

# Imperiled Majesty: North American Oceans and Coasts

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*We will ... work together to better integrate ocean observation systems, enhance early warning systems for natural disasters, and cooperate on marine protected areas ... [and] enhance the conservation and restoration of wetlands, which increase mitigation actions (blue carbon), preserve coastal ecosystems services, and reduce the potential impacts of more frequent or intense severe weather events under climate change projections.*

Prime Minister Justin Trudeau, President Barack Obama,  
and President Enrique Peña Nieto, Leaders' Statement on a North American  
Climate, Clean Energy, and Environment Partnership.  
June 29, 2016.

## INTRODUCTION

If there is any doubt about the state of threat faced by the coastal regions of North America, we need look no further than the massive sea star die-off of 2014–2015 in the Northwest Pacific, during which a virus—probably aided by unusually warm waters—killed tens of millions of sea

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stars over 18 months. Already touted as one of the greatest recorded marine mortality events in both scope and geographic area, scientists suspect that “sea star wasting syndrome” is linked to climate change and other anthropogenic factors. Though remarkable recovery rates have been noted, this loss of biomass will have serious implications for the marine food chain; for example, among other useful things, *Pisaster* sea stars regulate mussel populations (Johnson 2016).

Indeed this was just one marine mass mortality event in the region. Another was the unexpected death of tens of thousands of Cassin’s auklets, small blue-footed diving birds, found dead on coasts from San Francisco to central British Columbia, apparently from starvation (Welch 2015). In another example, nearly 8000 common murrelets were found washed up along the Alaskan coast in early 2016, and scientists have also linked this to starvation related to warmer oceans and El Niño weather patterns (Newbern 2016). Bird populations are an indicator of fish populations, which are in turn an indicator of phytoplankton, which does not rise to the surface in adequate numbers in warmer ocean depths. The BP Horizon oil spill of 2010 has now been blamed for unusually high levels of dolphin deaths in the Gulf of Mexico (Pantsios 2015), and Manatee deaths have been linked to excessive algal blooms in 2016. A recent global study suggests that 85% of seabirds have ingested plastic, which leads to choking and starvation (Wilcox et al. 2015), as well as microplastic ingestion, which in turn affects oyster reproductive rates (Sussarellu et al. 2016). Wildlife morbidity and health changes are not the only measures of ecological distress, but they are strong ones.

From the sunset beauty of Baja California to the teaming waters of Alaska’s Aleutian Islands to the local charm of the Bay of Fundy, North America’s oceans and coasts are revered and threatened at the same time. It would not be an exaggeration to say that North Americans adore their continental coasts, but also put tremendous pressures on related resources. Tourism, which is always both an opportunity and an ecological challenge, is one of the biggest industries on the continent, and coasts are a perpetual draw. Fisheries remain central industries in all three countries, though a gradual shift to aquaculture is putting additional stress on coastal regions. Offshore oil drilling continues with vigor in many areas, including the Gulf of Mexico, which experienced a catastrophic spill in 2010 and yet another major spill as late as the spring of 2016. Estuaries and wetlands are under constant threat from pollution and development; despite sea level rise and related hikes in insurance costs, people still want to build and live near coastlines, attracted to the sublime beauty of the sea.

This volume will offer critical case studies of political collaboration between Canada, the USA, and Mexico, an effort to further our knowledge of trilateral relations and environmental diplomacy at various levels of scale. The literature on trilateral and bilateral environmental collaboration is growing steadily, reflecting the continuation of a process of stilted integration (Craik et al. 2013; Healy et al. 2014; Temby and Stoett 2015; Stoett and Temby 2017, forthcoming). However, the editor of this volume has correctly identified a lacuna: Despite the growth of policy analysis on the Great Lakes and a few prominent shared river basins, and a chronic obsession with water resources exacerbated by recent droughts and floods, there is not much serious work on ocean and coastal policy development, collaboration, and coordination/convergence in the bilateral or trilateral contexts in North America.

One reason this shortage exists is that there are limited cases where policy convergence on oceans and coasts has taken place. It is noteworthy that the recently published *Routledge Handbook of National and Regional Ocean Policies* (Cicin-Sain et al. 2015) contains chapters on several evolving regional policy contexts, including the European Union, the Pacific Islands, East Asia, and Sub-Saharan Africa, but each of the North American countries is treated individually. To be sure, there are many cooperative efforts between the USA and Mexico, and between the USA and Canada. The Commission on Environmental Cooperation (CEC), the central trilateral agency with an environmental mandate, has offered various programmes over the years and is engaged in work on marine protected areas, blue carbon economies, and other oceans-related work. To claim the CEC sets policy would be an exaggeration, of course: For the most part, we have a patchwork quilt of bilateral agreements on fisheries, water management in the northern Great Lakes, the Gulf of Mexico, and marine transport (and, as some of the chapters in this text make clear, we also have ongoing disputes on these and other areas). A continental oceans and coasts policy does not exist, nor are we nearing the point where one can be identified. Given the interlinked geographic reality of the coastlines and the massive exclusive economic zones of each country, it might be expected that more advances had been made toward policy convergence and collaboration. Yet political factors have precluded genuine progress, or rather limited it to some noteworthy pockets of success, many of which are covered in this text.

It should be self-evident that the situation is urgent and that extensive work will be necessary to avoid the undesirable scenarios presently

unfolding. At a time when Canada is embarking on the development of a new oceans strategy, the US Interagency Ocean Policy Task Force is reconsidering its strategy, and Mexico seems open to projecting its famous concern for biodiversity conservation toward a more encompassing ecosystem approach, the time is ripe for analyses of past collaboration and conflict on oceans and coasts in North America. This chapter will present a short overview of some of the major threats to marine ecology, particularly to oceans and coasts, in the North American context, and then, it will briefly introduce several key policy questions that observers and analysts should strive to answer as we move forward, before exploring some nascent areas of cooperation. It would be nice to end on a note of cautious optimism, but the severity and breadth of the challenges are fast outpacing the capacity for political response.

### THREATS TO OCEAN AND COASTAL ECOLOGY IN NORTH AMERICA

Traditionally, the main oceanic concern for all three countries has been fish stocks and useful marine mammals. It is important to remember this: Though ocean ecology, marine biology, and related fields have been prominent for many decades, the oceans have been generally viewed as utilized resources for many centuries. The USA was once a prolific whaling nation, though today it is perhaps the most forceful anti-whaling country in the world (controversial exceptions are made for aboriginal whaling operations, as one of the chapters in this text reminds us). Canada is well known for controversial seal hunting among Newfoundlanders and the Inuit. Mexico's fisheries came under severe criticism during the famous tuna-dolphin GATT (WTO) disputes in the 1990s for the kill of bycatch. Offshore oil drilling began as early as the 1890s in the Santa Barbara Channel off California.

These may appear as negative images, but it would be unfair to ignore all of the positive aspects of marine mammal and fisheries conservation that have emerged from North America, as the chapter on Mexico's sea turtle preservation will indicate. The 1985 Canada-US Pacific Salmon Treaty was a landmark agreement involving indigenous communities and commercial and recreational fishers in the management of this anadromous species, despite ongoing disputes among stakeholders. Though USA-Mexican relations have often struggled to cope with fishing pressures from both states and jurisdictional squabbles (Rosendahl 1984) and

the tuna-dolphin case was disastrous for natural resource management relations, recent Mexican efforts to ban gillnet fishing in the Sea of Cortez to protect the world's smallest and most endangered porpoise, the *vaquita*, have curried favor with environmentalists in the USA and elsewhere.

Though fisheries are in crisis everywhere, and North America is no exception, it is as likely today for environmentalists and politicians alike to turn their attention to other threats to marine ecology, such as algae blooms, oil spills, marine debris, rising sea levels, aquatic invasive species, and wetlands destruction. Space limitations preclude an extensive discussion of the multitudinous threats facing the coasts and oceans proximate to the North American continent, but some cursory comments will follow.

Algal blooms and hypoxia are not only deadly, they are occurring at alarming levels in most coastal zones in North America, caused by a combination of warmer waters (linked to anthropomorphic climate change) and excess nutrient runoff (mainly nitrogen and phosphorous) from agriculture and wastewater. Nonpoint pollution sources (roadways, farms, suburban sewers) are largely unregulated across the continent, and a large amount of this pollution ends up on coastal beaches and in oceans. Though we have known about the global spread of algal bloom events and coastal eutrophication for decades (see Hallegraeff 1993), this has reached crisis proportions in Florida and elsewhere, including the infamous “Red Tide” events that occur off of coasts, and the National Oceanic and Atmospheric Administration (NOAA) devotes considerable resources to detection and prevention (NOAA 2016). Not all coastal pollution is related to agriculture, of course. Some toxic pollutants, such as dichlorodiphenyltrichloroethane (DDT) and polychlorinated biphenyls (PCBs), remain locked in sediment and are still gradually released into the ocean through river discharge. Marine debris is a problem in all coastal regions today; in particular, microplastics and nanoplastics (mostly from land-based sources) are prevalent, threatening the food chain on which all marine life on earth depends and, perhaps, the carbon cycle itself (see Rupe 2014; Stoett 2016).

Beyond nonpoint pollution sources, ocean warming—a consequence of anthropomorphic climate change—presents numerous challenges for marine life.<sup>1</sup> One of the most conspicuous effects of warmer waters is coral bleaching, the whitening of corals due to stress-induced expulsion of their symbiotic zooxanthellae, single-celled photosynthetic organisms responsible for most of the nutritional needs of coral animals.

Some species of zooxanthellae and corals are more resistant to stress than others, but if zooxanthellae cannot recolonize, the coral dies. Large coral colonies, such as *Porites*, are able to withstand extreme temperature shocks. Other more fragile branching corals are more susceptible to stress following temperature change. North America's coral reefs are found in Hawaii, Florida, the Caribbean and Pacific islands, and the *Sistema Arrecifal Veracruzano*, the largest coral reef in Mexico. In the autumn of 2015, Hawaii suffered the worst bleaching in its history as the surrounding water temperatures rose at abnormal rates (Rodgers et al. 2015).

Ocean warming also reduces the upwelling of nutrients in the carbon cycle, reducing phytoplankton productivity; results in the shifting of geographical ranges for marine species (mainly toward the poles) (see Poloczanska et al. 2013); reduces hunting ranges for ice-dependent species such as polar bears; and results in sea level rise from both melting glaciers and thermal expansion. Extreme weather events, such as Hurricane Sandy, are exacerbated by sea level rise, and it is hazardous to salt marshes and mangrove ecosystems. As the GEO-6 North American Assessment adds:

These [ecosystems] will have to migrate inland or increase their elevation in order to avoid being submerged by rising seas. As these are important habitats for birds and marine animals that use them as nursery habitats, many species are at risk if these wetlands cannot migrate. Coastal salt marshes and mangroves also serve as buffers, protecting human communities from storm surges and flooding. These wetlands provide many other benefits to humans, including habitat for commercially important fisheries and wildlife; improved water quality through sediment, nutrient, and pollution removal; recreation; and aesthetic values [...] In many areas, marshes are not expected to be able to increase their elevation fast enough to keep up with sea-level rise, but if storms transport new sediments into the marshes, they may be able to increase their elevation and persist for a longer time. In developed areas, there are roads, houses, etc. just landward of the marshes, which prevent them from migrating inland. (UNEP 2016, 97)

While these are all very serious problems, the greatest threat to the oceans from climate change may well be ocean acidification: Approximately one-third of the carbon from fossil fuel consumption dissolves in the ocean, combining with water to produce carbonic acid. Though the extent of acidification varies across time and geography, it is widely accepted

that, overall, it is increasing at unprecedented levels (we only have direct observations dating back to 30 years). The Regional Assessment wastes no time in outlining the seriousness of this issue:

Ocean acidification threatens the ecological health of the oceans and the economic wellbeing of the people who depend on a healthy marine environment. It is expected to harm a wide range of ocean life, particularly those that use calcium and carbonate ions from seawater to produce calcium carbonate for their shells. Larval molluscs and some other calcifying organisms are already showing impaired shell formation at some locations, and calcareous plankton, including some phytoplankton at the base of oceanic food webs, corals and shellfish are threatened.

Water off the North American Pacific coast already has a low carbonate saturation state. When surface winds blow the top layer of water out from coastal regions, deeper water with higher acidity can well up, and harm shellfish. Periodic upwelling of carbon-dioxide-rich water has already happened on the US west coast, where larval oyster survival has been very low. There has been a reduced natural set of juvenile oysters in some Pacific coast estuaries where the commercial shellfish industry relies on natural reproduction of oysters [...] Behaviour is also altered in many animals, especially that related to the olfactory system. Fish in acidic water in the lab or living next to natural seeps, where carbon dioxide is released by volcanic activity, lose their natural fear of the odour of predators and become attracted to them. But predatory behaviour can also be impaired. (UNEP 2016, 97–98)

Planners in coastal cities such as Miami are starting to respond to sea level rise, but the only response to ocean acidification is to lower carbon emissions, which of course extends far beyond oceans policy. As large emitters of carbon dioxide and other greenhouse gases, all three countries have a global obligation to curtail their emissions and develop renewable energy resources, though this is obviously a complex demand when all three countries have large, powerful, and heavily subsidized oil, gas, and coal industries.

All of these problems are tied further to what many biologists consider one of the gravest threats to marine life: aquatic invasive species (AIS), defined by the US legislation (the Non-Indigenous Aquatic Nuisance Prevention and Control Act of 1990/1996) as: “non-native aquatic organisms (plants, animals, or pathogens) that impact the diversity or abundance of native species, the ecological stability of infested

waters, and/or the commercial, agricultural, aquacultural, or recreational activities dependent on such waters.” Familiar culprits include the zebra and quagga mussels, the round goby, the sea lamprey, the dreaded Asian carps, the alewife, the lionfish, and many others.<sup>2</sup> Pathways include ship ballast water, aquaculture, recreational activities (including stocking for sport fishing), aquarium releases, live food and bait, biological controls, ecological restoration efforts gone array, and even melting sea ice (which could release pathogens against which there is no contemporary immunity). All three countries are well aware of the extent of this problem and have taken various actions toward prevention, including robust regulatory efforts to consign ballast water discharge to the open seas, but much more needs to be done to coordinate activities. A continental strategy was promised at the “three amigos” meeting cited at the start of this chapter.

Perhaps the biggest future concern is over the Arctic. The impacts of climate change are no longer a future concern but a present reality, yet we have still to come to terms with its geopolitical implications or its human security consequences for Northern peoples, including the Inuit. While this issue has relatively little resonance with Mexican policy makers, Arctic Council members Canada and the USA view this as a first-order foreign policy dilemma, and not just because of the resource rush that could follow greater accessibility. Alaskan and Canadian glacier ice loss continues at a predictable pace, part of a global trend that is contributing to accelerating patterns of sea level rise. Since there is some dispute about this in the popular literature, I will again quote the UNEP North American Regional Assessment at some length here:

Long-term observations show that glaciers around the world are in retreat and losing mass. The World Glacier Monitoring Service, which has a series of datasets collected since the 17th century, coordinates world-wide glacier-monitoring activities that provide an unprecedented dataset of glacier observations from ground, air, and space [...] Glaciological and geodetic observations show that since 2000 the rates of glacier-mass loss are unprecedented on a global scale, at least compared to the centuries of observation and probably also for recorded history, as indicated in reconstructions from written and illustrated documents. (UNEP 2016, 98)

The Assessment is quick to note, however, that melting glaciers are but part of the climate change scenario for the Arctic, with attendant geopolitical, trade, and human security implications:



Certain processes—including glacier ice loss, sea level rise, ocean acidification, and changes in ocean salinity and circulation—have been accelerating in the Arctic due to warming of the average global temperature [...] Ocean acidification is intensifying more rapidly in the Arctic Ocean than in other locations. This will produce consequences for marine ecosystems, Arctic fisheries, the value of Arctic ecosystem services, and marine management. (UNEP 2016, 118–119)

All of these problems (and there are many, many more that have not been presented here) suggest the need for policy coordination if we are to conserve ocean life and respect the rather simple yet profound dictum that we cannot live without healthy oceans.

## POLICY CONTEXT AND QUESTIONS

Concern over the state of ocean and coastal zones has led to the creation of local, national, and even regional policy approaches in many areas of the world. Though the legislative and regulatory context is very well developed in each of North America's three nation-states, perhaps second only to that of the coastal European Union states, we might conclude that little transnational planning has affected policy-making at this point. It is hoped that this will change in the near future, though this is impossible to predict with any certainty in the context of the rather uncertain politics found in the USA and Mexico in particular. Regardless, what type of questions can political scientists and other observers ask that will help us understand trends in policy development in this crucial issue area?

First of all, we need to identify the circuits of influence and power lines of the multi-scale governance that is typical when it comes to natural resource management, including fisheries (pelagic, coastal, and aquacultural), natural gas and oil drilling, the utilization of marine mammals, pollution control, and other sectors. While each of the three countries has a lead agency on oceans—Canada's Department of Fisheries and Oceans (DFO); the US National Oceanic and Atmospheric Administration (NOAA); and Mexico's Ministry of Environment and Natural Resources (SEMARNAT)—it is clear that oceans policy must cut across multiple departments and political jurisdictions, especially in the case of three adjacent but unique federal political systems. There is always a myriad of interlinked intra-governmental departments involved

as well. For example, the US State Department runs a Bureau of Oceans and International Environmental and Scientific Affairs; the US Department of Commerce makes key decisions on whaling and other marine mammals (and the Under Secretary of Commerce for Oceans and Atmosphere also heads NOAA); the US Fish and Wildlife Service runs a Coastal Program with employees located at 24 priority coastal areas, along the Atlantic and Pacific Oceans, Gulf of Mexico, Great Lakes, and in the Caribbean; the US Department of Energy makes key decisions about offshore oil drilling and also runs a Wind Program that includes offshore wind power research and development and so on. This is why the Interagency Ocean Policy Task Force recommended the establishment of a National Oceans Council, which the Obama Administration created in 2010 and which includes the following:

- The Secretaries of: State, Defense, the Interior, Agriculture, Health and Human Services, Commerce, Labor, Transportation, Energy, and Homeland Security.
- The Attorney General.
- The Administrators of: the Environmental Protection Agency (EPA) and the National Aeronautics and Space Administration (NASA).
- The Chairs of: the Council on Environmental Quality (CEQ), the Federal Energy Regulatory Commission (FERC), and the Joint Chiefs of Staff.
- The Directors of: the Office of Management and Budget (OMB), National Intelligence, the Office of Science and Technology Policy (OSTP), and the National Science Foundation (NSF).
- The Assistants to: the President for National Security Affairs, Homeland Security and Counterterrorism, Domestic Policy, Economic Policy, and Energy and Climate Change.
- An employee of the USA designated by the Vice President.
- The Under Secretary of Commerce for Oceans and Atmosphere (NOAA Administrator).

The Council also includes a Steering Committee, an Ocean Resource Management Interagency Policy Committee, an Ocean Science and Technology Interagency Policy Committee, a Governance Coordinating Committee which includes 18 state, local, and tribal representatives from across the USA who serve as a coordinating body on inter-jurisdictional

ocean policy issues, and an Ocean Research Advisory Panel. Mexico has an Inter-ministerial Commission for the Sustainable Handling of Oceans and Coastal Affairs (CIMARES); the Canadian Council of Fisheries and Aquaculture Ministers (CCFAM) brings provincial bureaucracies together with the federal government. The contextual complexity found in the modern federal state is a major factor when it comes to not just policy formulation but, as importantly, implementation.

Presumably, an awareness of how decisions are made and implemented is a key element in any case study related to oceans policy before we can even contemplate any bilateral or trilateral policy collaboration, convergence, or divergence taking place. This quest to locate power, or to identify power relations, is endemic to political science and policy analysis but also motivates much historical study and environmental activism. The latter is preoccupied with the perception of the unjust distribution of power, and many coastal communities are depicted as being victims of environmental injustice (the treatment of shrimp-farming communities after the BP oil spill in the Gulf is but one example). The theme of environmental (in)justice can animate our analysis of ocean and coastal policy along several lines: The differentiated impacts of climate change, the food security implications of hypoxia and other marine disruptions (including the collapse of fisheries), questions of rights of access to oceanic resources, gender relations in the marine tourism industry, the treatment of coastal and riparian indigenous communities, and many other issues can and should be raised.

Beyond the question of where and how political power is located and dispensed are more specific questions about how policy is developed. For example, is policy science-driven or politically (or, even, ideologically) determined? Typically in oceans policy and other areas, we speak mournfully of the inability of policy to keep up with science (Rudd 2015). In Canada, the rupture between science and policy was viewed as especially pronounced in recent decades, so much so that many specialists consider it an urgent priority that oceans policy is actively directed back toward scientific evidence-based development (see Bailey et al. 2016). A combination of funding cuts, library closings, and communication limitations made government scientists feel ostracized from the policy process. This will hopefully change as a new national administration settles into governing at the federal level, though the ideology of climate change denial remains an issue in some American state governments. In Mexico, biodiversity science has often received due respect by successive national

governments, but there are genuine ongoing concerns about rampant corruption in the administrative system and doubts about the ability of scientists to have more influence than crafty well-connected political operatives.

Another issue is the extent of development of transnational policy networks, which is linked in many cases to the growth of scientists as active players in policy development. For example, the CEC-supported NAISN uses an expansive typology for its members: hubs (regional or international organizations and agencies), nodes (government agencies and networks), and affiliates (individuals that are interested as experts or stakeholders). The network has compiled a list of hundreds of organizations associated with invasive species management in all three countries (NAISN 2016a). It is clear that a network has evolved that has some influence over specific regulatory decisions, perhaps on par with that exerted by private sector lobbyists. Universities often play a key role in the formation of such transnational policy networks. A clear and updatable mapping of the networks in place on ocean science and governance would be a welcome addition to our knowledge base.

Another question we must ask is whether economic and environmental priorities are in constant tension, or whether there is some congruence that will afford the possibility of relatively “easily,” or widely palatable, political commitments. The 2016 decision by the Obama Administration to create the world’s largest marine protected area by extending the Papahānaumokuākea Marine National Monument surrounding the Northwest Hawaiian Islands is an example, perhaps, of how a conservationist ethic and the significance of the tourism industry congealed to give President Obama (aided by the perpetual stalemate of Congress) a brilliant opportunity to implement an historical legacy decision. Though it will cause some disruption to local fisheries, it will be implemented with consultation with affected communities, and the idea that conserving Hawaii’s ecological beauty must start at the ocean if it is to remain a tourist destination is not a complicated one, even if the internal politics of the Hawaiian state are anything but simple. Transferred to other areas where significant investments have been made in offshore drilling and massive shrimp farming, such as the Gulf of Mexico, such a pronouncement seems almost dreamlike. All three countries will have to deal with the often-indelicate balance between economic opportunity and environmental conservation.

Finally, there are also issues related to the commitments all three countries (one of which has generally been regarded as the world’s remaining

superpower) have made to the international community, especially in the wake of the 2016 election of Donald Trump in the USA. It is worth noting that North American coastal and ocean policy does not occur in a regional vortex but reflects, and helps shape, global environmental governance as well. All three countries are intimately linked to international marine conservation efforts, and all three of them contribute immensely to the problems that result from modern trade, fisheries, oil drilling, and other forms of natural resource use. To what extent have the three countries implemented existing agreements? Here, it is easy to spot an anomaly of sorts: While international conventions such as the one on ballast water have been implemented with considerable care, the USA has not managed to ratify the UN Convention on the Law of the Sea (UNCLOS), and a Republican Congress will have no desire to do so (Canada was late with its ratification as well). This creates some room for friction in oceans policy, but it should not be exaggerated: Long before Canada had ratified UNCLOS, it had accepted the notion of an exclusive economic zone. Deep-sea and coastal mining might present future challenges, however.

All three states have participated in and, in fact, play(ed) key roles in, biodiversity conservation regimes. Canada hosts the Secretariat of the Convention on Biological Diversity (CBD); the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is often referred to as the Washington Treaty, given the USA support for its inception in the 1970s; and Mexico's international environmental diplomats and biodiversity are often at the front and center of the UN Environment Programme (UNEP) efforts. Another area where cooperation is hopefully approaching is the implementation of the Honolulu Strategy for the Prevention and Management of Marine Debris. The list of international commitments made by all three countries with environmental implications would go on for many pages, and many of the case studies in this book will touch on some of them (regional fisheries agreements are part of this puzzle, each with their own leadership issues). Again, balancing these commitments with what are perceived as national priorities is often a juggling act at which short-term politicians prove quite inept. Canada's notorious stance on climate negotiations, recently abandoned for a more reasonable approach with the election of a liberal federal government, reminds us of the vagaries of electoral politics when it comes to the pursuit of international commitments. The Trump presidency appears unlikely to even publicly acknowledge climate change as a legitimate concern.

Luckily, there are several issue areas in which future collaboration between these three states could materialize. Cooperation on pollination services is an early example: It is clear that the migratory monarch butterfly, for example, needs protection in all three states if it is to survive threats to its survival (and, again, the Obama Administration and the Mexican government have made impressive commitments to the task). Due to their material value and a less obvious jurisdictional context, it has not been as easy to work cooperatively on the conservation of migratory fish stocks. But there are many areas where common interests and the overarching theme of biodiversity conservation could converge in relation to oceans and coasts, including seabird protection and gray whale conservation (complications with aboriginal whaling and the Makah whaling decision aside).

Another area involves the further development and solidification of the transnational policy networks we have already discussed. With resource-based encouragement, scientific collaboration can further blossom, supported by the CEC and other organizations and buttressed by an intra-continental network of universities that are increasingly skilled at speaking to each other and pooling resources. Another development that holds promise is the increased popularity of what is often referred to as “citizen science” as more people become engaged in the work of natural science by collecting and disseminating data. Shoreline pollution and marine debris quantification owes much to this activity, as does the identification of aquatic invasive species and mass mortality events. The Coastal Observation and Seabird Survey Team (COASST) housed at the University of Washington is a good example of how public participation and professional science can work in tandem (COASST 2016). Encouraging the engagement of citizens in the scientific process across all three states could reap rewards in policy cohesion and public sentiment as well.

Another area where all three states can benefit with coordinated action and normative promulgation is the promotion of “blue carbon” as a partial response to the many dilemmas presented by climate change. Terrestrial carbon stored in plant biomass and soils in forested land, plantations, agricultural land, and pastureland is often called green carbon. Blue carbon is the carbon captured by the world’s oceans and represents more than 55% of total biological carbon (Nellemann et al. 2009). It is stored or sequestered in marine and coastal ecosystems including mangrove forests, tidal salt marshes, and seagrass meadows, as well as coral

reefs and oceanic carbon sinks in the form of marine algae. These habitats provide important ecosystem services as spawning habitat and defense against storms, and for nutrient cycling and pollination, and they provide economic resources including livelihoods and food, materials, and medicine. Yet they are largely disregarded in international climate change mitigation and adaptation frameworks (Nellemann et al. 2009). The need to conserve estuaries, mangrove forests, seagrass ecosystems, and other wetlands is well recognized as we adapt to rising sea levels and extreme weather events, but viewing these areas as carbon sinks can give extra incentive to pursue related policies and to build on each other's experience. The protection of estuaries and wetlands has been a key priority for US oceans policy since the 2004 US Commission on Oceans Policy report. The CEC has recently completed a North American Blue Carbon Scoping Study and is running an ongoing *North American Blue Carbon: Next Steps in Science for Policy* program (CEC 2016a, b).

The two recent developments deserve special mention in the Canadian and American cases, and they both promise developments but suffer from the casting of broader shadows. The first is the Trudeau government's announcement in November 2016 of a new "National Oceans Protection Plan," which will include \$1.5 billion (CAN) to be spent over the 2017–2023 period. Some of this will go to conservation research, though much of it will be used to strengthen the Canadian Coast Guard, improve maritime traffic and rescue operations, and enhance oil spill responses. The latter is easily linked to a subsequent decision by Ottawa to permit major oil pipeline expansions that will increase tanker traffic off the west coast. In the USA, Barak Obama's summer 2016 legacy decision to declare the sizeable expansion of the Papahānaumokuākea Marine National Monument off of Hawaii, making it the largest conservation area on earth at the time, is overshadowed by the election of the outright anti-environmentalist Trump Administration.

## CONCLUSION

This text will afford the opportunity to delve into many of the issues raised in this chapter in considerable detail as chapters look into geopolitical, legal, and environmental issues that have shaped and are shaping the oceans–coastal policy nexus in North America.

The key policy questions outlined above need answers if we are to look ahead and protect the most valuable resources off the beautiful

coasts of North America. While the extent of common challenges may appear overwhelming, sound science and committed policy action could well make the difference between marine life and death. Moving toward a regional oceans policy may be the best way forward in this respect, but we clearly need a serious effort to further investigate policy development in the trilateral oceans policy area. An interdisciplinary effort is necessary, combining science, policy, national sociology, continental integration studies, and other fields.

It may be heartening to realize that regional transnational policy networks are continuously evolving in the broader North American context (Stoett and Temby 2017, forthcoming). We can expect this to occur in the area of oceans and coastal governance as well. But if it is to meet the immediate and long-term needs of sustainability, it has a long way to go.

## NOTES

1. Please note that I have relied heavily on the following document; I was a lead author for the report: UNEP. 2016. *Global Environment Outlook (GEO-6): North American Regional Assessment*. Nairobi: UNEP.
2. The North American Invasive Species Network (NAISN) includes four subspecies of Asian carp in its list of North America's "top ten" invasive species: grass, silver, bighead, and black. It also includes the lionfish (which is harming fragile ecosystems in the Caribbean), hydrilla (an invasive aquatic plant), and both the zebra and the quagga mussels (see NAISN 2016b).

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