

CLIMATE SECURITY

Climate change impacts / adaptation of the French Navy

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Observatory*

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THE OBSERVATORY

The Defence and Climate Observatory, launched in **December 2016**, aims to study **climate-related security and defence issues**.

2016-2021: regional climate security stakes mapping exercises (South Asia, North Africa, South America, South-West Indian Ocean)

2021-2026: thematic reports on health, geoengineering, weaponisation, water scarcity, HADR, agriculture...

<https://defenseclimat.fr/en/>



FRAMING RISKS FOR ARMED FORCES

Equipment and implantation vulnerability

Soldiers' vulnerability

Missions' overlap or intensification

Conflicts' exacerbation

Led by armed
forces / research
as a support

Led by research

CASCADING EFFECTS

Climate change
impacts

Consequences
on human
systems / Risks
of destabilisation

Anticipation for
armed forces

Note

THE STRATEGIC USE OF CLIMATE VULNERABILITIES IN CONTEMPORARY CONFLICTS: MODALITIES AND FEEDBACK EFFECTS

November 2025

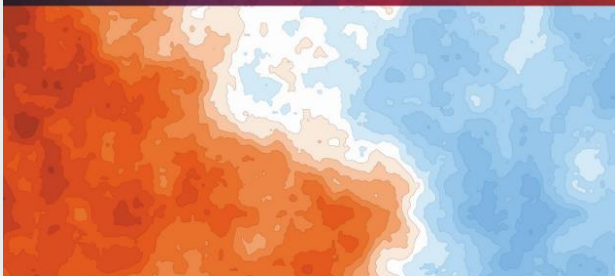


Note

SECURITY AND DEFENCE IMPLICATIONS OF CLIMATE TIPPING POINTS

AMOC

June 2025



CEMC: CLIMATE CHANGE EVALUATION METHODOLOGY FOR MILITARY CAMPS

STUDY REPORT N°16 - EXECUTIVE SUMMARY



CLIMATE SECURITY IN THE WESTERN INDIAN OCEAN



FRAMING RISKS FOR ARMED FORCES

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EQUIPMENT AND BASES' VULNERABILITY

Impacts of climate change on French Navy

Climate hazard

Temperature increase (land and ocean surface)

Sea-level rise

**Physical
consequences**

Mecanical and
electronical
systems
overheating

Cloud layer
thickening /
change in
salinity

Marine micro
organisms
thriving

Hurricanes/
cyclones

Submersion

**Impacts on
armed forces**

Threatened
functionnal
integrity

Compromised
navigation

Biofouling

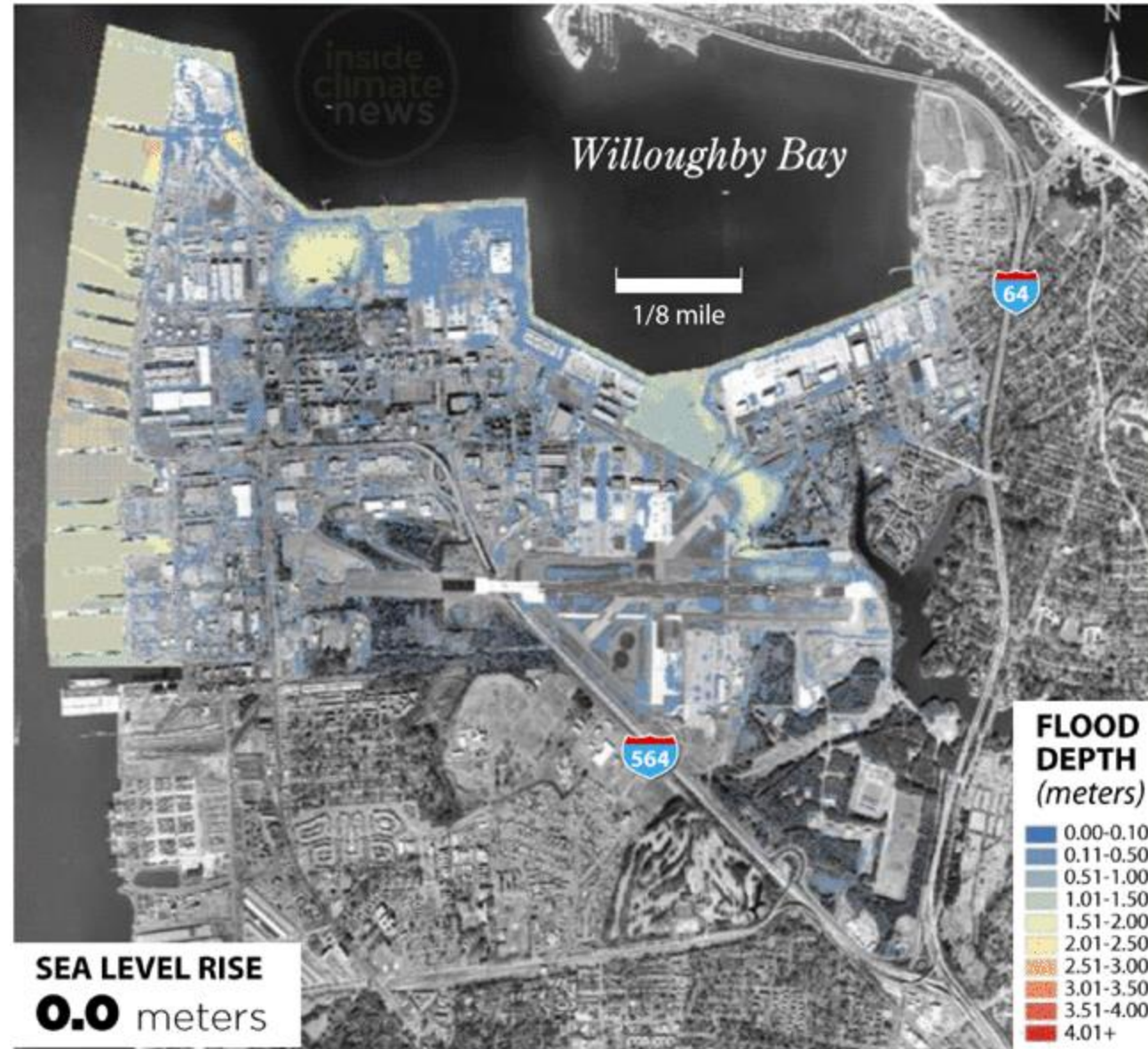
Infrastructure
vulnerability

Infrastructure and
supply lines at
threat

Infrastructures' climate vulnerability

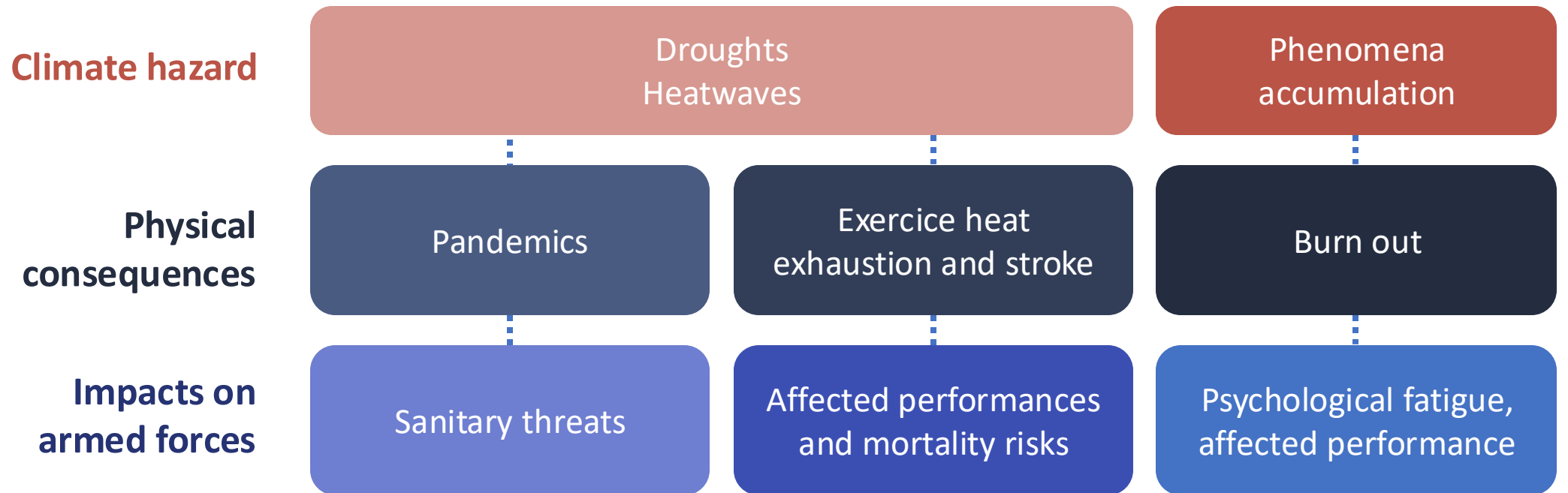
How Rising Seas Will Affect Norfolk Base

This animation shows the flooding that's likely to occur at Naval Station Norfolk, at current and higher sea levels, during the type of storm that hits on average once a year.



SOLDIERS' VULNERABILITY

Impacts of climate change on French Navy

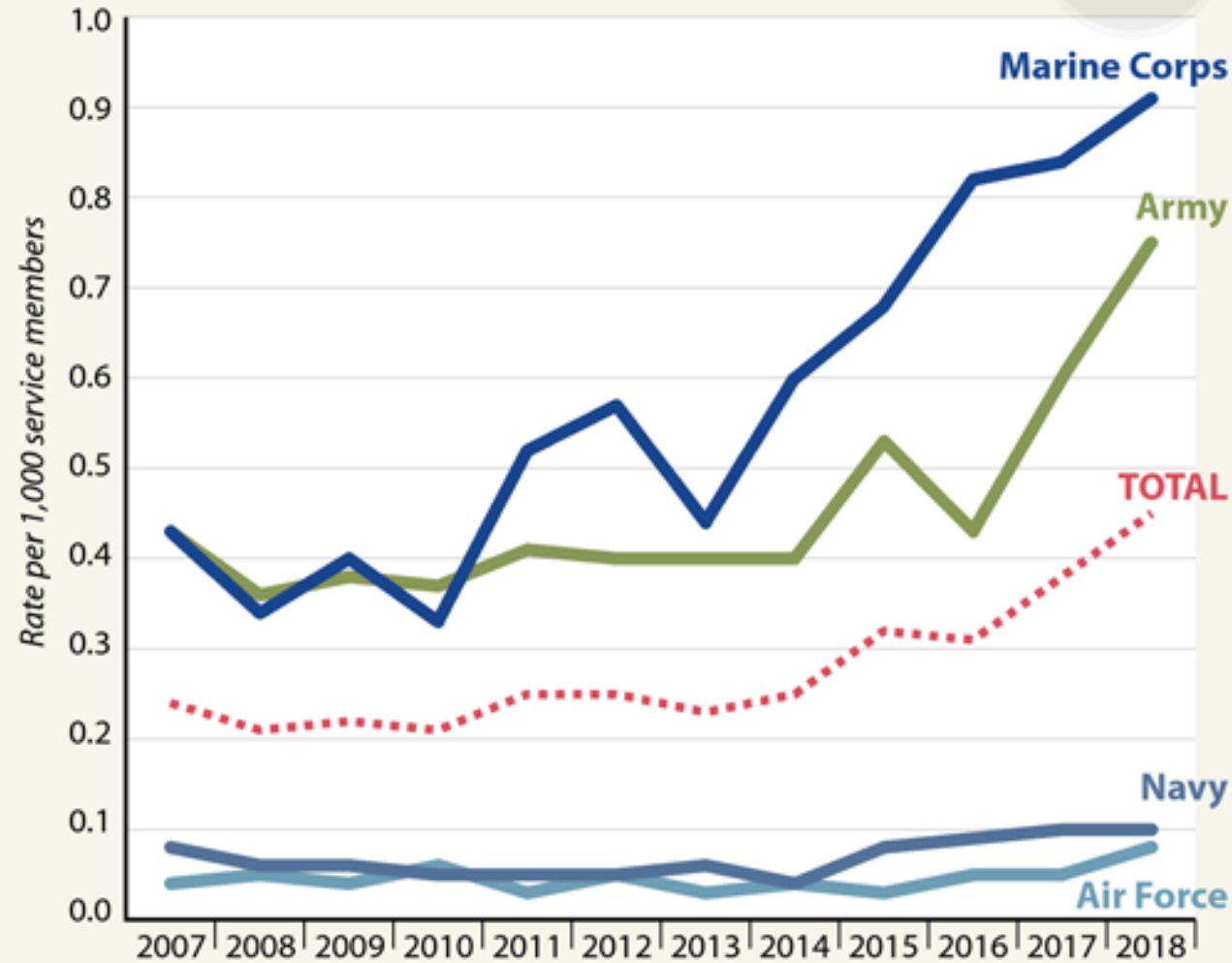


The Rising Danger from Heat

The rate of heat stroke among active-duty service members has risen across the military over the past decade. There were 60 percent more cases in 2018 than in 2008, even with a smaller active-duty force.

U.S. MILITARY HEAT STROKE INCIDENT RATE

Army, Navy, Marine Corps and Air Force, 2007-2018



Climate h

Phy
consequ

Impact
armed f

Phenomena
accumulation

Burn out

Psychological fatigue,
affected performance

IMPACTS ON MISSIONS

Impacts of climate change on French Navy

Climate hazard

Extreme weather events

Sea surface temperature

**Physical
consequences**

Population evacuation

Fish stocks' migrations

**Impacts on
armed forces**

HADR

Fishing police



IMPACTS ON MISSIONS

Impacts of climate change on French Navy

Military operations will be impacted:

- Humanitarian aid and disaster relief (HADR) operations will be more frequent

Needs for adaptation/anticipation (more frequent and intense extreme weather events and on a broader geographical area)
= training, equipment

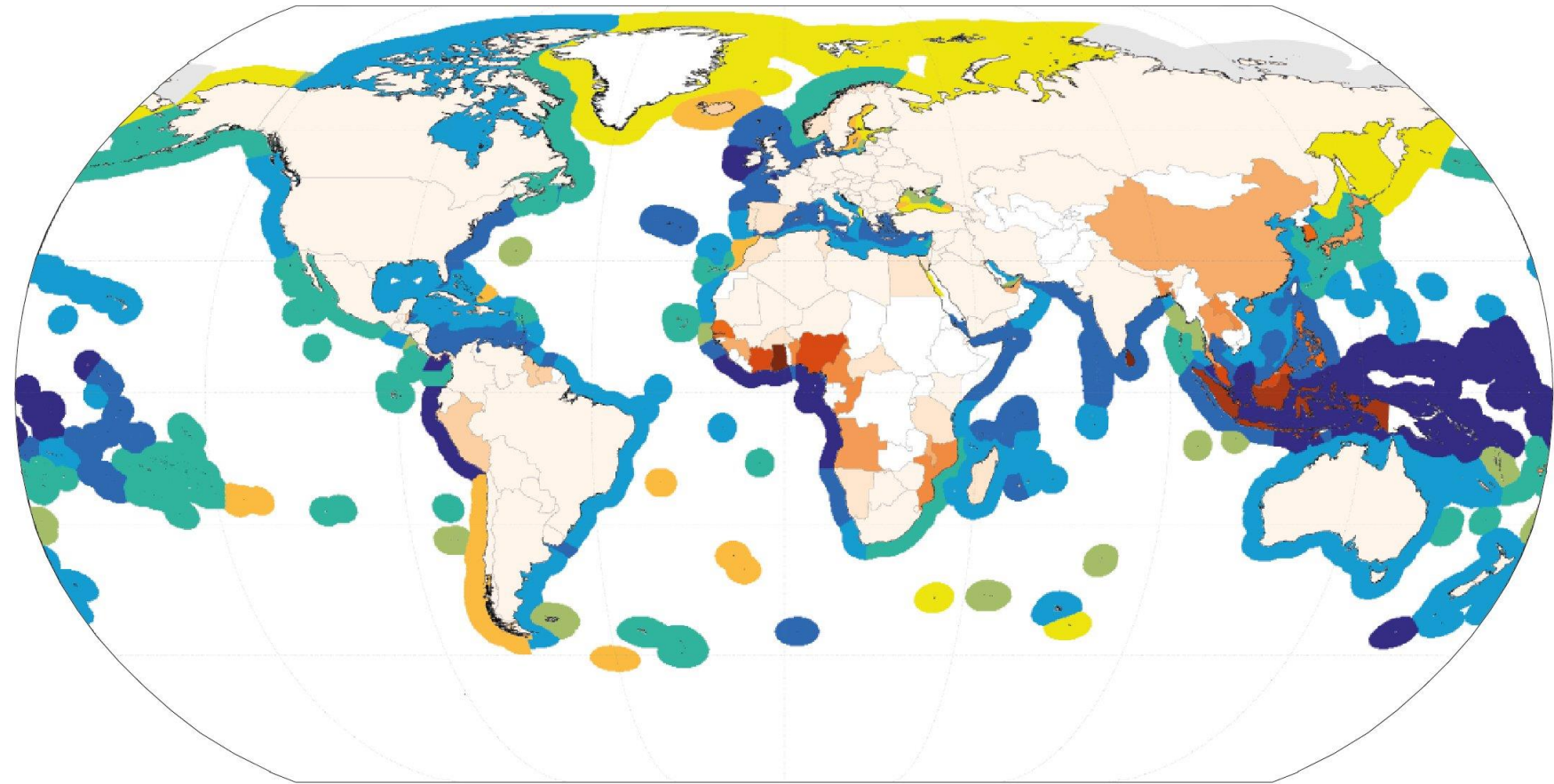
- Operations to protect natural assets will also be challenged, with new appetite for seafood



BSAOM: multi-purpose ship – large deck and containing capacity to support HDAR and depollution operations

FISH CATCH POTENTIAL DECREASE

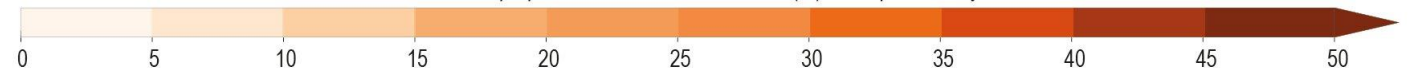
Projected changes in fisheries catch potential (colour scale in waters) under the high emission scenario and fish as proportion of animal-sourced food (colour scale on land)



Change in maximum catch potential (%) by 2100 under RCP8.5



Fish as proportion of animal-sourced food (%) in the present day



Source: 2019 IPCC report on oceans and cryosphere (SROCC, Chapter 5, Figure 5.21).

HADR OPERATIONS



BPC Tonnerre was deployed after Hurricane Irma which stroke Saint Martin Island (more than 500 people and 1 200 tons of fret) in September 2017



OBSERVATOIRE

Défense



&Climat

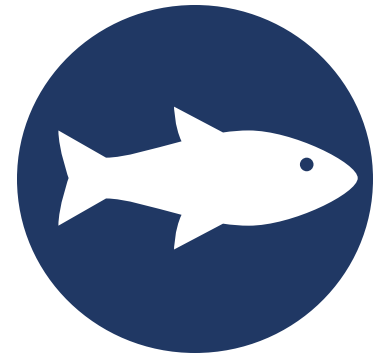
CLIMATE CHANGE IMPACTS



SEA LEVEL RISE



EXTREME WEATHER
EVENTS



IMPACTS ON
BIODIVERSITY

CLIMATE CHANGE PHYSICAL RISKS

Intensification and multiplication of droughts and heatwaves

Ice and permafrost melting

Rain regimes major changes

Ocean acidification

Intensification and multiplication of extreme weather events

Sea level rise

CLIMATE CHANGE IMPACTS ON HUMAN SECURITY

Rain regimes major changes

- **Consequences:** floods, desertifications and important lost of agriculture yields
- **Associated risks:** resource scarcity, gradual population displacements facing ecosystem services collapse, tensions due to population movements and resource sharing.

Intensification and multiplication of extreme weather events

- **Consequences:** destruction of infrastructures, habitats, crops and livelihoods.
- **Associated risks:** food insecurity, water scarcity, pandemics, massive population displacements.

Intensification and multiplication of droughts and heatwaves

- **Consequences:** water stress, decreasing river flows, wildfires, higher electricity/energy needs (A/C)
- **Associated risks:** high mortality rate in exposed populations, nuclear plants decreasing capacity and risks management, industrial disruptions and food insecurity.

CLIMATE CHANGE IMPACTS ON HUMAN SECURITY

Sea level rise

- **Consequences:** storm surges intensification, coastal infrastructures' erosion, habitat destruction, local economy and livelihoods threatening, islands and low lying territories submersion
- **Risks:** physical insecurity, gradual displacements, tensions associated with displacements.

Ice and permafrost melting

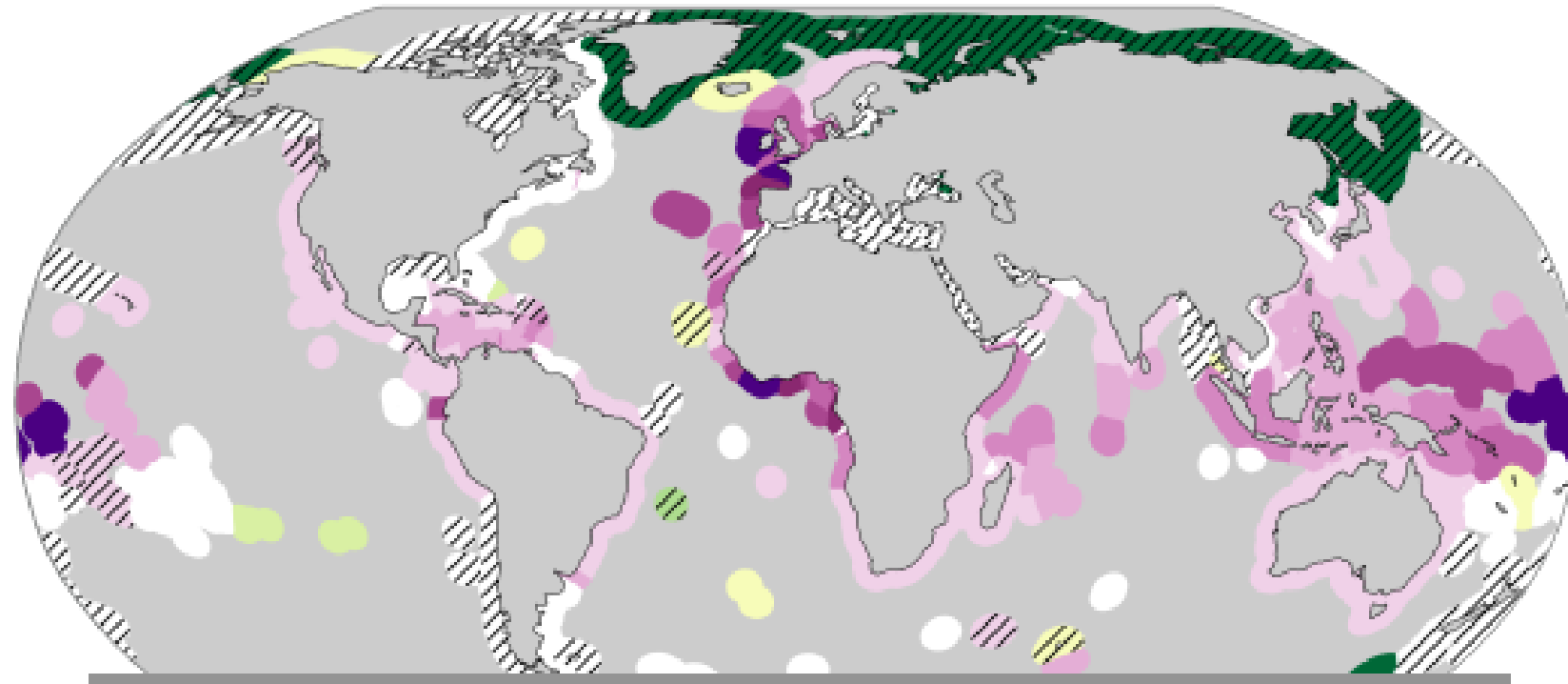
- **Consequences:** submersions, landslides, infrastructure collapse, avalanche, water stress, low river flows, methane emissions
- **Risks:** resource scarcity and associated tensions, increasing territorial claims in the Arctic, pandemics, displacements and associated tensions.

Ocean acidification

- **Consequences:** oceanic ecosystems depletion and decreasing carbon storage capacity
- **Risks:** food chains destabilisation (impacting fisheries, aquaculture, tourism)

Evolution of the maximum capture yield

Source : Rapport de synthèse (SYR) du sixième rapport d'évaluation du GIEC



0.9 – 2.0°C

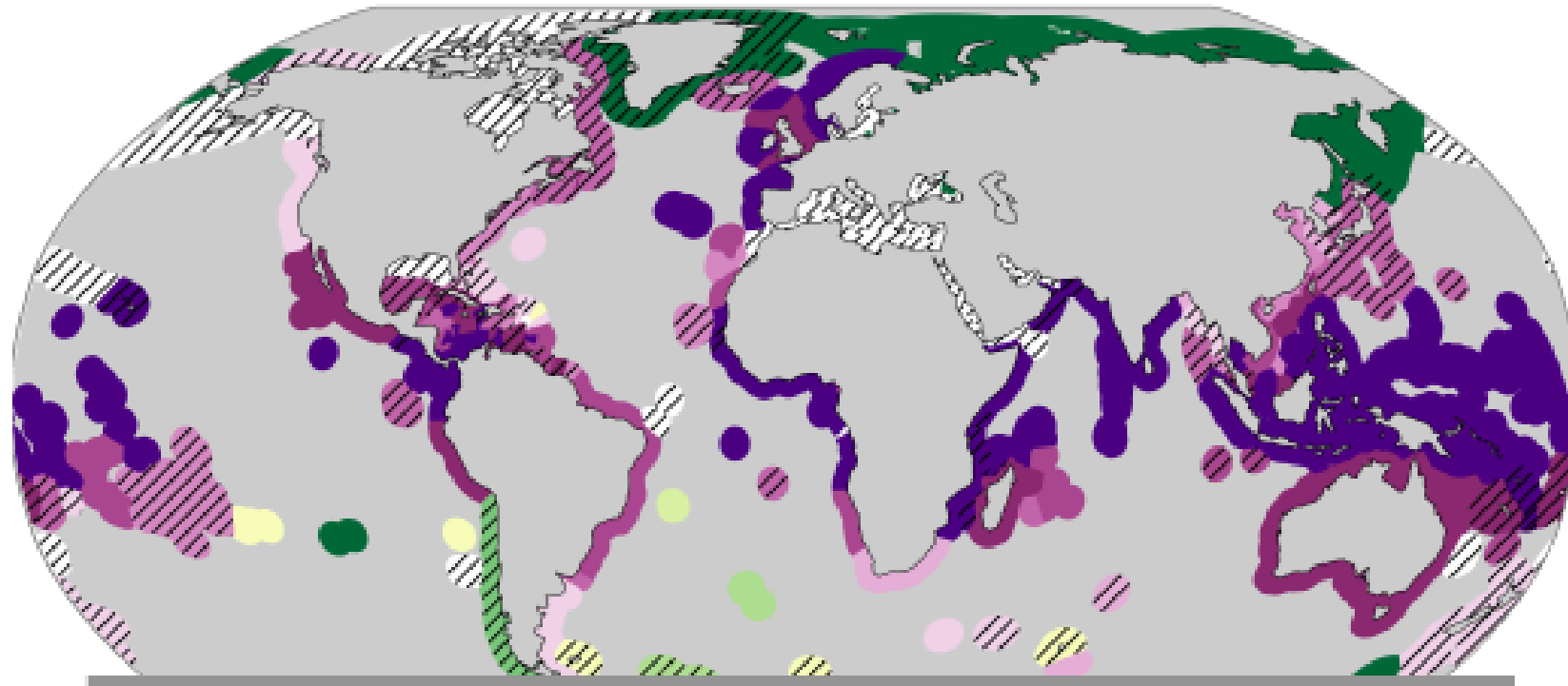


- Unevaluated zones
- ▨ Zones with inconsistent modelling

⁵Projected regional impacts reflect fisheries and marine ecosystem responses to ocean physical and biogeochemical conditions such as temperature, oxygen level and net primary production. Models do not represent changes in fishing activities and some extreme climatic conditions. Projected changes in the Arctic regions have low confidence due to uncertainties associated with modelling multiple interacting drivers and ecosystem responses.

Evolution of the maximum capture yield

Source : Rapport de synthèse (SYR) du sixième rapport d'évaluation du GIEC



3.4 – 5.2°C



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