ROUGH SEAS FOR RENEWABLE ENERGY: ADDRESSING REGULATORY OVERLAP FOR HYDROKINETIC PROJECTS ON THE OUTER CONTINENTAL SHELF

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Abstract: Hydrokinetic energy harnesses the power of the oceans and generates renewable energy with a low carbon footprint. Because wave and tidal energy projects have not yet been initiated for the Outer Continental Shelf (OCS) and scientific knowledge of the effects on the ocean environment is uncertain, analysis under the National Environmental Policy Act is particularly important. However, overlapping jurisdiction on the OCS creates an inhospitable regulatory environment for hydrokinetic energy developers and marine ecosystem protection. This comment will analyze these overlapping and duplicative regulations and will make recommendations to streamline the environmental review process. Programmatic environmental impact statements, adaptive management and marine spatial planning will simplify the environmental review process and balance the interests of federal agencies, hydrokinetic energy developers and the ocean environment.

I. INTRODUCTION

Hydrokinetic technologies capture the kinetic energy of a body of water, including the wave and tidal movements of the ocean. Tidal and wave energy projects are currently being developed and implemented in state waters[1] and on rivers throughout the United States[2] but have not yet been initiated for the Outer Continental Shelf (OCS).[3] In advance of concerted efforts to develop hydrokinetic energy on the OCS, this comment will analyze the overlapping and duplicative regulations governing leasing and licensing for hydrokinetic projects and will make recommendations to simplify the environmental review process to benefit federal agencies, hydrokinetic energy developers and the ocean environment.

Washington State is uniquely positioned to take advantage

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1. Aside from Texas and Louisiana, state waters extend from the coast to three nautical miles seaward. *See* Bureau of Ocean Energy Mgmt., Regulation and Enforcement, *Outer Continental Shelf (OCS)* (Oct. 29, 2010, 09:12 AM), http://www.boemre.gov/aboutboemre/ocsdef.htm.

2. As of March 7, 2011, the Federal Energy Regulatory Commission had issued 97 preliminary permits for hydrokinetic projects. *See* Fed. Energy Regulatory Comm'n, *Hydrokinetic Projects* (March 8, 2011), http://www.ferc.gov/industries/hydropower/indus-act/hydrokinetics.asp (follow "Issued Hydrokinetic Projects Preliminary Permits" hyperlink).

3. The Outer Continental Shelf consists of ocean lands between state waters and 200 nautical miles seaward of the continental shelf. *See Outer Continental Shelf (OCS), supra* note 1.

of the benefits of hydrokinetic energy and should work closely with federal agencies to encourage the development of new projects. Hydrokinetic energy harnesses the power of the oceans and generates renewable energy with a low carbon footprint. A vibrant hydrokinetic energy industry can increase energy independence, diversify our energy resource base, reduce greenhouse gas (GHG) emissions[4] and provide a power source near coastal population centers, avoiding the need for extensive over-land transmission lines.[5] As the reliability of traditional hydropower in Washington diminishes due to decreased snowpack,[6] new sources of clean, consistently available renewable energy will become increasingly important. Hydrokinetic energy can provide a consistent, non-fossil-fuel-based source to replace traditional hydropower, contribute to the State's renewable portfolio standard[7] and provide clean energy for coastal population centers. Efforts to encourage a new clean energy industry are consistent with Washington State's goals to lead the way in reducing GHG emissions and mitigating and adapting to climate change.[8]

Environmental analysis of these projects is particularly important because scientific knowledge of the effects of hydrokinetic energy on the ocean environment is still developing. The National Environmental Policy Act (NEPA) is the principal tool for federal agencies to understand the effects

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4. John Callaghan & Richard Boud, The Carbon Trust, *Future Marine Energy: Cost Competitiveness and Growth of Wave and Tidal Stream Energy,* 7 (2006).

5. *See* Roger Bedard, et al., Electricity Innovation Institute, *Final Summary Report: Offshore Wave Power Feasibility Demonstration Project,* (2005), *available at* http://oceanenergy.epri.com/attachments/wave/reports/009_Final_Report_RB_Rev_2_092205.pdf; *see also* Honorable John Wellinghoff, et al., *Facilitating Hydrokinetic Energy Development Through Regulatory Innovation*, 29 ENERGY L.J. 397, 398 (2008).

6. *See* Katharine Hayhoe, et al., *Emissions Pathways, Climate Change, and Impacts on California*, 101 PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES 12422 (2004); Jinwon Kim, *A Projection of the Effects of the Climate Change Induced by Increased CO_2 on Extreme Hydrologic Events in the Western U.S.*, 68 CLIMACTIC CHANGE 153 (2005); L. Ruby Leung, et al., *Mid-Century Ensemble Regional Climate Change Scenarios for the Western United States*, 62 CLIMACTIC CHANGE 75 (2004); Philip W. Mote, et. al., *Declining Mountain Snowpack in Western North America*, 86 AMERICAN METEOROLOGICAL SOCIETY, 39 (2005).

7. WASH. REV. CODE. 19.285.040(2)(a)(iii) (setting the Washington Renewable Portfolio Standard at 15% by 2020).

8. *See* Washington State Executive Order 07-02, *available at* http://www.governor.wa.gov/execorders/eo_07-02.pdf. (requiring the reduction of GHG emissions to 50% below 1990 levels by 2050, increase of clean energy jobs to 25,000 by 2020 and reduction of imported fuel expenditures by 20% by 2020).

that leasing, licensing and permitting of hydrokinetic energy projects will have on the ocean environment.[9] NEPA is a powerful tool to prevent environmental destruction, but current hydrokinetic permitting requirements call for duplicative, overlapping environmental reviews in an unnecessarily lengthy process that does not foster more effective environmental protection and may stifle the growth of the hydrokinetic industry.

Multiple state and federal agencies currently share jurisdiction over the Outer Continental Shelf (OCS), creating an inhospitable regulatory environment for hydrokinetic energy developers and marine ecosystem protection.[10] A jurisdictional dispute gives the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEM) and the Federal Energy Regulatory Commission (FERC) successive jurisdiction over hydrokinetic projects on the OCS. This arrangement may inhibit traditional models of inter-agency cooperation under the NEPA process. The legally unenforceable Memorandum of Understanding (MOU)[11] between FERC and the Department of Interior (DOI), created to resolve the jurisdictional dispute between the agencies, provides little assurance that they will coordinate NEPA analyses. Renewable energy developers and federal agencies are required to perform at least three, and up to five, NEPA analyses to satisfy the statutory requirements of BOEM, FERC and other responsible federal and state agencies. This duplication creates uncertainty for hydrokinetic energy developers, additional work for federal and state agencies, confusion for the public comment process, and does not benefit the ocean environment.

Scientific uncertainty complicates agency efforts to protect the ocean environment from the impacts of hydrokinetic

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9. 42 U.S.C. §4332 (2010).

10. Offshore wind energy, such as Cape Wind, the project off the coast of Massachusetts, faces different regulatory requirements from hydrokinetic projects. The Bureau of Ocean Energy Management, Regulation and Enforcement is responsible for all stages of permitting for offshore wind energy projects.

11. Memorandum of Understanding Between the U.S. Department of Interior and Federal Energy Regulatory Commission (Apr. 9, 2009) [hereinafter DOI-FERC MOU], *available at* http://www.ferc.gov/legal/maj-ord-reg/mou/mou-doi.pdf (clarifying jurisdiction over renewable energy on the OCS: "This MOU . . . shall not be construed to create any legal obligation on the part of either agency or any private right or cause of action for or by any person or entity.").

projects[12] under the mandates of the Endangered Species Act (ESA),[13] Marine Mammal Protection Act (MMPA)[14] and the Magnuson-Stevens Fisheries Act.[15] This uncertainty could be ameliorated by studies of existing hydrokinetic projects, but there are currently no completed or constructed facilities on the OCS. At present, agencies must conduct separate environmental reviews based on incomplete science to ensure protection of the marine environment and protect against litigation. Despite the benefits of hydrokinetic projects, natural resource agencies have critical statutory requirements that do not allow them to accept high levels of scientific uncertainty when permitting projects.[16]

An opportunity exists for federal and state agencies to work together to limit the number of NEPA reviews, while ensuring the adverse effects of hydrokinetic energy are mitigated or avoided. BOEM, FERC and federal natural resource agencies can rely on existing tools to simplify the hydrokinetic permitting process. BOEM can perform a programmatic Environmental Impact Statement (EIS) for each lease area at the outset, which FERC and other agencies can consult for site-specific environmental reviews. Natural resource agencies should use the information from already-permitted projects, adaptive management and marine spatial planning to better understand the effects these projects. A process that minimizes duplication in environmental analyses will balance the aims of protecting the ocean environment and encouraging the growth of clean hydrokinetic energy.

This comment presents the argument for a streamlined regulatory process for hydrokinetic projects on the OCS that will benefit the ocean environment, federal agencies, project developers and the public and Part II presents the potential effects of hydrokinetic projects on the OCS. Part III provides an overview of the regulatory jurisdiction over hydrokinetic projects on the OCS, including NEPA, the dispute between

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12. Jack K. Sterne, et. al., *The Seven Principles of Ocean Renewable Energy: A Shared Vision and Call for Action*, 14 ROGER WILLIAMS U. L. REV. 600, 602 (2009); s*ee generally* Kristen Carden, Comment, *Bridging the Divide: The Role of Science in Species Conservation Law*, 30 HARV. ENVTL. L. REV. 165 (2006).

13. 16 U.S.C. §1531(b) (2010).

14. 16 U.S.C. §1361 (2010).

15. 16 U.S.C. §1801(b)(7) (2010).

16. Sterne, *supra* note 12, at 602-603.

FERC and BOEM, and the federal agencies responsible for environmental review. Part IV discusses how scientific uncertainty and OCS regulation creates the potential for duplicative environmental reviews. Part V considers the cost of this duplication of effort. Finally, Part VI discusses possible solutions to streamline the permitting process while protecting the ocean environment.

II. HYDROKINETIC ENERGY FACILITIES HAVE VARYING IMPLICATIONS FOR THE HEALTH OF THE MARINE ENVIRONMENT

The effects of hydrokinetic energy facilities on the ocean depend on the technology used, the size, scope and location of the project. Though the impacts are uncertain, preliminary research suggests hydrokinetic facilities will have some adverse effects on fish and mammal species, coastal areas, bird species, and ocean water quality.[17] Conversely, hydrokinetic projects can provide a renewable energy source with low greenhouse gas emissions and reduce the effects of ocean acidification.[18]

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17. *See generally* U.S. DEP'T OF ENERGY, REPORT TO CONGRESS ON THE POTENTIAL ENVIRONMENTAL EFFECTS OF MARINE AND HYDROKINETIC ENERGY TECHNOLOGIES (2009) [hereinafter DOE REPORT]; U.S. DEP'T OF COMMERCE & NAT'L OCEANIC AND ATMOSPHERIC ADMIN., NOAA TECHNICAL MEMORANDUM NMFS-F/SPO-92, ECOLOGICAL EFFECTS OF WAVE ENERGY DEVELOPMENT IN THE PACIFIC NORTHWEST 56 (2008) [hereinafter NOAA TECHNICAL MEMORANDUM]; A.B. Gill, et. al., *COWRIE 1.5 Electromagnetic Fields Review: The Potential Effects of Electromagnetic Fields Generated by Sub-Sea Power Cables Associated with Offshore Wind Farm Developments on Electrically and Magnetically Sensitive Marine Organisms – A Review* 32 (2005), *available at* http://www.offshorewindfarms.co.uk/Assets/1351_emf_phase_one_half_report.pdf; Richard Inger, et. al., *Marine Renewable Energy: Potential Benefits to Biodiversity? An Urgent Call for Research*, 46 JOURNAL OF APPLIED ECOLOGY 1145 (2009); D.L. Millar, et. al., *Modeling Analysis of the Sensitivity of Shoreline Change to a Wave Farm* 34 OCEAN ENGINEERING 897 (2007); Sarah Ann Thompson, et. al., California Energy Commission, *Wave Energy Conversion Technology Development in Coastal California: Potential Impacts on Marine Birds and Mammals in* Developing Wave Energy in Coastal California: Potential Socio-Economic and Environmental Effects 137, 139 (2008), *available at* http://www.resources.ca.gov/copc/docs/ca_wec_effects.pdf.

18. *See* Callaghan & Boud, *supra* note 4. *See generally* The Royal Society, *Ocean Acidification Due to Increasing Atmospheric Carbon Dioxide* (2005).

A. *Hydrokinetic Facilities Will Likely Have Adverse Environmental Impacts*

Though more research is necessary to fully understand hydrokinetic facilities' effect on the marine environment, preliminary findings show several potential adverse impacts.[19] These impacts include alteration of current and wave strengths, changes in substrates and sediment transport, habitat alteration for ocean-floor organisms, noise during construction and operation, electromagnetic fields, releases of toxins into the water and interference of animal movements and migrations.[20] The severity of each impact depends on the technology type and project site; however, many of these adverse impacts can be mitigated or avoided with precautionary measures and proper siting.[21]

Hydrokinetic devices take some energy out of each wave, disturbing sediment transport and affecting the coastal environment. Changes in wave heights due to hydrokinetic facilities range from 3 to 15 percent, with the largest impact close to the facility and near the shore.[22] Models of the Wave Hub electrical grid off the coast of Cornwall, England predict that the installation, which will be located 20 km off coast in 50–60 meter deep waters, would affect the coastal waves by 1 to 2 cm.[23] Habitats and organisms on and under the sediment surface may be adversely affected by reduced wave heights.[24] Cables and the underwater systems can also create artificial fish habitats that may change the abundance and diversity of ocean species. Though hydrokinetic facilities may create new habitats that increase biodiversity,[25] they may also make species that congregate around the facilities more susceptible to predators.

Many hydrokinetic devices use hydraulic fluids, paints, and

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19. DOE REPORT, s*upra* note 17 at *i* ("There is no conclusive evidence that marine and hydrokinetic technologies will actually cause significant environmental impacts, and the possible effects detailed in this report should serve to highlight areas where further information and research is needed.").

20. *Id.* at 11.

21. *See generally id.*; *see also* NOAA TECHNICAL MEMORANDUM, *supra* note 17.

22. NOAA TECHNICAL MEMORANDUM, *supra* note 17, at 56.

23. Millar*, supra* note 17, at 897.

24. DOE REPORT, s*upra* note 17, at 14.

25. Inger, *supra* note 17, at 1148–1149.

other toxic chemicals, which can leach into the water. Accidental releases of hydraulic fluids are unlikely, but could have high impacts on the surrounding areas.[26] Paints, which prevent organisms from attaching to the hydrokinetic devices, may contain toxic compounds.[27] The discharge of these contaminants would be relatively small, but could bio-accumulate over time.[28] This may result in pollution and possible violations of state water quality standards, which would prevent the State from certifying compliance with §401 of the Clean Water Act.[29] Use of non-toxic paints and lubricating oils will avoid releases of toxic compounds into the ocean,[30] and will assure hydrokinetic facilities achieve compliance with the CWA.

Transmission lines carrying electricity to the mainland have electromagnetic fields and it is unknown whether this will disrupt certain species' navigation and hunting abilities. Current research cannot conclusively determine the impacts of electromagnetic fields on marine species.[31] Additionally, noise from construction and operation of the facilities may affect bird, mammal and fish species that use acoustics to navigate and hunt.[32] While the noise created from the operation of a few hydrokinetic units may meet acceptable noise levels, the cumulative effect from large facilities could potentially mask the communication sounds marine organisms use.[33] However, use of sound insulation, noise barriers during installation and looser, thicker cables may mitigate the impact of noise on marine species.[34]

Hydrokinetic projects' most likely impact is marine mammals and fish colliding with the physical structures. Cables that connect to the ocean floor also have the potential to entangle fish and other species.[35] Floating and submerged

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26. NOAA TECHNICAL MEMORANDUM, *supra* note 17, at 106.

27. *Id.;* DOE REPORT, s*upra* note 17, at 32.

28. DOE REPORT, s*upra* note 17, at 32.

29. 33 U.S.C. § 1341 (2010).

30. NOAA TECHNICAL MEMORANDUM, *supra* note 17, at 107.

31. Gill*, supra* note 17, at 32.

32. NOAA TECHNICAL MEMORANDUM, *supra* note 17, at 115-116.

33. DOE REPORT, s*upra* note 17, at 25.

34. *Id.*; NOAA TECHNICAL MEMORANDUM, *supra* note 17, at 117. *See generally,* Thompson*, supra* note 17.

35. Thompson*, supra* note 17, at 139.

structures, mooring lines and transmission cables may affect whales, crabs, salmon, sea turtles and birds if projects are sited along migration routes.[36] Based on studies of whale entanglements with pot and gill net lines, mooring lines may be particularly hazardous for species with large pectoral fins and the lines may not be big enough for whales to detect.[37] Turbine rotors create the greatest potential risks for collision with marine species.[38] Appropriate spacing of projects and creating screens or diversionary devices to ensure species avoid the facilities may mitigate many of these impacts.[39]

B. Hydrokinetic Energy Can Contribute to Climate Change Mitigation by Diversifying Our Renewable Energy Resource Base

Though hydrokinetic energy facilities will likely have some adverse effects on the ocean environment, these technologies can also mitigate climate change and reduce ocean acidification caused by increasing greenhouse gases from the exploitation of other energy sources. Ocean acidification is the greatest threat to the health of the ocean environment, caused by absorption of almost half of the CO_2 from fossil fuel combustion and cement production.[40] Based on global carbon models, ocean acidification will cause a lack of calcium carbonate in the ocean and shelled organisms will have difficulty creating skeletons and shells, affecting coral reefs, fish species and marine mammals dependent on fish and mollusks for food.[41] Research predicts that by 2050 the problem will be severe in the polar waters of the southern ocean, and by 2100 effects will be felt throughout the southern ocean and sub-arctic.[42] There is incomplete information about

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36. DOE REPORT, s*upra* note 17, at 35.

37. Amanda Johnson et. al., *Fishing Gear Involved in Entanglements of Right and Humpback Whales,* 21 MARINE MAMMAL SCIENCE 635, 644 (2005); NOAA TECHNICAL MEMORANDUM, *supra* note 17, at 95.

38. B. Wilson, et. al., Scottish Association for Marine Science, *Collision Risks Between Marine Renewable Energy Devices and Mammals, Fish and Diving Birds*, 36 (2007).

39. *Id.* at 73; DOE REPORT, s*upra* note 17, at 42.

40. *See* The Royal Society, *supra* note 18.

41. James C. Orr et al., *Anthropogenic Ocean Acidification Over the Twenty-First Century and Its Impact on Calcifying Organisms*, 437 NATURE 681, 685 (2005).

42. *Id.*

the adverse effects of hydrokinetic energy on the environment; nonetheless, in the face of climate change, hydrokinetic facilities will reduce reliance on fossil fuel-based power plants, help stop rising atmospheric CO_2 levels and slow ocean acidification.

Climate change will adversely affect hydroelectricity production in Washington and the Northwest as increased rain during the cold season leads to less snow pack and spring runoff throughout mountain watersheds in the Western U.S.[43] With a 1–2.5 Celsius increase in temperature, studies predict that the annual snowpack in the mountains will drop up to 70%,[44] leading to a decrease in the river flows that Washington State depends on for electricity production. The Northwest[45] region used 19,000 average megawatts of power in 2007, and will increase to 25,000 by 2030.[46] Generally, the Northwest has a higher energy load in the winter than summer, but with rising use of air conditioners and other appliances in the summer, the gap is decreasing. The Northwest Power and Conservation Council (NWPCC) predicts that summer peak demand will grow from 29,000 megawatts in 2010 to 40,000 megawatts by 2030.[47] In Washington State, traditional hydroelectric generation accounts for 67 percent and coal for 17 percent of the electricity consumed.[48] The state's reliance on traditional hydroelectric power depends on strong river flows. In 2001, when river flows were low, generation from hydroelectric plants dropped 32 percent compared to the average for the past 30 years.[49]

The combination of increased summer demand and

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43. *See* Kim, *supra* note 6, at 165-166.

44. *See* Leung, *supra* note 6, at 74; *see also* Hayhoe note 6, at 12426; Mote note 6, at 48.

45. The Northwest Region includes Washington, Oregon, Idaho, and Montana.

46. NORTHWEST POWER AND CONSERVATION COUNCIL, SIXTH NORTHWEST CONSERVATION AND ELECTRIC POWER PLAN, COUNCIL DOCUMENT 2010-09 3-1 (2010) [hereinafter SIXTH POWER PLAN], *available at* http://www.nwcouncil.org/energy/powerplan/6/final/SixthPowerPlan.pdf.

47. *Id.* at 3-2.

48. WASH. STATE CMTY. TRADE AND ECON. DEV., 2009 BIENNIAL ENERGY REPORT WITH INDICATORS: ISSUES AND ANALYSIS FOR THE WASHINGTON STATE LEGISLATURE AND GOVERNOR 35 (2009) [hereinafter CTED 2009 Energy Report], *available at* http://www.commerce.wa.gov/DesktopModules/CTEDPublications/CTEDPublicationsView.aspx?tabID=0&ItemID=6814&MId=863&wversion=Staging.

49. *Id.* at 31.

decreased snowpack could make traditional hydropower sources insufficient to meet the region's power needs. Based on current use and expected population growth in the Northwest region, NWPCC projects that energy efficiency measures can meet 85% of future energy demand.[50] However, the remaining 15% will need to come from new renewable energy sources. [51] Though wind power is the most likely source of renewable energy, the NWPCC finds that "there is likely to be an increased need for resources that can provide reliable capacity to meet high load conditions and that can operate flexibly to accommodate variable. . .wind energy." [52] Hydrokinetic energy can fill this gap as a renewable, consistent source of energy that is close to coastal population centers. The Electric Power Research Institute estimates that ocean wave energy can potentially contribute 270 Terawatt hours/yr, equivalent to the amount of energy produced by traditional hydropower in 2005. [53] Approximately 21 percent of the total wave energy potential is off the coast of Washington, Oregon and California. [54] In combination with energy efficiency measures and other renewable sources, wave and tidal power can contribute to the Northwest's future energy needs.

Though hydrokinetic technologies will likely have an adverse effect on the ocean environment and species, many impacts can be avoided by proper siting and mitigation measures.[55] Without more information from deployed projects, there will be ongoing uncertainty about hydrokinetic project impacts. The adaptable, impermanent, and removable nature of hydrokinetic facilities ensures that deployment of these projects can occur to minimize effects on the marine environment. However, the current regulatory structure creates duplicative environmental reviews that will slow even environmentally safe implementation of hydrokinetic projects.

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50. SIXTH POWER PLAN, *supra* note 46, at 3.

51. *Id.*

52. *Id.*

53. *See* Bedard, *supra* note 5, at 12.

54. *Id.*

55. *See* DOE REPORT, *supra* note 17; NOAA TECHNICAL MEMORANDUM, *supra* note 17.

III. REGULATORY JURISDICTION OVER HYDROKINETIC ENERGY ON THE OUTER CONTINENTAL SHELF

Seven federal agencies[56] share jurisdiction over hydrokinetic licensing on the OCS. In most federal actions, NEPA fosters inter-agency cooperation, but jurisdictional disputes impair collaboration for environmental review of hydrokinetic energy projects. Also, multiple NEPA and other environmental reviews are required to satisfy the statutory requirements of the multiple agencies with jurisdiction over the OCS.

Responsibility for approving hydrokinetic projects is split between the BOEM and FERC. BOEM provides leases for projects wholly or partially located on the OCS, pursuant to the Outer Continental Shelf Lands Act[57] and the Energy Policy Act of 2005.[58] Under the Federal Power Act, FERC is responsible for licensing hydropower projects, including hydrokinetic projects in both federal and state waters.[59] Other state and federal agencies, relying on thirteen statutes,[60] also provide reviews, permits and concurrences for hydrokinetic projects.

A. *The National Environmental Policy Act*

NEPA requires environmental analysis of all major federal actions that may have an adverse effect on the human environment. Major federal actions include "projects and programs entirely or partly financed, assisted, conducted, regulated, or approved by federal agencies. . . ."[61] NEPA designates a lead federal agency to undertake analyses of all

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56. Bureau of Ocean Energy Management, Regulation and Enforcement, Federal Energy Regulatory Commission, National Marine Fisheries Service, Corps of Engineers, United States Coast Guard, Advisory Council on Historic Preservation and United States Fish and Wildlife Service.

57. 43 U.S.C. § 1334(a) (2010).

58. Energy Policy Act of 2005, Pub. L. No. 109-58, 119 Stat. 594, § 388, (2005).

59. 16 U.S.C. §§ 792 – 823a (2010).

60. Federal Power Act, Energy Policy Act of 2005, Outer Continental Shelf Lands Act, Clean Water Act, Rivers and Harbors Act, National Environmental Policy Act, Endangered Species Act, Marine Mammal Protection Act, Magnuson-Stevens Fisheries Act, Fish and Wildlife Coordination Act, Migratory Bird Treaty Act, National Historic Preservation Act, Coast Zone Management Act.

61. 40 C.F.R. § 1508.18 (2010).

major federal actions. Hydrokinetic projects on the OCS require approval by both BOEM and FERC and are major federal actions under NEPA.

The lead federal agency that is responsible for conducting the environmental analysis for each major action manages the NEPA process.[62] If the action does not qualify for a categorical exclusion, the agency performs an environmental assessment.[63] The agency publishes a finding of no significant impact (FONSI) and opens it to public review if the action does "not have a significant effect on the human environment and for which an environmental impact statement therefore will not be prepared."[64] If the action is one that typically requires an EIS[65] or the Environmental Assessment (EA) shows that there may be a significant impact on the human environment, the agency will perform an EIS.[66] An EIS must be a detailed statement including the impact and adverse environmental effects of and alternatives to the proposed action.[67]

NEPA regulations encourage agencies to tier site and project-specific EIS's to broad programmatic analyses.[68] A NEPA EIS includes analyses that non-lead agencies can rely on in subsequent environmental reviews under the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA) and the Magnuson-Stevens Fisheries Act.[69]

In licensing hydrokinetic projects on the OCS, NEPA regards BOEM's issuance of a lease and FERC licensing as major federal actions requiring separate NEPA analyses. Permits required by other federal agencies and environmental reviews under the ESA, MMPA and the Magnuson-Stevens Fisheries Act may also require further NEPA analyses.

B. FERC and BOEM Jurisdictional Dispute

FERC and BOEM's overlapping jurisdiction over the OCS is

62. *Id.* § 1501.5.
63. *Id.* § 1501.3.
64. *Id.* § 1508.13.
65. *Id.* § 1501.4(a)(1).
66. *Id.* § 1501.4(c).
67. 42 U.S.C. § 4332(2)(C) (2010)
68. 40 C.F.R. §§ 1502.20, .21 (2010).
69. *Id.* § 1502.25(a).

the result of a conflict between the agencies over the correct interpretation of the Energy Policy Act of 2005 (EPAct). In February 2006, BOEM[70] issued a proposed rulemaking on alternative-energy uses on the OCS.[71] In response, FERC claimed jurisdiction over all hydrokinetic projects under the Federal Power Act (FPA),[72] which gives FERC responsibility for licensing and oversight of hydropower projects.[73] BOEM proposed the rules after the passage of the EPAct, which attempted to define federal agency jurisdiction over projects on the OCS. Section 388 of the EPAct amended the Outer Continental Shelf Lands Act to give BOEM authority to "grant a lease, easement, or right-of-way on the outer Continental Shelf."[74] Despite this, FERC alleged that its authority over hydrokinetic projects on the OCS was upheld because of a savings clause in the act which stated that "[n]othing in this subsection displaces, supersedes, limits, or modifies the jurisdiction, responsibility, or authority of any Federal or State agency under any other Federal law."[75] FERC argued that the FPA gave it jurisdiction over hydropower projects in all navigable waters, including the OCS, and that the EPAct did not modify that authority.[76]

To resolve the jurisdictional dispute, FERC and the Department of Interior entered into a Memorandum of Understanding (MOU) to clarify their roles regarding renewable energy projects on the OCS.[77] The MOU gave BOEM exclusive jurisdiction over all aspects of non-hydrokinetic projects. FERC maintains jurisdiction to issue licenses for hydrokinetic projects on the OCS after BOEM issues a lease, easement, and right-of-way (ROW) for a

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70. At that time, BOEM was known as the Minerals Management Service.

71. Alternate Energy-Related Uses on the Outer Continental Shelf, 70 Fed. Reg. 77345 (proposed Dec. 30, 2005) (to be codified at 30 C.F.R. pt. 285).

72. Fed. Energy Regulatory Comm'n, RIN 1010-AD30, *Comments on the Proposed Rule for Alternative Energy and Alternate Uses of Existing Facilities on the Outer Continental Shelf* (2008), *available at* http://www.ferc.gov/industries/hydropower/indus-act/hydrokinetics/pdf/mms082808.pdf.

73. 16 U.S.C. § 797(e) (2010).

74. Energy Policy Act of 2005, Pub. L. No. 109-58, § 388 (a), 119 Stat. 594, 744 (2005).

75. *Id.*

76. 16 U.S.C. §§ 817, 796, 797 (2010).

77. DOI-FERC MOU, *supra* note 11.

particular project. Though the MOU resolved the jurisdictional dispute, it did not provide methods for coordinating the required environmental reviews. Each agency is responsible for conducting analyses under NEPA, ESA, MMPA and Magunson-Stevens Fisheries Act for their respective actions.[78]

C. BOEM Leasing and Grants

BOEM is responsible for issuing commercial competitive leases and easements for ROWs on the OCS for hydrokinetic projects. To produce and sell energy, hydrokinetic project developers must secure a commercial lease from BOEM, a three to five year process[79] with two separate NEPA reviews. A commercial lease lasts up to thirty years, provides rights to produce and sell energy, and provides access to one or more easements for energy transmission to the grid.[80]

BOEM has a mandate to issue leases on a competitive basis unless it finds that no competitive interest exists.[81] An interested developer requests a lease from BOEM, who publishes a *Request for Interest* (RFI) in the Federal Register to determine whether there is additional interest in the lease area.[82]

After publishing the RFI, if BOEM determines that there is competitive interest in the lease area, BOEM issues a Call for Information and Nominations (Call).[83] Project developers must respond to the Call within 45 days to be eligible to compete.[84] At this point BOEM performs one of the two required NEPA analyses for the lease area.[85] Upon completion of the NEPA review, BOEM publishes a *Proposed Sale Notice* and solicits comments for 60 days.[86] BOEM incorporates comments into lease terms in the *Final Sale Notice*.

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78. *Id.* at 1.

79. PACIFIC ENERGY VENTURES, LLC, U.S. DEP'T OF ENERGY, SITING METHODOLOGIES FOR HYDROKINETICS: NAVIGATING THE REGULATORY FRAMEWORK 55-56 (2009) [hereinafter PACIFIC ENERGY VENTURES], *available at* http://www1.eere.energy.gov/windandhydro/pdfs/siting_handbook_2009.pdf.

80. 30 C.F.R. § 285.235, .200 (2009).

81. 43 U.S.C. § 1337(p)(3) (2005).

82. 30 C.F.R. §§ 285.210, 231. (2009).

83. *Id.* § 285.211(a).

84. *Id.*

85. *Id.* § 285.214(c).

86. *Id.* § 285.211(c).

BOEM then approves the most competitive bid and the successful bidder has six months to submit a Site Assessment Plan (SAP).[87] BOEM performs the second NEPA review, for which the project developer pays, along with the necessary consultations with other state and federal agencies.[88] Upon completion of the necessary reviews and consultations, BOEM can either (1) approve (2) approve with conditions or (3) disapprove the SAP. BOEM can also specify any conditions that must be included in the FERC license.[89] The competitive lease process will likely take three to five years.[90]

D. FERC Licensing

After a project developer receives a lease from BOEM, the developer must obtain a license from FERC. FERC has not developed new rules and regulations to govern hydrokinetic projects, relying instead on its authority under the Federal Power Act (FPA) to create exemptions for test projects and a pilot licensing process to encourage new technologies.

The conventional Integrated Licensing Process is similar to traditional hydroelectric projects and consists of pre-filing, filing and post-filing documents.[91] The final application includes a draft biological assessment and recommendations from the NMFS, USFWS and state fish and wildlife agencies to mitigate any adverse effects on the ocean environment and species.[92] Upon completion and submission of the final license application, FERC performs the third NEPA analysis in the permitting process to determine whether an EIS is required.[93] FERC may, but is not required to, rely on previous project

87. *Id.* § 285.235.

88. *Id.* § 285.610–612.

89. DOI-FERC MOU, *supra* note 11, at 2.

90. PACIFIC ENERGY VENTURES, *supra* note 79, at 55-56.

91. 18 C.F.R. §§ 5.5-5.7 (2010) (requiring developers to submit a pre-filing Preliminary Application Document (PAD) and Notice of Intent (NOI) which is publicly reviewed by state and federal agencies, tribes, and the public); 18 C.F.R. §§ 5.18(b)(3)(i) -(iv) (2007) (requiring the final license application to incorporate comments and Coastal Zone Management Act and Clean Water Act concurrency reviews from state and federal agencies).

92. 16 U.S.C. § 803(j)(1) (2010) (requiring resource agency recommendations be included in the final issued license, unless they are inconsistent with the purposes of the FPA).

93. 18 C.F.R. § 5.19, .22 (2010).

NEPA analyses.[94] This licensing process takes approximately three to six years.[95]

1. *Pilot License*

Relying on its authority under the FPA,[96] FERC has also provided guidance on an expedited pilot license process for hydrokinetic projects in both state and OCS waters. Projects licensed under the pilot process can last only five years and be up to 5 Megawatts. They must be experimental, include post-licensing monitoring, and may not be located in sensitive areas.[97] The project must also be removable in the event adverse environmental effects are found.[98] The process for obtaining a pilot license is similar to the integrated licensing process, but requires additional information about how the project meets the pilot license requirements.[99] FERC created the pilot license to encourage hydrokinetic energy development, but these efforts are also hampered by scientific uncertainty and duplicative regulatory oversight.

Though FERC has not developed procedures for this process, project developers may transition from a pilot license to a traditional 30-50 year commercial license.[100] Typically, the Notice of Intent and Preliminary Application Document for relicensing is submitted five years prior to the expiration of license.[101] Because pilot licenses are only five years in length, FERC will have to allow for extensions or some other mechanism to provide a longer timeline for relicensing.

E. Natural Resource Agency Permits and Concurrences

In addition BOEM and FERC regulation, the National Marine Fisheries Service (NMFS) must also approve hydrokinetic projects on the OCS. The NMFS, an arm of the

94. 40 C.F.R. § 1502.21 (2010); *See* DOI-FERC MOU, *supra* note 11.

95. PACIFIC ENERGY VENTURES, *supra* note 79, at 21.

96. 16 U.S.C. § 797 (2010).

97. FED. ENERGY REGULATORY COMM'N, LICENSING HYDROKINETIC PROJECTS 2, 4, 6 (2008), *available at* http://www.ferc.gov/industries/hydropower/indus-act/hydrokinetics/pdf/white_paper.pdf.

98. *Id* at 8.

99. *Id*. at 6.

100. *Id*. at 10-11.

101. 18 C.F.R. § 16.6(c) (2010).

National Oceanographic Atmospheric Administration (NOAA), is the primary agency responsible for protecting the ocean environment and species. The NMFS provides environmental analysis and must approve BOEM leases and FERC licenses pursuant to the Endangered Species Act,[102] the Marine Mammal Protection Act[103] and the Magnuson-Stevens Fisheries Act.[104]

1. *Endangered Species Act and Marine Mammal Protection Act*

The ESA and the MMPA seek to protect species and habitats and require federal agencies to consult with the NMFS for actions affecting threatened or endangered marine and anadromous species.[105] For hydrokinetic projects, the lead federal agency initiates informal discussions with the NMFS to determine if any listed species, including marine mammals, are in the project area.[106]

Under the ESA, if the NMFS finds critical habitat or threatened or endangered species in the project area, the project developer, in consultation with BOEM or FERC, prepares a draft biological assessment (DBA), which may be included as a part of the NEPA environmental analysis.[107] After reviewing the DBA, if the NMFS finds that the project is "not likely to jeopardize"[108] listed species or critical habitat, the NMFS issues a "no jeopardy" opinion.[109] If the project will adversely affect species or habitat, the NMFS issues a "jeopardy" biological opinion with "reasonable and prudent alternatives" with which the lead agency and project developer must comply[110] or face criminal penalties.[111] An incidental take statement is issued under both the ESA and MMPA to identify the reasonable and prudent alternatives and the amount of

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102. 16 U.S.C. § 1531(b) (2010).
103. *Id.* § 1361.
104. *Id.* § 1801(b)(7).
105. *Id.* §§ 1531(b), 1361.
106. *Id.* § 1536(a)(3).
107. *Id.* § 1536(c)(1).
108. 50 C.F.R. § 402.14(h)(3) (2009).
109. 16 U.S.C. § 1536(b)(3)(A) 2010); 50 C.F.R. § 402.14(h)(3) (2009).
110. 16 U.S.C. § 1536(b)(4) (2010).
111. *Id.* § 1540(b)(1).

allowed incidental take.[112] If there are no alternatives or if the project cannot comply with them, the project may apply for an exemption.[113]

Under the MMPA, the Secretary of the NMFS consults with BOEM or FERC and may approve a one-year *Incidental Harassment Authorization* for any projects unlikely to adversely affect protected mammal species.[114] For longer-term projects, the Secretary may also approve a five-year *Letter of Authorization* that includes required mitigation measures.[115] The NEPA documents may also include this MMPA analysis.[116] If the NMFS determines that the NEPA documents provide sufficient analysis, the agency will rely on that analysis for its determination under the MMPA. However, the NMFS may also perform its own EIS under NEPA if it finds the analysis in the original NEPA document inadequate.

2. Magnuson-Stevens Fisheries Act

The Magnuson-Stevens Fisheries Act requires federal agencies to consult with NMFS if a federal action will affect essential fish habitat (EFH).[117] EFH consists of "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity."[118] BOEM or FERC's consultation with NMFS may use one of five different procedures, including the use of existing environmental reviews, such as NEPA or ESA, general concurrence, abbreviated or expanded consultation, and programmatic consultation.[119] NMFS requests early consultation for federal actions that may have an adverse effect on EFH.[120]

3. Additional Permits and Concurrences

Other federal agencies are also responsible for issuing

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112. 50 C.F.R. § 402.14(i)(1)(i)–(v) (2009).
113. *Id*. § 402.15(c).
114. 16 U.S.C. § 1371(a)(5)(D) (2003).
115. *Id*. § 1371(a)(5)(A).
116. 50 C.F.R. § 216.33(c)(2)(v)(A) (2010).
117. 16 U.S.C. § 1855(b)(2) (2007).
118. *Id*. § 1802.
119. 50 C.F.R. § 600.920(a)(2) (2010); *see also* 50 C.F.R. § 600.920(e) – (j).
120. *Id*. § 600.920(a)(3).

permits and concurrency reviews for hydrokinetic projects on the OCS related to navigation, the ocean environment, and historic monuments. The Army Corps of Engineers (the Corps) issues Rivers and Harbors Act § 10 permits for structures placed within navigable waters.[121] The Corps also requires a Clean Water Act § 404 permit for any dredging on the seafloor associated with the installation of a hydrokinetic facility.[122] US Fish and Wildlife Service (USFWS) must review any projects that alter a body of water to determine fish and wildlife impacts under the Fish and Wildlife Coordination Act.[123] Under the Migratory Bird Treaty Act, the lead agency consults USFWS to determine whether the project will have any effects on migratory bird species.[124] National Historic Preservation Act § 106 requires that federal-action agencies identify any project impacts on natural historic resources.[125] Finally, the US Coast Guard must issue a Private Aid to Navigation permit for projects in navigable waters.[126]

For projects that affect state waters or coastal zones, state and local agencies provide federal consistency determination under § 307 of the Coastal Zone Management Act[127] and § 401 of the Clean Water Act[128] to ensure that project plans are in accordance with state coastal management programs and water quality standards, respectively.

In summary, commercial-scale hydrokinetic projects require a lease from BOEM, a license from FERC, approval from the NMFS under the ESA, MMPA and Magnuson-Stevens Fisheries Act, concurrences from four additional federal agencies under six different statutes and approval from state agencies for any project impacts on state waters or coastal areas. In addition, the current regulatory structure requires at least three, and up to five, NEPA analyses. In contrast, BOEM-regulated oil and gas leases require two to three EIS's

121. 33 U.S.C. §§ 401, 403 (2010).
122. *Id*. § 1344.
123. 16 U.S.C. §§ 661–667e (2011).
124. *Id*. §§ 703–712.
125. *Id*. § 470f.
126. 33 C.F.R. § 66.01–1 (2009).
127. 16 U.S.C. § 1456(c)(1) (2010).
128. 33 U.S.C. § 1341 (2010).

and take approximately five years to complete. [129] The same natural resource agency approvals are required but because the environmental effects of oil and gas facilities are better understood, the leasing process is less protracted than hydrokinetic approvals.

IV. OVERLAPPING JURISDICTION CREATES DUPLICATIVE ENVIRONMENTAL REVIEWS

The Memorandum of Understanding (MOU) and the corresponding guidance documents between BOEM and FERC state that these federal agencies will cooperate to the greatest extent possible.[130] BOEM and FERC assigned authority for leasing and easements to BOEM, and licensing to FERC, and resolved their jurisdictional dispute.[131] Each agency agrees to perform NEPA analyses for their portion of the permitting process.[132] Under the MOU, FERC commits to withhold licenses until BOEM approves a project lease and conversely, BOEM will include lease terms requiring a FERC license prior to project construction and operation.[133] The MOU also gives BOEM the ability to attach required lease terms for the final FERC license.[134] Finally, the MOU does not expand the authority of either agency and does not create a legal obligation.[135]

However, this agreement does not provide any procedures or assurance that FERC and BOEM will coordinate leasing and licensing NEPA analyses and is therefore likely to be

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129. Bureau of Ocean Energy Mgmt., Regulation and Enforcement, *Oil and Gas Leasing on the Outer Continental Shelf* (Sept. 19, 2010; 5:06 pm), http://www.boemre.gov/OffshoreOilGasLeasingProcess.htm.

130. DOI-FERC MOU, *supra* note 11; Minerals Mgmt. Serv. & Fed. Energy Regulatory Comm'n, *MMS / FERC Guidance on Regulation of Hydrokinetic Energy Projects on the OCS* 5 (2009) [hereinafter *FERC – MMS Guidance Document*], *available at* http://www.ferc.gov/industries/hydropower/indus-act/hydrokinetics /pdf/mms080309.pdf.

131. DOI-FERC MOU, *supra* note 11, at 1.

132. *Id*.

133. *Id*. at 2.

134. *Id*.

135. *Id*. at 3. Resolution of the jurisdictional dispute between BOEM and FERC through an MOU, as opposed to more clear statutory guidance, also exposes the agencies to additional legal risks from parties denied leases or licenses who may claim that there is no legally justifiable basis for the agency's exercise of jurisdiction over the leasing and licensing of hydrokinetic projects.

ineffective in creating efficiencies. A review of other MOUs between federal agencies reveals the pitfalls of leaving coordination functions undefined. The MOU, while well-intentioned, lacks the specific procedures and processes to carry out its intended goals and is too vague to effectively streamline the multiple statutorily required environmental reviews. In order to satisfy its statutory obligations under the ESA, MMPA and the Magnuson-Stevens Act, the NMFS will likely require additional EIS's to supplement those required by BOEM and FERC.

A. *MOUs Do Not Always Resolve Interagency Conflict*

Though widely used by federal agencies to define jurisdictional boundaries and resolve interagency disputes, MOUs do not always provide the necessary certainty or detail to ensure smooth implementation of their stated goals. Typically, MOUs contain clauses that make the agreement legally unenforceable,[136] ensuring agencies avoid the formal rulemaking or legislative process to resolve jurisdictional disputes or coordinate inter-agency efforts. Without a formal process requiring federal agencies to comply with the agreements, the agencies are less accountable and less likely to meet the commitments of the MOU.

The General Accounting Office (GAO) performs numerous studies on the efficiency of federal agency procedures generally, and the effectiveness of MOUs in particular. GAO recommends several steps to ensure that collaboration between agencies is successful, including:

> 1) defining and articulating a common outcome; 2) establishing mutually reinforcing or joint strategies to achieve the outcome; 3) identifying and addressing needs by leveraging resources; 4) agreeing upon agency roles and responsibilities; 5) establishing compatible policies, procedures, and other means to operate across agency boundaries; 6) developing mechanisms to monitor, evaluate, and report the results of collaborative efforts; 7) reinforcing agency accountability for collaborative efforts through agency plans and reports; and 8) reinforcing individual

136. *See, e.g.*, DOI-FERC MOU, *supra* note 11, at 3.

accountability for collaborative efforts through agency performance management systems.[137]

Using these criteria, this section evaluates the MOU between FERC and BOEM to determine whether it conforms to GAO recommendations. The section then studies examples of other MOUs that did not meet their stated goals.

1. *FERC and BOEM Meet Only a Few of the Requirements for Ensuring Successful Inter-agency Collaboration*

Though the MOU and its corresponding guidance document meet some GAO criteria, the MOU has not incorporated most of the suggestions for successful inter-agency coordination. FERC and BOEM set a common goal and settled their jurisdictional dispute by defining each agency's role in the permitting process for hydrokinetic projects on the OCS.[138] However, the MOU and guidance document did not establish specific joint strategies, leverage resources, establish compatible policies or procedures, develop monitoring procedures, provide agency plans or implement performance management systems.

The purpose of the FERC-DOI MOU is to "clarify jurisdictional understandings regarding renewable energy projects in offshore waters on the Outer Continental Shelf (OCS), in order to develop a cohesive, streamlined process that would help accelerate the development of wind, solar, and hydrokinetic. . .energy projects."[139] The MOU defines both agencies' responsibilities in a general sense, splitting leasing and licensing functions between them.[140] Each agency is responsible for performing the required environmental reviews for each of these actions, though the other agency may participate as a cooperating agency and provide comments to NEPA documents.[141]

The MOU meets two of the GAO requirements in that the agencies define a common outcome and agree upon agency

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137. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-06-15, RESULTS ORIENTED GOVERNMENT: PRACTICES THAT CAN HELP ENHANCE AND SUSTAIN COLLABORATION AMONG FEDERAL AGENCIES 4-5 (2005) [hereinafter RESULTS ORIENTED GOVERNMENT].

138. DOI-FERC MOU, *supra* note 11, at 1.

139. *Id*.

140. DOI-FERC MOU, *supra* note 11, at 2.

141. *Id*.

roles and responsibilities.[142] In the MOU and the guidance document, FERC and BOEM commit to "coordinate to ensure that hydrokinetic projects meet the public interest, including the adequate protection, mitigation, and enhancement of fish, wildlife, and marine resources and other beneficial uses."[143] The guidance document also includes recognition of the common goal of streamlining the leasing and licensing process for project developers.[144] Additionally, the agencies define their roles in the process, thereby settling their jurisdictional dispute.[145]

However, the MOU does not meet most of the GAO recommendations for successful inter-agency collaboration. The MOU is silent on specific joint strategies to achieve a streamlined process, though the guidance document does provide some advice to project developers on how to navigate the licensing process. The advice on NEPA reviews is vague and does not provide specific strategies to guarantee the agencies will cooperate to perform one coordinated environmental analysis. For example, the guidance document states that "elements of NEPA, such as scoping *may* be combined for efficiency."[146] However, in the same section, the agencies concede that the permitting process may require multiple NEPA analyses.[147]

Even though BOEM has promulgated specific rules relating to renewable energy on the OCS,[148] the agencies have not produced joint regulations or guidance on how they will collaborate to ensure streamlined environmental review. Each agency relies on separate processes and gives inexplicit assurances that they will collaborate on projects, but with no concrete framework to achieve this.[149] The GAO recommends implementing a performance management plan to determine if agency collaboration is effective.[150] However, the MOU and

142. RESULTS ORIENTED GOVERNMENT, *supra* note 137, at 4–5.

143. DOI-FERC MOU, *supra* note 11, at 2.

144. *FERC-MMS Guidance Document*, *supra* note 130, at 3.

145. DOI-FERC MOU, *supra* note 11, at 1.

146. *FERC-MMS Guidance Document*, *supra* note 130, at 8.

147. *Id.*

148. 30 C.F.R. §§ 250, 285, 290 (2009).

149. DOI-FERC MOU, *supra* note 11, at 8.

150. RESULTS ORIENTED GOVERNMENT, *supra* note 137, at 4–5.

guidance document do not indicate that FERC and BOEM have a process to evaluate the success of their collaborative relationship. Though the MOU and guidance documents provide a first step in defining the relationship between and jurisdiction of FERC and BOEM, the collaboration does not meet most of the GAO's criteria to ensure a successful relationship.

2. Many MOUs Do Not Resolve Jurisdictional Disputes or Encourage Inter-Agency Cooperation

The GAO, as part of its mission to investigate how the federal government spends taxpayer dollars, analyzes MOUs between agencies to determine their effectiveness in settling jurisdictional disputes and encouraging inter-agency cooperation.[151] To better understand how the collaboration between FERC and BOEM may work, it is constructive to examine how similar MOUs and informal agreements have worked for other agencies. Unfortunately, MOUs often fail to mitigate conflict or encourage cooperation between agencies. The following are three examples of MOUs that failed to resolve overlapping jurisdiction, encourage cooperation between agencies or streamline regulatory requirements.

a. *MOUs Do Not Adequately Address Overlapping Jurisdiction for Hazardous Workplaces*

Ten MOUs address jurisdictional disputes and inter-agency cooperation in the context of workplace safety and health and hazardous materials facilities[152] under the Department of Labor's Occupational Safety and Health Administration (OSHA), the Environmental Protection Agency (EPA), the Department of the Treasury's Bureau of Alcohol, Tobacco and Firearms (ATF) and the Chemical Safety and Hazard Investigation Board (CSB).[153] The GAO interviewed regulated

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151. The GAO has also produced reports on MOUs that have increased cooperation and satisfactorily resolved jurisdictional disputes. *See generally,* U.S. Gov't Accountability Office, *Search: Memorandum of Understanding,* http://www.gao.gov/search?q=%22memorandum+of+understanding%22&Submit=Search (last visited Mar. 30, 2011).

152. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-01-62, WORKER PROTECTION: BETTER COORDINATION CAN IMPROVE SAFETY AT HAZARDOUS MATERIAL FACILITIES 6 (2000).

153. *Id*. at 4.

facilities to determine the efficacy of these agencies' ten MOUs, and found that eight of the MOUs between the agencies did little to address duplicative and overlapping incident investigations.[154] The MOUs intended to encourage incident notification, information exchange, referrals, and joint inspections between the agencies.[155] However, more often than not, the agencies did not share information or have any formal process to notify other agencies when they performed an inspection.[156] Despite having an MOU in place, the lack of coordination between agencies did not reduce the multiple facility inspections.[157] Similarly, the MOU between FERC and DOI does not guarantee effective coordination between the two agencies.

b. MOUs Do Not Result in Identification of Sole Source Aquifers Under The Safe Water Drinking Act

Congress enacted Section 1424(e) of The Safe Water Drinking Act[158] in 1974 to protect groundwater that communities use as their sole source of drinking water. As a part of this program, the EPA must designate sole source aquifers and determine if federal activities will contaminate those aquifers.[159] EPA entered into MOUs with federal agencies to create procedures for agencies to screen and refer projects to EPA that may affect a sole source aquifer.[160] Federal agencies are not required to notify EPA about projects adversely affecting sole source aquifers. The MOUs are merely an effort by EPA to encourage voluntary reporting so that EPA may meet its mandate under the Safe Water Drinking Act. The GAO found that when agencies entered into agreements with the EPA, they did not always comply with the reporting requirements of the MOUs. Environmental groups or other stakeholders, rather than the federal agency funding the project, often notify regional EPA offices about projects

154. *Id*. at 33.

155. *Id*.

156. *Id*. at 27.

157. *Id*.

158. 42 U.S.C. § 300h (2010).

159. *Id*.

160. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO/RCED-93-4, DRINKING WATER: PROJECTS THAT MAY DAMAGE AQUIFERS ARE NOT ALWAYS IDENTIFIED 3 (1992).

affecting aquifers.[161]

This instance highlights the coordination issues that can arise when an agency is not statutorily required to implement certain programs. When an agency is not formally accountable for its actions, there is a stronger likelihood that the agency will not meet its commitments under the MOU. The FERC-DOI MOU also fails to create a legally enforceable mandate to cooperate when performing NEPA analyses, leaving the agencies similarly unaccountable, allowing space for these agencies to not meet their commitments

c. Service-disabled Veterans Cannot Access Entrepreneurial Assistance Provided in the MOU Between Veterans Administration (VA), Department of Labor (DOL) and Small Business Administration (SBA)

In 1999, Congress enacted the Veterans Entrepreneurship and Small Business Development Act[162] to create programs to assist service-disabled veterans starting small businesses. The law created a framework for the Small Business Administration (SBA), the Department of Veterans Affairs (VA), the Department of Labor (DOL), and Department of Defense (DOD) to coordinate the provision of entrepreneurial assistance to veterans and service-disabled veterans.[163] The Act requires that the agencies enter into MOUs to ensure program coordination.[164]

One of the three statutorily-required MOUs between VA, SBA, and DOL coordinated "vocational rehabilitation services, technical and managerial assistance, and financial assistance to veterans and service-disabled veterans interested in small business assistance."[165] In interviews with Veteran's Service Organizations, the GAO found that the coordination requirements of the MOU were inconsistent and ineffective.[166] Service-disabled veterans still had to consult several agencies

161. *Id*.

162. 15 U.S.C. § 657b (2010).

163. *Id*. § 657b(c)(2)(A).

164. *Id*. § 657b(c)(3).

165. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-11R, MULTIPLE AGENCIES PROVIDE ASSISTANCE TO SERVICE-DISABLED VETERANS OR ENTREPRENEURS, BUT SPECIFIC NEEDS ARE DIFFICULT TO IDENTIFY AND COORDINATION IS WEAK 4 (2008).

166. *Id*. at 8.

before obtaining the necessary information to start up their small business.[167]

The lack of coordination between agencies creates a confusing, time-consuming process that often constitutes an insurmountable barrier to veterans seeking assistance.[168] The GAO found that the lack of coordination between the three agencies was due to pre-existing animosity between the agencies and a lack of knowledge within participating agencies about the statutory requirements of the law and the MOU.[169] Similarly, hydrokinetic project developers will likely find that the MOU between FERC and the DOI does not solve the jurisdictional dispute or increase coordination between the agencies.

Each of these examples illustrates how informal agreements not codified in statutes or rules lack a legal mandate to ensure inter-agency cooperation. Without specific procedures for monitoring and evaluation to ensure agencies provide streamlined service to their constituents, MOUs are often ineffective in resolving jurisdictional disputes or encouraging inter-agency cooperation. Though the MOU between DOI and FERC addresses the jurisdictional dispute, few specific guidelines, enforcement mechanisms or accountability procedures will not lead to increased collaboration between the two agencies.

B. Scientific Uncertainty and Inflexible Statutory Mandates Require Protracted Environmental Reviews by Natural Resources Agencies

The NMFS must meet the mandates of the ESA, MMPA and Magnuson-Stevens Fisheries Act with incomplete information about hydrokinetic projects' impacts. This scientific uncertainty leads to protracted environmental reviews. At a hearing before the U.S. House of Representatives on the hydrokinetic energy technology, Craig Collar, the Senior Manager for Snohomish Public Utility District, in charge of their tidal projects stated:

> [G]iven the presence of endangered salmon and killer

167. *Id.*

168. *Id.*

169. *Id.*

> whales in Puget Sound, NMFS feels that they have little latitude to accept anything less than extremely detailed and rigorous studies in order to support their environmental analysis. While Snohomish has conducted or committed to approximately $1 million in pre-installation and baseline studies. . .for the pilot project, NMFS is reluctant to state with any certainty that this baseline information is sufficient. . .It seems clear that so long as key resource agencies are not enabled to effectively balance the proactive facilitation of renewable energy efforts with their existing responsibilities, the progress of renewable energy in the U.S will advance at a pace unlikely to meaningfully address our country's energy and environmental challenges.[170]

Mr. Collar's comments highlight the challenges federal natural resource agencies face in meeting their mandates under the ESA, MMPA and the Magnuson-Stevens Fisheries Act. The Council on Environmental Quality (CEQ), responsible for implementing NEPA,[171] recognizes coordination between NEPA and the ESA as a major hurdle to efficient implementation of the environmental reviews required for federal agency concurrence.[172] Other federal agencies and implementing partners also attest that overlapping environmental statutory responsibilities tend to result in duplicative analyses.[173]

Though federal natural resource agencies, such as the NMFS, may rely on EIS's completed by BOEM and FERC, the uncertain environmental effects of hydrokinetic projects will lead to additional environmental analysis. However, as noted

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170. *Marine and Hydrokinetic Energy Technology: Finding the Path to Commercialization: Hearing Before the H. Comm. On Science and Technology, Subcommittee on Energy and Environment*, 111th Cong. 17 (2009) (statement of Craig Collar, Senior Manager, Energy Resource Development, Snohomish Public Utility District No. 1).

171. 42 U.S.C. § 4342 (2010).

172. THE NEPA TASK FORCE, REPORT TO THE COUNCIL ON ENVIRONMENTAL QUALITY: MODERNIZING NEPA IMPLEMENTATION 80-81 (2003) [hereinafter MODERNIZING NEPA IMPLEMENTATION], *available at* http://ceq.hss.doe.gov/ntf/report/finalreport.pdf.

173. Task Force on Improving the National Environmental Policy Act and Task Force on Updating the National Environmental Policy Act, Committee on Resources, 109th Cong., Initial Findings and Draft Recommendations, 16 (2005) [hereinafter Draft Recommendations – NEPA].

by Mr. Collar above, additional studies will not provide the certainty required under the ESA, MMPA and the Magnuson-Stevens Fisheries Act. Scientific uncertainty, exacerbated by the "best available science" requirement, the lack of baseline data and the inflexibility of the applicable statutes, mandates additional EIS's that lengthen the permitting process without providing additional environmental protection.[174]

1. *Uncertain Science and the "Best Available Science" Mandate Create Unrealistic Data Collection Requirements*

Most modern environmental statutes, including the ESA, MMPA and the Magnuson-Stevens Fisheries Act, require decisions based on the "best available science"[175] which compels natural resources agencies to gather vast amounts of information to justify their decisions. Congress believes that reliance on scientific inquiry will produce the most objective decision-making process.[176] However, Congress did not define this term of art, leaving its interpretation to agencies and the courts.[177] Implementation of the best available science mandate leads to additional scientific inquiry above and beyond what the courts' interpretation of the statutes requires.[178] In the context of ecological sciences, ecosystem complexity creates additional scientific uncertainty, there is a lack of baseline data and ecologists perform studies over long

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174. Wind and solar energy developers have faced similar siting challenges. Efforts to address this problem include the Fish and Wildlife Service Wind Turbine Guidelines Advisory Committee, created to develop siting guidelines for wind energy projects that avoid adverse impacts on wildlife and their habitats. *See* U.S. Fish and Wildlife Service, *Wind Turbine Guidelines Advisory Committee Recommendations* (2010), *available at* http://www.fws.gov/habitatconservation/windpower/wind_turbine_guidelines_advisory_committee_recommendations_secretary.pdf.

175. *See, e.g.,* 16 U.S.C. §§ 1533(b)(1)(A), (b)(2) (2010); 16 U.S.C. §§ 1536(a)(2), (c)(1) (2010); 16 U.S.C. §§ 1362(19)(B), (27)(A) (2010); 16 U.S.C. §§ 1371(a)(3)(A), (4)(C) (2010); 16 U.S.C. § 1373(a) (2010); 16 U.S.C. §§ 1374 (c)(5)(C)(ii), (h)(3)(B) (2010); 16 U.S.C. § 1801(c)(3) (2010).

176. *See* Michael Brennan, *The Endangered Species Act: Thirty Years of Money and Science: Square Pegs and Round Holes: Application of the "Best Scientific Data Available" Standard in the Endangered Species Act*, 16 TUL. ENVTL. L.J. 387, 390 (2003); Holly Doremus, *The Purposes, Effects, and Future of the Endangered Species Act's Best Available Science Mandate*, 34 ENVTL. L. 397, 419 (2004).

177. *See* Brennan, *supra* note 176, at 404.

178. Doremus, *supra* note 176, at 424 (noting that many courts have required natural resource agencies to perform additional environmental studies to meet the best available science mandate).

periods of time.[179] These factors lead natural resource agencies to make decisions based on incomplete data, or delay decisions to attempt to gather additional scientific information.[180]

Federal agencies are committed to protecting endangered species and habitats, but are also motivated by a desire to avoid costly and time-consuming litigation. In response to the numerous suits brought because of agency decisions under the ESA and other similar statutes, the courts have been tasked with interpreting what Congress intended by "best available science." The courts have found that agencies may not disregard "scientifically superior" evidence in making a decision under the Endangered Species Act,[181] and must make decisions based on the best *available* data, not the best possible scientific data.[182] Generally, agencies do not need conclusive evidence to make a decision under the ESA[183] but the administrative record should include any evidence that is uncertain or contrary to the decision made by the agency.[184]

However, even with guidance from the courts on what is required to meet the best available science mandate of the statutes, in the face of scientific uncertainty of hydrokinetic project impacts on the ocean environment, the NMFS must take additional time and resources to ensure that it has the additional scientific data available to support its decisions. In a survey by CEQ, study participants, including federal agencies, non-profits and businesses, agreed that scientific analysis improves decisions but found that the search for more and better information could significantly delay projects.[185]

In the context of ecological science, where uncertainty and

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179. *See* Steven L. Yaffee, *Ecosystem Management in Practice: The Importance of Human Institutions*, 6 ECOLOGICAL APPLICATIONS 724, 725 (1996); Carden, *supra* note 12, at 203.

180. *See* Wendy Wagner, *Congress, Science and Environmental Policy,* 1999 U. Ill. L. Rev. 181, 262-263 (1999) (noting that scientifically unrealistic mandates have caused decision-making delays in the context of the spotted owl and air toxins).

181. City of Las Vegas v. Lujan, 891 F.2d 927, 933 (D.C. Cir. 1989).

182. Bldg. Indus. Ass'n of Superior Cal. v. Norton, 247 F.3d 1241, 1246 (D.C. Cir. 2001) (emphasis added).

183. Friends of Endangered Species, Inc. v. Jantzen, 760 F.2d 976, 985 (9th Cir. 1985).

184. *Id*.

185. COUNCIL ON ENVTL. QUALITY, EXECUTIVE OFFICE OF THE PRESIDENT, THE NATIONAL ENVIRONMENTAL POLICY ACT: A STUDY OF ITS EFFECTIVENESS AFTER TWENTY-FIVE YEARS 28 (1997) [hereinafter NEPA AT 25 YEARS].

data gaps are inevitable, agencies must implement the challenging statutory mandates of the ESA, MMPA and Magnuson-Stevens Fisheries Act.[186] Long time-horizons for scientific studies of ecosystems and our limited understanding of the interactions within a complex system inherently limit the certainty of decision-making processes.[187] Unlike basic scientific methods in disciplines like chemistry and physics, which rely on controlled experiments and allow for precise and accurate predictions, ecological science depends on information gathered from uncontrolled environments where the interactions of the ecosystem are unknown or misunderstood.[188] There is additional complexity and uncertainty when researchers seek to understand how and why species go extinct or how a particular action will affect a threatened or endangered species.[189] It often takes ten-to-twenty-year studies to understand why a species is in decline. In this context, there is "never enough science available when a decision needs to be made."[190] The best available science mandate, which implies that there is some superior scientific information that is discoverable by natural resources agencies, is ill-suited to the field of ecological science.[191] Federal natural resource agencies, in the face of uncertain science and the best available science mandate, must make prompt, difficult decisions based on incomplete information on how specific projects will affect species as a whole.

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186. *See* Carden, *supra* note 12, at 173 (citing Ronald D. Brunner & Tim W. Clark, *A Practice-Based Approach to Ecosystem Management*, 11 CONSERVATION BIOLOGY 48, 52 (1997)).

187. *Id*.

188. Holly Doremus, *Listing Decisions Under the Endangered Species Act: Why Better Science Isn't Always Better Policy*, 75 WASH. U. L.Q. 1029, 1030 (1997) [hereinafter Doremus, *Listing Decisions*].

189. Brunner & Clark, *supra* note 191, at 54.

190. Carden, *supra* note 12, at 202.

191. *See generally* Ronald D. Brunner & Tim W. Clark, *A Practice-Based Approach to Ecosystem Management*, 11 CONSERVATION BIOLOGY 48, 54 (1997) (positing that basic science principles cannot be the only basis for scientific inquiry in the ecological sciences).

V. DUPLICATIVE ENVIRONMENTAL ANALYSES ARE WASTEFUL, CONFUSING AND FAIL TO MEET NEPA'S GOALS

NEPA is a powerful tool for protecting the environment and helping federal agencies understand the environmental impact of major federal actions. Environmental analysis under NEPA is fundamental to habitat, species and ecosystem protection. Unfortunately, current regulations requiring multiple environmental reviews make the process financially prohibitive for renewable energy project developers, without providing any measurable benefits for the marine environment. Furthermore, multiple EIS's muddle the public comment process, making it time consuming and confusing for interested stakeholders, thereby frustrating NEPA's public outreach goals.[192]

A. *The Financial Cost to Federal Agencies and Renewable Energy Developers is Prohibitive*

NEPA provides meaningful and necessary review of the environmental impacts of a project on the human environment. However, under current regulations for hydrokinetic projects on the OCS, the time and funding necessary for multiple environmental analyses reduces the feasibility of such projects. In the face of increased NEPA litigation, federal agencies spend additional time and money to ensure that NEPA documentation survives challenge in court. Simultaneously, reduced federal agency budgets make it increasingly difficult to meet NEPA mandates. Duplicative NEPA analyses only exacerbate this problem, often resulting in permitting delays and increased costs without providing additional benefits for the natural environment.

The length and complexity of NEPA documentation has increased since the creation of NEPA, with the average Final EIS now 742 pages in length,[193] even though the CEQ regulations suggest that an EIS should normally be no more

192. 40 C.F.R. § 1500.1(b) (2010) ("NEPA procedures must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken.").

193. Draft Recommendations – NEPA, *supra* note 173, at 18.

than 300 pages.[194] The costs of implementation vary tremendously, are difficult to quantify, and are highly dependent on federal agencies' willingness and experience. The Forest Service, the agency with the largest number of EIS's per year,[195] spends about 40% of its annual budget on compliance with NEPA and other environmental statutes.[196] In 2002, the Department of Energy (DOE) spent about $1.5 million on each EIS and $40,000 - $100,000 for each EA at a total cost of $15-20 million per year. Because the DOE oversees complex energy projects, it has among the highest per-analysis rate of all federal agencies.[197]

Though the percentage of EIS's subject to litigation seems insignificant,[198] the costs of avoiding lawsuits have escalated in recent years. By one account, the cost of preparing NEPA related documentation addressing potential litigation concerns increased 200% from the 1980's to 2005.[199] Though the amount of litigation has not increased, federal agencies seem to spend additional money to avoid the possibility.[200]

While the quantity and depth of analysis for NEPA documents increased, many agencies face cuts to NEPA programs. For example, from 1992-2002, the DOE lost 12 NEPA-based staff positions and reduced its contract assistance budget from $7 million to $1.5 million per year.[201]

All of these factors—increased number and length of EIS's, decreased funding for implementing agencies and a perceived increased threat of litigation—extend the time needed to complete NEPA analyses. This analysis is the currently available framework, and is necessary to protect the natural environment. However, overlapping environmental reviews

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194. 40 C.F.R. § 1502.7 (2010).

195. ROBERT SMYTHE & CAROLINE ISBER, NEPA IN THE AGENCIES – 2002: A REPORT TO THE NATURAL RESOURCES COUNCIL OF AMERICA 7 (2002) (performing approximately 150 per year) *available at* http://classwebs.spea.indiana.edu/kenricha/NEPA%20and%20the%20Forest%20Service/NEPA%20-%20Forest%20Service/Smythe-%20NEPA%20in%20the%20agencies.pdf.

196. *Id*.

197. *Id*. at 8.

198. Draft Recommendations – NEPA, *supra* note 173, at 11 (finding that approximately .2% of the 50,000 EIS's filed annually result in litigation).

199. *Id*. at 21.

200. *Id*. at 12.

201. Smythe & Isber, *supra* note 195, at 9.

create an untenable situation for hydrokinetic project developers and without constructed projects that provide concrete evidence of project impacts, duplicative reviews do not provide additional environmental protection.[202]

B. Multiple EIS's Create Confusion for the Public Review Process and Frustrate NEPA's Purpose

The U.S. Supreme Court recognizes the dual purpose of NEPA: first, to require federal agencies to examine their actions' environmental impact, and second, to "inform the public that it has indeed considered environmental concerns in its decision-making process."[203] The public comment process in NEPA sets the bar for other environmental statutes and is integral to ensuring federal accountability in decision-making. Without NEPA's public participation requirement, environmental decision-making would be subject to additional appeals and litigation.[204] In fact, the public seems increasingly interested in NEPA analyses.[205] Agencies that effectively and efficiently include interested parties in decision-making processes are more likely to avoid delays and potential litigation.[206]

Multiple EA's and EIS's may hinder the public participation component of the NEPA review. Congressional studies found that "the increasing length and complexity of NEPA documents is having a negative impact on public participation."[207] Interested organizations and individuals have a limited amount of time to provide substantive and useful comments to increasingly complex EIS's. With multiple environmental analyses for each project, the amount of documentation only increases, creating an additional burden for stakeholders. This confusion may delay the process and increase public frustration. All of these factors confound one of the primary aims of NEPA: to ensure that the public is fully informed of the environmental consequences of federal

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202. *See supra* Section IV.B.

203. Baltimore Gas & Elec. Co. v. Natural Res. Def. Council, 462 U.S. 87, 97 (1983).

204. Draft Recommendations – NEPA, *supra* note 173, at 22.

205. MODERNIZING NEPA IMPLEMENTATION, *supra* note 172, at 14.

206. NEPA AT 25 YEARS, *supra* note 185, at 18.

207. Draft Recommendations – NEPA, *supra* note 173, at 23.

action.[208]

VI. A STREAMLINED PROCESS WILL CREATE CERTAINTY AND PROTECT THE OCEAN ENVIRONMENT

A revised process that limits duplicative environmental reviews and establishes reliable environmental data for decision-makers will serve all interested parties and protect the ocean environment. BOEM and FERC can rely on efficient processes to encourage commercial-scale renewable energy and the NMFS can meet its statutory mandate to protect the ocean environment.

A simplified regulatory process will provide project developers with the certainty to move forward with commercial-scale projects in an environmentally safe manner. The public will benefit from an efficient comment and review process and, in the long term, increased availability of renewable energy with a reduced carbon footprint. Finally, and most importantly, a streamlined process will protect species and habitat, encourage renewable energy, and contribute to climate change mitigation.

A. *BOEM Should Simplify the Environmental Review Process*

BOEM should revise its current renewable energy rules to limit the number of environmental reviews necessary for a hydrokinetic lease on the OCS. In collaboration with FERC and the NMFS, a programmatic EIS performed early in the leasing process for each of the ten regional areas of the OCS[209] will streamline the process and serve the interests of agencies, the public, project developers and the ocean environment. Programmatic EIS's provide a broad, cumulative, ecosystem-based understanding of the human environment and allow subsequent, site-specific analyses to build from the information

208. 42 U.S.C. § 4331(a) (2010).

209. The ten regions are Washington/Oregon, Northern California, Central California, Southern California, Western Gulf of Mexico, Central Gulf of Mexico, Eastern Gulf of Mexico, South Atlantic, Mid-Atlantic, and North Atlantic. *See* Bureau of Ocean Energy Mgmt., Regulation and Enforcement, U.S. Dep't of Interior, Figure 2: Regional Planning Areas on the Outer Continental Shelf, http://www.ocsenergy.anl.gov/guide/ocs/index.cfm (last visited Mar. 24, 2010).

in the programmatic EIS.[210] Though the programmatic EIS requires substantial effort, it will eliminate the need for additional environmental analyses during the leasing process. The final lease can be considered analogous to a FERC preliminary permit, which does not require an additional EA or EIS.

1. *BOEM Should Perform a Programmatic EIS for a Lease Area at the Call For Information Stage*

BOEM's current rules require a NEPA analysis at both the *Call for Information Stage* and at the lease sale stage, after submission of a Site Assessment Plan.[211] A more efficient way to account for the environmental effects of hydrokinetic projects is to perform a programmatic EIS[212] at the *Call for Information* stage. This analysis, with input from other federal and state agencies, would benefit the agencies, project developers and the ocean environment.

The programmatic EIS will provide baseline information about the state of the ocean environment at the ecosystem level. An ecosystem approach that looks at a region, rather than at one specific project, will provide data to inform the decision-making processes of NEPA, ESA, MMPA and the Magnuson-Stevens Fisheries Act. Examining the effects of hydrokinetic projects at the ecosystem level will also allow for more effective alternatives and mitigation measures. A programmatic EIS, prior to leasing, would allow BOEM to evaluate the cumulative effects of multiple hydrokinetic projects within a regional lease area.[213] This analysis considers the impacts of each specific project, while incorporating the effect of each additional project over time.

The federal government is currently undertaking similar programmatic analyses for both solar energy and offshore wind energy that can inform BOEM's programmatic EIS for hydrokinetic energy on the OCS.[214]

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210. 40 C.F.R. § 1502.20 (2010); MODERNIZING NEPA IMPLEMENTATION, *supra* note 172 at 35.

211. 30 C.F.R. §§ 285.235, 285.605–285.613 (2010).

212. 40 C.F.R. § 1502.20 (2010).

213. *See* MODERNIZING NEPA IMPLEMENTATION, *supra* note 172, at 39; NEPA AT 25 YEARS, *supra* note 185, at 14.

214. U.S. Dep't of Interior, *News Release: Salazar Launches 'Smart from the Start'*

a. *The Programmatic EIS Will Provide an Ecosystem and Cumulative Understanding of Hydrokinetic Technology Impacts*

The current regulatory approach to environmental protection parses an ecosystem into its component parts and gives an incomplete understanding of the complex interactions in the ocean environment. Applying a programmatic NEPA analysis at the ecosystem level provides a more comprehensive, effective and realistic understanding of the ocean habitat and provides BOEM, FERC and the NMFS with better information.

Generally, ecosystem-level analysis seeks to understand the complex interaction of ecological relationships to plan for the long-term health and diversity of the ecosystem.[215] The processes that shape an ecosystem are complex and inquiry at this level faces challenges of incomplete knowledge and scientific uncertainty.[216] The ever-changing and evolving nature of ecosystems means that effective management of natural resources requires continuous monitoring and adaptive management techniques.[217] Though human resource needs are an integral part of an ecosystem-level management approach,[218] conflict arises when human use outpaces the ability of the natural system to restore itself.

With its many complex interactions, the ocean environment lends itself to an ecosystem management approach. Data gathered through an inter-agency collaborative programmatic EIS would provide the baseline information for natural resource agencies to understand how hydrokinetic projects will

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Initiative to Speed Offshore Wind Energy Development off the Atlantic Coast (Nov. 11, 2010) [hereinafter *Smart from the Start Press Release*], *available at* http://www.doi.gov/news/pressreleases/Salazar-Launches-Smart-from-the-Start-Initiative-to-Speed-Offshore-Wind-Energy-Development-off-the-Atlantic-Coast.cfm; U.S. DEP'T OF INTERIOR, U.S. BUREAU OF LAND MGMT. & U.S. DEP'T OF ENERGY, DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT FOR SOLAR ENERGY DEVELOPMENT IN SIX SOUTHWESTERN STATES (2010) [hereinafter SOLAR DPEIS], *available at* http://solareis.anl.gov/documents/dpeis/index.cfm.

215. Yaffee, *supra* note 179, at 724.

216. Brunner & Clark, *supra* note 191, at 54.

217. *Id*. at 54-55.

218. Jory Ruggiero, *Toward a Law of the Land: The Clean Water Act as a Federal Mandate for the Implementation of an Ecosystem Approach to Land Management*, 20 PUB. LAND & RESOURCES L. REV. 31, 76 (1999); *see also* Carden, *supra* note 12, at 233.

impact fish, marine mammals, habitats and the ocean ecosystem as a whole.[219]

A programmatic EIS gives BOEM the opportunity to plan for future energy development on the OCS and understand how various alternatives cumulatively impact the ocean environment.[220] As the primary regulatory authority for energy projects on the OCS, BOEM knows where all renewable and non-renewable energy projects will be located. A programmatic EIS for hydrokinetic projects could plan for future development by taking non-hydrokinetic planned projects into consideration. Such an analysis can create certainty for project developers and federal natural resource agencies.

b. A Programmatic EIS Will Provide Initial Environmental Analyses that Project Developers and Natural Resource Agencies May Rely On

Information provided in the programmatic EIS would give FERC and the NMFS a head start on site-specific NEPA and ESA environmental reviews, ensuring more efficient project deployment. The solar programmatic EIS[221] and Secretary of Interior Ken Salazar's new "Smart from the Start" initiative[222] for wind power on the OCS are good examples of how a programmatic EIS can serve the interests of federal agencies and project developers.

The CEQ regulations encourage the use of programmatic EIS's and tiering. In tiering, an agency performs a broad EIS "with subsequent narrower statement or environmental analyses. . .incorporating by reference the general discussions and concentrating solely on the issues specific"[223] to the project site. This approach is appropriate when there is a broad program or plan followed by more narrow or site-specific analysis.[224] Effective tiering enables agencies to understand

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219. DOE REPORT, *supra* note 17, at *iii* ("[I]t is important that cumulative environmental impacts be evaluated during the leasing and site-specific permitting of individual projects to ensure informed decision making and the implementation of needed mitigation measures").

220. MODERNIZING NEPA IMPLEMENTATION, *supra* note 172, at 35.

221. SOLAR DPEIS, *supra* note 214, at ES-5.

222. *Smart from the Start Press Release, supra* note 214.

223. 40 C.F.R. § 1508.28 (2010).

224. *Id*.

mitigation efforts on an ecosystem or regional level, thereby, reducing the need for duplicative analysis at the site-specific level.[225]

Recognizing the challenges of implementing renewable energy projects, the Department of Interior (DOI), Bureau of Land Management (BLM) and the Department of Energy (DOE) have addressed environmental concerns of solar and offshore wind energy at the programmatic level. These efforts are intended to address the environmental community's concerns that solar and offshore wind projects have not taken adequate account of their adverse environmental impacts leading to litigation and long permitting processes.[226]

To identify environmental, social and economic effects of utility-scale solar projects, the BLM and DOE recently completed a programmatic EIS.[227] The EIS evaluates the environmental impacts of current solar technologies, the effects of establishing broad Solar Energy Program criteria and strategies, and provides an in-depth environmental analysis of BLM's proposal to create solar energy zones in each of six southwestern states.[228] The draft programmatic EIS provides guidance on areas appropriate for solar development and allows project developers and federal agencies to tier the information for each site-specific analysis.[229] A programmatic EIS prior to project development addresses the environmental community's concerns and engages them early in the process.

Similarly, the DOI recently launched the "Smart from the Start" initiative, intended to streamline the licensing process for offshore wind projects.[230] Current regulations require at least two environmental reviews.[231] This initiative reduces the duplication of reviews by establishing a single region-wide

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225. MODERNIZING NEPA IMPLEMENTATION, *supra* note 172, at 35.

226. *Smart from the Start Press Release*, *supra* note 214.

227. California, Nevada, Utah, Arizona, Colorado and New Mexico. *See* SOLAR DPEIS, *supra* note 214, at ES-1.

228. *Id*. at ES-5.

229. *Id*. at ES-9.

230. *Smart from the Start Press Release*, *supra* note 214.

231. U.S. Dep't of Interior, *Frequently Asked Questions: 'Smart from the Start' Atlantic OCS Offshore Wind Initiative* 2 (2010), *available at* http://www.doi.gov/news/pressreleases/loader.cfm?csModule=security/getfile&PageID=73317.

environmental analysis of "wind energy areas."[232] After identifying potential areas for offshore wind development in Atlantic coastal areas, the DOI will cooperate with other federal and state agencies to gather environmental and geophysical data on possible conflicting uses. This information is made publically available to project developers and BOEM to evaluate lease sales on the OCS.[233] DOI anticipates that this program, once implemented, will decrease the lease process by 6-12 months.[234] The proposed process is similar to a programmatic EIS where agencies may rely on the information provided by the "Smart from the Start" initiative when performing site-specific environmental analyses.

BOEM should implement a similar program to understand hydrokinetic energy impacts on the OCS early in the process. Unlike solar and offshore wind energy, hydrokinetic projects have not yet encountered substantial public controversy over effects on the ocean environment. An early, ecosystem-wide understanding of the short and long term effects of hydrokinetic facilities on the OCS will help BOEM, FERC and project developers avoid the pitfalls of other renewable energy projects and encourage efficient deployment.

2. BOEM Leases Should be Analogous to a FERC Preliminary Permit

Once BOEM performs a programmatic EIS, an additional environmental review at the leasing stage is repetitive. The programmatic EIS can analyze alternatives and provide a basic understanding of the environmental effects for a given geographic area. FERC should undertake the final site-specific environmental analysis during licensing. Final lease issuance, though currently considered a major federal action under NEPA, should be treated similarly to a FERC preliminary permit in the traditional hydroelectric licensing process and not require an additional EA or EIS.

The primary purpose of FERC preliminary permits for traditional hydroelectric projects is to maintain "priority of application for a license" for up to three years.[235] The

232. *Id.*

233. *Id.*

234. *Smart from the Start Press Release*, *supra* note 214.

235. 16 U.S.C. § 797(f) (2006); s*ee also* Delaware River Basin Commission v.

preliminary permit does not give applicants an opportunity to conduct feasibility studies or begin construction.[236] FERC and other federal agencies require additional permits before a project may move forward. Because the preliminary permit does not authorize any action by itself, no EIS is required before issuance.[237]

Courts have found similar situations in which a permit or other federal authorization does not qualify as a major federal action under NEPA.[238] For example, granting a mineral patent, financing an airport for continued operations, and leasing a building to another company are not considered major federal actions under NEPA.[239] The distinguishing factor in these cases is that the permit does not allow the private actor to take action without further approval and therefore does not change the status quo.

BOEM's leasing process for hydrokinetic projects on the OCS is analogous to a FERC preliminary permit in that it does not authorize any action by itself. As the MOU between FERC and BOEM states, "construction and operation of. . .hydrokinetic project[s] cannot commence without a license or exemption from [FERC]."[240] This indicates that a BOEM lease does not authorize action without additional permits from other agencies and does not change the status quo. Under current case law, and in combination with the programmatic EIS, another EIS should not be required for issuance of a final lease. Subsequent site-specific environmental analysis should be undertaken by FERC during the licensing process.

B. Natural Resource Agencies Should Draw on All Available Sources to Streamline Analysis Under the Best Available Science Mandate of Environmental Statutes

Practitioners and scholars recognize the challenges that the

F.E.R.C., 680 F.2d 16, 17 (3d Cir. 1982); City of Bedford v. F.E.R.C., 718 F.2d 1164, 1166 (D.C. Cir. 1983).

236. Sierra Club v. F.E.R.C., 754 F.2d 1506, 1509 (9th Cir. 1985).

237. *Id*.

238. *See* State of South Dakota v. Andrus, 614 F.2d 1190, 1194 (8th Cir.); Burbank Anti-Noise Group v. Goldschmidt, 623 F.2d 115, 117 (9th Cir. 1980); Committee for Auto Responsibility v. Solomon, 603 F.2d 992, 1001-03 (D.C. Cir. 1979).

239. *Id*.

240. DOI-FERC MOU, *supra* note 11, at 2.

"best available science" mandate poses for federal resource agencies.[241] The NMFS must meet this mandate when reviewing the effects of hydrokinetic projects on ocean habitat and species. When science is uncertain or incomplete, as is the case with hydrokinetic projects on the OCS, the NMFS gathers additional environmental information to supplement the NEPA analysis performed by BOEM and FERC.

To remedy this problem and reduce the number of duplicative environmental reviews, NMFS should draw on all available information to understand the effects of hydrokinetic projects on the OCS. Baseline information available from BOEM's programmatic EIS combined with the adaptive management and monitoring potential of hydrokinetic energy projects will help NMFS meet its statutory mandates.

1. *Adaptive Management and Monitoring Ensures Environmentally Sound Implementation of New Technologies*

Adaptive management tools, where projects are continually monitored after being deployed, enable agencies to better understand a project's impact on the ocean environment. This type of monitoring allows for changes over the life of the project and for project removal if warranted. The Oregon Reedsport project is implementing adaptive management strategies and provides an example of adaptive management implementation for future hydrokinetic projects.[242]

Adaptive management is "an iterative process used by resource managers to improve management processes over time when environmental impacts are uncertain."[243] In the face of scientific uncertainty and gaps in data about hydrokinetic projects' impact, adaptive environmental management provides a short- and long-term solution. Adaptive management gives agencies leeway to accept some

241. *See* Doremus, *supra* note 176; Doremus, *Listing Decisions, supra* note 188; Brennan, *supra* note 176; Wagner, *supra* note 180; Carden, *supra* note 12.

242. Joint Explanatory Statement for the Settlement Agreement, Regarding Construction and Operation of the Reedsport OPT Wave Park, FERC No. 12713 (2010) (hereinafter Reedsport Settlement Agreement).

243. Cherise Oram & Chad Marriot, *Using Adaptive Management to Resolve Uncertainties for Wave and Tidal Energy Projects*, OCEANOGRAPHY, June 2010 at 93.

uncertainty in their initial decision to permit a project.[244] Continuous project monitoring provides real-time data so decision-makers may revise or terminate projects in order to adapt to environmental realities and technological changes.[245]

In analyzing the success of NEPA after 25 years of implementation, CEQ recognized the value of adaptive management, finding that "where resources are not likely to be damaged permanently, where a project may be modified once begun, and where there is an opportunity to repair past environmental damage, an adaptive environmental management approach"[246] may be the best way to protect the natural environment and achieve project goals. The CEQ recommends establishing criteria to recognize "significant" environmental damage to the ecosystem that would warrant a change or cancellation of an already implemented project. This approach allows agencies to accept some initial scientific uncertainty, monitor the project impacts over the life of the project and "ensure that significant [environmental] degradation does not occur." [247]

Hydrokinetic projects are uniquely positioned to benefit from adaptive management techniques because they are not permanent and are subject to modification. Adaptive management will help federal agencies and project developers identify uncertainty, develop alternative strategies, monitor those strategies, and connect monitoring to a decision-making process.[248] Future projects will benefit from data gathered by current hydrokinetic facilities.

The first hydrokinetic project to implement adaptive management strategies, the Reedsport OPT Wave Project (Reedsport), located in Oregon state waters and not on the OCS,[249] is leading the way for future hydrokinetic energy projects. Reedsport is applying for a license for five

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244. Stephanie Tai, *Three Asymmetries of Informed Environmental Decisionmaking*, 78 TEMP. L. REV. 659, 716 (2005)*; See also Carden, supra* note 12.

245. *Tai, supra* note 244, at 717.

246. NEPA AT 25 YEARS*, supra* note 185, at 33.

247. *Id*.

248. Brunner & Clark, *supra* note 191, at 54; DOE REPORT*, supra* note 17, at 49-50; Oram & Marriot*, supra* note 243, at 92.

249. Oregon state waters include water extending from the Oregon coast to three miles offshore. Because the Reedsport Project is in state waters, FERC, rather than BOEM, has full jurisdiction. *See Outer Continental Shelf, supra* note 1.

PowerBuoys 2.5 miles off the coast of Oregon.[250] Reedsport's adaptive management plan includes collaboration with project developers, state and federal agencies and public interest groups to schedules analyses of environmental conditions before and after project development.[251] Through this plan, Reedsport is addressing concerns about wave power effects on marine mammals, while illustrating how adaptive management may work for other hydrokinetic facilities. The project developer is implementing a three-phase study to respond to concerns about how the PowerBuoys will affect gray whales and harbor porpoises whose migratory routes cross the Reedsport site.[252] The first phase occurred from December 2007 to May 2008 and determined baseline characteristics of local whale behavior prior to the introduction of wave power facilities. Phase II will characterize the acoustic emissions of the wave energy conversion facilities and model the whales' possible responses after deploying the first test buoy. Finally, after full deployment of the ten PowerBuoys, Phase III will monitor whale migration behavior around the buoys, and whether their migration patterns change in response to the wave power facility.[253] This pre- and post-implementation monitoring will include studies of electromagnetic fields, pinnipeds, fish and invertebrates, offshore bird use and wave, current, and sediment transport.[254] These studies will assure FERC and other stakeholders that the project will not have significant adverse impacts and will be subject to modification if adverse impacts are discovered through the monitoring process.

Adaptive management, if implemented in a collaborative way that incorporates the concerns of interested parties, will allow project developers and the NMFS to accept some scientific uncertainty in implementing projects. This uncertainty can be at least partially mitigated through the monitoring process and the adaptive nature of hydrokinetic

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250. PowerBuoy's are a wave energy converter developed by Ocean Power Technologies. *See* Ocean Power Technologies, *Making Waves in Power*, *available at* http://www.oceanpowertechnologies.com/ (last visited Mar. 18, 2011); Reedsport Settlement Agreement, *supra* note 242, at 4.

251. *Id*. at 14.

252. *Id*. at 17–18.

253. *Id*.

254. *Id*. at 15–16.

projects, thereby providing more streamlined, efficient project review.

2. Marine Spatial Planning Provides a Long Term Solution

Marine spatial planning, when conducted in a balanced way that considers all stakeholders equally, provides a long-term opportunity to understand the conflicting uses of the OCS. Federal and state agencies can map the ocean to determine hydrokinetic project site placement with input from environmental groups, renewable energy interests, commercial fishermen and other commercial interests.

Marine spatial planning is "a public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives,"[255] to reduce user conflicts, encourage ecosystem analysis and lead to a better understanding of the cumulative effects of human activity on the ocean environment.[256] Ocean resource managers create a comprehensive plan for the ocean, identifying priority areas for commercial activities like mining, energy and fishing, and for conservation of sensitive marine habitats.[257] Implementation of a comprehensive marine spatial plan will "improve planning and regulatory efficiencies, decrease associated costs and delays, engage affected communities and stakeholders, and preserve critical ecosystem functions and services."[258]

In the absence of marine spatial planning efforts at the federal level, many state and regional bodies have begun to map their coastal zones. In 2005, Washington established the Washington State Ocean Policy Work Group to summarize the value of ocean resources to the state economy and quality of life and provide recommendations for the management and

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255. Marine Waters Planning and Management, 2010 Wash. Sess. Laws 6350.

256. *See* COUNCIL ON ENVTL. QUALITY, FINAL RECOMMENDATIONS OF THE INTERAGENCY OCEAN POLICY TASK FORCE 7 (2010) [hereinafter FINAL RECOMMENDATIONS OF OPTF], *available at* http://www.whitehouse.gov/files/documents/OPTF_FinalRecs.pdf; WASHINGTON STATE DEP'T OF ECOLOGY, DRAFT REPORT: MARINE SPATIAL PLANNING IN WASHINGTON 4 (2010) [hereinafter MARINE SPATIAL PLANNING IN WA], *available at* www.ecy.wa.gov/programs/sea/msp/pdf/Draft_MSP_Report.pdf.

257. MARINE SPATIAL PLANNING IN WA, *supra* note 256, at 4.

258. FINAL RECOMMENDATIONS OF OPTF, *supra* note 256, at 7.

improvement of these resources.[259] This group began marine spatial planning efforts after the passage of the Washington State Marine Spatial Planning Bill in March 2010.[260]

Concurrent with state-level efforts, Washington, Oregon and California formed the West Coast Governors Agreement on Ocean Health in 2006[261] to address the recommendations of the U.S. Commission on Ocean Policy[262] and the Pew Center.[263] This agreement commits the states to collaboratively address coastal waters, beaches and habitats, ecosystem-based management, offshore development, ocean education and literacy, increased scientific monitoring and research, and sustainable economic development.[264]

Although this agreement is not officially a marine spatial planning effort, the information acquired via the renewable energy work group can form the basis of a regional marine spatial plan. The renewable energy work group recommends gathering additional information about the environmental effects of renewable offshore energy and improving project siting.[265] This effort would include creating "maps that display many types of spatial data such as important areas for key biological resources or habitats and human activities using coastal and ocean resources, and baseline information on physical environment and infrastructure."[266] This information

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259. THE OFFICE OF THE GOVERNOR, WASHINGTON OCEAN ACTION PLAN: ENHANCING MANAGEMENT OF WASHINGTON STATE'S OCEAN AND OUTER COASTS 8 (2006).

260. 2010 Wash. Sess. Laws 6350, *supra* note 255 (requiring an interagency team to make recommendations for moving forward with marine spatial planning by the end of 2010. It directs state agencies, subject to the availability of federal or other non-state funds, to compile spatial data, develop guidance on siting renewable energy facilities and begin marine spatial planning for Washington state waters).

261. SUSTAINABLE COASTAL COMMUNITIES ACTION COORDINATION TEAM, WEST COAST GOVERNORS' AGREEMENT ON OCEAN HEALTH (2006), [hereinafter AGREEMENT ON OCEAN HEALTH], *available at* http://westcoastoceans.gov/docs/WCOcean Agreementp6.pdf.

262. U.S. COMMISSION ON OCEAN POLICY, FINAL REPORT, AN OCEAN BLUEPRINT FOR THE 21ST CENTURY (2004), *available at* http://www.oceancommission.gov/.

263. PEW OCEANS COMMISSION, AMERICA'S LIVING OCEANS: CHARTING A COURSE FOR SEA CHANGE (2003), *available at* http://www.pewtrusts.org/our_work_report _detail.aspx?id=30009.

264. AGREEMENT ON OCEAN HEALTH, *supra* note 261.

265. SUSTAINABLE COASTAL COMMUNITIES ACTION COORDINATION TEAM, WEST COAST GOVERNORS' AGREEMENT ON OCEAN HEALTH, EXECUTIVE OVERVIEW OF THE ACTION COORDINATION TEAMS' FINAL WORK PLANS 26 (2010), *available at* http://westcoastoceans.gov/docs/WCGA_Executive_Overview_Final.pdf.

266. *Id*.

will contribute to and inform both state and federal-level marine spatial planning efforts.

At the federal level, President Obama established the National Ocean Council and a process for development of coastal and marine spatial plans that build upon existing state and regional processes.[267] This Executive Order adopts Interagency Ocean Policy Task Force recommendations and directs the National Ocean Council to establish marine spatial plans for the nine established regions[268] by 2015.[269]

When completed, the marine spatial plan will provide agencies and project developers with the information necessary to site and license hydrokinetic projects more effectively and efficiently. Agencies and developers will have baseline information on each site and will have priority sites already identified. However, to ensure that marine spatial planning serves the interests of both renewable energy developers and the conservation of ocean habitat and species, the planning process must represent all interests equally. Conflicts may arise over productive areas for wave and tidal energy when such areas are also sensitive marine habitats. The challenge for managers of the regional marine spatial planning efforts will be to balance the interests of all parties to ensure that protection of the marine environment is balanced with the need for clean, renewable energy sources that will provide long-term benefits for the ocean environment.

VII. CONCLUSION

Climate change is the greatest environmental challenge to current and future generations. The oceans are particularly susceptible to rising atmospheric CO_2 and will continue to acidify and warm as we emit more greenhouse gases. To mitigate the impact of climate change, we must draw on all possible tools in the transition to a cleaner, renewable energy economy. Hydrokinetic energy on the OCS has the potential to be an important part of these efforts.

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267. Exec. Order No. 13547, 75 Fed. Reg. 43021 (July 22, 2010), *available at* edocket.access.gpo.gov/2010/pdf/2010-18169.pdf.

268. FINAL RECOMMENDATIONS OF OPTF, *supra* note 256, at 52 (noting that the nine regional planning areas include Alaska/Artic, Pacific Islands, West Coast, Northeast, Mid-Atlantic, South Atlantic, Gulf of Mexico, Great Lakes, and Caribbean).

269. *Id*. at 8.

The current regulatory structure, which requires duplicative environmental reviews, can be modified to encourage the environmentally safe and efficient deployment of hydrokinetic energy. Implementing a programmatic EIS at an early stage of the leasing process will provide a comprehensive, ecosystem-based understanding of the potential effects of, and alternatives to, hydrokinetic projects on the OCS. Other federal agencies can rely on this comprehensive overview for their subsequent environmental reviews of specific projects. This programmatic EIS will also eliminate the need for an additional NEPA analysis during the leasing stage as FERC can undertake site-specific environmental analysis during the licensing stage.

The NMFS, tasked with implementing the ESA, MMPA and the Magnuson-Stevens Fisheries Act, should capitalize on all available means and methods to implement these important ocean conservation statutes. For projects like hydrokinetic facilities, that are removable, impermanent and offer substantial long-term benefits to the ocean environment, natural resource agencies should accept additional scientific uncertainty when implementing their statutory mandates. Adaptive management approaches will allow for pre- and post-implementation monitoring to mitigate scientific uncertainty and provide additional information for future hydrokinetic projects. Marine spatial planning, if implemented in a balanced way and in consideration of all stakeholders, provides a long-term solution for optimal siting of hydrokinetic facilities.

The urgency of climate change requires we do everything possible to ensure that new hydrokinetic technologies are efficiently implemented with minimal adverse impact to natural systems. Unfortunately, the current regulatory structure, which requires multiple, overlapping environmental reviews, delays the deployment of hydrokinetic projects. Small changes to the current regulations that shorten the leasing and licensing process will benefit the ocean environment, project developers, federal and state agencies, and the public.