Marine biodiversity under climate change –
A European overview of pressures, state and remaining challenges

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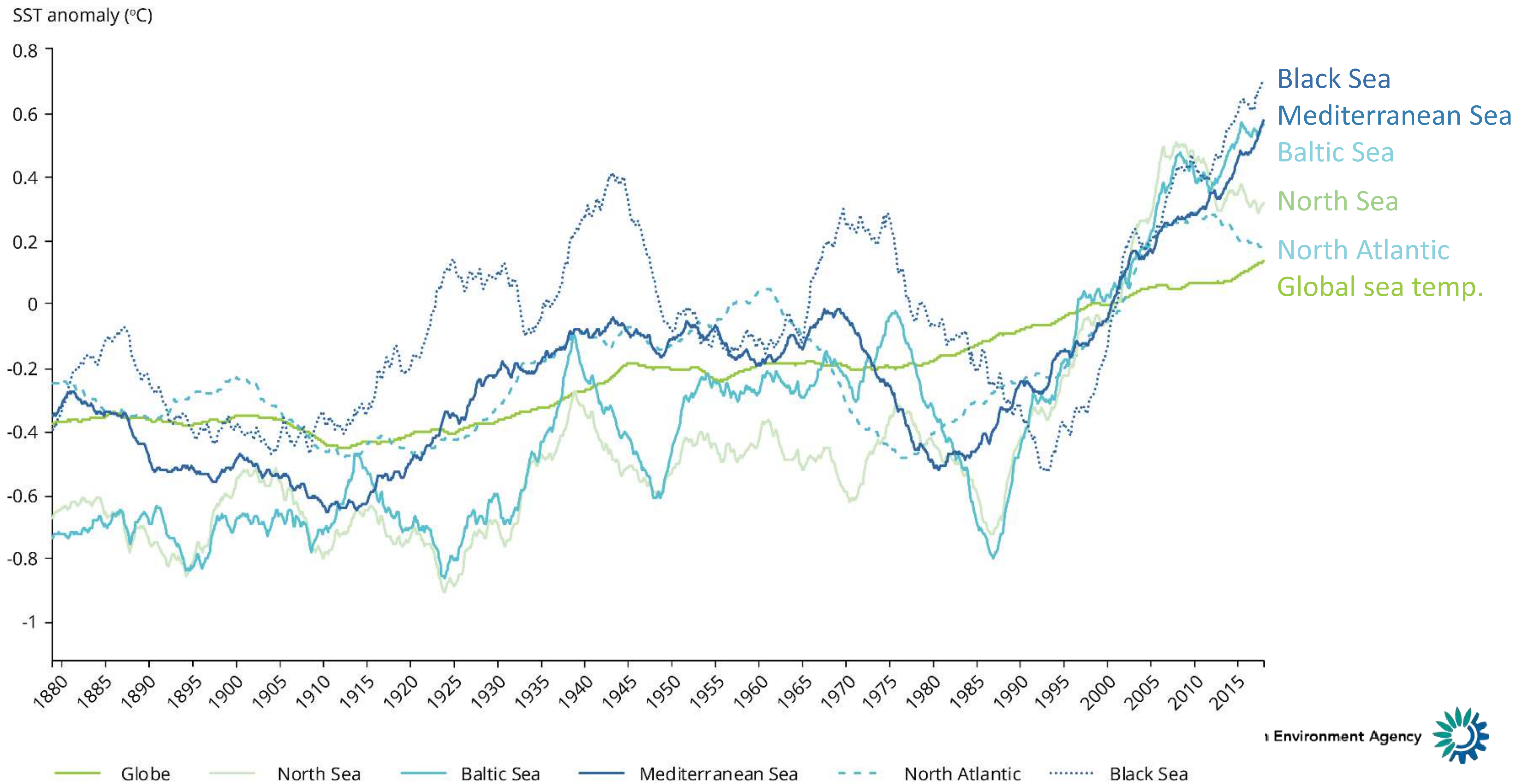
State of Europe’s marine environment

Thematic summary assessment

Theme	Past trends and outlook		Prospects of meeting policy objectives/targets
	Past trends (10-15 years)	Outlook to 2030	2020
State of marine ecosystems and biodiversity	Trends show a mixed picture	Deteriorating developments dominate	Largely not on track
Pressures and impacts on marine ecosystems	Trends show a mixed picture	Deteriorating developments dominate	Largely not on track
Sustainable use of the seas	Trends show a mixed picture	Developments show a mixed picture	Partly on track
Marine protected areas	Improving trends dominate	Developments show a mixed picture	Largely on track

Implementation Gap

Global and European marine warming



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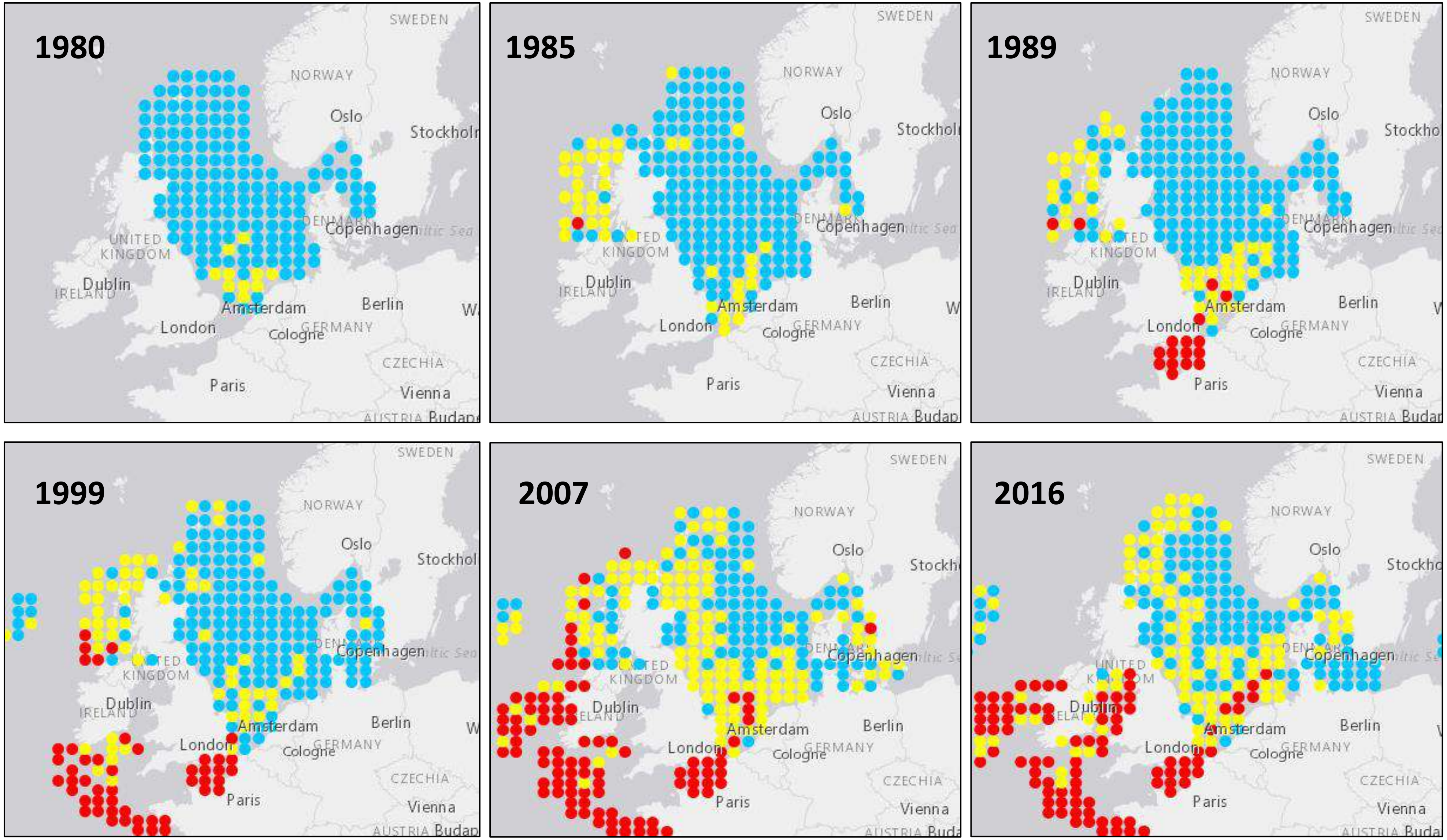
Chronic climate change effects – species move northwards due to high SST



Dominance of Boreal species

Dominance of Lusitanian species

High dominance of Lusitanian species

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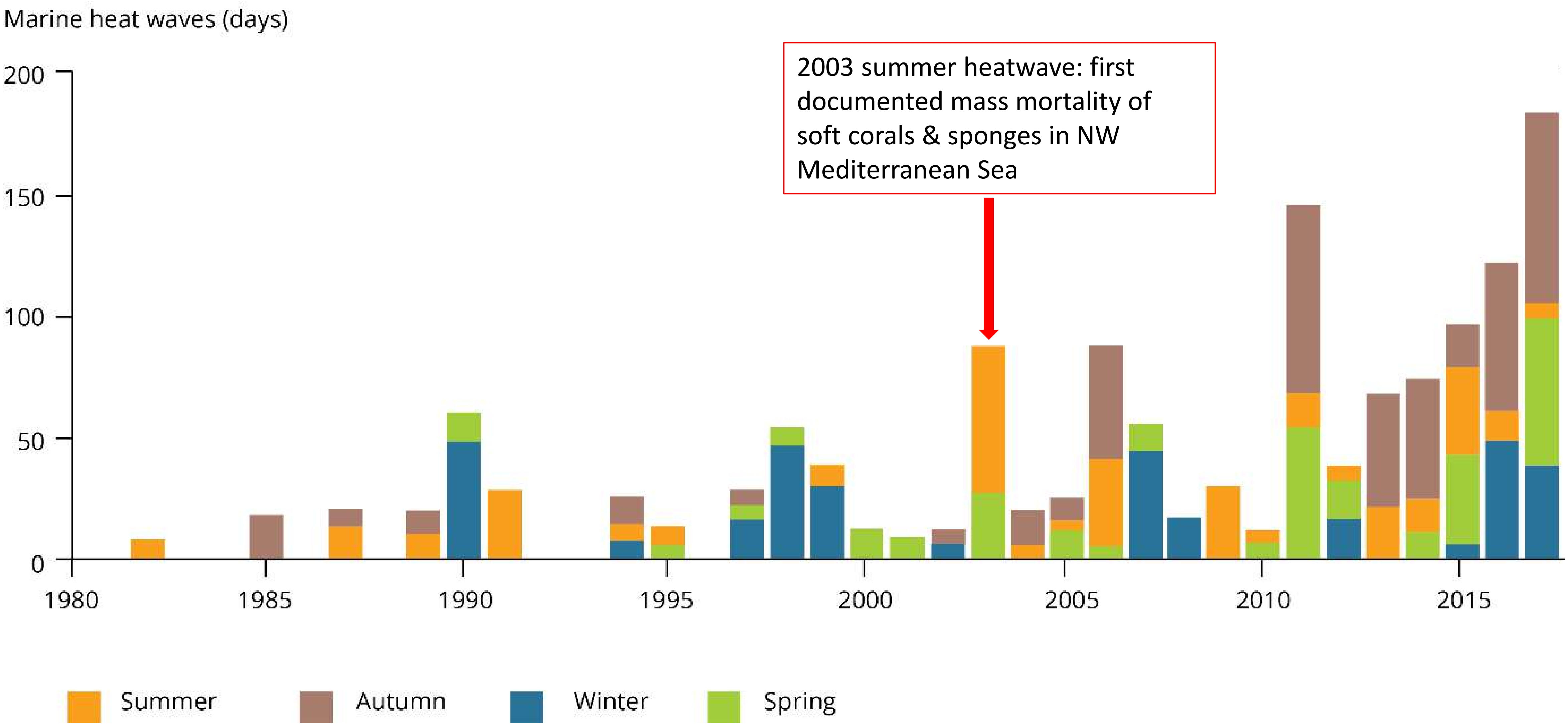
Acute climate change effects – marine heatwaves kill sea life



Source: Copernicus

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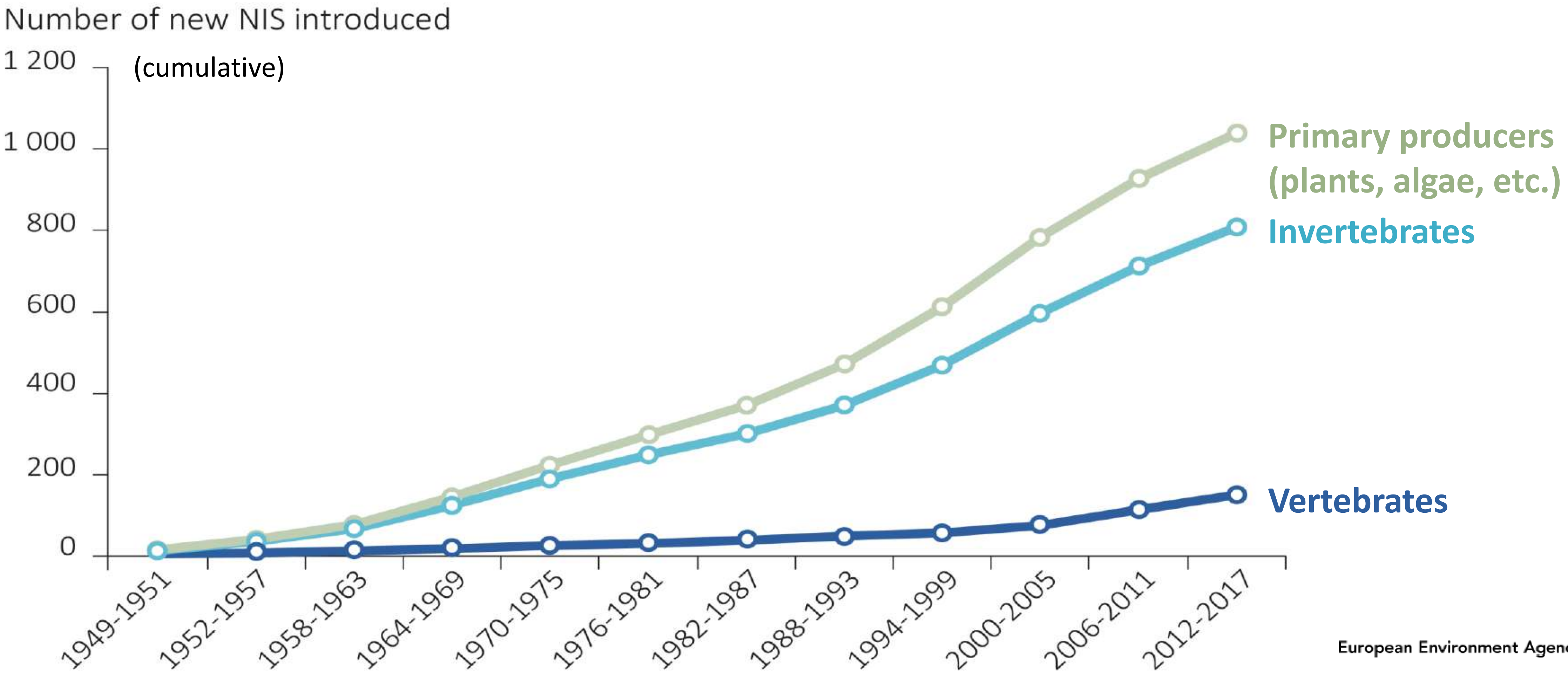
Stressed marine ecosystems are more sensitive to pressures

Climate change-stressed ecosystems are more sensitive to other pressures e.g. non-indigenous species can become invasive after marine heatwaves.



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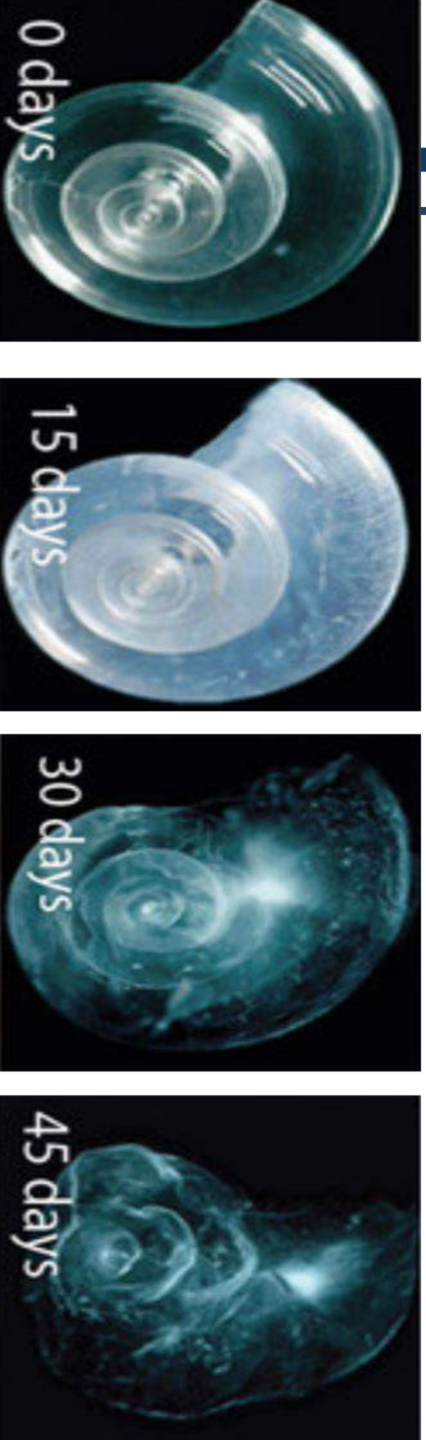
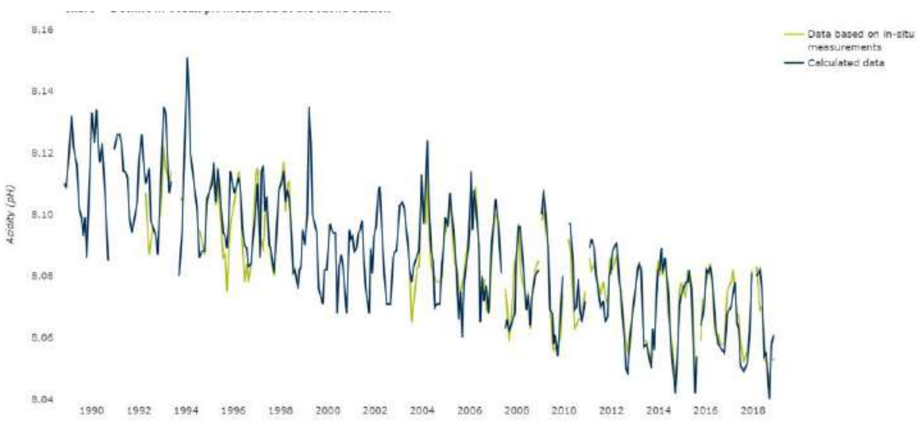
Ocean acidification – one driver behind mass extinctions



- The ocean has captured 28% of human-produced CO_2 since 1750 reducing pH from 8,2 to less than 8.1 (30% reduction)
- Acidity is impacting ’shell builders’ like oysters and corals
- Sea butterflies (photo) will disolve at the pH levels projected for 2100
- Sea butterflies and other plankton are a key part of the food web, which is the basis for all marine life



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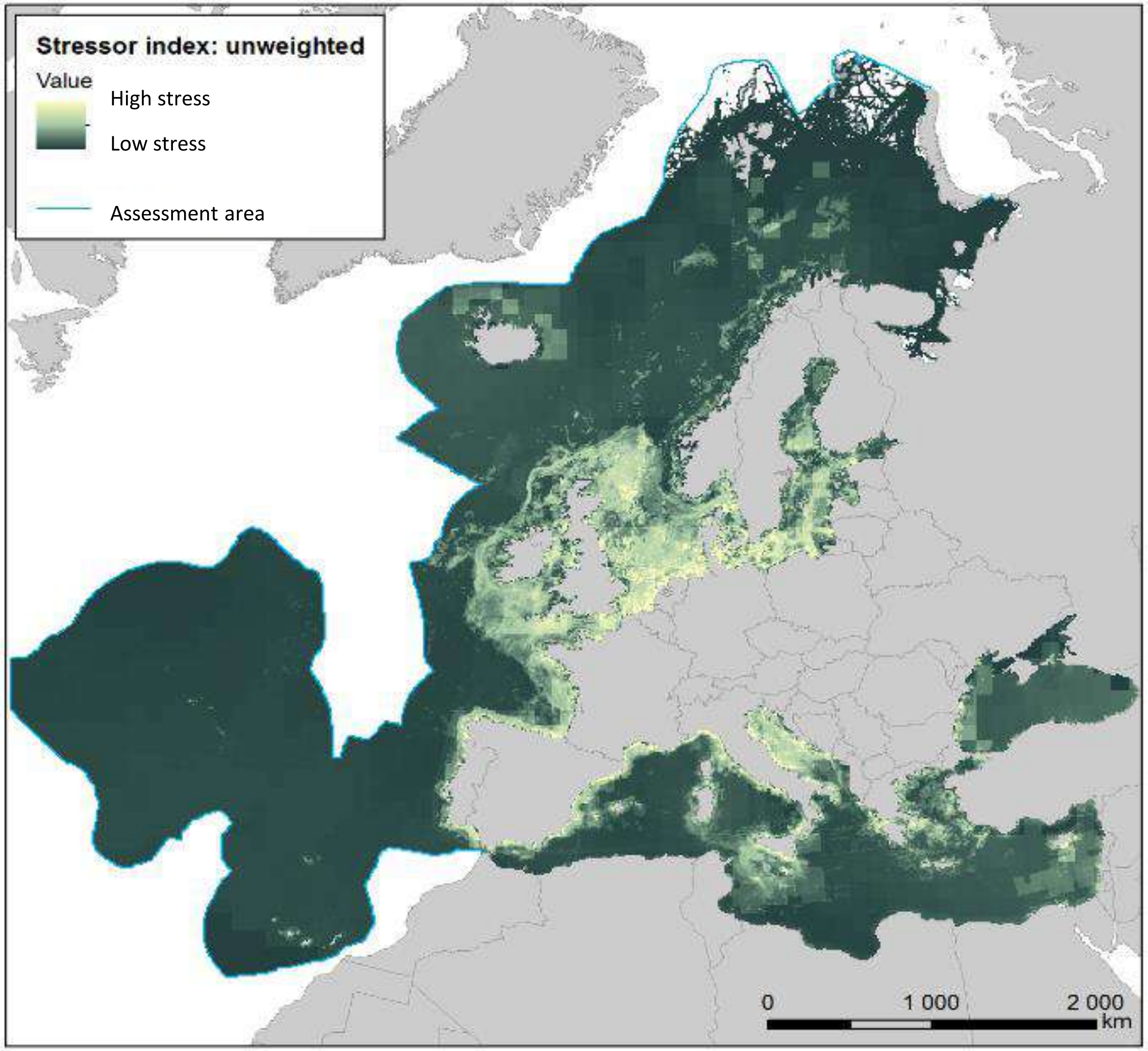
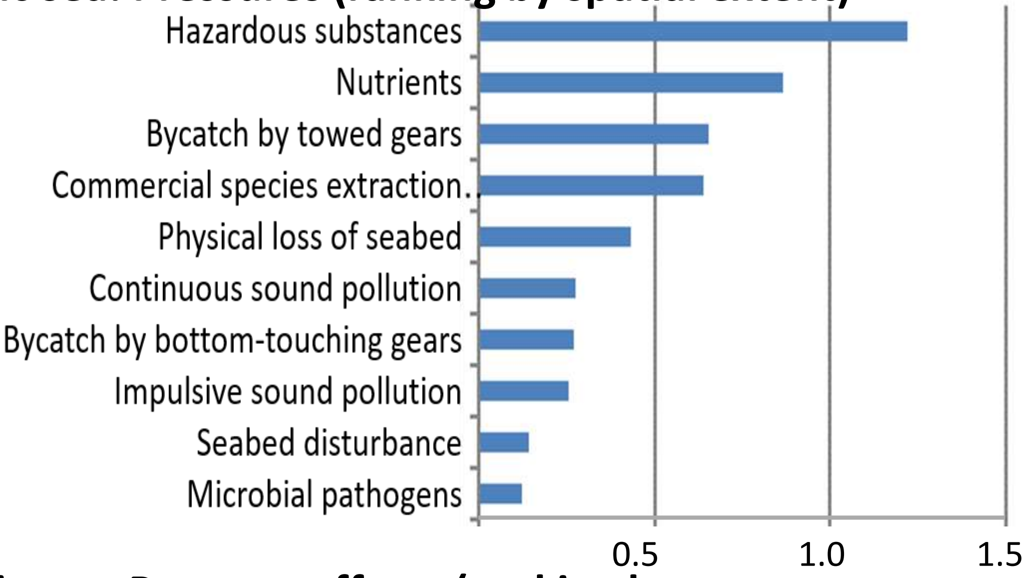
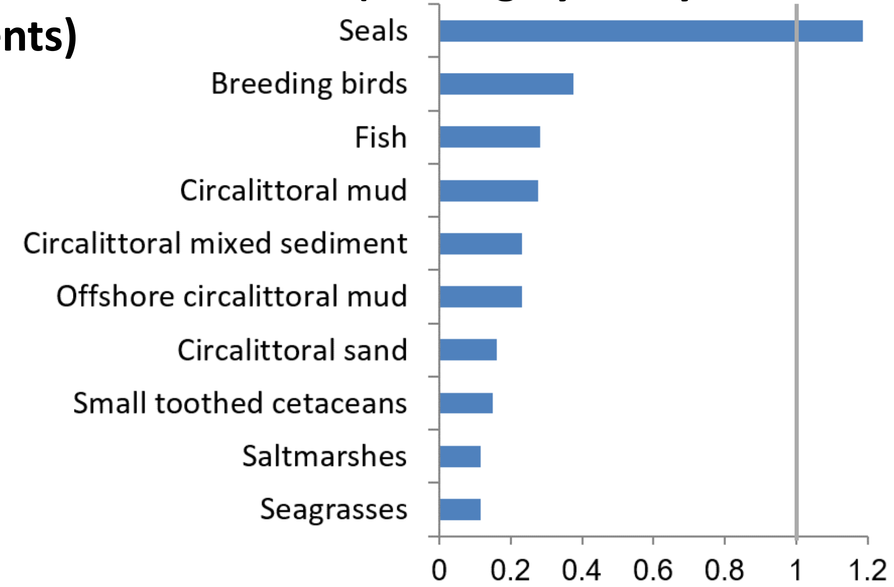
Multiple pressures & effects on Europe's seas & Baltic Sea



Baltic sea: Pressures (ranking by spatial extent)

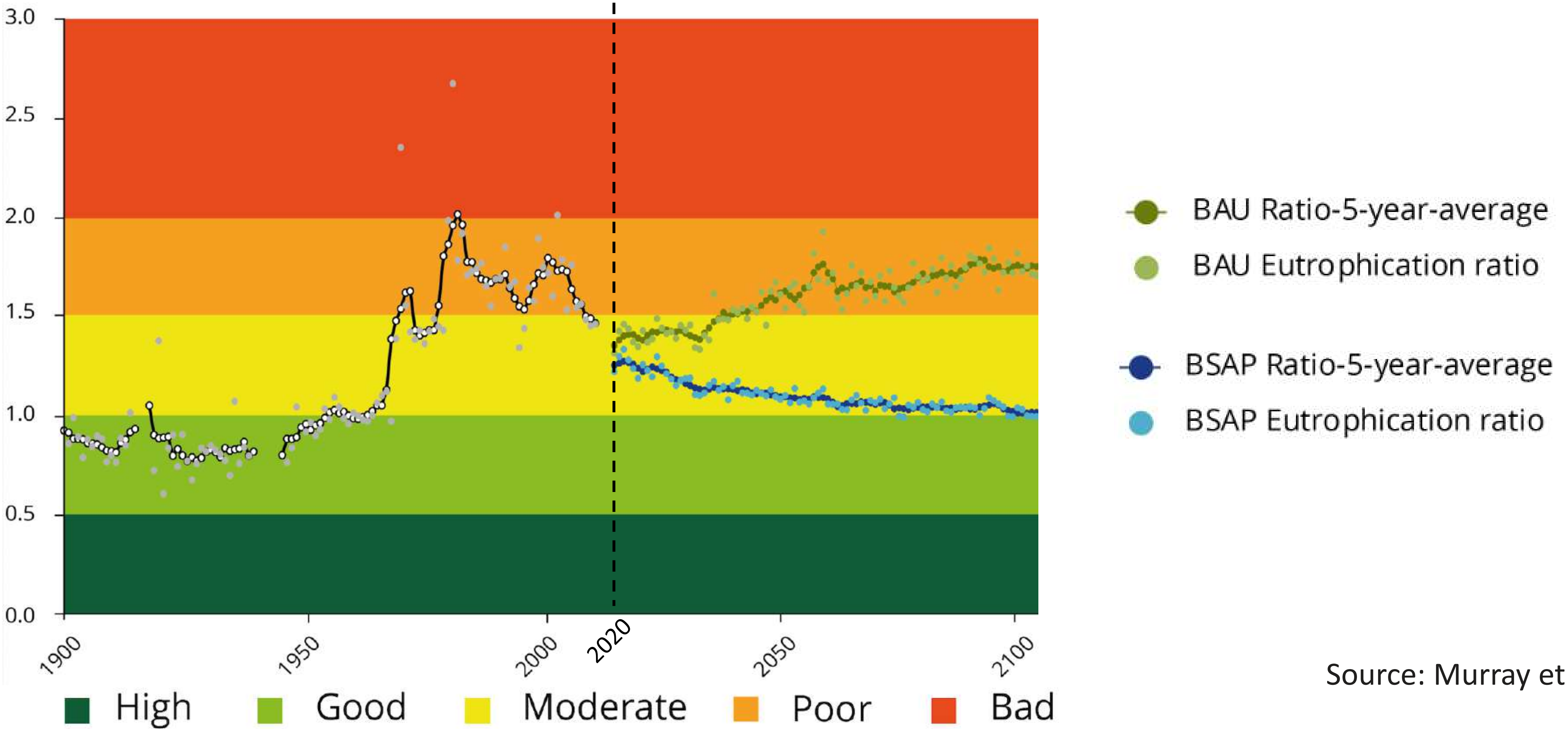


Baltic sea: Pressure effects (ranking by ecosystem components)



Baltic Sea eutrophication: policy matters but climate change needs to be accounted for

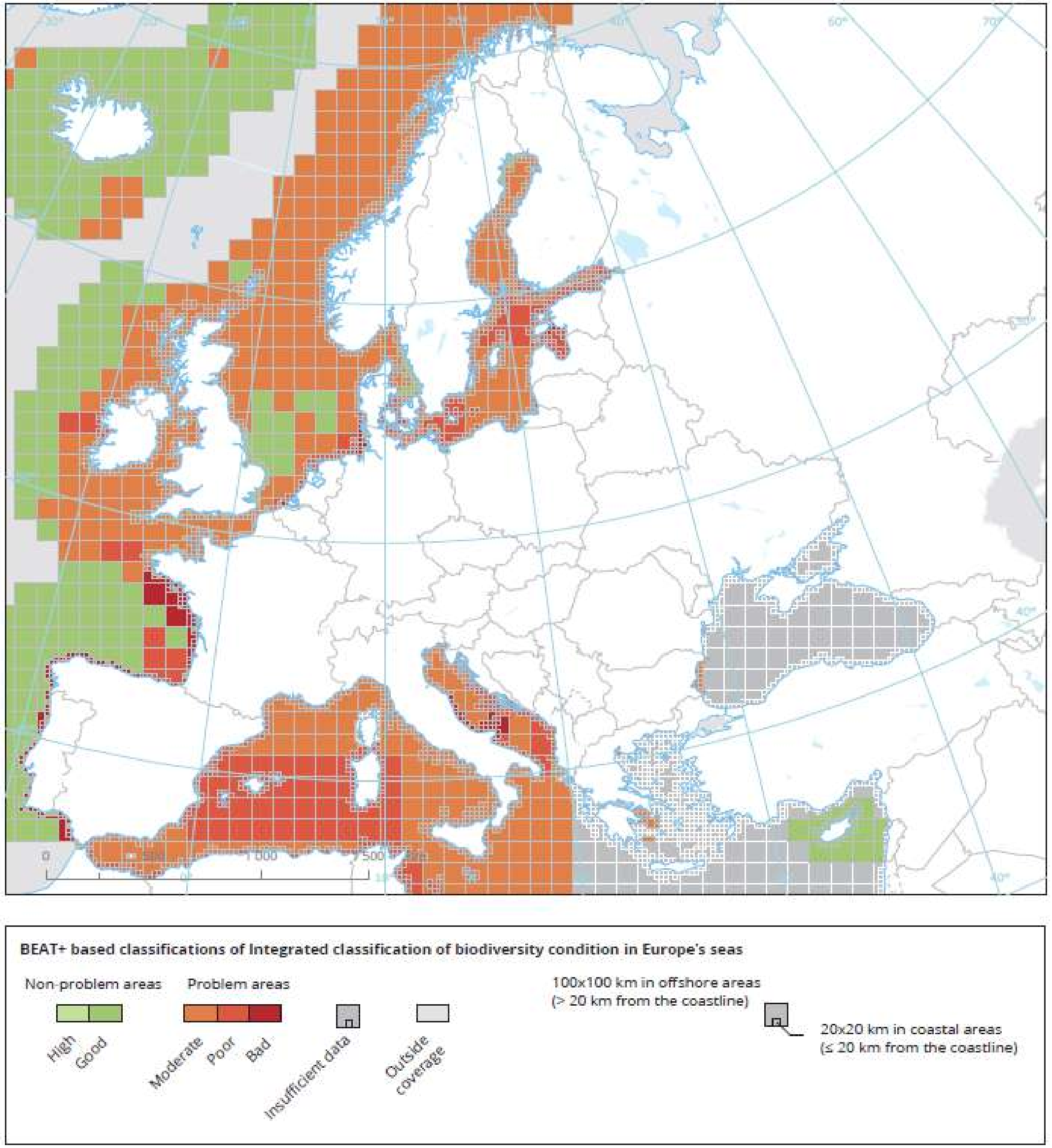
Eutrophication ratio in the Baltic Sea since 1900. Projections under different management regimes and link to ecological status classification without factoring in climate change



Source: Murray et al 2019

The condition of biodiversity in Europe’s seas

Figure 3.1 **Integrated classification of biodiversity condition in Europe's seas**



Where we have data and can assess it, multiple pressures, including climate change, result in the state of biodiversity being 'not good'

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Looking ahead

1. Measures to combat climate change **take a very long time** to make a visible difference in the state of the global ocean.

2. In the meantime, ecosystem resilience can be maintained by **reducing other pressures** (e.g. reduce nutrient loads, ban destructive fishing methods, reduce transfer of non-indigenous species, etc.).

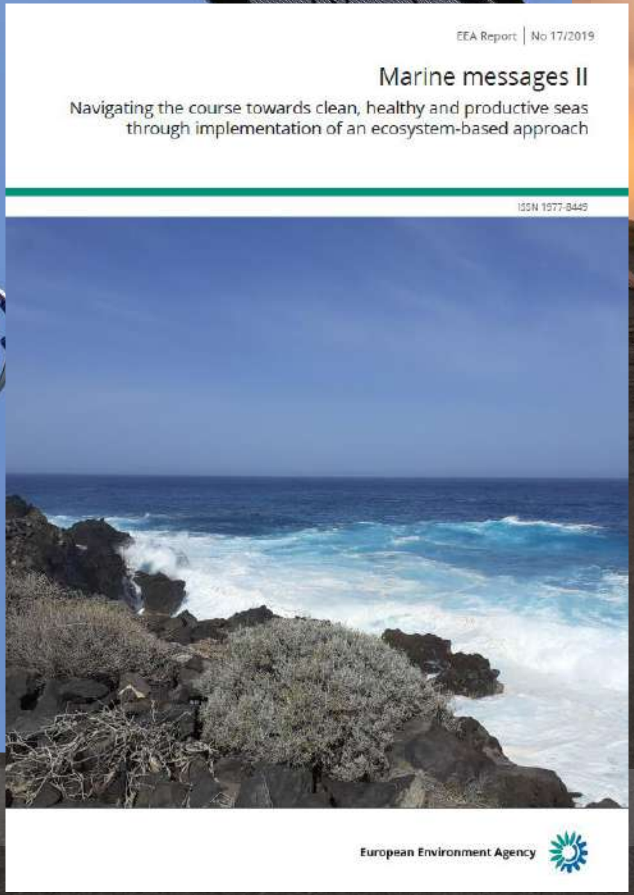
3. Fisheries is the most widespread pressure in Europe's seas, **improving and enforcing better fisheries management** (e.g. ban destructive fishing methods such as bottom trawling) would make an immediate (e.g. 4 years) difference on its state.

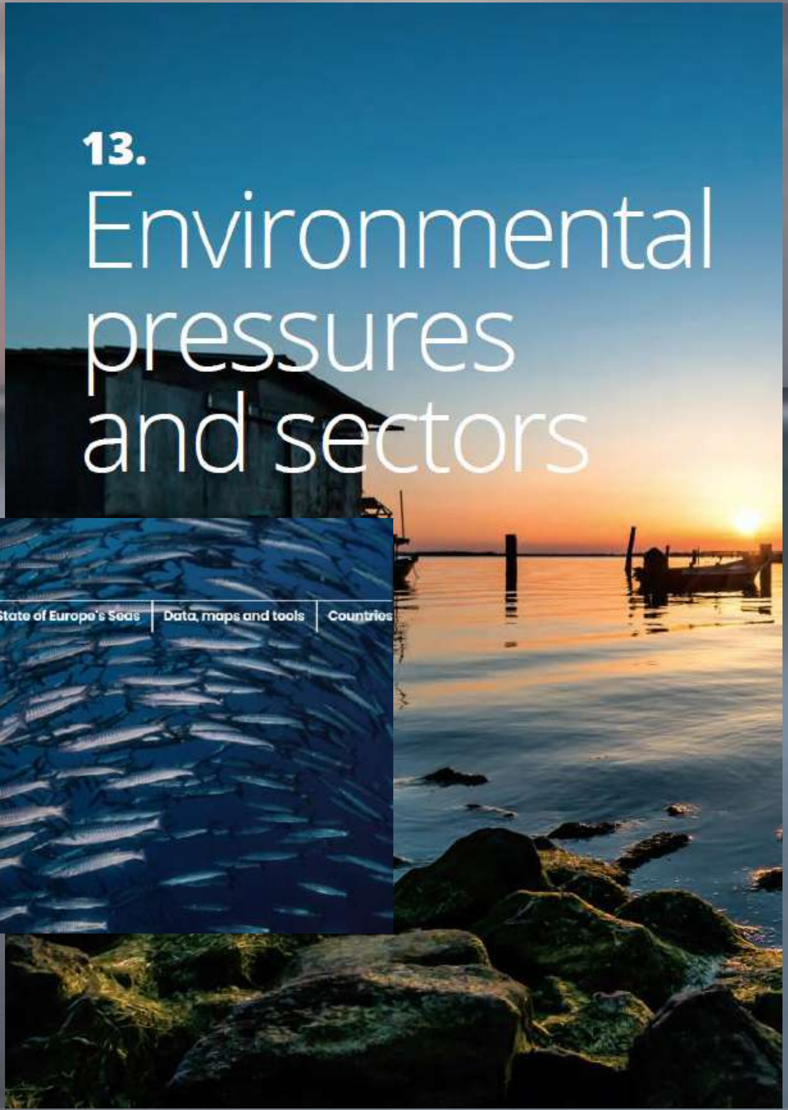
4. **Ecosystem resilience can be gradually restored** through specific initiatives (e.g. rebuild reefs, re-plant seagrass beds, implement and enforce strict spatial protection i.e. 'no-take' marine protected areas, expand protection regimes to include common, and not just vulnerable, species and habitats).

5. **Better** (increased temporal and spatial coverage) **and consistent monitoring** is needed to inform on long-term trends in the state of the sea, and on marine policy and management implementation progress.

6. **Management regimes dealing with single sectoral pressures** (e.g. fisheries) **can no longer stand alone** but need to be integrated with actions to halt biodiversity loss and combat climate change.

Thank you





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Global context: unprecedented challenges, improved knowledge

1. IPCC report on global warming of 1.5°C

2. IPBES global report on biodiversity and ecosystem services

3. International Resource Panel global outlook 2019

Urgent action needed because of

- Acceleration
- Tipping points
- Interconnectedness