2104

SPATIAL MODELLING OF MULTIPLE PRESSURES

TO SUPPORT THE IMPLEMENTATION OF THE MARINE STRATEGY FRAMEWORK DIRECTIVE (MSFD) AND MARINE SPATIAL PLANNING (MSP)

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MARITIME TRAFFIC

ONE DRIVER, MULTIPLE PRESSURES

MOTORWAYS OF THE SEA

- IMPORTANT ROLE IN THE WORLD TRADE AND ITS **ECONOMIC DEVELOPMENT**
- ENCLOSED SEA SUCH AS THE MEDITERRANEAN PARTICULARLY VULNERABLE
- PRESSURES RELATED TO MSFD DESCRIPTORS: BIODIVERSITY, ALIEN SPECIES, POLLUTION, LITTER, NOISE

AIS: AUTOMATED IDENTIFICATION SYSTEMS

- REGISTER THE POSITION OF COMMERCIAL SHIPS - WE DEVELOP A SYSTEM TO STORE, MANAGE, ANALYSE AND VISUALIZE AIS DATA USING POSTGIS AND R.

- WE GENERATE DIFFERENT GRIDDED PRODUCTS TO REPRESENT RELATED PRESSURES USING GIS

CASE STUDY: GULF of LYON

- TRANS-BOUNDARY CASE STUDY (TWO EU COUNTRIES)
- MARINE SPATIAL DATA INFRASTRUCTURE, CONTAINING:
- + PHYSICAL SYSTEM + BIOLOGICAL SYSTEM + HUMAN SYSTEM

208 OIL SPILLS

7,000 PORT TRANSITS

8 MAIN PORTS 45,000 MOORINGS

310 BATHING SITES

69 MARINAS 236 SCUBA SPOTS

20 MT FISH CATCHES

CUMULATIVE PRESSURES

MULTIPLE DRIVERS, ONE INDEX

HOLISTIC **APPROACH**

- •GOOD ENVIRONMENTAL STATUS OF MARINE ENVIRONMENTS CONDITIONED BY WIDE SET OF PRESSURES FROM HUMAN ACTIVITIES
- •A HOLISTIC APPROACH IS ESSENTIAL FOR THE MANAGEMENT OF MARINE AREAS
- •IDENTIFICATION, COMPARISON AND QUANTIFICATION OF **CUMULATIVE PRESSURES ARE NEEDED**

HIGH-RESOLUTION CUMULATIVE PRESSURE ANALYSIS

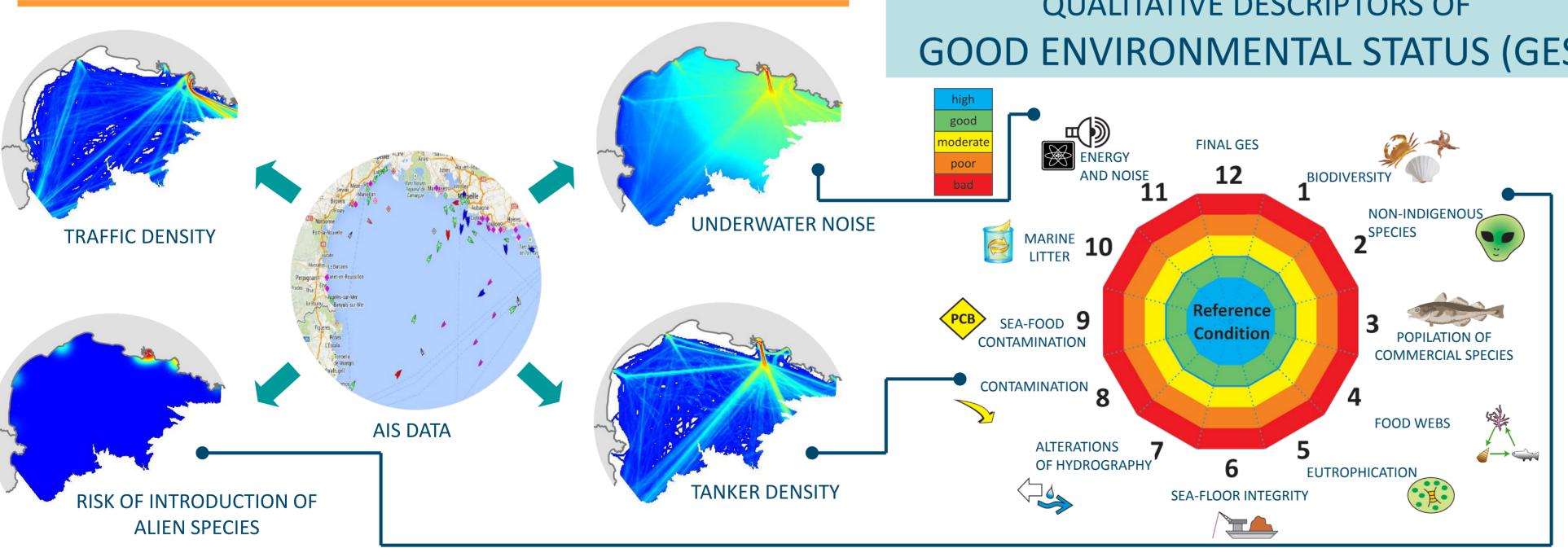
35 PRESSURE MAPS

16 ECOSYSTEM TYPES

35 x 16 VULNERABILITY MATRIX

750,000 GRID CELLS

PRESSURE MAPPING

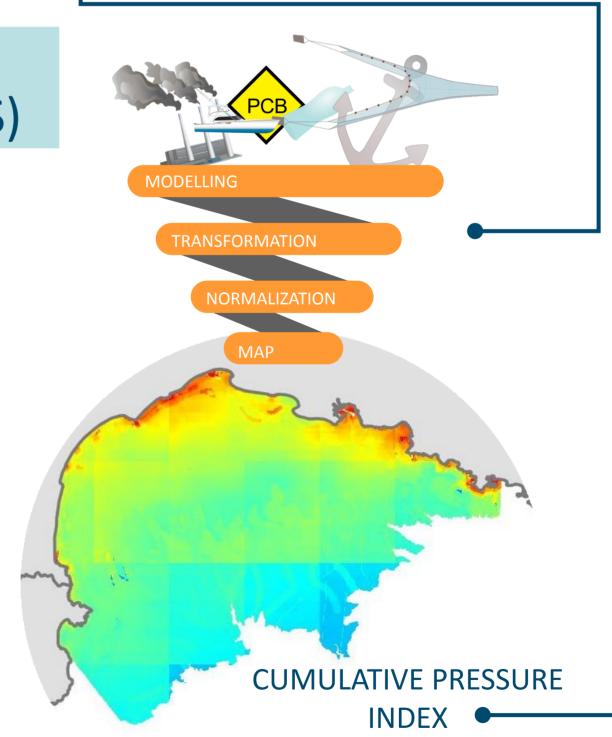


QUALITATIVE DESCRIPTORS OF GOOD ENVIRONMENTAL STATUS (GES)

• WE PROVIDE BASELINE INFORMATION TO SUPPORT INITIAL ASSESSMENT

• MONITORING PROGRAMS COULD USE THIS INFORMATION FOR SAMPLING DESIGN

PROGRAMS OF MEASURES AND MSP NEED TO CONSIDER HUMAN ACTIVITIES



ASSESSMENT UNIT **WEIGHT SCORES** ECOSYSTEM (E_i) **CUMULATIVE INDEX** $I = \sum_{i=1}^{n} \sum_{j=1}^{m} P_i \times E_j \times \boldsymbol{u}_{ij}$

HOW

WE CALCULATE THE INDEX?





SUPPORTED BY

FOR THE MSFD

IMPLICATIONS