

Canada's Healthy Oceans In An Era of Rapid Planetary Change



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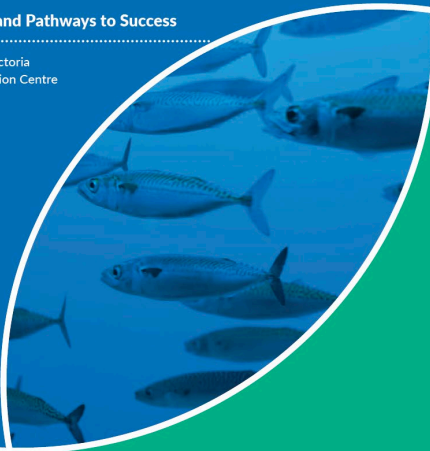
UVIC

State of Canada's marine fisheries

CANADA'S MARINE FISHERIES:

Status, Recovery Potential and Pathways to Success

Julia K. Baum, PhD, University of Victoria
Susanna D. Fuller, PhD, Ecology Action Centre



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2016

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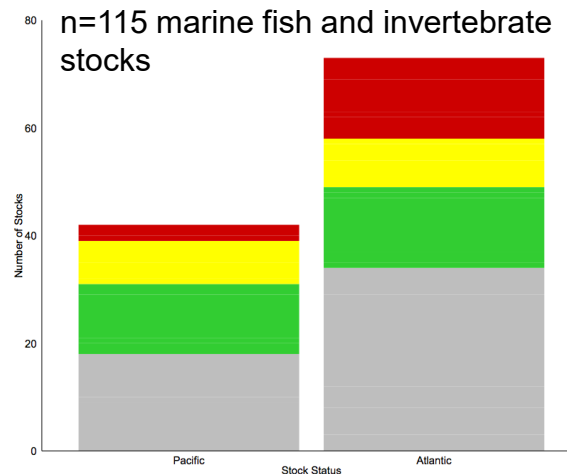
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OCEANA Protecting the World's Oceans

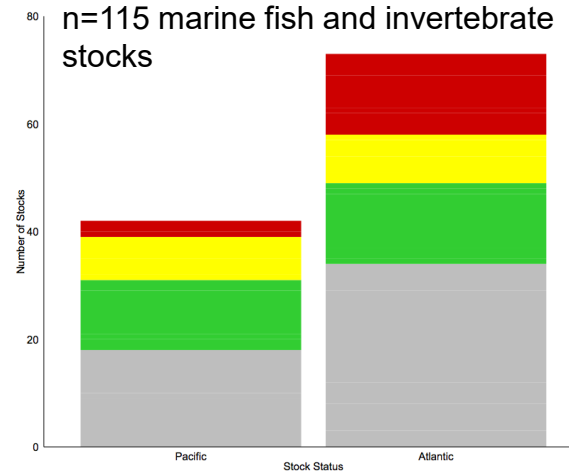
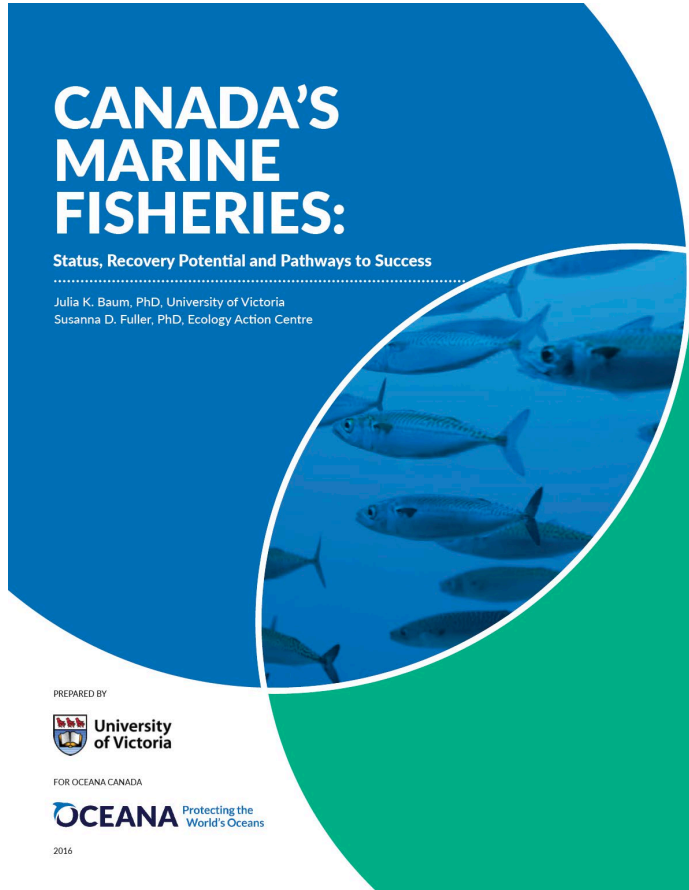
2016



Red=critical, Yellow=cautious
Green=healthy, Grey=unknown

*<1/4 of stocks
were considered
'healthy'*

State of Canada's marine fisheries

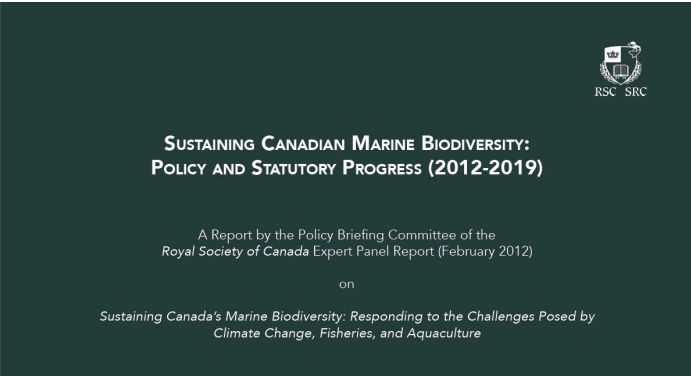


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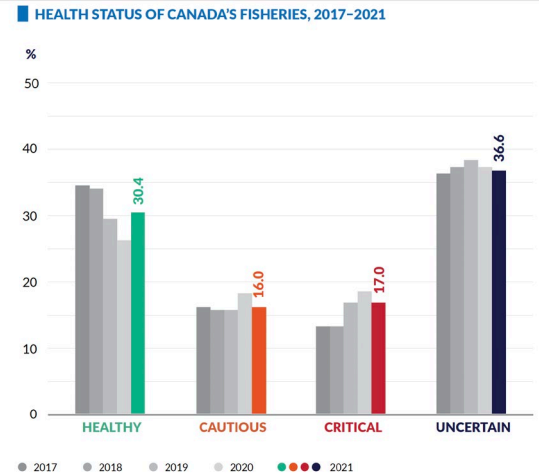
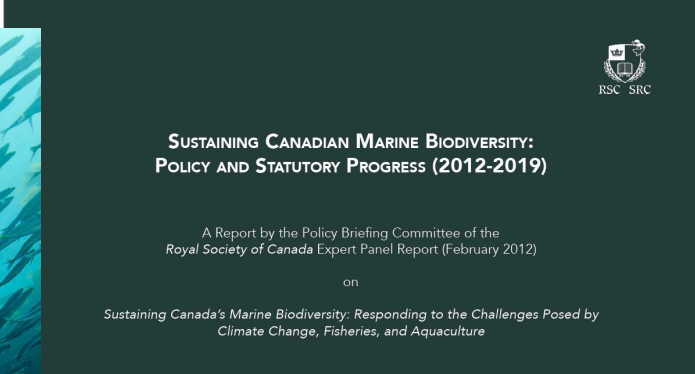
Key Recommendations:

- ❖ **Modernize the Fisheries Act**
- ❖ **Increase accountability and transparency**
- ❖ **Implement rebuilding plans**

State of Canada's marine fisheries and biodiversity



State of Canada's marine fisheries and biodiversity



State of Canada's marine fisheries and biodiversity

2021

FISHERY AUDIT

Unlocking Our Potential for Abundant Oceans: Canada's Performance from 2017-2021

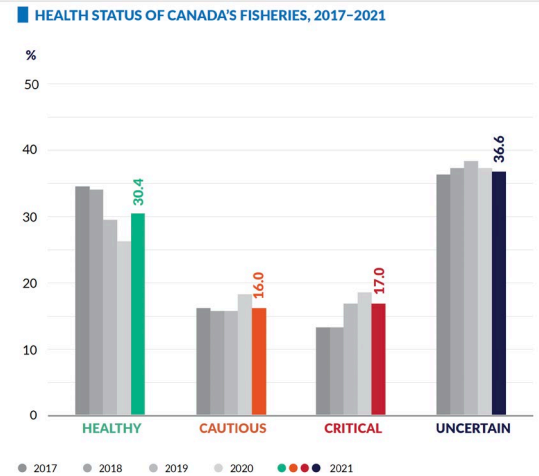
OCEANA Protecting the World's Oceans

SUSTAINING CANADIAN MARINE BIODIVERSITY: POLICY AND STATUTORY PROGRESS (2012-2019)

A Report by the Policy Briefing Committee of the Royal Society of Canada Expert Panel Report (February 2012)

on

Sustaining Canada's Marine Biodiversity: Responding to the Challenges Posed by Climate Change, Fisheries, and Aquaculture



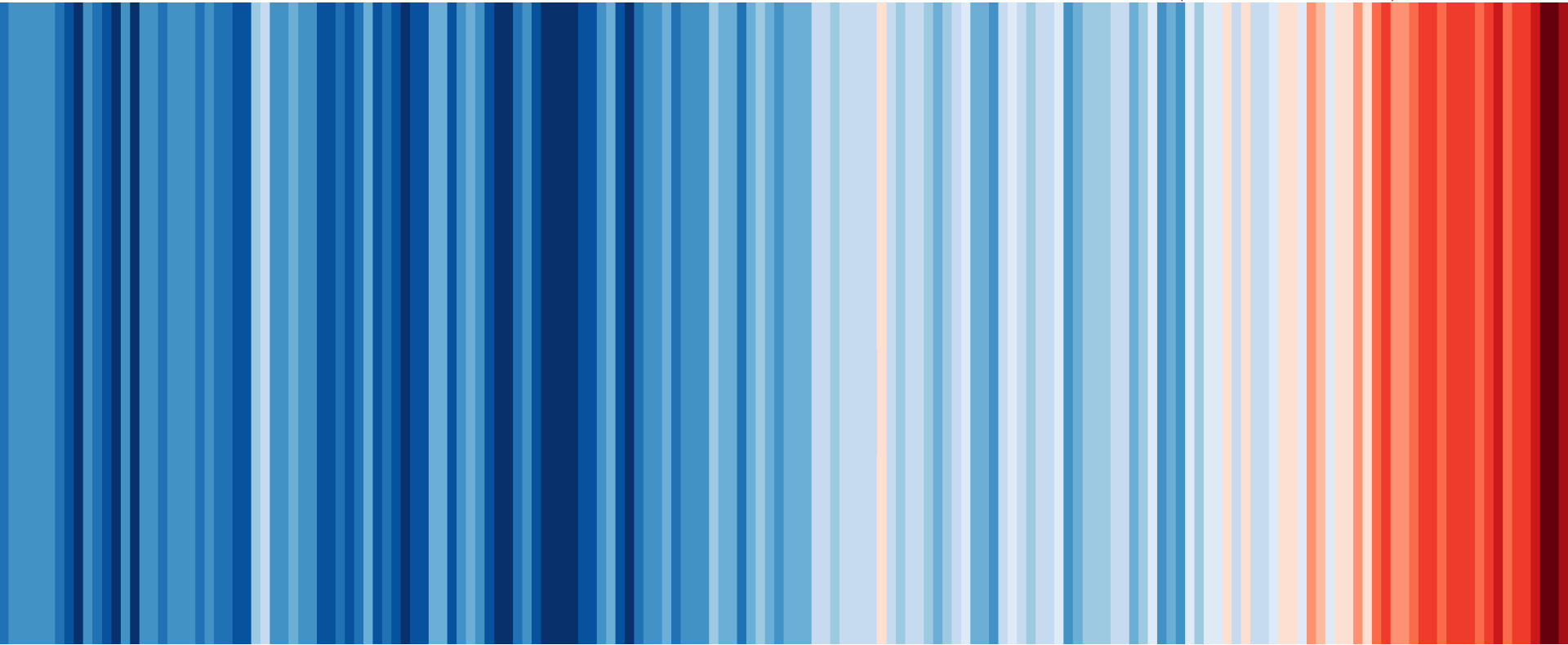
Report 7

Reports of the Commissioner of the Environment and Sustainable Development to the Parliament of Canada
Protecting Aquatic Species at Risk

Independent Auditor's Report | 2022

Office of the Auditor General of Canada / Bureau du vérificateur général du Canada

Rapid planetary change

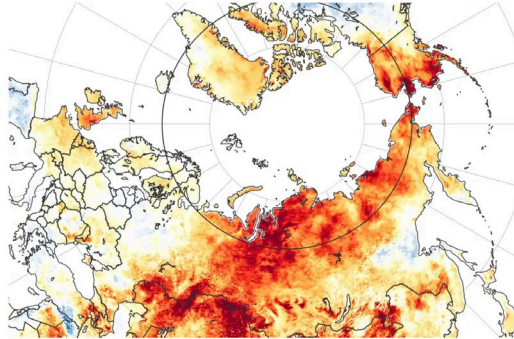


Warming stripes depicting annual mean global temperatures from 1850-2018, relative to 1971-2000.
Created by Ed Hawkins using World Meteorological Organization data

Rapid planetary change

Climate crisis: 2020 was joint hottest year ever recorded

Global heating continued unabated despite Covid lockdowns, with record Arctic wildfires and Atlantic tropical storms



▲ The Arctic and northern Siberia saw particularly extreme average temperatures in 2020, with a large area higher than the long-term average. Photograph: Nasa/EPA

Climate crisis: last seven years the hottest on record, 2021 data shows

Global heating continued unabated with extreme weather rife and greenhouse gases hitting new highs



📹 A firefighter sprays water as a house burns in the Dixie wildfire - the second largest in history - in Plumas County, California. Photograph: Josh Edelson/AFP/Getty Images

The last seven years were the world's hottest on record, with the first analysis of global temperature in 2021 showing it was 1.2C above pre-industrial levels.

Hottest ocean temperatures in history recorded last year

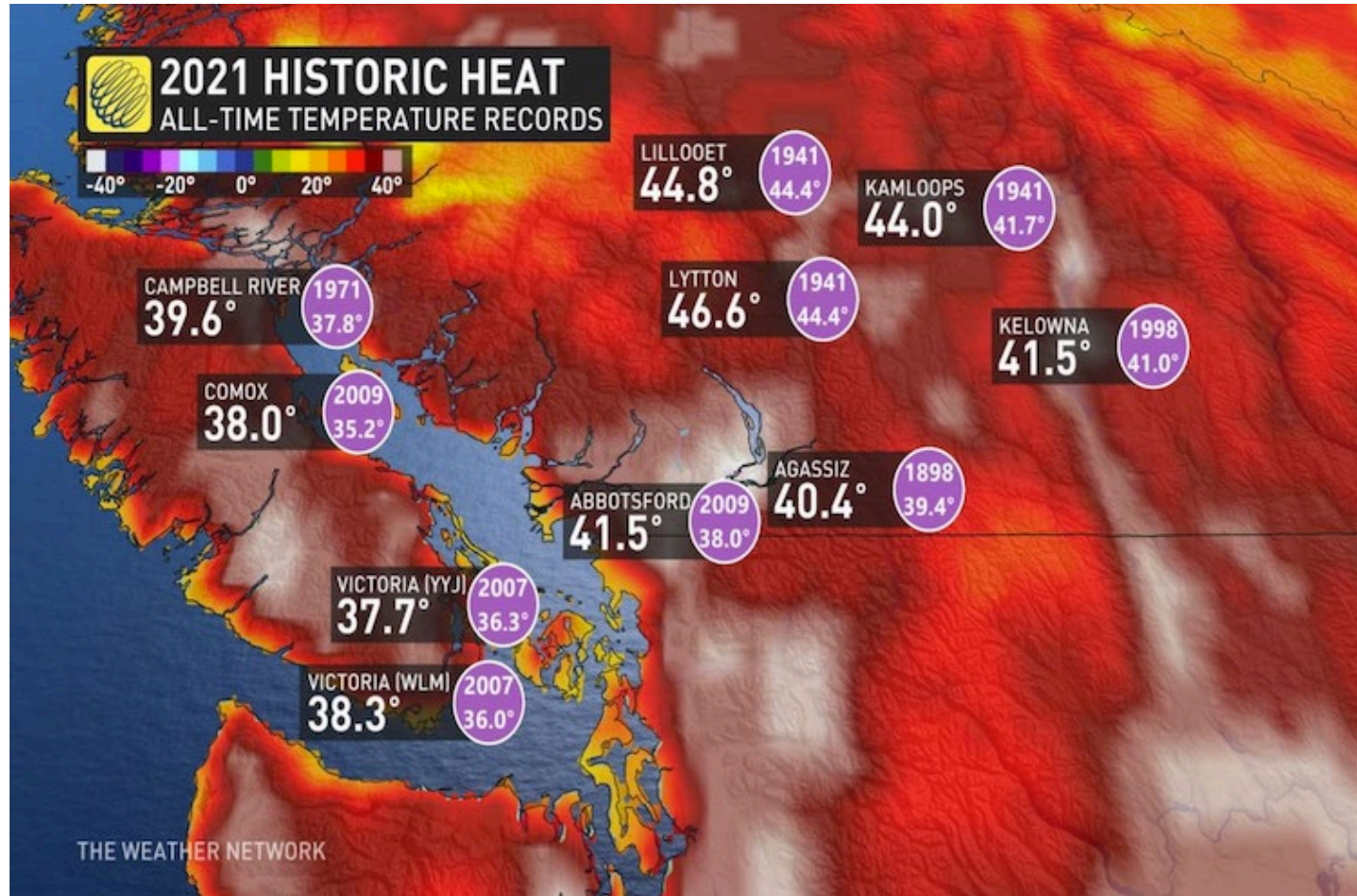
Ocean heating driven by human-caused climate crisis, scientists say, in sixth consecutive year record has been broken



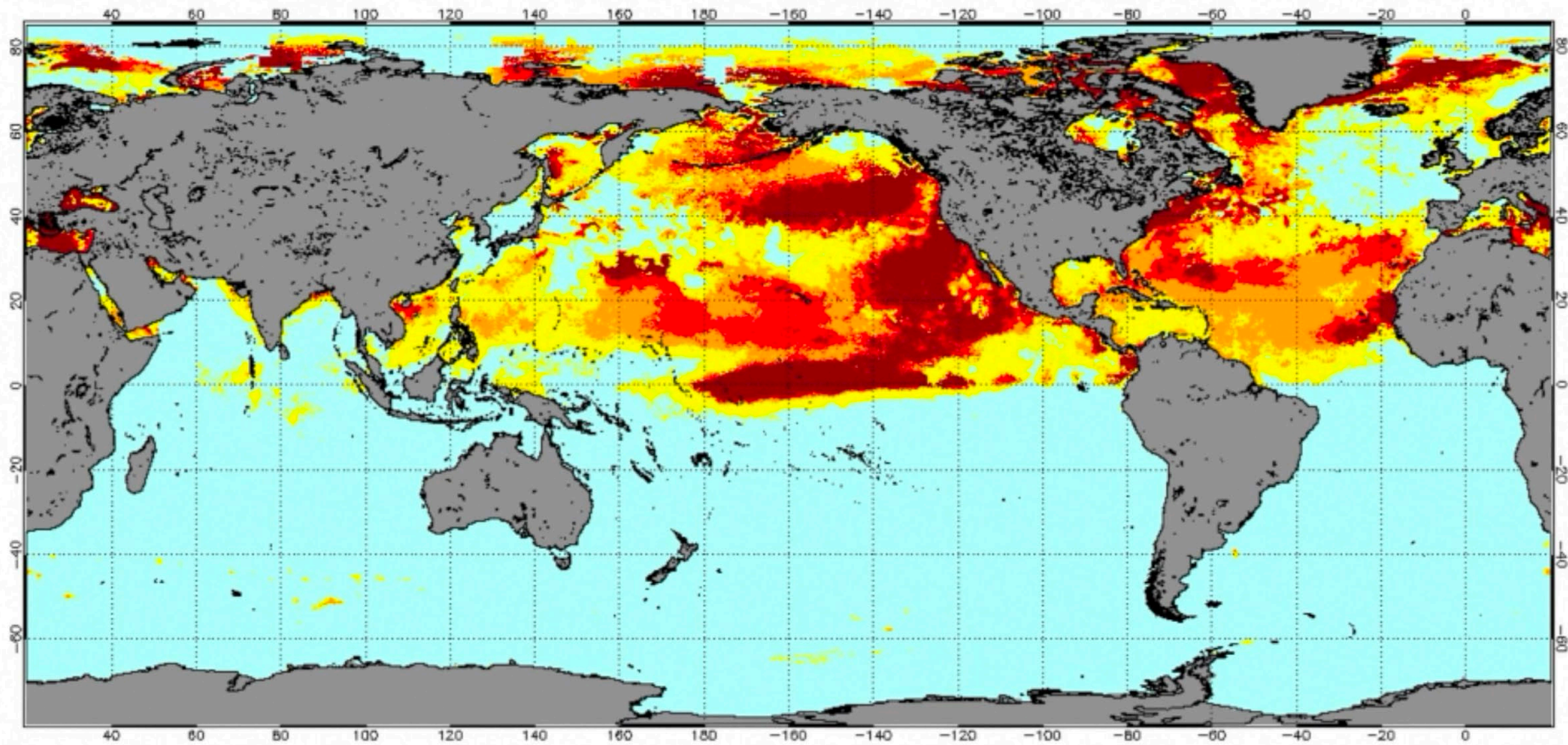
📹 An oil platform stands offshore as cargo shipping container ships wait in the Pacific Ocean to enter the port of Los Angeles. Photograph: Patrick T Fallon/AFP/Getty Images

The world's oceans have been set to simmer, and the heat is being cranked up. Last year saw the hottest ocean temperatures in recorded history, the sixth consecutive year that this record has been broken, according to new research.

Rapid planetary change with a fingerprint of extreme events



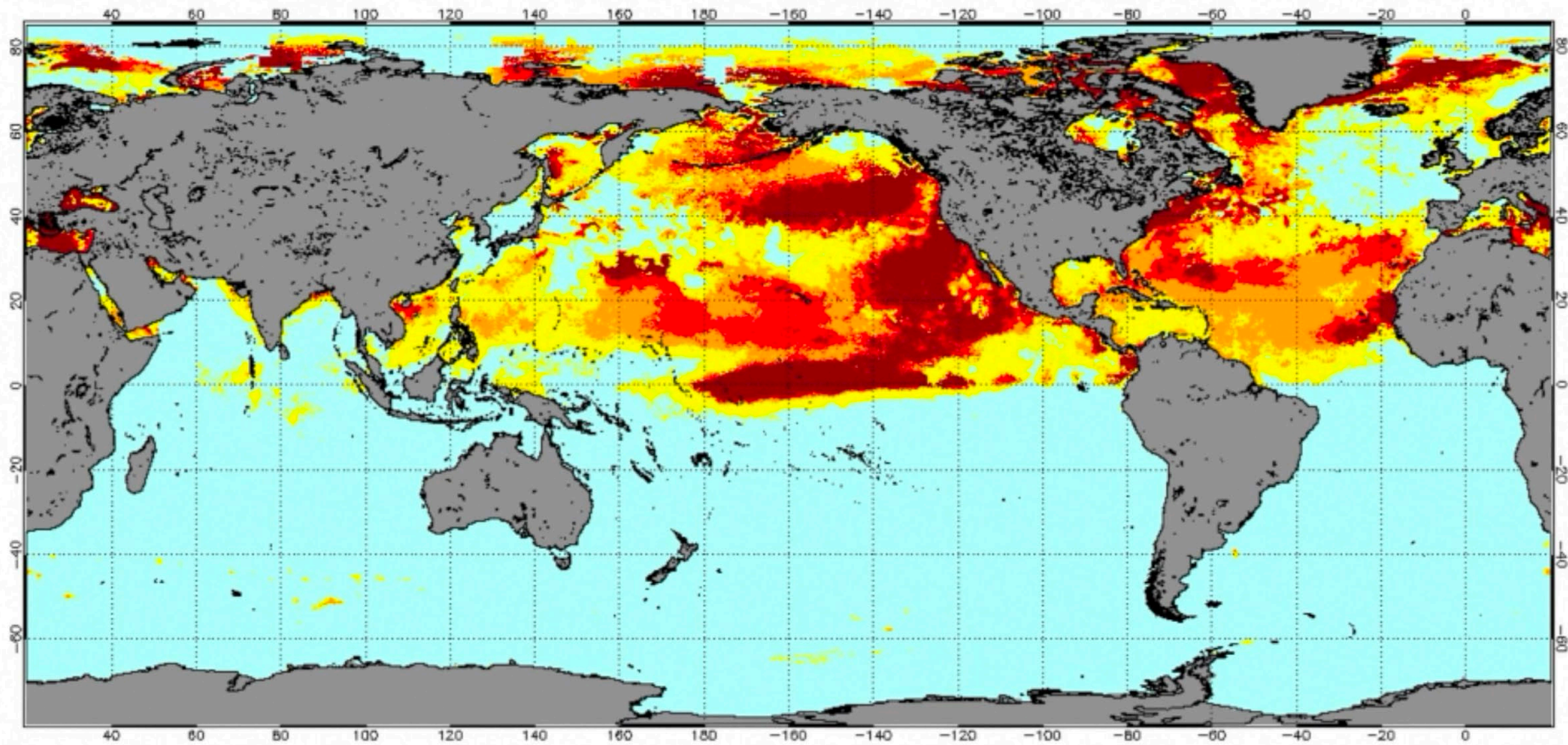
Ocean extreme events – marine heatwaves – now pose a serious threat to marine life







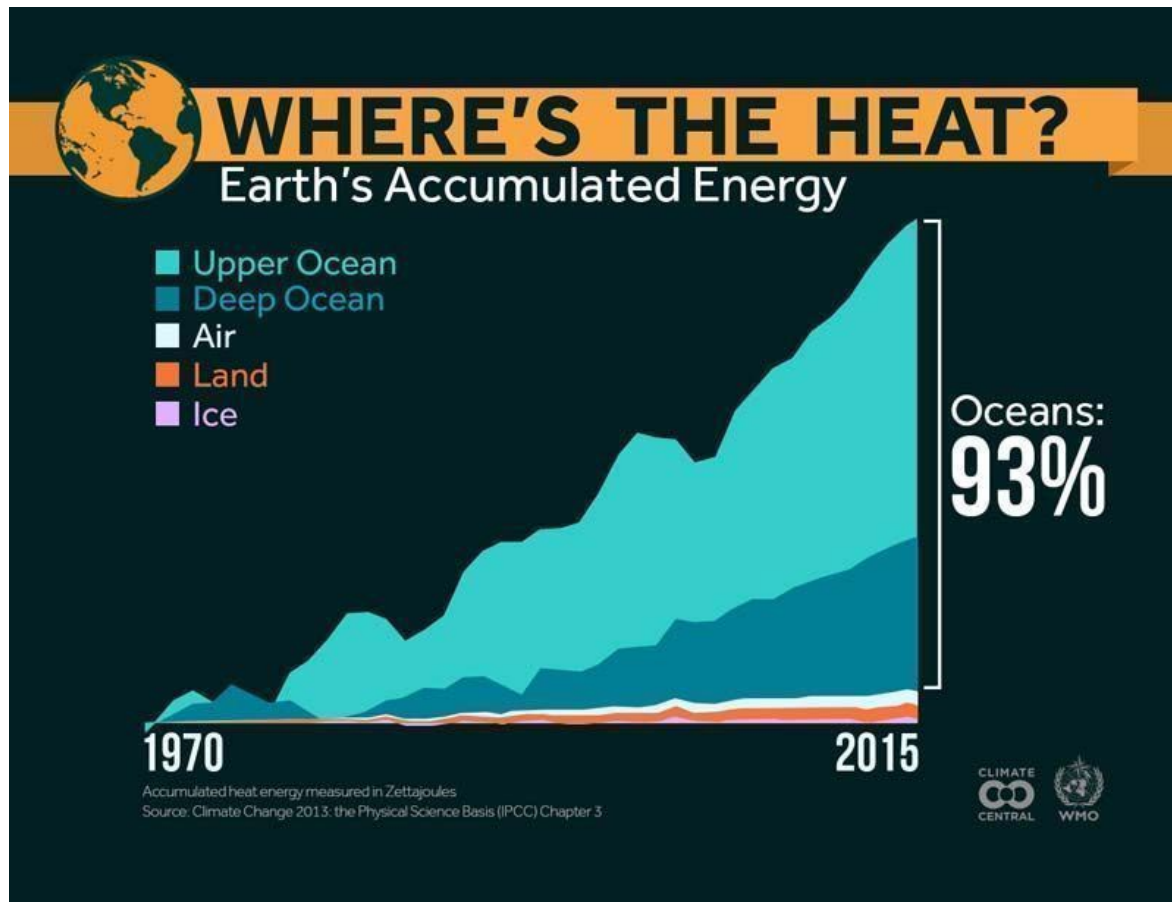
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Ocean extreme events – marine heatwaves – now pose a serious threat to marine life



Recognize that the most important role of oceans is climate regulation



Marine protected areas are an important tool in our ocean management portfolio...



...but most be highly protected and pro-actively plan for climate change to be effective

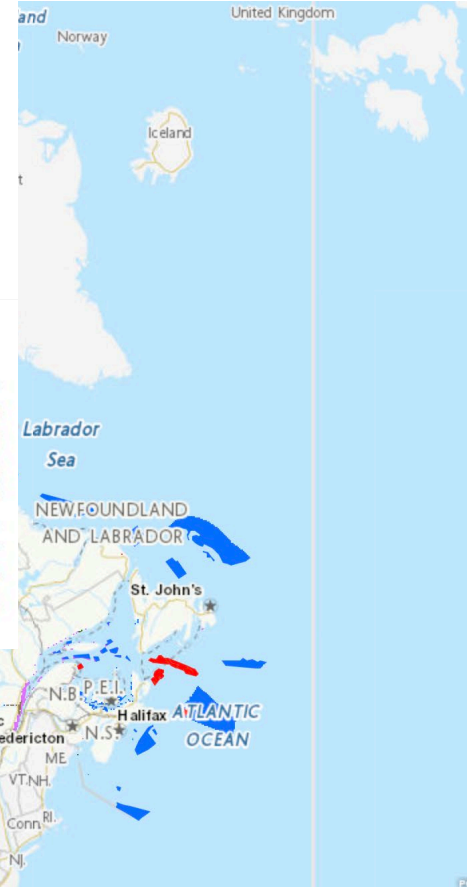
Review

Ocean conservation boosts climate change mitigation and adaptation

Juliette Jacquemont,^{1,2,3} Robert Blasiak,^{4,5} Chloé Le Cam,² Maël Le Gouellec,² and Joachim Claudet^{1,*}

SUMMARY

Marine protected areas (MPAs) are increasingly being promoted as an ocean-based climate solution. However, such claims remain controversial because of the diffuse and poorly synthesized literature on climate benefits of MPAs. To address this knowledge gap, we conducted a systematic literature review of 22,403 publications spanning 241 MPAs and analyzed these across 16 ecological and social pathways through which MPAs could contribute to climate change mitigation and adaptation. Our meta-analysis demonstrates that marine conservation can significantly enhance carbon sequestration, coastal protection, biodiversity, and the reproductive capacity of marine organisms as well as fishers' catch and income. Most of these benefits are only achieved in fully or highly protected areas and increase with MPA age. Although MPAs alone cannot offset all climate change impacts, they are a useful tool for climate change mitigation and adaptation of social-ecological systems.



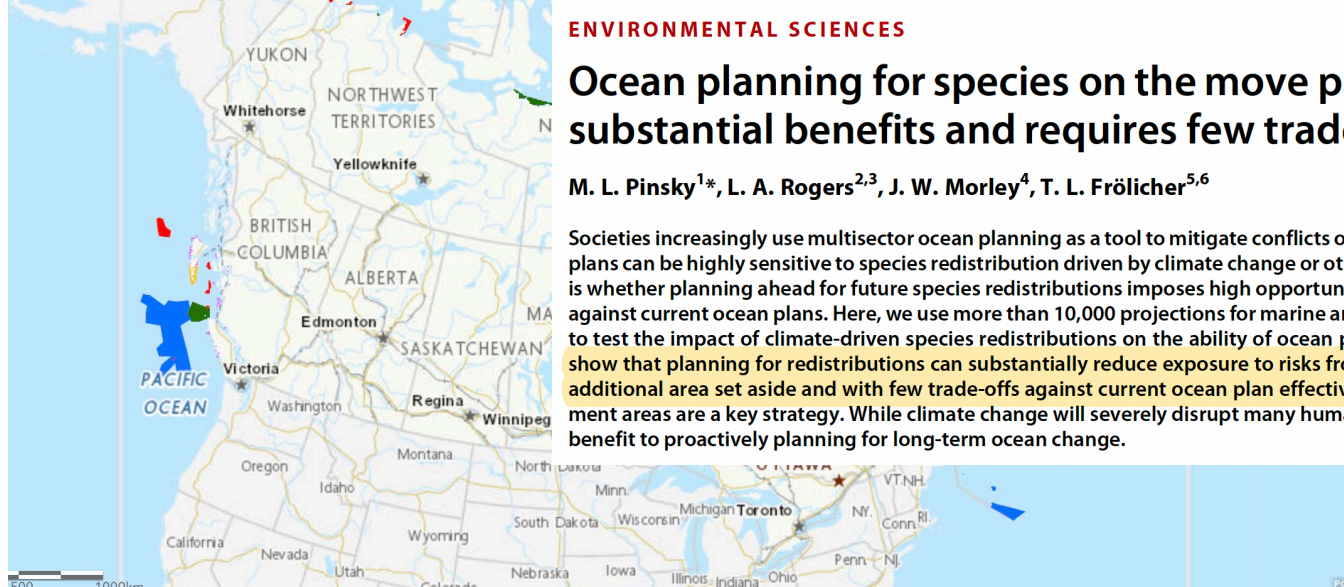
...but most be highly protected and pro-actively plan for climate change to be effective

 CellPress
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SCIENCE ADVANCES | RESEARCH ARTICLE

ENVIRONMENTAL SCIENCES

Ocean planning for species on the move provides substantial benefits and requires few trade-offs

M. L. Pinsky^{1*}, L. A. Rogers^{2,3}, J. W. Morley⁴, T. L. Frölicher^{5,6}

Societies increasingly use multisector ocean planning as a tool to mitigate conflicts over space in the sea, but such plans can be highly sensitive to species redistribution driven by climate change or other factors. A key uncertainty is whether planning ahead for future species redistributions imposes high opportunity costs and sharp trade-offs against current ocean plans. Here, we use more than 10,000 projections for marine animals around North America to test the impact of climate-driven species redistributions on the ability of ocean plans to meet their goals. We show that planning for redistributions can substantially reduce exposure to risks from climate change with little additional area set aside and with few trade-offs against current ocean plan effectiveness. Networks of management areas are a key strategy. While climate change will severely disrupt many human activities, we find a strong benefit to proactively planning for long-term ocean change.

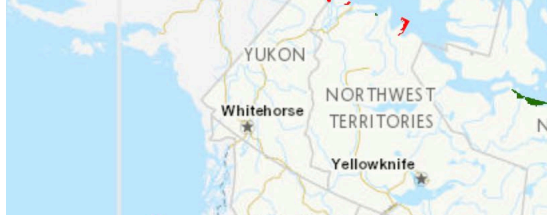
...but most be highly protected and pro-actively plan for climate change to be effective

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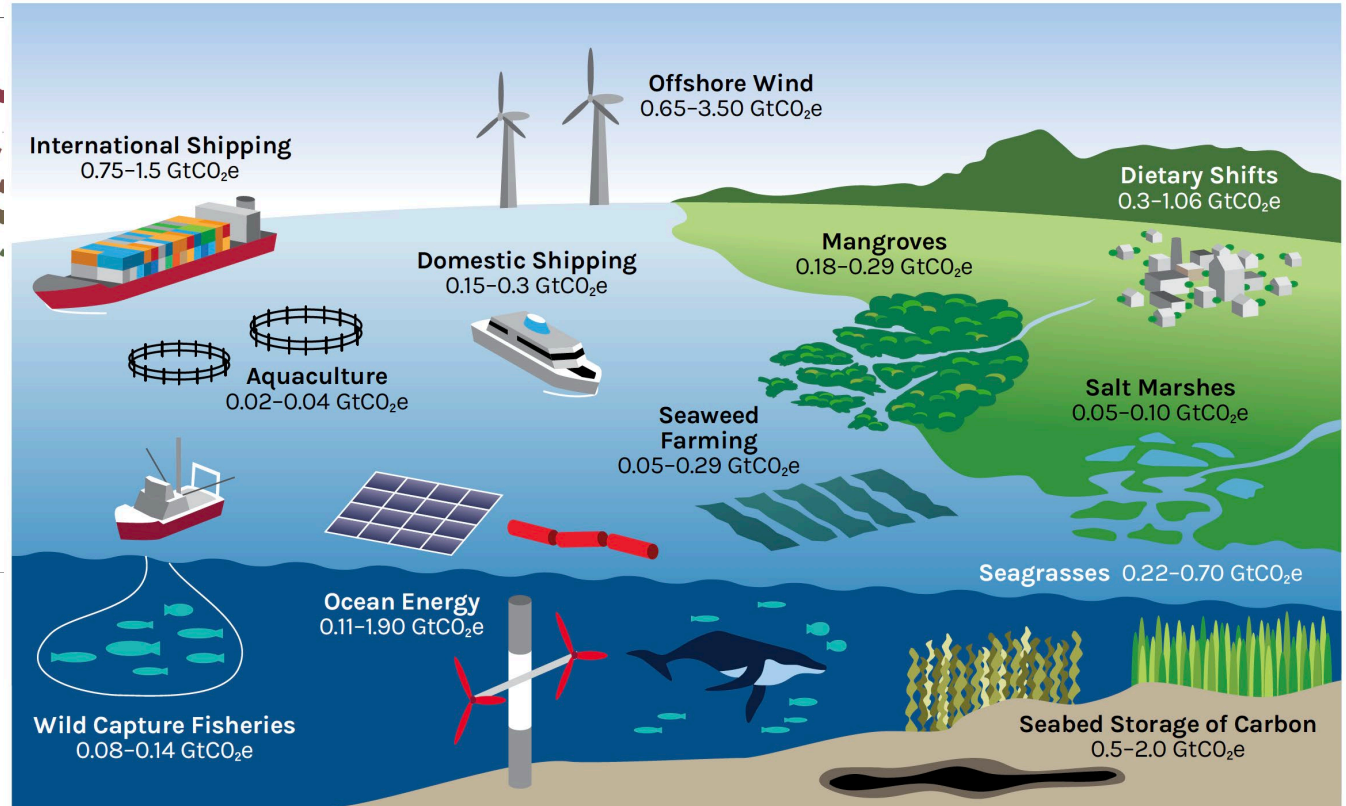
A climate-resilient marine conservation network for Canada

FACETS
a multidisciplinary open access science journal

A. Bryndum-Buchholz^{ab*}, K. Boerder^a, R.R.E. Stanley^c, I. Hurley^a, D.G. Boyce^{ac}, K.M. Dunmall^d, K.L. Hunter^e, H.K. Lotze^a, N.L. Shackell^f, B. Worm^{af}, and D.P. Tittensor^a



Oceans are also a source of climate solutions



OPINION

How harnessing oceans can help Canada in reaching its climate goals

JULIA K. BAUM AND SUSANNA D. FULLER
CONTRIBUTED TO THE GLOBE AND MAIL
PUBLISHED JUNE 8, 2021

11 COMMENTS SHARE    TEXT SIZE  BOOKMARK



A large iceberg floats in the Atlantic Ocean off the coast of Ferryland, N.L., on April 26, 2017.
DREW ANGERER/GETTY IMAGES NORTH AMERICA

Julia K. Baum is professor and President's Chair of Ocean Ecology and Global Change at the University of Victoria

CANADA'S
**NATIONAL
OBSERVER**

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ABOUT PODCAST OPINION COP26 COVERAGE ZERO CARBON ANALYSIS NEWS SPECIAL REPORTS CONVERSATIONS

Oceans are Canada's first line of defence against climate change

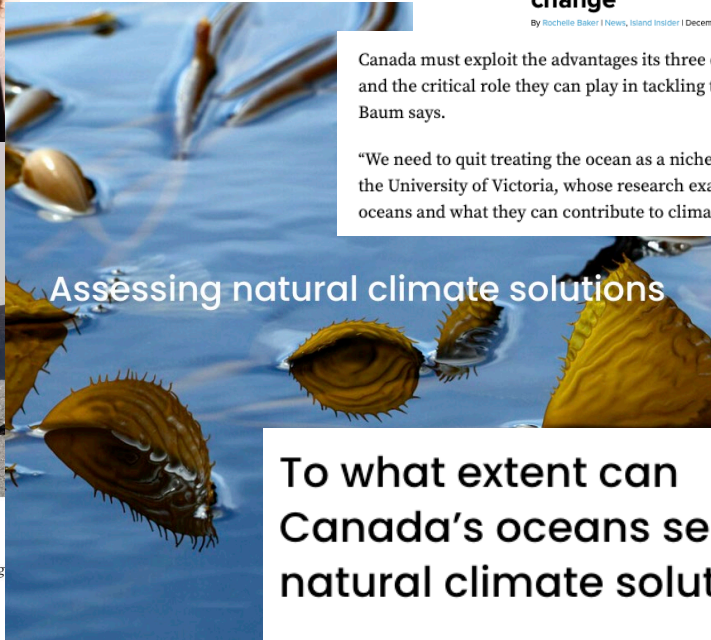
By Rochelle Baker | News, Island Insider | December 2nd 2021

Canada must exploit the advantages its three coasts provide and stop sidelining oceans and the critical role they can play in tackling the climate crisis, marine ecologist Julia Baum says.

"We need to quit treating the ocean as a niche issue," said Baum, President's Chair at the University of Victoria, whose research examines the impacts of global warming on oceans and what they can contribute to climate change solutions.

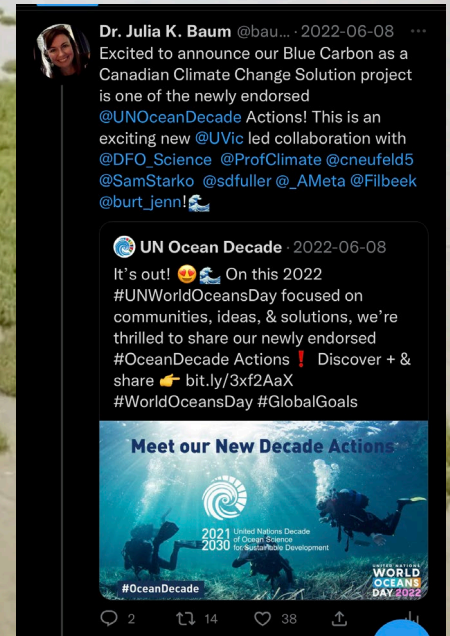
Assessing natural climate solutions

To what extent can
Canada's oceans serve as
natural climate solutions?



A new NSERC Alliance research program and United Nations Decade of Ocean Science for Sustainable Development endorsed action

Led by Julia K. Baum



The Kelp Rescue Initiative



Broughton Archipelago



VANCOUVER ISLAND

Hornby/Denman Islands



Barkley Sound



Bamfield Marine Sciences Centre



University of British Columbia



University of Victoria

Burrard Inlet



WASHINGTON

● Current research and restoration projects



huu ay aht

ANCIENT SPIRIT. MODERN MIND

An underwater photograph showing a dense field of seaweed in clear, blue water. The seaweed has long, thin stalks and broad, yellowish-green blades. The lighting is bright, creating a shimmering effect on the water's surface and highlighting the texture of the seaweed.

Ocean..
“optimism
means
envisioning our
desired future
and then
actively pulling
it closer.”

-Christiana Figueres,
UNFCCC Executive
Secretary for the Paris
Agreement

extra



Starko, Neufeld, Gendall, Timmer, Campbell, Yakimishyn, Druehl, Baum, 2022. *Ecological Applications*

Ocean extreme events – marine heatwaves – now pose a serious threat to marine life

