Response to reviewers on manuscript *Reducing Risk Together: moving towards a more holistic approach to multi-(hazard-)risk assessment and management*

By Philip J. Ward et al.

Editor – Margreth Keiler

Thank you for submitting your manuscript and for the considerable effort invested in this work. Following careful evaluation of the paper and the two reviewer reports, I am pleased to inform you that your manuscript is accepted pending minor revisions.

Many thanks for the encouraging words. We respond to each of your comment and those of the reviewers one by one in this document (in red).

As you are aware, the manuscript type was adjusted during the review process and is now classified as an Invited Perspective. This format very well reflects the nature and intention of your contribution. The manuscript not only reports on the results of the projects, highlighting valuable lessons learned and key challenges encountered, but considering the new manuscript type it also clearly intends to stimulate an open debate among peers. I encourage you to emphasize this perspective character even more explicitly in the revised version.

Many thanks. We have reviewed the manuscript and added several small textual changes throughout parts to further stress the perspective nature. In particular, we have adjusted the opening sentences of the outlook paragraphs to make the perspective aspect more explicit, as well as small changes in the introduction. Also important in this regards has been the expansion of the Outlook section to more clearly outline our perspective on the potential for (and challenges of) upscaling and transferring the MYRIAD-EU findings elsewhere. We address these changes in detail in our response to the final two comments of Reviewer 2, below.

Reviewer 1 has provided a thoughtful and well-structured summary of the manuscript's main strengths and core messages. It may be beneficial to highlight these central points more clearly in the structure of the manuscript itself. Strengthening the visibility of the main insights and take-home messages, for example through adapted section framing or synthesis elements, would further enhance readability and impact.

Following the very good suggestion of Reviewer 1, we have added an extensive section on the topic of MHEWS to the Outlook section (for details please see our response to the final comment of reviewer 1 below. Our feeling as that the summary points of the reviewer indeed reflect well the message of the paper, which we interpret as showing that the overall setup conveyed the main message that we were hoping to convey – in that sense, we would prefer not to change the overall flow of the paper, and feel that the current setup of the outlook, with the main message of each paragraph summarised in bold in the first sentence draws out the main points.

As suggested in the reviews, incorporating additional insights from related or subsequent studies would provide added value and help position your findings within a broader scientific context.

Thank you. In particular we have added an extensive section on MHEWS, referring to developments from a range of related studies (see response to comment of reviewer 1 on this topic). At the same time, in response to the first comment of reviewer on one on the scope, we have now to make it even more clear that the paper is intended to serve as a perspective based mainly on the progress made in this field through the project. During this period, several other projects and groups have also been working on this topic, and this contribution is not intended to summarise this impressive body of work. Having re-read the paper, we found this focus to be clear in the abstract, but indeed more open to interpretation in the introduction. We have therefore added the following sentence to the introduction to make this clear:

"This contribution is not intended to serve as a summary of the rich contributions from other multi-risk projects, including those mentioned above, but rather provides our perspective on how results from MYRIAD-EU contributed to advancing our research agenda and what next steps are still required."

As outlined in our response to reviewer 2, we have also made several amendments throughout the text to clarify this.

Where the manuscript aims to draw more general conclusions, a brief reflection on the transferability of the findings would strengthen the paper as suggested by one of the reviewers. In particular, discussing how insights derived from a predominantly European set of case studies may or may not apply to other global contexts would enhance the international relevance of the contribution.

This suggestion was indeed very useful for improving the paper. We have made extensive changes to the manuscript (sections 2.6 and section 3) in order to bring in these insights. A detailed description of these changes can be found in our response to the final two comments of reviewer 2 below.

Finally, I recommend based on the review report streamlining and clarifying the terminology used throughout the manuscript, particularly regarding the terms "multi-hazard," "multi-hazard risk," and "multi-risk." Providing clear and consistent definitions, ideally aligned with how these terms were used within your project, would greatly support readers from different disciplinary backgrounds.

Indeed, this is a very useful suggestion and in line with one of the suggestions of reviewer 2. We have now adopted and defined the terms multi-hazard and multi-risk, dropping the term multi-(hazard-)risk, and explaining our rationale for doing this, which is also based on experience within the project. We provide an extensive explanation of these changes in response to the specific comment of reviewer 2 on this topic.

Reviewer 1 – Alan Tan

General comments on manuscript

This manuscript highlighted the learnings gained and challenges faced in research conducted on multi-hazards risk assessment and management undertaken in the MYRIAD-EU project. The

manuscript was well-written with key points easy to understand and follow. Although the manuscript did not discuss any technical approaches in details, due to the limitation of the imposed length of the manuscript and the number of contributions made throughout the project, highlighted approaches were well-cited and easy to follow if readers wants to find out more details about those approaches.

Specific comments:

The authors highlighted valuable learnings and challenges that are beneficial and insightful for DRM researchers looking to apply their research to create real world impacts in practice. Some highlighted key learnings (scientific) includes:

- DRM-MR approaches needs to be holistic so as to enable understanding of interdependencies across hazards, sectors, governance.
- understanding the dynamics and interactions between hazards in a multi-hazard scenario is challenging and requires use of different methods, such as storylines, machine learning and exploratory data visualisation techniques, to help untangle the complex interactions.
- multi-hazards risk assessment research and solutions need to be flexible based on the sectors and scenarios it is applied to, for example the use of risk metrics will differ based on the impacted sector(s). This is to allow stakeholders to better understand the impacts of multi-hazards.

Some key learnings that extend beyond scientific research but is useful for DRM-MR researchers to consider:

- no one-size fits all solutions when it comes to DRM, even more so when applied to multi-hazards, due to the dynamic nature of interactions between factors such as environment, between-hazards, vulnerabilities, governance processes and implemented adaptation measures.
- importance of co-development with stakeholders involved as early as the proposal formulation stage, so as to ensure the research outputs stay relevant and integration of knowledge from different parties in the collaboration / consortium.
- importance of building a common understanding in the terms and definitions and that the process of doing so needs to be an evolving process.

The authors also highlighted relevant challenges faced in their MR research journey, pointing towards potential areas for future work in advancing our capabilities and understanding in multi-hazards:

- lack of datasets and scenarios to inform MR-related research and studies.
- limited understanding of multi-hazards and their complexity
- multiple data sources, such as from Earth Observations technologies, should be considered and integrated in applications to increase data quality and availability. The "how-to" remains an open research area.

We thank the reviewer for the time taken to review the manuscript. We appreciate the positive comments and the concise summary of our main highlights. Indeed, we are glad to see that the main points came across clearly in the manuscript.

While the authors have also highlighted some future directions for research, such as development of multi-hazards early warning systems, I would appreciate it even more if the authors were able to provide, from their perspective and experience in multi-hazards research, what is currently missing or challenges that are obstacles to the successful development and adoption of multi-hazards early warning systems in real-world.

Thank you for this comment. We have now expanded on the underlying challenges for the adoption of MHEWS by adding the following text:

> *"This is not surprising, as the integration of multi-hazard and multi-risk thinking across the four pillars of EW4ALL, namely risk knowledge, forecasting and monitoring, dissemination and communication, and preparedness and response, is inherently challenging because of methodological and practical complexities. For example, building strong risk knowledge requires locally relevant assessments that consider interactions between hazards as well as changing vulnerability patterns within a given multi- hazard scenario. In practice, however, the necessary data, especially detailed and disaggregated information on vulnerability such as age or gender, are often not available, while specifics of vulnerability per hazard type are not considered adequately (Haer & De Ruiter 2024). In their literature review on the role of AI for EWS, Tiggeloven et al. (2025c), note a similar pattern: even though technologies are rapidly changing and increasingly used, a significant gap exists on the implementation MWEHS in research papers. Similarly, preparedness and response planning faces similar difficulties, as it must account for the needs of both people and infrastructure under multiple, potentially compounding hazards. A combined tsunami and heatwave event, for instance, may require air-conditioned tsunami shelters and towers, showing how response strategies must address multi-hazards and multi-risk. Furthermore, response options also need to avoid conflicts (i.e., asynergies as defined by de Ruiter et al., 2021) between measures designed for different hazards. In reality, planning is still largely carried out for single hazards in isolation. From a broader governance perspective, effective MHEWS Systems depend on strong collaboration across institutions, sectors, and policy areas. Yet practical experience, including findings from the MYRIAD-EU project (Šakić Trogrlić et al., 2024), shows that achieving such coordination remains a major challenge due to siloed institutional working resulting in a lack of ownership of multi-hazard and multi-risk knowledge. Advances within MYRIAD-EU and related projects demonstrate clear potential to move towards truly multi-risk oriented systems, and especially from a methodological perspective."*

Reviewer 2 - Maximillian Van Wyk de Vries

In this manuscript, the authors compile the key findings of the recent MYRIAD-EU project and discuss the ways in which this improved our understanding and treatment of multihazard and multi-risk processes. The manuscript is well written and provides an appropriate level of detail – with well-placed citations throughout. The project's scope and achievements are impressive, and this paper will serve as a useful and accessible overview to a broader community. In some places it would be useful to clarify whether the manuscript serves primarily as a summary of key project outcomes, or rather a general commentary on the state of multihazard/multi-risk assessments

and management with an evidence base from the project, or a combination of both of these. Where the manuscript aims for more general conclusions, brief discussion of how insights derived from a predominantly European set of case studies may or may not transfer to other global contexts would strengthen the paper. Overall, minor revisions should be sufficient to address these points.

We thank the reviewer for the time taken to review the manuscript. We appreciate the positive comments on the results of the project and the paper, and very much value the suggestions to further strengthen the paper.

In terms of scope, the manuscript is indeed intended to serve as a perspective based mainly on the progress made in this field through the project. During this period, several other projects and groups have also been working on this topic, and this contribution is not intended to summarise this impressive body of work. Having re-read the paper, we found this focus to be clear in the abstract, but indeed more open to interpretation in the introduction. We have therefore added the following sentence to the introduction to make this clear:

"This contribution is not intended to serve as a summary of the rich contributions from other multi-risk projects, including those mentioned above, but rather provides our perspective on how results from MYRIAD-EU contributed to advancing our research agenda and what next steps are still required."

We also identified a few other locations in the manuscript where it was not explicit whether the findings being described stem from MYRIAD-EU or more general, and have rephrased to make this more explicit. For example, the following changes were made:

"Beyond DAPP-MR, additional approaches have been used to evaluate the effectiveness of DRM measures across hazards, sectors and time." → "Beyond DAPP-MR, we used additional approaches to evaluate the effectiveness of DRM measures across hazards, sectors and time."

"Beyond the pathways approach, additional approaches have been used to evaluate the effectiveness of DRM measures across hazards, sectors and time quantitatively" → "Beyond the pathways approach, we used additional approaches to evaluate the effectiveness of DRM measures across hazards, sectors and time quantitatively."

With regards the point on discussing how insights derived from a predominantly European set of case studies may or may not transfer to other global contexts, this is an excellent addition. We address this point below under the reviewer's final specific comment.

I include line by line comments below.

Thank you for these valuable comments. We respond to each point in turn below.

Title: I am sure there has been much discussion on this point, but is the term 'multi-(hazard)risk' the best to use? The complex double hyphen and brackets formulation leaves it open to some confusion, particularly as I am not sure this exact term is explicitly discussed. Could this be changed from 'multi-(hazard-)risk' to either 'multi-hazard and multi-risk' or simply 'multi-risk'. To dig further I went into the MYRIAD "D1.2 Handbook of Multi-hazard, MultiRisk Definitions and Concepts" which doesn't have this exact formulation, and different definitions for "Multi-hazard

risk" and "Multi-risk" with the difference being that the latter incorporates interrelationships on the vulnerability level. Given the discussion around vulnerability in this article perhaps "Multi-risk" is the most appropriate term? Either way some explicit definition and clarification would help and improve the readability of the article to broader audiences.

This is an excellent point, and one that we have indeed discussed at length at various points. We originally coined the term "multi-(hazard-)risk" in our research agenda paper in Ward et al. (2022). The reason for this was that we noticed that three different definitions had been put forward for different, yet related, concepts, namely: multi-hazard (UNDRR, 2017), multi-hazard risk (Zschau et al., 2017), and multi-risk (Zschau et al., 2017). For that perspective, we searched for a term that could be used to refer to these collectively, and came up with "multi-(hazard-) risk". Hence, given that the new perspective paper is intended as a follow-up to this original research agenda paper, we thought that it may be useful in terms of consistency to use the same term.

However, we also appreciate that the use of the double-hyphens and brackets is in itself not a particularly attractive phrasing, and hence we have indeed not used this widely throughout the project, as also observed by the reviewer who notes its absence in the Handbook. In fact, during the initial phase of the project, some of the feedback on general terminology used in the field was that the addition of "multi-" to more and more terms is not particularly useful (with multi-vulnerability being a case in point). In this sense, on reflection and given the reviewers comment on this, we propose to amend the manuscript and only use the terms multi-hazard (when specifically referring to aspects that only touch the hazard dimension) or multi-risk (when referring to aspects that move beyond hazard only). When the text refers to both (like the title) we would then use "multi-hazard and multi-risk". Also, we would add the following at the end of the introduction section to clarify this:

> *"In this paper, we use the term 'multi-hazard' to specifically describe both 'multiple hazards' faced by a region and the context in which various hazards interact with each other in various ways (e.g. simultaneously, cascadingly, or cumulatively) strictly at the hazard level. This follows the definition of multi-hazard of UNDRR (2017). We use the term 'multi-risk' when we specifically referring to risk that is generated from these multi-hazards, including how they interact with the other risk drivers (vulnerability and exposure), which reflects the definition of Zschau (2017). When the text refers to (or could refer to) both of these terms collectively, we state 'multi-hazard and multi-risk'. In this sense, we deviate from using the term 'multi-(hazard-)risk' that we put forward in the Ward et al. (2022) paper, since experience through stakeholder dialogue throughout the project showed that the proliferation of new terms including the 'multi' prefix itself can itself be a challenge for fostering common understanding (Gill et al., 2022). "*

Affils – 2. Is just an address. Should this be Deltares?

Correct, thanks for spotting this typo. It has been added.

L37-38 This line "how multi-(hazard-)risk both shapes, and is shaped by, risk dynamics over space and time" is not clear – could it be reworded?

We agree that this sentence is overly and unnecessarily complicated. We have amended to:

"..., continue developing a strong evidence base of how dynamics in hazard, exposure, and vulnerability in space and time shape multi-risk, ..."

This sentence is also amended in the outlook section (Section 3).

48 'recent mid-term review' -> '2023 mid-term review'

This is indeed more specific, amended as suggested.

125-130 Is there a mechanism for broader input into this gateway (e.g. 'wiki discussion' type, or comment section type)?

Thank you for the suggestion. The MediaWiki platform used to develop the Disaster Risk Gateway does include functionality for discussion pages associated with each content page. At present, these features have been disabled due to technical constraints and the limited resources available to support appropriate moderation. Subject to securing additional funding, our intention is to address these technical issues and enable discussion pages in a future development phase.

Figure 1- figure is low resolution – can you include the full res version? I can see it on the dashboard (https://dashboard.myriadproject.eu/).

Yes, a high resolution version will be uploaded at the production phase according the journal's requirements.

L228-229 Perhaps reword these lines, e.g. neural networks are a type of machine learning.

We have rephrased to:

"Machine learning and explainable AI approaches can help to enable the operationalisation of these complex, non-linear relationships by capturing dynamic interactions between hazards and evolving impacts"

L237 (paragraph) It would be good to comment on some of the limitations of these ML and data-driven approaches, particularly in areas where data is sparse.

Indeed, this is important, and while we do not want aim to provide a full review of this, we have added some reflections based on output of the consortoium. Namely, we add the following text:

"While ML, AI, and data-driven approaches may offer significant potential for multi-hazard risk assessment, their effectiveness is fundamentally constrained by data availability and quality. For example, there are limitations for ML and AI usage in data scarce regions as these regions may encounter insufficient historical records and inadequate monitoring networks on which to train models (Tiggeloven et al., 2025c), which may produce biased models that perform poorly for rare but catastrophic events. This may create concerning disparities where technological advances may worsen

rather than reduce existing warning system inequalities (e.g., language and data availability), with regions most affected by the digital divide receiving the least research attention. To address these gaps, we should both advance novel methodological approaches, such as physics-informed models, data augmentation, and transfer learning, and also propose explicit guardrails around explainability, accountability, and the integration of local knowledge to ensure that ML applications remain people-centred and equitable (Tiggeloven et al., 2025c)."

L275 It would be interesting to consider possible limitations here – being based on historical events this sounds like it might work less well in areas with less complete disaster records.

Indeed, such limitations of the dataset are also highlighted in the original paper by Claassen et al. (2023). We agree with the reviewer that it is valuable to briefly address this issue in the manuscript and have therefore added the following sentences to the end of the paragraph.

"While the dataset we compiled with MYRIAD-HESA has global coverage, it is limited by data availability, as global datasets may miss small local events or regions with incomplete hazard records. This can be addressed through the open-source nature of MYRIAD-HESA, which allows users to integrate higher-resolution local data and update results as data quality improves with future innovations."

L545 onwards – In this section it might be useful to separate out the notes on what was done in MYRIAD-EU with the outlook recommendations of where multi hazard research might go next. There are some excellent points in this section, but it currently feels quite closely tied to what was done in the project, and some changes might open it up some more – for instance, what aspects were not done in this project but would be valuable for future work? For instance, one aspect that could be discussed is how moving from the European focus of MYRIAD to a global perspective might change some of the lessons here – for instance in areas with different DRM frameworks, greater role of NGOs, few or incomplete event datasets, how might the key points change?

Thank you for the suggestion. We agree that it would be useful to expand in some parts of the manuscript how this could be expanded beyond the European setting. Still, in line with our response to the reviewer's first comment about the scope of the paper, we do prefer to do this from the perspective of learning and moving beyond our MYRIAD-EU experience, rather than brining in a wide outlook also on issues beyond the scope of MYRIAD-EU. Therefore, we propose to keep the same overall structure of the Outlook section, but to expand/clarify as follows in the individual paragraphs:

Paragraph on MHEWS: as per our response to reviewer 1, we have greatly elaborated the discussion of how learnings from MYRIAD-EU could inform the development of Multi-Hazard Early Warning Systems. This discussion is relevant in any setting, and not only within Europe. The additional text is:

"This is not surprising, as the integration of multi-hazard and multi-risk thinking across the four pillars of EW4ALL, namely risk knowledge, forecasting and monitoring, dissemination and communication, and preparedness and response, is inherently challenging because of methodological and practical complexities. For example, building strong risk knowledge requires locally relevant assessments that consider interactions between

hazards as well as changing vulnerability patterns within a given multi- hazard scenario. In practice, however, the necessary data, especially detailed and disaggregated information on vulnerability such as age or gender, are often not available, while specifics of vulnerability per hazard type are not considered adequately (Haer & De Ruiter 2024). In their literature review on the role of AI for EWS, Tiggeloven et al. (2025c), note a similar pattern: even though technologies are rapidly changing and increasingly used, a significant gap exists on the implementation MWEHS in research papers. Similarly, preparedness and response planning faces similar difficulties, as it must account for the needs of both people and infrastructure under multiple, potentially compounding hazards. A combined tsunami and heatwave event, for instance, may require air-conditioned tsunami shelters and towers, showing how response strategies must address multi-hazards and multi-risk. Furthermore, response options also need to avoid conflicts (i.e., asynergies as defined by de Ruiter et al., 2021) between measures designed for different hazards. In reality, planning is still largely carried out for single hazards in isolation. From a broader governance perspective, effective MHEWS Systems depend on strong collaboration across institutions, sectors, and policy areas. Yet practical experience, including findings from the MYRIAD-EU project (Šakić Trogrlić et al., 2024), shows that achieving such coordination remains a major challenge due to siloed institutional working resulting in a lack of ownership of multi-hazard and multi-risk knowledge. Advances within MYRIAD-EU and related projects demonstrate clear potential to move towards truly multi-risk oriented systems, and especially from a methodological perspective."

Paragraph on Mutual understanding of concepts and definitions: within this paragraph, we have now made explicit that it is essential to also provide translations in other languages beyond those spoken in Europe, by adding the following:

> *"Moving forward, we believe that similar translations would also be useful for other languages, also broadening the reach of mutual understanding of concepts and definitions beyond countries where English is widely spoken."*

We have also provided a short comment on how Risk-KAN could play a role in ensuring learning and mutual understanding internationally:

> "To reach audiences outside Europe, the aforementioned Risk-KAN network also has several working groups on topics related to multi-hazard and multi-risk management. These working groups, including their webinars and other events, allow for the transfer of knowledge and networking across the globe, and can play an important role in consolidating the international community working on the topic."

Paragraph on further developing methods for providing both current and future multi-hazard and multi-risk scenarios: We agree that it is important to further test the developed methods beyond Europe, and in fact for some this has already been carried out (although certainly not for all). To clarify this, we add the following:

> *"It is important to note that some of the methods developed within the project, such as MYRIAD-HESA (Claassen et al., 2023), have already been applied at the global scale, while others have been applied in regions outside Europe, such as the multi-hazard susceptibility mapping of Tiggeloven et al. (2025b). However, testing and application of more of the methods in non-European settings are important future research avenues."*

Moreover, in the final sentence of the paragraph, we have now stated that the intended upcoming ISIMIP projections, a spinoff of MYRIAD-EU, will be global scale in their analysis.

Paragraph on the availability of appropriate, solutions-oriented, usable tools: we have added the following:

> *"Moreover, the tools developed should be further developed and tested in non-European setttings and contexts. At the same time, there are several factors that could limit direct global transferability and upscaling (Guentchev et al., 2023; Met Office, 2024) and require careful adaptation, such as the need for high-quality, harmonised multi-hazard, exposure, and vulnerability datasets, which are often scarce or uneven outside Europe (Jäger et al., 2025)."*

Paragraph on more explicitly include equity issues and equitable disaster risk reduction and adaptation: we believe that this particular already strongly relates to non-European applications. However, we have made minor edits to the text to ensure that this is explicit, also making explicit that some of the analysis mentioned are themselves already global – this was maybe not so clear from the original manuscript, which we realised in retrospect.

We have also greatly expanded section 2.6 (*Testing of approaches in in-depth case studies on multi- (hazard-)risk multi-hazard and multi-risk assessment and management*) by adding text to describe specifically the transferability and upscaling of the overall MYRIAD-EU approach in cases outside our Pilot regions. We describe this change in detail in response to the reviewer's next comment (below).

Overall, as an EU project, MYRIAD-EU's team and case studies are focused on Europe, and many key findings have been evaluated within this context. It would be interesting to discuss, throughout the manuscript, which insights are likely to transfer well globally and which may require adaptation outside Europe. I thank the authors for their contribution and look forward to reading the final paper.

In response to the reviewer's suggestion, the manuscript has been revised to more explicitly highlight these dimensions of global applicability versus context-specific adaptation. To this end, we have expanded the text in each of the individual paragraphs: of the Outlook section to address this point, as described in detail in our response to the previous comment.

Moreover, we feel that in particular an expanded discussion would be useful of the transferability and upscaling of the overall MYRIAD-EU approach in cases outside our Pilot regions. This has been discussed and document within the project, but was not covered in the original manuscript. In the revised manuscript, we have therefore added the following text to section 2.6:

> "*We also reflected on the potential transferability and upscaling of the MYRIAD-EU approach beyond our Pilot regions. Although the Pilot studies were embedded in European governance, socio-economic, and environmental settings, the project's methodological foundations, such as the framework, DAPP-MR, Collaborative Systems Analysis, storylines, and mixed qualitative-quantitative tools, were intentionally designed*

to be generic, modular, and scalable. Across the five Pilots, these approaches proved effective in very different 'riskscapes', ranging from offshore energy-ecology conflicting priorities (North Sea), insular drought–tourism trade-offs (Canary Islands), high-latitude forest-energy interactions (Scandinavia), transboundary river-basin risks (Danube), and mountainous-coastal compound climate hazards (Veneto). This diversity demonstrates that the MYRIAD-EU approach is not culturally or geographically bound to Europe, but instead focuses on systemic interdependencies, cross-sectoral dynamics, and long-term adaptive decision-making, factors relevant to multi-hazard environments globally.

However, governance complexity emerged as a shared barrier across all Pilots, even though European institutions tend to have stronger coordination architectures than many regions globally (European Commission, 2025). This implies that approaches relying heavily on inter-agency collaboration, participatory co-production, or transboundary governance (e.g., North Sea or Danube Pilots) may require significant tailoring where institutional capacity is low or where informal systems dominate risk management. Similarly, the Canary Islands Pilot highlighted how deeply rooted socio-economic lock-ins, such as tourism dependency or water governance fragmentation, shape feasible pathways; these dynamics may be even more pronounced in Small Island Developing States (SIDS) or rapidly urbanising coastal regions, requiring customised scenario design and stakeholder engagement processes.

Nevertheless, regions facing complex and competing uses of maritime space are reasonable candidates for the transferability of the North Sea Pilot approach: relevant examples are the Baltic Sea, characterised by high density of activities, including fisheries, shipping and offshore wind, and the Mediterranean Sea, which faces similar intense shipping and fisheries, whilst also serving as a key area for regional tourism. Likewise, high-latitude forested regions in Europe, Canada or Northern Russia, experience interacting hazards including heatwaves, droughts, wildfires, and forest diseases making them well aligned with the insights generated in the Scandinavia Pilot on cross-sectoral energy-ecosystem interactions and climate-sensitive resource management. The Canary Islands Pilot, analysing multi-risk dynamics by shaping the systemic vulnerability of tourism destinations in a context of climate-driven, volcanic, and seismic risk, offers valuable insights for many Mediterranean as well as Pacific or Caribbean Islands regions, but also tourism-dependent regions exposed to multi-risks. The Danube Pilot results also have potential for transferability to other river basins exposed to multi-risks, sharing complex interdependencies between sectors, and displaying cross-border governance structures - conditions shared by basins such as the Rhine, Po, or Tisa. Finally, the mixed-method approach used in the Veneto Pilot, combining results from AI-based models with storylines to generate plausible future scenarios and multi-risk pathways, can serve as a model for various densely populated, heavily exploited territories exposed to multiple climate-driven hazards. However, in each of these settings, applying MYRIAD-EU methods demands contextual calibration of hazard data, governance arrangements,

socio-economic drivers, and sectoral interdependencies. Thus, while the project offers a coherent transferable framework, the pathways themselves are not exportable 'templates': they require localised tailoring to reflect different institutional capacities, cultural norms, risk perceptions, and resource regimes."