



Is it worth investing in NBS aiming at mitigating water risks?

Insights from three European case studies

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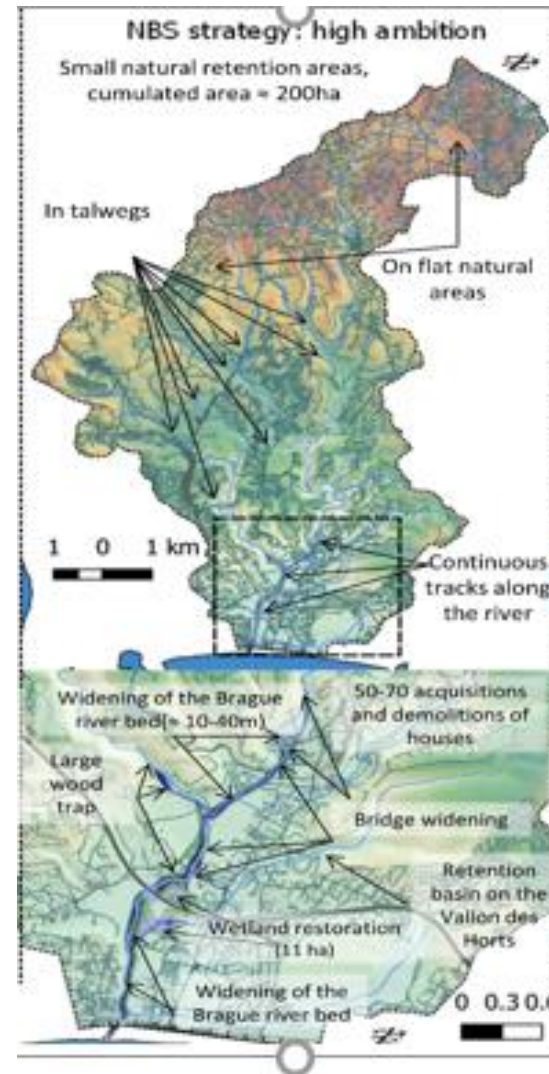
Introduction

- Annual damages due to climate risk expected to increase by 77% (IPCC, 2014), doubling of centennial floods in the next 3 decades (Alfieri et al., 2015)
- Limits of grey solutions to handle risks: environmental damages, high costs. Growing recognition of the role of ecosystems (NBS, green infrastructure...) in risk mitigation and the production of co-benefits
- Evaluating NBS economically is fundamental:
 - Cost-benefit analysis is a pre-requisite for large scale public investments in Europe.
 - Evidence are needed to convince decision makers and build business models
- We developed a common methodological framework fully applied to 3 case studies: Rotterdam (NL), Lez (FR) and Brague (FR)

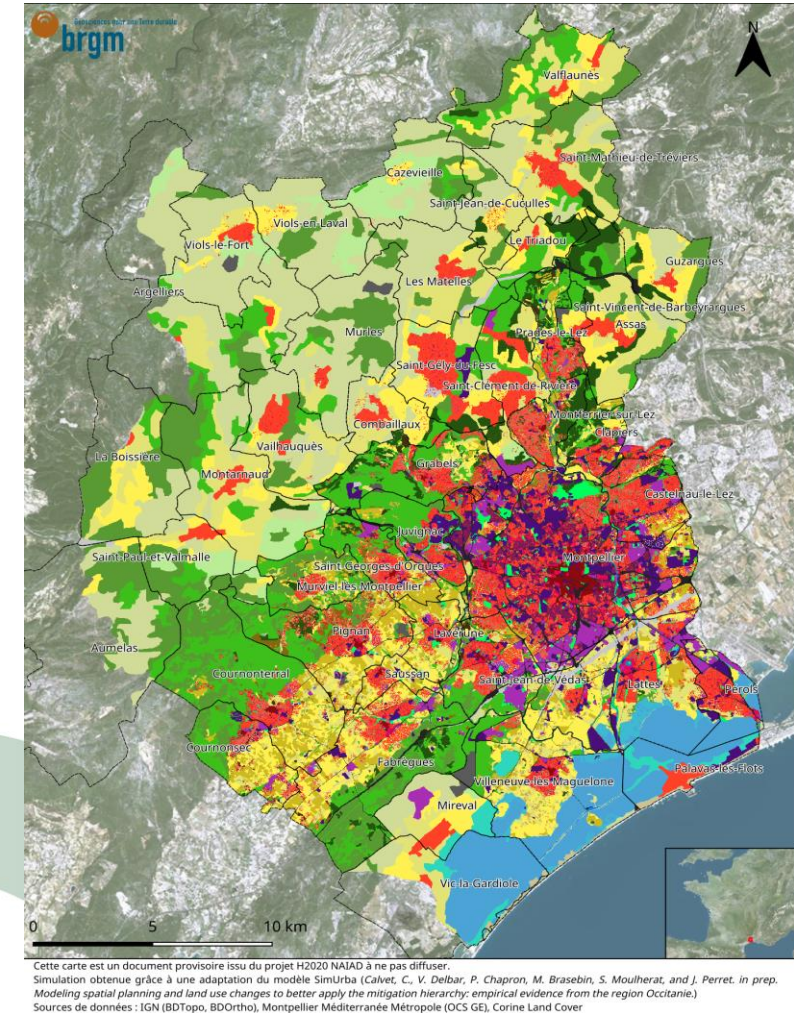
A diversity of scales and NBS Scenarios



Rotterdam (NL): Neighbourhood scale

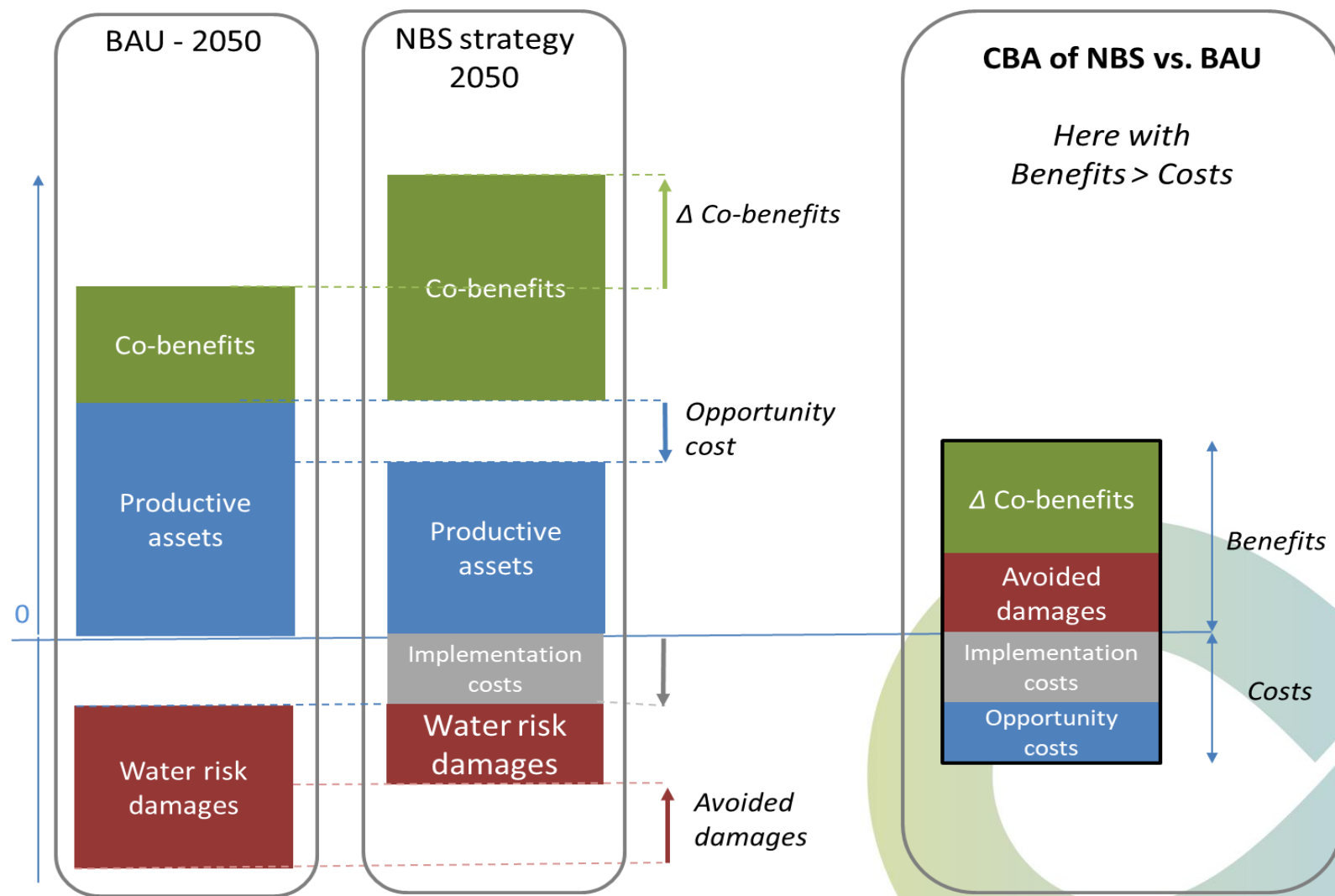


Brague (FR): river catchment scale



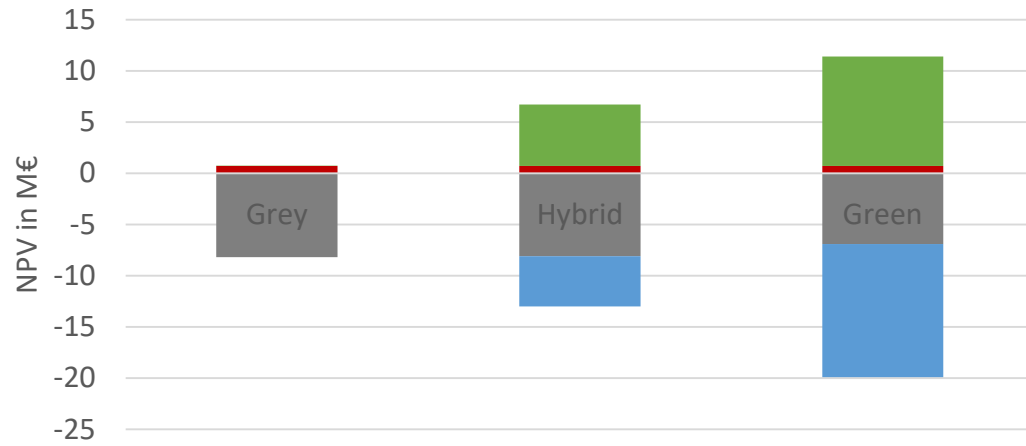
Lez (FR): city scale

Overall methodological framework



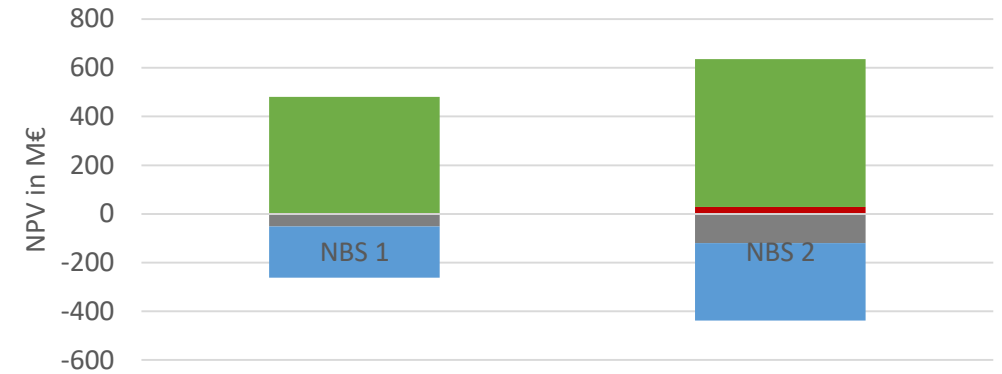
Results

Rotterdam



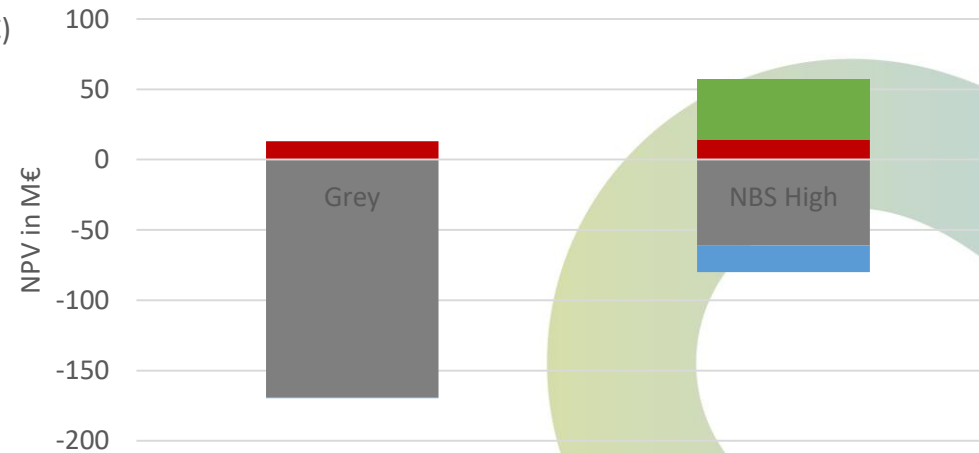
■ Cost of NBS scenarios (M€) ■ Opportunity cost (M€)
■ Avoided damages (M€) ■ Co-benefits (M€)

Lez



■ Cost of NBS scenarios (M€) ■ Opportunity cost (M€)
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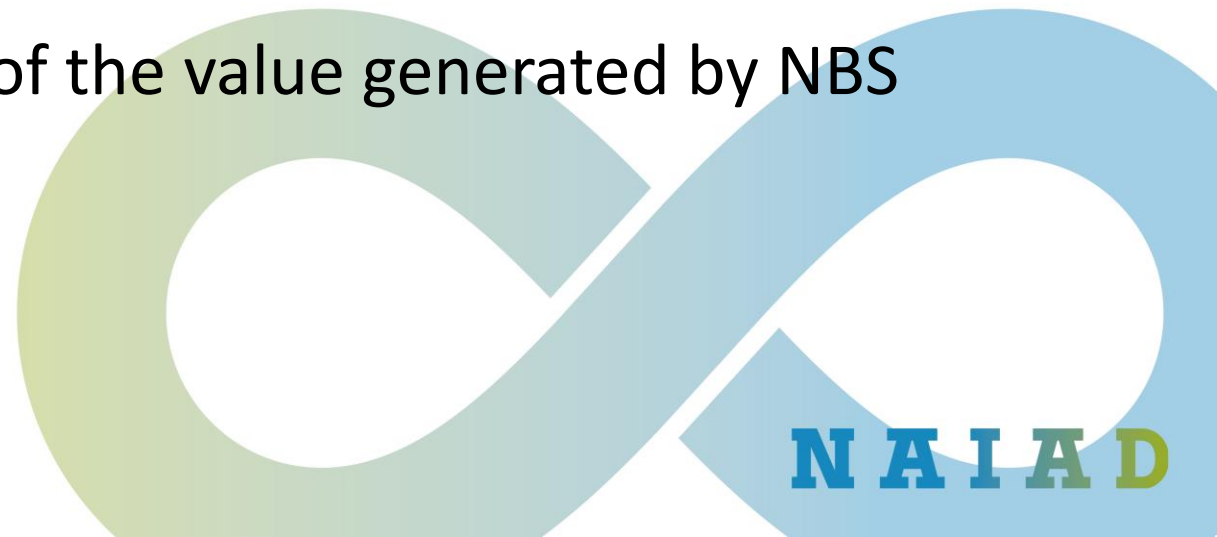
Brague



■ Cost of NBS scenarios (M€) ■ Opportunity cost (M€)
■ Avoided damages (M€) ■ Co-benefits (M€)

Results

- The cost of grey scenarios is higher than the cost of NBS scenarios for the same level of risk management: cost effectiveness advantage of NBS. Opportunity costs may be nevertheless large.
- Benefits in terms of avoided damages are not sufficient to cover costs. This situation is however worse for grey solutions evaluated in the project.
- Co-benefits represent the largest share of the value generated by NBS scenarios.



Results

- Opportunity costs, estimated by the land value occupied by NBS, represent a very large share of NBS especially in urban contexts
- There is no clear cut conclusions on the overall economic efficiency of NBS (Positive in Lez but slightly negative in Brague and Rotterdam).
- The assessment of avoided damages requires large modelling efforts for the evaluation of the impact of NBS on hazard and damages

Recommendations

- NBS for water-related risks cannot be automatically assumed to be economically efficient. Need for economic valuation to identify the most suitable strategy in a context of limited public funding.
- The largest share of the value of NBS comes from co-benefits. Large implications for the funding of NBS and the need to maximize co-benefits in the design of NBS.
- In urban areas: from designing NBS to solve one issue to managing scarce urban land with NBS and maximizing the diversity of benefits.