A New Vision For California Ocean Governance: Comprehensive Ecosystem-Based Marine Zoning

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> Sound ocean policy requires managers to simultaneously consider the economic requirements of society, the need to protect the nation's oceans and coasts, and the interplay among social, cultural, economic, and ecological factors. These factors are closely intertwined, just like the land, air, sea, and marine organisms. . . . Ocean policies cannot manage one activity, or one part of the system, without considering its connections with the other parts.
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> United States Commission on Ocean Policy
> *An Ocean Blueprint for the 21st Century* (2004)

I. INTRODUCTION

California coastal waters support a vast and diverse array of marine resources and human uses. Continued population growth, particularly in coastal communities, and relentless development pressure have put our marine resources under increasing stress and have put human uses of them, broadly defined, in increasing conflict. The state's existing, fragmented regulatory regime for ocean and coastal resources is ill-equipped to address the policy challenges that lie ahead. A new blueprint for California ocean governance is necessary.

This paper briefly examines the existing infrastructure of laws and regulations that govern marine resource uses along the California coast, identifies some of the fundamental shortcomings in that infrastructure, and explores alternative approaches that can both protect marine ecosystems and reduce user conflicts. Our objective is to foster and inform the emerging dialogue around alternative ocean governance regimes and to do so in a way that recognizes both the legitimate interests of existing stakeholders, including various expert agencies, and the need to preserve California's unique coastal heritage. We conclude that the development of place-based ecosystem planning and management which moves California away from the single-species, single-resource, single-use system of regulation that has characterized marine and coastal regulation for decades, may best achieve the twin goals of resource protection and conflict reduction.

To succeed in achieving these two goals, a new marine

management regime should, in our view, satisfy several criteria. First, it should facilitate coordination among key agencies by ensuring that they adhere to a fundamental set of guiding management principles. Second, it should reduce uncertainty for current and future coastal users, such as those seeking to develop new marine-related activities (e.g., liquefied natural gas terminals, aquaculture facilities, desalination plants, and ocean energy projects), by providing a mechanism and a mandate for prospective marine planning. Finally, it should include sufficient flexibility to adapt to changing uses and circumstances over time, including the inevitable changes caused by global warming. The existing fragmented California ocean governance system cannot achieve these objectives, as it contains neither the legal authority nor the institutional incentives necessary to do so. A carefully designed governance regime built upon coordinated marine spatial planning *and* management provides a potentially viable alternative for both protecting ocean resources and reducing conflict and uncertainty for users of the marine environment.

The vision for a comprehensive and integrated area-based marine governance system that we put forth in this paper is largely, though not entirely, a new direction for California and undoubtedly will require new state legislation. Yet it builds directly on some important initial steps already taken in recent forward-looking legislation such as the Marine Life Protection Act and the California Ocean Protection Act. Our governance reform proposal uses and expands on the basic architecture created by these statutes, and the lessons learned thus far from their implementation, to create a more robust and enduring system of marine ecosystem management for the twenty-first century.

In particular, we recommend new legislation that would create a structure and process for rudimentary "marine zoning" within state coastal waters. To be effective, such legislation must include sufficiently detailed substantive guidance, as well as mandatory directives, to those agencies with jurisdiction over coastal resources. At the same time, it must provide enough procedural flexibility to allow for stakeholder participation, the incorporation of emerging scientific knowledge, and adaptation over time. After evaluating various management regimes for achieving these multiple objectives, we conclude that the most viable and durable legislative option would (1) impose clear statutory directive on a broadly composed interagency governmental entity for the

"zoning" of state coastal waters into three or four general planning districts, (2) develop and implement a set of Ecosystem Management Principles to govern use decisions within the resulting zones by all state agencies with regulatory authority over marine and coastal resources, and (3) construct a system for managing interagency conflicts and holding agency decisionmakers accountable.

Change is never easy, but in this case it is necessary. If California's marine resources and the human uses they support are to flourish in the decades ahead, our historically unsuccessful management practices must adapt and change. Single resource management is no longer consistent with our scientific understanding of how marine systems function. Instead, California must find a way to implement ecosystem-based management that accommodates both the principles of conservation biology and our continuing need to access, use, and enjoy the ocean's bounty. While flexibility and adaptation are significant components of such a management regime, we also recognize the political and economic importance of creating certainty for those who use and depend upon coastal and ocean resources. We believe integrated marine spatial planning, explicitly tied to ecosystem function, holds promise for achieving sustainability without significant social dislocation.

II. STATEMENT OF THE PROBLEM

A. *Overexploitation of California's Ocean Resources Has Intensified User Conflicts and Threatens the State's Economy and Natural Heritage*

1. *Marine and coastal resources play a central role in California's history and economy.*

California's identity as a state and its powerhouse economy have been built in large measure on its rich natural heritage of marine and coastal resources. From abundant fisheries and coastal estuaries to convenient ports of entry to the broad sandy beaches and beautiful rocky shorelines that lure coastal recreation and tourism, the state's diverse coastal communities are primary drivers of economic activity and aesthetic enjoyment. Today, some seventy-seven percent of California's population lives on or near the coast, and employment continues to grow more rapidly along the coast

than inland.[1] Altogether, California's nineteen coastal counties are responsible for roughly $1.15 trillion in economic activity, or about eighty-six percent of the state's annual gross product.[2] The actual "ocean economy," more narrowly defined as those activities that derive at least some portion of their value from the ocean and its resources, provides more than 408,000 jobs and more than $11.4 billion in wages.[3] The total gross state product from the ocean economy in 2000 was nearly $43 billion annually[4]—more than twice the contribution from California's agricultural activity.[5]

While gross state product and employment derived from California's ocean economy continued to increase during the 1990s, the uses of coastal resources began to shift dramatically. Economic activity in virtually every traditional sector of the ocean economy declined over the course of the decade, with the exception of coastal tourism and recreation, which increased sharply. Economists studying this phenomenon have explained that "[t]his trend . . . represents a profound shift in how the ocean relates to the economy, towards services and away from goods-related economic activity."[6]

All sectors of the state's ocean economy except tourism and recreation experienced reduced economic activity in the 1990s, but the commercial fisheries and seafood processing sectors

1. JUDITH KILDOW & CHARLES S. COLGAN, NATIONAL OCEAN ECONOMICS PROGRAM, CALIFORNIA'S OCEAN ECONOMY 5 (2005). This study is based on data from 2000 and the economic trends noted by its authors are, for the most part, from the 1980's and 1990's. More current aggregate data are not available, but there is no reason to believe that long-term trends have changed over the last several years.

2. *Id.* at 1.

3. *Id.* at 21. When indirect employment and wages are included, these numbers increase to nearly 694,000 jobs and over $24 billion in wages.

4. *Id.*

5. In 2003, all agriculture sector activity in California, broadly defined as "farm production, forestry, fishing, hunting, and support service such as soil preparation, planting, harvesting, and management, on a contract or fee basis," accounted for just under $21 billion. Agricultural Issues Center, University of California, Davis, *Agriculture's Role in the Economy*, *in* THE MEASURE OF CALIFORNIA AGRICULTURE 2006, at 2-3 (Preprint Draft Nov. 29, 2006), *available at* http://aic.ucdavis.edu/publications/MOCA_Ch_5.10aPrePrint.pdf. To the extent that marine fish production is counted as part of both the ocean economy and the agricultural economy in these two different studies, there obviously is some duplication. But even if true, that fact does not diminish the significance of the data – that California's coastal resources play a more substantial role in the vitality of the state's economy than does agriculture.

6. KILDOW & COLGAN, *supra* note 1, at 24.

suffered the most dramatic declines in relative terms.[7] Although accurate economic data on the commercial fishing sector are difficult to come by, precipitous downward trends are evident. From 1982 through 1999, California's total fishing fleet declined from roughly 6,700 vessels to just 2,700 vessels. Furthermore, the commercial fleet landed 1.3 billion pounds of fish and invertebrates in 1976, but only 650 million pounds in 2000, a fifty percent reduction over the course of two and a half decades.[8] Landings of finfish, shellfish, tuna, ground fish, urchin, shark, swordfish, salmon, and abalone all experienced steep declines between 1970 and 1990.[9] Kelp and sea vegetable harvesting also fell off dramatically between 1970 and 2000.[10] As explained further below, these declines in living marine resources and the economic activity derived from them are due primarily to the failure of resource management practices to prevent anthropogenic damage (over fishing, habitat destruction, pollution, etc.).

In contrast to these declines in traditional resource extraction activities, tourism and recreational uses of the coastline have increased tremendously in recent years. These uses encompass economic activity at coastal hotels and restaurants, marinas, coastal watersports businesses, recreational boating harbors, and recreational fishing facilities and stores, as well as direct coastal recreation such as boating, swimming, recreational fishing, surfing, kayaking, diving, and snorkeling. Overall economic activity in this sector increased over the 1990s by roughly sixty-two percent.[11] Beach visitations alone accounted for $3 billion in economic activity and as much as another $2 billion in non-economic (consumer surplus) value.[12] Non-economic benefits from other, non-beach activities such as recreational boating and wildlife viewing also add to the intrinsic value of marine and coastal resource uses, although monetary estimates of that value have not been computed.

The Governor of California has stated that "California's

7. *Id.* at 33.
8. *Id.* at 34.
9. *Id.* at 34-37.
10. *Id.* at 42-43.
11. *Id.* at 104-05.
12. *Id.* at 112.

coastline and beaches are some of our most valuable assets."[13] As both residents and tourists continue to flock to the California coastline, it will be increasingly difficult—and yet increasingly necessary—to sustain the long-term value of these important state assets.

2. *California has experienced substantial declines in marine ecosystem health.*

By any measure, California's coastal resources, and most especially its living marine resources, are in serious decline. Problems with the state's management and protection of marine resources first came to light in the mid-20th century with the collapse of California's sardine fishery. Since that time, the evidence of declining ecological health has continued to mount. For example:

- Invasive species, like the Asian clam and Chinese mitten crab, have become rooted in California waters. San Francisco Bay alone now hosts more than 234 non-indigenous plant and animal species;[14]
- The west coast rockfish fishery collapsed, threatening the livelihood of 1,200-1,800 commercial fishing boat operators, and leading the Secretary of Commerce to designate the fishery as a "disaster";[15]
- Sewage, industrial waste, dredging, and filling of marshes have severely degraded estuaries. Currently, 40 animal and ten plant species that occur in or depend on California estuaries are threatened, endangered, or protected;[16]
- The combination of degraded spawning habitat, shifting ocean temperatures, and overfishing has led to the listing of several native species of salmon;[17] and

13. Press Release, Governor Arnold Schwarzenegger, Governor Appoints Three Members of the Coastal Commission (May 25, 2004), *available at* http://gov.ca.gov/press-release/3036/.

14. CAL. DEP'T OF FISH & GAME, CALIFORNIA'S LIVING MARINE RESOURCES: A STATUS REPORT 513 (2001).

15. PEW OCEANS COMM'N, AMERICA'S LIVING OCEANS: CHARTING A COURSE FOR SEA CHANGE 36 (2003).

16. CAL. DEP'T OF FISH & GAME, *supra* note 14, at 435.

17. Larry B. Crowder et al., *Resolving Mismatches in U.S. Ocean Governance*, 313 SCIENCE 617, 617 (2006).

- In 2006, a total of 4,644 beach closing and advisory days were reported along the California coast.[18]

The declining health of California's coastal and marine resources can be attributed to the combined effects of rampant coastal development, runoff and pollution from both land- and water-based activities, the invasion of nonnative species, and unsustainable resource extraction.[19] As the United States Commission on Ocean Policy concluded, "[o]ur failure to properly manage the human activities that affect the nation's oceans . . . is compromising their ecological integrity, diminishing our ability to fully realize their potential, costing us jobs and revenue, threatening human health, and putting our future at risk."[20]

The overarching theme of much recent scientific research is that biological diversity is a key to ecosystem productivity, complexity, and resilience in both marine and terrestrial systems. For marine systems, sustained diversity increases productivity, reduces 'leakage' of primary nutrients out of the ecosystem, protects against impacts of disturbance, maintains fisheries yields, and increases recovery rates of overfished species.[21] Given the relationship of diversity to many different elements of ecosystems, researchers have proposed the maintenance of diversity as a "master variable" in discussions of marine ecosystem management.[22] Scale is a pivotal factor in managing for such diversity. Thus, while much attention now focuses on the creation of smaller-scale marine reserves or marine protected areas designed to promote biological diversity, single or isolated marine preserves are unlikely to play a major ecosystem role. Instead, leading researchers have come to believe that interactive networks of protected areas, matched to the scale of marine species and human uses—as opposed to political boundaries—are necessary to

18. NAT. RESOURCES DEF. COUNCIL, TESTING THE WATERS 2007: CALIFORNIA CA.1 (2006).

19. *See, e.g.*, CAL. DEP'T OF FISH & GAME, *supra* note 14, at 29-45 (summarizing threats to coastal resources).

20. U.S. COMM'N ON OCEAN POLICY, AN OCEAN BLUEPRINT FOR THE 21ST CENTURY 3 (2004). The Pew Oceans Commission similarly described American oceans as being in a state of crisis based on the decline of fisheries, loss of wetlands, degradation of water quality, and spread of nonnative species. *See* PEW OCEANS COMM'N, *supra* note 14, at v-vii.

21. Email from Stephen Palumbi, Harold A. Miller Professor of Marine Sciences, Hopkins Marine Station, Stanford University, to Meg Caldwell (May 24, 2007, 10:02:19 PST) (on file with author).

22. *Id.*

preserve the productivity, complexity, and resilience that sustains long-term marine ecosystem health.[23]

3. *Competing demands for declining coastal resources have intensified user and resource conflicts.*

Expanding populations and increased competition for the state's limited and declining coastal resources also have intensified user conflicts almost everywhere along the California shoreline. For instance, there are user conflicts among commercial fishers who employ various gear types (i.e., harpoons vs. drift gillnets vs. longlines), between commercial fishers and sport anglers, and between commercial fishers and the environmental community over the level of bycatch of marine mammals and protected species.[24] A decade ago, the California Resources Agency concluded: "Conflicts between different ocean and coastal recreational activities and commercial operations appear to be increasing in congested harbors, high use open ocean areas, and along the coast. Examples of conflicts include those between recreational craft (personal watercraft, kayaks, wind surfers, rowers) and commercial vessels (tankers, container ships, and ferries), as well as between more unusual activities such as attracting sharks for viewing by paying customers in areas frequented by other users."[25] As we discuss below, proposed new commercial uses of the coastline will only exacerbate these conflicts.

In addition to direct user conflicts, consumptive uses that diminish the conservation value and long-term sustainability of coastal resources and the health of marine ecosystems are inconsistent with the kind of recreational and tourism activities that increasingly fuel much of California's ocean economy. These incompatibilities do not arise solely from extraction or consumption of resources, however. There also are emergent conflicts between water-based uses and land-based activities. For instance, "[a]s tourism continues to grow, it needs space,

23. *Id. See also* Tundi Argardy, *Ocean Zoning Is Coming! Ocean Zoning Is Coming! Music to Some Ears, A Fearsome Sound to Others*, THE W20 OBSERVER (World Ocean Observatory) Feb. 2007, *available at* http://auei.auburn.edu/pdf/w2o.pdf.

24. CAL. DEP'T OF FISH & GAME, *supra* note 14, at 316.

25. CAL. RES. AGENCY, CALIFORNIA'S OCEAN RESOURCES: AN AGENDA FOR THE FUTURE ES-16 (1997).

sometimes outcompeting fisheries for limited dock and shoreline space."[26] Beyond direct competition for space, land-based activities can have significant negative impacts on coastal resources. In 1998, for instance, algal blooms from agricultural and urban runoff killed 400 sea lions off California's central coast.[27]

Durable governance reform designed to address declining marine ecosystem health along the California coastline cannot ignore such use conflicts. Rather, policymakers must strive to incorporate structures and mechanisms that will address use incompatibilities, sustain working seascapes consistent with ecological function, and provide economic actors with some degree of predictability and regulatory certainty. Given the high stakes, we believe that any ecosystem-based management reform which fails to address the need for predictability and conflict resolution is doomed to the same political and legal paralysis that has so often afflicted coastal resource policymaking in California and elsewhere.

4. *The existing regulatory regime is not well-suited to facilitate the orderly siting of new and expanding coastal uses while protecting one of California's most important public trust resources.*

The emergence of new coastal-dependent uses and development portends even greater conflict and regulatory gridlock in the near future. Some of the most significant new industrial-scale demands on the marine environment include liquefied natural gas facilities, desalination plants, coastal aquaculture systems, and renewable energy power projects. Each of these expanding uses, and others like them, will likely encounter potential conflicts with more traditional extractive industries or non-consumptive recreational uses, and each presents its own risks to the state's marine ecosystems. For example, as explained below, proposals for offshore wave energy facilities along the north coast of California have raised questions about those facilities becoming new hazards to navigation, disturbing ecological function, and conflicting with recreational uses. Similarly, liquefied natural gas facilities already have faced stiff opposition from local populations, in both Northern and Southern

26. KILDOW & COLGAN, *supra* note 1, at 34.

27. PEW OCEANS COMM'N, *supra* note 15, at 2, 6.

California, due in part to feared public health and safety threats, as well as potential impacts to marine systems. Processing applications for such facilities in the face of public concern looms as a large challenge for state regulators and, in many cases, also may raise difficult federalism issues. As we briefly explain here, California's existing system of laws and regulations is ill-equipped to resolve the inevitable siting conflicts in any systematic or satisfactory fashion.

a. *Liquefied natural gas facilities.*

Four liquefied natural gas ("LNG") projects remain at various stages in their application review or appeal process for locating new facilities on and along the California coast.[28] The Legislature repealed California's LNG siting act (the LNG Terminal Siting Act of 1977) in 1987.[29] That statute required that the California Coastal Commission identify and rank potential LNG facility sites and relay the rankings to the California Public Utilities Commission for final review and approval. Since 1987, the state's review process for LNG facilities has lacked clarity and predictability. Under the existing legal framework, there is no meaningful way to evaluate or vet in advance the suitability of facility locations along the coast, nor is there an ability to compare and rank potential facility locations against one another.[30] In the end, the acceptability of a facility may

28. As of June 1, 2007, LNG facilities remaining in the California permit review pipeline are: Clearwater Port LNG Project by NorthernStar Natural Gas, offshore Oxnard; Port Esperanza by Esperanza Energy LLC, offshore specific site not determined; SES Terminal LLC Sound Energy Solutions, onshore Long Beach; and Ocean Way LNG Terminal by Woodside Energy, offshore Los Angeles. *See* CAL. ENERGY COMM'N, WEST COAST LNG PROJECTS AND PROPOSALS STATUS UPDATE (Sept. 7, 2007). In April 2007, the BHP Billiton Cabrillo Deepwater Port failed to receive necessary approvals from the State Lands Commission, California Coastal Commission, and the Governor. *See* Press Release, Office of the Governor, Gov. Schwarzenegger Rejects BHP Billiton's Application of LNG Process (May 18, 2007) *available at* http://gov.ca.gov/press-release/6281/. *See also* Matthew Singer, *Coast Clear-For Now*, L.A. CITY BEAT, Apr. 19, 2007, *available at* http://www.lacitybeat.com/article.php?id=5365&IssueNum=202.

29. *See* Analysis of S.B. 412, June 1, 2007, *available at* http://info.sen.ca.gov/pub/07-08/bill/sen/sb_0401-0450/sb_412_cfa_20070602_132710_sen_floor.html.

30. Senator Simitian has introduced an LNG-related bill this session, SB 412. S.B. 412, Cal. Reg. Sess. 2007-2008 (Cal. 2007). This bill would require the California Energy Commission to conduct an LNG Needs Assessment Study to be completed by November 1, 2008. The study must include an assessment of future demand and supply, as well as a determination whether it is feasible to meet California's future natural gas needs without construction of LNG terminals. The proposed legislation directs the California Energy Commission, in consultation with relevant state and federal agencies (including the California Coastal Commission) to evaluate every proposed LNG project, and prohibits the

hinge entirely on its prospective location (for example, whether it is proposed in a highly urbanized area or a marine protected area because LNG facilities can pose significant public health and safety impacts as well as coastal and marine ecosystem impacts) and yet the state has no legal mechanism to screen for site locations early in the application review process.

Currently, LNG project developers must secure a combination of federal, state, and local permits to site and operate LNG receiving and regasification terminals in California. Which federal, state and local agencies are involved in a project is dependent "upon the project's location (land-based on military reservation, other land-based, offshore but within three miles of the shore, and offshore between three and twelve miles of the shore), and interconnection to the natural gas pipeline network (interstate or intrastate)."[31] Ultimately, one federal agency becomes the lead agency for environmental impact review under the National Environmental Policy Act ("NEPA") and one state agency becomes the lead agency under the California Environmental Quality Act ("CEQA").

b. *Aquaculture facilities.*

Another growing industrial activity along the coastline is marine aquaculture (or mariculture), which includes the rearing and harvesting of both marine finfish and shellfish (oysters, abalone, mussel, etc.). At present, there are forty-two registered facilities in California that have been approved to rear marine species. These operations lease more than 1,950 acres on state water bottoms (twelve facilities) and nearly 2,200 acres on tideland grants (seven facilities); the remainder operate on private land.[32] Overall, thirty-six operations are raising bivalve shellfish or

permitting of any LNG facility prior to the state adopting a needs analysis.

31. CAL. ENERGY COMM'N, LIQUEFIED NATURAL GAS IN CALIFORNIA: HISTORY, RISKS, AND SITING 20 (2003). See pages 12 to 20 for a more extensive discussion of the current state and federal permitting situation.

32. Fred S. Conte, Communication Partnership for Science and the Sea (COMPASS), Sacramento Luncheon Briefing: California Marine Aquaculture: Our Current Industry—And, Is There a Future for California in Offshore Aquaculture? (Sept. 12, 2005), *available at* http://www.compassonline.org/meetings/briefings_pcoc_aquaculture.asp; and http://aqua.ucdavis.edu/Articulate/01-CALIFORNIA-MARINE-AQUACULTURE/player.html.

abalone, six are growing marine algae, five are rearing marine fish, and two are farming marine shrimp.[33] As native fisheries decline, there is increasing interest in and demand for both nearshore and offshore mariculture.[34]

Despite recent legislative changes, California continues to have a patchy and incomplete system for regulating marine aquaculture, one that is dependent upon the type of species involved. State law flatly prohibits the farming of salmon and genetically modified organisms.[35] In 2006, the state adopted the Sustainable Oceans Act (S.B. 201) to more closely regulate marine finfish aquaculture. The new law expressly prohibits marine finfish aquaculture in state waters without a lease from the California Fish and Game Commission. The Commission must evaluate a number of criteria before issuing such leases, including, among other things, the appropriateness of the site and whether the lease activity will interfere with other uses or public trust values or unreasonably harm the marine ecology.[36] Marine aquaculture facilities also must comply with all water quality requirements imposed by the State and Regional Water Boards,[37] and with the separate requirements of the California Coastal Act. S.B. 201 attempts to address the overlapping jurisdiction of the Fish and Game Commission and

33. *Id.*

34. For example, the National Offshore Aquaculture Act, introduced as S.1195 in 2005 but never enacted, was intended to encourage investment and development for offshore marine aquaculture (located between the three-mile state waters and the 200-mile exclusive economic zone). Revised versions of the bill, which would give a greater role to the states in the permitting process and allow them to opt out of offshore aquaculture within twelve miles of the coastline, were introduced as H.R. 2010 and S. 1609 in the House and Senate in April and June 2007, respectively. Although development in federal waters is generally beyond the jurisdiction of the state, California may have some role to play in siting such facilities pursuant to the consistency certification process under the Coastal Zone Management Act. 16 U.S.C. § 1456 (Westlaw 2007).

35. CAL. FISH & GAME CODE § 15700 (Westlaw 2007).

36. *Id.* § 15400(b)(1)-(2). The new law also requires the Department of Fish and Game to prepare a programmatic environmental impact report under CEQA for coastal marine finfish aquaculture projects if the Legislature appropriates funds and the aquaculture industry matches such funds. The purpose of the EIR is to evaluate appropriate marine aquaculture sites, designs, and practices that will avoid or minimize environmental impacts, as well as the effects of aquaculture operations on sensitive species and habitat, marine ecosystems, human health, commercial and recreational fishing, and other important ocean uses. *Id.* § 15008.

37. *Id.* § 15400(b)(10). Discharges from these operations typically are subject to Clean Water Act NPDES permits and/or Waste Discharge Requirements issued by the Regional Water Board.

the Coastal Commission by expressly declaring that marine aquaculture facilities are coastal-dependent uses under the Coastal Act, by directing the Fish and Game Commission to identify appropriate sites for such uses, by directing the Coastal Commission (or local agencies with approved local coastal programs) to accommodate aquaculture facilities for as many of these identified sites as possible consistent with the policies of the Coastal Act, and by prohibiting the Coastal Commission from imposing duplicative or more stringent regulatory controls on such facilities.[38] Marine shellfish are not covered by the specific provisions of the new law, but nevertheless remain subject to the leasing and permitting requirements of the same host of state and local agencies.

Thus, while California has begun to integrate the planning for and regulation of aquaculture and to take a closer look at the industry's ecological impacts and potential use conflicts, the existing regime does not fully address interagency jurisdiction issues or provide a complete mechanism for coordinating aquaculture activities with other coastal uses. Some proponents have argued that proactive planning and the designation of particular aquaculture zones is desirable and necessary to foster commercial development and reduce user conflicts.[39]

c. *Desalination facilities.*

Currently, more than twenty new desalination plants are at various stages of planning along California's coast, representing a "70-fold" increase in California's current desalination capacity.[40] Yet, as with LNG, the state's regulatory oversight process for reviewing these proposals lacks coherence and clarity. "[A]s many as 26 state, federal, and local agencies may be involved in the review or approval process for a desalination plant,"[41] yet there is no master planning, site ranking, or overarching policy that provides guidance to these agencies. Therefore each proposal is

38. CAL. PUB. RES. CODE § 30411 (Westlaw 2007).

39. *See* Kristen M. Fletcher & Erin Neyrey, *Marine Aquaculture Zoning: A Sustainable Approach in the Growth of Offshore Aquaculture* (2002), *available at* http://www.olemiss.edu/orgs/SGLC/zoning.htm.

40. PACIFIC INSTITUTE, DESALINATION, WITH A GRAIN OF SALT—A CALIFORNIA PERSPECTIVE 29 (2006).

41. *Id.* at 78.

reviewed on an ad hoc basis according to an atomized system of laws and policies. The stakes are high for California since desalination plants raise critical issues regarding use of the state's public trust resources and potential impacts to the state's growth and development patterns, coastal and marine ecosystems, water supply and quality, energy infrastructure, and transparency in public resource management, to name a few.[42]

d. Ocean renewable energy facilities.

With mounting pressure for renewable energy portfolios under the recently enacted Global Warming Solutions Act (AB 32) and similar legislation, California's long Pacific Ocean coastline is generating increasing interest among investors in wave, wind, and tidal energy development in marine waters. Ocean energy development and its associated transmission lines can take many different forms and may have impacts on marine ecosystems, navigation, commercial or sport fishing, and scenic vistas, among other things. While no ocean energy proposals have yet been presented to state regulators, projects near Half Moon Bay, Fort Bragg, San Francisco, and Avila Beach have all been contemplated.[43] As the San Francisco Chronicle very recently explained, "[a] new California 'gold rush' is on – to stake out claims to prime stretches of ocean along the coast where prospectors hope to harness waves to produce energy."[44]

Proposed offshore wind farm projects along the eastern seaboard have been highly controversial,[45] as have wave energy proposals along Oregon's coastline,[46] and there is no reason to believe that California will escape the same difficult policy choices. Indeed, in what may well be a harbinger of the coming battle, the

42. *See generally* CALIFORNIA COASTAL COMM'N, SEAWATER DESALINATION AND THE CALIFORNIA COASTAL ACT (2004).

43. *See* CALIFORNIA ENERGY COMM'N, OCEAN ENERGY (2007), *available at* http://www.energy.ca.gov/development/oceanenergy/.

44. Charles Burress, *Prospectors Claim Stretches of Ocean, Hoping to Harness Energy*, S.F. CHRON., Nov. 11, 2007, at A1, *available at* http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2007/11/11/MNNPT8U6A.DTL.

45. *See* FARA COURTNEY & JACK WIGGIN, OCEAN ZONING FOR THE GULF OF MAINE: A BACKGROUND PAPER 16 (2003), *available at* http://www.mass.gov/czm/oceanzoningreport.pdf.

46. *See, e.g.*, *Oregon Wave Energy Project Stirs Competing Concerns*, ASSOCIATED PRESS, Sept. 5, 2007, *available at* http://www.surfrider.org/blogger/2007/09/oreogn-wave-energy-project-stirs.asp.

City of San Francisco recently filed a protest to two Pacific Gas & Electric applications pending before the Federal Energy Regulatory Commission for proposed forty-megawatt wave farms off the north coast of California in Humboldt and Mendocino Counties. San Francisco noted that the applications cover some 200 miles and, if considered before FERC reassesses the regulatory regime for such projects, would carry a high risk of "sparking a 'gold rush' by ill-prepared applicants with ill-conceived projects."[47] Perhaps even more telling, the Sonoma County Board of Supervisors is gearing up to file its own application to FERC for a preliminary permit to conduct feasibility testing for wave energy projects off the County's coast, apparently driven largely by concerns about retaining local control of any development that does occur.[48] Both fishing interests and environmental groups have expressed concern with the rush to build wave energy plants on the north coast of California without thorough consideration of their impacts on the ecosystem and on other coastal uses.[49]

As is the case with other new coastal-dependent industrial activities, ocean energy development will likely require the involvement of several state agencies, including the Energy Commission, the Public Utilities Commission, the Coastal Commission, and the State Lands Commission, among others. Currently, however, there is no legal mechanism in state law for

47. *See* Motion to Intervene and Protest by the City and County of San Francisco in Project No. 12779-000 Before the Federal Regulatory Energy Commission (June 15, 2007), *available at* http://blogs.business2.com/greenwombat/wave_power/index.html. The County of Mendocino filed a similar FERC protest to a wave energy project application submitted by Chevron. The company has since withdrawn its application. *See* Press Release, Mendocino County Executive Office, Mendocino County Files Motion to Intervene Regarding PG&E's Mendocino Waveconnect Project (Oct. 17, 2007), *available at* http://www.co.mendocino.ca.us/administration/pdf/2007-10-17%20WaveConnect%20Project.pdf. But with a PG&E wave project still under consideration off Mendocino, concern about the role of local governments in the permitting process continues to be a pressing topic of public discussion in the county. *See* Mendocino County Board of Supervisors, Summary/Action Minutes, Sept. 18, 2007, *available at* http://www.co.mendocino.ca.us/bos/pdf/current/Minutes%2009-18-07.pdf.

48. *See* Press Release, Sonoma County Water Agency, Sonoma Board Considers Action to Protect Sonoma Coast—Wave Energy Proposal Assures Local Control (Nov. 5, 2007), *available at* www.scwa.ca.gov/documents/PressReleaseFERCApplicationSonomaCoast110507_000.pdf. According to FERC, Sonoma's would be the seventh such application from California, none of which have yet been granted. *See* Buress, *supra* note 44. FERC has, however, has granted four of the seven wave energy project applications from Oregon. *Id.*

49. Sonoma County Water Agency, *supra* note 48.

addressing the complicated regulatory issues raised by these overlapping jurisdictional authorities and no guidance on how state and local agencies might address the looming federalism concerns posed by the FERC licensing process.

5. *Comprehensive ecosystem-based marine zoning holds promise for more effective governance of California's coastal commons.*

The policy challenge, then, is to find a workable balance between the pressing ecological need for science-based, flexible, adaptive management over time and the desire of those who use and depend upon the marine environment for the regulatory certainty that facilitates sound economic investment. Our prescription for balancing these often competing goals is for California to adopt some form of area-based marine ecosystem planning and management—or what we call "ecosystem-based marine zoning"—for the state's coastal waters. The management regime that we envision involves the creation of a comprehensive system of marine zones or planning districts where specific activities or categories of activities are permitted, conditionally permitted, or prohibited. In contrast to the fragmented, largely reactive regulatory regime that currently governs California ocean policy (discussed further below), a comprehensive and coordinated place-based management approach has several potential advantages. It can provide prospective spatial and temporal compatibility planning consistent with ecological function, protect valuable ecosystem goods and services, accommodate important existing or potential future use patterns, and enhance regulatory certainty for coastal ecosystem users. If properly constructed, such a governance system also can provide the flexibility needed to respond to ecological changes, such as those that will inevitably occur as a result of global warming.

We discuss our proposal for ecosystem-based marine zoning in more detail below, but a preliminary note on nomenclature and our rationale is warranted here. The growing literature on innovative new methods for managing marine resources invokes a variety of different monikers to describe the process of designating particular areas of the marine environment for specific uses, including "area-based management," "marine spatial planning," and "ocean zoning," among others. These phrases may have different meanings to different people, and many of them are not

fully descriptive of the systems they are intended to name. We have deliberately elected to use the term "ecosystem-based marine zoning" because it conveys the true intent and extent of our recommendation. First and foremost, the governance regime we propose must be grounded in a set of sound ecological management principles; its primary purpose is to protect and sustain the ecosystem goods and services provided by the state's coastal waters. Because coastal waters are a public trust resource, the marine environment is fundamentally and categorically different from the terrestrial environment, where regulation must accommodate existing private property rights and ownership patterns. Ocean governance policy starts from the basic premise that regulators must manage marine public trust resources in the best long-term interests of the larger community.

Nevertheless, we analogize our proposal to traditional zoning, and thus consciously use that term, for one important reason: as conceived, our approach requires both prospective spatial planning for compatible uses and ongoing management according to the zoning districts established through that planning process. We intend more than just targeted area-based management (*e.g.*, marine protected areas); the goal is creation of a comprehensive set of zones based on long-term ecosystem health and the establishment of a system of presumptive compatible uses within those zones. While individual marine reserves are thus a limited form of marine zoning, they are not the end goal. Rather, marine protected areas, such as those currently being established off the California coast, will form the fundamental building blocks on which a more comprehensive system of marine zoning can be constructed.

While efforts are underway around the globe to explore large-scale marine spatial planning, to our knowledge, no state or nation has comprehensively zoned all of its territorial waters, although many jurisdictions, including California, have attempted more limited forms of area-based management.[50] As we explain below,

50. Good summaries of recent ocean zoning efforts, both in the United States and around the world, can be found in Agardy, *supra* note 23, and Courtney & Wiggin, *supra* note 45, at 8-13. As this article goes to press, the Massachusetts legislature is considering passage of the Massachusetts Ocean Act (Senate Bill 2346, 2007). If adopted into law, S.B. 2346 may ultimately result in comprehensive spatial management for that state. The bill vests the state secretary of energy and environmental affairs with the responsibility of producing an ocean management plan for the state and establishes an advisory

California policymakers have, for decades, discussed the need for comprehensive, integrated ocean governance, and the Legislature has recently taken the first real steps in that direction. In attempting to flesh out the contours of a better governance structure, we hope to draw upon that legislative foundation. In many ways, however, comprehensive marine zoning is an innovative approach that departs in important respects from California's existing regulatory regime, a regime that has outlived its usefulness and today does not particularly well serve either marine ecosystems or coastal users. Without significant reform, California will likely face further declines in biologic resources, increased coastal pollution, and political paralysis over user conflicts. On the other hand, thoughtful marine ecosystem planning and management can help California chart a new course for restoring the health of coastal waters, protecting the coastal economy's fast-growing recreational and tourism sectors, preserving the coastline's historic non-economic benefits, and providing users with better guidance and more certainty.

B. *California's Fragmented Existing Infrastructure for Regulating Marine Resources and Uses Prevents Effective Interagency Coordination, Impedes Ecosystem-Based Management, and Hinders Our Ability to Sustain a Resilient and Productive Working Seascape*

Many past marine management failures are attributable to California's highly fractured system of ocean and coastal governance, which developed haphazardly over many decades in response to particular resource or user challenges. Today, a bewildering array of different agencies manage a wide assemblage of different resources and resource uses, even within the same geographic area. For instance, the taking of fish, extraction of oil, and harvesting of kelp are governed by separate suites of laws specific to each resource, with little or no coordination between the agencies or departments that manage them.[51] The California

commission to make recommendations to the secretary. Notably, the bill preserves the independent jurisdictional authority of the state's division of marine fisheries. *See* http://www.mass.gov/legis/bills/senate/185/st02/st02346.htm.

51. In preparing this paper, we conducted an in-depth examination of the agencies and governing statutes that exercise jurisdiction over coastal resources. The results of that

Resources Agency has accurately characterized the state's marine resource management as "[a] complicated set of laws, regulations, and specific designations [that] have been developed over time to protect and manage these ocean resources, although such measures were developed without the assistance of a comprehensive planning and management approach."[52]

California's largely use-based and reactive regulatory structure impedes the state's ability to manage for ecosystem health and long-term sustainability because agencies do not manage on a spatial basis. Instead, they regulate uses and conflicts on a piecemeal basis under myriad, often contradictory, resource use objectives. From a scientific perspective, we now know that use-based management of individual resources is poorly suited to the complexity of marine environments. One recent comprehensive survey, for example, highlighted the fundamentally fragmented nature of resource management along the Southern California coast, where there is little evidence of interaction between regulatory authorities. The study's authors noted that while such jurisdictional fragmentation may be "understandable in historical and political terms," it makes "little ecological sense" in the marine context.[53]

Scientists and policymakers have long recognized, but not always acted upon, the need for integrated management of California's marine resources. As early as 1947, the Legislature sponsored a path-breaking study of the ecology of Monterey Bay in an attempt to place dangers to the sardine fishery in an ecosystem context.[54] The resulting study emphasized that use-based analysis and management were fundamentally inappropriate: "the sardines cannot be treated as isolated organisms living in a vacuum. The investigation must be an integrated one in which the proper weight is given not only to the currents and other aspects of the physical environment but also to the entire organic assemblage . . . including man."[55] Tragically, this landmark ecosystem-based work was never translated into management changes, and the sardine

research are on file with the authors.

52. CAL. RES.AGENCY, *supra* note 25, at 1-1.

53. Crowder et al., *supra* note 17, at 618.

54. Harry N. Scheiber, *From Science to Law to Politics: An Historical View of the Ecosystem Idea and Its Effect on Resource Management*, 24 ECOLOGY L.Q. 631, 640 (1997).

55. *Id.* at 641 (quoting letter from Roger Revelle to John Isaacs (Nov. 29, 1947)).

fishery ultimately collapsed, with the peak catch of 200,000 to 400,000 tons falling to only 5,700 tons a few years later.[56]

The state's efforts to establish a comprehensive management regime began in the 1960s, but "these efforts have been marked by a series of starts and stops which have precluded the establishment of a comprehensive management system . . . . In the absence of a comprehensive system, California has most often responded by creating new legislative or administrative approaches to address individual management issues."[57] In 1967, the Legislature took the first small step to address the increasing evidence of fisheries declines with passage of the California Marine Resources Conservation and Development Act,[58] which required the state to develop a comprehensive ocean development plan for coastal and marine resources. Although this plan was eventually prepared, comprehensive ocean resource management did not follow.[59] Instead, a series of statutory enactments, beginning with the California Coastal Act in 1976 and culminating most recently with the California Ocean Protection Act in 2004, have moved California incrementally closer to the ideal of an integrated, place-based ecosystem management regime. Nevertheless, truly integrated, comprehensive planning and coordinated management of our ocean resources remains elusive.

Before exploring new legislative initiatives to address California's ocean governance problem, we first briefly review the most important existing coastal resource management statutes on the books, including not only the Coastal Act and the Ocean Protection Act, but also the California Ocean Resources Management Act of 1989, the Marine Life Management Act of 1998, the Marine Life Protection Act of 1999, and the Marine Managed Areas Improvement Act of 2000. These laws provide

56. *Id.* at 644. Under careful state management, the commercial sardine fishery has rebounded in recent years, but its history illustrates the catastrophic consequences of regulating one species in isolation from its larger ecosystem.

57. CAL. RES. AGENCY, *supra* note 25, at 1-7.

58. 1967 Cal. Stat. ch. 1642.

59. That plan was issued in 1972, the same year that the precursor to the present-day Coastal Commission was created by voter initiative (via Proposition 20). The Marine Resources Conservation and Development Act was repealed the following year. The modern day Coastal Act, creating the modern Coastal Commission, was adopted by statute in 1976 to codify Proposition 20. California Coastal Act of 1976, Cal. Pub. Res. Code §§ 30000-900 (Westlaw 2007).

much of the basic framework on which new legislation can be built and their history of implementation provides several important lessons for how to structure durable legislative changes that will minimize political gridlock and maximize effective ecosystem-based management.

1. *The California Coastal Act.*

The California Coastal Act of 1976 provides one of the most enduring examples of a regional ocean and coastal governance system in the nation. The key mission of the management program it established is to "protect, conserve, restore, and enhance environmental and human-based resources of the California coast and ocean for environmentally sustainable and prudent use by current and future generations."[60] The region governed by the statute (the "coastal zone") covers all state waters (excluding San Francisco Bay, which is regulated by the Bay Conservation and Development Commission) and an onshore area varying in width from several hundred feet from the shoreline in highly urbanized areas up to five miles inland in certain rural areas, such as the Santa Monica Mountains.[61] The statute envisions a state and local government partnership whereby cities and counties in the coastal zone ultimately implement the Act within their jurisdictional boundaries through their own local coastal programs ("LCPs") that are certified by the California Coastal Commission as consistent with the Coastal Act.[62] Once a local jurisdiction's LCP is certified, the Coastal Commission serves as an appeal body for coastal zone management decisions made by local governments. For jurisdictions without certified LCPs, the Coastal Commission maintains primary decision-making authority on coastal and marine resource developments. Independent of LCP certification status, the Commission retains original jurisdiction over activities in specific areas (e.g., tidelands, submerged lands, and public trust lands). Because the jurisdiction of local cities and counties ends (and State jurisdiction begins) at the mean high tide line, LCPs and the zoning provisions they contain largely apply only to the terrestrial portion of the coastal zone. Within state waters, the

60. *See* California Coastal Commission, Program Overview, *available at* http://www.coastal.ca.gov/whoweare.html.

61. CAL. PUB. RES. CODE § 30103 (Westlaw 2007).

62. *Id.* § 30001.

Coastal Act interacts with several other state and federal laws, resulting in a matrix of agencies that oversee human uses and activities in state waters.

For certain development proposals and activities, such as construction or expansion of coastal power plants, coastal wastewater treatment facilities, aquaculture facilities, or desalination facilities, the Coastal Commission interacts with and/or shares jurisdictional authority with other state agencies (such as the California Energy Commission, the State Water Resource Control Board—or the applicable Regional Water Quality Control Board, the State Lands Commission, the Public Utilities Commission, and the Fish and Game Commission). The degree of interaction and "shared" decisionmaking between and among the Commission and its sister agencies depends on the specific activity under review and on whether the agencies have established protocols for interaction. For construction or expansion of coastal power plants, for example, the Energy Commission and the Coastal Commission have adopted a Memorandum of Understanding that governs how the two agencies will cooperate through the application review process.[63] Chapter 5 of the Coastal Act generally explains how the Coastal Commission's jurisdiction relates to and integrates with its sister state agencies.[64] As discussed earlier however, many of the most controversial new and emerging uses, such as desalination, liquefied natural gas, aquaculture, and alternative energy, pose significant regulatory oversight challenges because the laws and policies governing each of these uses produce a complicated network of processes and standards.

The Coastal Commission's work is both legislative (or forward thinking, as in the development, review, and approval of local coastal programs to provide a local blueprint for development as well as resource conservation and use that conforms to a statewide set of policies) and quasi-judicial (or reactive, as in review of specific development proposals). However, in the marine realm, the Coastal Commission functions almost exclusively in a reactive capacity, reviewing applications on an ad

63. California Coastal Commission & California Energy Commission, Memorandum of Agreement Regarding The Coastal Commission's Statutory Role in the Energy Commission's AFC Proceedings (Apr. 14, 2005) (on file with author).

64. CAL. PUB. RES. CODE §§ 30410-20.

hoc basis as they are submitted by project proponents.[65] The Coastal Commission works reactively in managing marine resources for two reasons. First, the Coastal Act does not authorize the Commission to engage in proactive master planning and zoning for *state waters*. Second, the Act is superimposed and intended to integrate with California's land use governance system, which does *not* apply to marine waters. Thus, the landward side of the coastal zone is organized into zoning districts, but the seaward component of the coastal zone is not.

Through designation of environmentally sensitive habitat areas ("ESHAs") on land and in marine waters, the Coastal Commission does engage in some form of ecosystem-based management and area-based management. This is because the Coastal Act affords ESHAs the highest level of protection possible,[66] and allows limited development of such areas only when to do otherwise would affect a "taking" under the state or federal Constitution.[67] ESHA designation and protection can approximate ecosystem-based management when designation refers to habitat types that are co-extensive with marine or coastal ecosystems. For example, ESHA designations typically cover coastal sand dunes as well as all coastal wetlands, salt marshes, lagoons, sloughs and estuaries. However, the protections afforded these areas is ultimately determined through an individualized project review process. Therefore, the majority of the coastal zone gains protection through an iterative, reactive process whereby individual applications for development dictate the specific areas and resources the Coastal Commission must focus on. With the exception of enforcement actions, only after a project proposal and its proposed location are submitted for a coastal development permit will the Coastal Act's protections apply.

Thus, the Coastal Act provides some important guidance on how the Legislature might structure broader ocean governance legislation. On its own, however, the Coastal Act does not create sufficient authority to achieve comprehensive, coordinated

65. One notable exception of prospective action affecting the land/sea interface and, to the extent marine ecosystems are affected, marine resources, is § 30413 of the Public Resources Code, which requires the Commission to update maps of areas *not suitable* for new coastal electric power plants every two years. *Id.* § 30413.

66. *Id.* § 30240.

67. *Id.* § 30010.

ecosystem-based marine resources management. More importantly, California's land zoning and management framework, which the Coastal Act overlays and influences, is based fundamentally on our state's *private* property rights system. State waters (and the resources they contain), on the other hand, are not private property; they are *public trust* resources. Public trust resources are held in trust by the State not only for traditional purposes, including navigation and commerce, but also for recreation and preservation of ecological processes.[68]

2. *The California Ocean Resources Management Act.*

The California Ocean Resources Management Act ("CORMA") of 1989 required the Secretary for Environmental Affairs to prepare a report on ocean management in California, but lack of funding prevented its implementation. In 1991, the Legislature amended the requirements of CORMA through AB 205, transferring responsibility for all non-statutory[69] marine and coastal management programs to the Secretary for Resources and mandating both a report and a plan.

That report and plan, which was issued as an ocean "agenda" (hereinafter *Ocean Agenda*) in 1997, is a call to arms for comprehensive and coordinated ocean resource management. In it, the California Resources Agency explained that:

> Provisions for regulating and managing ocean resources and waters are contained in a variety of statutes located in seven different California codes: the Fish and Game, Government, Harbors and Navigation, Health and Safety, Penal, Public Resources, and Water Codes. Often a given issue may be addressed in several places within one code, while also being addressed in other codes. Statutes criss-cross various code sections to achieve appropriate single-issue purposes, but their development on an incremental basis has led to a body of law lacking cohesion. Unfortunately, this fragmented approach often results in confusion over agency roles and responsibilities, making it difficult for ocean users and government regulators to

68. *See, e.g.*, Nat'l Audubon Soc'y v. Super. Ct., 658 P.2d 709, 718-26 (Cal. 1983); Marks v. Whitney, 491 P.2d 374 (Cal. 1971).

69. AB 205, 1991 Cal. Stat. ch. 1027. Certain fisheries are managed directly by the Legislature pursuant to individual statutes.

understand legal requirements relating to a specific issue.[70]

The *Ocean Agenda* identified no fewer than twelve departments just within the Resources Agency that exercise some authority over coastal and marine resources, in addition to other state agencies and local and federal agencies with overlapping jurisdiction.[71] The Resources Agency aptly concluded that:

> Many state and federal agencies are responsible for implementing issue-specific (and sometimes single-purpose) provisions relating to ocean and coastal habitats and living marine resources. This issue-specific approach occurs because legislation is often produced incrementally to address immediate problems. The result is management efforts based on geography, species type, or impact source, rather than the development of broader policy objectives. However, issues concerning ocean and coastal species do not necessarily conform to solutions addressed in this fashion. Therefore, more comprehensive approaches are needed.[72]

The *Ocean Agenda* also recognized the inherent value of ecosystem-based spatial management and the central role it should play in future legislation:

> Finding[:] California's ocean ecosystem supports a wide assemblage of ocean and coastal life that includes plants, invertebrates, fish, birds, and mammals. The health and productivity of this ecosystem is, and will continue to be, important to public health, species diversity, and ocean-dependent industries including the State's substantial tourism and recreation, and commercial and recreational fishing. Ecosystem management strategies are likely to be most effective

70. CAL. RES. AGENCY, *supra* note 25, at 3-7.

71. *Id.* at 3-4. The twelve Resources Agency departments include the California Coastal Commission, Department of Boating and Waterways, Department of Conservation, Department of Fish and Game, Department of Forestry and Fire Protection, Department of Parks and Recreation, Department of Water Resources, Energy Resources, Conservation and Development Commission, Office of Oil Spill Prevention and Response, San Francisco Bay Conservation and Development Commission, State Coastal Conservancy, and State Lands Commission. State agencies outside the Resources Agency with regulatory jurisdiction affecting marine resources include the State Water Resources Control Board, the Regional Water Quality Control Boards, and the California Department of Health Services.

72. *Id.* at ES-4.

> in maintaining these important ocean and coastal resources . . . Ecosystem strategies must include approaches that consider the interdependence of species and habitats within California's . . . ocean resource zones, the multiple jurisdictions and stakeholders concerned with these resources, and the efficacy of program planning and implementation measures.
>
> Finding[:] The array of California's ocean and coastal managed area designations is complex and often confusing, posing questions as to the effectiveness and enforceability of designations meant to safeguard the State's ocean and coastal biodiversity and to promote public use and enjoyment of these resources. . . . [Existing] designations have not necessarily conformed to any plan designed to establish managed areas in the most effective way or in a manner that ensures that the most representative or unique areas of the ocean and coastal environment are included.[73]

Accordingly, the Resources Agency recommended that California "[d]evelop a more effective and less complicated statewide system of ocean and coastal managed areas. A comprehensive program is needed, with clear criteria for creating, administering, and enforcing management measures in these specially designated areas."[74]

The 1997 *Ocean Agenda* concluded that:

> Attaining the goals identified in this Agenda is complicated by multiple agencies of jurisdiction, each with respective mandates and responsibilities that are sometimes conflicting or uncoordinated, and other times duplicative. What is self-evident to even a casual observer is the need to simplify and bring more cohesiveness to ocean resource management. This task is best accomplished by those entities involved in the day-to-day management of California's ocean resources and by establishing a process that effectively brings the most important and precedent-setting policy issues to the attention of the State's top policymakers.
>
> Accordingly, effective ocean resource management and implementation of the priorities identified in this Agenda would

73. *Id.* at ES-4 to ES-5. These same sentiments are echoed in the more recent national reports on ocean resource management. *See, e.g.*, U.S. COMM'N ON OCEAN POLICY, *supra* note 20, at 63 ("Ocean policies cannot manage one activity, or one part of the system, without considering its connections with the other parts"); PEW OCEANS COMM'N, *supra* note 15, at 110-11.

74. CAL. RES. AGENCY, *supra* note 25, at ES-5.

> be enhanced by two initiatives: (1) bringing together the many State agencies with ocean and coastal resource management responsibility to increase coordination efforts and to provide a forum to help resolve issues at the State level and (2) establishing a process for cooperating with and soliciting advice from other levels of government, the public, and the private sector.[75]

With the flurry of marine legislation that followed issuance of the *Ocean Agenda*, several of the Resources Agency's recommendations have been incorporated in some fashion into state law. However, as we explain briefly below, this follow-on legislation has done a relatively poor job of actually integrating and harmonizing multiple agency decisionmaking processes and has not fully implemented the concept of ecosystem-based management into state ocean resource decisions. The model of integrated ocean governance that we advocate in this paper attempts to build upon this relatively recent legislative infrastructure to finally implement the findings and recommendations of the *Oceans Agenda* a decade after its publication.

3. *The Marine Life Management Act.*

The first major piece of marine management legislation following the CORMA report was the Marine Life Management Act ("MLMA") of 1998, which declares that "the Pacific Ocean and its rich marine living resources are of great environmental, economic, aesthetic, recreational, educational, scientific, nutritional, social, and historic importance to the people of California" and that "[i]t is the policy of the state to ensure the conservation, sustainable use, and, where feasible, restoration of California's marine living resources for the benefit of all the citizens of the state."[76] The MLMA shifted management responsibilities from the Legislature to the California Fish and Game Commission (which previously managed only sport fisheries, kelp harvesting, and a few commercial fisheries and created ecological reserves) for a number of commercial fisheries. Although couched in terms of "healthy" marine fishery habitat and often touted as an ecosystem-based management regime, the MLMA is essentially a sustainable

75. *Id.* at ES-20.

76. CAL. FISH & GAME CODE § 7050 (Westlaw 2007).

fisheries statute that provides for the preparation of commercial fishery management plans to rebuild and maintain overfished stocks based on traditional notions of "optimum" or "maximum sustained" yield; the statute provides only incidental consideration of bycatch and habitat impacts and pays little attention to ecosystem-wide concerns.[77] In essence, the MLMA is California's version of the federal Magnuson Stevens Fishery Conservation and Management Act, which has not been particularly successful in achieving either sustainable commercial fisheries or ecosystem protection.[78]

4. *The Marine Life Protection Act.*

The California Marine Life Protection Act ("MLPA"), adopted in 1999, imposes for the first time some degree of area-based planning within state waters under the auspices of the State Fish and Game Commission. The MLPA creates a master planning team of scientists and experienced coastal managers to develop a detailed master plan network of marine protected areas stretching through all of the biogeographic regions of the California coast.[79] The master plan will form the core of a new marine life protection program designed to maintain and enhance California's extraordinary marine resources.[80] Although passage of the MLPA was a significant step forward for state ocean policy, its implementation has engendered significant controversy.[81]

It also is important to understand that the governance and management system established by the MLPA is neither comprehensive nor integrated. The chief objective of the MLPA is to establish a coherent network of Marine Protected Areas ("MPAs") in state waters designed to protect California's ocean and estuarine ecosystems. The three primary categories of MPAs available for use in designing the network are (1) State Marine Reserves, where all extractive activities are prohibited, (2) State

77. *See id.* §§ 7050-90.

78. *See* JOSH EAGLE, SARAH NEWKIRK, & BARTON H. THOMPSON, JR., TAKING STOCK OF THE REGIONAL MANAGEMENT FISHERIES COUNCILS (2003).

79. CAL. FISH & GAME CODE § 2855 (Westlaw 2007).

80. *Id.* § 2853.

81. *See, e.g.*, J. MICHAEL HARTY & DEWITT JOHN, REPORT ON LESSONS LEARNED FROM THE MARINE LIFE PROTECTION ACT INITIATIVE (2006), *available at* http://www.hartyconflictconsulting.com/MLPAI_Lessons_Learned_Report06.pdf.

Marine Parks, where all commercial extractive activities and potentially some extractive recreational activities are prohibited, and (3) State Marine Conservation Areas, where some combination of extractive commercial and/or recreational activities are prohibited.[82]

Functionally, however, the only *extractive* activities that MPAs address are those over which the California Fish and Game Commission currently enjoys jurisdictional authority. Such activities include commercial and sport fishing or kelp harvesting, but *exclude* oil and gas or mineral extraction because the latter are governed by the State Lands Commission. Similarly, uses such as mariculture facilities, which are regulated by the Fish and Game Commission (in combination with the California Coastal Commission, the Regional Water Quality Control Boards, the California Department of Health Services, and the California Office of Spill Prevention and Response), are left out entirely from the MPA equation because they technically are not "extractive" uses. Thus, the MLPA neither requires nor permits comprehensive zoning of state waters. Similarly the MLPA does not require, nor will it necessarily result in, integrated management of state waters because there are no statutory requirements for agencies to import the new MPA system into their own decision-making processes.

5. *The Marine Managed Areas Improvement Act.*

Following on the heels of the MLPA, the Marine Managed Areas Improvement Act ("MMAIA") of 2000 attempted to bring some order to the proliferation of special designations for various areas of the marine environment. The express purpose of the MMAIA is "to ensure the long-term ecological viability and biological productivity of marine and estuarine ecosystems and to preserve cultural resources in the coastal sea . . . ."[83] Prior to 2000, the state had eighteen different classifications for marine managed areas (e.g., reserves, preserves, refuges, areas of special biological significance, and others). The MMAIA reduced this array of managed areas to a uniform and streamlined classification system with only six classifications (State Marine Reserves, State Marine

82. CAL. DEPT. OF FISH & GAME, CALIFORNIA MLPA MASTER PLAN FOR MARINE PROTECTED AREAS, REVISED DRAFT 48-51 (2006).

83. CAL. PUB. RES. CODE § 36620 (Westlaw 2007).

Parks, State Marine Conservation Areas, State Marine Cultural Preservation Areas, State Marine Recreational Management Areas, and State Water Quality Protection Areas) and provided a specific definition and designation process for each classification.[84]

In addition, the statute directs the Resources Secretary to create and chair a State Interagency Coordinating Committee, made up of representatives from "those state agencies, departments, boards, commissions, and conservancies with jurisdiction or management interests over marine managed areas, including, but not limited to, the Department of Fish and Game, Department of Parks and Recreation, California Coastal Commission, State Water Resources Control Board, and State Lands Commission."[85] The purpose of this Committee is to review proposals for new marine managed areas, to ensure their consistency with the state designation system, to conduct periodic reviews of the statewide system to evaluate whether it is meeting its mission and statement of objectives, and to develop guidelines to be used for designating areas. Although the Coordinating Committee did streamline the state's MPA designation system, it has been inactive since 2004.

While each agency with authority to designate marine managed areas retains its jurisdiction, the MMAIA directs the Resources Secretary to establish a scientific review panel for technical and scientific review of proposed designations (to be the same as the MLPA master plan team to the extent practical) and requires the designating agency to establish a public review and comment process.[86] The MMAIA provides another important milestone on the road to the integration and harmonization of coastal resource decisionmaking. Like its predecessors, however, the statute falls short of a comprehensive area-based management regime because it applies only to the designation of a certain portion of state waters, does not provide in any way for coordinated management once specific areas are designated, and is entirely reactive—that is, it does not provide legal authority for proactive marine planning. Functionally, the formation of the California Ocean Protection Council (described below), combined with efforts to implement the MLPA since 2004, have subsumed the substantive domain of

84. *Id.* § 36700.

85. *Id.* § 36800.

86. *Id.* § 36900.

the Coordinating Committee.

6. *California Ocean Protection Act.*

The most recent and far-sighted attempt to reform the state's marine governance system is the California Ocean Protection Act ("COPA") of 2004. In this statute, the Legislature again recognizes the importance of California's coastal resources and marine ecosystems to the state's economic and environmental vitality and the need to preserve the health, productivity, and resilience of these resources.[87] COPA expressly declares that "[t]he governance of ocean resources should be guided by principles of sustainability, ecosystem health, precaution, recognition of the interconnectedness between land and ocean, decisions informed by good science and improved understanding of coastal and ocean ecosystems, and public participation in decisionmaking."[88] And the statute expressly establishes "the state's policy to incorporate ecosystems perspectives into the management of coastal and ocean resources, using sound science, with a priority of protecting, conserving, and restoring coastal and ocean ecosystems, rather than managing on a single species or single resource basis."[89]

As part of the Legislature's intent to "integrate and coordinate the state's laws and institutions responsible for protecting and conserving ocean resources," COPA calls for "a set of guiding principles for all state agencies to follow . . . in protecting the state's coastal and ocean resources."[90] The principal way that the statute attempts to implement its directives is through the establishment of the Ocean Protection Council ("OPC"), a five-member body charged with the duty, among other things, to "[c]oordinate activities of state agencies that are related to the protection and conservation of coastal waters and ocean ecosystems . . . ."[91] The OPC, which consists of the Secretary of the Resources Agency, the Secretary for Environmental Protection, the chair of the State Lands Commission (designated by statute as the Lieutenant Governor) and two public members,[92] is guided in its

87. *Id.* § 35505(a), (c).
88. *Id.* § 35505(c).
89. *Id.* § 35510(b)(3).
90. *Id.* § 35515.
91. *Id.* § 35615(a)(1).
92. *Id.* §§ 35600-35605. In addition to these three voting members, the OPC also

coordination work by a set of five statutory objectives[93] and a set of six principles for the preservation and conservation of coastal waters.[94] These principles provide an appropriate template on which to begin building the more specific set of Ecosystem Management Principles that we propose to apply to a system of comprehensive area-based management for California's coastal waters.

Early versions of COPA would have established mandatory substantive standards to which state agency actions affecting marine resources would conform. Specifically, the legislation would have included provisions governing Regional Water Quality Control Board plans, local general plans, and local coastal plans, as well as state infrastructure funding to ensure their consistency with statewide coastal and marine resource standards. However, the version of COPA ultimately adopted by the Legislature and signed into law controls a far narrower band of human activities. As passed, COPA reaffirmed that state marine waters, including their coastal and marine ecosystems, are a public trust resource, and it established the OPC as an advisory body whose authority extends to guiding voluntary coordination between state agencies, recommending legislative changes, and funding projects that meet specified objectives. But because COPA, as enacted, does not provide the OPC with actual regulatory authority or management jurisdiction, it does not currently provide a viable vehicle for ocean governance reform.

III. POTENTIAL SOLUTIONS: COMPREHENSIVE ECOSYSTEM-BASED MARINE ZONING

As it presently exists, California's complex and relatively uncoordinated ocean governance structure is not adequate to stem the continuing decline in marine resources or resolve increasing user conflicts along the coastline, let alone grapple with the new

includes one nonvoting member of the Senate and one nonvoting member of the Assembly. *Id.* § 35610. SB 1845, signed into law on September 18, 2006, adds two public member positions on the OPC, one of which must be filled by an individual with a "scientific professional background and experience in coastal and ocean ecosystems." 2006 Cal. Stat. ch. 295. These new appointments to the OPC have not been made as of the date of this paper.

93. *Id.* § 35515.

94. *Id.* § 35510(b).

challenges posed by expanding demand for commercial uses within state coastal waters.[95] Although several state agencies arguably possess some legal authority to implement more ambitious prospective marine planning and management than currently occurs, they lack sufficient incentives and resources to do so. Better management of marine resources and conflicts will undoubtedly be time-consuming and controversial and will require more effective interagency coordination than presently exists.[96] Without express statutory directives and the resources to fulfill those directives, therefore, existing regulatory agencies are unlikely to initiate more than marginal reform efforts.[97]

In contrast to the state's historic management by species or resource, legislatively mandated area-based marine management holds promise for addressing both declines in ecosystem health and the need for regulatory certainty among coastal users. As the

95. A very recent study by the Monterey Bay Aquarium's Center for the Future of the Oceans and the Joint Ocean Commission Initiative, a collaborative bipartisan effort by members of the U.S. Commission on Ocean Policy and the Pew Ocean Commission, confirmed that "[f]ragmented decision making . . . is cited as a major barrier to managing oceans and coasts on a regional, ecosystem basis." JOINT OCEAN COMMISSION INITIATIVE & MONTEREY BAY AQUARIUM, AN AGENCY FOR ACTION: MOVING REGIONAL OCEAN GOVERNANCE FROM THEORY TO PRACTICE 11 (2007), *available at* http://www.jointoceancommission.org/.

96. Extensive interagency cooperation is not the norm in state government. To the contrary, there are many examples of interagency "turf wars" over management of natural resources and, of course, agencies compete in the legislative arena for a limited pool of funding. *See id.* at 11 ("Competition over jurisdiction and financial resources, incompatible legal mandates, and inadequate funding are a few of the reasons inhibiting coordination and integration among agencies. . . ."). Interagency barriers can be, and occasionally are, overcome with creative cross-agency arrangements (e.g., memoranda of understanding or agreement), usually driven by some unusual necessity. Without legislative pressure, however, individual agency decisionmakers reap little reward for pursuing such strategies in the normal course of implementing their day-to-day management obligations.

97. Although California has taken strong hortatory steps toward improving marine ecosystem health, in part through area-based management (e.g., the MLPA), the corresponding governance reforms have not been comprehensive either in their geographic scope or their breadth of coverage, and even the most recent implementing legislation provides little opportunity for third-party enforcement. In the course of our analysis, we evaluated an assortment of conventional legal drivers to compel more aggressive ecosystem management by regulatory agencies, including the pursuit of strategic lawsuits pressing expansive liability theories under the California Environmental Quality Act, the public trust doctrine, and various resource-specific state statutes. Although such court challenges may, under the best set of facts, make incremental progress through the development of judicial precedent, the time and resources necessary to pursue such a strategy make it a poor vehicle for the kind of immediate ocean policy changes we urgently need.

Joint Ocean Commission Initiative's recent action agenda report explains, a patchwork legal regime such as exists in California:

> cannot respond effectively and coherently to such complex challenges as ocean dead zones, overfishing, habitat loss, and the impacts of and possible adaptation to climate change along our densely populated coasts. It also constrains our ability to explore and take advantage of promising new opportunities such as ocean-based forms of alternative energy production, environmentally and economically sustainable offshore aquaculture, and marine bioprospecting. These are just a few examples of the types of challenges the current system for managing ocean resources is ill-equipped to understand and address in environmentally and economically responsible ways.[98]

In its place, the Joint Initiative "identifies area-based management as an important site-based planning and management technique for implementing ecosystem-based management."[99]

Area-based management draws from traditional terrestrial zoning concepts and has been defined as a "place-based framework for ecosystem-based management that reduces conflict, uncertainty, and costs by separating incompatible uses and specifying how particular areas may be used."[100] Such spatial planning in the marine environment does not necessarily replace existing regulations or requirements, but "add[s] an important spatial dimension by defining areas within which compatible activities could occur."[101] By "specifying places in which particular purposes have precedence, zoning provides assurance that those interests can operate with minimal or no competition from incompatible uses within their zones."[102]

Of course, area-based management does not, in and of itself, ensure the protection of important marine resources; its primary purpose is to reduce conflict and provide greater regulatory

98. *Id.* at 2-3 (noting that the Pew Ocean Commission and the U.S. Commission on Ocean Policy "emphasized the need for mechanisms that achieve a more coordinated and integrated approach for improving ocean and coastal health").

99. *Id.* at 4.

100. Elliott A. Norse, *Ending the Range Wars on the Last Frontier: Zoning in the Sea*, *in* MARINE CONSERVATION BIOLOGY: THE SCIENCE OF MAINTAINING THE SEA'S BIODIVERSITY 422, 432 (Larry B. Crowder & Elliott A. Norse eds., 2005).

101. Crowder et al., *supra* note 17, at 618.

102. Norse, *supra* note 100, at 432.

certainty for potential users. Ocean waters can readily be carved into arbitrary zones that separate incompatible uses and user preferences without consideration of ecological impacts, much as local jurisdictions historically have separated residential, commercial, and industrial land uses without regard to ecological function. The much more difficult task is to tether marine zones to ecological function. Thus, area-based management in the marine environment must be grounded in and driven by ecological principles if it is to fulfill the promise of reversing ongoing decline in coastal resources and ecosystem health. Such principles should inform and guide decisions about where particular activities or uses can occur. In essence, ecosystem-based marine zoning attempts to blend the conventional terrestrial notion of separating incompatible uses with more contemporary concepts of integrated ecological management to form a new, more robust and enduring marine governance structure.

A. *The fundamentals of ecosystem management.*

Ecosystem-based management is "an integrated approach to management that considers the entire ecosystem, including humans."[103] The goal of an ecosystem-based approach is to "maintain an ecosystem in a healthy, productive and resilient condition so that it can provide the services humans want and need."[104] In particular, ecosystem management:

- emphasizes the protection of ecosystem structure, functioning, and key processes;
- is place-based in focusing on a specific ecosystem and the range of activities affecting it;
- explicitly accounts for the interconnectedness within systems, recognizing the importance of interactions between many target species or key services and other non-target species;
- acknowledges interconnectedness among systems, such as between air, land, and sea; and
- integrates ecological, social, economic, and institutional

103. K.L. MCLEOD, J. LUBCHENCO, S.R. PALUMBI, & A.A. ROSENBERG, SCIENTIFIC CONSENSUS STATEMENT ON MARINE ECOSYSTEM-BASED MANAGEMENT 1 (2005) (signed by 219 academic and policy experts).

104. *Id.*

perspectives, recognizing their strong interdependencies.[105]

Both the United States Commission on Ocean Policy and Pew Oceans Commission recommend adopting an ecosystem-based approach to managing marine resources.[106] The United States Commission on Ocean Policy explained that:

> Ecosystem-based management looks at all the links among living and nonliving resources, rather than considering single issues in isolation [and] considers human activities, their benefits, and their potential impacts within the context of the broader biological and physical environment. Instead of developing a management plan for one issue (such as a commercial fishery or an individual source of pollution), ecosystem-based management focuses on the multiple activities occurring within specific areas that are defined by ecosystem, rather than political, boundaries.[107]

Marine ecosystem-based management, in particular, "applies an ecosystem approach to the regulation and management of development and activities in the marine environment by safeguarding ecological processes and overall resilience to ensure the environment has the capacity to support social and economic benefits (including those benefits derived directly from ecosystems)."[108] This approach also provides a "strategic, integrated and forward-looking framework for all uses of the sea to help achieve sustainable development, taking account of environmental as well as social and economic objectives."[109] Thus, marine ecosystem-based management "[i]dentifies, conserves, or where necessary and appropriate, recovers or restores important components of coastal and marine ecosystems . . . ."[110]

105. *Id.*

106. U.S. COMM'N ON OCEAN POLICY, *supra* note 20, at 63; PEW OCEANS COMM'N, *supra* note 15, at 110-11.

107. U.S. COMM'N ON OCEAN POLICY, *supra* note 20, at 63.

108. FANNY DOUVERE & CHARLES N. EHLER, U.N. EDUC. SCIENTIFIC & CULTURAL ORG. [UNESCO], THE INTERNATIONAL PERSPECTIVE: LESSONS FROM RECENT EUROPEAN EXPERIENCE WITH MARINE SPATIAL PLANNING 3 (2007).

109. *Id.* at 4.

110. *Id.*

B. *Incorporating ecological principles into marine zoning.*

Area-based marine planning and management tied to ecosystem function departs from the current regulatory regime in that it "focuses on managing the suite of human activities that affect particular places."[111] It involves a comprehensive approach that manages all of the various resource uses affecting a single place under a common, spatially based plan. Because ocean ecosystems are dynamic, interrelated systems, an area-based approach considers the entire ecosystem, as well as ecosystem processes, in making management decisions, rather than managing ecosystem components separately. Thus, area-based ecosystem management seeks to ensure that vital ecological functions and processes are preserved in perpetuity within their range of natural variability.

Key elements of a place-based approach include "locating and designing zones based on the underlying topography, oceanography, and distribution of biotic communities; designing systems of permits, licenses, and use rules within each zone; establishing compliance mechanisms; and creating programs to monitor, to review, and to adapt the zoning system."[112] Importantly, an area-based management approach should be "comprehensive, adaptive, and participatory, and resolve conflicts among multiple uses and the ecosystem."[113]

Marine spatial planning is currently underway in numerous sites around the world.[114] One of the first and most well-known examples of marine spatial planning is the multiple-use marine protected area ("MPA") encompassing Australia's Great Barrier Reef Marine Park ("Park"),[115] a geographic area much larger than California's state waters. In 1975, the Australian federal government passed the Great Barrier Reef Marine Park Act, which established the Great Barrier Reef Marine Park Authority

111. Crowder et al., *supra* note 17, at 617.

112. *Id.* at 618.

113. U.N. Educ. Scientific & Cultural Org. [UNESCO], *Conclusions and Next Steps from the International Workshop on Marine Spatial Planning*, (Nov. 8-10, 2006), *available at* http://ioc3.unesco.org/marinesp/files/FinalConclusionsNextSteps_041206.pdf .

114. For these and other current examples of marine spatial planning, see DOUVERE & EHLER, *supra* note 108, at 5-6.

115. Osmond et al., *Lessons Learnt for Marine Spatial Planning: A Comparison of Three Marine Protected Area Processes* 6 (forthcoming 2007) (manuscript on file with author).

("Authority").[116] The Authority manages the Park primarily through zoning, as well as permitting, public education, and other management tools.[117] Currently, there are eight zoning designations, ranging from the least restrictive General Use Zone, which allows many uses including shipping and most commercial fishing, to the most restrictive Preservation Zone, which prohibits virtually all entry.[118] Through a series of rezonings over the last 25 years, roughly a third of the Park now receives high levels of protection. The percentage of Great Barrier Reef waters placed under high levels of protection started at five percent and was ultimately increased to twenty and then thirty percent when the results of monitoring showed that ecosystem protection goals were not being achieved at lower protection levels.[119]

One key difference between the Great Barrier Reef model and the MLPA is that determination of the conservation goal—that is, what percentage of the ocean should be set aside for high levels of protection —was overtly made by the Great Barrier Marine Park Authority *prior to* drawing lines on a map. Not surprisingly, this is one of the most controversial decisions in marine spatial management because it effectively determines the "size of the pie" left for impact uses. In Australia, where environmental and conservation issues occupy center stage in national politics, bold conservation decisions are rewarded in the political system. Strong political will is a key to front-loading the conservation determination. Under MLPA, the key conservation decision has been enmeshed in the MPA review and development process so that the act of drawing lines on a map and attaching use restrictions to delineated areas produces a *de facto* percentage of protection, which can be determined only once the MPA configurations and regulations are finally adopted. In short, the resource conservation decision is comingled with the resource allocation decision under MLPA.[120] The danger in this structure is

116. *See* Great Barrier Reef Marine Park Act, 1975 (Austl.), *available at* http://www.frli.gov.au/ComLaw/Management.nsf/current/bytitle/4C3C28C2F60D7B63CA256F710006F792?OpenDocument.

117. *Id.*

118. *See* GREAT BARRIER REEF MARINE PARK AUTHORITY, GREAT BARRIER REEF MARINE PARK ZONING PLAN 2003 at 4, *available at* http://www.gbrmpa.gov.au/__data/assets/pdf_file/0016/10591/Zoning_Plan.pdf.

119. Osmond et al., *supra* note 115, at 3.

120. In the context of federal fisheries management, Josh Eagle et al. warn against

that without an independent arbiter deciding how much marine ecosystem should be set aside for higher level protection, the pressures from the resource users are likely to result in an MPA array that provides less overall resource protection since each allocation decision (location or type of MPA) will meet resistance from those individuals for whom the zoning change will reduce their extractive use. An alternative to the Australian and MLPA approaches to determining the conservation decision would be to establish a minimum required percentage for high level protection in the enabling statute itself.

In the United States, marine spatial planning is utilized in the Florida Keys, Monterey Bay, and Channel Islands National Marine Sanctuaries. In the Florida Keys National Marine Sanctuary ("NMS"), the National Oceanic and Atmospheric Administration ("NOAA") has implemented marine zoning focused primarily on conserving biodiversity, as well as dispersing marine impacts and reducing user conflicts. To this end, NOAA has established five zones throughout the sanctuary: Existing Management Areas (National Wildlife Refuges, state parks, etc.), Wildlife Management Areas, Ecological Reserves, Sanctuary Preservation Areas, and Special-Use Areas.[121] The sanctuary covers several existing state parks, national parks, and national wildlife refuges and thus overlaps with many agency jurisdictions. This has hindered management integration because sanctuary regulations were designed to augment, not usurp, these agencies' existing authority. Unless these other agencies agree to and integrate the sanctuary's zonal restrictions into their own regulatory system, the impact of the sanctuary's designations is purely rhetorical.

The Monterey Bay NMS is divided into thirteen separate marine zone types and 72 total zoned areas; recreational activities are generally permitted but are limited in some zones, while other uses, such as disposal of dredge material and large vessel traffic, are allowed only in certain zones.[122] Finally in the Channel Islands

vesting the resource conservation and allocation decisions in the same decision-making body because the decision-maker will move toward increasing the total allocation (i.e., weakening the conservation outcome) in order to relieve political pressure from resource users to increase their individual allocations. *See* EAGLE, NEWKIRK, & THOMPSON, *supra* note 78, at 5, 37-38.

121. *See* FLORIDA KEYS NATIONAL MARINE SANCTUARY, ZONING ACTION PLAN, http://floridakeys.noaa.gov/regs/zoning.html (last visited Nov. 15, 2007).

122. For more detail on zoning in the Monterey Bay National Marine Sanctuary, see

NMS, marine reserves now cover approximately 19 percent of state waters surrounding the islands and 11 of these 13 designated reserves will be no-take areas.

These and other examples illustrate the increasing prevalence of marine spatial planning in ocean management and can provide guidance on the design and implementation of a marine zoning regime in California. However, it is worth noting that these examples were each implemented in discrete ecological regions, such as the Great Barrier Reef or the Channel Islands, rather than on a broad, statewide scale. Thus, while they can inform a zoning initiative in California, none is a perfect parallel.

IV. FOUR POSSIBLE MODELS FOR COMPREHENSIVE MARINE ZONING IN CALIFORNIA STATE WATERS

A. *Criteria for a Workable Ecosystem-Based Marine Zoning Scheme for California*

After reviewing California's existing regulatory structure for coastal resources and the lessons to be learned from recent attempts at modest place-based planning around the Channel Islands and on the Central Coast, we have identified four criteria as measures of effectiveness and feasibility against which we believe any new ocean governance system should be evaluated. Our purpose in doing so is to provide a set of criteria that will assist policymakers in assessing different possible models for comprehensive ecosystem-based zoning. Any new governance system should be:

Integrated. As identified in the California Resources Agency's 1997 *Ocean Agenda*, the 2003 Pew Commission's *Charting a Course for Sea Change* report, and, most recently, the Joint Initiative's 2007 *An Agenda for Action*, one of the key deficiencies in California's existing regulatory system—and indeed, in the nation's marine regulatory regime —is the lack of mandatory coordination and integration between agencies and across resources. Such single focus management not only precipitates conflicts between existing uses and prevents meaningful ecosystem-level consideration, it also threatens to paralyze the siting of potential new activities. California will undoubtedly face many proposals over the next

U.S. DEP'T OF COMMERCE, A REVIEW OF MARINE ZONES IN THE MONTEREY BAY NATIONAL MARINE SANCTUARY (2001).

decade to locate any number of emerging coastal- or ocean-dependent activities, including mariculture operations, LNG terminals, desalination plants, wave or wind farm energy facilities, and perhaps other projects that are not yet apparent. Each of these activities will likely require a number of different regulatory approvals from a number of different regulatory agencies, and each poses the potential to adversely impact both existing uses and ecosystem function.

An integrated system of governance that attempts to coordinate between responsible agencies and to mediate conflicts between uses based on ecological function and capacity presents the best hope for managing present and future demands on California's coastal resources. A system that gives project approval authority to an individual agency with a narrow resource perspective (as is now the case for certain decisions) is both vulnerable to agency capture and highly unlikely to fully account for a project's impacts on ecosystem function. A system that splinters regulatory authority across agencies without providing a robust mechanism for interagency coordination and conflict resolution (as is now the case for other decisions) is likely in many cases to lead to regulatory stalemate, thwarting even projects that may have a significant environmental benefit. While such political standoff may temporarily protect ecosystem function, California's history of ongoing marine decline strongly suggests that this kind of project-by-project trench warfare has not been successful in providing long-term resource protection. Despite the ability of conservation or other interests to slow or stop particular projects, haphazard resource development and ad hoc coastal decisionmaking have proceeded apace, to the detriment of California's marine environment.

While the MMAIA has begun the process of interagency coordination through creation of the State Interagency Coordinating Committee, the charge to that entity has been extremely limited, covering mostly review of proposed new management area designations. OPC's coordination role also is limited by the fact that this body does not exercise jurisdiction over any marine or coastal resources or possess the authority to establishing enforceable regulations. A new ecosystem-based marine zoning scheme should provide for integration across the board, from designation through implementation, in one or more government entities with authority to exercise regulatory control.

Comprehensive. Similarly, any governance system that hopes to address conflicts and protect California's vast coastal heritage should be reasonably comprehensive, covering all state waters in some fashion and adaptable to any proposed use of marine resources, not just project proposals that are currently on the table. In the absence of a comprehensive scope, any new marine governance system is not likely to achieve the goal of managing for minimum conflict and optimum certainty. Although both the MPLA and the MMAIA have begun the process of place-based management, their effect is ultimately limited. At the end of the day, the MLPA will result in a network of marine reserves, marine parks, and marine conservation areas based on a scientific understanding of particular living marine resource populations and habitats. Such limited marine managed areas do not provide comprehensive zoning for all state waters, nor do they dictate how living and non-living resource conflicts are resolved in protected zones. The MMAIA, while broader in its focus because it potentially protects areas for their non-living cultural, geological, and water quality resources, is entirely reactive; it applies only where a new zone designation is proposed and it does not require, or provide any authority for, prospective marine zoning.

Publicly Accountable. Because a new ocean governance system will be entrusted with the protection and management of some of California's most valuable public assets, its ultimate decisionmakers must be highly accountable to the public. The regulatory phenomenon of agency capture by particular stakeholders is a long-studied and well documented one. Mechanisms to ensure public accountability should, therefore, occupy a central place in any ocean governance reform plan. Such accountability can be created both through institutional structure design (e.g., transparent decision processes, administrative appeal systems, etc.) and by ensuring that the judiciary maintains its traditional role as the ultimate backstop for the protection of public trust resources. Indeed, precisely because marine zoning is intended to move us away from hand-to-hand combat over every proposed ocean project or action by creating presumptive and conditional use zones that foster healthy marine ecosystems, it is critical that the best technical, scientific, and policy expertise possible be brought to bear on zoning and management decisions and that those decisions be subject to judicial review against a set of statutorily prescribed criteria. Otherwise, we risk handing an

enormous amount of unfettered discretion to an insulated and largely unaccountable set of political actors.

Politically Viable. Finally, any new legislative proposal also must be politically viable in two important respects. First, it must have some serious likelihood of passage in the Legislature and signature by the Governor. A viable proposal is one that does not engender insurmountable stakeholder resistance. Stakeholders here include not only private recreational and commercial interests and public conservation interests, but also entrenched agencies with substantial jurisdiction over coastal resources. Second, a viable proposal is one that can be implemented without political gridlock or stalemate and without serious compromise of the proposal's underlying principles.

B. *Potential Options for New Ocean Governance Legislation*

Below, we discuss a continuum of four ocean governance proposals that would, in varying degrees, address the deficiencies identified in the *Ocean Agenda* and by many other commentators. Obviously, there are other options, or different versions of the basic options we elected to describe, that may be feasible and even superior. Our modest goal here is to examine a spectrum of reasonable alternatives as a vehicle for advancing the discussion and as a starting point for thinking more closely about the nuances of a particular legislative proposal. We thus begin by providing a brief description of each conceptual proposal, from most to least radical, and then apply a rough screen for each option using the foregoing feasibility criteria: Integrated, Comprehensive, Publicly Accountable, and Politically Viable. As a result of this screen, we recommend further analysis of Option 3 – Master Planning Districts Implemented through Ecosystem Management Principles.

Two caveats to our analysis are in order. First, we fully recognize that many threats to California's state coastal waters and marine systems are land-based. However, this paper focuses on spatial management of state waters and the governance system that can support effective spatial management. While we do incorporate major regulatory players affecting land-based impacts, such as the State Water Resources Control Board, the Regional Water Quality Control Boards, and the California Coastal Commission, we do not attempt to address all land-based

regulatory agencies and systems that can impact marine systems.[123]

Second, we also recognize that the state-federal waters jurisdictional divide is an ecologically artificial one. Activities in federal waters can significantly impact the health of near-shore ecosystems and state trust resources. Our goal in this paper, however, is to make recommendations for changes in state regulation; overhaul of the management regime for federal waters is a much larger undertaking for another day. To the extent that California chooses to play a leadership role on ocean governance reform, it may be able to influence federally permitted activities in offshore waters by working informally with federal officials or, more formally, through the state consistency certification process provided by the Coastal Zone Management Act.[124]

Option 1: Master Management Plan Implemented by One Agency

Description: This proposal would dramatically alter the existing governance regime by mandating the preparation of a comprehensive management plan for all state waters that (1) identifies the suite of activities to be governed, (2) specifies locations (zones) where each conceivable use would be permitted and under what conditions, (3) develops a mechanism for resolving conflicts between uses, (4) establishes monitoring requirements, performance standards, and a feedback mechanism to allow for adaptive management over time, and (5) transfers implementation authority to a single state body. The plan could be prepared by an existing agency such as the OPC or State Interagency Coordinating Committee or by a new or altered entity created by the authorizing legislation. For instance, either the OPC or the State Interagency Coordinating Committee could be

123. A more ambitious legislative effort could certainly encompass additional land-based activity. This end might best be accomplished through targeted amendments to existing legal authority that controls land-based decisionmaking. For instance, the California Environmental Quality Act could be amended to require a mandatory finding of significance for any state or local project that may adversely affect coastal water or marine resources. More substantively, the Porter-Cologne Water Quality Act could be amended to require that water quality control plans prohibit discharges that would significantly affect coastal waters or marine resources or to impose additional conditions in waste discharge requirements. The California Coastal Act could be amended to require that local coastal plans include similar prohibitions. The Fish and Game Code affecting habitat or natural community conservation plans and fishery management plans could be similarly amended, as could the timber harvest plan provisions of the Forest Practices Act.

124. 16 U.S.C. § 1456(c) (Westlaw 2007).

expanded in size and/or broadened in scope to be more representative. Under Option 1, responsibility for implementation of the resulting management plan would be situated by statute in the agency that created the plan in order to maximize the likelihood that management decisions are consistent with the plan and to reduce the need for interagency coordination.

Assessment: This proposal maximizes both integration and comprehensiveness and is most likely to lead to a governance regime that promotes ecosystem health and reduces user conflicts. However, an approach that effectively strips existing agencies of much of their current jurisdiction for coastal resource management will almost certainly hit a buzz saw of resistance from agency stakeholders and some of their constituents and is unlikely to ever win passage in the state Legislature. Moreover, this approach has potentially serious flaws with respect to public accountability. A single decisionmaking entity that is largely removed from the myriad existing agencies with jurisdiction over marine and coastal resources, such as the politically appointed OPC, is less likely to utilize the accumulated technical, scientific, and policy expertise of those agencies in making planning and use decision and, as the sole focal point for controversial decisions, may be more susceptible to classic agency capture.

Option 2: Master Management Plan Implemented by Multiple Agencies

Description: This option is similar in all respects to Option 1, except that once the master management plan is completed, existing agencies (e.g., Fish and Game Commission, Coastal Commission, State Lands Commission, etc.) would retain their historic jurisdiction over particular resources. All future management decisions by individual agencies would have to be consistent with the management plan, and interagency disputes would be resolved by the entity that prepared the plan through a statutorily prescribed dispute resolution process.

Assessment: As with Option 1, this approach would be comprehensive (zoning all state waters with specificity) but would sacrifice integration in some relatively small part because individual agencies could make individual implementation decisions that undermine the objectives of the plan. On the other hand, Option 2 disperses the decisionmaking authority in a way that enhances the potential for incorporating existing agency

expertise and reduces the problem of single agency capture. Moreover, because Option 2 largely retains the historic jurisdiction of existing agencies to manage particular resources, new legislation incorporating this proposal is likely to be more politically viable. This heightened degree of accountability and political viability appears to outweigh the potential for decreased integration, especially because interagency conflicts can be partially mitigated by the establishment of an appeal mechanism to an arbiter agency. Thus, Option 2 seems superior to Option 1.

However, Option 2 has another serious feasibility concern: Given the complexity of marine systems, the absence of complete scientific information about those systems, and the sheer number of different and potentially conflicting marine and coastal uses that would need to be accommodated, we believe it may be extremely difficult to effectively zone all state waters *for specific uses*. For instance, whether an aquaculture facility is appropriate in any particular place depends not only on what species are being cultivated, but also on what commercial or sport fisheries exist in the area, what recreational activities occur in the area, and what water quality exists in the area, among other things. Until a specific aquaculture project is proposed in a specific location, we are not likely to have the resources necessary to study its impact and make an appropriate siting decision. At best, we can predict with some accuracy those areas where an aquaculture project is not likely to be ecologically sustainable. Similarly, for many potential future uses, we may not know enough about the potential ecological impacts and user conflicts until a specific project is actually proposed and evaluated through the environmental review process. For example, a wind farm project may or may not pose significant threats to bird species or other wildlife depending on its location, size, and technology, just as a wave energy project may or may not be problematic depending on how it sits in the water column and where it is located vis-à-vis navigational channels.

In light of the complex matrix necessary to allocate all conceivable uses into specific zones and the potential for political gridlock if the state attempts, at the front end, to fix use and development expectations in such an ambitious way, we believe that development of a comprehensive management plan which predesignates specific areas for all existing and anticipated uses is unworkable. Indeed, we are not aware of any local land use plan or public land management plan—or any marine zoning effort—that

seeks to attain this level of specificity and detail. Most terrestrial planning and zoning efforts attempt to create categories of uses (industrial, commercial, residential, wilderness, recreational, timber management, etc.) and to establish prohibitions or presumption as to those uses within more broadly drawn zoning districts. The problems inherent in the creation of a single, highly specific master management plan are exacerbated in the marine environment, where it may be appropriate to differentiate uses seasonably or vertically in the water column. For all of these reasons, we do not recommend a legislative proposal, which mandates the creation of a master management plan that designates the specific locations for all anticipated future uses.

Option 3: Master Planning Districts Implemented Through Ecosystem Principles

Description: Under this option, the designated planning agency would map all state waters into one of three or four master planning districts, without attempting to specify particular uses in particular districts beyond the creation of rebuttable presumptions for each district. For instance, under the proposal we flesh out below, one type of district might establish a presumption of minimal non-consumptive recreational use only, another might establish a presumption in favor of categories of recreational or commercial uses, with other uses conditionally allowed, and yet another might establish a presumption in favor of commercial uses subject to some limitations. This master planning district overlay is intended to reduce user conflicts within zones, while recognizing ecological function. The main difference between this version of marine spatial planning and traditional land-based planning is that the designated marine districts would be drawn largely based on ecosystem health concerns, not historic uses; historic infrastructure would be a factor in designating districts, but in many cases is likely to map up with the areas least deserving of enhanced protection. Existing agencies would continue to make resource use decisions within each district consistent with their existing jurisdiction over particular resources, but to facilitate and ensure ecosystem-based management, such decisions would be subject to the application of a set of Ecosystem Management Principles developed by an independent science advisory team of advisors and embodied in statute or created by regulation. As with Options 1 and 2, the

government entity that creates the master planning districts could be the OPC, the State Interagency Coordinating Committee, or some newly created statutory body. Similar to Option 2, a state coordinating entity also would be charged with responsibility for resolving interagency conflicts over the application of the Ecosystem Management Principles to a particular use in a particular district.

Assessment: This option attempts to preserve some of the key aspects of integration and comprehensiveness while increasing public accountability, political feasibility and overall implementability. Option 3 is neither as comprehensive as the master management plan options nor quite as integrated, since it allows individual agencies to retain more implementation discretion than does Option 2. On the other hand, by foregoing the ambitious goal of zoning virtually every anticipated use into a specific location, Option 3 makes successful implementation within a reasonable timeframe more likely. Although not perfect, Option 3 presents what we believe is the best opportunity for successful ecosystem-based prospective spatial management of the marine commons. Accordingly, we discuss this option in more detail in the next section.

Option 4: Ecosystem Principles Implemented Through CEQA-Type Review Process

Description: This option is the least radical of the four and does not actually involve the drawing of any lines on a map. Rather, each agency with jurisdiction over coastal resources would be required to adhere to a set of Ecosystem Management Principles, much like Option 3. To enhance accountability, each decision agency would be required to engage in a CEQA-like process for evaluating the proposed activity against the Ecosystem Management Principles. The process of applying the principles to a particular activity would be a public one, subject ultimately to judicial challenge. If the governing principles are drawn narrowly enough, the agency's decisionmaking discretion would be considerably constrained. As with Option 3, the Ecosystem Management Principles that are developed by an independent science advisory team reflecting the best readily available science

could be embodied entirely in statute or could be left partially to implementation via regulation by a statewide coordinating agency like the OPC. Similar to the other three options, this option could convey interagency dispute resolution responsibility on a coordinating agency. It would not, however, attempt to make a priori decisions or presumptions through the creation of specific zoning or planning districts.

Assessment: This option is the least integrated and least comprehensive because it does not require that a coordinating body create any management zones of any kind. As such, it most closely mirrors the current system of wholly reactive decisionmaking. Although it retains the accountability associated with dispersed decisionmaking, Option 4 nevertheless increases the possibility for agency abuse, as compared against Options 2 or 3, because the management principles would be applied on a case-by-case basis without the benefit of use presumptions in particular districts. Additionally, the ability to create low or no impact districts, which exists under all of the prior options, is lost under Option 4. Any marine protected areas would be limited to those that a particular agency could create under the MLPA, the MMAIA, or other existing authority. Without a mechanism for integrated decisionmaking, Option 4 is unlikely to assist in the resolution of user conflicts or to provide increased regulatory certainty for marine users. On the other hand, Option 4 is likely to be the easiest option to enact legislatively and would face the least political resistance because existing agencies would be required to cede the least amount of autonomy to another body. Because it does not involve the creation of definitive zones that restrict types or categories of uses, Option 4 also may experience less opposition from traditional resource extraction constituents. However, given the potential for non-compliance by recalcitrant agencies and concerns about reduced accountability, we do not recommend this approach.

V. INCORPORATING PRINCIPLES OF GOOD GOVERNANCE TO FURTHER REFINE OPTION 3

For the reasons explained above, we believe that a new ocean governance approach utilizing master planning districts and the application of a uniform set of Ecosystem Management Principles is the most workable area-based management option and is the

one most likely to succeed in meeting the diverse goals of preserving ecosystem function, reducing user conflict, and building upon the existing legal infrastructure. However, as with any model of governance, there are many smaller details within this larger framework that can be adjusted to maximize opportunities for success. We have identified ten principles of good governance that, we believe, should be incorporated into any legislative process to the greatest extent possible.[125] Application of these principles to Option 3 suggests some additional refinements to the barebones model set forth above. Ideally, our recommended refinements would be addressed in the actual implementing legislation, as follows:

Clear Legislative Findings and Statutory Objectives. Legislative drafters could begin with and build on the strong ecosystem protection language contained in the findings for California Ocean Protection Act. Additional language regarding the need to minimize conflicts, to integrate marine resource management in the state, and to ensure that ocean resource management is both comprehensive and adaptive to changing conditions also should be included.

Establishment of Planning Authority in a Master Planning Committee. The legislation should designate an existing or a newly-configured body as the entity charged with responsibility for creating master planning district maps and promulgating appropriate regulations. Although the OPC might appear to be the obvious decisionmaking body, we recommend a more broadly drawn committee of agency stakeholders, similar to, but different from, the State Interagency Coordinating Committee, to undertake the actual planning work. In particular, the legislation should create a new Marine Master Planning Committee whose members represent all agencies with any significant jurisdiction over the use of marine resources, including the Fish and Game Commission, Coastal Commission, State Lands Commission, State Park and Recreation Commission, Energy Commission, State Water Resources Control Board, and Ocean Protection Council. The body should be created by statute and not left to the discretion of a political appointee in order to ensure that its composition maximizes stakeholder buy-in and minimizes

125. *See* Appendix A.

interagency conflicts.

Rather than seat an individual commissioner or board member from each of the participating agencies, we recommend that the Master Planning Committee be composed of the executive officer or director for each commission/board or the head of the agency that staffs the commission/board (e.g., Director of State Park and Recreation Department on behalf of the State Park and Recreation Commission, Executive Policy Officer of the Ocean Protection Council). This configuration may insulate decisionmakers to some extent from the politics that often plague state commissions and thereby enhance independent decisionmaking. Accountability is not lost, however, since the executive officer or director of each member board or commission is hired by and serves at the pleasure of the board or commission.

Moreover, to further ensure accountability and reduce the possibility of interagency deadlock, the Legislature could convey ultimate decisionmaking authority on the OPC. Thus, while the Master Planning Committee would do the "heavy lifting" of gathering public input, coordinating scientific information, and drawing zoning lines on the map, the resulting marine district map would be provided to the OPC for ultimate approval. Whatever the final configuration of the Committee or its relationship to the OPC, the legislation should expressly provide the necessary authority for the ultimate decisionmaker to promulgate implementing regulations.

Master Planning Committee Responsibilities. The legislation should very clearly articulate the new Committee's duties and deadlines. These include the duty to (1) gather and organize all readily-available scientific information about marine resources and ecosystem function for California state waters, (2) map unique or diverse ecosystems and existing physical/virtual infrastructure, (3) facilitate the development of interagency memoranda of understanding for the management of resources or uses with overlapping jurisdiction, and (4) monitor and adapt implementation of the program through mandatory five-year reviews. Given our proposed configuration for the Master Planning Committee, we suggest that the OPC, rather than the Committee, be charged not only with responsibility for ultimate decisions on the master zoning district, but also with authority to arbitrate or mediate interagency disputes that may develop over time,

essentially serving as a neutral third party in the implementation of interagency MOUs.

Master Planning Districts. While conveying on the new Master Planning Committee and the OPC the discretion to create planning districts or zones, the legislation also should constrain and focus that jurisdiction in order to minimize political gridlock and maximize agency accountability. We propose, for example, that the following basic structure be written directly into the authorizing legislation:

1. No Impact Districts. The statute should require that a certain percentage of state waters be included in "no impact" zones (e.g., fifteen or twenty percent of all state waters) and should enumerate a set of criteria for establishing such zones. These criteria could be written in a way that requires designation of California's most important marine habitats (e.g., upwelling areas) and of a biogeographically diverse array of resources; they also could automatically include particular areas, such as existing or subsequently designated marine reserves or areas of biological significance. Within these districts, the statute should create a strong presumption that only no impact or very low impact non-consumptive uses be allowed, while also providing action agencies with the ability to allow other uses if a preponderance of the evidence demonstrates that such uses would not undermine the goal of creating the district, the Ecosystem Management Principles, or other allowed uses.[126]

2. Infrastructure Districts. The statute should require that the Master Planning Committee map existing physical and virtual infrastructure within state waters, with buffers appropriate to protect such infrastructure from conflict. The infrastructure components to be mapped should be enumerated by statute and could include such uses as ports and harbors, shipping lanes, mineral extraction facilities, underwater cables, coastal facilities that use ocean water or discharge waste to the oceans, etc. Within these districts, the statute would create a presumption that commercial uses are allowed, but that presumption would be rebuttable if the proposed use is inconsistent with the Ecosystem Management Principles or incompatible with existing

126. These no impact zones would be analogous to "marine reserves" under the MLPA scheme, but would extend to a broader range of human activities. Established marine reserves could form the building blocks for more protective no impact zones.

infrastructure uses. The statute should also include a directive that, where practical and consistent with federal law, existing infrastructure uses in areas that would otherwise satisfy the criteria for a "no impact" district be amortized out of existence and that the area be restored and rezoned.

3. General Recreational/Commercial Use Districts. For the remaining state waters that are not designated as "no impact" or infrastructure districts, the statute could create a rebuttable presumption that recreational uses are allowed and commercial uses are conditionally allowed consistent with the Ecosystem Management Principles, much like terrestrial zones often permit some uses and require other uses to obtain a conditional use permit. These use presumptions could, therefore, be rebutted by application of the Ecosystem Management Principles or by a showing that the proposed use would conflict with other existing uses. We anticipate that the largest percentage of state waters might fall within such general use districts and that most of the post-zoning implementation decisions would be subject to the standards and procedures applicable to this type of district.

For example, a proposed commercial aquaculture or wave energy project would have to demonstrate to permitting agencies that its operation would be consistent with the Ecosystem Management Principles and compatible with existing uses in the area. Each relevant permitting agency would be required to make findings to this effect and could approve the project with any conditions deemed necessary to comport with its findings. If different permitting agencies disagreed as to whether the project should be approved or whether certain conditions should be imposed, that dispute would be mediated by the OPC. Similarly, otherwise permitted recreational uses that are shown to be incompatible with the Ecosystem Management Principles could be prohibited (e.g., diving in an area that disturbs a marine mammal rookery).

To build on substantial prior planning work, the implementing legislation should require automatic incorporation of all marine protected areas ("MPAs") already established under the MLPA. In terrestrial land use parlance, the MPAs would be considered "overlay districts," serving as the backbone for marine ecosystem protection in state waters. The human use restrictions provided by existing MPAs would provide minimum protection standards for

the master planning district.

To increase the political durability of the resulting master planning district, the implementing statute could require that the planning maps and attendant regulations restricting uses developed by the Master Planning Committee and approved by OPC be subject to an "up or down" vote of the Legislature, as was done for the Great Barrier Reef Marine Park Authority.

Ecosystem Management Principles. The effectiveness of Option 3 hinges to a significant degree on the successful implementation of the guiding Ecosystem Management Principles. These principles should be carefully crafted and, to the maximum extent possible, explicitly articulated in the authorizing statute, so that disputes over their content take place primarily at the legislative, rather than the administrative, level. Knowledgeable scientists should be engaged in helping craft potential Ecosystem Management Principles for inclusion in implementing legislation. However, the Master Planning Committee or the OPC should be charged with turning the statutory principles into enforceable regulations. The governing protection principles incorporated into the Coastal Act illustrate how an agency can effectively weigh statutory criteria against individual use applications to reach a decision. Our proposal would build on this example.

Science-based Decisionmaking. The authorizing legislation should expressly provide that all decisions of the Master Planning Committee, or ultimately the OPC, (designation of districts, elaboration on ecosystem principles, adaptive management review, etc.) must be based on the "best readily-available science." This standard will ensure that decisionmaking is based on best science, but will not paralyze the process over the availability of information.

Public and Stakeholder Participation and Transparency. The authorizing statute can and should ensure adequate constituency participation. The Master Planning Committee, as we have conceived it, will guarantee that agency stakeholders participate fully in the process. The mapping and regulatory decisions of the Committee, as adopted by the OPC, would be subject to routine APA requirements, but the statute also might mandate additional processes that facilitate maximum participation and transparency, such as mandatory webcasting of all meetings, mandatory workshops, and the like.

Decisionmaking Rules. The statute should provide clear decisionmaking rules for the Master Planning Committee, which under our proposal would consist of seven members, and ultimately the OPC. For instance, the Committee could be chaired by a neutral agency such as the OPC representative and could make decisions by majority vote. Given the potential for the Board's work to be controversial, we recommend against a consensus decision approach.

Deadlines. New legislation should set firm deadlines for the work of the Master Planning Committee, and ultimately the OPC, including deadlines for completion of mapping, designation of districts, promulgation of regulations, and periodic review and adjustment. Such deadlines keep the process from degenerating into gridlock and give the public a mechanism by which to hold decisionmakers accountable, if necessary, in the courts. Understanding that public resource management processes can and do often take more time than originally envisioned, if adjustment of these deadlines is ultimately necessary, the Legislature can provide that flexibility by amending the statutory deadlines.

Citizen Suit Provision. The failure of the Master Planning Committee or the OPC to meet deadlines or comply with the mandates of the statute would, under existing law, be subject to judicial challenge under an abuse of discretion standard pursuant to California's writ of mandate process. Similarly, decisions by individual agencies implementing the statute and making determinations consistent with the Ecosystem Management Principles also would be subject to normal writ review procedures. Some of these decisions might first be subject to administrative appeal and exhaustion requirements consistent with the agency's established process. For instance, where an activity requires a permit from the Regional Water Quality Control Board, any person who wishes to challenge the permit decision must begin with an administrative appeal to the State Water Resources Control Board. Our proposal would not alter these normal channels of accountability. However, given the extremely high stakes in managing public trust resources, we recommend the development and inclusion in the authorizing statute of a specific citizen suit provision allowing the public to hold individual agencies accountable for failure to implement or enforce zone restrictions.

Funding and Staffing. To ensure adequate funding, the authorizing legislation should establish a dedicated funding source to cover the costs associated with the work of the Master Planning Committee, much as the California Ocean Protection Act did for the work of the OPC. Out-of-pocket costs will likely be incurred in gathering scientific data, compensating technical experts, and completing the necessary mapping. In addition, because the individual agencies that comprise the Committee are already stretched thin, the statute should make provision for new staffing to help complete this work. For example, each of the member agencies could receive additional staff specifically devoted to the work of the Committee and/or the OPC staff could be expanded to provide "staff" to the Master Planning Committee.

Enforceability through Federal Coastal Zone Management Act of 1972. California will need to revise the state's enforceable coastal policies to incorporate the Ecosystem Management Principles, the designation of master planning districts, and their associated regulations in order to preserve the state's ability to undertake consistency review of activities sponsored or permitted by the federal government that may affect the state's coastal or marine resources.[127]

With these refinements, we believe that Option 3 may provide a sound, politically workable system for integrated, ecosystem-based management of California's marine resources. Such governance reform potentially can ameliorate many of the current management problems—lack of interagency coordination leading to user conflicts, absence of prospective planning authority for anticipated future uses, fragmented resources management undermining ecosystem function, etc.—in a way that is not possible under the current legal regime. There surely will be considerable opposition to any proposal that substantially overhauls the existing governance structures. But our Option 3 attempts to build on several concepts that have already been adopted into state law and to incorporate sufficient agency stakeholder participation, decisionmaker accountability, public process, flexibility, and regulatory certainty to withstand the inevitable interest group lobbying against it.

127. *See* 16 U.S.C. §§ 1451-64 (Westlaw 2007); CAL. PUB. RES. CODE §§ 30200-65 (Westlaw 2007).

VI. CONCLUSION

Faced with overwhelming and irrefutable evidence of declining marine ecosystem health and increasing conflict over marine resources, the time is ripe for California to lead the nation, and indeed the world, in innovative ocean governance reform. That reform must, first and foremost, fully protect California's public trust resources. At the same time, it should strive to minimize use incompatibilities and to provide users of coastal resources with some degree of regulatory certainty. For the reasons discussed above, we believe that ecosystem-based marine zoning can achieve these objectives if it is carefully designed and properly implemented. Our specific legislative design recommendations are intended to ensure that ocean policy reform in California is effective, accountable, and consistent with the basic principles of good governance.

APPENDIX A: TEN PRINCIPLES FOR GOOD GOVERNANCE

1. Regulatory authority. Whether it is the OPC, the State Interagency Coordinating Committee, or some newly created statutory body, the entity charged with mapping state waters into planning districts and establishing Ecosystem Management Principles must have regulatory authority to engage in these activities, including the authority to evaluate the efficacy of those decisions and adjust them over time.

2. Real accountability. Entities charged with implementing this new policy must be accountable to the state and its residents for effectively implementing, in a timely manner, the twin goals of managing for ecosystem health and regulatory certainty. Accountability can be achieved through several different tools, including setting clear milestone deadlines, linking funding with achievement or performance, issuing performance reports for public consumption, or allowing citizen suits to force agency compliance with substantive and procedural requirements.

3. Science-based decisionmaking. Decisionmaking under established policy must be based on the best readily available science. This is a standard that recurs in resource management laws and should be contained in enabling legislation. The scientific community and judiciary are accustomed to this type of standard, and the plight of the state's marine waters deserves nothing less. "The role of scientific information in implementing ocean policy is critical because managers must understand the characteristics and vulnerabilities of targeted species and habitats in order to sustain human activities that depend on ocean ecosystems."[128] This standard combines a requirement for using the best science with the practicality of knowing that decisionmakers cope with uncertainty and less than perfect information every day. Because it is not always possible to wait for high levels of scientific certainty when resource and economic health are hanging in the balance, the use of best *available* science is the linchpin to effective policy. Where significant scientific uncertainty exists, the precautionary principle should guide decisionmaking. Both the Great Barrier Reef Marine Park Authority and the MLPA provide excellent

128. Osmond et al., *Lessons Learnt for Marine Spatial Planning: A Comparison of Three Marine Protected Area Processes* 11 (forthcoming 2007) (manuscript on file with author).

examples of how independent scientific experts can be utilized to develop fundamental scientific biophysical operating principles—or scientific guidelines—based on the best readily available science. These principles or guidelines were developed by scientists to guide decision-makers in establishing and adaptively managing ecosystem-based MPA and marine zoning systems.

4. Independent decisionmaking. To the greatest extent possible, a new legislative proposal should attempt to foster independent decisionmaking and reduce the potential for agency capture or political gridlock.

5. Adaptive to change. A central tenet of resource management in the twenty-first century is that the systems we develop and use to "manage" ecosystems must include effective feedback and be flexible enough to adjust management practices over time, if necessary. Therefore, a new ocean governance system should include a robust monitoring program that will allow managers to determine whether goals are being met. In addition, the management system should facilitate the incorporation of new science and information as it becomes available. Similarly, the system should account for the variability of natural systems and the possibility of regime shifts, such as those we are likely to face in the wake of global climate change.

6. Dependable funding. If comprehensive area-based management is to succeed, the state needs to guarantee sufficient and dependable funding to the effort. In the early years, such funding must be sufficient to cover necessary agency staff, as well as the cost of obtaining the requisite scientific data and completing the mapping necessary to establish planning districts in an open public participation process.

7. Public and stakeholder participation. The MLPA Initiative is widely believed to have set the "gold standard" for public and stakeholder participation. Early and regular consultation with stakeholder advisors is the norm, as is rapid dissemination of information, materials, public comments, etc. Of course, the state's Administrative Procedure Act ("APA") establishes minimum public noticing and involvement requirements. Legislative reform should at least incorporate minimum APA requirements, and may incorporate additional public participation requirements.

8. Clear decisionmaking rules. Whether decisionmaking is by consensus (as it was in the Channel Islands) or majority rule (used

by the MLPA Blue Ribbon Task Force for the Central Coast), the decisionmaking rules should be established up front, leaving no ambiguity regarding how decision outcomes will be achieved. As the facilitators' report for the Channel Islands points out, the multi-stakeholder decisionmaking body—called the Marine Reserves Working Group ("MRWG")—operated on a consensus basis, requiring "unanimity among its members for a recommendation to be made."[129] This approach allowed single individuals to have disproportionate influence and ultimately resulted in the group not being able to reach consensus.

9. Clear objectives and directives. Critically, any new management system should set forth overarching principles, clear tasks, deadlines for completing tasks, directives explaining the standards by which decisions will be measured and made, and the processes for making those decisions, as well as periodic review for determining progress.

10. Transparency. Finally, a new management system should provide for maximum transparency so that the basis for data analysis and decision-making is unambiguous and the process by which decisions are made is obvious as the decisions are under consideration.

129. JOHN C. JOSTES & MICHAEL ENG, FACILITATORS' REPORT REGARDING THE CHANNEL ISLANDS NATIONAL MARINE SANCTUARY MARINE RESERVES WORKING GROUP 1 (2001).