Building 2030 30% 10% scenarios in European Seas - marine conservation futures

Stelios Katsanevakis, Michael Elliott, Antonios D. Mazaris, Nikolaos Nagkoulis, Maria Bas, Marta Coll, Miguel Ortega, Maren Kruse, Robert M. Runya, Olga Lukyanova, Benedict McAteer, Ibon Galparsoro, Sylvaine Giakoumi, Vanessa Stelzenmüller

Funded by the European Union

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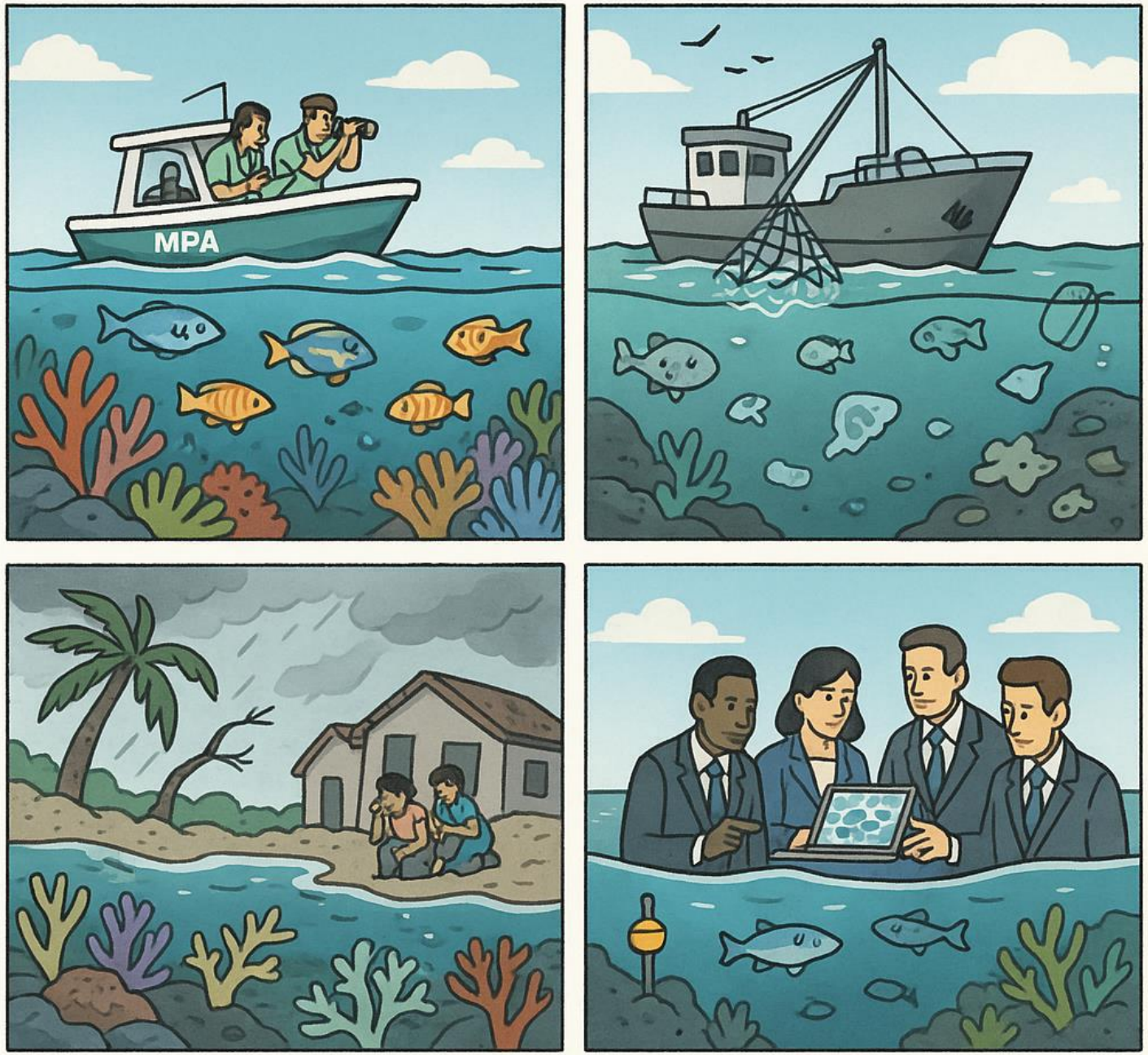

The future isn't predicted—it's planned.

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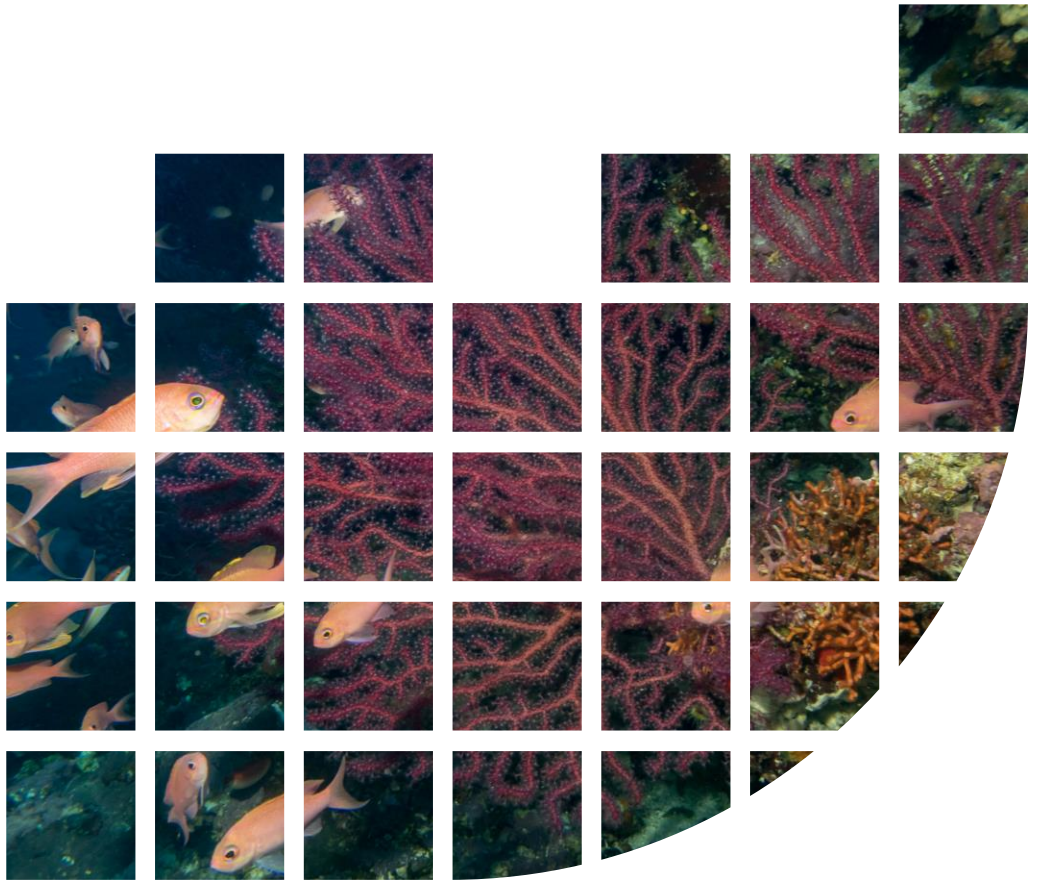


Scenario development

1. Specify objective: Identify specific question(s), time frame and spatial scale of analysis

“Exploring alternative futures regarding marine conservation and conservation planning at the global level through to 2030”

Scenario development

2. Identify drivers: List potential drivers influencing the future of marine conservation

14 Potential drivers (identified through a dedicated workshop):

- International politics, governance, and legislation
- Climate change
- Natural disasters / Natural catastrophic events
- Global food security
- Economic growth (including blue growth)
- Lifestyle and consumption patterns
- Technological development and innovation
- Human Population Growth
- Human migration
- Transport systems
- Energy supply/demand
- Biological Invasions
- Social understanding / acceptance of marine conservation
- Natural Resource Use

Scenario development

3. Identify key pair of drivers: experts vote for the most challenging and uncertain pair of drivers

- Through an online questionnaire

Participants voted for:

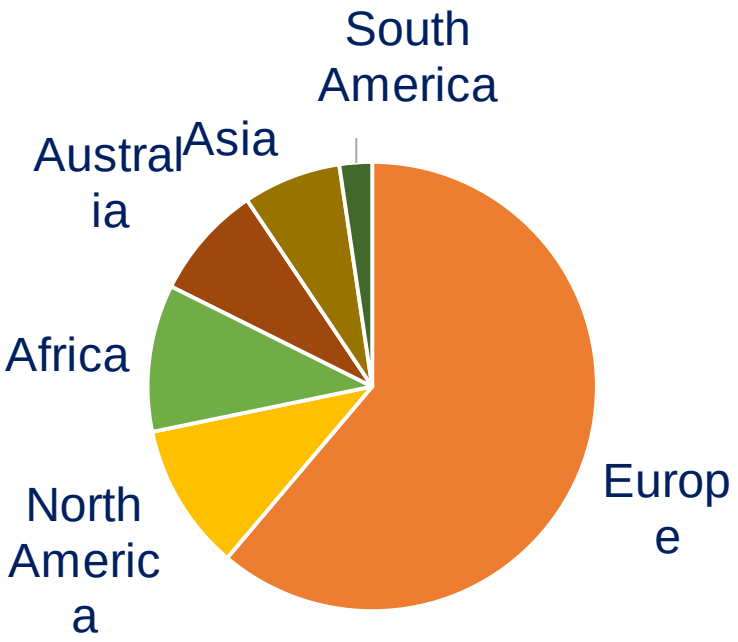
1. **Relevance**: importance for marine conservation and conservation planning
2. **Uncertainty**: range of plausible different directions this driver may take

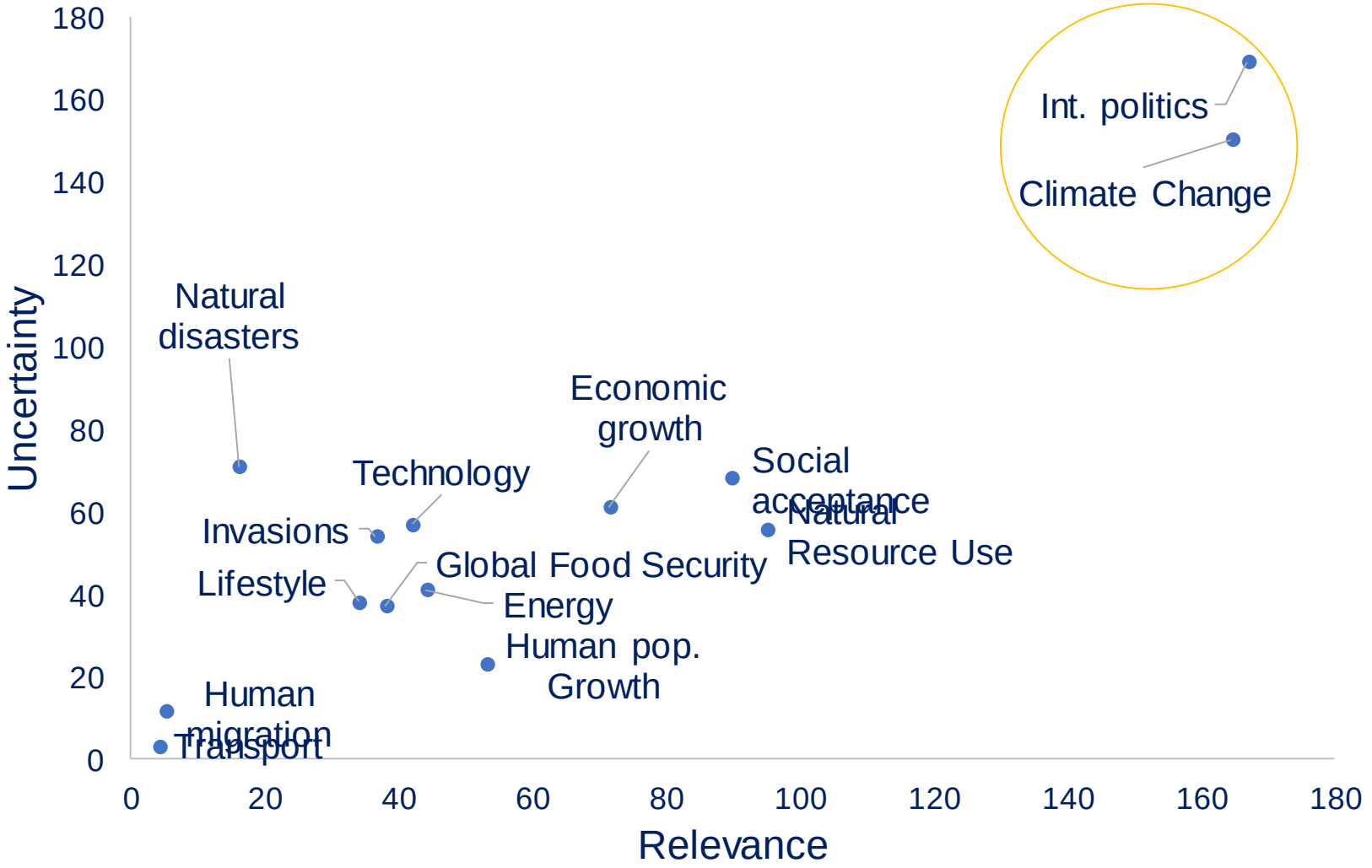
Voting system: each participant → **ten points** to rank the most **relevant** drivers and an additional **ten points** to rank the most **uncertain** drivers

Scenario development

3. Identify key pair of drivers: experts vote for the most challenging and uncertain pair of drivers

- 85 responses
- 33 countries





Scenario development

4. Framing key pair of drivers: Examine potential states within the space described by the pair of key drivers

Inadequate Climate Action

- Absence of any major policy improvement
- Governments fail to achieve agreed targets and policy action
- Ocean warming continues at increased rates, increased frequency of marine heatwaves
- CC adaptation-oriented actions as CC mitigation fails
- The rates of native biodiversity decline/extinctions, biological invasions, and regime shifts increase
- Conservation will no longer focus on native biodiversity but rather on functions and services

Commitment to mitigate CC

- UNFCCC, Paris Agreement, Glasgow Climate Pact are fully implemented and COP28 objectives are fully achieved. All announced targets are reached
- Global warming well below 2ºC, reducing carbon emissions by 45% by 2030
- CC mitigation-oriented actions
- The rates of native biodiversity decline/extinctions, biological invasions, and regime shifts decline
- Conservation will continue to focus on protecting native biodiversity also accounting for functions and services when relevant

Scenario development

4. Framing key pair of drivers: Examine potential states within the space described by the pair of key drivers

Economic growth/conflict oriented

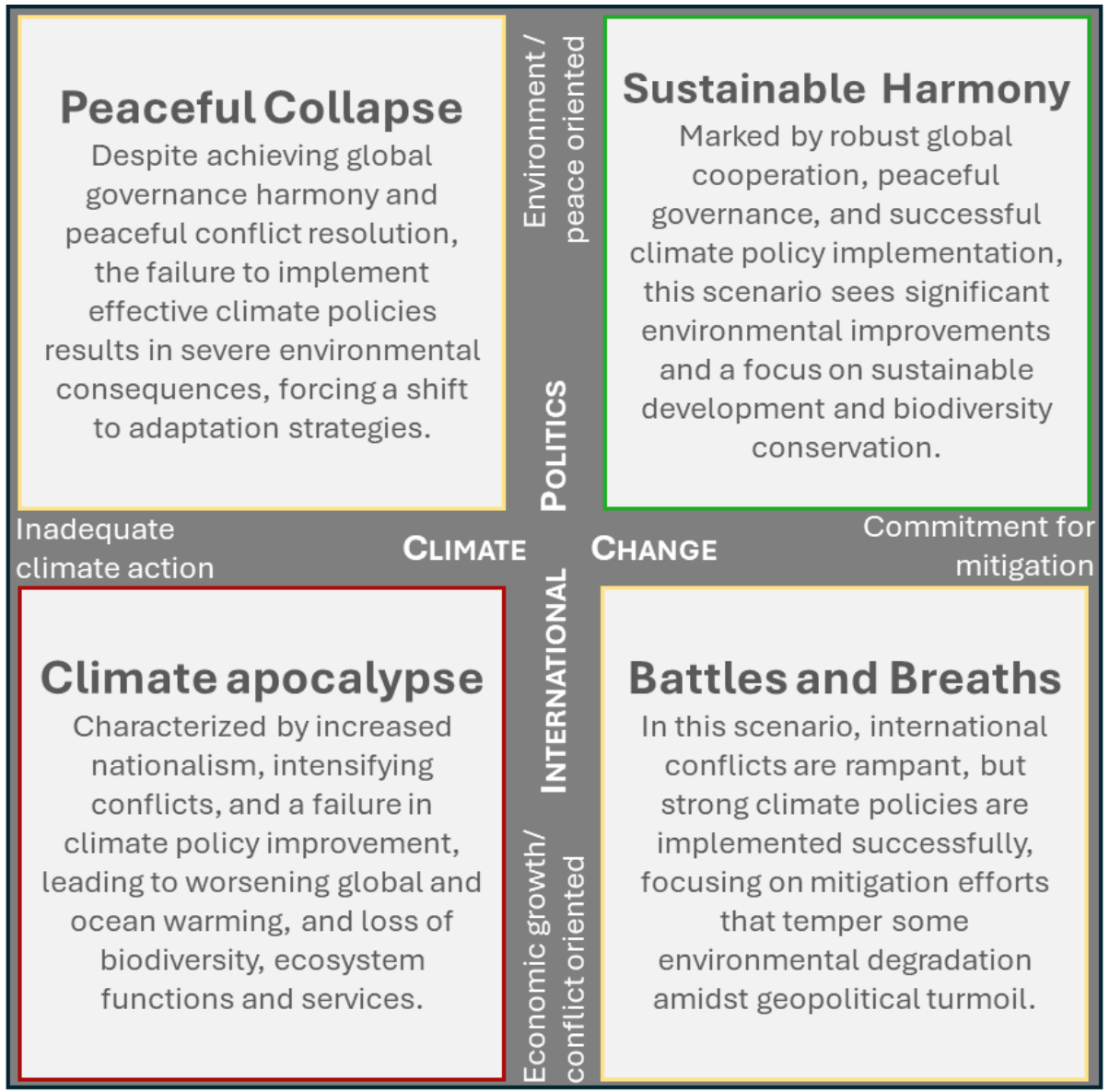
- Increased nationalism
- Global/regional wars are intensified (even limited use of nuclear weapons)
- International policies focusing on short-term profit and economic growth disregarding environmental problems

Environment/peace oriented

- Democratic societies with balanced regional and global governance system
- Differences are solved peacefully – armed conflicts are substantially reduced
- International policies focusing on protecting and supporting the environment and environmental services

Scenario development

5. Develop plausible scenarios: Develop scenario narratives by examining general (e.g. 10-tenets) and specific variables for marine conservation



1. General narrative of the scenario

2. ten-tenets:

- Ecological
- Technological
- Economic
- Political
- Social
- Administrative
- Legislative
- Cultural
- Ethical/moral
- Communicative

3. For conservation & conservation planning

Scenario development

Improved transdisciplinary science for effective ecosystem-based maritime spatial planning and conservation in European Seas

Scenarios for the future of marine conservation

1. Climate Apocalypse

Key characteristics

Ecological: Marine ecosystems face widespread collapse due to unchecked climate change and habitat destruction.

Technological: Minimal technological advancements focus on basic survival; innovation stagnates under political instability.

Economic: Economies prioritize short-term resource extraction, worsening inequality and regional disparities.

Political: Weak international cooperation; governance fragmented by nationalist agendas.

Social: Societal fragmentation, mass displacement, and resource scarcity exacerbate social unrest.

Administrative: Conservation administration becomes highly localized, reactive, and poorly resourced.

Legislative: International environmental agreements disintegrate; enforcement of laws is ineffective.

Cultural: Focus shifts toward immediate survival, with declining cultural emphasis on sustainability or conservation.

Ethical/Moral: Survival-oriented ethics prioritize national interests over global welfare and long-term sustainability.

Communicative: Fragmented and dominated by misinformation; environmental issues are deprioritized in public discourse.

General Overview

- Nationalism dominates, with global and regional conflicts intensifying, including limited use of nuclear weapons.
- Climate agreements fail; global warming accelerates, causing more frequent marine heatwaves and acidification.
- Marine ecosystems collapse, with widespread biodiversity loss, disruption of food webs, and regime shifts.
- Natural disasters become more frequent, disproportionately affecting vulnerable communities.

Conservation impacts

- Focus shifts from biodiversity to maintaining critical ecosystem functions and services.
- Conservation is reactive, hindered by poor funding, political instability, and lack of global coordination.

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This project has received funding from the European Union's Horizon Europe research and innovation programme HORIZON-CL6-2021-BIODIV-01-12 under grant agreement No 101059407 and by UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee grant numbers 10038951 & 10050537.

Improved transdisciplinary science for effective ecosystem-based maritime spatial planning and conservation in European Seas

Scenarios for the future of marine conservation

4. Sustainable Harmony

Key characteristics

Ecological: Marine ecosystems show resilience and recovery due to effective conservation and sustainable practices.

Technological: Rapid innovation in renewable energy, ecosystem restoration, and conservation technologies.

Economic: Thriving green economies promote equitable resource distribution and sustainable development.

Political: Balanced governance fosters collaboration, equity, and strong environmental policies.

Social: Social equity and shared responsibility enhance cooperation and trust among communities.

Administrative: Well-coordinated, proactive conservation administration ensures effective implementation of initiatives.

Legislative: Strong international laws promote biodiversity conservation and sustainable resource use.

Cultural: Sustainability becomes embedded in cultural norms, with widespread public support for environmental action.

Ethical/Moral: A stewardship ethic prioritizes intergenerational equity and global environmental justice.

Communicative: Transparent, inclusive communication builds optimism and public engagement with sustainability goals.

General Overview

- Global cooperation and peace support the successful implementation of climate policies.
- Green technologies and sustainable practices thrive, driving environmental restoration and economic growth.
- Social equity improves, fostering trust in governance and optimism about the future.

Conservation impacts

- Proactive conservation integrates biodiversity protection with ecosystem services and climate resilience.
- Ample funding and global collaboration support large-scale, holistic conservation initiatives.

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Planning options

6. Translating scenarios to planning options: Each scenario will lead to different operational targets and planning options

Scenarios are neither predictions nor forecasts - they are descriptions or qualitative explorations of alternative paths along which the future might unfold (Van der Heijden 2005).

- One realistic planning option
- Four scenarios

} **Five plans**

van der Heijden K (2005) Scenarios: the art of strategic conversation. Wiley, Chichester

Planning options

Peaceful Collapse

- The 10% strict protection target is partially achieved
- The 30% target is achieved by declaring new MPAs and OECMs
- Connectivity and ecological corridors are accounted for
- No climate change considerations (climatic refugia or future distributions are not considered)
- Effective transboundary collaboration
- 3D planning

Sustainable Harmony

- The 10% strict protection target is achieved
- The 30% target is achieved by declaring new MPAs and OECMs – additional measures are taken in OECMs to enhance conservation outcomes
- Connectivity and ecological corridors are accounted for
- Climatic refugia and future distributions under climate change are considered in spatial planning
- Effective transboundary collaboration
- 4D planning

Climate apocalypse

- The 10% strict protection target is not achieved
- The 30% target is achieved by declaring OECMs – no new MPAs
- Connectivity and ecological corridors are ignored
- No climate change considerations (climatic refugia or future distributions are not considered)
- No transboundary collaboration
- 2D planning

Battles and Breaths

- The 10% strict protection target is partially achieved
- The 30% target is achieved by declaring new MPAs and OECMs
- Connectivity and ecological corridors are accounted for
Climatic refugia and future distributions under climate change are considered in spatial planning
- No transboundary collaboration
- 4D planning

Environment / peace oriented

POLITICS

Economic growth/ conflict oriented

INTERN.

Inadequate climate action

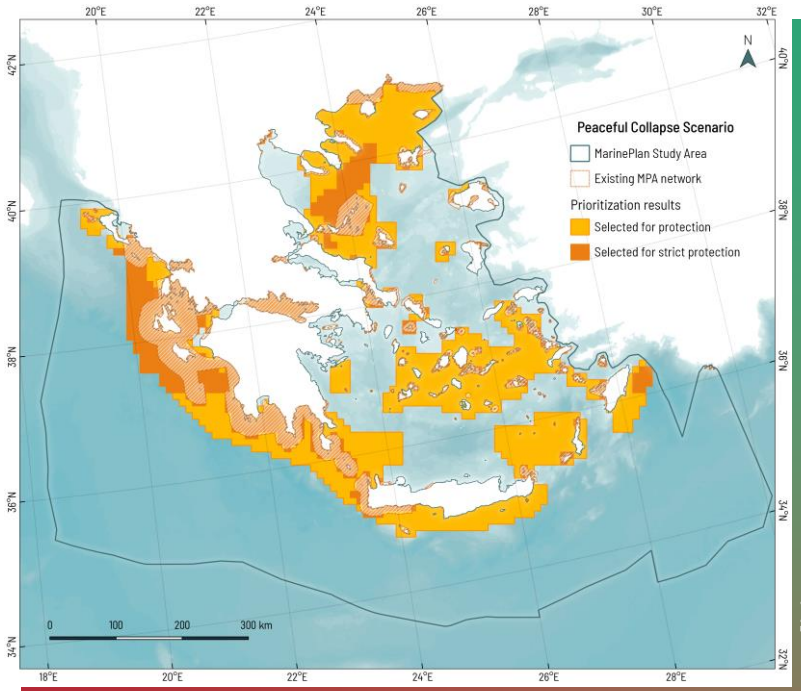
CLIMATE CHANGE

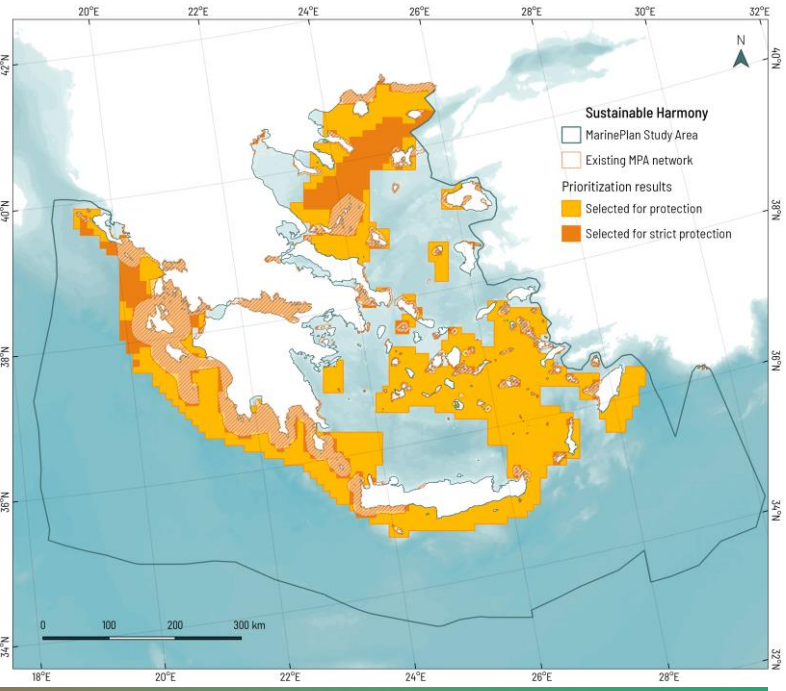
Commitment for mitigation

Planning options

Tools	Realistic option	Climate apocalypse	Battles and Breaths	Peaceful Collapse	Sustainable Harmony
2D planning (e.g., MARXAN, prioritizr)		Y			
prior3D (3D planning)	Y		Y	Y	Y
priorCON (connectivity analysis)	Y		Y	Y	Y
ecological corridors	Y		Y	Y	Y
priorOECM	Y	Y	Y	Y	Y
climate risk and 4D planning	o		Y		Y
alternatives for cost layers	Y		Y	Y	Y

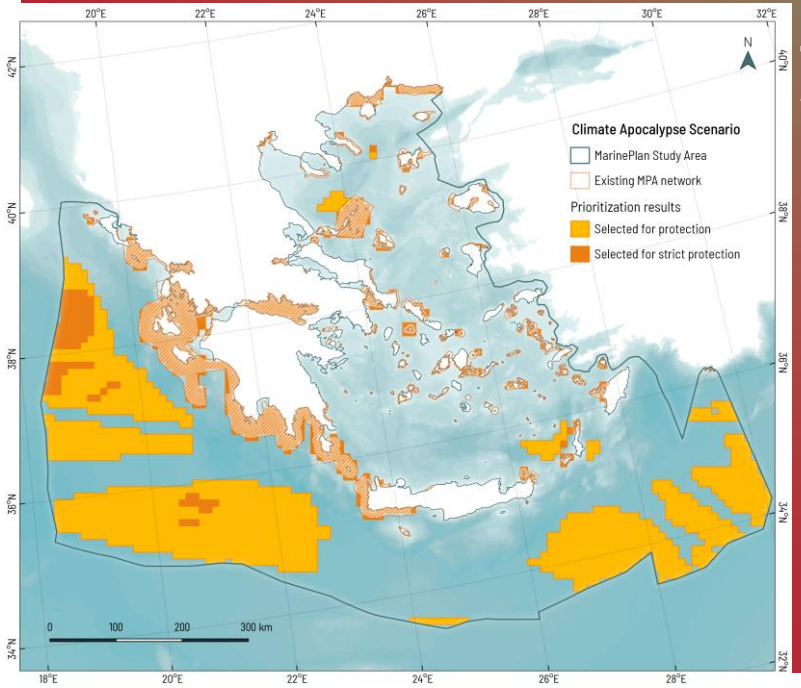
Y:YES – o: optional



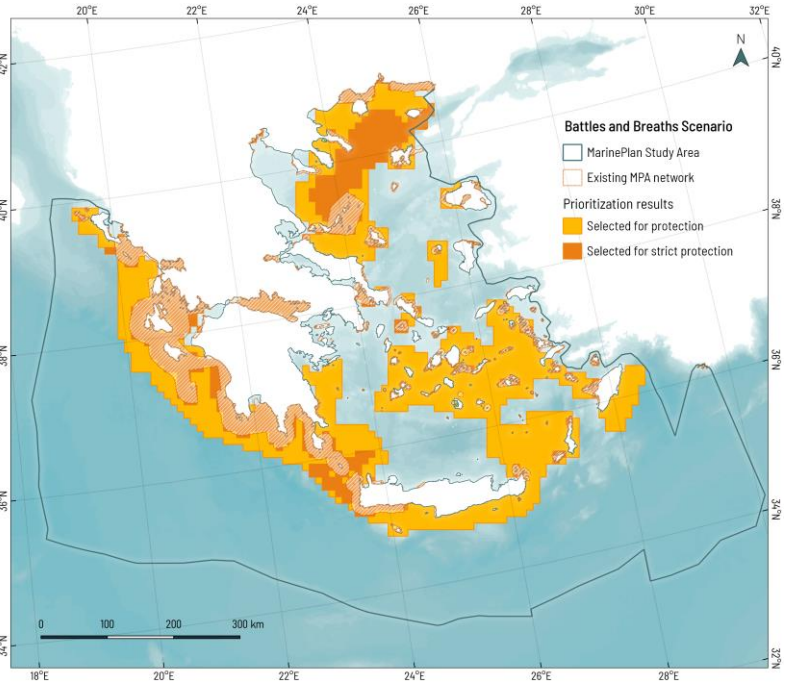


Politics

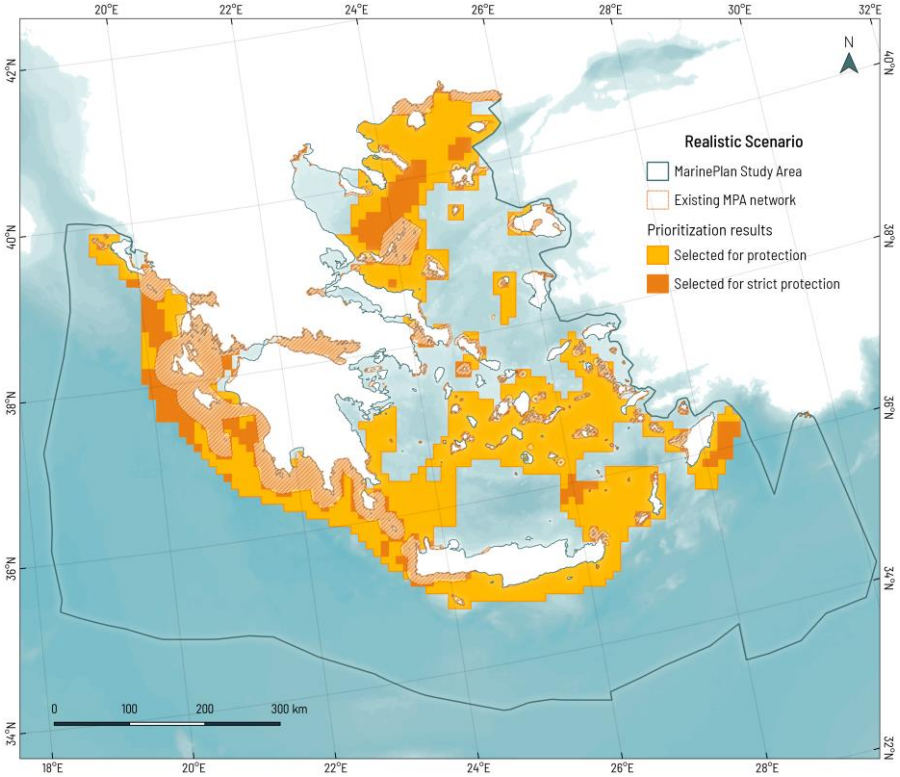
Climate change



International



Realistic Scenario



- Some priority areas emerge consistently across scenarios
- Under-sampled (offshore) areas are deprioritized.
- Cost and weighting schemes shape outcomes, especially for strict protection.
- Realistic Scenario balances ambition with feasibility.

Overall approach

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2. Identify drivers: List potential drivers influencing the future of marine conservation

3. Identify key pair of drivers: experts vote for the most challenging and uncertain pair of drivers

4. Framing key pair of drivers: Examine potential states within the space described by the pair of key drivers

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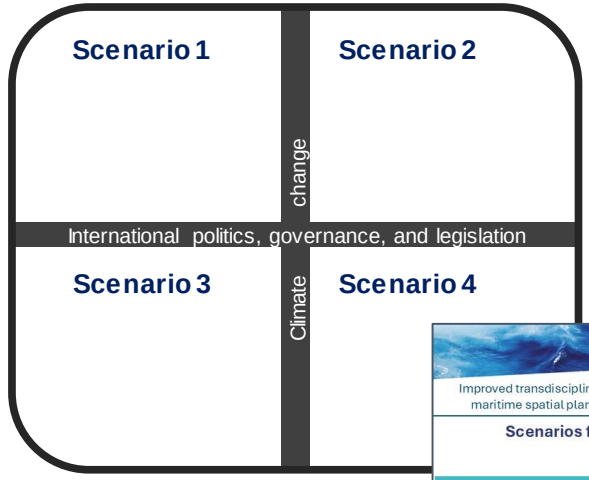

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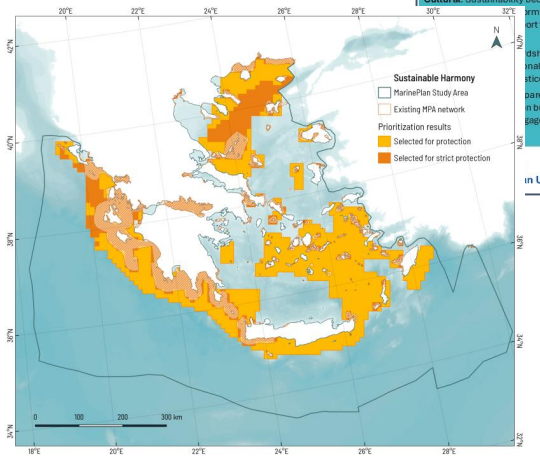

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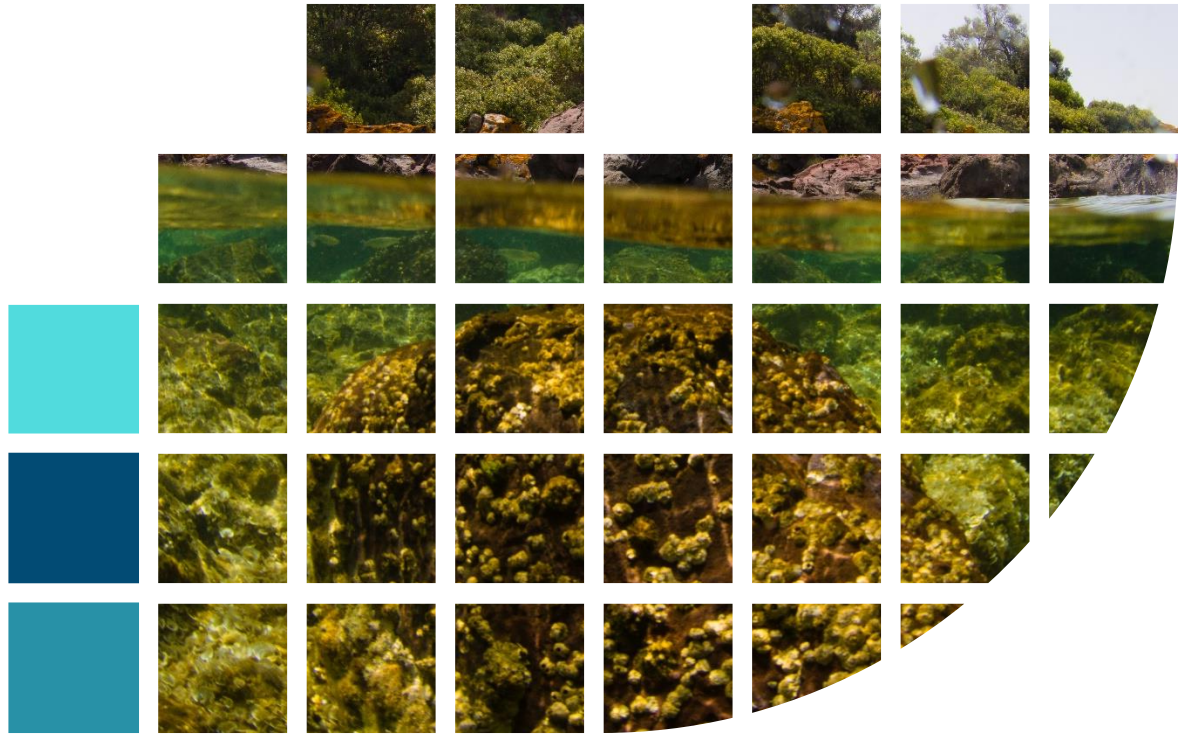

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