KNOWLEDGE HUB

SEA LEVEL RISE

FIRST ASSESSMENT REPORT

European Knowledge Hub on Sea Level Rise

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JPI Climate — Governing Council — JPI OCEANS

Co-chairs	Management Committee		Secretariat
Task Group I	Task Group II	Task Group III	Task Group IV
Co-design	Policy	Physical Science	Communication & Outreach

Surveyed stakeholders, contributing authors, invited reviewers

Experts form 4 Task Groups of KH SLR

Drafting of 1st Assessment Report

2020 — 2021 — 2022 — 2023 — 2024

Countries nominate 60+ experts to form KH SLR

Stakeholder scoping phase

- Stakeholder survey (Winter 2021-22)
- Basin- specific workshops (Spring 2022)
- SLR Conference (Autumn 2022)

Open discussion, review and publication in **State of the Planet** journal

in review

1st Assessment Report

STATE OF THE PLANET

Introduction

Summary for Policy Makers

1. **Knowledge gaps through a participatory approach**
2. **Observations and projections**
3. **Impacts and consequences**
4. **Adaptation and decision-making**
5. **Governance context and challenges**

https://sp.copernicus.org/special_issues.html

Knowledge gaps identified through a participatory approach

...An online survey targeting stakeholders involved in coastal planning and research to assess i) availability and usage of Sea Level Rise (SLR) information, ii) impacts and impact assessments of SLR, iii) adaptation strategies and policy implications...

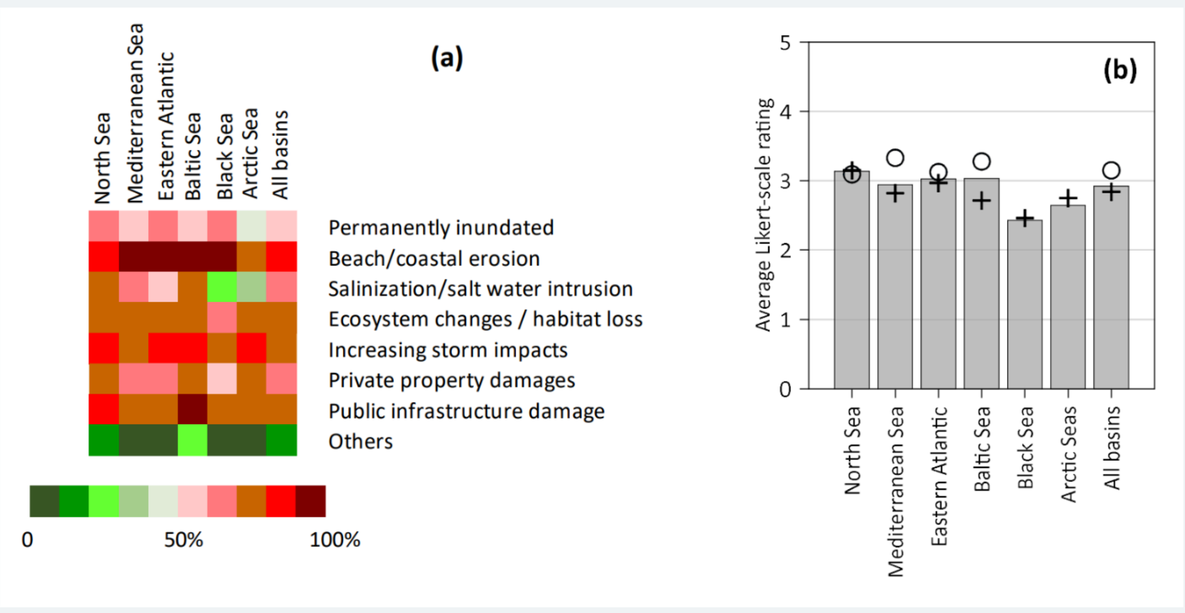

Figure: (a) Relevance of SLR-induced impacts per sea basin by % of respondents. (b) Average rating on Likert-scale to the statement: "High quality and up-to-date assessments of SLR impacts are available for making decisions on planning"). (o: government; +: research; colour bar: total)

...Responses from 200 participants, with 94% from 23 European countries and 6% from 8 non-European nations, 35% from government and 64% from research...

Observations and Projections

...Ongoing ice mass loss on Iceland and Svalbard contributes to local land uplift. Recent studies highlight widespread elastic Vertical Land Motion (VLM) in the European Arctic due to ice mass loss from Greenland...

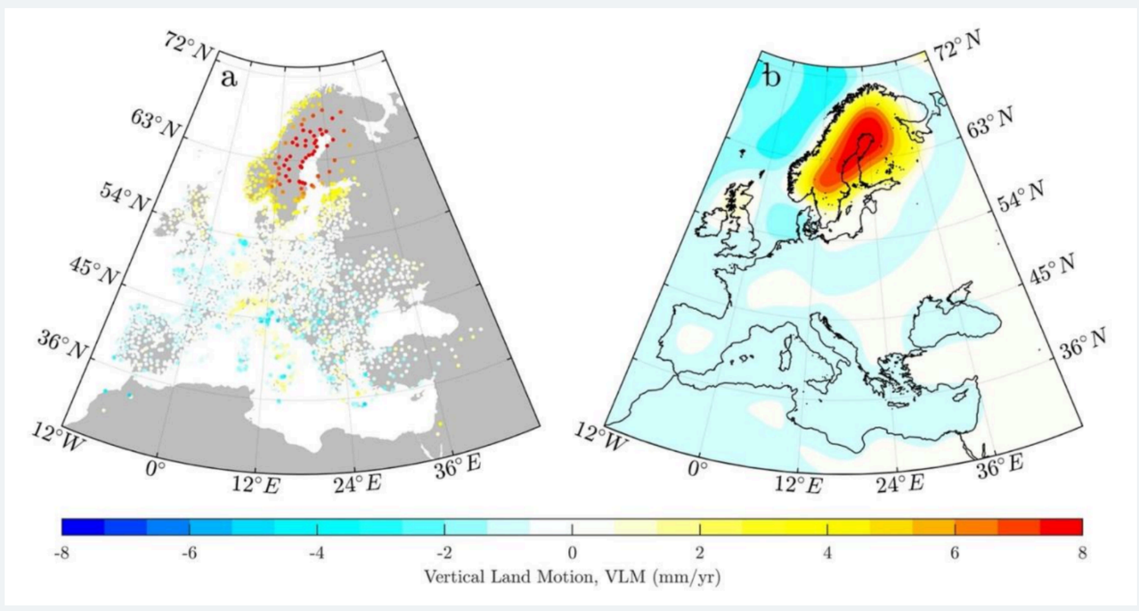

Figure: (a) preferred filtered and smoothed present day VLM field from Piña-Valdés et al. (2022) and based on data from ~4000 GNSS stations in Europe. (b) the present day VLM from the GIA inversion model from Caron et al. (2018). Units in mm/year.

Adaptation measures and decision-making

...In the North Sea Basin, countries have integrated sea-level rise information into coastal planning, employing a combination of hard and soft protection measures such as dike upgrading, sand nourishment, and managed retreat...

Response		Adaptation measure	Sub-KTM	Sea Basin	Impact	References
Accommodate	1	Flood-proofing and raising buildings	Grey options	North Sea, Mediterranean Sea	Coastal flooding, coastal erosion	(Dal Cin et al., 2021); (Ventimiglia et al., 2020); (Oppenheimer et al., 2019); (Ministerio de Agricultura y Pesca, Alimentación y Medio Ambiente, 2016).
	2	Adaptation measures to increase resilience of critical infrastructure	Grey options	Mediterranean Sea	Coastal flooding	(Cavalié et al., 2023); (Koks et al., 2023)
	3	Adaptation of groundwater management	Management and planning	North Sea	Coastal flooding, saltwater intrusion	(Ministerie van Infrastructuur en Waterstaat, 2023); (Ward et al., 2020); (Oppenheimer et al., 2019)
	4	Sustainable fisheries and aquaculture management	Management and planning	Baltic Sea	Impacts on ecosystems and estuaries	(Payne et al., 2021); (Oppenheimer et al., 2019)
	5	Restricting new developments in flood prone areas	Management and planning	North Sea	All	(Ministerie van Infrastructuur en Waterstaat, 2023); (Oppenheimer et al., 2019)
	6	Climate risk insurance schemes	Insurance and risk sharing instruments	Mediterranean Sea	Coastal flooding	(Bednar-Friedl B. et al., 2022); (Oppenheimer et al., 2019); (Ministerio de Agricultura y Pesca, Alimentación y Medio Ambiente, 2016)
Protect	11	Hard defence for coastal management (dams, dikes, levees etc.)	Grey options	Eastern Atlantic, North Sea	Coastal flooding, coastal erosion	(Ministerie van Infrastructuur en Waterstaat, 2023); (Del-Rosal-Salido et al., 2021); (Egberts & Riesto, 2021); (Estrategia de Adaptación al Cambio Climático de La Costa Española, 2016)
	12	Soft defence for coastal management (reloading littoral strips, cliff reshaping, polymer grids)	Green, blue, and grey options	Eastern Atlantic	Coastal erosion	(Oppenheimer et al., 2019); (Programa de Ação Para a Adaptação Às Alterações Climáticas, 2019); (ClimateAdapt, 2016b); (Buisson et al., 2012)
	13	Restoration and management of coastal ecosystems	Green and blue options	Eastern Atlantic	Impacts on ecosystems and estuaries, coastal flooding, coastal erosion	(Moraes et al., 2022); (Programa de Ação Para a Adaptação Às Alterações Climáticas, 2019); (Estrategia de Adaptación al Cambio Climático de La Costa Española, 2016); (Buisson et al., 2012); (Barbier et al., 2011)

Table extracts:
Adaptation measures to sea level rise

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For more information visit: https://www.knowledgehubsealevelrise.org/

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