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Climate Change and the Coastal Zone Management Act: The Role of Federalism in Adaptation Strategies

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Climate Change Impacts on Ocean and Coastal Law

U.S. AND INTERNATIONAL PERSPECTIVES

Edited by Randall S. Abate

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II Coasts



19 Climate Change and the Coastal Zone Management Act: THE ROLE OF FEDERALISM IN ADAPTATION STRATEGIES

Chad J. McGuire

Introduction 419

- I. The Impacts of Climate Change on Coastal Areas 421
 - A. Physical Impacts 422
 - B. Ecosystem Impacts 424
 - C. Societal Impacts 425
 - II. The Coastal Zone Management Act and Climate Change 427
 - A. Federal Consistency under the CZMA 428
 - B. The Context of Climate Change 430
 - III. Utilizing Federal Consistency to Respond to Climate Change Impacts 431
 - A. Two Legal Arguments for States 431
 - 1. Carbon Intensity of Federal Activities 432
 - 2. Federal Offshore Activities 433
 - B. Suggestions for Implementation 435
- Conclusion 436

Introduction

Coastal areas are dynamic places lying at the intersection between land and water, a boundary that is never static.¹ For example, gravity constantly pushes

¹ See generally CHAD J. MCGUIRE, ADAPTING TO SEA LEVEL RISE IN THE COASTAL ZONE: LAW AND POLICY CONSIDERATIONS 1–3 (2013).

and pulls at the water, exerting its influence and, in the process, altering coastal boundaries.² Nevertheless, the changes observed at the coastline are relatively consistent, sitting within our expectations based on past and current observations. Gravity will pull the sea away from the coastline to an average low-tide mark, and it will also push the sea landward to an average high-tide mark.³ Full and new moons can further influence high and low tides, creating larger tidal ranges beyond the averages normally observed.⁴ Storms can do the same.⁵ But collectively these historically observed phenomena are part of the observed experiences of humans, and as such, they have been internalized into the decision-making frameworks that coincide with the development and regulation of coastal areas.⁶

Climate change brings a new variable—uncertainty—into our expectations about coastal dynamics. Rising sea levels result in water moving inland, altering the observed average high and low tidelines.⁷ Coastal storms derived from ocean-based cyclones are occurring with greater intensity, and there is evidence suggesting conditions are ripe for a greater frequency of such storms in the future.⁸ These observations increase the uncertainty associated with coastal area dynamics by challenging previous assumptions about coastal system equilibrium, thereby questioning the validity of legal and policy frameworks developed under previous assumptions. For example, is it wise to develop along coastal areas where uncertainty from climate change makes it difficult, if not impossible, to discern future coastal impacts? Or do preexisting legal and policy frameworks need to be examined, and potentially changed, to accommodate the realities of coastal areas in an era of climate change? These are but a few of the inquiries that highlight difficulties presented when planning for coastal management under conditions of increasing uncertainty.⁹

² RICHARD A. DAVIS JR. & DUNCAN M. FITZGERALD, *BEACHES AND COASTS* 189–95 (2004).

³ *Id.*

⁴ *Id.*

⁵ *Id.* at 76–77.

⁶ MCGUIRE, *supra* note 1, 76–80.

⁷ *Id.* at 15–16.

⁸ INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *CLIMATE CHANGE 2007: SYNTHESIS REPORT* 30, 147 (Abdelkader Allali et al. eds., 2007), *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf (noting observational evidence of an increase in intense tropical cyclone activity in the North Atlantic since about 1970, and also suggestions of increased cyclone activity in other regions); GLOBAL CLIMATE CHANGE IMPACTS IN THE UNITED STATES 24–25 (Thomas R. Karl et al. eds., 2009), *available at* <http://downloads.globalchange.gov/usimpacts/pdfs/climate-impacts-report.pdf> (noting models project a tendency for more extreme wind events and higher ocean waves in a number of regions, and also noting more rain-producing tropical storms and hurricanes are generally more likely due to increased precipitation and surface water temperatures).

⁹ There is always uncertainty at the coastline; however, the degree of uncertainty is increasing, making previous observations inadequate as the basis of evidence for planning that includes assumptions about future events. *See* CLIMATE CHANGE 2007: SYNTHESIS REPORT 30 (discussing observations of climate change and concluding that warming of the climate system is unequivocal).

This chapter discusses the role of coastal zone management under conditions of climate change in the United States. More specifically, this chapter explores coastal zone management by examining the relationship between coastal states and the federal government, political entities that share interests and rights in coastal areas under constitutional federalism.¹⁰ To help place this review of federalism into a coastal management context, a particular federal law, the Coastal Zone Management Act (CZMA),¹¹ will provide the context to highlight federal and coastal state interactions when managing coastal resources in an era of climate change. The CZMA will also provide a legal foundation from which coastal states and federal government interactions will be analyzed to see the influence of federalism when responding to threats in coastal areas caused by climate change.

This chapter will focus on adaptation policies to respond to climate change impacts in the coastal zone. The chapter begins with an exploration of the impacts of climate change on coastal areas. It then addresses the legal context of federalism by identifying how climate change adaptation strategies under the CZMA are impacted when coastal state and federal government interests diverge. The chapter concludes with suggestions to overcome or otherwise mitigate conflicts that arise between federal and state activities in coastal regions related to climate change adaptation, identifying pathways for cooperative federalism to help achieve meaningful and proactive adaptation strategies along the coast.

I. The Impacts of Climate Change on Coastal Areas

Climate change is having numerous impacts on coastal areas, with the degree of impact influenced by morphological and spatial considerations. For example, a low-lying coastal area will experience greater impacts from sea-level rise than a coastal region dominated by high bluffs.¹² Also, coastal areas that exist in storm-prevalent regions may experience increased intensity and frequency of storm events due to climate change, while coastal regions existing outside of storm-prevalent areas may continue to experience reduced storm-related impacts.¹³ For the most at-risk areas (low lying and geographically situated

¹⁰ The term “federalism” in this context refers to the relationship between state governments and the federal government of the United States. State governments adjacent to coastlines enjoy sovereignty both in principle and practice. However, the extent of state sovereignty is limited when applied to matters of federal (national) concern. For example, while the state government owns the water adjacent to the coastline, the federal government has supremacy in controlling navigation routes along the coastline. Or, in the case of climate change, state government goals regarding climate change may be impacted by conflicting federal goals under principles of federalism.

¹¹ Coastal Zone Management Act of 1972, 16 U.S.C. §§ 1451–1466 (2012).

¹² See generally INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, MANAGING THE RISKS OF EXTREME EVENTS AND DISASTERS TO ADVANCE CLIMATE CHANGE 76–89 (Christopher B. Field et al. eds., 2012), available at http://ipcc-wg2.gov/SREX/images/uploads/SREX-All_FINAL.pdf.

¹³ *Id.*

422 | Climate Change Impacts on Ocean and Coastal Law

in storm-prone areas), there are various threats based on changes in localized conditions experienced compared to historical conditions.¹⁴ These changes can lead to biogeochemical alterations that have significant consequences for the management of coastal areas. Current and future impacts to coastal regions from climate change may be divided into three categories: *physical* impacts focusing on the features of the coast and the processes that both drive and are impacted by climate change, *ecosystem* impacts that consider the effect of climate change on vulnerable coastal species and associated habitat, and *societal* impacts that consider the effect climate change has on the human-built environment.

A. PHYSICAL IMPACTS

Physical impacts to the coast vary depending on several factors, including elevation and proximity to storm centers.¹⁵ In general, lower lying coastal regions with a gradual slope are at greater risk than higher coastal elevations or coastlines with a more dramatic slope. In addition, the proximity of the coastal area to epicenters of strong storm activity (e.g., hurricanes, tsunamis, earthquakes, etc.) can increase physical impacts associated with climate change as the increased proximity of human habitation to the shoreline can intensify the effects of the seismic event. Nearshore water depth impacts the ability of ocean-borne storm surges to reach closer to the shoreline before releasing their energy. Greater ocean depths brought on by sea-level rise associated with climate change can increase a storm's proximity to coastal land before releasing the brunt of its force. Warming ambient surface temperatures increase the temperature of surface waters, which in turn increase the intensity of storms such as ocean-borne hurricanes. Warmer surface waters moved inland through sea-level rise also increase the probability and reach of coastal storms, intensifying their potential impact.¹⁶

Expected climate-change-induced physical changes associated with coastlines include the flooding of low-lying areas. Flooding, or inundation, generally occurs in sheltered, low-energy areas where physical processes such as sediment accumulation are minimal.¹⁷ The levees of New Orleans, Louisiana, are an example of human-built protection against flooding in a low-lying area; the levees create an artificial environment where the water's edge buttresses up against human development. When Hurricane Katrina struck in 2005, the sea was pushed inland—albeit by a storm surge—unabated by natural

¹⁴ *Id.* The newest observations indicate a changing climate leads to changes in the frequency, intensity, spatial extent, duration, and timing of extreme weather and climate events, and can result in unprecedented extreme weather and climate events. See generally *id.* at 115–202.

¹⁵ See generally Nick Brooks et al., *The Determinants of Vulnerability and Adaptive Capacity at the National Level and the Implications for Adaptation*, 15 GLOBAL ENVTL. CHANGE 151 (2005).

¹⁶ MANAGING THE RISKS OF EXTREME EVENTS AND DISASTERS TO ADVANCE CLIMATE CHANGE ADAPTATION, *supra* note 12, at 76.

¹⁷ See SAMUEL D. BRODY, WESLEY H. HIGHFIELD & JUNG EUN KANG, RISING WATERS: THE CAUSES AND CONSEQUENCES OF FLOODING IN THE UNITED STATES 71–80 (2011).

sediment buildup or wetlands. The result was the immediate inundation (submergence) of low-lying portions of the city nearest to the levees.¹⁸ The extent of inundation is physically based on the relative slope of the land; coastal areas with minimal slopes have the greatest potential to be impacted by sea-level rise. Seas moving landward create shifting coastal boundaries. Some of the upland connected to the ocean is more susceptible to erosion, depending on the makeup of the soil and the dynamics associated with the new land-sea boundary. A strong surging tide can also impact the shape of the shoreline, creating shifting land that is relatively unstable. In addition, the rate of sea-level rise in a given coastal area can impact existing wetlands and the development of new wetlands or intertidal areas, depending on local conditions.¹⁹ Approaching seawater can also mix with existing underground aquifers, impacting freshwater resources.²⁰

Many of the physical impacts of climate change are already being felt along coastal regions. For example, global sea levels have been observed to be rising recently in the late nineteenth and early twentieth centuries.²¹ Recent analysis has shown that global averages of sea-level rise have been approximately 7.5 inches during the twentieth century, and the rate of sea-level rise has been increasing over the past fifteen years.²² Finally, there is strong evidence that the rate of sea-level rise in the twenty-first century will exceed that of the twentieth century.²³ Areas of the coast exhibiting combinations of at-risk characteristics identified above that are located in dynamic areas will be prime targets for continued and sustained physical impacts for the foreseeable future.

There are economic consequences to the physical impacts described above. Impacts on tourism, for example, can provide some measure of the direct economic costs associated with climate-induced physical changes. Tourism activity in the United States contributed approximately \$2 trillion dollars of economic output in 2012.²⁴ While the percentage of this total tourism attributable to coastal activities is hard to quantify, eight of the top ten U.S. states visited in 2011–2012 by overseas tourists were coastal states, suggesting

¹⁸ See John W. Day Jr. et al., *Restoration of the Mississippi Delta: Lessons from Hurricanes Katrina and Rita*, 315 SCI. 1679, 1680 (2007).

¹⁹ See generally Brooks et al., *supra* note 15.

²⁰ See Adrian D. Werner & Craig T. Simmons, *Impact of Sea-Level Rise on Sea Water Intrusion in Coastal Aquifers*, 47(2) GROUNDWATER 197 (2009).

²¹ See generally Kirk Lambeck et al., *Sea Level in Roman Time in the Central Mediterranean and Implications for Recent Change*, 22.4 EARTH & PLANETARY SCI. LETTERS 563 (2004); W. Roland Gehrels et al., *A 20th Century Acceleration of Sea-Level Rise in New Zealand*, 35 GEOPHYSICAL RES. LETTERS L02717 (2008).

²² See LISA ALEXANDER ET AL., INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, TWELFTH SESSION OF WORKING GROUP I APPROVED SUMMARY FOR POLICYMAKERS 20 (2013), http://www.climatechange2013.org/images/uploads/WGI_AR5_SPM_brochure.pdf. See generally Svetlana Jerejeva et al., *Nonlinear Trends and Multiyear Cycles in Sea Level Records*, 13 J. GEOPHYSICAL RES. C09012 (2006), available at ftp://soest.hawaii.edu/coastal/Climate%20Articles/Jevrejeva_2005%20Nonlinear%20sea%20level%20trends.pdf.

²³ See ALEXANDER ET AL., *supra* note 22, at 21.

²⁴ U.S. Travel Ass'n, *2012 Travel Economic Impact Overview* (2013), available at <http://www.ustravel.org/sites/default/files/page/2009/09/EconomicImpactTravelandTourism2013update.pdf>.

424 Climate Change Impacts on Ocean and Coastal Law

a substantial portion of total tourist economic activity is tied to coastal attributes.²⁵ One recent case study suggests complete coastal erosion along Waikiki Beach in Hawaii will result in a revenue loss of \$2 billion out of total revenue of \$5.2 billion, representing a loss of approximately 39 percent in tourism for Waikiki Beach alone.²⁶ If we conservatively assume half of the total 2012 tourism (\$2.0 trillion) is related to coastal tourism, and the percentage of revenue loss in the Waikiki Beach case study is roughly representative of expected tourism revenue losses along coastal areas (39 percent), then we are left with a potential tourism revenue loss associated with sea-level rise of roughly \$390 billion based on 2012 total tourism revenue. Even if these rough estimates are only half true, the direct economic impacts of climate change to coastal areas are substantial.

B. ECOSYSTEM IMPACTS

Ecosystem impacts consider the effect of climate change on vulnerable coastal species and associated habitat. A “coastal zone” often contains a variety of characteristics that are consistent among such areas across the globe. These features include a waterline that distinguishes between land and sea, an intertidal zone that represents the fluctuation of the land-sea interface based on tidal range, an area above the influence of the tide (sometimes a sandy beach), and a vegetation line that represents the landward extent of the coastal area.²⁷

Many coastal zones contain wetland areas that are either always partially wet or intermittently wet, and usually subject to tidal influences.²⁸ Wetlands often contain unique plant species that, collectively, form important habitat for a variety of marine and terrestrial animals. Many coastal wetlands are often considered ecologically important zones because of the richness and diversity of species present.²⁹ As sea-level rise associated with climate change inundates inland areas, the existing ecological footprint of wetlands changes. Areas that were partially submerged become completely submerged underwater. Plants not adapted to full submergence underwater die off as the water overtakes

²⁵ Office of Travel and Tourism Industries, *Overseas Visitation Estimates for U.S. States, Cities, and Census Regions: 2012* (2012), available at http://travel.trade.gov/outreachpages/download_data_table/2012_States_and_Cities.pdf

²⁶ Amber Himes-Cornell et al., *Impacts of Climate Change on Human Uses of the Ocean*, in OCEAN AND MARINE RESOURCES IN A CHANGING CLIMATE: TECHNICAL INPUT TO THE 2013 NATIONAL CLIMATE ASSESSMENT 64, 100–01 (Roger Griffiths & Jennifer Howard eds., 2013) (projected revenues are based on 2007 tourist revenue for Waikiki Beach, and the estimated losses are based on the presumption of a totally eroded beach due to sea-level rise).

²⁷ DAVIS & FITZGERALD, *supra* note 2, 115–28.

²⁸ *Id.* at 263–77.

²⁹ See generally Robert Costanza et al., *The Value of the World's Ecosystem Services and Natural Capital*, 387 NATURE 253 (1987), available at http://www.esd.ornl.gov/benefits_conference/nature_paper.pdf (ecosystem services are often given little weight in policy decisions but they are important to human sustainability).

them. Sea-level rise changes the balance of wetland ecosystems, which disrupts the functions and processes of these systems.³⁰

Current sea-level rise is already causing significant impacts in coastal ecosystems. For example, in low-lying regions of the United States, ocean storm surges and particularly high spring tides are increasingly causing flooding of coastal areas. These events are causing the loss of wetlands and the conversion of coastal forest and developed lands (farmlands, residential properties) to wetlands.³¹ Freshwater areas (lakes, ponds, aquifers) that are found near the land-sea boundary are also increasingly becoming flooded with salt water from sea-level rise, which is changing the salinity of the freshwater bodies, leading to significant impacts on those localized ecosystems.³²

Climate change impacts to coastal ecosystems and the services they provide can be substantial in both direct and indirect economic terms. Coastal wetland resources provide valuable nursery habitat for commercial and recreational fisheries.³³ In addition, coastal wetlands buffer the impacts of ocean-derived storms on inland resources.³⁴ There are other valuable provisioning, regulating, and aesthetic services provided by coastal wetlands. The value of these services has been estimated to range from billions to trillions of dollars.³⁵

Climate change impacts on these coastal ecological values are substantial and will likely increase over time.³⁶ Choices about development in undisturbed coastal areas today can have a substantial impact on the extent of ecological impacts in the future. For example, the choice to armor against the rising sea by building walls prevents the opportunity for coastal features, such as coastal wetlands, to migrate inland. Coastal management planning needs to incorporate the ecological values at stake in the coastal zone from climate change risks, particularly values that are not directly associated with direct human consumption of coastal resources.

C. SOCIETAL IMPACTS

Societal impacts observed from climate change in the coastal zone vary depending on a variety of factors. “Vulnerability” is a term often used as a multiple variable factor to describe and analyze these impacts to society.³⁷ Vulnerability suggests a mix of actual

³⁰ See generally James T. Morris et al., *Responses of Coastal Wetlands to Rising Sea Level*, 83 *ECOLOGY* 2869 (2002).

³¹ *Id.*

³² GLOBAL CLIMATE CHANGE IMPACTS IN THE UNITED STATES 31 (Thomas R. Karl et al. eds., 2009), available at <http://downloads.globalchange.gov/usimpacts/pdfs/climate-impacts-report.pdf>.

³³ Costanza, *supra* note 29, at 256.

³⁴ DAVIS & FITZGERALD, *supra* note 2, 371–79.

³⁵ Costanza, *supra* note 29, at 256.

³⁶ Degradation of existing coastal assets will lead to scarcity of those assets. Assuming demand either remains constant or increases for those assets, the value of a depleted remaining supply will increase over time.

³⁷ W. Neil Adger & Katherine Vincent, *Uncertainty in Adaptive Capacity*, 337 *GEOSCI.* 399, 400–04 (2005).

426 | Climate Change Impacts on Ocean and Coastal Law

environmental risk (e.g., the geographic characteristics of the coastline) and human decisions related to those risks. How humans decide to plan and respond to risk—including assessing the capacity to plan and respond to risks—is an important consideration when determining the vulnerability of a region.³⁸ Human-based factors impacting this kind of risk assessment of vulnerability include: awareness of the hazard, intensity and sophistication of development along coastal regions, and the kinds of public policy institutions established to deal with the risk.³⁹ As Anthony Oliver-Smith points out, “[v]ulnerability... explicitly links environmental issues, such as hazards, with the structure and organization of society, and the rights associated with membership.”⁴⁰

Vulnerability thus links environmental hazards to the capacity of institutions to provide for the needs of its society. Where institutions are weak, allowing for inequitable distribution of the risks from these hazards across society, vulnerability will generally be high. Conversely, a society with stronger institutions and more equitable distribution of rights and benefits between citizens will tend to have lower vulnerability. This is true even where the environmental factors are similar between governments, such as where two coastal states share similar exposure to climate change hazards and similar population densities near coastal areas. The extent of vulnerability between these two governments with similar environmental factors will be determined by their respective sociopolitical structures. Institutions with sociopolitical structures capable of dealing with climate risks will generally have less societal vulnerability toward climate change than those with weaker sociopolitical structures.⁴¹

Coastal states currently exercising their planning capacities are finding ways to mitigate and adapt to the current impacts of climate change. In general, the coastal regions where purposeful management and planning are occurring are developing more resilient policy plans than similar coastal areas where management and planning are not occurring to the same extent.⁴² Even so, climate change impacts are occurring in many areas where institutional capacity exists and planning is ongoing, suggesting that even early adaptive planning cannot completely negate the impacts of climate change. On the Atlantic Seaboard of the United States, for example, “ghost forests” of standing dead

³⁸ For example, a community located on a large continental coastline with a diverse economic base and strong distributed political system is generally more capable of limiting the societal impacts of climate change than a small, geographically and economically isolated coastal state; the continental coastal community can simply move inland, and the socioeconomic system in place can more easily absorb this migration. The same cannot be said of the small coastal state; it does not have the same “capacity” as the continental coastal community in terms of geographic options and economic tools, which limits its ability to mitigate the impacts of climate change.

³⁹ Brooks et al., *supra* note 15, at 157–58.

⁴⁰ Anthony Oliver Smith, *Sea Level Rise and the Vulnerability of Coastal Peoples*, 7 U.N. Univ. Inst. for Env’t & Human Sec. 8, 15 (2009).

⁴¹ ROBERT NICHOLS & FRANK M.J. HOOZEMANS, *Global Vulnerability Analysis*, in *ENCYCLOPEDIA OF COASTAL SCIENCE* 486–91 (Maurice Schwartz ed., 2005).

⁴² See generally *GLOBAL CLIMATE CHANGE IMPACTS IN THE UNITED STATES*, *supra* note 32, at 61–70.

trees killed by saltwater intrusion are becoming increasingly common in southern New Jersey, Maryland, Virginia, Louisiana, and North Carolina.⁴³ In addition, many coastal regions are experiencing moderate-to-severe erosion along coastal areas due to a mix of natural processes (storms and sea-level rise) and human activities (development, dredging, and armoring) as population densities increase in coastal regions of the United States. These realities suggest institutional capacity can only go so far in stemming coastal vulnerability from the effects of climate change.

Climate change is impacting coastal areas physically, degrading ecosystem services provided by coastal systems, and influencing the capacity of society to address dynamic changes to coastal systems. These categorical impacts help define the context through which existing legal frameworks are examined in light of climate-induced changes. For example, a coastal state with an active beach tourism industry likely places a high value on its coastline because of the physical attributes of the coast. As such, coastline protection is prioritized to ensure the underlying “asset base” (the coast itself) is preserved to ensure future economic opportunity from tourism.

Climate change can alter this asset base. Sea-level rise, coupled with increased storm intensity and duration, can erode tourism demand. Coastal states are empowered under the law to adapt to climate change impacts, but their strategies can be limited by federal government priorities and actions. An exploration of state and federal law interactions, commonly referred to as federalism, can highlight how coastal state powers to adapt to climate change can be limited. Through this highlighting of coastal state limitations through a lens of state and federal interactions, the importance of federal cooperation in coastal state adaptation strategies becomes apparent.

II. The Coastal Zone Management Act and Climate Change

The Coastal Zone Management Act (CZMA) is a federal statute passed in 1972.⁴⁴ The coastal management program of the CZMA established a uniform set of standards for the creation and implementation of coastal management plans to promote sustainable coastal development and protection.⁴⁵ By providing financial assistance and helping to frame the priorities for coastal development and planning, the CZMA initially acted as a mechanism to create consistency among coastal states in how they planned for coastal development and protection. As of 2013 all eligible coastal states in the United States,

⁴³ See U.S. CLIMATE CHANGE SCI. PROGRAM SYNTHESIS AND ASSESSMENT PRODUCT 4.1, COASTAL SENSITIVITY TO SEA-LEVEL RISE: A FOCUS ON THE MID-ATLANTIC REGION 22 (2009), available at <http://downloads.globalchange.gov/sap/sap4-1/sap4-1-final-report-all.pdf>.

⁴⁴ Coastal Zone Management Act of 1972, 16 U.S.C. §§ 1451–1466 (2012).

⁴⁵ 16 U.S.C. § 1451 (2012) (noting the purpose of national coastal management planning is to preserve, protect, develop, and where possible, restore or enhance the resources of the nation’s coastal zone for this and succeeding generations).

428 | Climate Change Impacts on Ocean and Coastal Law

with the exception of Alaska, which allowed its participation to lapse in 2011, have accepted the terms of the CZMA and have developed coastal management plans within the framework of the federal law.⁴⁶

A. FEDERAL CONSISTENCY UNDER THE CZMA

Beyond the financial incentives offered by the federal government to develop and implement coastal management planning, the CZMA also provides for “federal consistency” under the Act, a condition sometimes referred to as “reverse supremacy” whereby the federal government assures the state that federal activities with the potential to affect identified coastal resources—to the extent practicable—are consistent with the coastal state’s management plan.⁴⁷ Precisely what kinds of federal actions have the potential to affect identified coastal resources in such a way that trigger federal consistency requirements under the CZMA have been the subject of both legislative and judicial inquiry.

The U.S. Congress, in supporting the importance of federal consistency under the CZMA, has noted the review process is “the single greatest incentive for State participation in the coastal zone management program.”⁴⁸ Indeed, Congress has gone to great lengths to ensure coastal state rights remain paramount when federal actions come into conflict with state coastal management planning. In one historical example, a judicial interpretation that limited the application of federal consistency was legislatively overruled by Congress. This occurred in the U.S. Supreme Court case of *Secretary of the Interior v. California*.⁴⁹ The original language under the CZMA dealing with federal consistency required a review only when federal actions had a *direct effect* on the coasts.⁵⁰ The Supreme Court interpreted this language conservatively, limiting the scope of federal actions that must comply with a state-approved coastal management plan.⁵¹ Following this decision, Congress passed the Coastal Zone Management Reauthorization Amendments of 1990, changing the language triggering a federal consistency review to

⁴⁶ See NOAA, *Coastal Programs: Partnering with States to Manage Our Coastline*, last updated Jan. 30, 2013, <http://coastalmanagement.noaa.gov/programs/czm.html> (last visited Nov. 29, 2013); see also NOAA Action Notice, Alaska Coastal Management Program Withdrawal from the National Coastal Management Program under the Coastal Management Zone Act (CZMA), 76 Federal Register 39857–39858 (July 7, 2011), available at <http://www.gpo.gov/fdsys/pkg/FR-2011-07-07/html/2011-16987.htm> (noting that the Alaska Coastal Management Plan expired on June 30, 2011).

⁴⁷ 16 U.S.C. §1456(c) (2012); see also Chad J. McGuire, *Coastal Planning, Federal Consistency, and Climate Change: A Recent Divergence of Federal and State Interests*, 27 NATURAL RESOURCES & ENV’T 41 (2012).

⁴⁸ S. REP. NO. 94-277, at 8 (1975), reprinted in 1976 U.S.C.C.A.N. 1768, 1776; see also Martin J. LaLonde, *Allocating the Burden of Proof to Effectuate the Preservation and Federalism Goals of the Coastal Zone Management Act*, 92 MICH. L. REV. 438, 442–44 (1993).

⁴⁹ *Sec’y of the Interior v. California*, 464 U.S. 312 (1984).

⁵⁰ 16 U.S.C. § 1456(c)(1) (1990).

⁵¹ See *supra* note 48, at 342–43.

any federal “activity within or outside the coastal zone that affects any land or water use or natural resource.”⁵² Congress noted in its record that its primary objective in amending the federal consistency requirement of the CZMA was to overturn the Supreme Court’s decision in *Secretary of the Interior v. California*.⁵³

What this example shows is a strong legislative preference for favoring coastal state rights under federal consistency when federal actions have the potential, whether directly or indirectly, to impact coastal state resources. With our knowledge of this preference for advancing coastal state rights under federal consistency requirements of the CZMA, what remains to be understood is the impact this preference has on federal and state interactions that influence coastal assets when compared against traditional interpretations of federalism.

Traditionally, the federal government need not *legally* concern itself with state priorities when acting wholly within federal legal jurisdiction. And even when there may be a conflict between federal actions and state goals, the federal actions take precedence.⁵⁴ In coastal areas, states have ownership rights over the submerged lands and resources within the ocean up to three miles out to sea from an established baseline.⁵⁵ The federal government has ownership rights past this three-mile limit to the extent of its exclusive economic zone (at least 200 miles from the established baseline).⁵⁶ In addition, the federal government maintains management rights and responsibilities within the three-mile state jurisdiction of waters for a host of purposes that are in the national interest.⁵⁷ Thus, federal activities that occur within federal jurisdiction, even if they impact state marine or coastal resources, traditionally cannot be *legally* challenged by coastal states.

The federal consistency requirement under the CZMA changes this traditional legal hierarchy between federal and state government. When federal actions have the potential to impact identified state priorities, the federal government must ensure, to the extent practicable, that its actions conform to documented state priorities. Without a federal consistency requirement, there is little in the law mandating that the federal government consider the potential impact of its proposed actions on coastal state resources, and this is particularly true when proposed federal actions contemplate the use of federally owned marine resources—resources existing beyond the three-mile state jurisdiction to the extent of the federal government’s exclusive economic zone.

⁵² 16 U.S.C. § 1456(c)(1)(A) (2012).

⁵³ 136 CONG. REC. H8075 (daily ed. Sept. 26, 1990); see also LaLonde, *supra* note 48, at 443–44.

⁵⁴ U.S. CONST., art. VI, cl. 2.

⁵⁵ Submerged Lands Act, 43 U.S.C. §§ 1301–1315 (2012).

⁵⁶ Proclamation No. 5030, 60 Fed. Reg. 43, 825 (Aug. 25, 1995).

⁵⁷ These include responsibilities for securing the shoreline from threats, ensuring navigability, protecting interstate commerce, and a host of similar obligations that are in the nation’s collective interest.

B. THE CONTEXT OF CLIMATE CHANGE

In the context of climate change, the relationship between federal actions and coastal state impacts is optimally presented through the example of offshore oil and gas development. Historically, the federal assertion of jurisdiction to submerged lands after World War II for resource development (and leasing royalties) led to battles between coastal states and the federal government over ownership rights of marine resources. In the *United States v. California*, the U.S. Supreme Court held that ownership rights accrued to the federal government,⁵⁸ but Congress overturned this ruling by legislating ownership rights between coastal states and the federal government with the passage of the Submerged Lands Act of 1953,⁵⁹ effectively creating a “buffer” of coastal state ownership and rights up to three miles seaward of an agreed baseline. Congress further established rules regarding the development of offshore resources in federal jurisdiction with the passage of the Outer Continental Shelf Lands Act.⁶⁰

Collectively these laws helped to provide a framework for offshore oil and gas development at the federal level (ownership and process), but the coastal states relied on the CZMA to protect their interests from federal activities that the states thought would have the potential to harm coastal assets. As offshore oil spills had historically been seen as a major threat to coastal assets such as tourism (such as the Santa Barbara Oil Spill of 1969), many early coastal management plans highlighted the pristine nature of coastal areas as a resource priority under approved plans, and then sought to enforce protection of these resources from federal government actions. These historical antecedents provide the conditions upon which a coastal state may proactively seek to protect its coastline from the harms of climate change by acting to limit both continuation and expansion of federal offshore oil and gas development.

A coastal state might identify its natural shoreline attributes as a major priority of its coastal plan because of the importance the coastline plays in tourism, recreation, and supporting services. Meanwhile, the federal government may propose additional offshore oil and gas development that adds to carbon redistribution from the lithosphere to the atmosphere. If this proposed oil and gas development conceivably threatens shoreline attributes, then the validity of that federal action may be challenged by coastal states under the consistency requirements of the CZMA.⁶¹

⁵⁸ *United States v. California*, 332 U.S. 19, 38–39 (1947).

⁵⁹ 43 U.S.C. §§ 1301–1315 (2012).

⁶⁰ 43 U.S.C. §§ 1331–1356(a) (2012).

⁶¹ States can object to proposed federal actions that may affect the coastal zone. 16 U.S.C. § 1456 (c)(3)(A) (2012); 15 C.F.R. § 930.34(b) (2014). Federal and state governments may request mediation to resolve the objection. 16 U.S.C. § 1456(h) (2012). In the alternative, the state also has the right to bring suit in federal court. 15 C.F.R. § 930.116 (2014) (state is not required to mediate prior to bringing suit). There is also an option for the president of the United States, responding to a request from the Secretary of the Interior, to exempt the federal activity from federal consistency requirements under the CZMA if the president deems the federal activity is in the paramount interests of the United States. 16 U.S.C. § 1456(c)(1)(B) (2012).

The coastal state will identify the coastal resource at-risk from the federal activity and challenge the federal action as inconsistent with its obligations to ensure, to the extent practicable, that federal activities do not interfere with coastal priorities. The coastal state challenge identifies the connection between federal activity and state impact, creating an avenue for state-federal negotiations in a way that may not be apparent under traditional roles of federalism. In order for there to be a better understanding how this can occur, a more detailed explanation of this example follows.

Domestic offshore energy production contributes to the entire portfolio of energy production within the United States, although its relative importance has been impacted by several factors over the last decade. In 1954, offshore oil production represented 0.10 percent of the entire U.S. oil production, and offshore gas production represented 0.69 percent of the entire U.S. domestic gas production.⁶² In 2011, offshore oil production accounted for approximately 25 percent of total U.S. production, while offshore gas accounted for approximately 8 percent of total U.S. production.⁶³ Based on historical trends while accounting for political and technological factors, it is very likely that offshore oil and gas development will continue into the foreseeable future.

Assuming federal offshore oil and gas development continues into the future, one important issue is whether the federal government is obliged to alter its offshore oil and gas production when such actions threaten coastal resources by reinforcing climate change. Under traditional concepts of federalism, the federal government likely has no *legal* obligation to coastal states under such circumstances. However, assuming these federal activities can be causally linked to climate change impacts on coastal state resources, the CZMA's federal consistency requirement may provide leverage to examine the causal relationships between federal actions and coastal state impacts.

III. Utilizing Federal Consistency to Respond to Climate Change Impacts

A. TWO LEGAL ARGUMENTS FOR STATES

Coastal states have, at least, two legal arguments at their disposal when utilizing the federal consistency requirements of the CZMA in response to planned federal activities that may intensify the impacts of climate change. The first argument is not marine

⁶² BUREAU OF SAFETY & ENVTL. ENFORCEMENT, FEDERAL OCS OIL AND GAS PRODUCTION AS A PERCENTAGE OF TOTAL U.S. PRODUCTION: 1954–2010 (2010), *available at* http://www.bsee.gov/uploadedFiles/BSEE/Newsroom/Offshore_Stats_and_Facts/ANNUAL%20PERCENTAGE.pdf.

⁶³ *Id.* Both oil and gas production offshore has reduced in recent years in terms of both total output and as a percentage of total U.S. production. Events such as the 2010 Deep Horizon oil spill in the Gulf of Mexico have influenced federal proposals to increase offshore oil and gas leases to include the Mid-Atlantic region. *See* Juliet Eilperin & Steve Mufson, *Offshore Drilling Policy Reversed*, WASH. POST, Dec. 2, 2010, <http://www.washingtonpost.com/wp-dyn/content/article/2010/12/01/AR2010120107185.html>. In addition, technological advancements such as “fracking” and favorable price points have increased the onshore domestic production of natural gas, thereby further reducing offshore natural gas production as a percentage of total domestic natural gas production.

432 | Climate Change Impacts on Ocean and Coastal Law

dependent, but rather focuses on the relationship between federal actions connected to climate change and the impacts those actions, in the aggregate, can have on priority coastal resources. The second argument is focused on a subset of federal actions occurring in marine waters that have the potential, both from singular events or aggregated over time, to harm coastal assets. What follows is a summary discussion of each legal argument highlighting the role the CZMA plays in helping to bring coastal state concerns into the discussion of federal activities that arguably contribute to climate change.

1. Carbon Intensity of Federal Activities

The first argument utilizing the federal consistency requirements of the CZMA focuses on the carbon intensity of federal activities and their connection to climate change. This argument borrows from the causality discussions described in parts of the *Massachusetts v. EPA* decision.⁶⁴ In that case, coastal states argued the Environmental Protection Agency (EPA) of the federal government was obliged under a federal statute (the Clean Air Act) to make a determination as to whether carbon qualified as a “pollutant” under the Act because of the association between human-induced atmospheric carbon emissions and climate change. Coastal states argued harm that included the loss of coastal uplands due to sea-level rise, and claimed the federal government had an obligation to control that harm under the Clean Air Act (or at least decide whether or not to attempt to control the harm) because the federal government had authority over the issue under principles of federalism.⁶⁵

The standing argument, in part, focused on whether coastal states could connect the harm claimed—loss of landmass to sea-level rise—to the inaction of the EPA when deciding whether or not to control carbon as a pollutant under the Clean Air Act. The federal government argued that even if it regulated carbon in the United States, the actions of other countries in expanding their utilization of greenhouse gases would render the regulation useless *as it pertained* to stopping sea-level rise because other countries would continue to mine and burn carbon, and sea-level rise would continue to harm coastal states regardless of the federal government’s actions.⁶⁶ The U.S. Supreme Court dismissed the federal government’s claim that its actions alone cannot redress the harm of sea-level rise suffered by coastal states. Accepting the causal connection between carbon emissions and sea-level rise, the Court concluded that *any* action undertaken by

⁶⁴ *Massachusetts v. EPA*, 549 U.S. 497 (2007).

⁶⁵ *Id.* at 518–19. The argument stems from the fact that Congress created a federal statute, the Clean Air Act, which covers the field of emissions from automobiles that harm air quality. By creating this law, the federal government becomes responsible for protecting coastal states against the harms caused by pollution of the atmosphere.

⁶⁶ *Id.* at 523–25. “EPA does not believe that any realistic possibility exists that the relief petitioners seek would mitigate global climate change and remedy their injuries. That is especially so because predicted increases in greenhouse gas emissions from developing nations, particularly China and India, are likely to offset any marginal domestic decrease.” *Id.* at 523–24.

the federal government, even if not definitive, would be a positive factor in reducing the impacts of climate-induced sea-level rise and associated coastal hazards.⁶⁷

Under the CZMA's federal consistency requirement, coastal states can draw on the logic from the *Massachusetts v. EPA* decision to assert that any federal activity allowing an increase in greenhouse gas emissions is inconsistent with existing priorities contained in approved coastal management plans. Thus, when the federal government engages in actions, terrestrial or ocean bound, that increase the *likelihood* of priority coastal assets being harmed, the federal consistency requirement of the CZMA requires the federal government to consider these impacts, and to the extent practicable, alter its actions to mitigate such impacts. Coastal states can argue the question of causation, at least for legal standing purposes, is somewhat settled based on the logic announced in *Massachusetts v. EPA* by noting that any activity that adds to carbon concentrations in the atmosphere is a contributing factor to coastal zone degradation. Thus, continued development of domestic carbon-based energy production triggers federal consistency review under the CZMA because, whether viewed individually or in the aggregate, these actions conflict with federally accepted coastal state priorities.

2. Federal Offshore Activities

The second legal argument under the CZMA's federal consistency requirements emphasizes federal *offshore* oil and gas development, highlighting the additional risks based on the proximity of the development to coastal resources. Borrowing from the greenhouse gas emissions argument above (any addition of carbon into the atmosphere from human activities harms coastal resources), this argument focuses more closely on the dangers associated with offshore oil and gas development as an *activity* rather than, as in the first argument, focusing on the *effects* of the federal activity.⁶⁸ This second legal argument identifies the direct dangers associated with drilling, such as oil spills through malfunctioning drilling platforms. These kinds of dangers, because they are directly connected to the offshore activity, pose far less of a proximate cause hurdle than the more attenuated first argument. The additional benefit of this second legal argument is that it contains precedent in terms of linking these direct dangers of federal offshore activities to federal consistency obligations under the CZMA. Through the analysis of the precedent of federal consistency for these more direct dangers associated with federal actions, the

⁶⁷ In supporting its contention that incremental steps can justify agency actions, the Court noted the following: "EPA overstates its case. Its argument rests on the erroneous assumption that a small incremental step, because it is incremental, can never be attacked in a federal judicial forum. Yet accepting that premise would doom most challenges to regulatory action. Agencies, like legislatures, do not generally resolve massive problems in one fell regulatory swoop." *Id.* at 524–25.

⁶⁸ The first legal argument above focuses mainly on the *indirect* danger accompanying offshore oil and gas exploration. The future use of the oil and gas removed from the ocean's depth will result in greenhouse gas emissions that will help to cause climate change, and then the effects of climate change will be the cause of coastal resource degradation, through sea-level rise and increased storm impacts as described above.

groundwork is established to revisit the more indirect argument of how the CZMA can aid in helping to align federal and state actions relative to climate change adaptation strategies.

Historically there have been instances where the federal government has altered its actions to meet federal consistency requirements under the CZMA, and there have also been instances where the federal government has sought to move ahead with its actions even where there is clear evidence the federal action will impact coastal interests explicitly identified under approved coastal management plans. There is probably no greater example of the potential conflict between federal desires and coastal state priorities than the energy crisis of the 1970s associated with the Arab oil embargo. Early adopters of coastal management planning under the CZMA sought to limit the impact of expanded federal offshore oil and gas development plans to counter the reduced global supply of oil. The federal government responded to protective coastal state management planning legislatively, amending the CZMA in 1976 to include a Coastal Energy Impact Program.⁶⁹ This program acknowledged the potential impact that increased oil and gas exploration could have on coastal resources by including additional federal funding to coastal states to help mitigate these impacts.⁷⁰ However, the program also included a key change in applying federal consistency requirements—the so-called “national interest” provision—that allowed the federal government to essentially bypass federal consistency considerations when the federal activity was deemed by the Secretary of Commerce to be in the “national interest” of the country.⁷¹

Today the “national interest” exception is one of the main mechanisms by which the federal government can avoid its consistency obligation under the CZMA.⁷² Because

⁶⁹ BILIANA CICIN-SAIN & ROBERT W. KNECHT, *THE FUTURE OF U.S. OCEAN POLICY: CHOICES FOR THE NEW CENTURY* 118–20 (2000).

⁷⁰ *Id.*

⁷¹ 15 C.F.R. § 930.122 (2014): “A federal license or permit activity, or a federal assistance activity, is ‘necessary in the interest of national security’ if a national defense or other national security interest would be significantly impaired were the activity not permitted to go forward as proposed. Secretarial review of national security issues shall be aided by information submitted by the Department of Defense or other interested Federal agencies. The views of such agencies, while not binding, shall be given considerable weight by the Secretary. The Secretary will seek information to determine whether the objected-to activity directly supports national defense or other essential national security objectives.”

⁷² 15 C.F.R. § 930.121 (2014): “A federal license or permit activity, or a federal assistance activity, is ‘consistent with the objectives or purposes of the Act’ if it satisfies each of the following three requirements:

- (a) The activity furthers the national interest as articulated in § 302 or § 303 of the Act, in a significant or substantial manner,
- (b) The national interest furthered by the activity outweighs the activity’s adverse coastal effects, when those effects are considered separately or cumulatively.
- (c) There is no reasonable alternative available which would permit the activity to be conducted in a manner consistent with the enforceable policies of the management program. The Secretary may consider but is not limited to considering previous appeal decisions, alternatives described in state objection letters and alternatives and other information submitted during the appeal. The Secretary shall not

the concept of national interest implicitly weighs the state interest against the federal interest, coastal states must be careful in how they employ the CZMA as a means of negotiating federal actions, particularly federal actions that deal with “core” national interests such as energy security.⁷³

When the focus is moved back to climate change, coastal states find themselves in an awkward position: they are the owners of the coastline, but their ability to ensure the security of that coastline is limited. Federal activities beyond three miles have the capacity to intensify coastal insecurity. The question is really: What can coastal states do to engender federal actions that aid in increasing coastal security in the face of climate change? Although federalism places limitations on coastal states in forcing the federal government’s hand from a legal standpoint, the CZMA’s existing legal structure helps coastal states position themselves into a cooperative position with federal planning.⁷⁴

B. SUGGESTIONS FOR IMPLEMENTATION

This section offers recommendations for how coastal states can engender federal cooperation in adapting to the challenges of climate change along the coastline of the United States. First, coastal states can lead by example. Alternative, non-carbon offshore energy projects can help to establish a carbon-neutral path to energy security. Such alternatives can mitigate the “national interest” exception and thus bolster federal consistency claims by showing the promise of carbon-free offshore energy development. Massachusetts, Rhode Island, and other coastal states are leading the charge in supporting offshore wind energy development, and this includes aiding in the development of federal offshore wind energy projects that have been sited just outside the coastal state jurisdictional limit.

consider an alternative unless the State agency submits a statement, in a brief or other supporting material, to the Secretary that the alternative would permit the activity to be conducted in a manner consistent with the enforceable policies of the management program.”

⁷³ Coastal states have previously attempted to use the federal consistency provision of the CZMA as a means to intervene in federal offshore activities wholly within federal jurisdiction. These attempts aimed at oil and gas activities were thwarted when the U.S. Supreme Court held that federal offshore oil and gas leasing activities do not “directly affect” coastal states as contemplated under the federal consistency provision of the CZMA. *See* *Sec’y of Interior v. California*, 464 U.S. 312 (1984). Later amendments to the CZMA replaced the “directly affecting” language with a more generalized “effects test” providing latitude for coastal states to apply federal consistency to federal offshore activities. *See* 15 C.F.R. § 930.11(g) (2014).

⁷⁴ *Discretionary* offshore federal activities provide the clearest avenue for coastal state interdiction and cooperation opportunities because federal consistency compliance is not required when the federal government is acting pursuant to a *mandatory* obligation under a different statute, such as the leasing provisions of the Outer Continental Shelf Lands Act (OSCLA). *See* 16 U.S.C. § 1456(c)(1) (2012). For example, if the federal government acts pursuant to a mandatory leasing requirement under OSCLA, then the federal government is not required to alter its actions under a federal consistency determination, even if the action can result in harm to documented coastal priorities.

436 | Climate Change Impacts on Ocean and Coastal Law

Second, coastal states can strategically employ the CZMA's federal consistency provision by highlighting the correlation between federal expansion of offshore oil and gas projects and the effects of climate change, in particular sea-level rise and increased storm impacts. Indeed, the congressional findings contained in the CZMA identify the threat of global-warming-induced sea-level rise, noting that coastal states must anticipate and plan for such occurrences.⁷⁵ Coastal states can directly engage the federal government through a public awareness campaign on the issue, drawing on arguments similar to those that the coastal states made in *Massachusetts v. EPA*.⁷⁶ This combination of legal maneuvering and political pressure can help to align state and federal interests in a manner that overcomes the challenges of federalism, particularly when that challenge is defined in the context of protecting coastal resources at the expense of national energy security.⁷⁷

These recommendations demonstrate how an existing legal framework such as the federal consistency requirement of the CZMA can be strategically employed to help protect coastlines from the impacts of climate change. The fact that the federal government has the power and authority to act unilaterally under the guise of the nation's interest does not mean a forward-looking coastal state cannot help to move the conversation of coastal impacts from climate change onto the federal agenda. Strategic use of laws, including the CZMA's federal consistency requirement, can help to overcome traditional federalism barriers and help in the development and implementation of rational strategies to address the threat of climate change, both today and tomorrow.

Conclusion

Climate change has the potential to significantly impact coastal systems, particularly through the phenomenon of sea-level rise. Coastal nations must be responsive to changing conditions, for example, by developing meaningful adaptation strategies that incorporate planning and accommodation of coastal climate change phenomena. But this does not mean coastal nations will always prioritize climate change and its impacts at the coastline. In nations structured under cooperative federalism principles such as the United States, situations can arise where coastal state and federal government priorities

⁷⁵ 16 U.S.C. §1451(l) (2012) ("Because global warming may result in a substantial sea level rise with serious adverse effects in the coastal zone, coastal states must anticipate and plan for such an occurrence").

⁷⁶ *Massachusetts v. EPA*, 549 U.S. at 521–26. The CZMA contains mediation provisions to help resolve state-federal conflicts over federal actions claimed to be inconsistent with state coastal priorities. 16 U.S.C. § 1456(h) (2012). The mediation process includes public hearings in the affected coastal state. *Id.* This public mediation process can provide coastal states with a platform to advocate for federal policies that reduce carbon intensity both within and outside the coastal zone.

⁷⁷ By utilizing the consultative processes of the CZMA's federal consistency requirements, coastal states can highlight current federal practices that reinforce climate change, including federal activities emanating from other statutory mandates where coastal states might lack a legal basis for intervention.

diverge: coastal states wish to advance climate adaptation policies, but federal activities might frustrate coastal state goals.

The question examined in this chapter focused on the federal consistency requirement of the CZMA as a legal mechanism that can allow coastal states an advantage when attempting to implement climate change adaptation policies that run counter to federal activities. For example, as was discussed, federal offshore oil and gas leasing can bolster carbon emissions, thus leading to increases in climate change. Coastal states can challenge these federal actions on the grounds that they conflict with the protection of coastal resources, and thus are inconsistent with approved coastal management plans under the CZMA. Although this may not guarantee the federal government alters its offshore oil and gas leasing activities, it does provide a legal mechanism for consultation between the federal government and coastal states. Consultation, including the potential for mediation, creates a dialogue that can help identify interests at stake, potentially leading to better outcomes for coastal climate adaptation.

There is little argument that adapting to the impacts of climate change is a daunting task, particularly for low-lying coastal areas. Ultimately government, at all levels, has a vested interest in helping to mitigate the potential impacts of climate change while planning proactively to adapt to impacts that are inevitable. The use of existing legal instruments such as the CZMA can help create important pathways in moving toward more immediate mitigation and adaptation planning at the coastline.

