



ALICE:

Improving biophysical models to link terrestrial,
riverine and coastal interfaces accounting for
biodiversity and ES

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KEY OBJECTIVES

- ✓ Develop a full-package of **new methods, tools and procedures to assist with coastal and inland landscape management**
- ✓ **Targeting and stimulating BGI investment within the 4 CS by quantifying the benefits for ES including biodiversity conservation**
- ✓ **Identify solutions for the economic and social barriers, which may limit investment in BGI in each of the 4 CS**
- ✓ Provide with **stronger scientific and socioeconomic support** for the **effective implementation of future BGI** and environmental policy.

France, Couesnon River



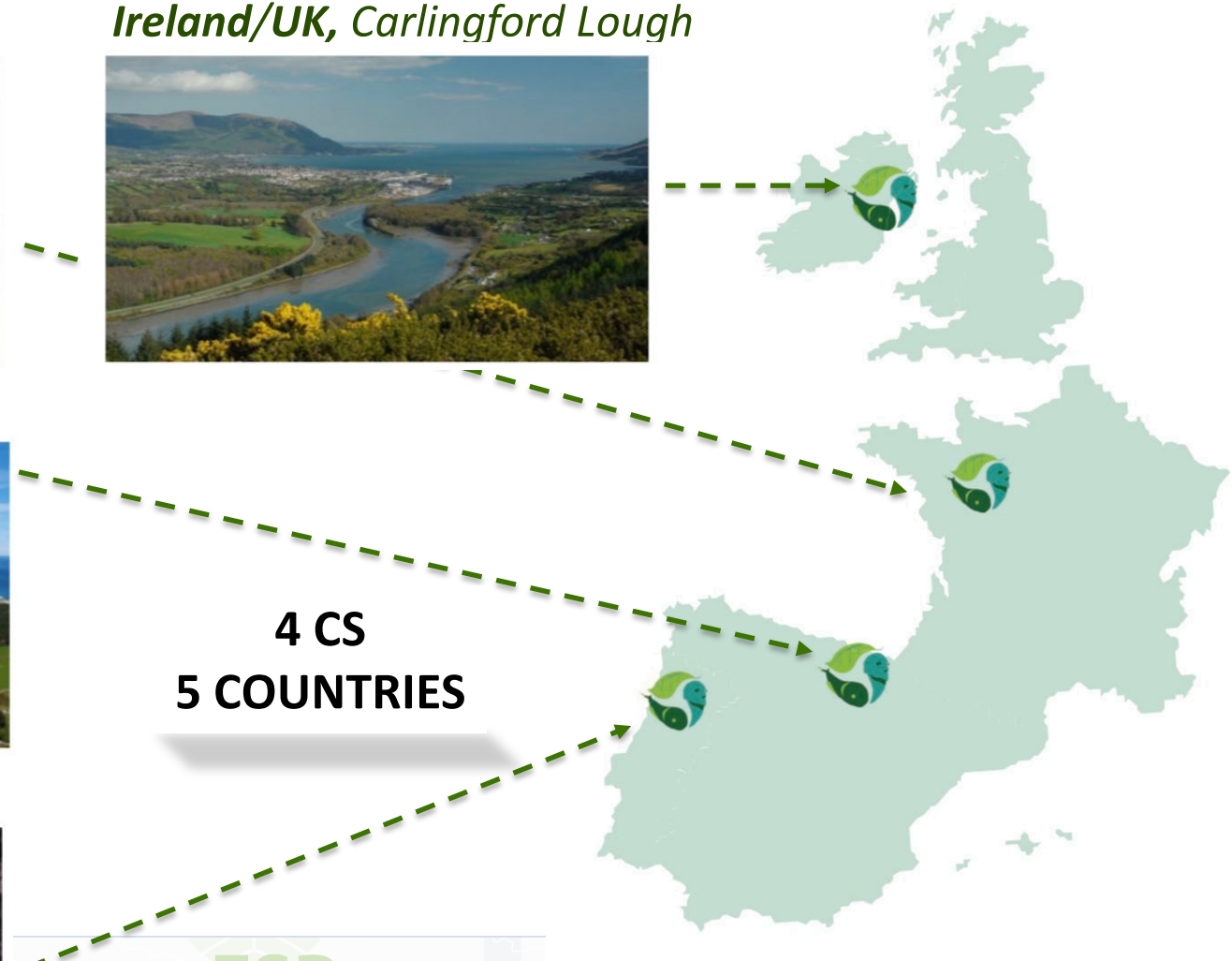
Ireland/UK, Carlingford Lough



Spain, Pas, Miera and Asón



Portugal, Paiva

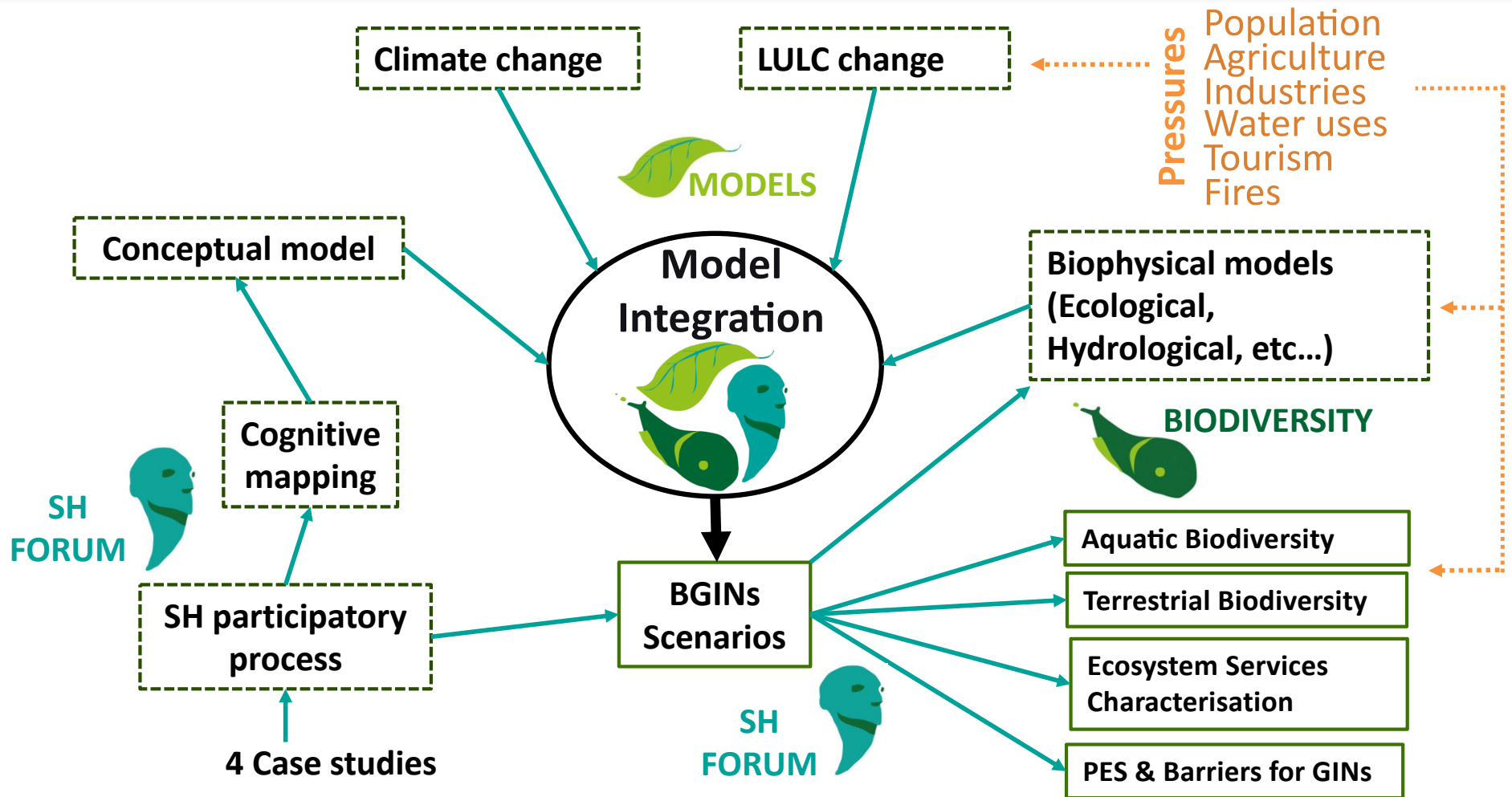


**4 CS
5 COUNTRIES**



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ALICE Model Integration



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Interreg
Atlantic Area
European Regional Development Fund
EUROPEAN UNION

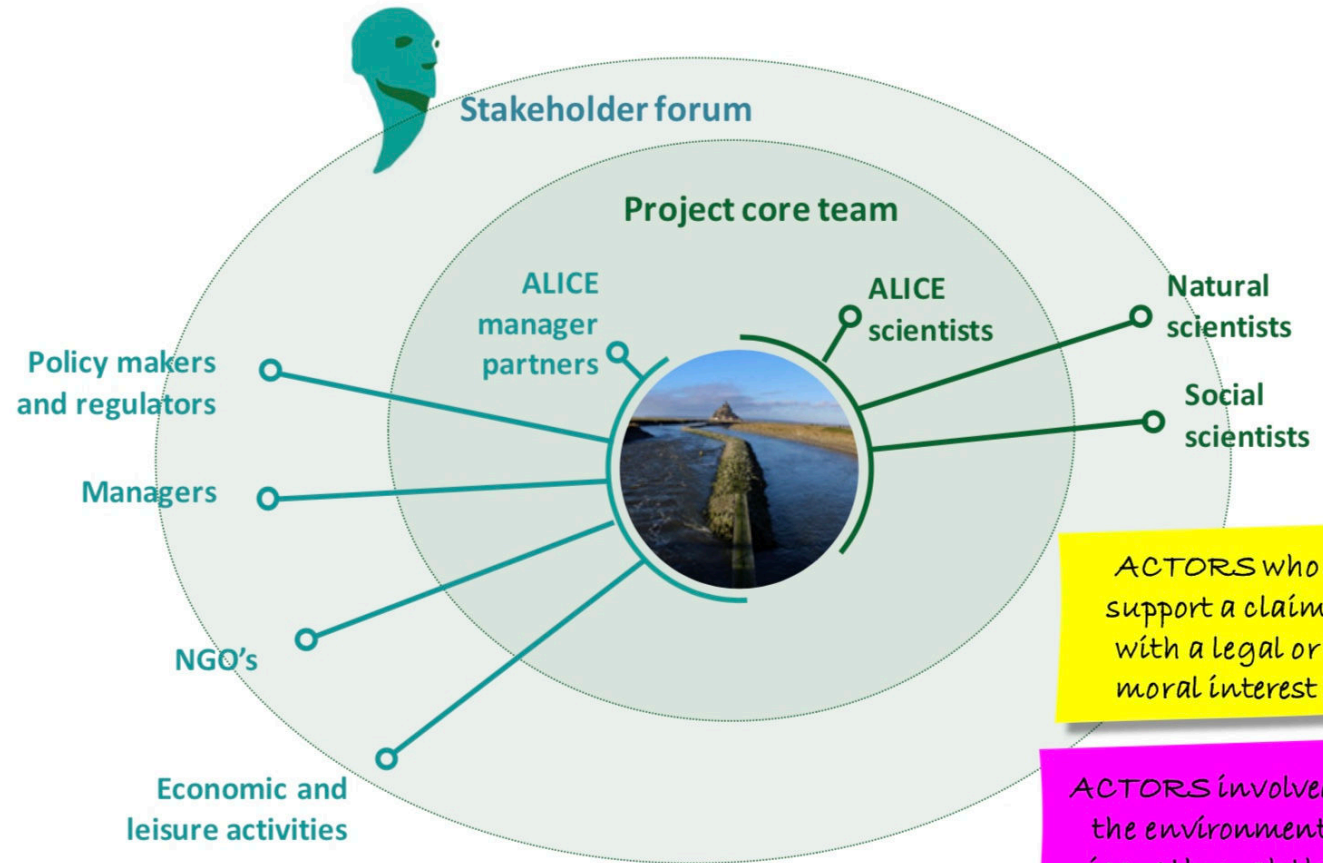
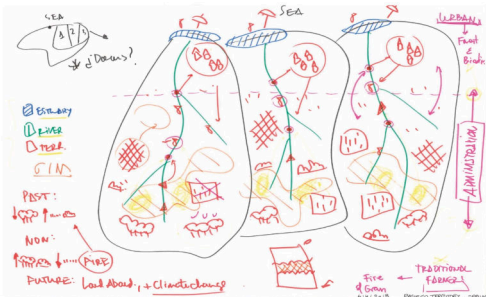


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STAKEHOLDER INVOLVEMENT



Pasiego case study preliminary conceptual mapping

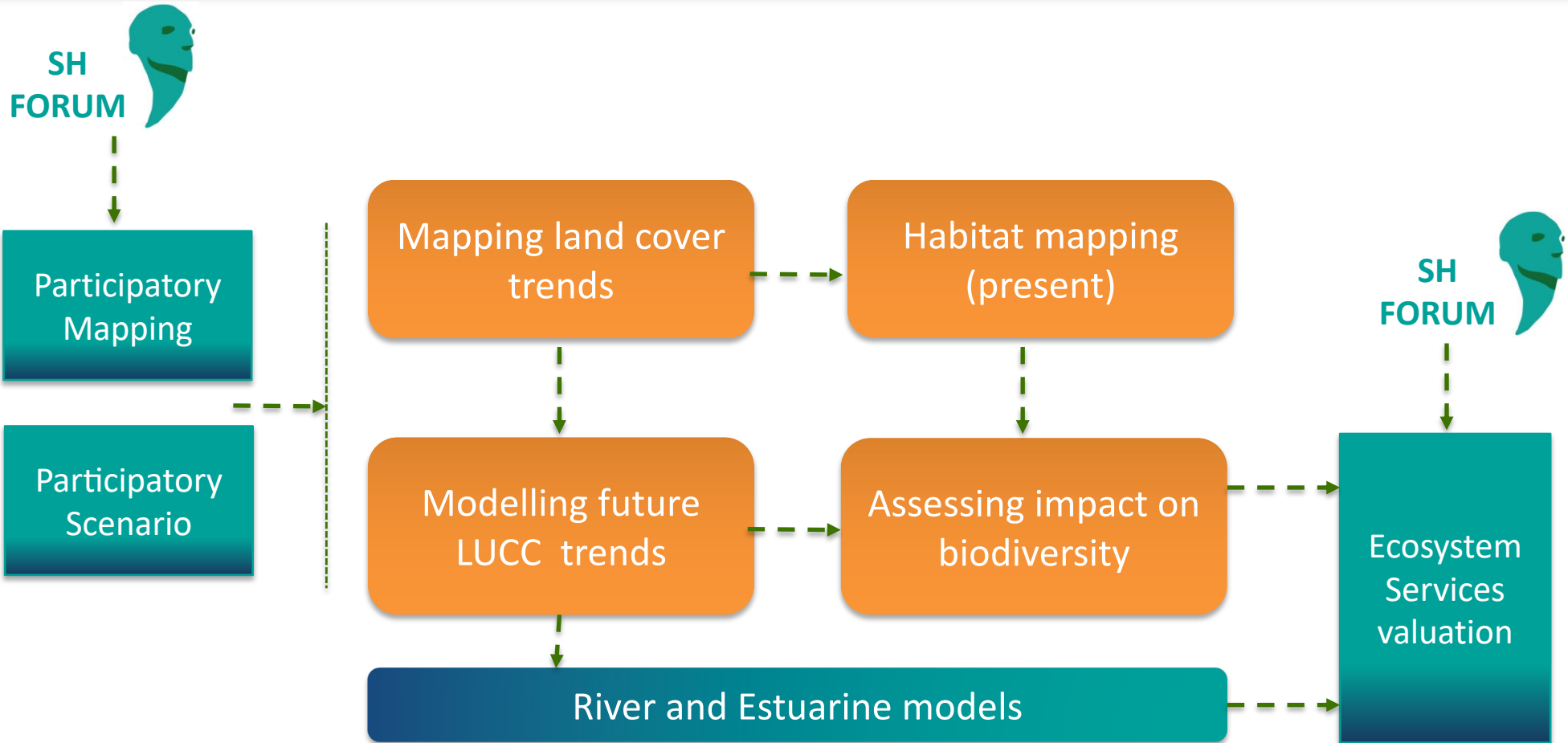


ACTORS who support a claim with a legal or moral interest

ACTORS involved in the environmental issue through their activities

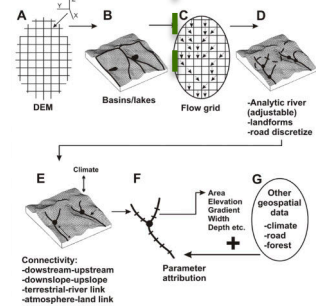
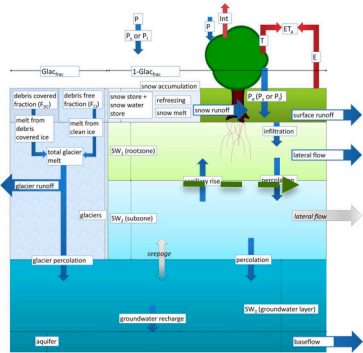
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Hydrological model

Hydrology (SPHY) model



Virtual Watershed

StDM Simulation
Out put
Biological and Environmental levels

StDM model
Land use dynamic level
Stella

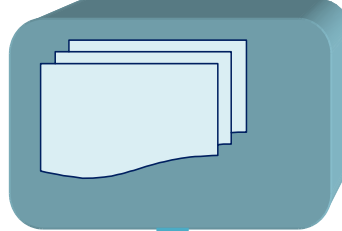
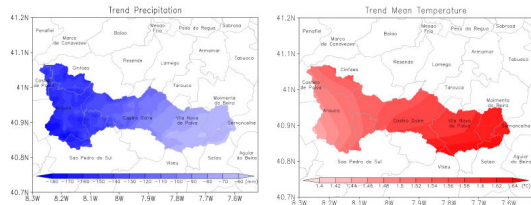


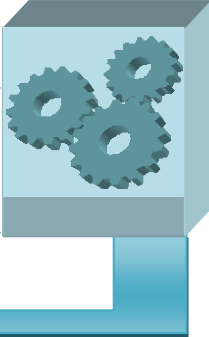
Image Simulation
Out put

Climate model

IPCC Scenarios



Cellular Automata



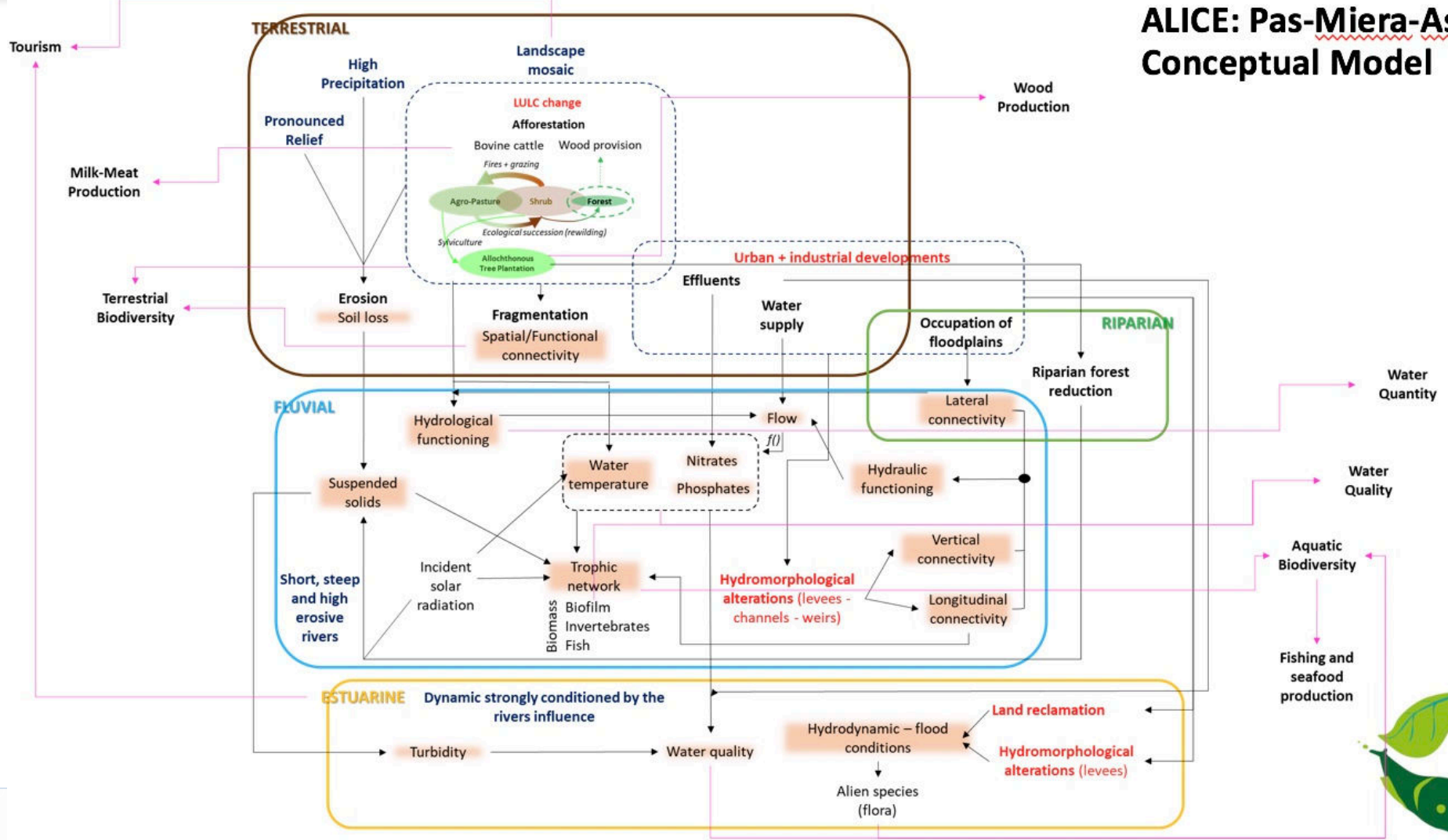
LULC model



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INTEGRATED MODELING

ALICE: Pas-Miera-Ason Conceptual Model



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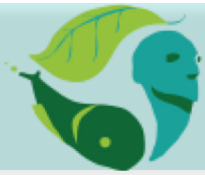
EURO-CORDEX ensemble simulations

- ✓ This methodology take in account the uncertainties associated with the design and parameterization of physical-mathematical climate models.
- ✓ 5 pairs of models are considered
- ✓ **Regional climate models (RCMs)** are coupled to **global climate models (GCM)**, allowing a significant reduction of scale and an increase in spatial resolution of the study.

Table 1. Listing of model pairs (GCM-RCM) used in ALICE.

GCM	RCM
CNRM-CERFACS-CNRM-CM5	CLMcom-CCLM4-8-17
CNRM-CERFACS-CNRM-CM5	SHMI-RCA4
MPI-M-MPI-ESM-LR	CLMcom-CCLM4-8-17
ICHEC-EC-EARTH	DMI-HIRHMA5
MPI-M-MPI-ESM-LR	SHMI-RCA4

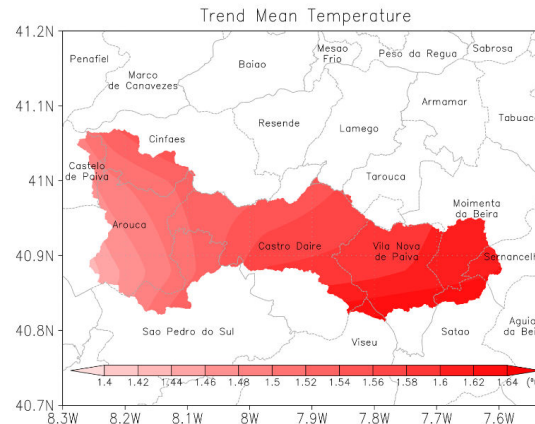
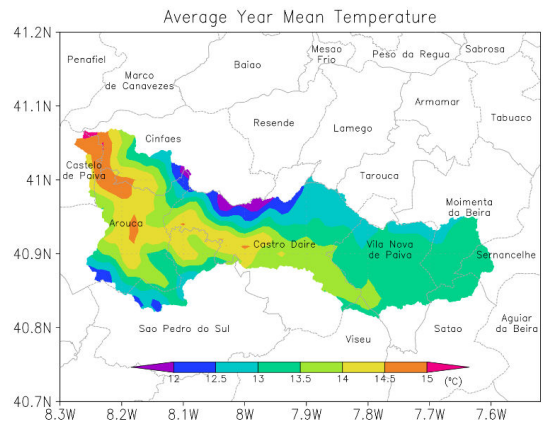
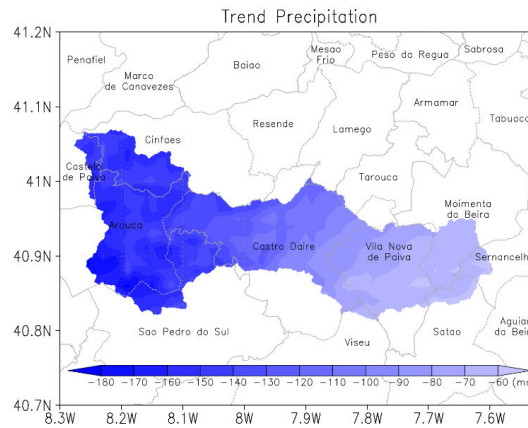
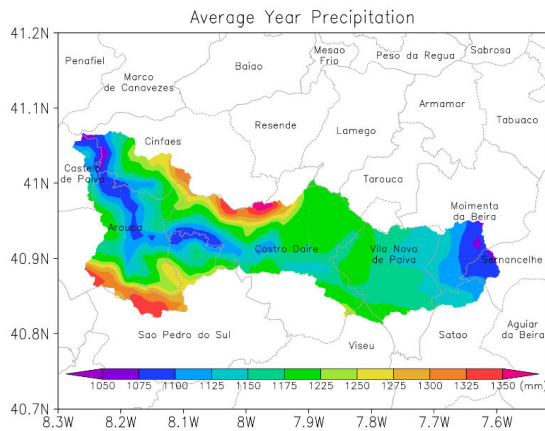
Data were subject to a bias correction performed under the previous project (SMHI-DBS45-MESAN, 1989-2010).



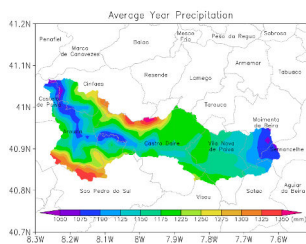
- ✓ Complementary scaling methodologies were applied, allowing the increase of the spatial resolution of ~12 km to ~1 km in all variables.

IPCC Scenario 4.5

IPCC Scenario 8.5

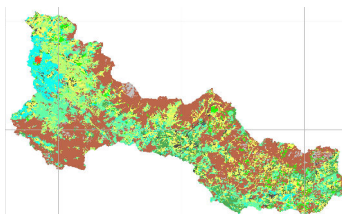


Climate projections



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LULC model



River and Estuarine models

- Hydrological models
- Flood models
- Water Temperature
- Nutrients (NO_3^4 , PO_4^3)
- Suspended solids
- DOM
- Ecological Status

- LULC
- Habitat Maps
- R&E Ecosystem Models

+

Selected BGINs, Scenarios & Case Studies



- Ecosystem Service Valuation and analysis of trade-offs
- Terrestrial and Aquatic Biodiversity



Establishment of schemes for payment for ES and biodiversity conservation



ALICE TEAM

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Thank you!!



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