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2 - 13 JUNE 2025

Adapting to the Changing Cryosphere and Sea-Level Rise: Key Policy Insights from PROTECT & CoCliCo

11 June 2025

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CRYOSPHERE & SEA LEVEL

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CoCliCo
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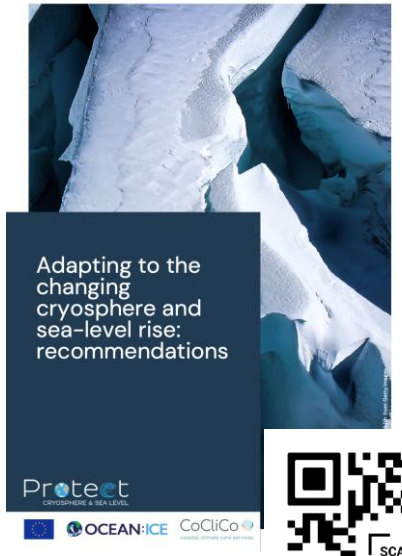

Key findings and recommendations

The cryosphere plays a critical role in the Earth's climate system. Glaciers, ice sheets, and sea levels are at the forefront of climate change impacts. Findings from PROTECT underscore the urgency of mitigating greenhouse gas emissions and adopting adaptation strategies to address inevitable impacts.

- **Mitigation is critical**: Reducing emissions directly limits mountain glacier and ice sheets mass loss, preserving critical water resources and limiting further acceleration of sea-level rise, thus giving more time for coastal adaptation. [Factsheets 1, 4, 5 and 7]
- **Adaptation is urgent**: With inevitable impacts on water availability and coastal regions, adaptation is of greatest importance. [Factsheets 1, 2, 6, 7, 8 and 9]
- **Regional variability matters**: Climate impacts on glaciers and sea levels vary substantially across regions, requiring tailored responses. [Factsheets 2 and 6]
- **Uncertainties are not barriers to action**: Decision science offers pathways to act amid the uncertainties, leveraging adaptation frameworks and pathways. [Factsheets 7 and 8]

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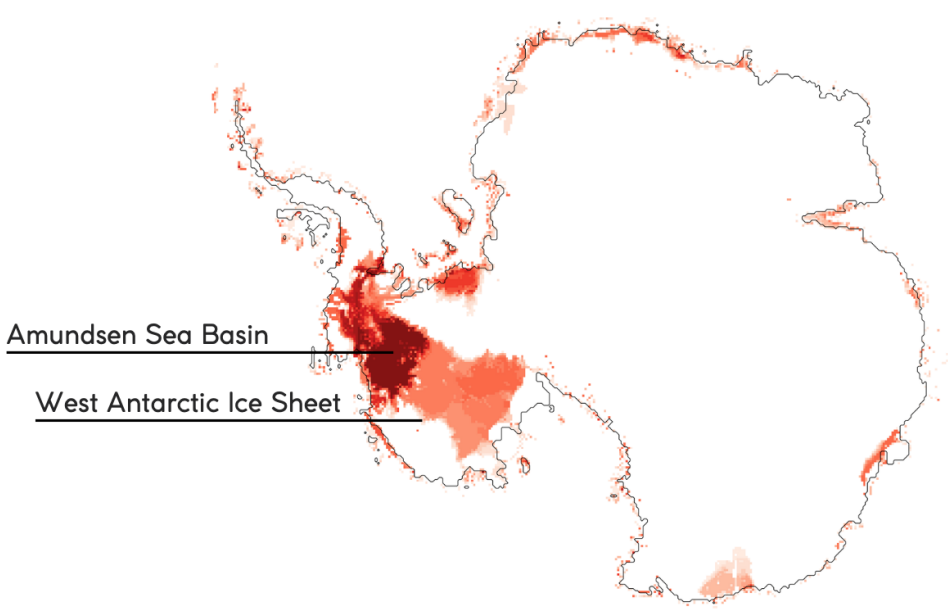
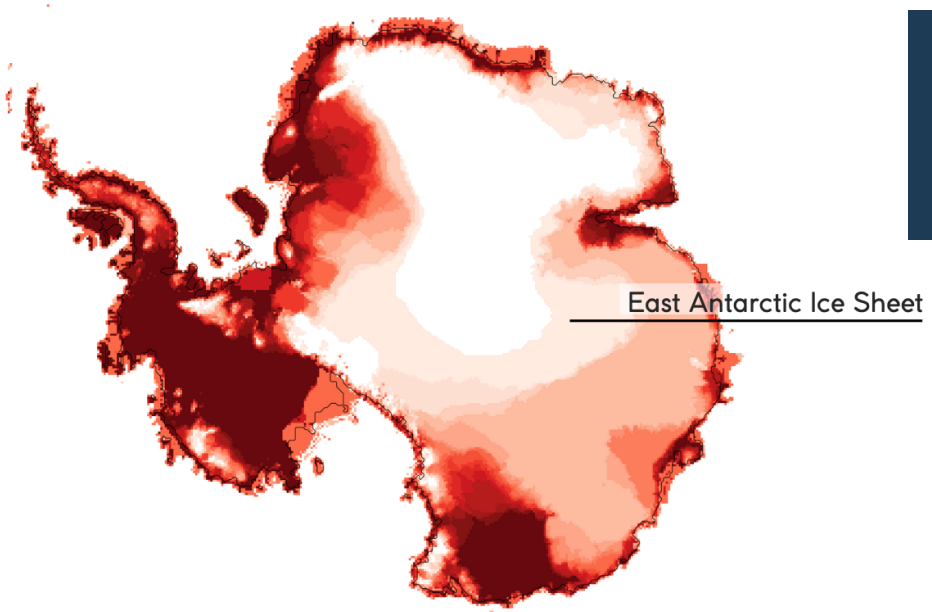
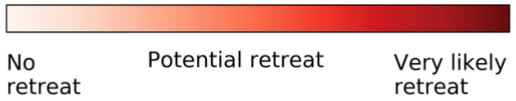
Future Sea-Level : the enduring legacy of Antarctic ice loss



Committed retreat of the Antarctic Ice Sheet when stabilizing climate in 2050 under low emissions (SSP1-2.6)
Contribution to sea-level rise in 5000 years: from 0.4 to 4 m

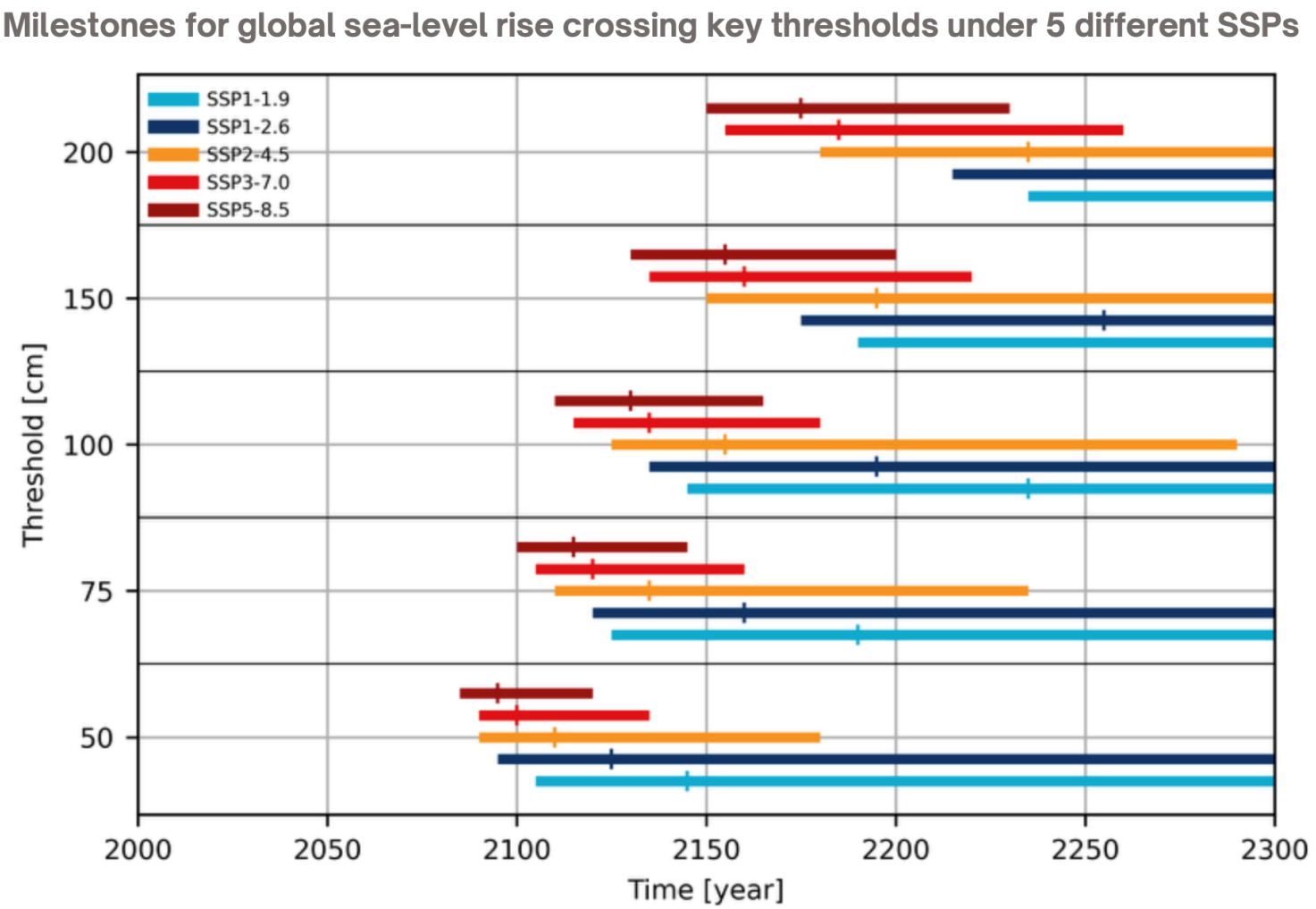


Committed retreat of the Antarctic Ice Sheet when stabilizing climate in 2300 under high emissions (SSP5-8.5)
Contribution to sea-level rise in 5000 years: from 7 to 40 m under extreme warming



Mitigation Is Critical

Sea level is committed to rise until 2300, but we can influence how much and how fast

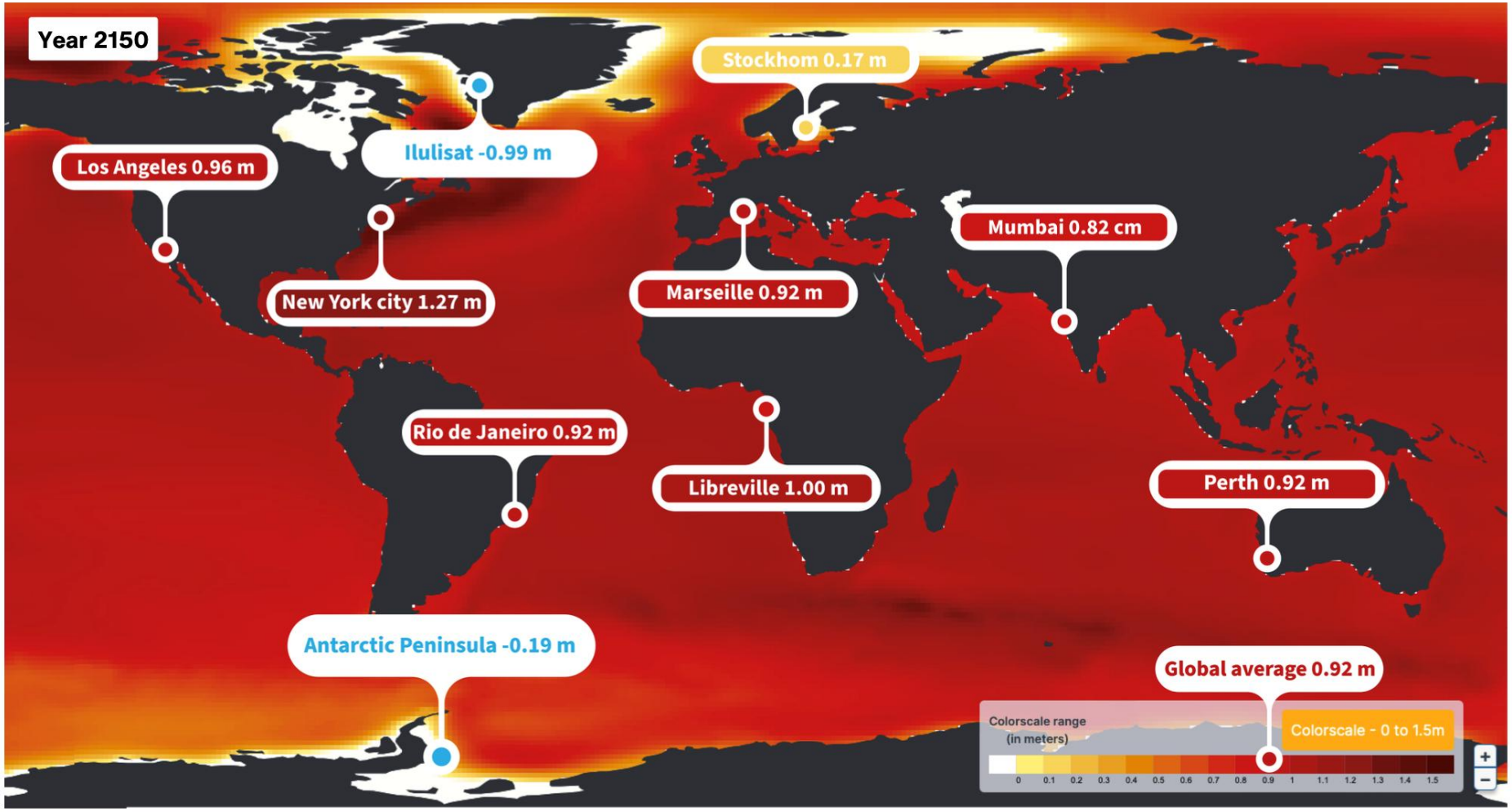


Mitigation Is Critical

Adaptation Is Urgent

Regional Sea-Level Change is different from the global average

Median sea level change under an intermediate warming scenario (SSP2-4.5) in 2150

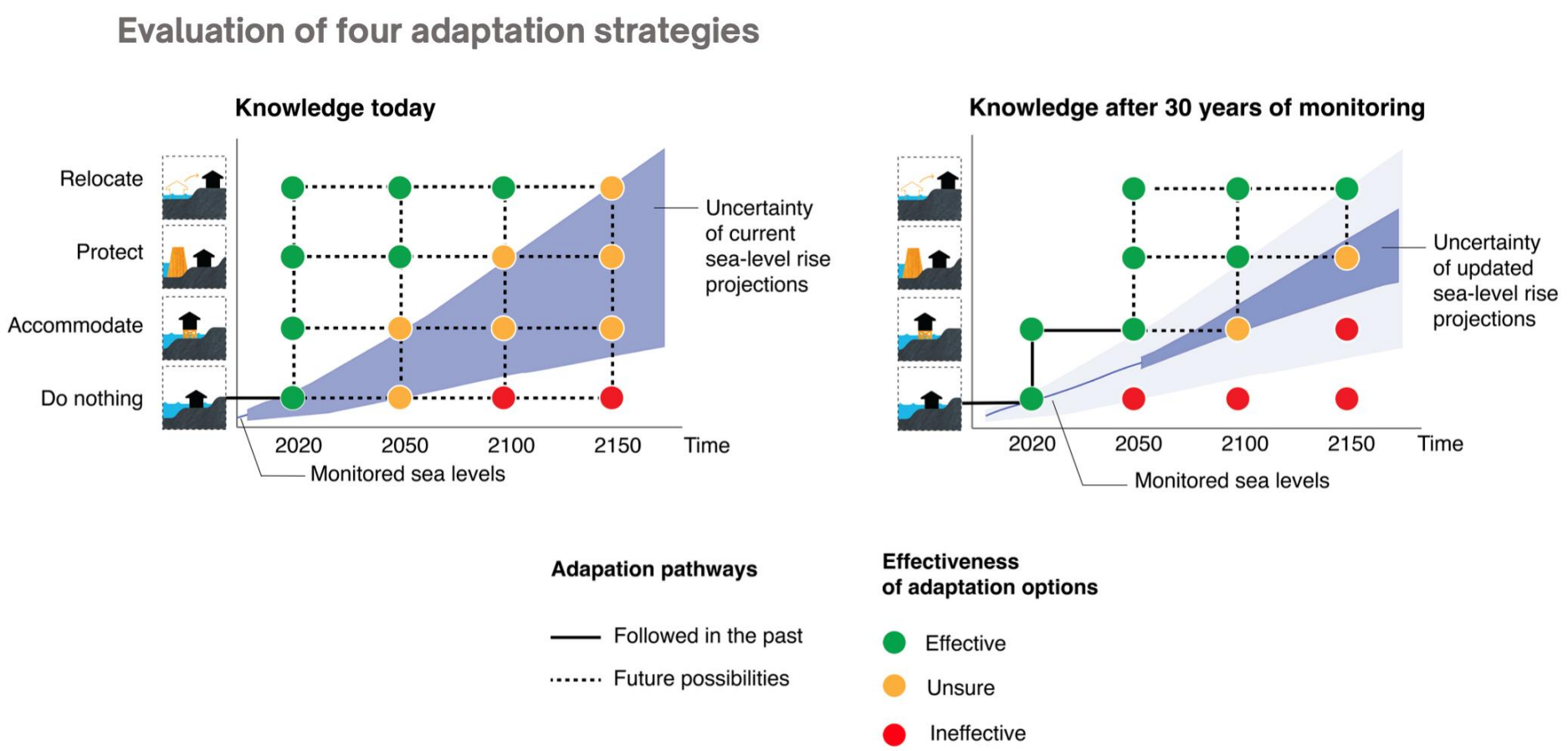


Mitigation Is Critical

Adaptation Is Urgent

Regional Variability Matters

Navigating Uncertainties: adapting to sea-level rise with flexible strategies



Mitigation Is Critical

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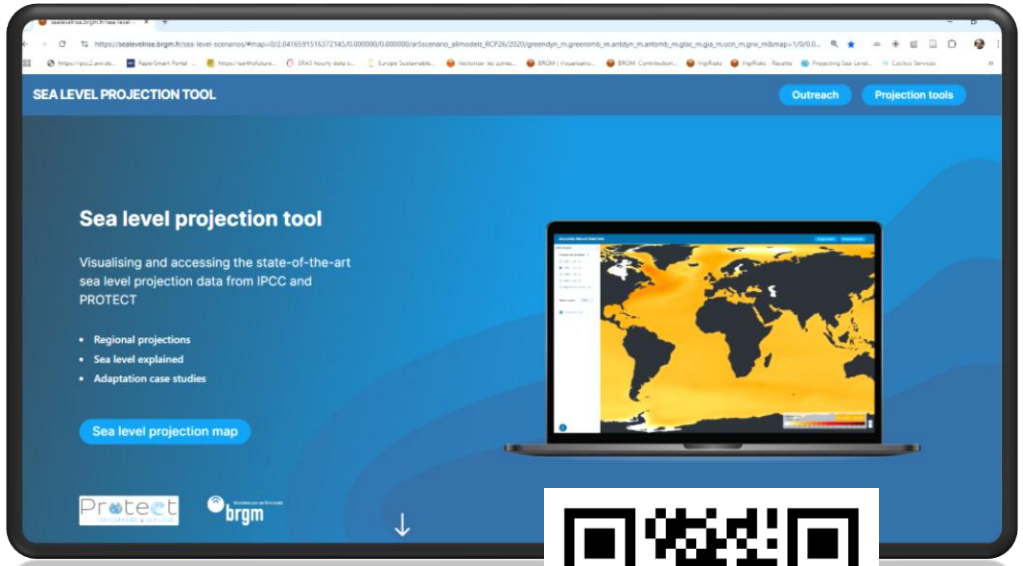
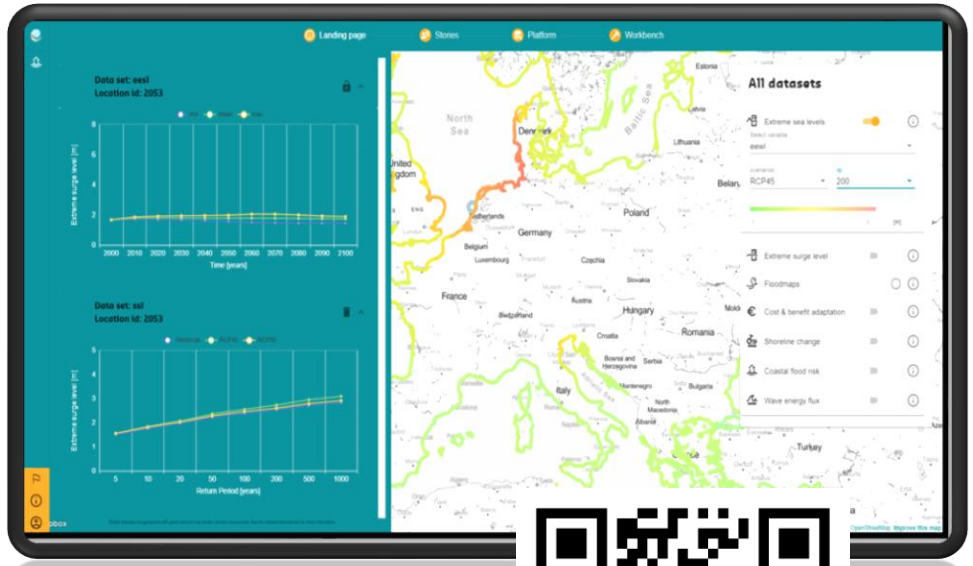
Regional Variability Matters

Uncertainties Are Not Barriers To ACTION

PROTECT Sea Level Projection Tool
CoCliCo Coastal Risks Platform





⇒Climate services for coastal adaptation to sea-level rise are now ready for operationalization

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Knowledge Gaps and Recommendations

- Improve monitoring and modeling of ice sheets
- Promote adaptive decision-making frameworks to integrate future learning into long-term coastal planning
- Use sea-level projection tools (e.g., NASA's tool, the PROTECT Sea-Level Projection Tool, or the CoCliCo Coastal Risk Platform) to support region-specific adaptation planning
- Institutionnal and policy support needed for operationnal uptake

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