Welcome to NIOZ!

Den Helder – Zoölogic Station

Yerseke – Zeeland (NIOZ-YE)

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Royal Netherlands Institute for Sea Research

FROM CLIMATE CHANGE

TO BIODIVERSITY

FROM DELTA

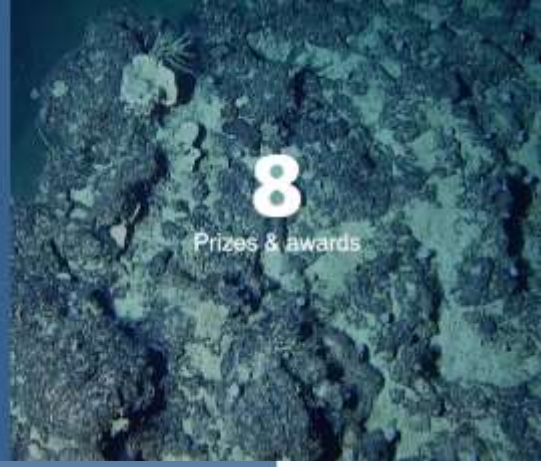
TO DEEP SEA

HIGHLIGHTS FACTS & FIGURES 2022

All figures >

312
Peer-reviewed journal articles

304
Open Access

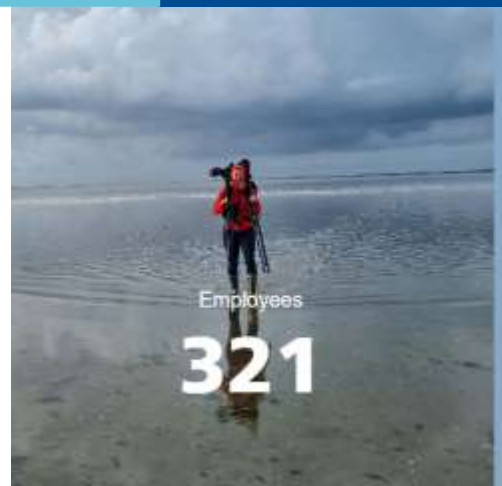


44
Courses

Internships
175

497
International news items

Radio & tv
127



34
Nationalities

154
Women

€
~42.5 Million

Royal Netherlands Institute for Sea Research

NIOZ is the national oceanographic institute and the Netherlands centre of expertise for ocean, sea, and coast. We advance fundamental understanding of marine systems, the way they change and the role they play in climate and biodiversity and how they may provide solutions to society in the future.

We advance fundamental understanding of marine systems within 4 science departments:

Marine Microbiology & Biogeochemistry

Estuarine & Delta Systems

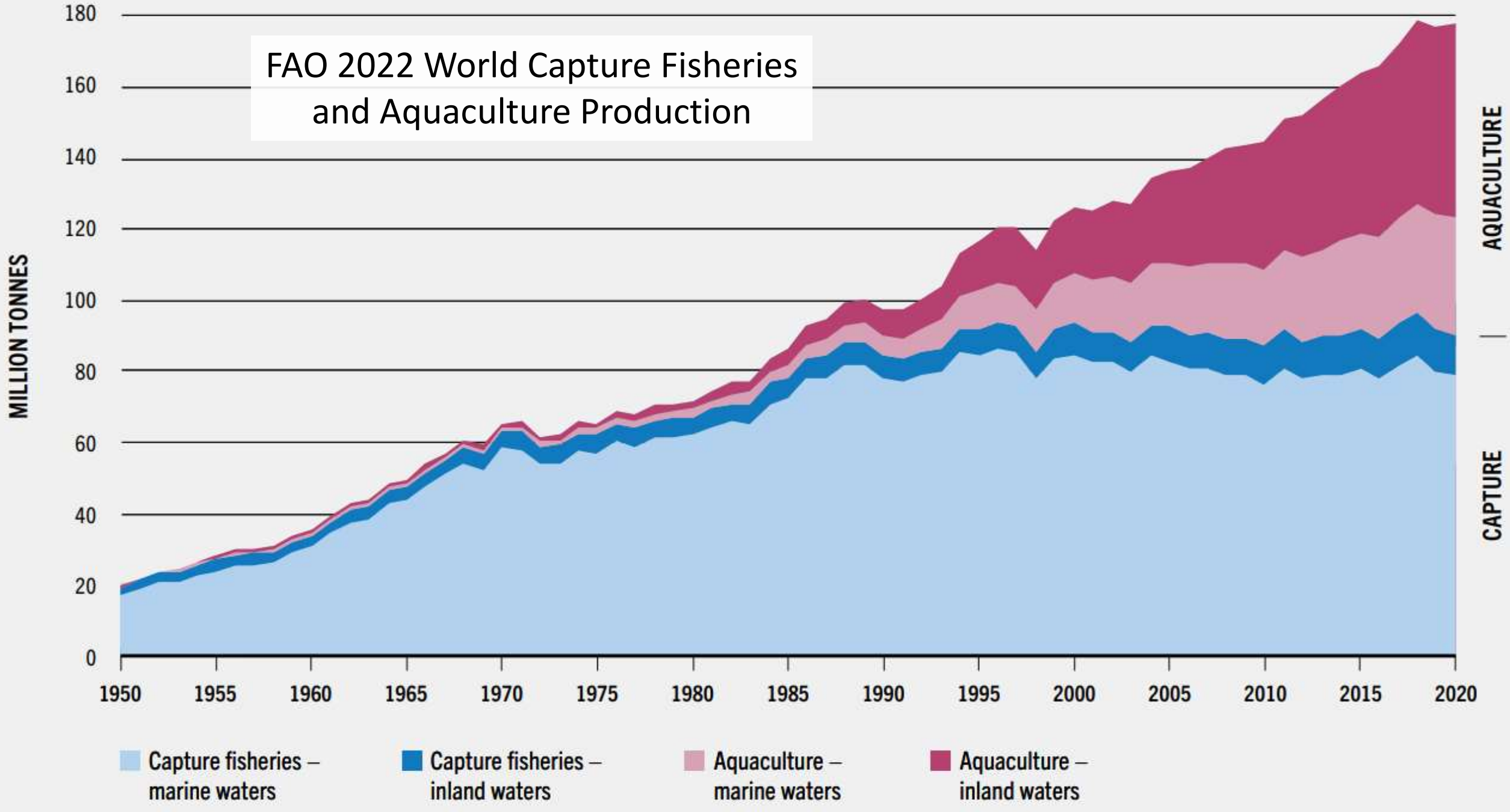
Coastal Systems

Ocean Systems

Working across regions…

… and across habitats

FAO 2022 World Capture Fisheries and Aquaculture Production



Climate Change & Top-value European Aquacuture Species

ceresproject.eu

Salmon
Salmo salar

Trout
Oncorhynchus mykiss

Sea bass
Dicentrarchus labrax

Carp
Cyprinus carpio

Sea bream
Sparus aurata

Blue mussel
Mytilus edulis

Cupped oyster
Crassostrea gigas

Mediterranean mussel
Mytilus galloprovincialis

European clam
Ruditapes decussatus

https://ec.europa.eu/fisheries/cfp/aquaculture/species_en

Impacts of Climate Change on Growth Performance of Aquaculture Species

- Physiological-based cultivation model calibrated against specific farms (same model for all species / countries).
- Climate change ‘winners‘ and ‘losers‘ depending on location and species.
- Some shellfish farms do particularly poorly due to warming and reduced primary production projected for 2100 (much less change by 2050).
- Only direct and no indirect (e.g. disease) effects included here.

Year 2100

Country	Species	Total Prod	
		RCP4.5	RCP8.5
Ireland	Salmon		
Norway	Salmon		not tested
Turkey	Sea bass		
Spain	Sea bream		
Poland	Carp		
Turkey	Rainbow trout		
Denmark	Blue mussels		
Netherlands	Blue mussels		
Netherlands	Pacific oysters		
Portugal	Med mussels		

much lower
same average and range
significantly greater

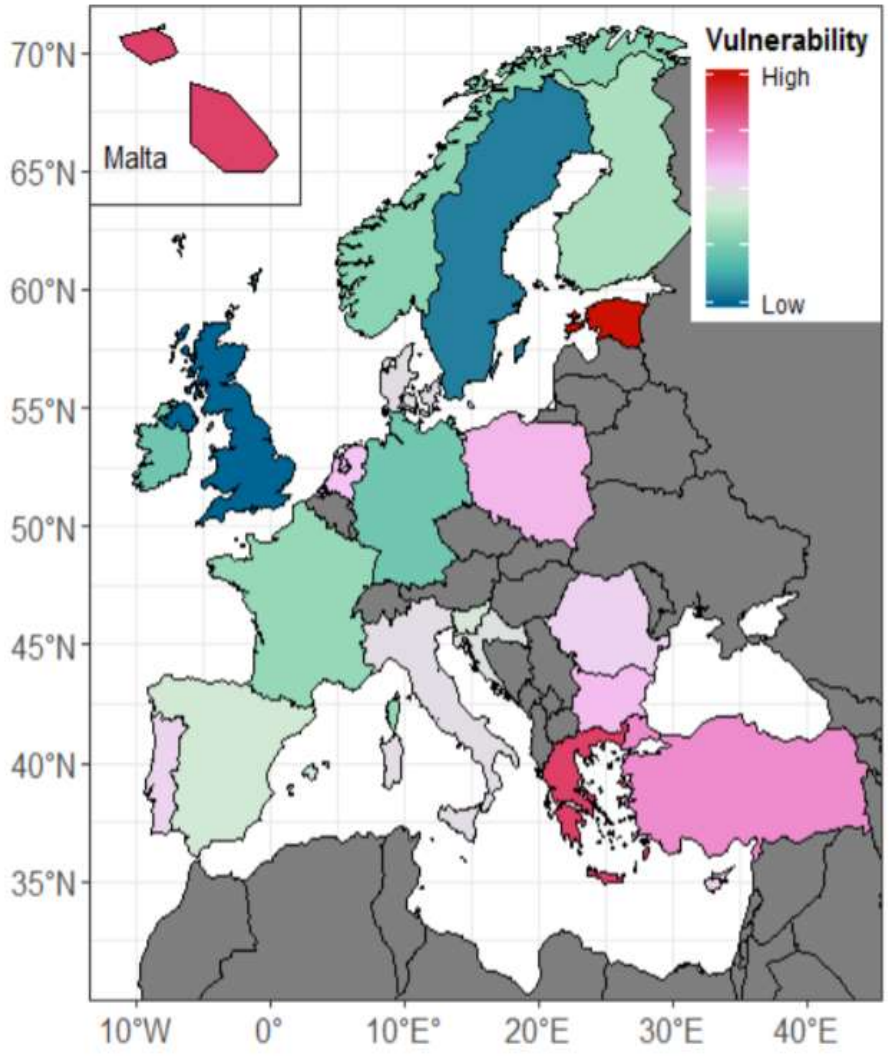
significantly lower
same average, wider range
much greater

lower average
≥ present day

≤ present day
Higher average

Europe-wide Climate Change Vulnerability Assessment

- Ranked national vulnerability based on farmed species, methods, economic indicators, expert evaluation.
- climate-driven warming (RCP8.5, 2050) caused little reduction in habitat suitability based on species thermal growth performance.
- Small farms lacking environmental control (e.g. traditional trout, carp and shellfish farms) more vulnerable (low adaptive capacity by technological innovation).
- SE Europe vulnerable due to relative importance of aquaculture to GDP, smaller portfolio of species, and status of national climate adaptation plans.
- Measures increasing economic performance (e.g. vertical integration, RAS) will also reduce climate change vulnerability.



CERES Synthesis Report: Chapter 5

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Enjoy the Symposium!

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