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Estuarine marshes restoration through 'depolderisation': ecological, social and economical perspectives on the Ile Nouvelle case study (Gironde estuary, France)

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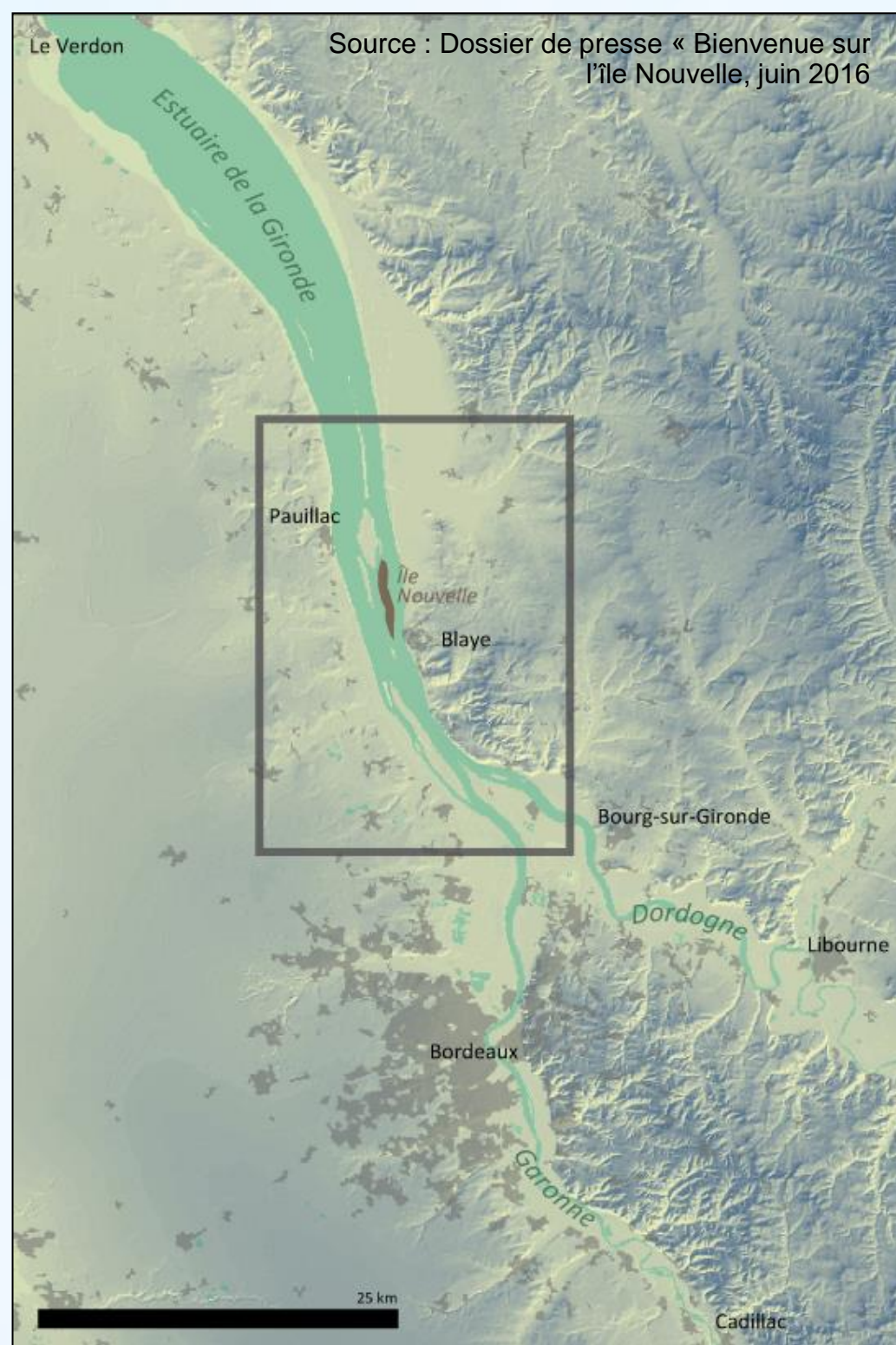
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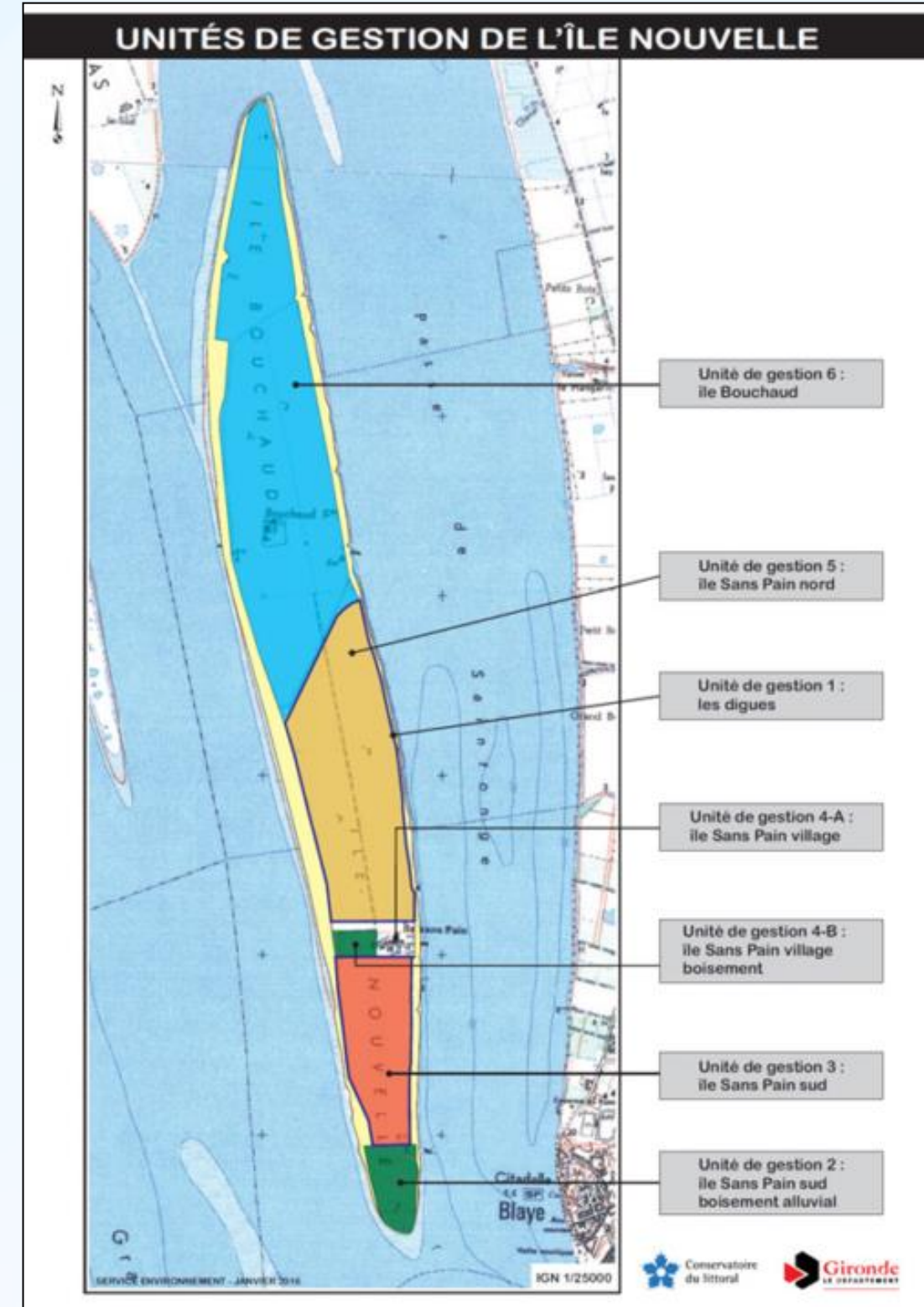
General context

- Coastal and estuarine marshes have been intensively dyked in Europe, with > 15,000 km² of polders^a.
- Climate change scenarios forecast an elevated risk of marine submersion and flood hazards.
- The cost of dykes management in such hazardous environment justifies an increasing interest towards nature-based (NB) solutions.
- The restoration of natural flood expansion zones is one of those NB solutions retaining some managers interest.
- Such restoration can also promote marsh ecological functionalities, that serve many other regulation and cultural services for human societies.

The 'Ile Nouvelle' as a pilot study site



An inhabited island in the upstream estuary



Flexible, multi-party and dynamic management

« Uncontrolled » tidal restoration
 « Controlled » tidal restoration
 Dyked area managed with locks



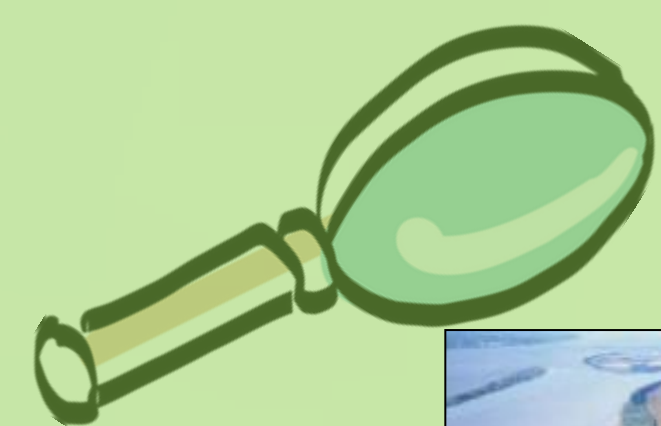
Observed rapid evolution of ecosystems in response to management decisions

Past and current research @ Irstea...

AQUATIC ECOSYSTEMS

Response of **nekton** structure and composition to tidal restoration^b

Response of **aquatic food webs** to hydrological management examined by stable isotopes ($\delta^{13}\text{C}$, $\delta^{15}\text{N}$, $\delta^{34}\text{S}$)



SOCIETY

Stakeholders perception (convergence/divergence; citizens & managers) of the system's dynamics in response to management actions^d



GOVERNANCE

Societal and political mechanisms behind **public decision making** when tackling the issue of climate change related risks (focus on flood and marine submersion risks; the Ile Nouvelle as a **policy window** or new model to promote wetland renaturation...)^c



ECONOMICS

Identify and quantify **ecosystem services related to estuarine marshes**^{e,f,g}
 Evaluate the benefits of **alternative estuarine wetland restoration scenarios**^h



Looking forward...

...to a broader context, considering **contrasted socio-economical and cultural frameworks**, and the **diversity of water exchange regulation regimes** applied in estuarine and littoral marshes in France and Europe

References and notes

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