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# A MULTISCALE APPROACH FOR COASTAL RISK ASSESSMENT: THE CASE STUDY OF ABRUZZO REGION

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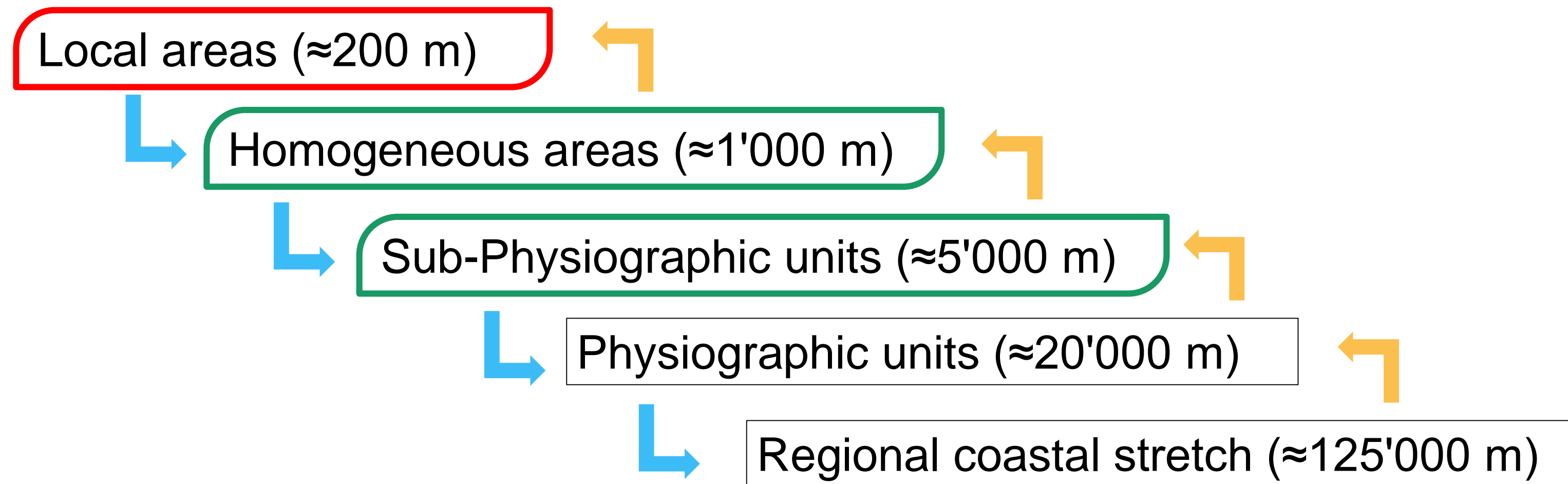
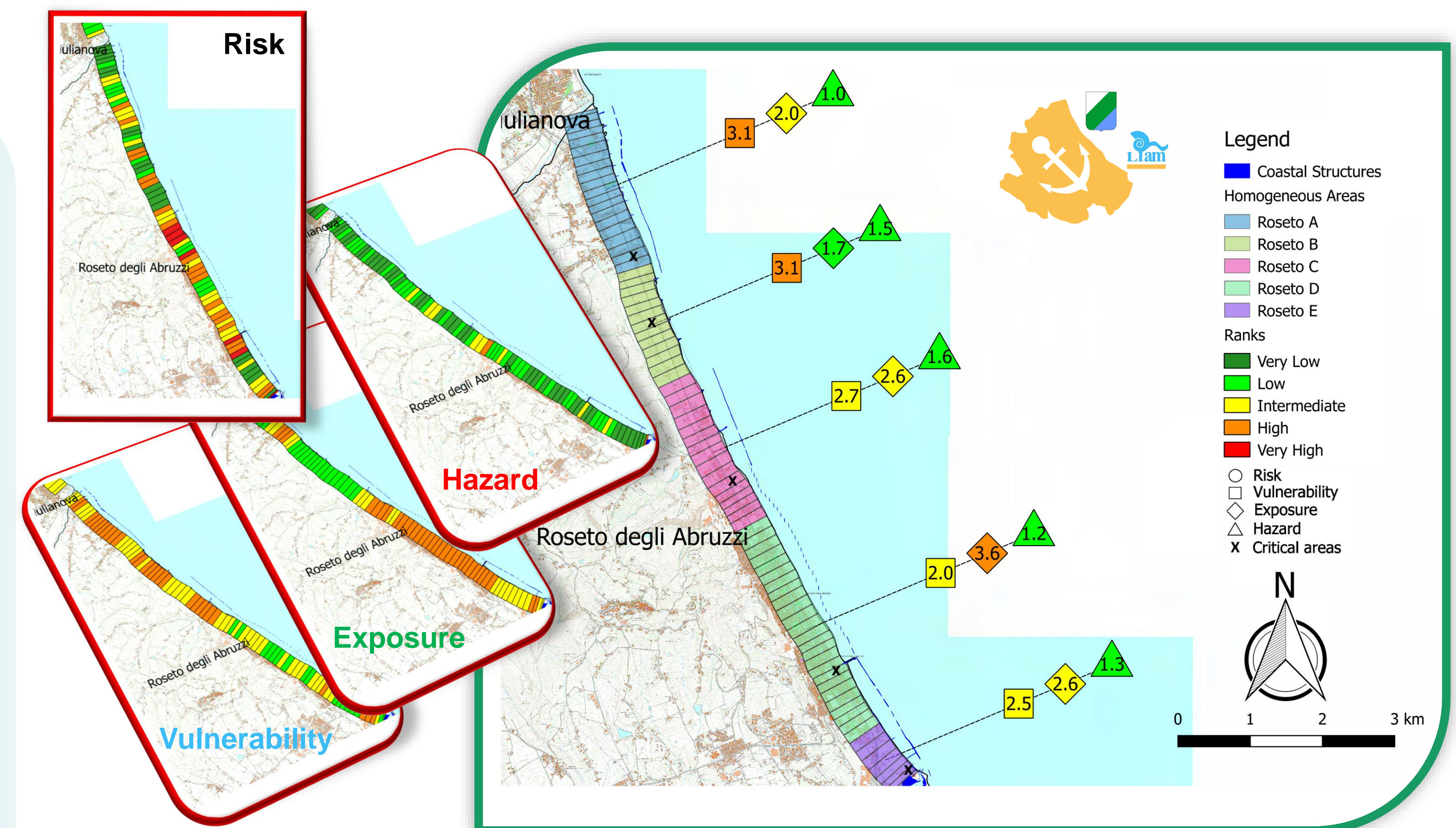
## ABSTRACT

Coastal risk assessment, related to coastal flooding and erosion, is an important issue to be tackled within the frame of climate change adaptation.

(Coastal) Risk is usually defined as the interaction of a hazard that threatens a vulnerable system where the value of human, economic or environmental elements are exposed to the considered hazard. The vulnerability may be viewed as the intrinsic capability of the system to sustain the hazard.

Public authorities are in charge to manage coastal risk; hence they need efficient tools to handle long coastal stretches by taking also into account localized spots. Indeed, effective and timely decisions on the use of resources must be made both in the immediate and longer term. The former is usually related to localized critical points, whilst the latter to the management of larger areas, often referred to as coastal physiographic units.

This poster aims at illustrating the key features of a multiscale approach for coastal risk assessment and its application to the case study of Abruzzo Region (Middle Adriatic Sea coastal area). The proposed approach allows to gain insight about coastal risk of wide coastal stretches while keeping the capability of individuating localized critical points.



**SOURCE**

**PATHWAYS**

**RECEPTORS**

**Hazard**

**Vulnerability**

**Exposure**

• Wave runup

- Morphology
- Shoreline evolution
- Beach width
- Beach slope
- Emerged Berm elevation
- Mean annual significant wave height
- Coastal structures
- Fluvial Flooding hazard

- Population density
- Age weighted population density
- Buildings density
- Construction year weighted building density
- Floors number weighted building density
- Economic activities
- Cultural and environmental heritage
- Exposed infrastructures
- Supporting infrastructures

## METHODS AND APPLICATIONS

The approach is made of six steps.

- 1 - A series of local areas are defined along the coastal stretch belonging to the area of interest. The areas are defined based on the definition of the Radius of Influence of Coastal Erosion (RICE) proposed by Salman et al. (2004). The longshore extension of the areas is about 200 m, while they extend up to 500 m landward (up to a maximum land elevation equal to 5 m) and up to 1 km seaward (up to a maximum water depth equal to about 10 m).
- 2 - The vulnerability is assessed (and ranked) for each area (see Table).
- 3 - The exposure is assessed (and ranked) for each area (see Table).
- 4 - The hazard is assessed (and ranked) for each area (see Table).
- 5 - The risk is assessed (and ranked) for each area.
- 6 - Homogeneous areas (from a vulnerability, exposure and hazard point of view) are identified and a (mean) risk index is assessed.

The assessment may be time consuming, hence a (series of) script has been implemented to perform the analyses and to assess the vulnerability, the exposure, the hazard and eventually the risk for the case study of Abruzzo Region (see upper panels in the poster).

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