

Thank you, Jelte, for your review of the Summary for Policymakers (SPM). Your constructive suggestions have contributed towards improving the overall quality and relevance of the SPM. We have based our revisions on your comments and suggestions, and hereunder answer your review points as well as provide the modifications that have been made in the manuscript.

- Reviewer's comment is shown in black colour and *italic font style*
- Our responses are shown in blue colour
- Text from the manuscript (added or modified) is shown in green colour
- The lines markers mentioned in some of our responses below are from the revised SPM manuscript copy which highlights all changes made

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- *The target groups could be made more explicit in the abstract or an introduction to the article.*

We have more detailed information on 'target audience' in the Introduction chapter of the assessment report, also published on the SoP website. Following your suggestion, this information was synthesised briefly and has now been added to the SPM abstract for clarity of the reader.

“The report's target audience includes national and sub-national bodies focused on research and policy advice for coastal management and climate adaptation, as well as European experts who contribute to shaping policy frameworks and collecting information at a pan-European scale.”

- *The current layout of the article is not very problematic, but it could be considered to start with the impact and adaptation measures, or to start the article with a clear indication where the reader can find what information. Some policymakers will not even be able to take (or make) the time to read this 15-page summary.*

Thank you for this relevant point. We have now added to the start of the SPM a set of “key messages”, to set the scene for what the document expands upon. Each key message provides references, in brackets, to the SPM sections it is a synthesis of. This will allow policymakers to know where they can find what information.

Addition of Key messages:

“Key statements from the First Assessment Report on Sea Level Rise in Europe

- *Sea level rise is a chronic hazard that is addressed in the governance of environmental and economic development of European coastal regions in all surrounding sea basins (section 5, 5.1, 5.2, 5.3, 5.4, 5.5).*
- *The mean rate of European absolute sea level rise slightly exceeds the global mean trend and is accelerating. Regional variability is large, with lower (or negative) relative sea level rise in some Baltic regions due to vertical land movements and effects of loss of land ice masses. Future sea level rise rates are very uncertain and depend greatly on emission scenarios. Higher relative sea level rates are expected in the southern areas (section 2, 2.3, 2.4, 2.5).*
- *Sea level rise has several coastal impacts (such as increased likelihood of floods, shoreline retreat by coastal erosion, freshwater shortages by saltwater intrusion). Other human interventions can exacerbate these impacts, such as reduced sediment supplies due to streamflow obstructions, urbanization and habitat loss in exposed coastal areas, lack of sustainable groundwater strategies, or ageing coastal infrastructure (section 3.1, 3.2).*
- *Values of sea level rise considered in the management of coastal developments vary across countries, and depend on socio-economic developments in coastal areas, environmental constraints and options to take measures against negative sea level rise impacts. Many countries have mainstreamed sea level rise in national and regional policies for climate adaptation, and (marine) spatial planning and environmental conservation (section 4.3, 5.1)*
- *Selection of options against adverse sea level rise impacts usually must strike a balance between multiple objectives, available time windows, and long-term implications. Uncertainty in future sea level rise and socio-economic developments require long term flexibility by adopting an iterative decision process and monitoring progress in reaching policy objectives (section 4.2, 4.3).*
- *Many measures to reduce adverse sea level rise impacts exist, classified in broad categories (accommodate, protect, advance and retreat). They include hard (engineering) and soft (nature based) infrastructure measures, upgrading or restoring existing coastal assets (such as dikes) or resources (such as aquifer recharge), preventive (such as early warnings) or recovery (such as insurance) measures, and changes in land occupation (such as managed retreat) (section 4.1, 4.3).”*

- *1.2.1: It would be interesting to know if there were representative responses from the different sea basins in both government and research groups.*

We already provide a reference in the SPM to the figure present in the full paper as part of this Assessment Report, titled ‘SLR: Knowledge gaps identified through a participatory approach’ (Jiménez et al. 2024) which gives an overview of the responses received from the different groups surveyed, per sea basin. We have decided not to include images from the various chapters in the SPM and would like to apply this approach to all images. However, we have now

added comments between lines 85-94 of the revised manuscript that describe the governmental and research groups. We hope this is sufficient.

1.2.1 Online Survey

An online survey targeting stakeholders involved in coastal planning and in research was conducted to assess the availability and ~~usage~~ use of SLR information, impacts ~~induced by~~ of SLR, and adaptation strategies and policy implications of SLR. Responses were received from 200 stakeholder participants, with 94% from 23 European and 6% from 8 non-European countries, with participants' professional backgrounds separated into two groups. The first group (labeled as “government”) consists of potential users of SLR information for policy design and implementation, usually professionals in public regional and national governance and in private industry with advisory roles, and was represented by ~~government~~ about one third of the respondents. The second group (labeled as “research”) consists of information providers, and consists primarily of academic research staff (about two third of the respondents) (see Figure 2, Jiménez et al., 2024, this volume). Major outcomes of the survey are summarized in the text below (also see Jiménez et al., 2024, section 3.1, this volume).

Section 2 is the most difficult to digest, especially for the assumed target audience. It is relatively dense compared to the other sections. Although this is the crucial information needed to understand the why and what of impact and adaptation measures, it could be considered to move this section (see previous comment) or decrease the amount of scientific jargon.

Thank you, we agree with your analysis here, and have reworded section 2, replacing domain-specific terms with simpler, more-commonly known terms wherever possible.

Changes made are as follows:

Section 2.1 lines 202-210: Regional patterns of relative SLR are mostly explained by ~~ocean dynamics and gravitational patterns associated with~~ ocean current changes and mass loss from Greenland ice sheet and mountain glaciers. Climate ~~modes of~~ variability such as the North Atlantic Oscillation (NAO) significantly affects ~~regional sea level trends and extremes, impacting storm surges along western Europe. Changes in~~ storminess and atmospheric pressure patterns ~~impacting associated with NAO influence~~ the frequency and intensity of extreme sea level events, particularly storm surges.

Section 2.2 lines 235-236: ~~a temporal variability~~ → large changes over time

Section 2.2 lines 244-245: ~~glacial isostatic adjustment~~ → past and present terrestrial ice mass loss

Section 2.2 lines 245-247: Changes in SLR, ~~due to temperature, salinity and currents~~ ~~is~~ are projected to be relatively uniform across the North Sea. However, ~~projections acknowledge the~~ uncertainty stemming from factors like the resolution of global climate models (GCMs) and local dynamics ~~are still large.~~

Section 2.3 line 257: attributed to past ice mass loss ~~and glacial isostatic adjustment (GIA).~~

Section 2.3 lines 258-259 → Recent studies highlight widespread ~~non-negligible elastic~~ VLM in the European Arctic due to ice mass loss from Greenland.

Section 2.3 lines 263-265 → Projections suggest that the European Arctic will experience a below ~~than~~ global average relative SLR, mainly due to ~~land uplift GIA and gravitational, rotational, and deformational (GRD)~~ effects, particularly from Arctic glaciers and the Greenland ice sheet ~~melting.~~

Section 2.3 line 267: ~~stereodynamic-SLR~~ → temperature, salinity and current driven SLR

Section 2.4 line 277: ~~steric component~~ → temperature and salinity components

Section 2.4 line 284: ~~steric-SLR~~ → SLR

Section 2.5 line 307: ~~GIA~~ → ice mass loss

Section 2.5 line 317: ~~Meridional gradient~~ → north-south gradient

Section 2.5 line 318: ~~GIA-induced effects~~ → the effects of ice mass loss

- *For several sections, it could be considered to use visual elements (tables/figures) to show the differences between the six European sea basins. Providing policymakers an overview of the basic difference between the knowledge needs, impacts, adaptation measures, drivers and projections in the different sea basins.*

We have added references to relevant figures/tables/graphs present in the full chapters of the Assessment Report throughout the SPM. This is to keep the SPM a text-only document. The secretariat of the Knowledge Hub is preparing a summary report of the SPM, to be used for dissemination activities; this summary report will have the visual elements in it.