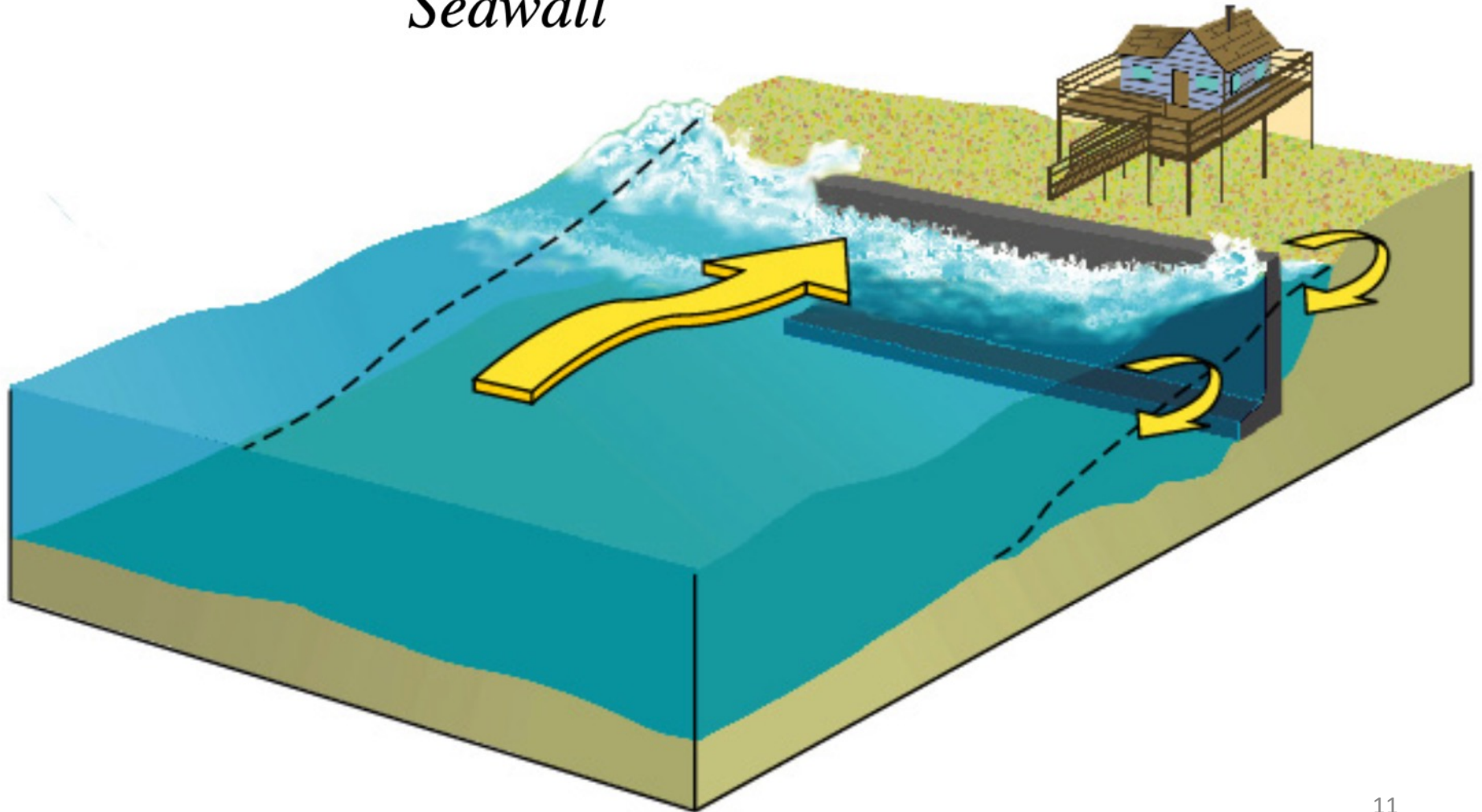
Stop 3: Aguada, Camino Playa (Monumento Historico al Santuario Cruz de Colón)

Rip-Raft build to protect Camino Playa and the properties if front of the beach has produced a high relieve along the coast.



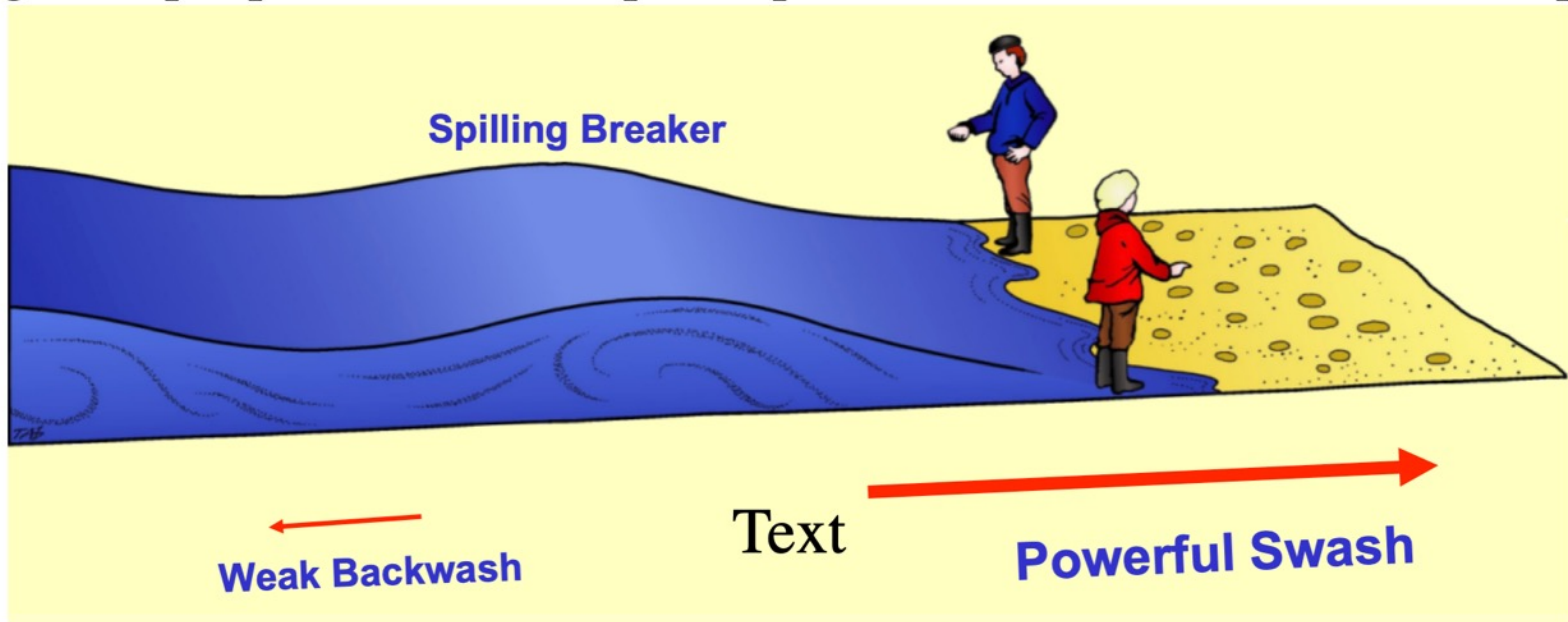
Rompeolas - Muro de Concreto

Seawall



Rompeolas - Muros de Concreto y de Rocas

Protegen la propiedad a corto plazo pero aumentan la erosión en la playa.











Stop 4: Aguada, Camino Playa (close to Balneario Pico de Piedra)

Loss of sand has exposed large sections of beachrock.
Beachrock & beach sand with high content of magnetite.









Stop 5: Aguada, Pico de Piedra Public Beach

The eroded beach sand at Pico de Piedra Public Beach was replenished in the 1990's and is still present.



Remediación de Playas

1990's



2,003



Balneario Pico de Piedra, Aguada

2,005



2,013



Regeneración de Playas



Balneario Pico de Piedra, Aguada

2,018

23



Stop 6: Rincón, Marina Las Palmas

Wave refraction influenced by the marina breakwater and bathymetric features along the offshore southwest created a beach across the entrance making it useless.









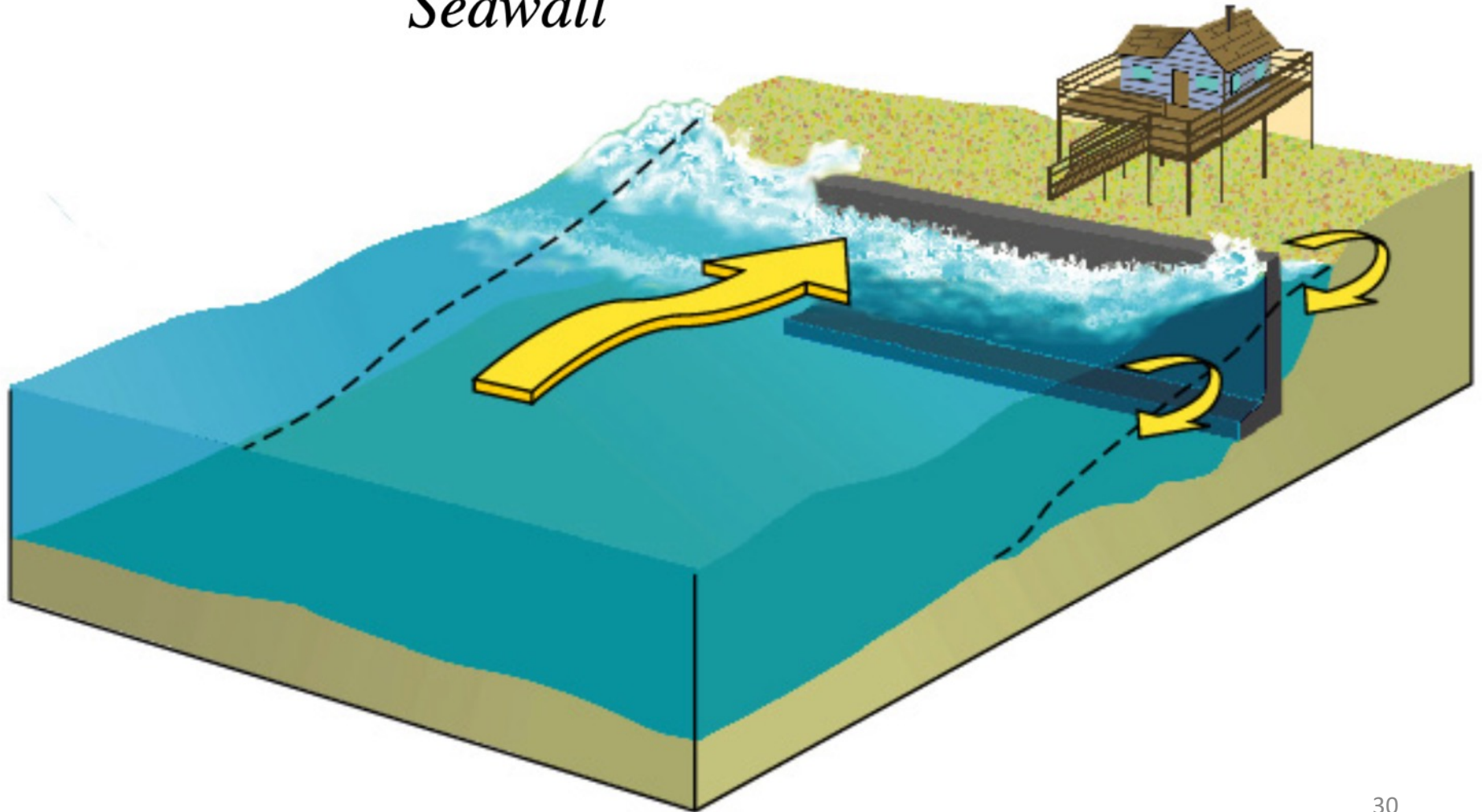
Stop 7: Rincón, Public Beach

Concrete walls replaced the earlier Gabon and are aggravating the erosion at the site.



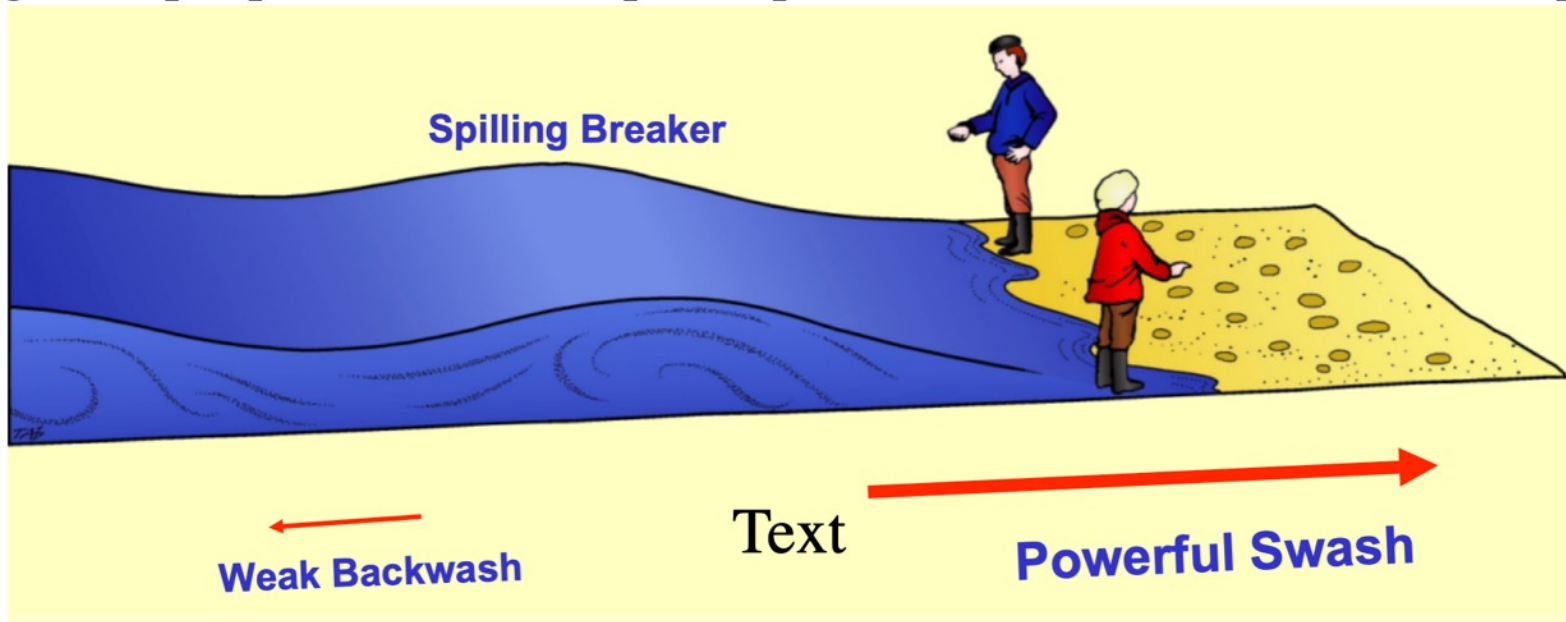
Rompeolas - Muro de Concreto

Seawall



Rompeolas - Muros de Concreto y de Rocas

Protegen la propiedad a corto plazo pero aumentan la erosión en la playa.



Rincón, 2000



gaviones



Rincón, 2001













Stop 8: Rincón, Sea Beach Colony Engineered Quebrada Discharge

The jetties at the end of this creek are damaged often and require constant repairs/maintenance. The beach has enlarged to bypass the jetties making them useless. Downdrift erosion in relation to the jetties continues and a rip-rap constructed in front of the beach house properties has produced a high relief at the shoreline.



Jetties:

Diferentes a los
Espolones en:

1. Localización

a. Entradas a

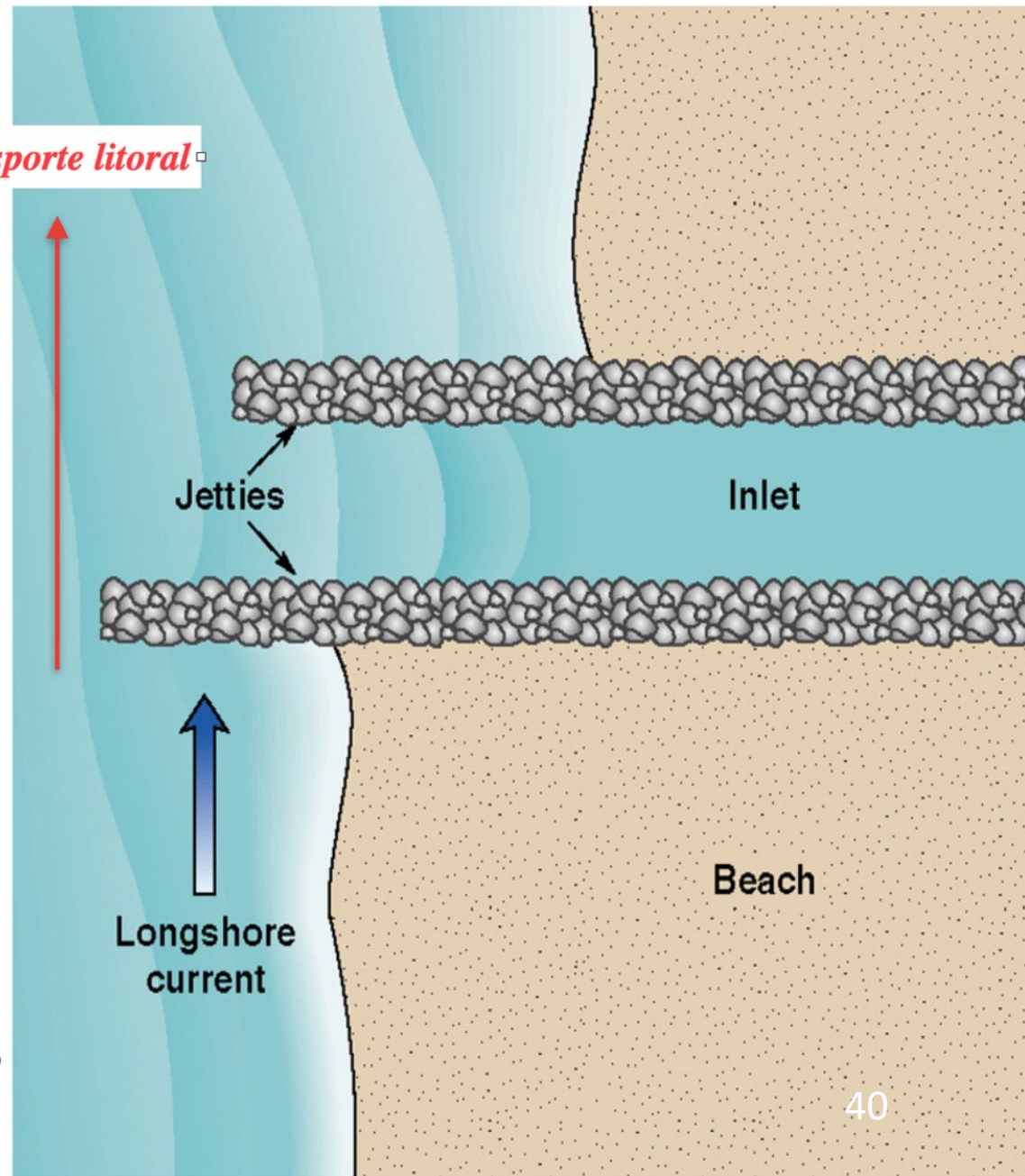
- Ríos

- Puertos

2. Propósito

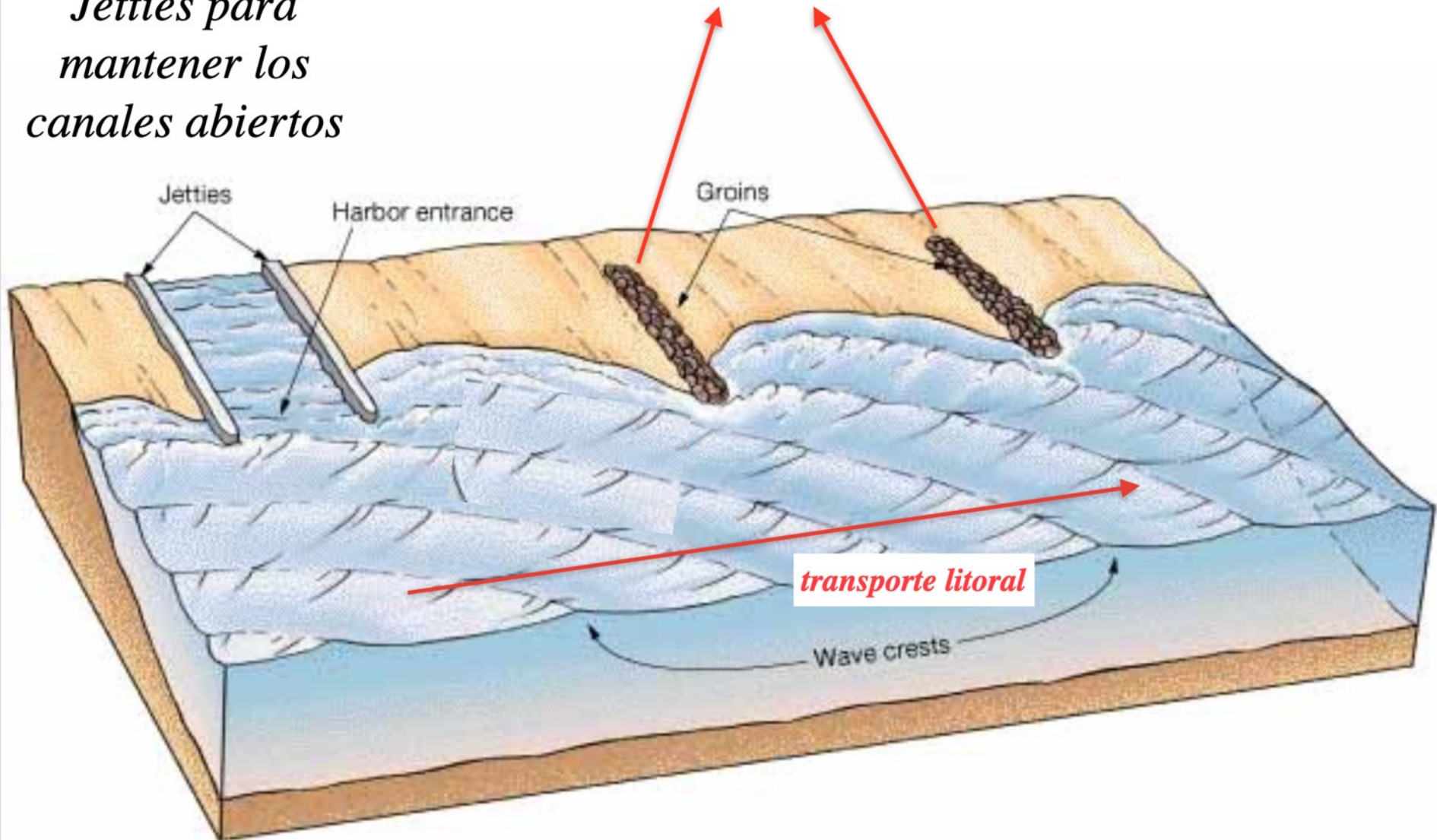
a. Mantener canales
abiertos

□ *transporte litoral* □



Espolones para controlar la erosión

*Jetties para
mantener los
canales abiertos*







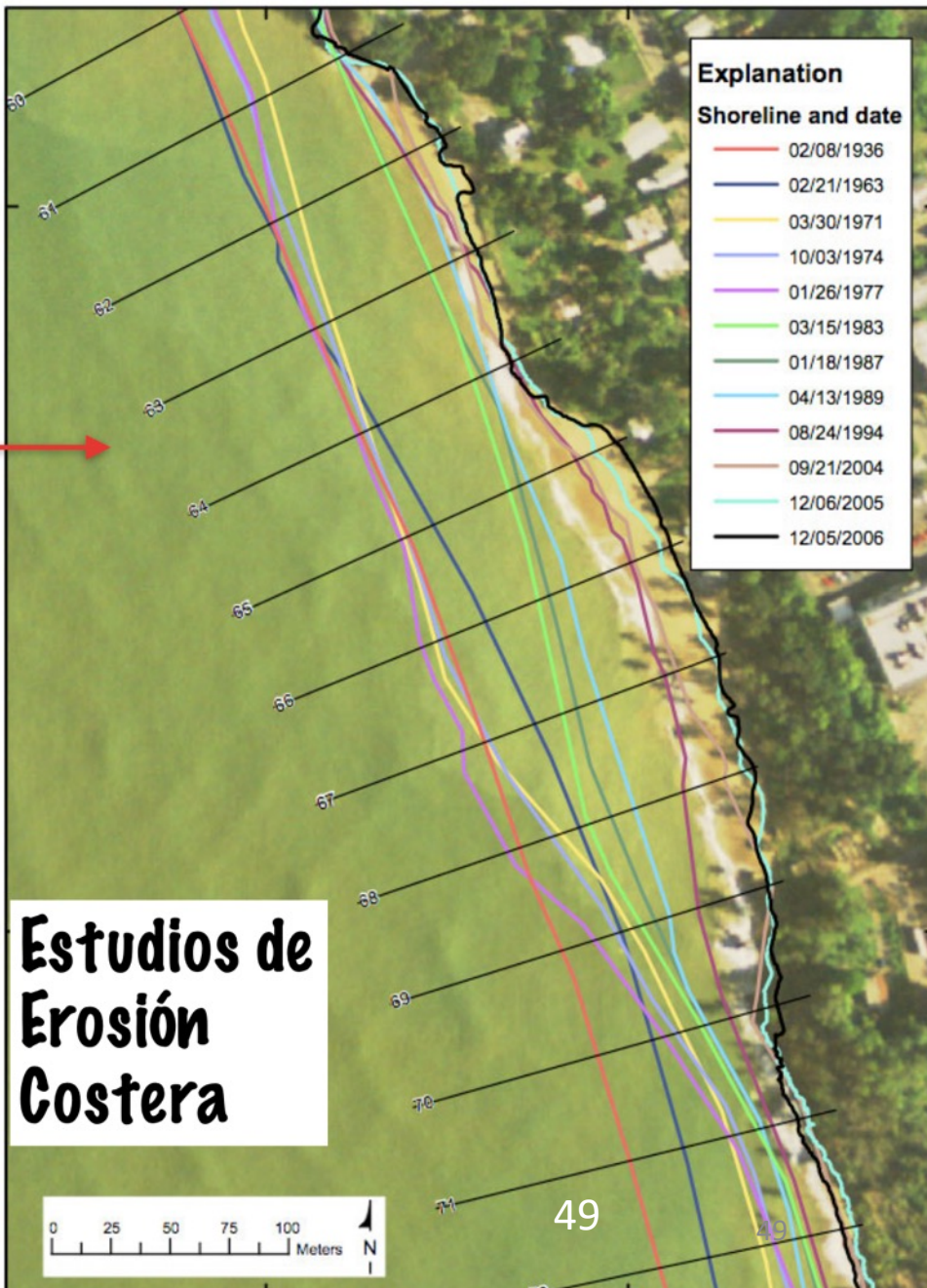
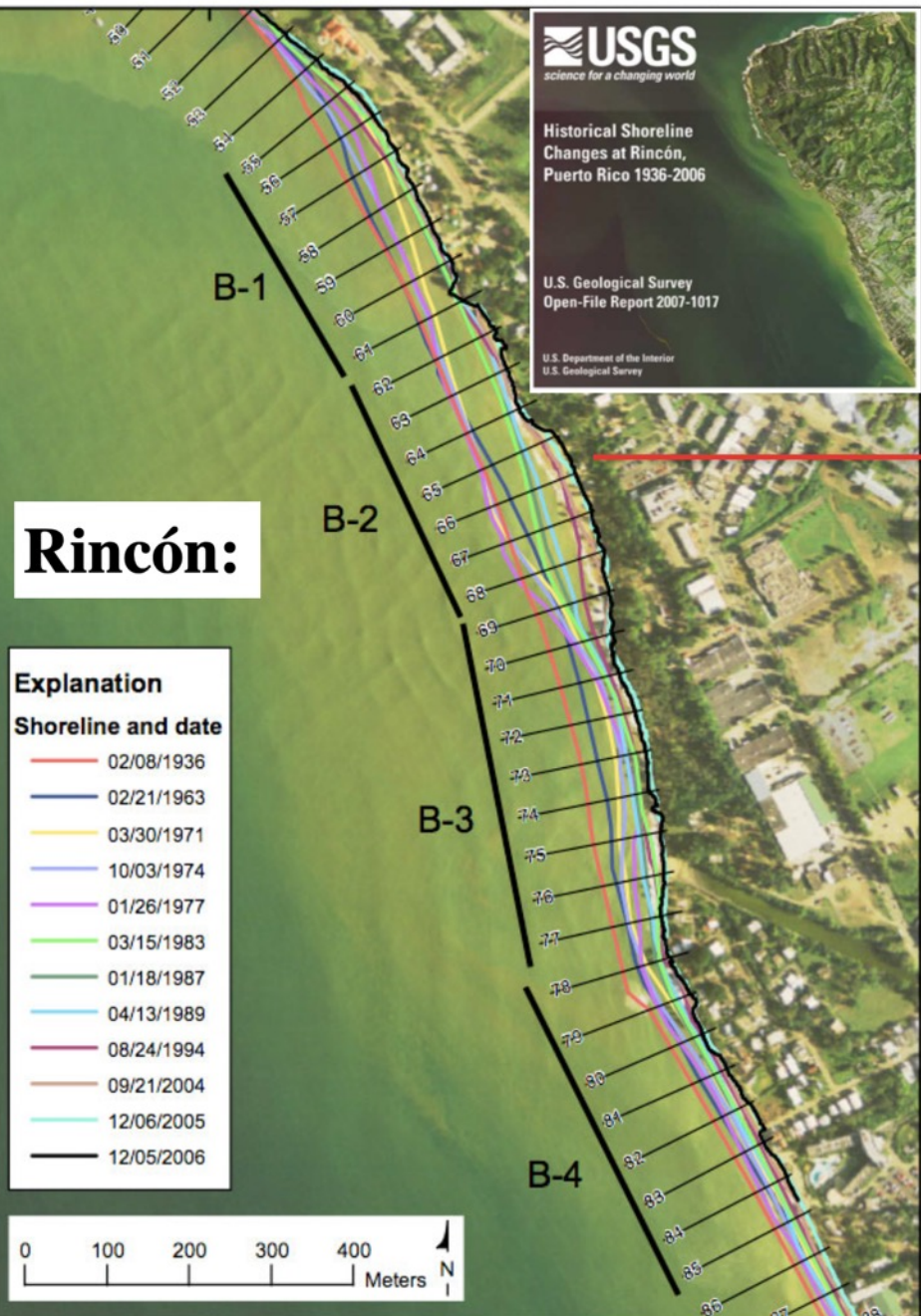












**Stop 9:
Jetties
Río Yagüez**





Que tipo de Costa Prefieres ?

*Debemos oponernos a todo tipo
de construcción y/o permisos
de construcción en las
costas....*



Rincón



Fin



NO !