Coastal Studies

- **Upgrading of Alinda beach, Leros (2026**): This is a technical proposal to support a request for financing the project of upgrading a one km long Leros coast in terms of minimizing coastline erosion. A thorough coastal engineering study was performed for average and exceptional wave conditions to assess longshore and cross-shore sediment transport. A small number of groynes are proposed along with sand replenishing and subsidiary structures along short sections of the land sector of the coastal zone.

- **Coastal study and upgrading of Palouki harbour (2025):** A fishing harbour on the west coast of Peloponnese was moderately expanded and rearranged in order to shelter, besides the fishing craft, pleasure boats up to medium length. A severe sedimentation around the harbour entrance is presently hampering its smooth operation. A large-scale hydrodynamic model was applied to the gulf area north of the project site in order to identify the regime of the sediment movement. The effort here was to combine any anti-sedimentation measures with works serving the harbour extension.

- **Enhancement of the bathing coast adjacent to Paloi harbour, Nisyros (2024**): This was a coastal protection study and technical proposal for beach enrichment at Paloi harbour, Nisyros Island. After the extension of the harbour main breakwater, sand of the nearby bathing coast started piling up in the sheltered coastline behind that extension. A detailed topographic/bathometric representation of the current relief was firstly executed; then, models of wave propagation, induced currents, and sediment transport were applied and, based on results received combined with laboratory analyses of sediment samples, suitable actions were proposed such as: partly demolish the breakwater extension and use suitable dredge material for coastal enrichment in first phase, while in second phase, following a monitoring period, constructing submerged detached rubble mound breakwaters if need be. The study was carried out on behalf of the local government of Nisyros island.

- **New Port of Paros Master Plan - Coastal Engineering Study:** Mathematical models were used to evaluate shoreline changes based on various structural layouts proposed in the Preliminary Report for the New Port of Paros and wave directions affecting the project area. Additionally, an assessment of the annual sediment transport entering the dredged harbour basin was conducted to estimate the required dredging volumes. Finally, proposed interventions, including artificial nourishment and construction of submerged breakwaters, were developed to maintain the existing shoreline.

- **Coastal engineering study to prevent siltation inside the Harper port in Liberia**: It is noted that the coastlines of Liberia exhibit intense phenomena of marine sediment transport. Hence, this study, commissioned to ADK Consulting Engineers by the European Communities, aimed at preventing sedimentation inside the Harper commercial port. This was achieved by applying a simple hydrodynamic model inside the port basins to calculate the water renewal time, as

part of the environmental impact assessment prepared on behalf of ADK Consulting Engineers.

- **Study of Coastal Rehabilitation of the Municipality of Alexandroupolis (2013):** The study included,

  - Identification and consideration of alternative sites for a new marina: This involved investigating the advantages and disadvantages of marina construction at various locations based on port and spatial planning criteria. For the chosen location, a preliminary study of required projects and a special architectural study were conducted.

  - Rehabilitation of the coastal front: The final study addressed the rehabilitation of the coastal front, which was significantly damaged by wave attack from the southern sector. The study examined alternative protective measures and included a preliminary study for constructing offshore breakwaters, and coastal sand dunes for the protection of Alexandroupolis's coastline. In parallel a preliminary design was conducted of the proposed by the architectural study berthing facilities.

- **Design of coastal zone protection, Vouliagmeni, Greece:** This project involved the design of rubble mound coastal zone protection for the facilities of the Nautical Club of Vouliagmeni. For economic reasons, the design was optimized by considering the (acceptable to the client) probability of failure.

- **Study of the coastal protection for a hotel in Zakynthos and supervision of its construction:** The hotel 'A. Tripapoulos' is situated on an 18.5m natural slope in an area undergoing continuous coastline erosion. The protection was implemented using a toe construction made of natural armour stones with a rockfill filter and has operated successfully since then.

- **Restoration of the beach at the Hotel Africa in Monrovia, Liberia:** This study refers to a critical coastal protection problem related to the historic Hotel Africa (1,100 beds) suffered severe erosion due to Atlantic Ocean swells. The beach has been destroyed, rendering the hotel's waterfront unusable. This is due to longshore sediment transport in Liberia that moves strongly toward the north. Since the hotel is located north of the capital and the Port of Monrovia, there is no replenishment of the sand being washed away, leading to continuous shoreline retreat. The study specifies a solution via artificial nourishment of the coast and construction of a series of groynes to retain the material and prevent further erosion.

- **Studies commissioned by ADK Consulting Engineers on wave penetration**: Expected wave regime was estimated by using advanced Delft Hydraulics numerical models, for the interior of the following port projects, aiming to ensure suitable wave conditions with the minimum possible external works:
  - Aluminium of Greece port facilities in Noussa Bay
  - Maridaki Pier at the Souda Naval Base
  - NATO Naval Base in Crete