2021 2030 United Nations Decade of Ocean Science for Sustainable Development

NB : this document aims at preparing the submission of the project using the online form, the submission will be done on Saturday 31st August 2024.
Form questions are in black, draft answers are in Blue

Call for Decade Actions No. 07/2024 - Project Application

Information - Please read it entirely before proceeding with your application

Call for Decade Actions No. 07/2024 – Request for Endorsement for a Decade Project linked to an endorsed Decade Programme

This form should only be used to request for endorsement of a Decade Project linked to an endorsed Decade Programme.

Please read all the supporting documentation to the Call carefully before submitting your application:

1. **Guidance Note, especially Annex I for Project priorities of participating Programmes**
2. **FAQ**
3. **Ocean Decade Implementation Plan and Summary**

We strongly encourage you to contact the relevant Decade programme to discuss your application before submission. Contact details for Decade programmes can be found in the Guidance Note.

The deadline for submission of this form is 31 August 2024 23h59 UTC.

If you wish to submit another type of Decade Action during Call for Decade Actions No 07/2024, please refer to the Guidance Note and the Call page for more information.

Important Information:

Please note that all character limits include spaces.

You can find PDF and Word versions of the form here. Please note that these are for your use only, e.g. to help prepare your submission. Only submissions sent via the online form will be accepted.

If you need a copy of your responses please email us at oceandecade@unesco.org with the exact full name and contact name of your submission. Please be aware that

it may take some time to provide you with the download.

For any questions please contact oceandecade@unesco.org with "Call for Decade Actions No. 07/2024" in the subject line.

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Call for Decade Actions No. 07/2024 - Project Application

Eligibility

* 1. To which Ocean Decade Programme are you applying to be a project under?

NOTE: Make sure to read Annex I of the Guidance Note to understand the priorities of your chosen programme before proceeding with your application.

FORESEA (is in the list:n°28)

(Nb: in the proposal we'll also mention DITTO as a relevant programme)

* 2. Is your project already affiliated with the programme you have selected?

- Yes
- No

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Proponent and Partner Details

* 3. Lead Institution Name

The lead institution is the one responsible for the project and where the lead contact is affiliated to.

Mercator Ocean International

*

* 4. Lead Institution Type

* 5. Lead Institution Physical Address

Street Address

Town/City

Postal/Zip Code

2 avenue de l'aerodrome de montaudran, 31400 Toulouse, France

* 6. Lead Institution Country

France

* 7. Is your institution based in a Least Developed Country, Small Island Developing State, or Africa

Please find a list of SIDS here: https://www.un.org/ohrlls/content/list-sids

Please find a list of LDCs here: https://www.un.org/development/desa/dpad/least-developed-country-category/ldcs- at-a-glance.html

Yes No

To be addressed later, open , we have the potential to add them later on and co-design regional studies

* 8. Lead Institution Website

Home - Mercator Océan - Ocean Forecasters (mercator-ocean.eu)

* 9. Lead Institution Primary Contact

This is the person responsible for the proposal and who will be directly contacted in future communications throughout the review process, and will be expected to sign the letter of endorsement should your application be successful.

First Name

Last Name

Marie Drevillon

* 10. Lead institution primary contact gender

Male

Female

* 11. Lead Institution Primary Contact Email Address

mdrevillon@mercator-ocean.fr

* 12. Email contact of person completing survey

This person might not be the same as the lead institutional contact, but will be someone we will include in future communications throughout the review process.

chunxue.yang@cnr.it

* 13. Partner Institution Names

Please provide the names of up to five partner lead institutionsOther partner details can be provided in the supplementary information section.

Partner No. 1 Institution name

CNR (Italy, Europe, co-chair, Physics and climate)

Partner No. 2 Institution name

HCMR (Greece, Europe, waves)

Partner No. 3 Institution name

MIT (USA, Physics and climate)

Partner No. 4 Institution name

NERSC (Norway, Arctic and marine biogeochemistry)

Partner No. 5 Institution name

Australian Bureau of Meteorology BOM (Australia, Asia Pacific, reanalysis and forecast)

* 14. Partner focal points' contact details

Please provide the full name of the focal point person in the partner institution and their email address.

Partner No.1 Focal point contact details

Chunxue Yang chunxue.yang@cnr.it

Partner No.2 Focal point contact details

Charikleaia Oikonomou, c.oikonomou@hcmr.gr

Partner No.3 Focal point contact details

Gael Forget, gforget@mit.edu

Partner No.4 Focal point contact details

Annette Samuelsen, annette.samuelsen@nersc.no

Partner No.5 Focal point contact details

Prasanth Divakaran, prasanth.divakaran@bom.gov.au

* 15. Partner Institution Countries

Partner Institution Country

Partner No. 1

Italy

Partner No. 2

Greece

Partner No. 3

USA

Partner No. 4

Norway

Partner No. 5

Autralia

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Decade Action Description

* 16. Name of Decade Action

The public facing name used to refer to your Decade Action. Your Action name must be fewer than 50 characters.

Marine Environment Reanalyses Evaluation Project

17. Short name or acronym of Decade Action

MER-EP

* 18. Is the project you are proposing an ongoing initiative or new?

Ongoing Initiative

* 19. Have you contacted the relevant endorsed Decade programme in the development of your proposal (see Annex I of Guidance Note)?

Yes. Please inform which one and briefly summarise the results of the discussion.

Improving ocean reanalyses is a core activity of FORESEA and will also contribute to the improvement of forecasting systems. MER-EP is thus fully endorsed by FORESEA. DITTO also strongly encourages the project which is very relevant to build communication material on ocean model productsand develop innovative data access and knowledge data bases on digital twins

* 20. Have you contacted any relevant National Decade Committee(s) in the development of your proposal? Full list can be found here.

Yes. Please inform which one and briefly summarise the results of the discussion.

France : aurelie.chamiot-prieur@developpement-durable.gouv.fr
Italy : **Rosalia Santoleri**, Chair of the Italian Oceanographic Commission | Email: segreteria.coi@cnr.it

* 21. When will your proposed Action start and end?

Please use the first of the month in which your Action will start if you do not have a specific start date.

Start Date

01/01/2025

End Date

31/12/2028

* 22. Total Budget estimate for the Decade Action to the nearest whole number with no punctuation.

1300000

* 23. Please indicate the currency of the above budget.

eur

* 24. Estimate of percentage of total budget secured

This can include in-kind and financial resources.

800k€ estimation of Copernicus marine service effort (secured) 62%
500k€ estimation of in kind effort from partners
(to be secured)*25. Please tell us who your current funders are and from whom you are seeking or planning to seek additional financial or in-kind support.

i) Copernicus Marine Service is the current funder
ii) we'll seek in-kind contributions from all participating partners not funded by Copernicus Marine

● 26. Please select all countries in which the Decade Action will be implemented.

list countries of partner institutions, will benefit to other countries through the co-design of metrics and studies with the OP DCC regional teams

* 27. Please select all ocean basins in which the Decade Action will be implemented

all basins

28. Summary of Decade Action

This summary will be used publicly on the Ocean Decade Network should your contribution be endorsed. (max. 1000 characters)

Ocean reanalyses are reconstructed past ocean states by combining ocean numerical models and observations through data assimilation techniques. They are key in the seamless ocean information value chain. Thanks to their temporal and spatial consistency, continuity, and high accuracy, ocean reanalyses are widely used for ocean and climate studies in the scientific andprivate sector. The primary objective of MER-EP is to improve our knowledge of the ocean by understanding and ultimately improving the reliability and usability of global and regional ocean reanalyses, including physics, waves, biogeochemistry and sea ice, based on representative and high-priority use cases identified after extensive discussions with scientific and private ocean reanalyses users. In line with the objectives of the ForeSea Decade Program, the corollary objective is to improve our knowledge of the capabilities of similar forecasting systems at regional scales and for a range of applications.

* 29. Please provide details on how your proposal aligns with the following Ocean Decade endorsement criteria.

Please keep in mind that this section is essential to the evaluation of your application, and therefore please be as objective and explanatory as possible. In case a criterion does not align with your proposal, please provide 2 to 3 sentences on why not (max. 5000

characters per criteria)

Contributes to achieving one or more of the following Decade objectives: Objective 1: Identify critical ocean knowledge; Objective 2: Build capacity and generate knowledge; Objective 3: Increase the use of ocean knowledge.

The MER-EP proposal contributes to achieving the 3 objectives of the decade. To contribute to objective 1, MER-EP will provide new insights on recent and state-of-the-art marine environment reanalyses that are ready-to-use ocean environmental data and information. Ocean reanalyses are often the only estimate we have for the past state of the ocean in many regions and for a number of physical, biogeochemical or sea ice variables. The evaluation of these datasets and their intercomparison allows the identification of knowledge gaps, and the characterisation of the impact of past observational gaps, as revealed, for example, by strong disagreement between reanalyses for a given variables and/or geographical area. Understanding the strengths and weaknesses of ocean reanalyses is key to improve ocean knowledge for past and present periods but also for future changes because similar models and data assimilation techniques are used to initialize ocean forecasts. Also, reanalyses are consistent and continuous 4D descriptions of the past that are often used to train end-users applications including AI forecasting systems. It is therefore essential to provide better access to reanalyses and their conditions of use to foster capacity building, thus contributing to objective 2.

The MER-EP project is building on previous ocean reanalysis intercomparison exercises (ORA-IP Full article: The Ocean Reanalyses Intercomparison Project (ORA-IP) (tandfonline.com),) and the joint efforts of Oceanpredict (oceanpredict.org), CLIVAR/GSOP (Global Synthesis and Observations Panel (GSOP) | www.clivar.org) , GCOS/GOOS/OOPC (Physics and Climate Panel (OOPC) Terms of Reference – Global Ocean Observing System (goosocean.org)) research programmes. Previous intercomparison exercises of ocean reanalyses have targeted specific variables, such as ocean heat content, mixed layer depth, and ocean transport, to assess the consistency and discrepancies among various ocean reanalysis products. Future intercomparisons should complement this approach including more systematic regional focus (as An assessment of ten ocean reanalyses in the polar regions | Climate Dynamics (springer.com)) and evaluating different ocean reanalyses to determine their quality for specific applications and identify which reanalyses are most suitable for these purposes. Ocean reanalyses producers, relevant scientific programmes and users are willing to get involved in a new evaluation and intercomparison exercise including new variables, new point-of-views (user oriented) and new focus areas, with studies focused on relevant use cases.

Mercator Ocean International (MOi) initiated and leads MER-EP, due to synergies with the European Copernicus Marine Service. Indeed, MOi has implemented the European Copernicus Marine Service since 2014. Copernicus Marine gives access to global and regional physical ocean, waves, sea-ice, biogeochemical ocean and ecosystems reanalyses, and dedicates funding to their evaluation and intercomparison (see also https://doi.org/10.1175/BAMS-D-24-0034.1). The recent development of the EDITO Horizon Europe project (led by MOi too, European Digital Twin of the Ocean (European DTO) - European Commission (europa.eu)) also provides a unique opportunity to link MER-EP to the DITTO programme and to international efforts to build digital twins of the ocean. The latter will improve the access to ocean reanalyses for the project's needs, connecting them and facilitating their intercomparison using a unique computing platform and tools that will eventually be accessible to users. This project thus makes a connection between scientific and data service advances answering users needs, and contributes to objective 3 to increase the use of ocean knowledge.

Accelerates the generation or use of knowledge and understanding of the ocean, with a specific focus on knowledge that will contribute to the achievement of the SDGs and complementary policy

frameworks and initiatives.

The first objective of the MER-EP project is understanding and improving the reliability and usability of global and regional ocean reanalyses, including physics, waves, biogeochemistry and sea ice components, based on representative and high-priority use cases identified after extensive dissussions and collaborations with scientific and private ocean reanalyses users. One of the priority use cases, or questions we expect users to ask is "how to monitor the physical and biogeochemical ocean variability and long-term changes at global and regional scales using ocean reanalyses?". By answering this question, MER-EP will contribute to the achievement of sustainable development goal 14 focusing on life below water and aiming to conserve and sustainably use the ocean sea and marine resources while also improving the marine services answer to complementary policy frameworks needs. By improving our knowledge about regional trends in the ocean, MER-EP will also contribute to the achievement of SDG 13 to take urgent action to combat climate change and its impact. By contributing to building a shared framework and fostering innovations in the ocean reanalysis and forecasting communities and their users, MER-EP also contributes to SDG 9 to build resilient infrastructure, promote sustainable industrialization and foster innovation, and to SDG 17 to revitalize the global partnership for sustainable development.

Is co-designed and/or co-delivered by knowledge generators and users, and thus facilitating the uptake of science and ocean knowledge for policy, decision-making, management and/or innovation.

The knowledge generated by the MER-EP project will be based on priority use cases and scientific questions identified by the community of ocean reanalyses producers, and by the community of users. The community of ocean reanalyses producers includes the Copernicus Marine Service producers, thus involved in a user-driven service of the Copernicus European programme. The ocean reanalyses producers worldwide belong to scientific programmes gathering ocean modelers and data assimilation specialists involved in improving ocean analysis and forecasting systems on one hand (Oceanpredict) and in improving the representation and understanding of ocean variability and long-term changes on the other hand (CLIVAR/GSOP).

Copernicus Marine reanalyses users already participate in the design of the project and will participate in use case studies. OOPC will co-design and participate in particular in the evaluation of ocean climate variables. Moreover, MER-EP will also be advertised in OceanPrediction-Decade Collaborative Center (OP-DCC) regional teams to foster the co-design of regional studies. The panel of participants and partners thus ensures that relevant use cases evaluation and intercomparison studies will be designed, some at global scale and some with a regional focus that is relevant to local stakeholders and users, which will facilitate the uptake of the results. For instance, a priority use case for which a regional co-design could be implemented is "how to use ocean reanalyses for the study of extremes in the ocean?"

Ensures that all data and resulting knowledge are provided in an open access, shared, discoverable manner

MER-EP will leverage the European DTO infrastructure initiated in the EDITO project developments which is a unique opportunity to provide open and shared access to a number of participating ocean reanalyses (open and free access to the Copernicus Marine reanalyses is already possible from the Marine Data Store). Digital twins of the ocean will allow to connect reanalysis datasets together and facilitate their intercomparison using common computing platform and tools.
All the knowledge generated will be open access publications. Communication material will be hosted on Oceanpredict/ForeSea and/or other partners webpage. A dedicated MER-EP webpage

will be hosted by the OP-DCC website.

Strengthens existing or creates new partnerships across nations and/or between diverse ocean actors, including users of ocean science.

MER-EP will strengthen the existing partnerships between ocean reanalyses producers belonging to the ocean analysis and forecasting systems community (Oceanpredict programme), ocean reanalysis producers from the climate community (GSOP/CLIVAR) and their expert users within the scientific community. The objective of MER-EP is also to provide useful insights on the conditions of use of ocean reanalyses to end-users in other communities and to reach out to nations not already involved in the project. This will be achieved by trying to address their specific questions via the OP-DCC regional teams or forums, and via the feedback gathered from data services such as Copernicus Marine.

Contributes toward capacity development, including, but not limited to, beneficiaries in SIDS, LDCs and LLDCs.

MER-EP will provide conditions of use of marine environment reanalyses for capacity building in ocean models downscaling, AI reconstruction or forecasting, regional monitoring etc. It will reach out to nations not already involved in the project, including SIDS, LDCs and LLDCs by trying to address their specific questions or co-design studies answering their needs via the OP-DCC regional teams or forums.

Overcomes barriers to diversity and equity, including gender, generational and geographic diversity.

Participation in the MER-EP project is balanced in terms of gender, generation and geographical origin.

Collaborates with and engages local and indigenous knowledge holders.

The collaboration with local indigenous knowledge holders is not planned and is not an objective of the project per se. However the MER-EP project is open and will reach out to nations and communities not already involved in the project using the OP-DCC regional teams or forums. In that framework, collaboration with indigenous knowledge holders is both feasible and desirable.

* 30. Please select which of the Decade Outcomes your Decade Action contributes to (max. 3)

- [ ] Outcome 1: A clean ocean where sources of pollution are identified and reduced or removed.
- [ ] Outcome 2: A healthy and resilient ocean where marine ecosystems are understood, protected, restored and managed.
- [ ] Outcome 3: A productive ocean supporting sustainable food supply and a sustainable ocean economy.
- [ ] Outcome 4: A predicted ocean where society understands and can respond to changing ocean conditions.
- [ ] Outcome 5: ~~A safe~~ ocean where life and livelihoods are protected from ocean-related hazards.
- [ ] Outcome 6: An accessible ocean with open and equitable access to data, information and technology and innovation.
- [ ] Outcome 7: An inspiring and engaging ocean where society understands and values the ocean in relation to human wellbeing and sustainable development.

* 31. Please select which of the Decade Challenges your Decade Action contributes to (max. 3) Marie

5, 8, 9

- [ ] Challenge 1: Understand and map land and sea-based sources of pollutants and contaminants and their potential impacts on human health and ocean ecosystems, and develop solutions to remove or mitigate them.
- [ ] Challenge 2: Understand the effects of multiple stressors on ocean ecosystems, and develop solutions to monitor, protect, manage and restore ecosystems and their biodiversity under changing environmental, social and climate conditions.
- [ ] Challenge 3: Generate knowledge, support innovation, and develop solutions to optimise the role of the ocean in sustainably feeding the world's population under changing environmental, social and climate conditions.
- [ ] Challenge 4: Generate knowledge, support innovation, and develop solutions for equitable and sustainable development of the ocean economy under changing environmental, social and climate conditions.
- [ ] Challenge 5: Enhance understanding of the ocean-climate nexus and generate knowledge and solutions to mitigate, adapt and build resilience to the effects of climate change across all geographies and at all scales, and to improve services including predictions for the ocean, climate and weather.
- [ ] Challenge 6: Enhance multi-hazard early warning services for all geophysical, ecological, biological, weather, climate and anthropogenic related ocean and coastal hazards, and mainstream community preparedness and resilience.
- [ ] Challenge 7: Ensure a sustainable ocean observing system across all ocean basins that delivers accessible, timely, and actionable data and information to all users.
- [ ] Challenge 8: Through multi-stakeholder collaboration, develop a comprehensive digital representation of the ocean, including a dynamic ocean map, which provides free and open access for exploring, discovering, and visualizing past, current, and future ocean conditions in a manner relevant to diverse stakeholders.
- [ ] Challenge 9: Ensure comprehensive capacity development and equitable access to data, information, knowledge and technology across all aspects of ocean science and for all stakeholders.
- [ ] Challenge 10: Ensure that the multiple values and services of the ocean for human wellbeing, culture, and sustainable development are widely understood, and identify and overcome barriers to behaviour change required for a step change in humanity's relationship with the ocean.

* 32. In addition to SDG 14 (Life below water), which we assume is relevant to all Decade Actions, please indicate which of the other Sustainable Development Goals your Decade Action contributes to

- [ ] GOAL 1: No Poverty.
- [ ] GOAL 2: Zero Hunger
- [ ] GOAL 3: Good Health and Well-being
- [ ] GOAL 4: Quality Education
- [ ] GOAL 5: Gender Equality
- [ ] GOAL 6: Clean Water and Sanitation GOAL
- [ ] 7: Affordable and Clean Energy
- [ ] GOAL 8: Decent Work and Economic Growth
- [ ] GOAL 9: Industry, Innovation and Infrastructure
- [ ] GOAL 10: Reduced Inequality
- [ ] GOAL 11: Sustainable Cities and Communities
- [ ] GOAL 12: Responsible Consumption and Production
- [ ] GOAL 13: Climate Action
- [ ] GOAL 15: Life on Land
- [ ] GOAL 16: Peace and Justice Strong Institutions
- [ ] GOAL 17: Partnerships to achieve the Goal

* 33. What is the high-level objective of your Decade Action? (max. 1000 characters)

Ocean reanalyses are reconstructed past ocean states by combining ocean numerical models and observations through data assimilation techniques. They are key in the seamless ocean information value chain. Thanks to their temporal and spatial consistency, continuity, and high accuracy, ocean reanalyses are widely used for ocean and climate studies in the scientific andprivate sector. The primary objective of MER-EP is to improve our knowledge of the ocean by understanding and ultimately improving the reliability and usability of global and regional ocean reanalyses, including physics, waves, biogeochemistry and sea ice, based on representative and high-priority use cases identified after extensive discussions with scientific and private ocean reanalyses users. In line with the objectives of the ForeSea Decade Program, the corollary objective is to improve our knowledge of the capabilities of similar forecasting systems at regional scales and for a range of applications.

* 34. What are key outcomes of your Decade Action? (max. 2000 characters).

The key outcomes of our decade action will be:
A comprehensive understanding of the reliability and usability of various ocean reanalyses at both global and regional scales, focusing on the physical, biogeochemical, ice, and wave components based on specific use cases and their suitability for different purposes.
Enhanced knowledge of ocean and climate interactions through the analysis of different types of ocean reanalyses, particularly regarding ocean variability across various basins and the ocean's role in climate change.
Insights into how ocean reanalyses can be utilized to improve ocean predictions, especially through AI-based forecasting methods.
Identification of the strengths and limitations of current ocean reanalyses, paving the way for advancements in the next generation of ocean reanalyses.
Exploration of future potential applications of ocean reanalyses to deepen our understanding of

ocean systems.
improved uptake of ocean reanalyses (and ocean prediction) via the co-design of evaluation and intercomparison use cases with users and regional stakeholders

The key outcomes of this Decade Action will be disseminated through scientific articles and presentations at international conferences to engage broad communities and raise awareness of ocean reanalyses and their usability in enhancing ocean knowledge.

* 35. What are key discrete activities that you will carry out in the first 3 years of your Decade Action? (max. 5000 characters)

In the first three years, our focus will be on several key activities: (1) consolidating the intercomparison and evaluation of reanalyses while identifying experts for specific topics, (2) gathering the necessary data and establishing a platform for analysis, and (3) conducting data analysis, discussing the findings, and finalizing the results.

Previous intercomparison exercises of ocean reanalyses have targeted specific variables, such as ocean heat content, mixed layer depth, and ocean transport, to assess the consistency and discrepancies among various ocean reanalysis products. In this Decade Action, we will adopt a slightly different strategy: the intercomparison and evaluation process will be use-case based. This means we will evaluate different ocean reanalyses to determine their quality for specific applications and identify which reanalyses are most suitable for these purposes.

To initiate this process, in the first year, we will convene meetings with project partners, ocean reanalysis producers, and users to gather use cases related to ocean reanalyses. We will then prioritize the intercomparison and evaluation of global and regional reanalysis topics that correspond to these use cases, focusing on their representativeness (e.g., using ocean reanalyses for seasonal forecasts, decadal predictions, training AI-based ocean forecasts, and understanding ocean-climate variability). This approach aims to enhance the ocean community's understanding and improve our capabilities in ocean prediction.

The evaluation activities will encompass both global and regional ocean reanalyses, including physical, biogeochemical, ocean ice, and wave components, resulting in a substantial volume of data to manage. To facilitate collaboration and data sharing, we will establish a shared workingenvironment, for example, the European digital ocean platform EDITO. In the second year, we will collaborate with the digital ocean team to develop this shared data analysis platform and prepare the analytical tools. Ocean reanalyses datasets for evaluation will be uploaded to this platform, allowing partners to work on the data. Based on the identified use cases, we will form specialized teams of experts to focus on specific evaluation topics. Team meetings will be scheduled to monitor progress and discuss results. We will leverage the regional teams of OceanPrediction Decade Collaborative Center to co-design regional intercomparisons and evaluations.

In the third year, we expect to have preliminary results available for intercomparison and evaluation. Activities will focus on interpreting the results, engaging in discussions with application users, and providing final evaluation insights for these studies. We will leverage international conferences to present our findings, raising community awareness of our activities and demonstrating the usefulness and reliability of ocean reanalyses in enhancing ocean knowledge and prediction capabilities. We will contribute to the ForeSea programme, relying on their ocean (re)analyses validation methodology.

* 36. How does your project align with your chosen Decade Programme's priorities? (max. 3000 characters)

NOTE: Make sure to read Annex I of the Guidance Note to understand the priorities of your chosen programme to answer this question.

The project will be affiliated with two Decade Programs, The Ocean Prediction Capacity of the Future (ForeSea) and the Digital Twin of the Ocean (DITTO).

The priorities of ForeSea are to increase ocean prediction capacity globally and to strengthen the operational oceanography value chain connecting ocean prediction systems, ocean observing systems, and end users of ocean predictions. One of the planned activities to achieve these objectives is the improvement of "community description of historical ocean conditions" (i.e. reanalysis) at high resolution (https://oceanpredict.org/un-decade-of-ocean-science/foresea/foresea-planned-activities/), which is fully in line with MER-EP objectives. MER-EP will demonstrate how we can use ocean reanalyses to improve ocean prediction, either as initial conditions or as training data for AI-based ocean forecasts. Also, the identified strengths and limitations, in particular how to improve ocean reanalyses in terms of ocean modelling, observations system and data assimilation will also benefit the improvement of the ocean prediction systems' similar components. The main outcomes of MER-EP will thus contribute to the ForeSea program to improve and strengthen the capabilities of both ocean reanalyses and ocean prediction systems.

In addition to the ForeSea program, MER-EP will contribute to the DITTO program. The activities of MER-EP will involve a huge amount of datasets at different spatial and time scales, and for different ocean properties (ocean currents, ocean ecosystem, waves and ice). A digital platform is needed to apply the FAIR (Findable, Accessible, Interoperable, and Reusable) principles to perform the activities. The shared computing environment and analysis tools developed within this project using the EDITO platform will increase the awareness of EDITO and MER-EP outcomes. Mercator Ocean International (MOi) implements the European Copernicus Marine Service which gives access to global and regional physical ocean, waves, sea-ice,biogeochemical ocean and ecosystems reanalyses, and dedicates funding to their evaluation and intercomparison. The recent European DTO developments (including EDITO), relying on the Copernicus Marine data store, provides a unique opportunity to link MER-EP to the DITTO program and international efforts to build digital twins of the ocean, while improving the access to ocean reanalyses, connecting them and facilitating their intercomparison using a unique computing platform and tools.

* 37. Please describe the management structure which will be used to coordinate your Decade Action (max. 2000 characters)

The MER-EP activities will be led by Mercator Ocean International, which has implemented the Copernicus Marine Service since 2014. Copernicus Marine has been producing and providing ocean reanalysis products to the public (scientific and private sectors) for the past decade. These activities will be supported by the OceanPredict Community, reflecting the close collaboration between the two communities and the interactions between their respective initiatives. The Ocean Observations Physical and Climate (OOPC) panel within the Global Climate Observing System (GCOS) and the Global Synthesis and Observations Panel (GSOP) within the Climate and Ocean Variability, Predictability and Change (CLIVAR) core project of the World Climate Research Progamme (WCRP) have expressed their support for MER-EP activities. Regular meetings will be organized with the OceanPredict, OOPC, and GSOP communities to share progress and co-design activities based on the needs and priorities of the ocean communities.

As part of the Decade Action MER-EP, the Mercator Ocean International, as the coordinator, will organize regular meetings (e.g., twice a year) with all partners to report on progress. Additionally, expert teams for each topic may hold more frequent meetings to discuss activities in detail,

organized by their respective coordinators.

To disseminate information, the MER-EP team will develop a website hosted by the Decade Collaborative Centre for Ocean Prediction (DCC-OP). This website will showcase the progress and outcomes of MER-EP activities, enhancing visibility. We will leverage international conferences to engage additional ocean reanalysis users and communities that may benefit from MER-EP. Furthermore, MER-EP activities will be linked with forums of OceanPredict, ForeSea, and OP DCC and Ocean Climate Nexus activities to strengthen and ensure the contribution of the MER-EP Decade Action to affiliated programs (ForeSea, DITTO) and the priorities of Ocean Decade Programs.

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Supplementary Information

38. Please provide any supplementary information you would like reviewers to take into account as they review your Decade Action. This may include details of additional partners (max. 5000 characters).

history, context, workshop paper

Starting in autumn 2023, ocean reanalysis producers and users have been discussing the opportunity of a new intercomparison exercise for marine environment reanalyses (physical ocean including surface waves, sea ice, ocean biogeochemistry and ecosystems).
It was agreed to focus the intercomparison work around users needs, by building "use cases" around several types of use for these products, ocean, wave, sea ice reanalysis are concerned but also biogeochemical and ecosystem reanalyses. For instance, each "use case" article would display a number of intercomparisons of relevant metrics and EOVs for each use case, and focus on reanalysis products we think are fitted and available for this specific use, including regional products at high resolution.
It was agreed to organise this new intercomparison project around a UN decade project that could be called MER-EP (for Marine Environment Reanalyses - evaluation project). This project includes more than 10 partners, including the list of 5 partners associated with this proposal which was chosen to illustrate the diversity of expertise and geographical origins, the project will seek to reach out to other partners including in SIDS, LDCs and LLDCs.

scientific programmes partners of the project:
CLIVAR/GSOP
contacts: Peter Oke, Aida Alvera Azcarate, Nathalie Zilberman
WMO/OOPC
contacts: Karina Von Schuckmann, Peter Oke

list of additional partners lead institutions (confirmed at the date of submission):
CMCC (Italy)
contact : Emanuela Clementi, Simona Masina, Ali Aydogdu, Pietro Miraglio, Leonardo Lima, Andrea Cipollone

Metoffice (UK)
contact: Richard Renshaw, Matthew Martin

University of Reading (UK)
contact: Keith Haines

University of Liège (Belgium)
contact: Luc Vanderbulcke, Marilaure Grégoire, Aida Alvera Azcarate

Magellium (France)
contact: Gilles Larnicol, Julia Pfeffer, Michael Ablain

ACRI-ST (France)
contact: Quentin Jutard

JAMSTEC (Japan)
contact: Satoshi Osafune

JMA/MRI (Japan)
Contact: Yosuke Fujii

UCSD (US)
contact: Nathalie Zilberman

CSIRO (Australia)
contact: Peter Oke

ECCC (Canada)
contact: Greg Smith, Drew Peterson, Fraser Davidson