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**“Discussing the Blue Arctic Economy
A Case Study of Fisheries in Alaska and North Norway”**

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Discussing the Blue Arctic Economy
A Case Study of Fisheries in Alaska and North Norway

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As maritime issues have already been climbing the political agendas of the Arctic states since the early 2000s, another global catchphrase has also entered the Arctic scenery: blue economy. Retreating sea ice, changing distribution of marine natural resources, and demand for the same resources have combined to create a ‘perfect storm’ for increased economic interests in the region. With the rapid changes underway across the Arctic, questions are being asked about the profitability and sustainability of northern economic

¹ The authors would like to thank AlfHåkon Hoel, Professor of Ocean Law and Policy, College of Fisheries Science, University of Tromsø, for valuable contributions to earlier versions of this working paper.

ventures, together with conditions for local and regional development (Nymand Larsen, 2016).

However, the boom/bust cycles of regional activity are both a blessing and a curse. Designing a new economic model for the Arctic sub-regions is becoming a matter of urgency as older economic systems approach their limits, even before COVID-19 times. This is partly the case with natural resources like fisheries, but also with those who have exploited the resources, economic tipping points are involved, such as significant age imbalances in the local populations (Christiansen et al., 2014; Lam et al., 2016).

In comes an allegedly new macro economy concept, involving every aspect of national and global governance, economic development, environmental protection and sustainability and international communication: the blue economy (Wenhai et al., 2019, p. 3). In the following, we briefly discuss the term/concept ‘blue economy’ as an emerging idea of how to sustainably – from both an ecological and economic understanding – manage and use the world’s oceans and its resources. Essentially, we aim to give some food for thought of how the blue economy could help to change the way we think about fisheries in Alaska and North Norway by discussing a four-level transition phase, focusing on these two regional Arctic domains.²

1. The Blue Economy: A New Sustainable Catchphrase?

The global oceans are not only vital for human wellbeing as climate-regulator and oxygen producer (through the plants such as phytoplankton, kelp, and algal plankton that live in it), they also provide invaluable ecosystem services, contribute to global food security, and offer opportunities for economic growth and development (OECD, 2019). Valued at 1.5 trillion USD in 2010 – about 2.5 percent of the world’s gross economic value – the economic value of the ocean outputs could be doubled by 2030, reaching over 3 trillion USD and approximately employing 40 million full-time jobs (OECD, 2016, pp. 13–14). Thus, also the interest of investing in a sustainable blue economy is growing – globally (Credit Suisse, 2020).

Over the past two decades, the ‘blue economy’ has slowly but steadily emerged as both a term and a concept to embrace the manifold economic opportunities associated with the

² For the purpose of this short working paper, we are only discussing the aspect of commercial fishing, which is the harvest of wild fish, and have not included, albeit relevant, considerations on aqua- and mariculture.

ocean, while at the same recognising, accounting and – in some cases – addressing related threats of climate change, overfishing, pollution or habitat destruction (Voyer et al., 2018). Most often, the 2012 UN Conference on Sustainable Development (Rio +20) and its explicit focus on ocean-related challenges is considered the catalyst for a broader use of this relatively new term in the global environmental governance arena (Silver et al., 2015, p. 136).

The term blue economy emerged before and during Rio +20 in four prominent discourses on human-ocean relations, all representing different ways of approaching the ocean and its economic use: the ocean as natural capital; the ocean as good business; the ocean as integral to Pacific small island developing states; and the ocean as small scale fisheries livelihoods (Silver et al., 2015, pp. 143–149). Essentially, the ‘specification of ‘blue’ makes explicit the focus on oceans, as opposed to land-based resources’ (Keen et al., 2018, p. 334). As such, the term blue economy emphasis the multifaceted economic and social importance of the ocean (and inland waters) (Eikeset et al., 2018, p. 178).

Today, the blue economy – as a macro economy concept – basically constitutes an evolution of ideas about sustainable economies used to denote an expansion of economic wealth derived from the oceans and coasts in such a way as to maintain or improve the natural systems upon which economic systems depend. As such, the very essence of a blue economy internalises the common understanding of sustainable development to meet the needs of the present without compromising the ability of future generations to meet their own needs. Essentially, it shares the idea that economic activities/growth are not antithetical to ecological conservation and sustainability but are rather complementary, or even reinforcing (Boonstra et al., 2018, p. 341).

Although increasingly understood in these multidimensional *sustainable* terms and accordingly invoked by governments, international organisations and relevant stakeholders to tackle both ocean-related opportunities and challenges, the clarity of the term/concept, as well as the implementation steps to achieve an ecologic-economic balance of sustainable exploitation remain vague (Keen et al., 2018, p. 333).

Moreover, while some focus a potential definition predominantly on the economic pillar of the term, e.g. with regard to the development of an innovative (marine) economy (Pauli, 2010), others tackle the management aspect and broadly focus on the sustainable

development perspective and related blue growth considerations (Häyhä & Franzese, 2014; Keen et al., 2018; Lillebø et al., 2017; Mulazzani et al., 2016; Sarker et al., 2018).

Generally, most definitions today emphasize environmental sustainability, economic growth and social equity, driven by an integrated oceans governance approach and technological innovation (Voyer et al., 2018). This ‘all-in-approach’ has led to the blue economy being considered a socially constructed concept – employed differently in different contexts and by different actors, depending on the respective need and economic activity;³ (too) often used to discursively support certain economic sectors, development initiatives, or conservation programs (Silver et al., 2015, p. 153). Although the term closely interacts with other ocean governance tools such as marine spatial planning, ecosystem based management and integrated coastal management, the blue economy essentially lacks established frameworks, guidelines or toolkits through which objectives can be developed, action plans implemented and assessment and monitoring programs devised (Voyer et al., 2018).

The very absence of both a clear definition, as well as related implementation frameworks, has led to many international actors progressing with a broad range of actions all subsumed under a blue economy umbrella, e.g. the European Union’s blue growth strategy and related blue innovation plans (Wenhai et al., 2019, p. 3; Winder & Le Heron, 2017, p. 5). Particularly, in terms of management, data access, monitoring, and product development, these stakeholders are making decisions according to their own needs and less based on a global consensus definition of what blue economy actually is and entails (Wenhai et al., 2019, p. 1). Because of this lack of a (broad) single definition, the precise nature of the ‘blue economy’ will only emerge from the way in which the term is conceived and implemented in specific locations and situations. This brings us to

³ Prior to the attention on the blue economy, or as part of it, is the question of what is the ‘ocean economy’. That is, what parts of national or regional economies are related in some way to the ocean? This definition varies widely with as many as 50 different sectors/industries defined as part of the ocean economy by two dozen nations and international organizations. There are some, such as fisheries, marine transportation, minerals, and tourism which are common, but some are unique to only one or two countries or are themselves general categories with varying definitions such as ‘blue technology’. Basically, ocean economic activities can be distinguished between established and emerging marine industries. While established sectors include, for instance marine living resources, marine extraction of non-living resources, maritime transport, port activities, shipbuilding and repair and coastal tourism, emerging and innovative sectors refer to activities within the blue energy segment, i.e. offshore wind energy, ocean energy (wave and tidal), blue bio economy and biotechnology, marine minerals, desalination and maritime defence. However, no real boundary exists between what is often called blue (= ocean) economy and land-based economy as the latter is often highly dependent and interlinked with an ocean economy (Atkisson et al., 2018, pp. 6–7).

fisheries in the Circumpolar North – another region where discussions on the blue economy has found its way into broader public debate over the past few years.

2. Blue Arctic Fisheries?

Currently, three global developments increasingly affect the Arctic and related economic considerations: climate change, technological development and global economic demand. However, these changes have varying impacts on the region's blue economy due to the simple fact that *the Arctic* is not simply *the Arctic* but consists of *many Arctics*.⁴ Thus, also the manifold blue economies of the Arctic vary with culture, bathymetry, politics, geology, currents and several other variables. These variables create different levels of importance of economic activities, for example with regard to fisheries.⁵

Although the global relevance of Arctic fish captures is rather low, underscored by a 4 percent share of global fisheries (3.5 million tons per year) between 1975 and 2006,⁶ Arctic fish is an important export commodity for the Arctic states and also subsistence activity for regions and indigenous communities in Alaska, Greenland and Russia (Rudloff, 2010, p. 11).⁷ Generally, these states have well-developed management regimes, score high in global assessments of related management performance with most fisheries being certified by international eco-labelling schemes (Hoel, 2018, p. 393). However, the fishing industry in the broader Arctic region is currently undergoing a

⁴ Despite often being publicly considered a homogeneous region, the Arctic entails many different regions: Arctic sub-zones that vary greatly in their physical geography, accessibility, climate and population (Raspotnik, 2018, p. 36).

⁵ Arctic/northern fisheries are difficult to delineate (Hoel, 2018, p. 394) with often four major areas of relevance to be distinguished: 1) the North East Atlantic (Barents Sea, the east and south of the Norwegian Sea, waters around Iceland and East Greenland, FAO Area 27), 2) the Northwest Atlantic (Northeast Canada Sea around Newfoundland and Labrador area, FAO Area 21), 3) the Northwest Pacific (southwest-line along mainland coast of Russia to Alaska, Canada and the United States, FAO Area 61) and 4) the Northeast Pacific (Bering Sea, FAO Area 68) (Rudloff, 2010, p. 8). In comes also FAO's major fishing area 18, the Arctic Sea – an area of potential future importance for fishing purposes. The main species of current (economic) importance are capelin, Greenland halibut, northern shrimp, polar, Atlantic and Pacific cod, haddock, Alaska pollock, snow crab, and others.

⁶ Referring to the difficulty of exactly delineating Arctic/northern fisheries and which areas/species to include into the calculation, Hoel proposes slightly higher numbers and argues for fish catches and landings to be around 6-7 million tons (5.4 to 6.3 million metric tons) (2018, p. 397).

⁷ In addition, aquaculture has become a key regional economic factor in North Norway, Iceland, the Faroes, Northwest Russia and Eastern Canada (Hoel, 2018, p. 394).

process of transformation driven by climate change⁸ or the global market's continuously increasing demand for fish.

In recent years, Arctic industrial fisheries production has remained relatively stable at about 5 million tons (4.5 million metric tons) per year. By comparison, the global annual total has consistently averaged about 80 million tons (72 million metric tons) since 2003 (FAO, 2018, p. 8). However, the economic value of Arctic fish on the global market has been declining steadily. As the types of fish caught in the Arctic change, due to previously Arctic-unknown species moving northwards, their value also changes. However, also other economic factors, such as local prices, exchange rates or differences in catch species may be playing a role (Atkisson et al., 2018, p. 26).

In Alaska and North Norway, the fisheries and aquaculture industries are among the best-managed and most sustainable in the world, counting for a substantial number of landings and production in the United States and Norway.⁹ Generally, the United States and Norway are two of the world's leading fishing nations, with annual catches of wild fish of some 4.5 million tons (4.3 million metric tons) and 2.5 million tons (2.2 million metric tons) respectively (FAO, 2018; National Marine Fisheries Service, 2020). Between one half and two thirds of this catch are taken in the cold but highly productive waters off Alaska and Northern Norway – the Bering Sea, the Gulf of Alaska, the Norwegian Sea and the Barents Sea. Today, most of the stocks in these areas are in good condition, largely thanks to prudent management in recent years.

Alaska produces more than half the fish caught off the coast of the United States, with an average wholesale value of nearly 4.5 billion USD a year. Alaska is the leading US state in volume and value of US fish landings and would be the sixth-largest fishing nation in the world if being its own country. The seafood industry contributes more than 250 million USD in taxes and fees to the State, municipalities and a wide spectrum of state and federal agencies, providing numerous opportunities for the State's population (Resource Development Council for Alaska, n.d.).

⁸ Climate change will, however, not affect all Arctic fish species in the same way. (Water) temperature, currents, and salinity changes are likely to lead to both positive and negative changes in species' availability.

⁹ The following paragraphs are part of a summary report on the blue fishing economy potential in Alaska and North Norway, compiled for the High North Dialogue 2020 in Bodø, Norway and supposed to be presented on 18 March 2020. The conference was, however, cancelled due to the global COVID19-outbreak. More information on the blue economy in Alaska and North Norway and the related AlaskaNor project can be found here: www.alaskanor.com.

In 2017 both Alaskan and total US fish catch were close to their historical maximum. US commercial landings reached nearly 4.5 million tons (4.3 million metric tons), with Alaska accounting for 61 percent (2.7 million tons; 2.4 million metric tons). In value terms, Alaska's share was 33 percent (1.8 billion USD) (National Marine Fisheries Service, 2020).

The largest commercial fisheries in Alaska are those for groundfish (pollock and others), salmon (chinook, chum, Coho, pink, sockeye), crabs (mainly king and snow) and halibut. Sports and recreational fisheries, and subsistence fisheries by Alaskan indigenous peoples, also contribute significant economic value, as well as being socially and culturally important.

In total, the seafood industry of Alaska adds yearly 5.2 billion USD to the state's economy. Most of this revenue can be attributed to the abundance of wild salmon in its waters. Among all species in the Alaska seafood industry, salmon has the greatest economic impact (jobs, income, and total value), mainly thanks to the recent development of hatcheries and the sustainable management of salmon stocks.

In Norway, Northern Norway accounts for a substantial amount of fishery landings and its industry contributes significantly to both the nation's economy and regional wealth. With less than 10 percent of the total population, North Norway (and its two northernmost counties, Nordland, and Troms & Finnmark)¹⁰ is home to nearly 50 percent of Norway's full-time fishers and more than 50 percent of all fishing vessels.

In 2018, about 990 000 tons (900 000 metric tons) of wild fish was landed in North Norway, with an estimated landed value of 12.9 billion NOK (about 1 billion USD) and representing around 40 percent of the total amount landed in Norway. Annual catch volume is fairly evenly distributed between the then three counties, with Finnmark country accounting for 27 percent, Troms representing 35 percent and Nordland constituting 38 percent.

Importantly, this represents 45 percent of all wild capture fish landed on a national level, while 55 percent of it was carried out by vessels registered in one of the two northernmost

¹⁰ Finnmark was its own county until the end of 2019. It was dissolved on 1 January 2020 and merged with the county of Troms to the new Troms & Finnmark county.

counties. In addition, it is estimated, that a substantial part of the fish caught in the adjacent waters of North Norway is also landed in North Norway, creating further employment and value in related industries. Additional value creation from fisheries in North Norway during 2016 was estimated to be 5.9 billion NOK (500 million USD), equivalent to 42 percent of the national total.

As briefly outlined, fisheries is a significant export commodity (and to some extent subsistence activity) in both Alaska and North Norway. Generally, and historically, the Arctic region has almost only been a purely extractive economy – both with regard to fisheries and other sectors – with a very narrow economic base. As regional climate change might positively contribute to total fisheries revenue in the Arctic region (Lam et al., 2016) with certain fish stocks moving northwards, one wonders about whether/how the region's resources and related economic opportunities, further available from climate change, can be realised without making mistakes of the past, e.g. with regard to over exploitation, bad management, etc. In comes the blue economy.

3. What then for an Arctic Blue Fishing Economy?

The blue economy is obviously a complex concept that a) lacks a consensus definition and b) requires multifaceted understanding of interacting ecological and socioeconomic systems. Because there is no single definition, the precise nature of the 'blue economy' will emerge from the way in which the term is conceived and implemented in specific locations and situations. Thus, any blue economy is essentially a very regionalised one.

However, one thread that is likely to be consistent across all the places where the definition evolves is that the blue economy represents a new and different way of using the ocean. The key to any blue economy is thus found in changing the way in which we use the ocean. Change, particularly at so large a scale as human-ocean interactions, is extraordinarily difficult. Therefore, the blue economy needs to be thought of as much as a process as an outcome. That process towards a regionalised blue economy relevant to Alaska and North Norway and other areas of the world, can be described in very general terms as having four phases:

1) Attention

The first phase is already underway: attention by policy makers and stakeholders to the possibilities of ocean-related economic growth and to the need to do so in ways that remediate the damages already done to natural ocean systems and prevent future damages. In Norway, for example, the current government recognises the blue economy as having been essential for the country's economic well-being for centuries, making Norway today a leading ocean economy with an important competitive edge globally (Norwegian Ministries, 2019, pp. 7–9). In the United States, the Department of State recently announced 1.2 billion USD to support the blue economy, essentially to promote sustainable fisheries (U.S. Department of State, 2019). Similarly, but from an energy perspective, also the Department of Energy discusses the opportunities for marine renewable energy in blue economy related terms (LiVecchi et al., 2019). As neither Norway nor the United States have a direct national/federal program specifically targeted at promoting the concept of the blue economy, however defined, high-level attention might be a necessary first step but eventually not sufficient for creating the changes that will be needed.

2) Planning

Basically, a general commitment to the blue economy must be narrowed to the specific economic sectors ecosystems where attention will be focused. This planning stage identifies sectors such as fisheries, minerals, transportation, tourism, energy, and the very specific context of coastal regions. Such a planning process will focus on identifying the ways in which economic activity and ecosystems interact with one another both positively and negatively and which actions are likely to expand the former and reduce the latter.

Planning can take many forms, but usually includes some assessment of local factors such as strengths upon which to build and weaknesses to be addressed and overcome. It may also include non-local factors such as opportunities emerging because of new technologies and national or global markets and threats such as climate change and the extent to which ocean systems have already been degraded in quantity or quality. The planning stage should identify goals for blue economic development – short term or long term – that are, to maximum extent practicable, measurable so that progress towards or away from blue economy objectives. What are the key indicators that would track progress towards or away from the desired outcomes? In that regard, a broad ocean accounting effort is of particular relevance. What are the contributions of the oceans to the market transaction based national income accounts? What is the value of ocean

environmental and natural resource assets on which contributions to national income depend? What are the services to the economy and populations provided by marine and coastal ecosystems? (Colgan, 2016, p. 2)

If looking at fisheries in Alaska and North Norway, it becomes obvious that both are set in very different legal contexts. Alaskan fisheries management is divided between the federal and state governments, with federal government having responsibility for 3 nautical miles out from shore and state governments within 3 nautical miles. The joint responsibility is coordinated through the North Pacific Fishery Management Council which includes representatives of federal and state governments as well as industry. In contrast, Norway does not operate a management level below the national one. While the federation/state interface is the pivot of US fisheries management, the national/international junction point has the same function in the Norwegian system, e.g. in the Barents Sea and the related Joint Norwegian-Russian Fisheries Commission.¹¹ Yet, regardless the approach and the reasoning behind it, both fisheries are well-managed and have been so for decades.

Thus, a key planning task would be a careful assessment of current policies and programs addressing fisheries sustainability and ask how those lessons can be best applied to other fisheries or regions. It should not be assumed that what works in one aspect will also work in other ones, even though subsumed under the same national/federal level. Accordingly, the planning phase should further involve a broad assessment of which fisheries support programs such as direct or subsidized loans, education and training, and infrastructure in Alaska and North Norway contribute to (broadly) defined blue economy goals or adhere to blue economy principles.

The planning process should also identify and determine how to take advantage of the number of similarities between the US and Norwegian systems for fisheries management. The precautionary approach has become the main device in both systems, and both manage according to harvest control rules based on biological reference points for stock size and fish mortality. While focus has traditionally been on single-stock management, both systems increasingly apply a broader ecosystem approach and give more attention to the impacts of fishing on e.g. bottom habitats. Both systems also allow for a high degree

¹¹ For the Norwegian case, this is essentially due to the fact that most fisheries are on transboundary stocks, thus necessitating cooperation between neighbouring countries. Also, the United States and Russia have a bilateral cooperation in the Bering Sea but do not engage in the actual management of its resources.

of user-group involvement, at regional/state, national and international level. And both have had a considerable amount of success in maintaining fish stocks at sustainable levels.

3) Focused Implementation

Naturally, any planning effort must be transformed into actions at some point, which should involve all necessary stakeholders – from the public, private, and nongovernmental sphere. Some actions may be at the policy level (involving legislation, regulation, finance and investment), but many will be made at the project level. Specific development opportunities must be evaluated for their possible gains in both ecological and economic terms. This requires a process that integrates the economic and environmental aspects rather than treating as separate processes which intersect only in the form of regulatory review. Such an integrated process is one of the most important innovations needed to create a blue economy. It is likely to be a difficult innovation since organizations tend to be highly specialized.

Actions to implement the blue economy plans are likely to require starting at rather small scales, addressing very specific economic development or a specific ecological management issue. This phase of the blue economy transformation should be both an opportunity to learn what policy levers (incentives, regulation, finance, design) and the stakeholder involvement processes most likely to be effective in shaping the larger blue economy of certain regions, such as Alaska or North Norway. Moreover, focused implementation could also include the incorporation of blue economy ideas into education and related training programs.

4) Broad Implementation

Based on the experiences learned in phase 3, the procedures, policies, and investments needed to fully implement the plans developed in phase 2 can be adopted more broadly to encompass the full range of economic sectors and ecological systems identified in the plans.

The Arctic Ocean touches the shores of the fewest nations but spans the world. It is inhospitable to all but those who have lived from its resources for centuries, but it is increasingly the focus of attention for the construction of 21st century economies. The attention it is receiving in places like Alaska and North Norway is occurring as part of a

global quest to expand the creation of wealth from the oceans but to do so in ways that both repair and avoid the mistakes that have damaged the resources and ecosystems upon which the wealth depends. The ‘blue economy’ has become the term that expresses this quest, but the blue economy has no specific rules or guideposts. It is created in each place through the sum of actions by governments, industries, indigenous peoples, nongovernmental organizations, academics, and others. Looking at fisheries in Alaska and North Norway, we are only at the beginning to even define on what we mean by blue economy strategies and where we want to go with it

The creation of an Arctic blue economy, either with regard to fisheries or other economic sectors, is at the early stages. The opportunities, particularly in fisheries, are significant particularly given the degraded condition of so many other fisheries around the world. A concerted effort to broaden awareness, to plan rigorously, to take specific actions, and to learn from those actions over the next several years will determine whether the opportunities to establish a blue economy in the Arctic can be seized or whether, as has too often happened elsewhere, the Arctic’s economy will continue the historical pattern of boom and bust with little lasting benefit.

Five years down the line the term/concept might itself have been replaced by another buzzword, or it might have taken root and become an integral part of the regional discourse. In that way, the term can be compared with ‘sustainable economy’. Taking lessons from that catchphrase, it is fair to say that proponents of the ‘blue’ would be well served by a clear definition and further guidelines for operationalisation. The oceans and the related resources at sea are not becoming any less relevant, especially in the Arctic. Figuring out what the blue economy actually includes, and why that matters, is a worthwhile next step.

References

- Atkisson, A., Arnbom, T., Tesar, C., & Christensen, A. (2018). *Getting it right in a new ocean: Bringing Sustainable Blue Economy Principles to the Arctic*. World Wide Fund for Nature (WWF).
https://arcticwwf.org/site/assets/files/2050/report_arctic_blue_economy_web.pdf
- Boonstra, W. J., Valman, M., & Björkvik, E. (2018). A sea of many colours – How relevant is Blue Growth for capture fisheries in the Global North, and vice versa? *Marine Policy*, 87, 340–349.
- Christiansen, J. S., Mecklenburg, C. W., & Karamushko, O. V. (2014). Arctic marine

- fishes and their fisheries in light of global change. *Global Change Biology*, 20(2), 352–359.
- Colgan, C. S. (2016). Measurement of the Ocean Economy From National Income Accounts to the Sustainable Blue Economy. *Journal of Ocean and Coastal Economics*, 2(2), 1–43.
- Credit Suisse. (2020). *Investors and the Blue Economy*. <https://www.esg-data.com/blue-economy>
- Eikeset, A. M., Mazzarella, A. B., Davíðsdóttir, B., Klinger, D. H., Levin, S. A., Rovenskaya, E., & Stenseth, N. C. (2018). What is blue growth? The semantics of “Sustainable Development” of marine environments. *Marine Policy*, 87, 177–179.
- FAO. (2018). *The State of World Fisheries and Aquaculture 2018 - Meeting the sustainable development goals*. <http://www.fao.org/3/i9540en/i9540en.pdf>
- Häyhä, T., & Franzese, P. P. (2014). Ecosystem services assessment: A review under an ecological-economic and systems perspective. *Ecological Modelling*, 289, 124–132.
- Hoel, A. H. (2018). Northern fisheries. In M. Nuttall, T. R. Christensen, & M. J. Siegert (Eds.), *The Routledge Handbook of the Polar Regions* (pp. 393–404). Routledge.
- Keen, M. R., Schwarz, A. M., & Wini-Simeon, L. (2018). Towards defining the Blue Economy: Practical lessons from pacific ocean governance. *Marine Policy*, 88, 333–341.
- Lam, V. W. Y., Cheung, W. W. L., & Sumaila, U. R. (2016). Marine capture fisheries in the Arctic: Winners or losers under climate change and ocean acidification? *Fish and Fisheries*, 17(2), 335–357.
- Lillebø, A. I., Pita, C., Garcia Rodrigues, J., Ramos, S., & Villasante, S. (2017). How can marine ecosystem services support the Blue Growth agenda? *Marine Policy*, 81, 132–142.
- LiVecchi, A., Copping, A., Jenne, D., Gorton, A., Preus, A., Gill, G., Robichaud, R., Green, R., Geerlofs, S., Gore, S., Hume, D., McShane, W., Schmaus, C., & Spence, H. (2019). *Powering the Blue Economy: Exploring Opportunities for Marine Renewable Energy in Maritime Markets*. U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy. <https://www.energy.gov/sites/prod/files/2019/03/f61/73355.pdf>
- Mulazzani, L., Trevisi, R., Manrique, R., & Malorgio, G. (2016). Blue Growth and the relationship between ecosystem services and human activities: The Salento artisanal fisheries case study. *Ocean and Coastal Management*, 134, 120–128.
- National Marine Fisheries Service. (2020). *Fisheries of the United States 2018* (NOAA Current Fishery Statistics No. 2018). U.S. Department of Commerce.

- <https://www.fisheries.noaa.gov/national/commercial-fishing/fisheries-united-states-2018>
- Norwegian Ministries. (2019). *Blue Opportunities: The Norwegian Government's Updated Ocean Strategy*.
<https://www.regjeringen.no/en/dokumenter/the-norwegian-governments-updated-ocean-strategy/id2653026/>
- Nyman Larsen, J. (2016). Polar economics: expectations and real economic futures. *Polar Journal*, 6(1), 1–10.
- OECD. (2016). *The Ocean Economy in 2030*. OECD Publishing.
<http://dx.doi.org/10.1787/9789264251724-en>
- OECD. (2019). *OECD work in support of a sustainable ocean*.
<https://www.oecd.org/ocean/OECD-work-in-support-of-a-sustainable-ocean.pdf>
- Pauli, G. A. (2010). *The Blue Economy: 10 Years, 100 Innovations, 100 Million Jobs*. Paradigm Publications.
- Raspotnik, A. (2018). *The European Union and the Geopolitics of the Arctic*. Edward Elgar.
- Resource Development Council for Alaska. (n.d.). *Alaska's Fishing Industry*. Retrieved January 1, 2020, from <https://www.akrdc.org/fisheries>
- Rudloff, B. (2010). *The EU as fishing actor in the Arctic: Stocktaking of institutional involvement and existing conflicts* (SWP Working Paper FG 2, 2010/02). Stiftung Wissenschaft und Politik (SWP).
http://www.swp-berlin.org/fileadmin/contents/products/arbeitspapiere/Rff_WP_2010_02_ks.pdf
- Sarker, S., Bhuyan, M. A. H., Rahman, M. M., Islam, M. A., Hossain, M. S., Basak, S. C., & Islam, M. M. (2018). From science to action: Exploring the potentials of Blue Economy for enhancing economic sustainability in Bangladesh. *Ocean and Coastal Management*, 157, 180–192.
- Silver, J. J., Gray, N. J., Campbell, L. M., Fairbanks, L. W., & Gruby, R. L. (2015). Blue Economy and Competing Discourses in International Oceans Governance. *Journal of Environment and Development*, 24(2), 135–160.
- U.S. Department of State. (2019, October 23). *U.S. Announces \$1.21 Billion To Support Blue Economy: Commitment Strengthens Sustainability of Ocean Economy, Enhances Health of Planet, and Advances Global Economic Security*. Media Note.
<https://www.state.gov/u-s-announces-1-21-billion-to-support-blue-economy-commitment-strengthens-sustainability-of-ocean-economy-enhances-health-of-planet-and-advances-global-economic-security/>

- Voyer, M., Quirk, G., McIlgorm, A., & Azmi, K. (2018). Shades of blue: what do competing interpretations of the Blue Economy mean for oceans governance? *Journal of Environmental Policy and Planning*, 20(5), 595–616.
- Wenhai, L., Cusack, C., Baker, M., Tao, W., Mingbao, C., Paige, K., Xiaofan, Z., Levin, L., Escobar, E., Amon, D., Yue, Y., Reitz, A., Neves, A. A. S., O'Rourke, E., Mannarini, G., Pearlman, J., Tinker, J., Horsburgh, K. J., Lehodey, P., ... Yufeng, Y. (2019). Successful blue economy examples with an emphasis on international perspectives. *Frontiers in Marine Science*, 6(261), 1–14.
- Winder, G. M., & Le Heron, R. (2017). Assembling a Blue Economy moment? Geographic engagement with globalizing biological-economic relations in multi-use marine environments. *Dialogues in Human Geography*, 7(1), 3–26.