OCEAN CANADA

2014/2015 PARTNERSHIP UPDATE

INTRODUCTION AND BACKGROUND

This is the first annual update of the newly established OceanCanada Partnership. The OceanCanada Partnership is a 6-year research programme funded by the Social Sciences and Humanities Research Council of Canada. The Partnership is dedicated to building resilient and sustainable oceans on all Canadian coasts and to supporting coastal communities as they respond to rapid and uncertain environmental changes. Our multi-disciplinary research synthesizes social, cultural, economic and environmental knowledge about oceans and coasts nationally. Over the life of the project and beyond, we are taking stock of what we know about Canada's three oceans, building scenarios for the possible futures that await our coastal-ocean regions, and creating a national dialogue and shared vision for Canada's oceans.

Our research activities will take place over three phases. In *Phase One: Taking Stock*, we are integrating existing information from several disciplinary areas and identifying knowledge gaps in our current social, economic, policy, legal and ecological understanding of Canada's coasts and oceans. In *Phase Two: Building Scenarios*, we will be mapping scenarios through advanced modelling techniques that will allow us to generate new knowledge by (i) defining plausible future scenarios of Canada's coastal-ocean interdependent social-ecological systems from the national perspective, and then (ii) comparing and 'ground-truthing' our scenarios at the local levels using comparable case studies in each of the three ocean-adjacent regions of the country. These scenarios will illustrate the ways in which uncertain social-ecological stressors create changes that produce social and economic impacts on jobs, cultural and social identity, ecology and the economy. In this way, in *Phase Three: Shared Vision*, we will develop a shared vision among Canadians of different possible future states of social-ecological system interactions. At all stages, we prioritize engagement with governments, industry, communities and other stakeholders in order to employ participatory approaches to knowledge mobilization.

OUR AIMS AND MISSION

1. To effectively integrate local and national social science and ocean science research in order to optimize national-level policy planning and management, facilitate knowledge sharing across regions and integrate local and traditional knowledge into national policies.

2. To develop an enhanced understanding of the current and future social-ecological stressors affecting Canada's three coastal-ocean regions, including ocean acidification, market and cultural globalization and climate change.

3. To work collaboratively towards a pan-Canadian vision for sustainable and healthy coastal-ocean regions by 2050, fostering public awareness and promote engaged national dialogue.

ORGANIZATION OF RESEARCH

Our Partnership includes six working groups, covering two spatial scales of analysis (national, regional with local) and two cross-cutting themes (law/policy and community engagement). Our national cluster has three working groups: the Law and Policy Working Group, the National Data and Integrated Scenarios Working Group and the Communications and Outreach Working Group. Our regional/local cluster also has three Working Groups: the Pacific Region Working Group, the Arctic Region Working Group and the Atlantic Region Working Group. Our use of geographical regions, different scales and specific issues (law, policy, data, scenarios, communication) allows us to focus on collaborative and integrated research across disciplines and areas of expertise.

OVERVIEW OF WORKING GROUP OBJECTIVES

Arctic

The Arctic Working Group is working to connect current knowledge of key issues of concern to Arctic Ocean coastal communities to broad questions of science and policy integration. The group holds as a key goal the empowerment of community voices in the Arctic region and is currently establishing collaborative activities that can support this work. Researchers are working towards the creation of an Arctic Ocean Atlas using the Nunaliit data management platform.

Pacific

The Pacific Region Working Group is studying human well-being in the face of social-ecological change in Pacific coastal communities. Members have partnered with local communities and industry stakeholders to conduct policy-relevant research on social-ecological interactions in coastal and ocean areas to support marine spatial planning. Research themes include assessing social values of community and coastal resource users and understanding the impacts of climate change on biodiversity and ecosystem valuation. Collectively, the research is generating a better understanding of the socio-cultural, economic and ecological challenges facing coastal communities. The group hopes to integrate academic research with on the ground adaptive management.

Atlantic

The Atlantic Working Group is addressing critical knowledge gaps, contributing methodologically innovative strategies for ocean and coastal planning, and developing policy insights about pressing regional concerns.

Members are using participatory modelling and scenario building tools to assess development, governance and stewardship options in collaboration with community partners. Models and scenarios are used to explore specific economic development and environmental conservation options, including exploration of interactions between economic sectors, such as fisheries, tourism, and mineral extraction, as well as the impact of a range of climate change scenarios, and possible human responses.

Members are conducting regional-scale assessments to identify the relationships among core marine ecosystem services (the benefits people derive from nature through provisioning, regulating, supporting and cultural functions), the material, relational and subjective wellbeing of coastal communities, and the experience with rapid changes (i.e., tipping points) in ocean and coastal systems.

Members of our group are also undertaking an assessment and analysis of the governance mismatch between: a) local-provincial coastal management processes (e.g., provincial aquaculture policies, support for coastal community diversification) and ocean-related planning processes operating at federal levels; and b) the ability of existing institutions and governance arrangements at multiple scales to respond to rapid changes in social-ecological conditions (e.g., stock decline, stock shifts, acidification).

National data and integrated scenarios

The National Data and Integrated Scenario Working Group is compiling secondary data to create a user-friendly searchable research database. This database will house important social, cultural, governance, economic and environmental data and we envision that it will help researchers more easily assess and monitor trends related to the health of Canada's three coastal-ocean environments. Using scenario modelling techniques, members are also mapping the potential pathways to human and environmental sustainability within Canada's coastal and ocean regions and their associated opportunities and risks.

Law and policy

The Law and Policy Working Group is studying the current state of Canada's law and policy frameworks in critical sectors affecting the management of our oceans, with a view to strengthening a principled approach to these legal and policy structures. Legal principles of sustainable development can be made the "foundation stones" for supporting healthy social-ecological systems, and we employ this perspective in all aspects of our work.

One of our key research activities will be a comprehensive assessment how Canada has performed in implementing its international and national legal commitments to ensure ***integrated coastal/ocean management***. Regional case studies will compare and critique integrated planning efforts under Canada's Oceans Act that have occurred in the Arctic, Atlantic and Pacific regions. We will also review approaches used in other countries (e.g., Australia and the United States) to draw out best practices that can be implemented at home.

Our Working Group is also evaluating national fisheries law and policy frameworks, in light of sustainability principles, in order to better understand Canadian approaches to, and challenges faced in, seeking principled governance in the ***fisheries sector***.

Canada's law and policy approaches and challenges in the ***growing field of aquaculture*** will be also assessed by members of our team, and compared to international experiences elsewhere, with a view to the future development of a coherent legislative approach to the sector. Here too, regional case studies will be carried out to assess the extent to which sustainability principles are being implemented, and where they may be more forcefully advanced.

Communications and Outreach

The Communication and Outreach Working Group is conducting research that explores how modern media (such as video and social media) can be used to document, in Canada's three coastal and ocean regions, different perspectives on the importance of oceans for community well-being (such as food, culture, economy).

We are also actively supporting other OceanCanada Working Groups, as they engage with coastal communities. We are helping other research groups mobilize insights and learning gathered at the local level, by sharing it with Canadians.

Our method is based on a participatory approach where residents of coastal communities are encouraged to voice their concerns and show their leadership.

RESEARCH LEADERSHIP

PROJECT DIRECTOR

Dr. U. Rashid Sumaila

Dr. U. Rashid Sumaila is Professor and Director of OceanCanada and the Fisheries Economics Research Unit at the UBC Fisheries Centre. He specializes in bioeconomics, marine ecosystem valuation and the analysis of global issues such as fisheries subsidies, IUU (illegal, unreported and unregulated) fishing and the economics of high and deep seas fisheries. Sumaila has experience working in fisheries and natural resource projects in Canada and the North Atlantic region, Norway, Namibia and the Southern African region, Ghana and the West African region and Hong Kong and the South China Sea. He has published articles in several journals including, Journal of Environmental Economics and Management, Journal of Bioeconomics, Land Economics, ICES Journal of Marine Science, Environmental and Resource Economics and Ecological Economics. Sumaila's work has generated a great deal of interest, and has been cited by, among others, the Economist, the Boston Globe, the International Herald Tribune and the Vancouver Sun.

2014/2015 OCEANCANADA SCIENTIFIC COMMITTEE

Dr. Nancy Doubleday, Arctic Working Group Co-Lead

Dr. Nancy Doubleday holds the Hope Chair in Peace and Health at McMaster University. As well as having expertise in ecological sciences, Nancy holds an LLB from Osgoode Hall, was called to the Bar of Ontario in 1982, and is a member of the Law Society of Canada. In her career as a lawyer she has contributed to development of international and domestic law embracing human rights, health and the environment. Examples of her experience include: early work to establish conservation easements, environmental impact assessment, and development of co-management under comprehensive claims; amending the Canadian Constitution; contributing to the establishment of the Northern Contaminants Program; linking Inuit interests with the

international Arctic Monitoring and Assessment Program; and participating in the University Consortium in Support of the Secretariat for the Convention on Biodiversity. She has also participated in the Working Group on Indigenous People(s) held in Geneva, the Conferences of the Parties to the International Union for the Conservation of Nature and Natural Resources in Costa Rica and in Ottawa, and the International Whaling Commission in New Zealand, and the U.S.A., as well as the Finnish Initiative leading to the signing of the Arctic Environmental Protection Strategy and to the Arctic Council. She works at the interface of human rights and social justice, resilience and health to develop new syntheses and strategies for realizing peace and health, good governance and knowledge integration. Currently she chairs the Cold Region Environments Commission of the International Geographical Union and has just completed a major International Polar Year research project addressing human experience of impacts of a changing tree line to better understand change and adaptive capacity in social-cultural-ecological systems.

Dr. D. R. Fraser Taylor, Arctic Working Group Co-Lead

Currently Dr. Taylor is Chancellor's Distinguished Research Professor of Geography and Environmental Studies, and in International Affairs. As well, he is a Fellow of the Royal Society of Canada. In 2013 he was awarded the Carl Mannerfelt Gold Medal by the International Cartographic Association and in 2014 he was the recipient of the Killam Prize in the Social Sciences. Professor Taylor's main research interests are in the application of geospatial information management to the analysis of key socio-economic problems in a national and international context and the presentation of the results in innovative new cartographic forms. He introduced and continues to develop the new paradigm of cybercartography. His interests in cartography and international development issues are often inter-related. His research interests in this area include: development studies with special reference to Africa, China and Latin America; regional and rural development theory and practice sustainable development and indigenous development strategies; technology transfer in the field of geomatics; Canada's international policies in ODA; and technology transfer. Current research includes the use of cybercartography to create a series of atlases with Inuit and other aboriginal peoples in Canada's north.

Dr. Derek Armitage, Atlantic Working Group Lead

Dr. Derek Armitage is an Associate Professor in the Department of Environment and Resource Studies at the University of Waterloo, and Director of the Environmental Change and Governance Group. His research interests centre on the human dimensions of environmental change and the formation of adaptive, multi-level governance systems. The problem of 'fit' is a central interest - how governance systems and institutions can

better match the dynamics of biophysical systems, with a primary focus on aquatic contexts in the Arctic and Southeast Asia. His publications have appeared in such journals as Frontiers in Ecology and the Environment, Global Environmental Change, Ecology and Society, and International Journal of the Commons. He is co-editor (with Fikret Berkes and Nancy Doubleday) of Adaptive Co-Management: Collaboration, Learning and Multi-Level Governance (UBC Press, 2007) and co-editor (with Ryan Plummer) of a volume on the relationship between adaptive capacity and environmental governance (Springer-Verlag, 2010). He has served as a consultant on a variety of projects for government agencies in Canada (Environment Canada, Fisheries and Oceans Canada, OMNR, Alberta Environment), the Global Environmental Facility (World Bank), ADB and IADB. He is a Senior Fellow, Earth Systems Governance project, Adjunct Professor - Natural Resources Institute (University of Manitoba), and past Working Group Leader - Oceans Management Research Network (Canada). He serves as Associate Editor for the integrative journal, Ecology and Society.

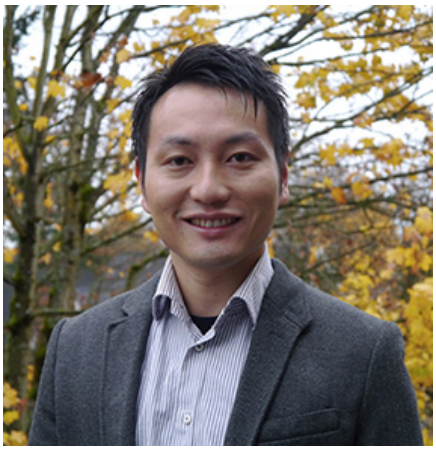
Dr. Natalie Ban, Pacific Working Group Co-Lead

Dr Natalie Ban is an assistant professor in the School of Environmental Studies at the University of Victoria, where she leads the Marine Ethnoecology Research group. Trained in geography (B.A. and M.A. in geography from McGill University), resource management and environmental studies (PhD from UBC Fisheries Centre), Dr Natalie Ban draws upon many disciplines from natural and social sciences in her work. Her research interests span ethnoecology, conservation biology, marine spatial planning, conservation planning and implementation, and evaluation and mapping of cumulative impacts, mainly in marine and coastal systems, with funding from both SSHRC and NSERC, among others. With over 50 peer-reviewed journal publications, Dr Ban's current research focuses on identifying options for management and conservation of biodiversity whilst respecting people's needs and uses of resources. She also serves as a member of the science advisory committee of the Marine Planning Partnership, the research management committee of the Marine Environmental Observation, Prediction and Response (MEOPAR) network, is an associate director of Canadian Council on Ecological Areas (CCEA), and a member of the recently funded Canadian Healthy Oceans Network (CHONe) II.

Dr. Ian Perry, Pacific Working Group Co-Lead

Dr. Ian Perry is a research scientist with the Canadian Department of Fisheries and Oceans (DFO), at the Pacific Biological Station in Nanaimo, British Columbia. In addition, Dr. Perry is an Adjunct Professor at the Fisheries Centre of the University of British Columbia, and has taught courses on fisheries oceanography at universities in Canada, Chile, and Portugal. Dr. Perry holds a B.Sc. from the Department of Zoology, and a

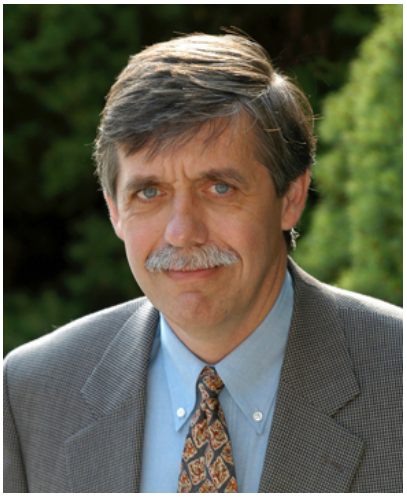
PhD from the Departments of Zoology and Oceanography, both from the University of British Columbia. He currently heads the Ecosystem Approaches Program at the Pacific Biological Station, and is one of two co-leads for the DFO Strait of Georgia Ecosystem Research Initiative. His research expertise includes the effects of the environment on finfish and invertebrates; the structure and function of marine ecosystems; ecosystem-based approaches to the management of marine resources; the human dimensions of marine ecosystem changes; and scientific leadership of international and inter-governmental programs on marine ecosystems and global change. In addition, he is a former Chair of the international Global Ocean Ecosystem Dynamics (GLOBEC) program, the goal of which was to understand how global changes affect the abundance, diversity and productivity of marine populations, and a former Chief Scientist and Chair of the Science Board for the North Pacific Marine Science Organization (PICES). He is a past Editor for the scientific journal Fisheries Oceanography, is presently an Associate Editor for the journal Ecology and Society, and is a member of the editorial boards for Fisheries Oceanography and Current Opinion in Environmental Sustainability. In 2008, Dr. Perry received the Fisheries and Oceans Canada Assistant Deputy Minister's Distinction Award, as well as the Fisheries and Oceans Canada Prix d'Excellence.



Dr. William Cheung, National Data and Integrated Scenarios Working Group Co-Lead

Dr. William Cheung is an Associate Professor at the UBC Fisheries Centre, head of the Changing Ocean Research Unit (CORU) and co-Director of the Nippon Foundation-UBC Nereus Program. Dr. Cheung has published more than 100 articles on the vulnerability and responses of marine ecosystems and fisheries to climate change, fishing and other human stressors, and studying the scope, options and effectiveness for mitigation and adaptation to these impacts. Specifically, he develops empirical and numerical simulation models to examine the impacts of climate change on marine biodiversity and fisheries, globally and in various regional seas. Dr. Cheung's research group hosts a large quantity of data on gridded observed (past and current) and projected (future) ocean environmental, biodiversity and fisheries data particularly in the context of global change studies.

Dr. Cheung co-leads the working group with OceanCanada Director, Dr. Rashid Sumaila.



Phillip Saunders, Law and Policy Working Group Co-Lead

Dalhousie University Schulich School of Law Associate Professor Phillip M. Saunders, Q.C., is cross-appointed to the School for Resource and Environmental Studies and is a Research Fellow at the Centre for Foreign Policy Studies. He is a Member of the Nova Scotia Bar. His teaching and research interests are in international marine and environmental law, maritime boundary delimitation, tort law, judicial remedies and international fisheries law. Professor

Saunders was formerly with the International Centre for Ocean Development, as Senior Policy Advisor and as Field Representative, South Pacific. He was Dean of Law from 2005-2010.

Dr. David VanderZwaag, Law and Policy Working Group Co-Lead

David VanderZwaag is Professor of Law and the Canada Research Chair (Tier 1) in Ocean Law and Governance at Dalhousie University, Halifax, Canada. He teaches international environmental law and is the past Co-director of Dalhousie's interdisciplinary Marine Affairs Program (1986-1991) and the past Director of the Marine & Environmental Law Institute. Dr. VanderZwaag is currently a member of the IUCN's World Commission on Environmental Law (WCEL) and Co-chair of the WCEL's Specialist Group on Oceans, Coasts & Coral Reefs. He is an elected member of the International Council of Environmental Law. David has authored over 150 papers in the marine and environmental law field. He has written widely on polar law and policy issues including: co-leading the writing of the Governance of the Arctic Shipping chapter of the Arctic Marine Shipping Assessment (Arctic Council 2009) and co-editing The Challenge of Arctic Shipping: Science, Environmental Assessment and Human Values (Montreal & Kingston: McGill-Queen's University Press, 1990) and Transit Management of the Northwest Passage: Problems and Prospects (Cambridge: Cambridge University Press, 1988, reprinted 2008). His most recent book publication is: Polar Oceans Governance in an Era of Environmental Change (edited with Tim Stephens) (Cheltenham, UK: Edward Elgar 2014). He continues to serve as regional reporter on the Arctic for the Yearbook of International Environmental Law. Professor VanderZwaag's educational background includes: PhD (1994, University of Wales, Cardiff), LL.M. (1982, Dalhousie Law School), J.D. (1980, University of Arkansas Law School), M.Div. (1974, Princeton Theological Seminary), and B.A. (1971, Calvin College).

Dr. Ian Mauro, Communications and Outreach Working Group Co-Lead

Dr. Ian Mauro is an Associate Professor in the Department of Geography at the University of Winnipeg. Dr. Mauro is a community-based researcher and filmmaker and has pioneered the development of multi-media methodologies for the social sciences. He uses participatory video to collect, communicate and conserve local and indigenous knowledge, an approach that allows people who live on the land to tell their own stories, in their own language, and within the landscapes where their knowledge has been generated.

Eric Solomon, Communications and Outreach Working Group Co-Lead

Mr. Eric Solomon has more than 15 years of experience working in the field of science and environmental education and communication with museums, science centres and public aquariums in the U.S. and Canada. He has dedicated much of his career toward improving communication of complex science and environmental issues to public audiences. After nearly five years as the Aquarium's Vice President of Conservation, Research and Education, his focus is now on development and implementation of integrated approaches to advancing the Vancouver Aquarium's mission and strategic priorities. One significant priority is creating greater public awareness of, and engagement in, the important issues facing Canada's north. Eric holds a Bachelor's in Psychology, a Master's degree in Marine Ecology, and advanced graduate studies in Science Education.

ADVISORY BOARD AND MANAGEMENT COMMITTEE

The OceanCanada Advisory Board provides independent intellectual advice and support to the Partnership. The Advisory Board is arm's length from the project and monitors our overall progress in relation to the established milestones and timelines, also provides guidance on ways to strengthen and sustain the partnership – by helping us to attract new funding, recruit new partners and stakeholders, improving our knowledge mobilization and extending and internationalizing our research. The Board consists of six senior scholars and community and national leaders with expertise across our areas of intellectual inquiry.

Advisory Board members:

Rosemary Ommer (Advisory Board Chair), University of Victoria
Russ Jones, Haida Nation
Fikret Berkes, University of Manitoba
Gordon Munro, The University of British Columbia
Christopher Harvey, MacKenzie Fujisawa LLP
Herb Dhaliwal, Former Minister of the Department of Fisheries and Oceans

OceanCanada's organizational structure also includes a Management Committee, which is comprised of the Project Director, two Working Group leaders (currently, Dr. Nancy Doubleday and Dr. David VanderZwaag serve on the Management Committee) and the Chair of the Advisory Board (ex officio). It meets monthly by videoconference, or as required, and monitors research progress, addresses challenges, plans collaborative initiatives and team meetings, and reviews budgets.

The OceanCanada Scientific Committee includes the Project Director and all nine WG leaders and meets monthly via videoconference. The Scientific Committee provides the overall intellectual vision for our work, and guidance on training and skills development of students, research assistants, and postdocs. Together, these three governance entities (Advisory Board, Management Committee and Scientific Committee) provide direction to working groups and ensure that a consistent approach is taken to research, training, mentorship and engagement and public outreach throughout project activities.

OCEANCANADA PARTNERS AND COLLABORATORS

OceanCanada research is undertaken in partnership with a large number of universities, organizations and faculty members across Canada.

OceanCanada Partners

University of British Columbia

University of Victoria

Dalhousie University

University of Winnipeg

Carleton University

Vancouver Aquarium

McMaster University

WWF

ArctiCONNEXION

Simon Fraser University

Ecotrust

University of Waterloo

St. Mary's University

Friends of Port Mouton Bay

Living Oceans Society

Fisheries and Oceans Canada

OceanCanada Collaborators

Devlin Fernandes, Ecotrust
Nadja Steiner, Fisheries and Oceans Canada
Ronald Loucks, Friends of Port Mouton Bay
Karin Bodtker, Living Oceans Society
Anthony Charles, St. Mary's University
Evelyn Pinkerton, Simon Fraser University
Marie-Hélène Truchon, ARCTIConnexion
Thomas Okey, University of Victoria
Claudio Aporta, Dalhousie University
Jeff Hutchings, Dalhousie University
Trevor Swerdfager, Fisheries and Oceans Canada
Robyn Forrest, Fisheries and Oceans Canada
Robert Stephenson, Fisheries and Oceans Canada
Ratana Chuenpagdee, Memorial University
Carrie Brown, Port Metro Vancouver
Kavern Cochrane, Rhodes University
Kai Chan, The University of British Columbia
Sumeet Gulati, The University of British Columbia

Colleen Maloney, University of Cape Town
Yoshitaka Ota, The University of British Columbia
Grant Murray, Vancouver Island University
Megan Bailey, Dalhousie University

SUMMARY OF OCEANCANADA ACTIVITIES

(APRIL 2014 to MARCH 2015)

OCEANCANADA CORE AND COLLABORATIVE RESEARCH

Sumaila, U. R. et al. Winners and losers in a world where the high seas is closed to fishing. *Scientific Reports* 5, Article number: 8481 doi:10.1038/srep08481 Received 14 September 2014 Accepted 06 November 2014 Published 12 February 2015.

WORKSHOPS AND MEETINGS

Meeting of the Pacific Working Group. March 2015. Nanaimo.

Meeting of the National Data and Integrated Scenarios Working Group. October and December, 2014, February, March, 2015. Vancouver.

Meeting of the OceanCanada Scientific Committee. January 2015. Vancouver.

Meeting of the Law and Policy Working Group. October 2014 and July 2015. Halifax.

Meeting of the Atlantic Working Group, Port Mouton, October 2014. Nova Scotia.

Open House and Community Meeting, Port Mouton, October 2014. Nova Scotia.

MEDIA

Canada would benefit from high seas fishing. Vancouver Sun.

World closes in on consensus to regulate fishing on the high seas. Scientific American.

Spreading the wealth. The Cordova Times.

Researchers propose high seas fishing ban. Geogarage.

Researchers propose high seas fishing ban. Canadian Geographic.

Study recommends closing high seas to fishing. Farm News.

Banning high seas fishing could benefit Canada. Market Business News.

Scientists propose high seas fishing ban. Canada Journal.

Researchers propose high seas fishing ban. FIS Canada.

High seas fishing ban could boost global catches. Science Daily.

High seas fishing ban could boost global catches, equality. The Global Source for Science News.

Researchers propose high seas fishing moratorium. Metro News.

Why are we paying to destroy our high seas? Virgin Unite.

Dr. Rashid Sumaila interview with Real News. Real News Network, USA.

Global Ocean Commission Report. National Geographic Society.

How fish cool off global warming. Scientific American.

Should we close the high seas to fishing? FIS.
Unregulated deep ocean fishing threatens a 148 billion carbon sink. VICE Motherboard.

Stop high seas fishing. The Ecologist.

End high seas fishing for climate's sake. Climate News Network.

Oceans worth $222 billion annually. Phys Org.