



## A1. GEOMORPHOLOGY, ECOLOGY AND BIODIVERSITY OF COASTAL AREAS

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### Course outline-lectures

#### Introduction to coastal environment

- The coastal area – preliminary definitions
- Formation - evolution and human alteration of coastal landforms (introductory)

#### Waves – Currents – Tides

- Waves - currents and tides in the open sea
- Waves and currents in the coastal area
- Storm surges and coastal flooding

#### Coastal Processes

- Sediment characteristics
- Erosion & Deposition processes
- Longshore Sediment transport
- Littoral processes
- Coastal evolution

#### Erosional Landforms

- Landforms overview
- Cliff Recession
- Soft Cliff Material
- Hard Cliff Material
- Bays and headlands

#### Depositional Landforms (geomorphologic, physical chemical and biological aspects)

- Landforms overview
- Deltas and Estuaries
- Beaches (sandy beaches – gravelly beaches)
- Spits
- Sand Dunes
- Salt Marshes

#### Coastal Management

- Why defend the coast?
- Coastal protection
- Hard Engineering Works
- Soft Engineering Methods

#### Brief overview of intertidal and shallow subtidal ecology

##### Physical drivers in coastal systems

- Heat, mass and momentum exchange
- Physiological ecology at the scale of the organism
- Role of waves and disturbance

##### Physiological responses of organisms

- Thermal physiology
- Breakage and attachment strength
- Interaction of multiple stressors

##### Species interactions

- Competition
- Predation





- Facilitation
- Indirect effects of the physical environment on species interactions

**Scaling to communities**

- Intermediate disturbance hypothesis
- Tipping points and stable states

**Metacommunity processes: ecology on a geographic scale**

- Coupled roles of local and regional scale processes
- Larval dispersal and connectivity

**Climate change and conservation biology**

- Marine Spatial Planning
- Climate adaptation strategies
- Ecological Forecasting