

Climate change and MSP

NESB Project Kick-off Meeting

Dr. Catarina FRAZÃO SANTOS

25 February 2025



Ciências
ULisboa



European Research Council
Established by the European Commission



Funded by the
European Union





**Climate
change**



Ocean warming



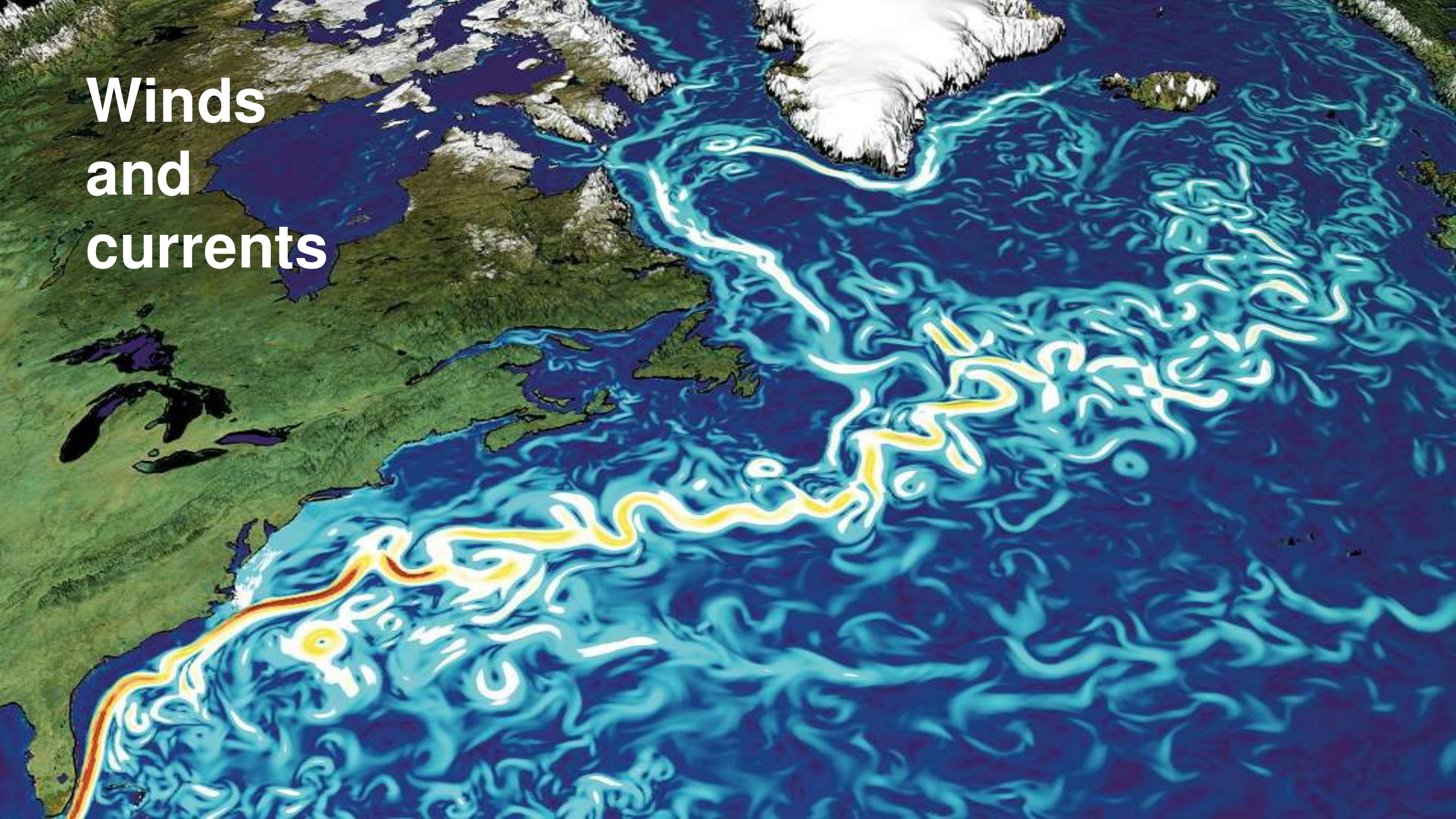
Acidification



Extreme events



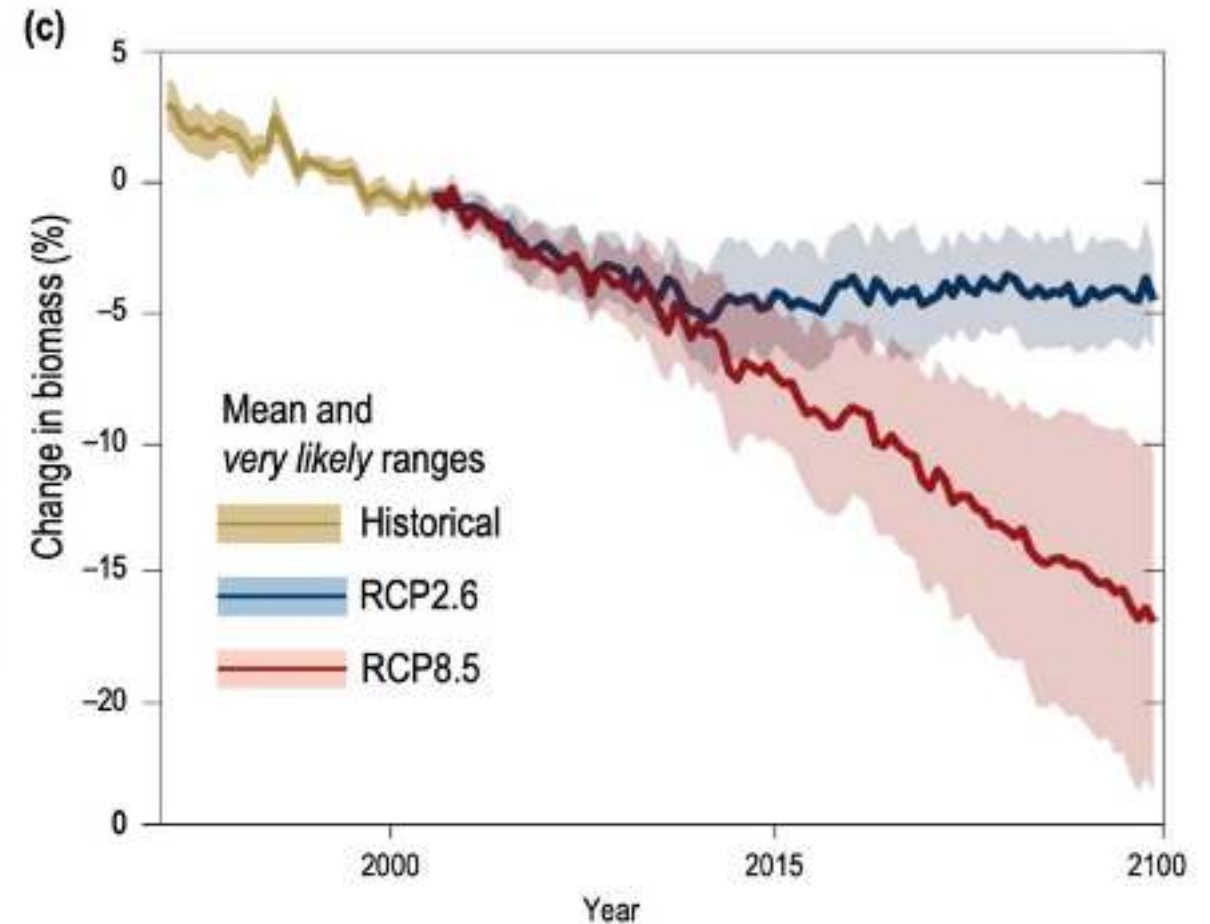
Winds and currents



Climate driven species redistribution



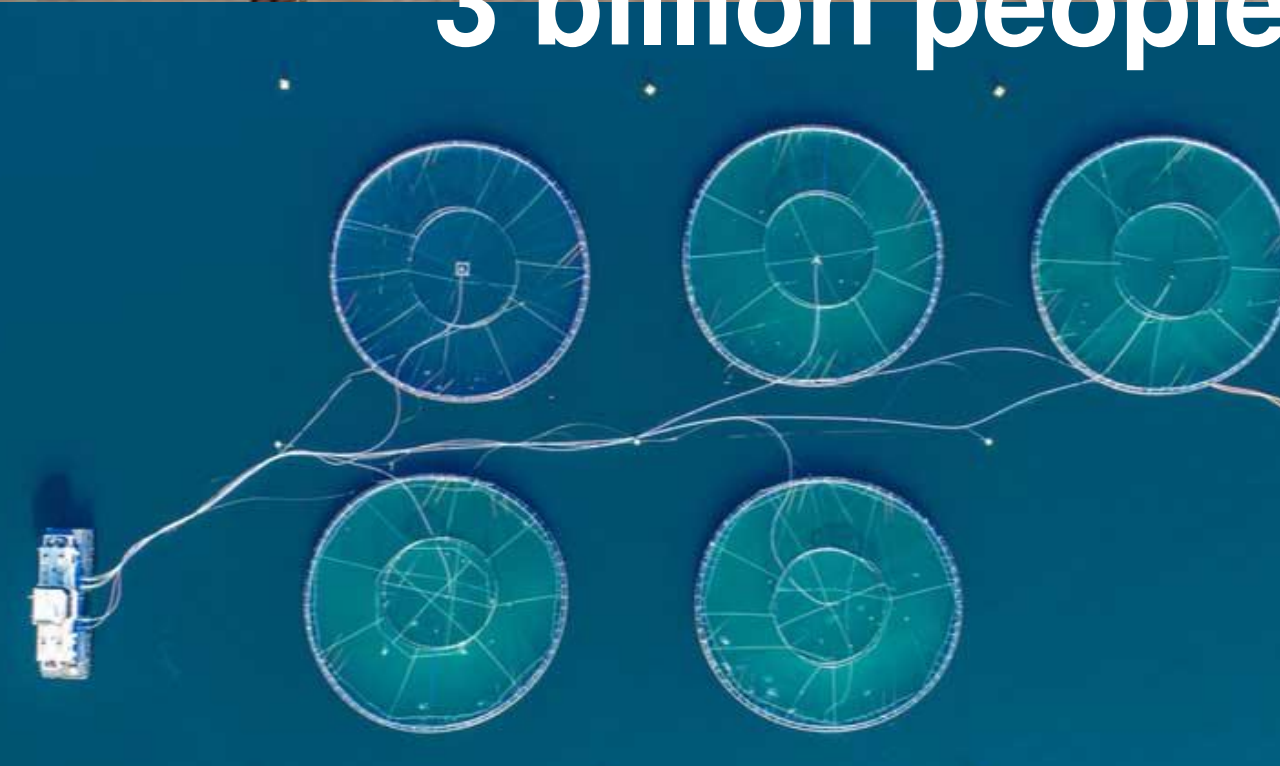
ECCWO (2018)



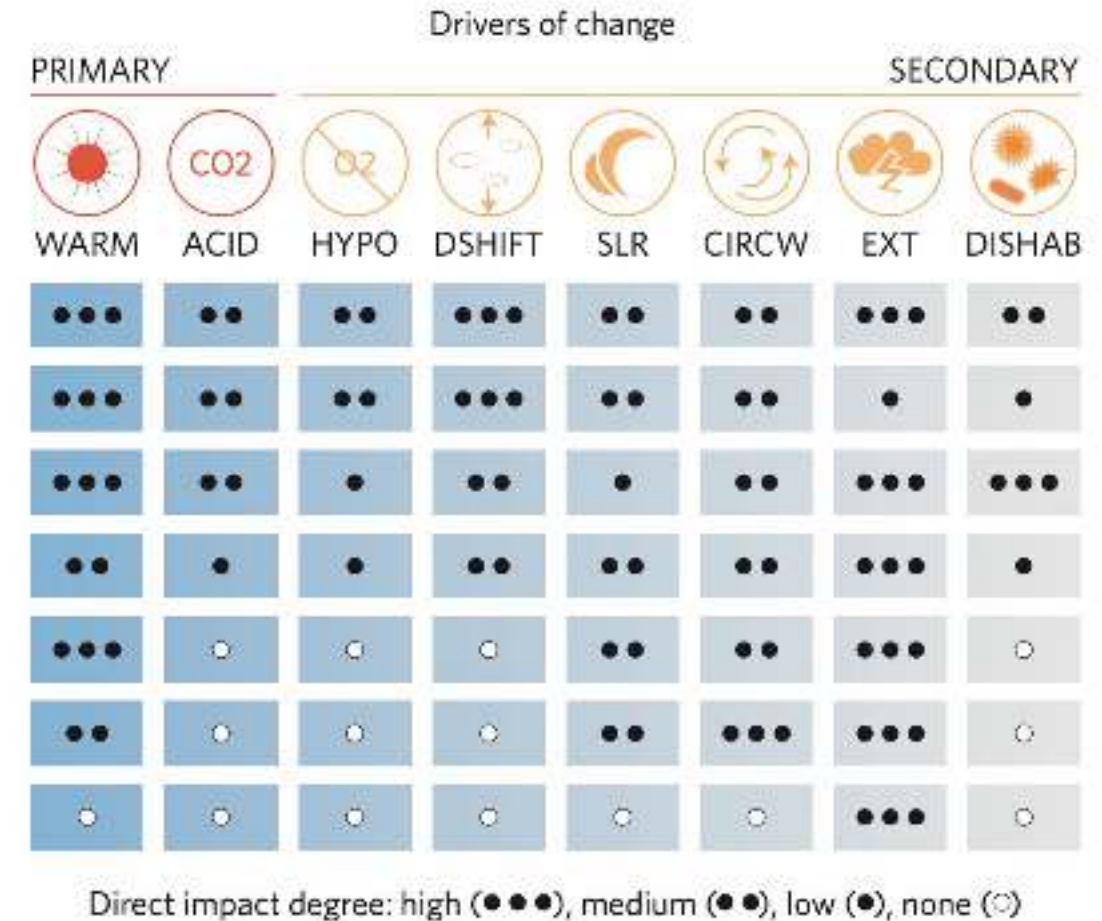
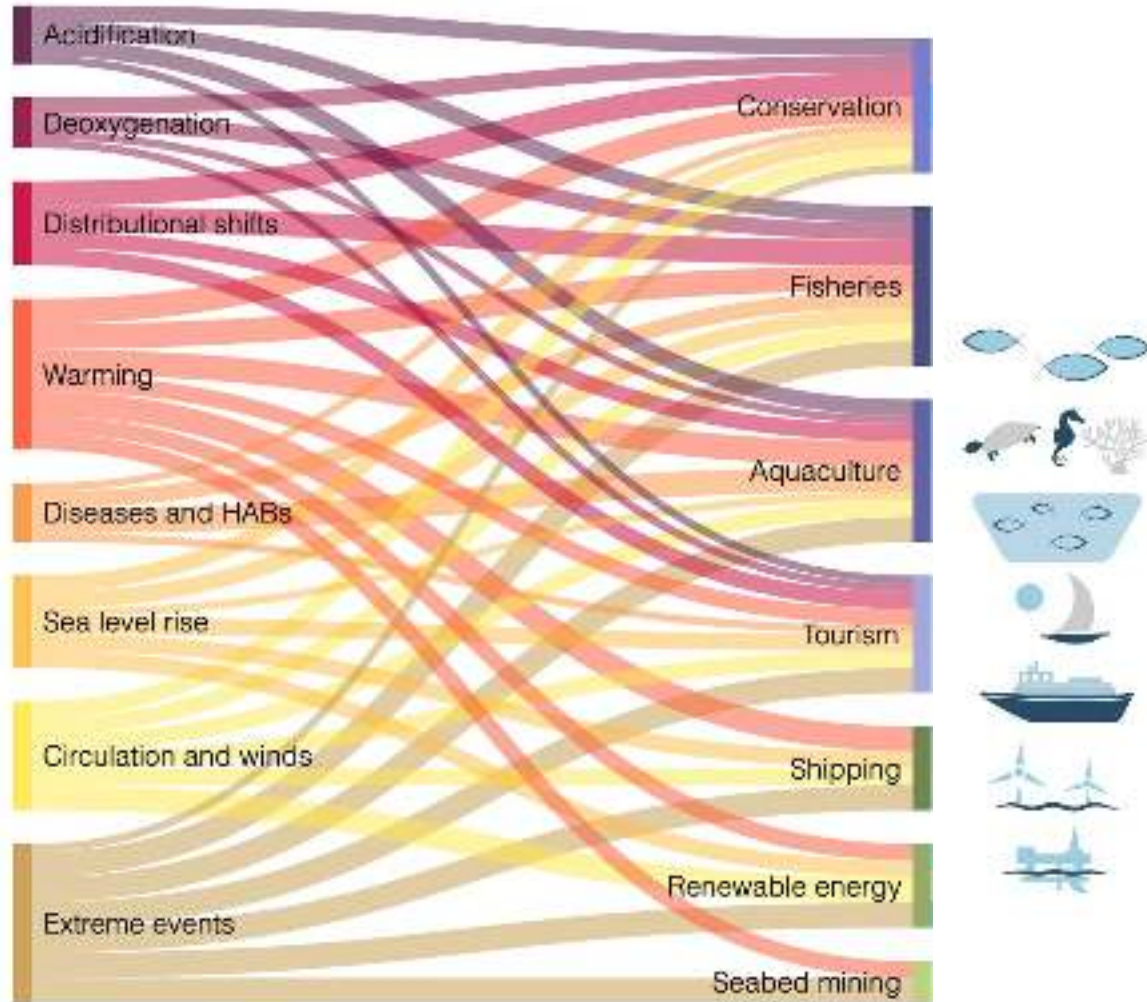
European Research Council
Established by the European Commission



3 billion people



Different uses, different impacts



www.nature.com/articles/ngeo2821



When We
move (because
of climate change)...

...Our Conservation
AREA moves
with us!

that's what
i call flexible
msp!

Stop!
Protection
AREA!

Aqua
tourism
Zone

Aqua
farm

So, now
We finally
Have this new
Route...

...thanks to
the melting
Polar...

... at a sudden
EVERYBODY
shows up
HERE!

Ben Koller

Climate-smart planning

Climate-smart MSP

“integrates climate-related knowledge, is flexible and adapts to changing conditions, and supports climate adaptation and mitigation actions”

Frazão Santos et al. 2024



European Research Council
Established by the European Commission

Moving towards Climate-smart MSP





**INTEGRATED SEASCAPE
MANAGEMENT**

Knowledge Partnership Series | #2

**Climate-Informed
Marine Spatial Planning**

Supporting
Mitigation and
Resilience

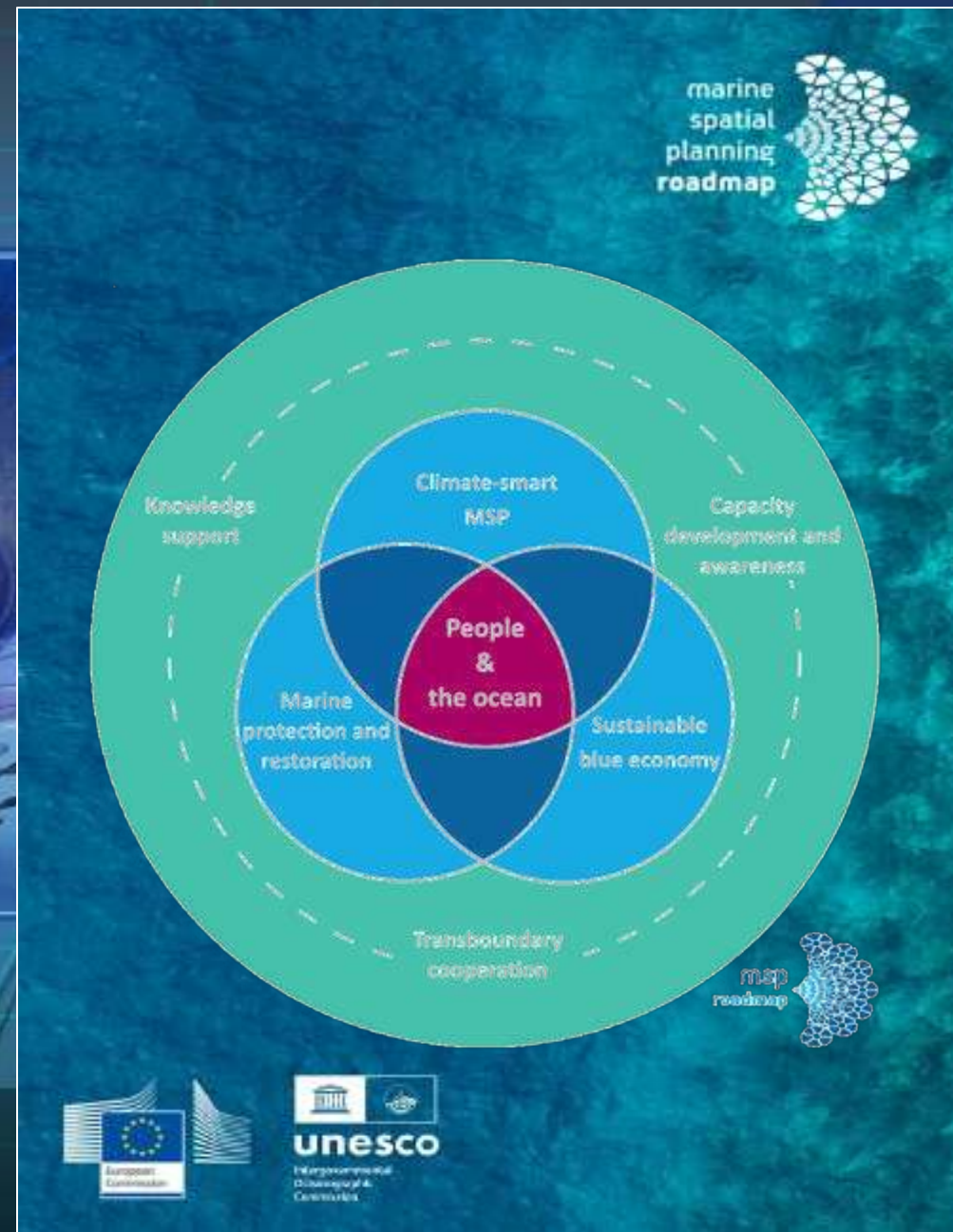


7 WHAT IS CLIMATE-INFORMED MSP?

Climate-informed marine spatial planning (MSP) is a participatory process that considers current and future climate risks and opportunities during design, planning, and implementation. While climate-informed MSP is key to realising the Blue Economy, this process supports clients in meeting their national and international climate targets and enables the World Bank Group to implement its Climate Change Action Plan (CCAP). Climate-informed MSP furthers the economic opportunities of the decarbonization pathway, while responding to the growing challenges of climate change through adaptation and integrated ocean management.



World Bank Group
The World Bank Group
2023. All rights reserved. No part
of this publication may be
reproduced without
prior written permission
from the World Bank Group.





To save the high seas, plan for climate change

Species are already on the move, as water warms. Conservation plans need to take this into account.

Could it be that the 100,000 tons of more plastic than the U.S. produces — still the change in worldwide plastic in the same time span? There is a strange, unexplained increase, a swelling in 100% of global plastic demand after the Convention on Biological Diversity (CBD) signed at the high seas — where the world's largest marine animal, except for the giant squid, lives. It is the authorship of the plastic industry — a global, because the plastic industry, not the world, said

policy mechanism to (re)allocate resources
to the health sector.

THE 1,000 MOST INFLUENTIAL PEOPLE IN THE world, according to the annual list published by *Time* magazine in June 2011, shared a common trait: they are all men. In fact, the magazine's 100 Most Influential People list was 100% male. The list was compiled by a panel of 100 experts, and the results were announced on June 13, 2011. The list was compiled by a panel of 100 experts, and the results were announced on June 13, 2011. The list was compiled by a panel of 100 experts, and the results were announced on June 13, 2011.

2004 | Feature | Neil Blom | Volume 2004

Science



POLICY FORUM

Environ Biol Fish (2015) 98:123–134

Taking climate-smart governance to the high seas

Comprehensive spatial planning in international waters is key to achieving ocean sustainability.

Ry: Catherine Fauriol-Egerton^{1,2,3}, Tarek
Hegazy^{1,2}, Cassandra Brooks^{1,2}, Erik
Björndal^{1,2}, Cynthia Payne^{1,2}, Lisa M. Rice
^{1,2,3,4}, Karen L. Berry^{1,2}, Amy D. Simonsen¹

Under the United Nations Convention on the Law of the Sea (UNCLOS), the Agreement on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction (UNCLOS-CO-

Ranking agreement was adopted by some and informally signed by nearly 60 authors (7). This agreement calls for increased opposition to high seas fisheries on U.S. and ECUA waters, economic cooperation, such as marine protected areas (8) and strategic environmental assessments (9). Although highly political areas can be resolved in an everday marine biodiversity, in special location, is the fact of a changing climate, conservation of biodiversity and

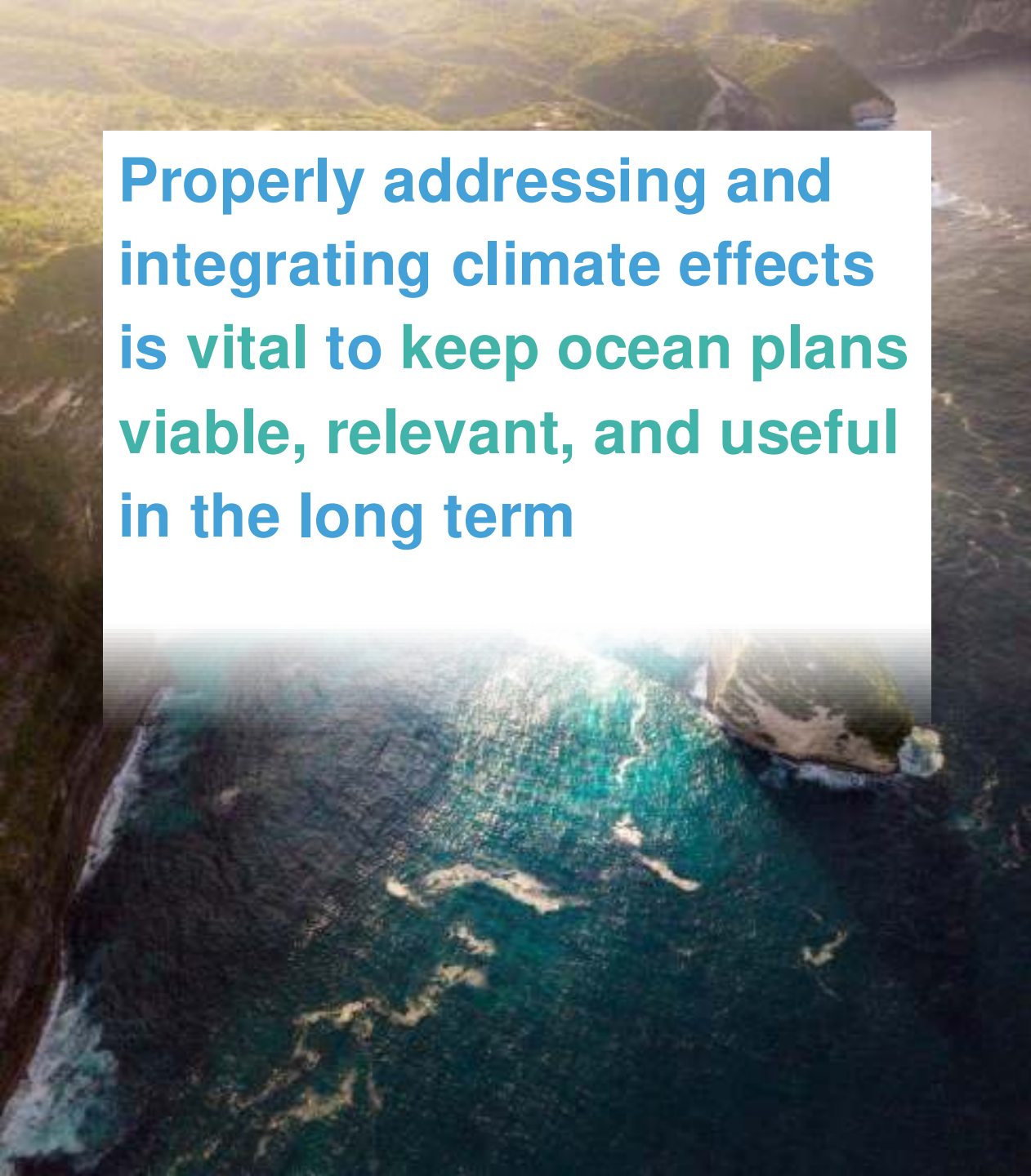
coral planting (20,000 to 30,000) will be performed in the high zone in different long-term settlements of 4 months, continuous and spaced. At the end, the 2008 planting. Parties to the Atlanta Treaty can consider climate as an issue and seize an opportunity to foster unity, a red thread already to create, maintained in JEPIC.

[illegible]

Climate-smart MSP



**Why do we need
to address
climate change
in MSP?**



Properly addressing and integrating climate effects is vital to keep ocean plans viable, relevant, and useful in the long term



When developed with explicit climate-related considerations, MSP can support climate adaptation and mitigation actions

Integrating climate change into MSP

—

How to?



Practical Guidance



European Research Council
Established by the European Commission

1.
Prioritizing
ecosystem
health

10 Key components **Climate-smart MSP**



nature
npj | ocean
sustainability

2.
System
interactions
and dynamics

4.
Integrate
climate-related
knowledge

6.
Supporting
flexible and
adaptive
planning

8.
Supporting
climate
adaptation
and mitigation
actions

3.
Social data,
equity and
change

5.
Develop
proactive,
future-looking
plans

7.
Balancing
flexibility and
legal certainty

9.
MSP and
climate-related
policies

10.
Building
common
narratives

Operational pathways



2. System interactions and dynamics

4. Integrating knowledge on climate change

6. Supporting flexible and adaptive planning

8. Supporting climate adaptation and mitigation actions

3. Social data, equity and change

5. Future-looking plans

7. Balancing flexibility and legal certainty

9. MSP and climate-related policies

10. Building common narratives

**1.
Prioritizing
ecosystem
health**

**2.
System
interactions
and dynamics**

**3.
Social data,
equity and
change**

Foundational principles

4.
Integrating
knowledge
on climate
change

6.
Supporting
resilient
adaptive
change

8.
Supporting
climate
adaptation
and mitigation
actions

5.
Future-looking
plans

7.
Balancing
flexibility and
legal certainty

**9.
MSP and
climate-related
policies**

10.
Building
common
narratives



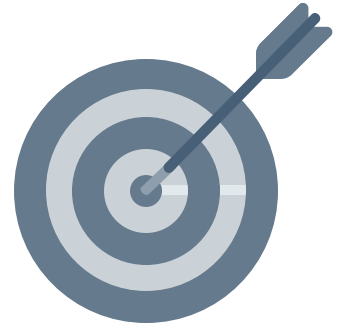
4.
**Integrate
climate-
related
knowledge**

**into MSP, identifying
expected climate impacts,
risks, and opportunities
(environmental, social,
economic)**



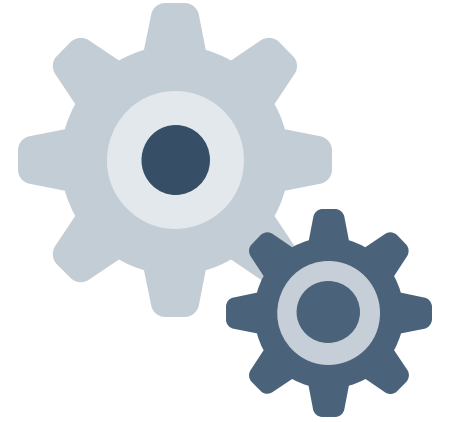
5.
Develop
proactive,
future-looking
plans

**that explore future
scenarios and can be
used to stress-test
ocean plans**



6.
**Promote
adaptive and
dynamic
planning**

**to ensure MSP's
ability to face
uncertainty and adapt
to moving biophysical
features and uses**



7.
**Balancing
flexibility with
legal
certainty**

**to address the tension
between the human
need for predictability
and moving biophysical
resources**



8.
**Identify
ocean-based
climate
solutions**

**and prioritize space
allocation to support
climate mitigation and
adaptation actions**



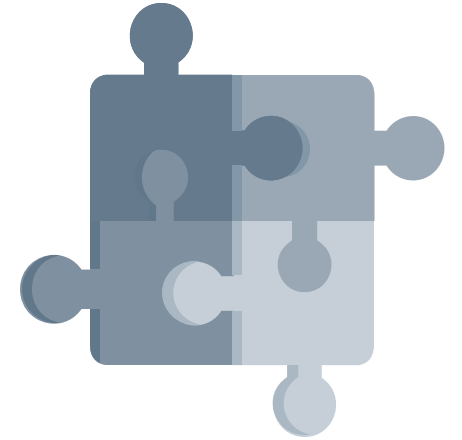
**1.
Prioritizing
ecosystem
health**

**as the primary
strategy for MSP
decision-making,
acknowledging that to
be climate-smart MSP
needs to sustain the
ecosystems on which
it relies**



**2.
Understand
system
interactions
and dynamics**

**to promote an
integrated and
systems view for
ocean planning**



**3.
Social
knowledge,
equity and
change**

**Reinforce the
importance of social
knowledge, equity and
change in co-developing
sustainable ocean plans**



9.
**Align
policies for
MSP and
climate**

**to support the
integration of climate
change into MSP and
ensure effective
coordination among
different policy arenas**



**10.
Build
common
narratives**

with policymakers, the private sector, civil society, and other integrated ocean management stakeholders to change perceptions of ocean sustainability and climate change



1 Prioritize ecosystem health as the primary strategy for MSP decision-making, acknowledging that to be climate-smart MSP needs to sustain the ecosystems on which it relies
Foundational principle

3 Reinforce the importance of social knowledge, equity and change in co-developing sustainable ocean plans
Foundational principle

5 Develop proactive, future-looking plans that explore future scenarios and can be used to stress-test ocean plans
*Operational pathway
Based on 2 & 4*

7 Balance flexibility with legal certainty to address the tension between the human need for predictability and moving biophysical resources
*Operational pathway
Key challenge of 6*

9 Align policies for MSP and climate to support the integration of climate change into MSP and ensure effective coordination among different policy areas
Foundational principle



2

Understand system interactions and dynamics to promote an integrated and systems view for ocean planning
Foundational principle

4

Integrate climate-related knowledge into MSP, identifying expected climate impacts, risks, and opportunities (environmental, social, economic)
Operational pathway

6

Promote adaptive and dynamic planning to ensure MSP's ability to face uncertainty and adapt to moving biophysical features and uses
Operational pathway

8

Identify ocean-based climate solutions and prioritize space allocation to support climate mitigation and adaptation actions
*Operational pathway
Based on 3-5*

10

Build common narratives with policymakers, the private sector, civil society, and other integrated ocean management stakeholders to change perceptions of ocean sustainability and climate change
Operational pathway

Deeply interrelated

Context specific



European Research Council
Established by the European Commission

Box 1 | Checklist for measuring 'climate-smartness' of marine spatial planning (MSP) initiatives

A number of simple queries can be made to any particular MSP initiative to rapidly assess the extent to which climate change is being recognized and integrated (or not) into planning. Such queries — which link to the ten key components proposed — can be further used as a baseline to develop a more detailed system of 'SMART indicators' (i.e., specific, measurable, achievable, relevant, and time-bound) to be used in the monitoring and evaluation of marine spatial plans, and on the assessment of their the 'climate-smartness'.

Some examples are provided below:

- Does the plan address climate change in its objectives?
- Does the plan prioritize ecosystem health, contributing to biodiversity conservation and climate action? (*component 1*)
- Do plans address land-ocean interactions? (*component 2*)
- Does the plan include social considerations, data, and diverse knowledge systems? (*component 3*)
- Does the plan have equity considerations and concerns? (*component 3*)
- Is the plan co-produced with stakeholders and rightsholders? (*component 3*)
- Is the plan using climate-related modeling tools to assess current/future spatial temporal changes in ocean uses? (*component 4*)
- Is the plan using climate-related modeling tools to assess current/future spatial temporal changes in ecosystem goods and services? (*component 4*)
- Is the plan using climate-related vulnerability and risk tools to assess environmental, social, economic, and governance consequences of change? (*component 4*)
- Is the plan using scenario building processes (e.g., 'visioning' or 'fore-sighting') to assessing planning alternatives? Does the plan clearly outline the planning timeframe and the likely climate-scenario(s) (e.g., 'business-as-usual') to be considered over that timeframe? (*component 5*)
- Does the plan have adaptive mechanisms for management decisions? (*component 6*)
- Does the plan include monitoring indicators related to climate change effects? (*component 6*)
- Does it allow for areas allocated to a certain use to move following shifting conditions? (*components 6 and 7*)
- Does it prioritize space for ocean-climate solutions? (*component 8*)
- Does the plan identify nature-based approaches for climate change, such as conservation and restoration of blue carbon ecosystems? (*component 8*)
- Does the plan identify areas for renewable ocean energy production? (*component 8*)
- Does the plan refer to other instruments (plans, policies, strategies) that relate to climate change? (*component 9*)
- Does it promote ocean-climate literacy close to stakeholders? (*component 10*)



“Climate-smartness”



Multiple pathways

Thank you !



cfsantos@fc.ul.pt



www.OceanPlanningLab.com

PL_{anning}AnT_{arctica}



Science

POLICY FORUM OCEAN



nature
npj | ocean
sustainability



U
LISBOA
UNIVERSIDADE
DE LISBOA



Ciências
ULisboa



UNIVERSITY OF
OXFORD

AR
NET
ATLANTIC RESEARCH NETWORK

Integrative
Organismal
Biology
A journal of the Society
for Integrative and
Comparative Biology



European Research Council
Established by the European Commission



Funded by the
European Union

