University of California, Irvine
School of Law

Opportunities for Improving Water Quality and Ecosystem Health in California's Marine Managed Areas

by the UC Irvine School of Law Center for Land, Environment, and Natural Resources (CLEANR)

April 2018

Table of Contents

Introduction

California's marine conservation regime, including those areas protected through the Marine Life Protection Act (MLPA)[1] and Marine Managed Areas Improvement Act (MMAIA),[2] is one of the most advanced in the world.[3] These Acts, in addition to the California Ocean Resources Stewardship Act (CORSA)[4], and the California Ocean Protection Act (COPA)[5], were integral in paving the way for a partnership-based approach to managing California's marine resources.[6] Nonetheless, as is the case with most resource management programs, including at the federal level,[7] marine resource management authority in California remains distributed across multiple government entities with overlapping jurisdiction and differing mandates.[8] This regulatory fragmentation may compromise marine resource conservation approaches such as ecosystem-based management[9] and impair each agency's ability to adapt and learn.[10] Decentralized and overlapping regulatory systems can also result in significant impediments to addressing overarching issues such as climate change.[11]

A wide range of resource managers and stakeholders in California acknowledge these challenges and are pursuing more integrated, ecosystem-based approaches to promote marine ecosystem health and manage

---

1 CAL. FISH & GAME CODE §§ 2850–2863.

2 CAL. PUB. RES. CODE §§ 36600–36900.

3 *See* JULIA M. WONDOLLECK & STEVEN L. YAFFEE, MARINE ECOSYSTEM-BASED MANAGEMENT IN PRACTICE 76–78 (2017); Jason Patlis et al., *The National Marine Sanctuary System: The Once and Future Promise of Comprehensive Ocean Governance*, 44 ENVTL. L. REP. 10932, 10956 (2014) (noting that the MLPA Initiative serves as an example of a process that integrates best available science, stakeholder interests, and private funding to protect valuable ecological and economic resources); Mary M. Gleason et al., *Designing a Network of Marine Protected Areas in California: Achievements, Costs, Lessons Learned, and Challenges Ahead*, 74 OCEAN & COASTAL MGMT. 90, 91 (2013).

4 CAL. PUB. RES. CODE §§36970-36995.

5 CAL. PUB. RES. CODE §§35500-35650.

6 *See* CAL. DEP'T OF FISH & WILDLIFE, 2016 FINAL MASTER PLAN FOR MARINE PROTECTED AREAS 2 [hereinafter 2016 MASTER PLAN].

7 Larry B. Crowder et al., *Resolving Mismatches in U.S. Ocean Governance*, 313 SCIENCE 617, 617–618 (2006) (noting that at least 20 federal agencies implement over 140 federal ocean-related statutes).

8 DONALD C. BAUR ET AL., AREA-BASED MANAGEMENT OF MARINE RESOURCES: A COMPARATIVE ANALYSIS OF THE NATIONAL MARINE SANCTUARIES ACT AND OTHER FEDERAL AND STATE LEGAL AUTHORIITIES 79 (2013); Deborah A. Sivas & Margaret R. Caldwell, *A New Vision for California Ocean Governance: Comprehensive Ecosystem-Based Marine Zoning*, 27 STAN. ENVTL. L.J. 209, 228 (2009) (attributing past marine management failures to California's highly fractured system of ocean and coastal governance).

9 Sivas & Caldwell, *supra* note 8, at 228–30 (noting that California's piecemeal regulatory structure impedes the state's ability to manage for ecosystem health and long-term sustainability).

10 Alejandro E. Camacho, *Adapting Governance to Climate Change: Managing Uncertainty through a Learning Infrastructure*, 59 EMORY L.J. 1, 25–27 (2009).

11 *Id*. at 26–32 (discussing the poor adaptive capacity of fragmented regulatory systems).

conflicting coastal uses.[12] The unique role of the Ocean Protection Council (OPC) under California law,[13] the MLPA Implementation Memorandum of Understanding (MOU),[14] the Marine Protected Areas (MPA) Statewide Leadership Team,[15] recent updates to the California Ocean Plan,[16] and investments in Integrated Regional Water Management[17] (IRWM) exemplify these efforts to break down regulatory silos and coordinate across agencies and legal authorities.

The University of California, Irvine School of Law Center for Land, Environment, and Natural Resources (CLEANR), in partnership with UCI OCEANS, convened two dialogues with policymakers, managers, scientists and stakeholders involved in marine water quality protection or implementation of California's Marine Managed Areas (MMAs)—a June 2016 scoping session[18] and a January 2017 plenary roundtable.[19]

---

[12] *See* Evan Fox et al., *Addressing Policy Issues in a Stakeholder-Based and Science-Driven Marine Protected Area Network Planning Process*, 74 OCEAN & COASTAL MGMT. 34, 37–38 (2013) [hereinafter Fox et al., *Addressing Policy Issues*]; *see also* West Coast RPB Charter, *available at* http://www.westcoastmarineplanning.org/ documents/; Telephone Interview with Cyndi Dawson, MPA Policy Advisor, OPC (Mar. 17, 2016).

[13] OPC is tasked with coordinating activities of ocean-related state agencies and establishing policies to coordinate the collection and sharing of scientific data related to coastal and ocean resources among agencies. CAL. PUB. RES. CODE §§ 35600–35625.

[14] The 2010 MOU was amended in 2015; it recognizes the need for cooperative and coordinated efforts to implement the MPAs and is signed by 15 government and non-governmental entities, including the State Water Board. *Available at* http://www.opc.ca.gov/webmaster/_media_library/2016/08/151104-FINAL-MPA-implementation-MOU_scannedsigs.pdf.

[15] The MPA Statewide Leadership Team includes state and federal agencies and other partners that play a direct or key support role in management of the network. The Leadership Team is led by the Ocean Protection Council (OPC), and includes the Department of Fish and Wildlife (CDFW), DFW Law Enforcement Division, Fish & Game Commission (FGC), California Coastal Commission (CCC), California State Lands Commission (CSLC), Department of Parks and Recreation (DPR), State Water Resources Control Board, California Ocean Science Trust (OST), MPA Collaborative Network, the National Park Service (NPS), Resources Legacy Fund (RLF) and West Coast Regional Office of National Marine Sanctuaries.

[16] STATE WATER RES. CONTROL BD., CALIFORNIA OCEAN PLAN (2015) [hereinafter CAL. OCEAN PLAN].

[17] IRWM brings local agencies and other stakeholders, with a range of water-related roles and interests, together to address water management needs collaboratively within self-identified regions. Subsequent to the IRWM Planning Act of 2002, three State bond measures allocated funds to support IRWM planning and implementation efforts by regional water management groups. *See* DEPT. OF WATER RESOURCES, STAKEHOLDER PERSPECTIVES, RECOMMENDATIONS FOR SUSTAINING AND STRENGTHENING INTEGRATED REGIONAL WATER MANAGEMENT (2017).

[18] Participants in the June 2016 initial exploratory session included Alejandro Camacho, Professor of Law & Dir., Univ. of Cal., Irvine (UCI) Sch. of L. Ctr. For Land, Envt. & Natural Res's (CLEANR); Cyndi Dawson, MPA Pol'y Advisor, Ocean Prot. Council; Kaitilin Gaffney, Dir. & Attorney, Res. Legacy Fund; Sara Lowell, Marine Program Dir., Marisla Found.; Adam C. Martiny, Associate Professor, UCI; Carla Navarro, Chair, Orange Cnty. Marine Protected Area Council (OCMPAC); Kenneth Schiff, Deputy Dir., Southern Cal. Coastal Water Research Project; Cascade Sorte, Assistant Professor, UCI; Pete Stauffer, Envtl. Dir., Surfrider Found.; Stephanie Talavera, Envtl. & Land Use Fellow, CLEANR; Elizabeth Taylor, Staff Att'y, CLEANR [hereinafter June 2016 Dialogue].

[19] Participants in the January 2017 plenary session included Calla Allison, MPA Collab. Network; Ed Almanza, Laguna Ocean Found.; Sara Aminzadeh, Cal. Coastkeeper Alliance; Matt Bracken, UCI Sch. of Biol. Sci.; Alejandro Camacho, Professor of Law & Dir., CLEANR; Michelle Claud-Clemente, City of Newport Beach; John Corbett, N. Coast Reg. Wtr. Quality Control Bd (RWQCB).; Rikki Dunsmore, Cal. Marine Sanctuary Found.; Katherine Faick, SWRCB Ocean Standards Unit; Kristen Goodrich, Tijuana River Nat'l. Estuarine Research Reserve; Tova Handelman, Heal the Bay; Ray Hiemstra, Orange Cty. Coastkeeper; Volker Hoehne, Watermens Alliance; Luhui Isha, Wishtoyo Found.; Kristopher Jones, CA Water Quality Monitoring Council; Rita Kampalath, Heal the Bay; Taya Lazootin, CA Sea Grant Fellow; Michael Lyons, L.A. RWQCB; Adam Martiny, Associate Professor & Dir. UCI

Participants at the scoping session identified the integration of marine resource protection and water quality regulation as meriting further deliberation, and the plenary roundtable focused on efforts and opportunities to promote such integration. This report, produced through research, interviews, and these dialogues, explores the current framework for managing coastal water quality and monitoring in the context of MMAs and identifies challenges to and opportunities for enhanced coordination and improved management.

At the suggestion of dialogue participants, this analysis has endeavored to develop concrete, realistic strategies within the capacities of participating agencies, policymakers and stakeholders. As such, the focus has been on opportunities for improving management under existing statutory regimes affecting marine water quality. Though the report does identify more fundamental legislative changes that ultimately might be needed to protect marine water quality long-term, it concentrates on more viable near-term strategies.

Specifically, the study considers three areas identified by roundtable participants as presenting the most concrete opportunities for improving marine water quality management in California. Part I explores opportunities for enhancing MMA water quality through other existing regulatory programs. These include: (1) increasing MPA designation as protected areas under water quality programs; (2) enhancing standards and enforcement for existing protected areas under the water quality regime; (3) leveraging Coastal Act restrictions; and (4) enabling stakeholders to enhance implementation, education and enforcement. Participants particularly identified the lack of coordination between marine monitoring programs and resource challenges as important issues for which opportunities exist in the short term. Accordingly, Part II focuses on water quality monitoring and data access, offering recommendations for promoting regional coordination of monitoring and the dissemination of monitoring data. Part III considers ways to offset resource constraints on programs protecting marine water quality, including the advantages of increased coordination, early pollution prevention, targeted regulatory fees, state and local funding opportunities, and enhanced accountability through reporting standards and statewide metrics.

I. Improving Coordination of Coastal Water Quality and Ocean Health Protection

Water quality impacts ocean health, including the marine ecosystems designed to be protected by California's Areas of Special Biological Significance (ASBSs) and Marine Protected Areas (MPAs).[20] Both

---

OCEANS; Erin Meyer, Cal. Ocean Science Trust; Meredith Meyers, S.D. Coastkeeper; Carla Navarro, Chair, OCMPAC; Becky Ota, CA. Dept. of Fish & Wildlife; Zachary Plopper, Wildcoast; Daniel Pondella, Occidental College & So. Cal. Mar. Inst.; Michael Quill, L.A. Waterkeeper; Terri Reeder, Santa Ana RWQCB; Bruce Reznik, L.A. Waterkeeper; Kenneth Schiff, Deputy Dir., Southern Cal. Coastal Water Research Project; Robert Stein, City of Newport Beach; Stephanie Talavera, Envtl. & Land Use Fellow, CLEANR; Elizabeth Taylor, Staff Att'y, CLEANR; Mati Waiya, Wishtoyo Found.; Steve Wertz, CA Dept. of Fish & Wildlife; Holly Wyer, Ocean Protection Council; Asena Yildiz, Envtl. & Land Use Fellow, CLEANR [hereinafter January 2017 Roundtable].

[20] Fox et al., *Addressing Policy Issues, supra* note 12, at 34 (2013). Degraded water and sediment quality impact marine life, as well as community structure and function. MLPA MASTER PLAN SCIENCE ADVISORY TEAM WATER

MPAs and ASBSs aim to protect ecosystem health,[21] yet they are regulated under different regimes with disparate management practices. Though the MLPA mentions concerns regarding water quality effects on MPAs,[22] it does not provide any independent mechanism for restricting or abating sources of such pollution. Rather, California regulates coastal water quality through a separate regulatory regime.

This regulatory fragmentation, as well as enforcement and monitoring deficiencies, has led to gaps in both management and the protection of marine resources and coastal water quality. Short of the heretofore politically unpopular alternative of modifying the MPA management regime to authorize direct regulation of marine water quality, any near-term enhancements in water quality regulation for MPAs will depend on the existing water quality regime. While recent policies adopted by the State Water Resources Control Board (State Water Board) attempt to integrate MPAs into water quality regulation,[23] there are a number of opportunities to improve the coordination of marine resource management and water quality regulation.

MPA AND WATER QUALITY PROTECTION ARE BIFURCATED

Setting aside the further overlay of federal agencies with management or regulatory authority, California's regulatory regime for protecting coastal water quality overlaps with, but remains fairly separate from, its MPA program. As discussed below, the two major categories of protected areas along California's coasts—MPAs and ASBSs—are managed under separate legislative mandates: MPAs by the California Department of Fish and Wildlife (CDFW) in the Natural Resources Agency, and ASBSs by the State Water Board in the California Environmental Protection Agency (CalEPA).

The different missions of the two agencies are reflected in their implementing regulations, with MPA management focused on protecting marine resources and limiting direct extractive activities, and ASBS management focused on regulation of coastal discharges. Although both agencies aim to protect ecosystem function and integrity, these two regulatory regimes address different sets of stressors on coastal waters, and there are limited incentives to promote joint management. Some efforts have been made to enhance integration, but additional opportunities remain.

California's Network of MPAs

The Marine Life Protection Program[24] (MLPP), established to adaptively manage the MPA network, protects certain areas, to varying degrees, from extractive uses.[25] In an effort to strengthen protections and

---

QUALITY WORK GROUP, DRAFT RECOMMENDATIONS FOR CONSIDERING WATER QUALITY AND MPAS IN THE SOUTH COAST STUDY REGION 10–11 (2008) [hereinafter WATER QUALITY WORK GROUP DRAFT RECOMMENDATIONS].

21 The MLPA establishes six overall goals for California's statewide MPA network, including protection of the natural diversity and abundance of marine life, and the structure, function, and integrity of marine ecosystems. Cal. Fish & Game Code § 2853; ASBS are ocean areas requiring protection of species or biological communities. CAL. OCEAN PLAN, *supra* note 16, at 28, app. I.

22 *See, e.g.*, CAL. FISH & GAME CODE §§ 2851(c), 2852(d), 2853(b)(1), (3), 2857(b)(2).

23 *See infra* notes 77- 75 and accompanying text.

24 CAL. FISH & GAME CODE § 2855.

25 *See* 2016 MASTER PLAN, *supra* note 6, at 8.

coordinate management, the MMAIA re-categorized MPAs and other pre-existing protected areas (such as ASBSs) into six classifications of newly defined "Marine Managed Areas" (MMAs), three of which are MPAs: State Marine Reserves,[26] State Marine Parks,[27] and State Marine Conservation Areas (SMCAs).[28] The MLPP fundamentally seeks to minimize resource disturbance by restricting, at various levels, human uses of these areas. The MLPP accomplishes this through a robust interagency management program that involves four focal areas: policy and permitting, enforcement and compliance, outreach and education, and research and monitoring.[29]

CDFW and the Fish and Game Commission (the Commission) have jurisdiction over the management and take of species in state waters, with the Commission serving as the primary decision-making body and the CDFW providing data and implementing and enforcing regulations set forth by the Commission.[30] OPC is directly responsible for setting and guiding MPA policy and is tasked with helping to coordinate activities of ocean-related state agencies.[31] OPC's Science Advisory Team (OPC-SAT) is tasked with ensuring that the best available science is applied to OPC policy decisions.[32] Following its designation by the Commission, each MPA network region[33] completes a Phase 1 five-year baseline period, including approximately two years of monitoring, after which Phase 2 statewide long-term monitoring begins.[34] The Central Coast was the first region to launch and complete baseline monitoring, followed by the North Central Coast, then the South Coast and most recently the North Coast region.[35]

The 2016 Master Plan for MPAs,[36] developed by CDFW and adopted by the Commission to implement the MLPP pursuant to the MLPA,[37] emphasizes coordination of California's marine and coastal governance as a statewide network. Integral to that plan are a reliance on interagency coordination, consultation with tribal governments, and regional collaborations. For example, the MLPA Implementation MOU includes the State Water Board as a signatory and identifies roles for the Regional Water Quality Control Boards (Regional

---

[26] CAL. PUB. RES. CODE § 36700(a). State marine reserves are the most restrictive, allowing no commercial or recreational take without specific authorization from CDFW and the Fish and Game Commission. CAL. CODE REGS. tit. 14, § 632(a)(1)(A).

[27] CAL. PUB. RES. CODE § 36700(b). State marine parks prohibit commercial take but allow limited recreational take. CAL. CODE REGS. tit. 14, § 632(a)(1)(B).

[28] CAL. PUB. RES. CODE § 36700(c). State marine conservation areas allow some combination of commercial and/or recreational take, as specified by the CDFW and Fish and Game Commission. CAL. CODE REGS. tit. 14, § 632(a)(1)(C).

[29] *See* 2016 MASTER PLAN, *supra* note 6, at 8.

[30] CAL. FISH & GAME CODE § 2860.

[31] CAL. FISH & GAME CODE §§ 2850.5.

[32] The OPC-SAT is composed of 26 esteemed scientists, convened to serve the science and policy needs of California. *See OPC Science Advisory Team*, CAL. OCEAN PROTECTION COUNCIL, http://www.opc.ca.gov/science-advisory-team/ (last visited Feb. 5, 2018).

[33] The four regions include the North Coast, the North Central Coast, the Central Coast, and the South Coast.

[34] 2016 MASTER PLAN, *supra* note 6, at 44–45, F-2, F-22.

[35] *See, e.g.,* CAL. OCEAN SCIENCE TRUST, CAL. DEPT. OF FISH & WILDLIFE & CAL. OCEAN PROTECTION COUNCIL, STATE OF THE CALIFORNIA SOUTH COAST: SUMMARY OF FINDINGS FROM BASELINE MONITORING OF MARINE PROTECTED AREAS, 2011–2015 (2017).

[36] *See* 2016 MASTER PLAN, *supra* note 6.

[37] CAL. FISH & GAME CODE § 2855.

Water Boards).[38] Further, the MPA Statewide Leadership Team convened in 2014 with the goal of increasing communication and collaboration among agencies and partners to ensure that the State is effectively managing the statewide MPA network. California's Partnership Plan, which was incorporated into the 2016 Master Plan, emphasizes and provides a framework for collaborative management within California's marine and coastal governance.[39] Finally, the MPA Collaborative Network is composed of fourteen member MPA Collaboratives that represent community stakeholders and provide a localized, comprehensive approach to ocean resource management by bringing together local experts and authorities in the areas of outreach and education, enforcement and compliance, and research and monitoring.[40]

A Complex and Separate Regime of Coastal Water Quality Protections

California protects coastal water quality through restrictions on discharges under both federal and state law. In addition to significant roles for federal agencies such as the Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (USACE), under the federal Clean Water Act (CWA) states are required to adopt water quality standards for each water body,[41] including designating beneficial uses and setting water quality criteria.[42] Once established, states implement these standards primarily through permitting for specific levels of pollution from individual point sources,[43] known as National Pollutant Discharge Elimination System (NPDES) permits,[44] and secondarily by developing total maximum daily loads (TMDLs) for each water body that are then allocated among all dischargers.[45] If a water body fails to meet the state's standards, the state must list the water body as impaired and develop TMDLs for particular pollutants to restore water quality.[46] However, like many other states, California has experienced challenges in both the establishment and enforcement of rigorous TMDLs.[47]

Due at least in part to these difficulties, in 1990, the U.S. Congress passed the Coastal Zone Act Reauthorization Amendments (CZARA) to improve nonpoint source pollution control in coastal waters.[48] As required under the Act, California developed a Coastal Non-Point Source Pollution (NPS) Program in 2000

---

38 The MOU includes all of the signatories' commitment to avoiding adverse impacts to MPAs from a range of activities, including water pollution; *supra* note 14.

39 CAL. OCEAN PROTECTION COUNCIL, THE CALIFORNIA COLLABORATIVE APPROACH: MARINE PROTECTED AREAS PARTNERSHIP PLAN 10 (2014) [hereinafter PARTNERSHIP PLAN].

40 *See* MPA COLLABORATIVE NETWORK, www.mpacollaborative.org (last visited Feb. 5, 2018).

41 33 U.S.C. § 1313(a).

42 33 U.S.C. § 1311(c)(2)(A); § 1313(c)(2)(A).

43 Point sources include any confined, discrete conveyance, such as pipes, ditches, wells, and containers. 33 U.S.C. § 1362(14).

44 33 U.S.C. § 1342.

45 33 U.S.C. § 1313(d)(1)(C).

46 33 U.S.C. § 1313(d). Often referred to as the impaired water body or the "303(d)" list.

47 *See* Ryan P. Kelly & Margaret R. Caldwell, *Ten Ways States Can Combat Ocean Acidification (and Why They Should)*, 37 HARV. ENVTL. L. REV. 57, 75 (2013) (noting the failure of states to create enforceable TMDLs).

48 16 U.S.C. § 1455(b); *See* Kelly & Caldwell, *supra* note 47, at 87–88.

that established a statewide approach to dealing with nonpoint source pollution.[49] The State Water Board and the nine Regional Water Boards are responsible for the implementation of and compliance with the provisions of the CWA and, together with the California Coastal Commission, implement the NPS Program.[50]

California also regulates water quality through the State's Porter-Cologne Water Quality Control Act (Porter-Cologne Act),[51] which establishes a comprehensive program to protect water quality and beneficial uses for state waters.[52] It sets forth obligations of the State and Regional Water Boards to adopt and periodically update water quality control plans in which beneficial uses, water quality objectives, and implementation programs are established for each of the state's nine regions.[53] The Porter-Cologne Act also requires waste dischargers to establish self-monitoring programs and submit compliance reports to the relevant Regional Water Board, and authorizes the State and Regional Water Boards to issue and enforce waste discharge requirements,[54] NPDES permits, and water quality certifications under Section 401 of the federal CWA.[55]

The California Ocean Plan, first adopted in 1972, also establishes standards to protect the beneficial uses of ocean waters[56]—uses ranging from industrial water supply to aesthetic enjoyment and shellfish harvesting.[57] The State Water Board periodically reviews and amends the Ocean Plan and, in conjunction with the six coastal Regional Water Boards,[58] implements and interprets the Plan.[59] The Ocean Plan applies

---

49 *See* CAL. NONPOINT SOURCE PROGRAM IMPLEMENTATION PLAN 2014-2020 (2015) [hereinafter CAL. NONPOINT SOURCE PLAN], http://www.waterboards.ca.gov/water_issues/programs/nps/ plans_policies.shtmll (last visited Feb. 5, 2018). The NPS Program aims to ensure the ongoing integration and coordination of point and nonpoint source efforts within the structure of the TMDL and watershed-based planning and implementation programs. *Id*. at 12.

50 The California Coastal Commission was created in 1976 under the California Coastal Act with the mission to protect all coastal resources, including water quality, from the impacts of development, broadly defined. CAL. PUB. RES. CODE §§ 30000–30013.

51 CAL. WATER CODE §§ 1251; 13000 et seq.

52 CAL. WATER CODE §§ 13050(e), 13260(a), 13263(a), 13376, 13377.

53 CAL. WATER CODE §§ 13240–13247.

54 Waste discharge requirements (WDRs) may include effluent limitations and other requirements designated in the applicable water quality control plan, including designated uses and water quality objectives to protect those uses. CAL. WATER CODE § 13263. WDRs serve as valid NPDES permits for purposes of the CWA, but unlike NPDES permits, WDRs under California state law may also apply to nonpoint source pollution and act as an enforcement measure under the state's NPS Program. The State and Regional Water Boards can agree to waive WDRs for the discharger's application of best practices, and many of California's NPS Plan's management measures are administered this way. Kelly & Caldwell, *supra* note 47, at 89.

55 CAL. WATER CODE §§ 13260, 13263. *Tahoe-Sierra Preservation Council v. State Water Resources Control Bd*., 210 CAL. APP. 3d 1421, 1431–1438 (1989).

56 CAL. WATER CODE § 13170.2. Applies to ocean waters, as defined "territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons."

57 CAL. OCEAN PLAN, *supra* note 16, at 3.

58 Coastal Regional Water Boards consist of the North Coast, San Francisco Bay, Central Coast, Los Angeles, Santa Ana and San Diego Regions.

59 STATE WATER RES. CONTROL BD., FINAL SED FOR OCEAN PLAN AMENDMENTS 3 (Oct. 16, 2012) [hereinafter FINAL SED FOR OCEAN PLAN AMENDMENTS].

to both point and nonpoint source discharges and provides for review standards to evaluate the effect of municipal industrial waste discharges on the marine environment.[60]

Finally, in the mid-1970s, in response to a growing recognition that coastal ecosystems are a valuable economic and ecological resource, thirty-four ASBSs were designated along the California coast.[61] The State Water Board designates ASBSs in ocean areas that require protection of unique or significant species or biological communities.[62] ASBSs remained unchanged until 2000 when, like MPAs, they were reclassified as a marine managed area under the MMAIA[63] and became a subset of state water quality protected areas (SWQPAs).[64] In these biologically significant areas, the State Water Board is to maintain "natural" water quality through a flat prohibition on all discharges into ASBSs, absent an exception.[65] However, Regional Water Boards may approve waste discharge requirements or recommend certification for limited-term (typically weeks or months) activities in ASBSs.[66] Additionally, the Thermal Plan requires that thermal wastes be discharged a sufficient distance from ASBSs to assure the maintenance of natural temperature in these areas.[67]

PROBLEM: MPA AND WATER QUALITY PROTECTION ARE NOT SUFFICIENTLY INTEGRATED

Many participants at the January dialogue noted that the size and complexity of California's coastal ecosystems, the multiplicity of agencies with authority over ocean and coastal resources, and the jurisdictional overlap among federal and state agencies[68] present inherent challenges for managing and improving marine water quality and ecosystem health.[69] Fortunately, the MLPP recognizes the need for

---

60 The Ocean Plan also establishes standards for the physical, chemical, and bacteriological characteristics of offshore waters, and includes implementation provisions for marine managed areas. CAL. OCEAN PLAN, *supra* note 16, at 2–6, 21. The State Water Board has also adopted water quality control criteria covering thermal discharges through the California Thermal Plan, which sets out specific thermal criteria for various state waters. *See* WATER QUALITY CONTROL PLAN FOR CONTROL OF TEMPERATURE IN THE COASTAL AND INTERSTATE WATERS AND ENCLOSED BAYS AND ESTUARIES OF CALIFORNIA [hereinafter CAL. THERMAL PLAN].

61 CAL. OCEAN PLAN, *supra* note 16, at 85–86. ASBS support an unusual variety of aquatic life and are considered the basic building blocks for a sustainable, resilient coastal environment and economy.

62 CAL. PUB. RES. CODE § 36700(f); CAL. OCEAN PLAN, *supra* note 16, at 28, app. I.

63 CAL. PUB. RES. CODE §§ 36600–36900.

64 CAL. PUB. RES. CODE § 36700(f).

65 CAL. OCEAN PLAN, *supra* note 16, at 21–27. The State Water Board may grant exceptions where the exception does not compromise protection, is in the public interest, complies with the California Environmental Quality Act, and is granted subsequent to a public hearing with the concurrence of the EPA.

66 *Id.* at 21.

67 CAL. THERMAL PLAN, *supra* note 60, at 6.

68 Evan Fox et al., *Enabling Conditions to Support Marine Protected Area Network Planning: California's Marine Life Protection Act Initiative as a Case Study*, 74 OCEAN & COASTAL MGMT. 14, 15 (2013) (explaining that four national marine sanctuaries managed by NOAA, four protected areas managed by the National Park system, several national wildlife refuges managed by USFWS and the California Coastal National Monument managed by the U.S. Bureau of Land Management are adjacent to or extend into state waters).

69 January 2017 Roundtable, *supra* note 19.

enhanced coordination and is currently working to connect MPA science and management with other efforts to manage fisheries, climate change, and water quality.[70] Both the OPC[71] and MPA Statewide Leadership Team[72] integrate mechanisms that attempt to address these coordination challenges. Existing efforts to meaningfully improve water quality in MMAs, however, necessarily rely on the effectiveness of the fairly independent system of water quality regulation embodied in the CWA, Porter-Cologne Act, and the California Ocean Plan.

Opportunity: Support and Expand Emerging Integration Efforts

Participants at the January Roundtable agreed that coordination between MPA and water quality management was vital. Several pointed to the MPA Statewide Leadership Team as a valuable avenue. The Leadership Team's current work plan has action items to align multiple management mandates and priorities that include integrating water quality and MPA management.[73]

Recent Ocean Plan amendments and policies adopted by the State Water Board also have started to integrate concerns regarding MPAs into water quality regulation. The State Water Board recently adopted an amendment to the Ocean Plan to address effects associated with the construction and operation of seawater desalination facilities, including potential negative impacts to MPAs and SWQPAs from intake and discharge structures.[74] The State Water Board also recently adopted an Ocean Plan amendment to control trash, designed to prevent plastic pollution and other marine debris from entering the marine environment.[75] In 2016, the State Water Board adopted a stormwater strategy that aims to lead the evolution of stormwater management in California by advancing the perspective that stormwater is a valuable resource, supporting policies for collaborative watershed-level stormwater management and

---

70 2016 MASTER PLAN, *supra* note 6, at 35; *see also*, Gleason et al., *supra* note 3, at 92 (stating that CDFW is identifying ways to integrate MPAs with fisheries management under the Marine Life Management Act).

71 OPC works to break down traditional silos and create novel partnerships and collaborations as it supports and informs MPA network management and a range of water quality projects, including those that link to MPAs. As OPC consists of both the Secretary of the National Resources Agency (which plays a strong role in MPA management) and the Secretary of CalEPA (overseeing state water quality programs), by its very structure it provides a degree of coordination between these efforts. *See* OPC, MARINE PROTECTED AREAS, http://www.opc.ca.gov/programs-summary/marine-protected-areas/ (last visited Feb. 2, 2018). Moreover, OPC has invested tens of millions of bond dollars in support of MPA planning, designation, and management, and it has directly recognized the link between MPAs and water quality in multiple projects.

72 The MPA Statewide Leadership Team is set up to promote communication, collaboration, and coordination among entities that have significant authority to affect the statewide MPA network and is a key tool OPC uses to support management. *Id.*

73 *See* MARINE PROTECTED AREA (MPA) STATEWIDE LEADERSHIP TEAM WORK PLAN FY 15/16–17/18 [hereinafter LEADERSHIP TEAM WORK PLAN] (other action items include aligning MPA monitoring efforts with fisheries and climate change efforts and increasing alignment of research activities with state priorities).

74 CAL. STATE WATER RES. CONTROL BD., FINAL STAFF REPORT AND FINAL DESALINATION AMENDMENT, INCLUDING THE FINAL SUBSTITUTE ENVIRONMENTAL DOCUMENTATION (adopted May 6, 2015). CAL. STATE WATER RES. CONTROL BD., STATEWIDE WATER QUALITY CONTROL PLANS FOR TRASH (adopted Apr. 7, 2015). *Id.*

75 CAL. STATE WATER RES. CONTROL BD., STATEWIDE WATER QUALITY CONTROL PLANS FOR TRASH (adopted Apr. 7, 2015).

pollution prevention, and integrating regulatory and non-regulatory interests.[76] In 2012, the State Water Board adopted Ocean Plan amendments to establish criteria for designating SWQPAs in MPAs, discussed further below. Finally, in 2010, the State Water Board adopted a policy to implement CWA section 316(b) to reduce the harmful effects associated with cooling water intake structures of coastal power plants and phase out the use of once-through cooling (OTC Policy).[77] The policy gives preference to funding mitigation projects directed toward enhancing MPAs in the geographic region of the facility.[78]

These recent amendments and policies represent an encouraging trend to integrate MPA protection into the water quality regulatory regime. However, Participants concurred that existing efforts remain nascent, and that sustained attention and support are needed for these initiatives to be flourish. Moreover, as detailed in the next subsections, significantly more integration is possible and would improve marine water quality protection along California's coasts.

Opportunity: Increased Use of Water Quality Designations for MPAs

Although water quality is not regulated under the MLPA, it was identified as a major stressor to avoid in the designation of MPAs, particularly in the heavily urbanized South Coast. During the South Coast region designation process, the CDFW's Science Advisory Team[79] recognized water quality as an issue that affects overall ocean health—including ecosystems within MPAs—and issued recommendations for siting MPAs that anticipated water quality issues.[80] Although these recommendations were secondary to the core scientific guidelines regarding habitat type, size and spacing of MPAs, stakeholders generally heeded this advice and avoided designating MPAs in areas of major water quality concern.[81]

---

76 *See* STATE WATER RES. CONTROL BD., STRATEGY TO OPTIMIZE RESOURCE MANAGEMENT OF STORM WATER (STORMS), https://www.waterboards.ca.gov/water_issues/programs/stormwater/storms/ (last visited Feb. 6, 2018).

77 CAL. STATE WATER RES. CONTROL BD., STATEWIDE WATER QUALITY CONTROL POLICY ON THE USE OF COASTAL AND ESTUARINE WATERS FOR POWER PLANT COOLING (adopted May 4, 2010) [hereinafter OTC POLICY]. The Policy was amended in 2011, 2013 and 2016. S*ee also* Angela Kelley, *A Call for Consistency: Open Seawater Intakes, Desalination, and the California Water Code*, 4 GOLDEN GATE U. ENVTL. L.J. 277, 278-279 (2011).

78 OTC POLICY, *supra* note 77. The State Water Board, OPC and the Coastal Conservancy signed an MOU in 2016 regarding acceptance and use of interim mitigation funds and OPC is currently developing a framework to identify and prioritize projects that fulfill the requirements of the OTC Policy and are consistent with the State Water Board's preference for investment in the State's MPA network. *See* MOU between OPC, State Water Bd., and Coastal Conservancy (2016), *available at* http://www.opc.ca.gov/webmaster/_media_library/2016/10/Compressed_Acceptance-Use-of-Interim-Mitigation-Funds-for-the-Once-Through-Coolin.pdf (last visited Feb. 6, 2018); CAL. STATE WATER RES. CONTROL BD., ONCE-THROUGH COOLING MITIGATION PROGRAM (adopted Aug. 30, 2016).

79 The Science Advisory Team, which consists of appointed technical experts in a range of fields including marine ecology, fisheries, economics, and social sciences, provides the scientific information and technical judgment which assists CDFW with meeting the objectives of the MLPA. *See Master Plan Science Advisory Team, South Coast Study Region*, CAL. DEP'T OF FISH & WILDLIFE, http://www.dfg.ca.gov/marine/mpa/scsat.asp (last visited Feb. 6, 2018).

80 WATER QUALITY WORK GROUP DRAFT RECOMMENDATIONS, *supra* note 20, at 10–11 (recommending avoiding placing MPAs in areas that contain power plant entrainment sites, major stormwater discharge sites, and major wastewater discharge sites).

81 Telephone Interview with Brian Owens, Member of Water Quality Work Group, CDFW (Oct. 19, 2017).

While some MPAs, particularly state marine reserves, were designated to overlap with pre-existing ASBSs designated under the water quality regulatory regime, many MPAs do not. The State Water Board determined that the stringent ASBS protections were not appropriate for some MPAs, as significant environmental and socioeconomic stressors might exist, particularly in densely populated areas and/or where substantial wastewater or stormwater outfall infrastructure is located.[82] As a result, MPAs in these areas do not contain heightened water quality regulation.

Recognizing an opportunity to further integrate MPAs and water quality protection, in 2012, the State Water Board created a new designation that was anticipated to provide some protection of water quality in MPAs. It amended the Ocean Plan to establish a new type of SWQPA, "general protections" (GPs),[83] specifically intended to overlap with MPAs and provide an intermediate level of protection.[84] The SWQPA-GP designation thus was created to give State and Regional Water Boards additional flexibility for protecting water quality in ecologically sensitive areas by providing an intermediate level of protection appropriate for areas where recreational and/or commercial take is allowed and where a discharge prohibition is unnecessary and/or not feasible.[85] Within the SWQPA-GP designation, certain types of existing low-risk discharges are allowed, but future high-risk discharges are prohibited.[86]

Unfortunately, although these new SWQPA designations might help address regulatory fragmentation, no SWQPA-GPs have been designated to date. Participants discussed the political and practical challenges of designating new SWQPAs to overlap with MPAs, given that the MPA network is located off the coast of a heavily populated and developed state and that most of the costs related to implementation would fall on already fiscally stressed local governments.[87] Implementation of these regulations could be prohibitively expensive if new infrastructure were required to meet water quality standards.[88] Moreover, some municipalities sought assurances during the MPA designation process that additional water quality regulations would not be imposed as a result of siting an MPA within its boundaries.[89] Without the political will to achieve such designations, the ability to enhance coastal water quality for MPAs will continue to be limited.

Accordingly, participants attempted to identify opportunities that might help cultivate such political will. Some suggested that proponents of MPAs should look to leverage regional stakeholders and the periodic review of basin plans to help increase opportunities for MPAs to benefit from protections under the water quality regulatory regime. New SWQPA proposals are developed at the Regional Water Board level and

---

82 FINAL SED FOR OCEAN PLAN AMENDMENTS, *supra* note 59, at 33–35.
83 *Id.* at 42.
84 CAL. OCEAN PLAN, *supra* note 16, at iii; STATE WATER RES. CONTROL BD., RES. NO. 2012-0056 (adopted Oct. 16, 2012).
85 FINAL SED FOR OCEAN PLAN AMENDMENTS, *supra* note 59, at 34.
86 FINAL SED FOR OCEAN PLAN AMENDMENTS, *supra* note 59, at 36.
87 June 2016 Dialogue, *supra* note 18.
88 Telephone Interview with Ken Schiff, Deputy. Dir., SCCWRP (Mar. 15, 2017) (noting that if water quality is the issue of concern, it is more effective to start with enforcing current water quality regulations).
89 Telephone Interview with Calla Allison, Dir., MPA Collaborative Network (Dec. 20, 2016) (describing the City of Laguna Beach's requests).

come to the State Water Board as a package for approval.[90] As such, any new proposal would benefit from buy-in and support from regional stakeholders. The MPA Collaborative Network can play a critical role in identifying high priority sites for new SWQPA designations and building this local support.

Moreover, to promote designation, regional boards could assess all existing discharges and use this information to determine what controls are needed to maintain water quality, including developing and adopting more stringent permits, discharge conditions, or prohibitions within these areas. Some Regional Board staff have stated they do not have adequate resources to conduct this type of comprehensive survey.[91] They did suggest, however, that interested groups could assist with gathering the information needed to promote designation.[92]

As coastal Regional Water Boards conduct their basin plan reviews, additional opportunities for new SWQPA designations will likely arise. As established community networks for outreach and education, enforcement and compliance, and research and monitoring, the MPA Collaborative Networks are well-situated to enhance the informational capacity and political mobilization needed for SWQPA designation. The State Water Board should consider directing Regional Water Boards to work with the MPA Collaborative Network and others interested in enhancing coastal water quality to identify candidate areas for SWQPA designation and prepare for these basin plan reviews.

Opportunity: Upgrade ASBS Program Standard Setting and Enforcement

Of course, SWQPA designations alone are not sufficient to ensure that water quality and ecosystem health are protected.[93] As stated above, the new SWQPA-GP category provides a lower level of protection compared to ASBS designation,[94] and participants agreed that even ASBS designation does not automatically lead to adequate water quality protection.[95] ASBS protections are intended to maintain natural water quality standards by preventing pollution from entering the area, but some noted that the program is not functioning as originally envisioned.[96] When the ASBS program was established in the 1970s with the goal of eliminating all discharge into these areas, managers did not foresee or adequately address the types of diffuse pollution caused by stormwater runoff.[97] While an ASBS designation may be a helpful tool in implementing water quality protection, there are several deficiencies that limit the effectiveness of the program.

As an initial matter, the ASBS program requires maintenance of "natural" water quality, but participants noted that what is deemed the natural baseline may already be fairly compromised, describing it as "the

---

90 Telephone Interview with Karen Larsen, Deputy Dir., State Water Bd. (Dec. 22, 2016).
91 Telephone Interview with Peter von Langen, Central Coast Regional Water Bd. (Oct.13, 2017).
92 *Id*.
93 January 2017 Roundtable, *supra* note 19.
94 FINAL SED FOR OCEAN PLAN AMENDMENTS, *supra* note 59, at 33–37.
95 June 2016 Dialogue, *supra* note 18.
96 Telephone Interview with Sara Aminzadeh, Exec. Dir., Cal. Coastkeeper (Mar. 9, 2017).
97 Telephone Interview with Jonathon Bishop, Chief Dep. Dir., State Water Bd. (Nov. 1, 2017).

best of what is left."[98] As urban, industrial, and agricultural runoff have elevated background levels of pollution, the accepted "natural" water quality baseline today for the purposes of the ASBS program is different than what the baseline would have been one hundred years ago.[99] The ASBS Natural Water Quality Committee (NWQC)[100] has already recommended that the State Water Board identify strategies to account for shifting baselines, including identifying how they plan to deal with future increases in human population and development and the potential for water quality degradation in and near ASBS and present day reference sites.[101] The NWQC also recommends quantitatively defining natural water quality such that any detectable human influence on the water quality must not hinder the ability of marine life to respond to natural cycles and processes,[102] as well as continuing efforts to better understand the true range and causes of natural variability in water quality and impacts from anthropogenic contributions.[103] The State Water Board should adopt the NWQC's recommendations to better quantify "natural ocean water quality" and take action to avoid shifting baselines.

Second, enforcement by the State and Regional Water Boards is deficient.[104] Participants suggested that the problems are a result of competing priorities within the State Water Board, with more attention given to freshwater ecosystems and a general unwillingness within the State and Regional Boards to punish violators.[105] Participants also commented that, in general, the State Water Board does not verify monitoring reports or follow up with permittees that are not meeting even the basic requirements, and there is currently widespread non-compliance with ASBS program requirements as a result.[106] A 2016 California

---

98 June 2016 Dialogue, *supra* note 18; *see also* NATURAL WATER QUALITY COMMITTEE, SUMMATION OF FINDINGS 2006-2009 (2010) [hereinafter, SUMMATION OF FINDINGS] (warning against "shifting baselines" and lowered expectations for water quality).

99 Telephone Interview with Ken Schiff, *supra* note 88 (noting that the water quality baseline is shifting).

100 The NWQC was established under State Water Board Resolution 2004-52 to define natural water quality in the San Diego-Scripps ASBS and provide guidance for assessing impacts to water quality in any ASBS in the state. *See* STATE WATER RES. CONTROL BD., RES. NO. 2004-0052 (adopted July 22, 2004).

101 *See* SUMMATION OF FINDINGS, *supra* note 98, at 19.

102 The NWQC proposes defining "natural ocean water quality" as: "That water quality (based on selected physical, chemical and biological characteristics) that is required to sustain marine ecosystems, and which is without apparent human influence, i.e., an absence of significant amounts of: a) man-made constituents (e.g., DDT); b) other chemical (e.g., trace metals), physical (temperature/thermal pollution, sediment burial) and biological (e.g., bacteria) constituents at levels that have been elevated due to man's activities above those resulting from the naturally occurring processes that affect the area in question; and c) non-indigenous biota (e.g., invasive algal bloom species) that have been introduced either deliberately or accidentally by man." ASBS Program Final Environmental Impact Report, *supra* note 108, at 45–46.

103 *See* SUMMATION OF FINDINGS, *supra* note 98, at 18.

104 *See* John J. Lormon, *California's Ban on Waste Discharges into Areas of Biological Significance*, 20 NAT. RESOURCES & ENV'T. 28, 29 (2005) (noting that despite numerous violations, only one enforcement action of an illegal discharge into ASBS has been prosecuted).

105 June 2016 Dialogue, *supra* note 18; *see also* LITTLE HOOVER COMMISSION, CLEANER WATER: IMPROVING PERFORMANCE AND OUTCOMES AT STATE WATER BOARDS 32-36 (2009) [hereinafter, CLEANER WATER].

106 January 2017 Roundtable, *supra* note 19.

Coastkeeper Alliance review and analysis of ASBS Final Compliance Plans from the State Water Board also found widespread non-compliance with the ASBS Policy.[107]

While the Ocean Plan has prohibited all waste discharges into ASBSs from point and nonpoint sources since 1983,[108] a 2003 survey found waste discharges into ASBSs amounting to a total of 1,654 potential violations.[109] In response to a CWA citizen suit over these violations, in 2012 the State Water Board adopted a resolution approving exceptions for selected discharges into ASBSs.[110] Some contend that these exceptions are necessary because the zero-discharge approach is not feasible, particularly in heavily urbanized areas.[111] Others argue these exceptions have been applied too broadly.[112]

Finally, some participants advocate for the ASBS program to shift more toward reliance on holistic monitoring, assessment, and ultimately management of ecosystem health, rather than the program's current discharge-driven approach. Quantifying the chemical components of an effluent only partially assesses the potential of waste discharge to ASBS. It is also critical to assess the biological integrity of marine communities residing in ASBS to determine if anthropogenic influence on water quality is hindering the ability of marine life to respond to natural cycles and processes.[113] Moreover, current monitoring protocols involve sending water quality samples to the lab for testing, as well as toxicity and bioaccumulation studies. However, only sporadic in situ biological monitoring is required under ASBS permits.[114] A long-term program with time-series data to track the status of living organisms within ASBSs would be more informative.[115] Additionally, to keep pace with improving scientific understanding of

---

107 The review of draft Compliance Plans for Carmel, Los Angeles County and Malibu, Monterey City, County, and Pacific Grove, Newport Beach, Pebble Beach, and Trinidad, and final Compliance Plans for San Diego and Laguna Beach, show that none of the dischargers have acknowledged that their discharges alter natural ocean water quality; none of the Compliance Plans use, apply, or demonstrate compliance with the standards for pollution control set out in the ASBS Exception; and none of the Compliance Plans propose any best management practices beyond those already contemplated under other, existing programs. Email communication with Sara Aminzadeh, Cal. Coastkeeper Alliance (Mar. 16, 2017).

108 STATE WATER RES. CONTROL BD., ASBS PROGRAM FINAL ENVIRONMENTAL IMPACT REPORT 40–41 (2012) [hereinafter ASBS PROGRAM FINAL ENVIRONMENTAL IMPACT REPORT].

109 OCEAN UNIT, DIV. OF WATER QUALITY, STATUS REPORT AREAS OF SPECIAL BIOLOGICAL SIGNIFICANCE 13–20 (2006) (identifying 391 industrial and municipal storm drains, 1,012 small storm drains from homes, and 224 nonpoint sources draining into ASBS).

110 STATE WATER RES. CONTROL BD., RES. NO. 2012-0012 (adopted Mar. 20, 2012) (approving exceptions to the California Ocean Plan for Selected Discharges into ASBS, including special protections for beneficial uses).

111 Telephone Interview with Bob Stein, Asst. City Engineer, City of Newport Beach (Oct. 19, 2017); *see also* Lormon, *supra* note 104.

112 *See Coastal Envtl. Rights Found. v. California Reg'l Water Quality Control Bd.*, 12 CAL. APP. 5th 178, 185, (2017) (challenging the San Diego Regional Water Board's use of the exception for approval of fireworks displays and resulting discharges into the La Jolla ASBS and Heisler Park ASBS).

113 *See* SUMMATION OF FINDINGS, *supra* note 98, at 18.

114 Telephone Interview with Kimberly O'Connell, Env. Specialist, UC San Diego (Nov. 9, 2017).

115 Telephone Interview with Steve Murray, OPC-SAT (Oct. 19, 2017)

ecosystem functioning, monitoring and management will need to adapt.[116] For example, climate change is adding to the stressors affecting these communities, and the ASBS program will need to address new threats such as OAH.[117] Because the state of knowledge about these emerging threats is still limited,[118] improved monitoring and assessment is vital and expected to increase the options available for promoting ecosystem health.[119]

Due to these institutional deficiencies, a number of participants advocated for a comprehensive overhaul of the ASBS program so that it can function as originally intended and better protect biological communities.[120] In particular, policymakers should consider exploring a suite of strategies for improving SWQPA monitoring and enforcement, including:

- dedicating more resources for and improving marine monitoring and enforcement;
- adapting ASBS permit requirements to better assess ecosystem health;
- using grant funding to incentivize permittees to comply with ASBS regulations; and
- addressing the issue of shifting baselines by quantitatively defining natural ocean water quality.

In addition, reforms should seek to foster opportunities to coordinate with and make use of other public and private actors with the means and incentives to promote compliance with water quality protections. Given that many ASBSs overlap with marine reserves, the Collaborative Network and MPA citizen-science water quality monitoring programs could help promote monitoring and compliance. In 2000, for example, Orange County Coastkeeper, a member of the Orange County MPA Collaborative (OCMPAC), advocated for the prosecution of illegal discharges into the Irvine Coast ASBS, prompting the Santa Ana Regional Water Board to issue a cease and desist order to the dischargers. To date, this is the sole enforcement action of ASBS discharge prohibitions. OPC should explore these and other potential reforms for integrating MPA and ASBS management and develop guidelines that help relevant agencies act in coordination to achieve effective coastal water quality protections, perhaps by convening further dialogues involving ASBS permittees, regulators and scientists.

---

116 *Id*. (noting that dischargers currently aren't monitoring emerging chemicals of concern such as endocrine disruptors).

117 For example, the existing water quality criteria for pH are not scientifically valid for application to ocean acidification and will need to be updated. *Id*.; *see also* WEST COAST OAH SCIENCE PANEL, RECOMMENDATIONS AND ACTIONS, APP. G (2016) [hereinafter, WEST COAST OAH SCIENCE PANEL].

118 Nonetheless, managers can take action to improve local conditions by managing local factors that are known to contribute to declining water quality. For example, implementing better controls on nutrients and organic matter pollution that flow from land into coastal waters will reduce local pollutant inputs that degrade water quality and exacerbate OAH. See WEST COAST OAH SCIENCE PANEL, *supra* note 118, at 7.

119 *Id*. at 9.

120 January 2017 Roundtable, *supra* note 19.

PROBLEM: PERSISTENT COASTAL WATER QUALITY IMPACTS

Improving water quality in MMAs inevitably requires a higher level of protection for California coastal waters as a whole.[121] Regulators have long recognized the negative impacts that land use activities along the shoreline have on coastal water quality,[122] and OPC's Strategic Plan highlights this as an area of critical need for action.[123] The consensus among agencies and water quality specialists is that pollution from urban runoff significantly contributes to the impairment of downstream waters and aquatic dependent wildlife, including nearshore habitats contained in MMAs.[124] Although California's NPS Program attempts to establish a statewide approach to managing nonpoint source pollution and identifies goals and objectives to reduce or eliminate impacts,[125] it is notoriously difficult to control technologically, politically, and regulatorily.[126] For example, as the 2016 Orange County Infrastructure Report Card notes, the infrastructure improvements necessary to control runoff will require significant capital investment as well as innovation, collaboration, and integration among stormwater, water supply, wastewater treatment, and flood control agencies.[127] Further, although industrial dischargers are required to monitor and report stormwater sampling results to the Regional Water Boards, violations of allowed pollutant limits are rampant and enforcement is weak.[128]

Participants noted that even with effective monitoring and enforcement of prohibitions against direct discharge into ASBSs and MPAs, many of these protected areas are located within or near watersheds that

---

121 ASBS are not separate from or isolated from those waters. Water, biota, and substances move between ASBS and surrounding coastal waters.

122 *See* Kelly & Caldwell, *supra* note 47, at 87–88.

123 *See* CAL. OCEAN PROTECTION COUNCIL, A VISION FOR OUR OCEAN AND COAST, FIVE-YEAR STRATEGIC PLAN 2012-2017, http://www.opc.ca.gov/webmaster/ftp/pdf/2012-strategic-plan/OPC_042412_final_opt.pdf (last visited Jan. 22. 2018).

124 Robin Kundis Craig, *Urban Runoff and Ocean Water Quality in Southern California: What Tools Does the Clean Water Act Provide?* 9 CHAPMAN L. REV. 313, 314 (2006) [hereinafter, Craig, *Urban Runoff*]; Steven Bay et al., *Water Quality Impacts of Stormwater Discharges to Santa Monica Bay* 56 MAR. ENV. RES. 205-23 (2003); Megan E. Mach et al., *Assessment and Management of Cumulative Impacts in California's Network of Marine Protected Areas* 137 OCEAN & COAST. MGMT. 1-11 (2017).

125 See CAL. NONPOINT SOURCE PLAN, *supra* note 49, at 13–15. The NPS Program is comprised of a myriad of Water Board and Coastal Commission programs (e.g., agriculture and irrigated lands, forestry, TMDL, coastal water quality protection, etc.).

126 *See* Craig, *Urban Runoff*, supra note 124, at 322–329 (describing the implementation of management measures under the CZARA to control nonpoint sources of coastal water pollution and the challenges, which are exacerbated with increasing numbers of coastal residents); *see also* Kelly & Caldwell, *supra* note 47, at 75 (noting that the failure of states to create enforceable TMDLs to more strictly enforce nonpoint source pollution requirements is a well-known problem).

127 ASCE/UC IRVINE CIVIL AND ENVIRONMENTAL ENGINEERING AFFILIATES, 2016 ORANGE COUNTY INFRASTRUCTURE REPORT CARD 62 (giving surface water quality a grade of D+).

128 Email communication with Matt O'Malley, Exec. Dir., S.D. Coastkeeper (Mar. 16, 2017); *see also* DECONSTRUCTING ENFORCEMENT, A PRIMER ON WATER QUALITY ENFORCEMENT 12 (2010) (noting that the most significant challenge facing the Regional Water Boards is the lack of adequate resources to assess compliance with the General Industrial and Construction Stormwater Permits); *see also* CLEANER WATER, *supra* note 105, at 32-36; *see also* Charles Lester, *CZM in California: Success and Challenges Ahead* 41 COASTAL MGMT. 219, 243 (2013) (noting that the Coastal Commission has a backlog of more than 1,750 enforcement cases).

are not subject to these prohibitions.[129] Managers must consider water quality impacts outside MPA boundaries as well as within, as this will affect how the MPA itself performs and how the network functions as a whole. While the precise impact of water quality in MPAs is not well understood,[130] it is often cited as a determinant factor in an MPA's success.[131] As an example, the southern sea otter is a keystone species in kelp forest communities, acting to increase species diversity and providing ecosystem services.[132] However, despite federal protection since 1977, the southern sea otter population has struggled to recover, and a major contributing factor is disease-related mortality caused by a parasite that is thought to reach coastal waters in contaminated runoff.[133] Climate change, with its projected increases in the frequency of extreme weather events and associated increases in precipitation, will likely exacerbate challenges caused by runoff[134] and other significant stressors.[135] Although knowledge gaps exist, managing water quality is clearly important for reducing environmental burdens that interact with climate change.[136]

---

129 January 2017 Roundtable, *supra* note 19 (pointing to the example of Crystal Cove ASBS and the nearby Newport Bay, a federally impaired water body whose plume flows into the ASBS). *See* Peter A. Rogowski et al., *An Assessment of the Transport of Southern California Stormwater Ocean Discharges* 90 MAR. POLL. 135-142 (2014) (finding that major river systems in southern California have the potential to expose MPAs to urban stormwater runoff).

130 Historically, water quality has been a significant cause for degraded nearshore rocky reef habitat. *See* Michael S. Foster & David R. Schiel, *Loss of predators and the collapse of southern California kelp forests(?): Alternatives, explanations and generalizations* 393 J. EXPER. MAR. BIO. & ECO. 59 (2010) (finding that Southern California kelp losses were caused primarily by large increases in contaminated sewage discharged into coastal waters, sedimentation from coastal development, and the 1957-1959 El Niño).

131 Ken Schiff et al., *Impact of Stormwater Discharges on Water Quality in Coastal Marine Protected Areas*, 87 WATER ENVT. RES. 772-782 (2015) (noting that pollutants can lead to habitat alteration, eutrophication, contaminated sediments, and accumulation of toxics in tissues of marine organisms and finding that sites in southern California, where proportionally greater urbanization occurs, fared worse than their northern or central California counterparts).

132 *See* Tinker and Estes Lab, UC Santa Cruz, *Infectious Disease in the Nearshore*, https://werc.ucsc.edu/Current%20Research/disease.html (last visited Jan. 22, 2018).

133 Karen Shapiro et al., *Effect of Estuarine Wetland Degradation on Transport of Toxoplasma gondii Surrogates from Land to Sea*, 76 APPL. ENVT'L. MICROBIOL. 6821-6828 (2010) **(**finding that protection and restoration of wetlands can reduce coastal contamination with pathogens that are transported in contaminated runoff); *see also* Mike McPhate, *The Plight of the Sea Otter*, N.Y. TIMES (Oct. 26, 2017).

134 Although much of the research to date has focused on temperature-related impacts on biota, climate change is likely to bring major shifts in rainfall patterns, including increased risks of drought and severe flooding, which will have major impacts on coastal water quality. Telephone Interview with Ken Schiff, *supra* note 88. These shifts in rainfall patterns will not only change pollutant inputs, but may also change how municipalities use water, such as increased efforts to stop discharging wastewater and start reusing it. *Id*.

135 Climate change is affecting California's coastal ocean conditions, creating a fundamental shift in ocean chemistry to the detriment of marine ecosystems. Scott C. Doney et al., *Climate Change Impacts on Marine Ecosystems*, 4 ANN. REV. MARINE SCI. 11, 24–29 (2012) (describing the impacts of climate change on the California Current Large Marine Ecosystem); Kelly & Caldwell, *supra* note 47, at 61–66 (describing the impacts of acidification on marine ecosystems). Colleen A. Burge et al., *Climate Change Influences on Marine Infectious Diseases: Implications for Management and Society*, 6 ANN. REV. OF MAR. SCI. 249-277 (2014) (describing impacts to marine mammals, corals, fish and marine invertebrates).

136 Burge et al.*, supra* note 135, at 276.

Opportunity: Make Better Use of Coastal Act Restrictions on Land Uses

Therefore, opportunities exist for better addressing the effects of urban runoff and other land use activities on protected marine areas through closer coordination among agencies managing coastal uses. Under the California Coastal Act, the California Coastal Commission addresses urban runoff and other sources of NPS pollution through their coastal NPS program, working in partnership with coastal cities and counties primarily through the preparation of Local Coastal Programs (LCPs).[137] Because LCPs must be submitted to the Coastal Commission for review and approval, they present an opportunity to require local governments to consider and address impacts to coastal water quality.[138]

As cities and counties update their LCPs, the Coastal Commission can educate local regulators and decision makers about local MPAs and other MMAs and incentivize their protection and restoration.[139] There is also an opportunity to positively affect coastal water quality planning by incorporating concepts such as low impact development (LID) and other source control measures and best management practices (BMPs) into LCPs.[140] This can facilitate the movement toward distributed and green infrastructure (rainwater tanks and green roofs) as a complement to the centralized infrastructure (aqueducts, water treatment plants and, more recently, desalination plants) cities have long relied on.[141] However, the Coastal Act does not require LCP updates, and many LCPs do not have adequate measures to address runoff or new management issues such as climate change and sea level rise.[142]

In addition to ensuring that Coastal Development Permits (CDPs) are consistent with any Regional Water Board-approved NPDES permits at the project scale, the Coastal Commission and local jurisdictions can also condition CDPs on measures to avoid impacts to MPAs and ASBSs. For example, consistent with the Ocean Plan desalination amendment, potential impacts to nearby MPAs are a required consideration in the Coastal Commission's evaluation of the proposed Huntington Beach desalination facility.[143] Similarly, the Santa Ana Regional Water Board must also consider impacts to MPAs when determining whether to renew

---

137 *See* CAL. NONPOINT SOURCE PLAN, *supra* note 49, at 6–7.

138 *Id*. at 20.

139 Telephone Interview with Michael Sandecki & Al Wanger, Cal. Coastal Comm. (Dec. 6, 2016).

140 *Id*.

141 *See* Asal Askarizadeh et al., *From Rain Tanks to Catchments: Use of Low-Impact Development to Address Hydrologic Symptoms of the Urban Stream Syndrome*. 19 ENVTL SCI. & TECH. 49 (2015).

142 *See* CAL. NONPOINT SOURCE PLAN, *supra* note 49, at 6–7. Many of these LCPs were certified in the 1970's and 1980's and do not reflect the mandates of current state stormwater programs or the CA NPS Program Plan. *See also* Lester, *CZM in California, supra* note 128 (lamenting that inadequate funding and resources for accomplishing comprehensive LCP updates has led to piecemeal decision-making, which has increased conflict and the likelihood of poor resource management).

143 *See* Letter from Cal. Fish & Game Commission to Coastal Commission (Feb. 1, 2017) (urging avoidance of open ocean intakes and siting away from MPAs), https://www.waterboards.ca.gov/santaana/water_issues/programs/Wastewater/Poseidon/Letter_CFG_2017_02_01.pdf (last visited Jan. 22, 2018).

the facility's NPDES permit.[144] These agencies thus can and should condition permits to minimize or avoid impacts to MMAs.

MMA water quality can also be addressed through enhanced coordination via the Coastal Commission's Critical Coastal Areas (CCA) Program and the State Water Board's Integrated Regional Water Management (IRWM) Program. The CCA Program is a non-regulatory planning tool that was designed to foster collaboration among local stakeholders and government agencies and to focus efforts on addressing polluted runoff in coastal watersheds that flow to high resource value marine areas.[145] In 2000, a Statewide CCA Committee[146] convened to develop goals and strategies for the program. The goals include developing customized action plans for each of the 119 CCAs identified by the Committee.[147] The Statewide Committee envisioned that local CCA teams, comprised of watershed groups, special interest organizations, government agencies, and community members, would be formed to develop each CCA action plan.[148] These action plans were intended to integrate and build on existing local watershed protection and restoration efforts, identify needs and available resources, focus the attention of responsible agencies, and coordinate with other relevant water quality protection programs.[149]

In 2005, the CCA Committee selected five pilot CCAs and formed teams of local stakeholders and government agencies to develop community-based NPS watershed assessments and action plans for addressing polluted runoff that threatens coastal resources within these CCAs.[150] The Orange County Pilot CCA Project contained four CCAs, including three ASBSs (Newport Beach ASBS, Irvine Coast ASBS, and Heisler Park ASBS), and led to development of the Central Orange County Integrated Regional Watershed Management Plan (IRWMP).[151] The comprehensive IRWMP takes a partnership-based approach to addressing NPS pollution as well as other water quality, water supply, flood management and habitat issues, including strategies to reduce adverse impacts to CCAs, ASBSs and MPAs in the region. Participants report that this program has led to innovative planning and pioneering projects to address NPS

---

144 *See 2017 Renewal of the Huntington Beach Desalination Facility Permit*, SANTA ANA WATER RES. CONTROL BD., https://www.waterboards.ca.gov/santaana/water_issues/programs/Wastewater/ Poseidon.html (last visited Jan. 16, 2018).

145 The program aims to ensure that effective NPS management measures are implemented to protect or restore coastal water quality in CCAs. *See Critical Coastal Areas Program,* CALIFORNIA COASTAL COMMISSION, https://www.coastal.ca.gov/nps/cca-nps.html (last visited Jan. 16, 2018).

146 The Statewide CCA Committee included representatives from CCC, State and Regional Water Boards, CDFW, CA State Parks, CA Coastal Conservancy, CalTrans Stormwater Program, NOAA, USEPA and Ocean Conservancy. The Statewide Committee met from 1994 through 2008, and is currently inactive. *Id*.

147 *See* CRITICAL COASTAL AREAS DRAFT STRATEGIC PLAN 5-12 (2002). *Id*.

148 The Statewide Committee provides guidance on developing action plans, including a process for review and adaptive management. *See* CRITICAL COASTAL AREAS NPS WATERSHED ASSESSMENT & ACTION PLAN OUTLINE (2005).

149 *See Critical Coastal Areas Program*, *supra* note 145.

150 One pilot CCA was selected for each region of the coast. *Id*.

151 In 2006, the City of Newport Beach was awarded funding by the California Department of Water Resources through Proposition 50 for preparation of an IRWMP, which was completed in 2009. *See Central Orange County Watershed Management Area*, OCPUBLICWORKS.COM, http://www.ocwatersheds.com/programs/ourws/wmaareas/wmacentraloc (last visited Jan. 22, 2018).

pollution and impacts to MMAs.[152]In addition, in order to better protect MPAs from NPS pollution, Coastal Commission staff recently proposed adding a new criterion for identifying CCAs that include "coastal watersheds where an impaired waterway flows to the coast adjacent to an MPA."[153] This represents an opportunity to better align the CCA program with the MPA and ASBS programs. However, the CCA program has languished in recent years due to lack of resources.[154] The Statewide Committee has not met since 2008, and most CCAs do not have NPS watershed assessments and customized action plans. The Orange County pilot project demonstrates the potential of the CCA program to promote coordinated management and it should therefore be reinvigorated.

Although the CCA program has declined, the State Water Board has been promoting regional integrated management as a central component of its water policy since the early 2000s, and recent water bonds earmarked substantial funding for integrated regional water management (IRWM) programs.[155] To qualify for these funds, nearly 50 IRWM programs have been formed, covering the most populated areas of the state.[156] The Department of Water Resources and the State Water Board should require and otherwise provide incentives for these IRWM programs to include consideration of CCAs, MPAs, and ASBSs within their watersheds.

Opportunity: Jettison "Safe Harbors" for Municipal Clean Water Act Violations

In addition to the Ocean Plan prohibitions against direct discharge, all ASBSs are also generally subject to restrictions in Municipal Separate Storm Sewer System (MS4) permits for stormwater runoff.[157] Polluted

---

152 Telephone Interview with Bob Stein, *supra* note 111 (claiming that the Central OC IRWMP has won the most grants and is the best watershed-visioning plan in the state and noting that numerous projects and partnerships have resulted from this process, including a recent pilot project with UC Irvine that will assess constituent loads into Newport Bay to help manage and improve water quality).

153 *See* CAL. NONPOINT SOURCE PLAN, *supra* note 49, at 15–17. Existing criteria for designating CCAs primarily relies on state designations of impaired waters under the CWA or government designations of marine and estuarine areas with high resource value (e.g., ASBS).

154 Telephone Interview with Michael Sandecki & Al Wanger, *supra* note 114 (noting that NOAA used to provide CZARA money for coastal water quality, but Congress eliminated this funding in 2005). Although Coastal Commission staff have expressed interest in doing more to protect coastal water quality, they lack dependable funding because CWA money goes first to the State Water Board before passing through to the Coastal Commission. *Id*.

155 *See* Ellen Hanak, et al., PAYING FOR WATER IN CALIFORNIA 49 (2014).

156 *Id*.

157 Phase I NPDES storm water permits are for medium (serving between 100,000 and 250,000 people) and large (serving 250,000 or more people) municipalities. Phase II general permits provide coverage for smaller municipalities (population less than 100,000), including non-traditional Small MS4s, such as military bases. *See Storm Water Program,* STATE WATER RES. CONTROL BD., https://www.waterboards.ca.gov/water_issues/programs/stormwater/ (last visited Feb. 6, 2018).

stormwater runoff is regularly transported through MS4s and discharged into local water bodies.[158] As such, these MS4 permits offer an additional avenue for addressing direct and adjacent discharges into ASBSs.[159]

However, several Regional Water Boards have recently adopted alternative compliance, or "Safe Harbor" provisions for their municipal stormwater permits, which create a partial or complete exemption from enforcement for violations of water quality standards.[160] Such amendments weaken a permit holder's accountability by shielding them from citizen suits so long as they have a plan to improve water quality.[161] CWA citizen suits,[162] when available as a means of enforcement, have proven effective at improving water quality, reducing or eliminating harmful discharges,[163] and instituting needed infrastructure improvements.[164]

Unraveling these exemptions would undoubtedly require substantial political will. Regrettably, the trend at the federal level is decidedly in the opposite direction.[165] Fortunately, some in the California legislature have shown interest in adopting pre-Trump federal environmental and safety regulations as the minimum standards under California law.[166] Nonetheless, without more stringent standards and enforcement, ASBSs

---

158 *See Stormwater Discharges from Municipal Sources*, USEPA, https://www.epa.gov/npdes/stormwater-discharges-municipal-sources (last visited Feb. 6, 2018).

159 Telephone Interview with Ken Schiff, *supra* note 88.

160 San Francisco, Los Angeles and San Diego Regional Water Boards have adopted safe harbor to some extent. *See, e.g.*, S.D. REGIONAL WATER QUALITY CONTROL BD., RES. NO. R9-2015-0100, NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT AND WASTE DISCHARGE REQUIREMENTS FOR DISCHARGES FROM THE MUNICIPAL SEPARATE STORM SEWER SYSTEMS (MS4S) DRAINING THE WATERSHEDS WITHIN THE SAN DIEGO REGION (adopted Nov. 18, 2015).

161 Email communication with Matt O'Malley, *supra* note 128.

162 33 U.S.C. §1365. The federal CWA authorizes any person to file a suit on their own behalf to enforce violations of a standard or limitation imposed in an NPDES permit or violations of orders issued with respect to such standards or limitations.

163 Email communication with Matt O'Malley, *supra* note 128 (noting that S.D. Coastkeeper and S.D. Surfrider's sewage spills litigation resulted in a 90% reduction of such spills in the City of San Diego). For example, San Francisco Baykeeper secured stricter regulations for stormwater runoff into the Bay after successfully suing several Bay Area cities under the CWA for deficient stormwater management. By working closely with the San Francisco Bay Regional Water Board to improve the guidelines, Baykeeper was able to ensure stronger controls on trash, pesticides and other toxic pollution in stormwater. *See* SAN FRANCISCO BAYKEEPER, *Urban Stormwater*, http://baykeeper.org/blog/local-cities-taking-steps-reduce-storm-water-pollution (last visited Jan. 9, 2018).

164 For example, Baykeeper recently settled a lawsuit against the City of San Jose that requires the City to spend $100 million on "green infrastructure" to capture and filter polluted stormwater. Paul Rogers, *San Jose Agrees to $100 Million Pollution Cleanup Program to Reduce Trash, Sewage Spills,* SAN JOSE MERCURY NEWS, (June 14, 2016).

165 The Trump administration has repeatedly sought to reduce funding and staffing for environmental law implementation and enforcement, including drastic cuts to EPA funding. *See* Brady Dennis, *Trump Budget Seeks 23 Percent Cut at EPA, Eliminating Dozens of Programs,* WASHINGTON POST (Feb. 12, 2018);*see also*, Coral Davenport, *Trump Budget Would Cut EPA Science Programs and Slash Cleanups*, N.Y. TIMES, (May 19, 2017).

166 SB 49, part of the **"**Preserve California" legislative package introduced in 2017, would make certain federal laws, including the CWA, enforceable under state law, even if the federal government rolls back and weakens those standards. *See* http://focus.senate.ca.gov/preserve-california. The bill is active and currently in the Assembly Rules Committee, *available at* http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB49 (last visited Feb. 22, 2018).

and MPAs will continue to be exposed to damaging discharges from MS4s. At a minimum, protection of MMAs from MS4 discharges necessitates that local plans adopted through the exemption process for improving water quality are rigorous and enforceable.

Opportunity: Leverage Stakeholders in Implementation, Education, and Enforcement

Given the ubiquity of polluted runoff and resource limitations, stakeholders play a key role in implementation and education to address runoff and other water quality problems. Because toxic runoff is the result of many diffuse actions, such as failure to properly dispose of pet waste or over-irrigating yards, numerous groups can provide education and outreach to the public about the problem and what they can do to prevent it. Moreover, citizen groups undoubtedly have helped promote enforcement and innovative strategies for improving coastal water quality. For example, San Diego Coastkeeper and Surfrider, both members of the San Diego Collaborative, successfully led efforts to challenge the outdated permit for the City of San Diego's Point Loma Wastewater Treatment Plant.[167] The resulting Pure Water Program seeks to transition to large-scale wastewater recycling, including a cooperative agreement laying out steps to achieve both significant reduction in discharges of treated sewage to the ocean and production of at least 83 million gallons per day of drinking water by 2035, enough to meet about 40% of the City of San Diego's current use.[168]

A possible additional avenue for harnessing private parties to promote coastal water quality, particularly in light of any prospects of future limitations on federal citizen suits, might include the addition of a citizen suit provision under state law through the Porter-Cologne Act.[169] Citizen suit plaintiffs generally seek declaratory and injunctive relief, and settlement agreements often include payments identified as supplemental environmental projects (SEPs) or "mitigation payments," intended to offset impacts to local waters (through restoration projects, monitoring, watershed education projects, etc.) or improve infrastructure.[170]

Another more comprehensive and cooperative strategy might be to cultivate a network of regional coastal watershed collaboratives that builds on and proliferates the capacity of interested parties to promote coastal water quality. An entity analogous to the MPA Collaborative Network focused on coastal watersheds, with a diverse and engaged membership base and full-time support staff, could provide a forum for coordinated action at the State and Regional Water Boards. When a waste discharge requirement, stormwater permit,

---

167 *See* COOPERATIVE AGREEMENT IN SUPPORT OF PURE WATER SAN DIEGO (2014).

168 *See* , *San Diego Coastkeeper Lauds City Council Approval of Large-Scale Recycled Water Program,* SAN DIEGO COASTKEEPER, http://www.sdcoastkeeper.org/act/fix/san-diego-coastkeeper-lauds-city-council-approval-of-large-scale-recycled-water-program (last visited Jan. 9, 2018).

169 This is supported by a recent study finding that sanitary sewer overflow (SSO)-related citizen enforcement actions initiated under the CWA's citizen suit provision in California from 1996 through mid-2015 have helped improve collection system performance. NELL G. NYLEN ET AL., CITIZEN ENFORCEMENT AND SANITARY SEWER OVERFLOWS IN CALIFORNIA 140–142 (2016).

170 For example, the Coastal Watershed Council received SEP funds to conduct watershed assessment and restoration projects. *See* CENTRAL COAST REGIONAL WATER QUALITY CONTROL BD., SEP PROJECTS, https://www.waterboards.ca.gov/centralcoast/water_issues/programs/sep/projects/coastal_watershed_council.shtml (last visited Jan. 9, 2018).

or water quality control plan relevant to protected areas is renewed or amended, this type of robust coastal watershed network could coordinate efforts to ensure that any water quality standards, effluent limitations, restrictions, and conditions will be adequate to protect coastal water quality. While California has a history with watershed councils,[171] funding for coordination has waned in recent years.[172] For example, in 2012 the regional watershed coordinator positions were eliminated due to budget cuts.[173] In order to restore the critical linkage to communities involved in coastal resource protection projects, OPC and the State Water Board should examine avenues to support coastal watershed councils and the California Watershed Network, including support for regional watershed coordinator positions.

The Network of Oregon Watershed Councils (NOWC) offers a potential model for a coordinated and robust statewide network.[174] Fifty-nine watershed councils receive funding through the Oregon Watershed Enhancement Board (OWEB),[175] and NOWC provides capacity training as well as a collective voice to policy-makers and natural resource agencies.[176] This community-based model is effective in part because it is financially supported by the state, but also because it meaningfully involves and has buy-in from local governments, has an engaged membership base including landowners, and focuses on restoring land and water from "ridgetop to ridgetop" rather than according to political boundaries.[177]

II. Integrating Monitoring and Assessment of Coastal Water Quality and Ocean Health

While coordinating the implementation of the various regulatory regimes that seek to advance coastal and marine protection is an especially challenging long-term goal, Participants considered coordination of the monitoring and assessment functions of such overlapping regulatory regimes to be realistic in the shorter

---

171 For example, the Coastal Watershed Council is dedicated to the conservation and restoration of watersheds that drain into the Monterey Bay National Marine Sanctuary. *See* https://coastal-watershed.org/ (last visited Jan. 9, 2018).

172 Personal communication with Donna Meyers, Conservation Collaborative (Mar. 7, 2018).

173 *See* CALIFORNIA WATERSHED NETWORK (CWN), WHITE PAPER ON FUNDING NATURAL RESOURCE PROJECTS & RECOMMENDATIONS 2 (2014) (noting that the progress made since 1997 in collaboration and integration of watershed restoration has begun to unravel). CWN, run by a volunteer Board of Directors, identify multiple measures to enhance revenue as top policy issues. *See* http://www.watershednetwork.org/ (last visited Mar. 8, 2018).

174 Oregon Watershed Councils are locally organized, voluntary, non-regulatory groups established to improve the conditions of watersheds in their local area. NETWORK OF OREGON WATERSHED COUNCILS, http://www.oregonwatersheds.org/ (last visited Feb. 6, 2018).

175 The Oregon Watershed Enhancement Board is a state agency that provides grants, funded from the Oregon Lottery, federal dollars and salmon license plate revenue. *See* http://www.oregon.gov/oweb/Pages/index.aspx (last visited Feb. 28, 2018).

176 Telephone Interview with Shawn Morford, Exec. Dir. NOWC (Feb. 28, 2018).

177 *Id*.

term. A comprehensive monitoring and assessment program is invaluable for the effective protection and restoration of coastal waters and associated ecosystems. Regulators recognize that collaboration in monitoring helps to build support and buy-in and is critical to ensure that development and implementation of monitoring and assessment programs is informed by a broad range of experience and expertise.[178] However, entrenched institutional impediments often hamper the coordination across programs that is key to improved information access. Indeed, myriad local, state, and federal agencies, nongovernmental organizations, universities, regulated entities, and water bond grant recipients conduct water quality and aquatic ecosystem monitoring with limited coordination,[179] spending millions of dollars each year.[180] Enhanced alliances between key agencies and organizations both within and outside state government is necessary to bridge the water quality and marine resource monitoring communities.

As a remedy to address these types of challenges, the legislature established the Water Quality Monitoring Council[181] (Monitoring Council) in 2006 and required CalEPA and the Natural Resources Agency to jointly address significant problems related to (1) the coordination and efficiency of water quality and ecosystem monitoring, and (2) access to data and assessment tools.[182] In 2014, California conducted its first triennial audit of the Monitoring Council's efforts to implement a comprehensive monitoring program strategy for the state. The audit found that while the Monitoring Council has made impressive progress in coordination, forming six interagency workgroups to address water quality and associated ecosystem monitoring, assessment and reporting, there is still a large amount of work left to do.[183] After exploring the monitoring programs most relevant to coastal water quality and ocean health, this section details various opportunities for enhancing the coordination of such efforts.

PROBLEM: COASTAL MONITORING PROGRAMS ARE NOT WELL INTEGRATED

California's coasts are subject to a variety of overlapping monitoring programs. MPA baseline monitoring was conducted by a range of agencies and academic, tribal, and citizen group organizations. For example,

---

178 *See, e.g.,* S.D. REGIONAL WATER QUALITY CONTROL BD., A FRAMEWORK FOR MONITORING AND ASSESSMENT IN THE SAN DIEGO REGION 16-21 (2012) (describing a ten-step process for collaboratively developing and implementing monitoring and assessment programs).

179 While the major monitoring programs generally have a high degree of internal coordination of monitoring designs and methods, there is much less coordination across programs. CAL. WATER QUALITY MONITORING COUNCIL, MY WATER QUALITY OCEAN PORTAL ROADMAP 27 (2014) [hereinafter OCEAN PORTAL ROADMAP] (noting that this results in inconsistent QA/QC requirements and data formatting).

180 CAL. WATER MONITORING COUNCIL, INCREASING EFFICIENCY AND EFFECTIVENESS THROUGH COLLABORATION 3-6 (2014) [hereinafter INCREASING EFFICIENCY AND EFFECTIVENESS].

181 Members of the Monitoring Council represent a diversity of interests, including: state regulatory, resource management, and public health agencies; regulated storm water, wastewater and agricultural interests; water suppliers; citizen monitoring groups; the scientific community; and the public.

182 INCREASING EFFICIENCY AND EFFECTIVENESS, *supra* note 180, at 3.

183 *Id*. at 7-11.

the South Coast rocky intertidal monitoring project[184] included researchers from five academic institutions, representing two long-term monitoring programs (PISCO[185] and MARINe[186]), as well as a long-term citizen science monitoring program (LiMPETS[187]). A majority of this Phase 1 MPA baseline monitoring data is compiled at OceanSpaces,[188] a website hosted by Ocean Science Trust (OST).[189] A Statewide MPA Monitoring Action Plan is currently in development under the leadership of CDFW and OPC and is planned for release in 2018.[190] While the Statewide MPA Monitoring Program strives to ensure that MPA monitoring data can also support broader ecosystem-based management, including fisheries, climate adaptation, and water quality management,[191] most MPAs are subjected to only limited monitoring for water quality.[192]

Under the ASBS regime, water quality monitoring is focused on tracking trends in compliance with Ocean Plan standards, pollutant loads to the coastal ocean, and impacts on traditional indicators of biological effects such as benthic communities.[193] ASBS monitoring includes permit-specific ambient monitoring conducted by local NPDES permittees. However, as participants noted, this monitoring is limited and does not cover all ASBSs. Others have noted that there is widespread non-compliance with ASBS water quality monitoring requirements and that the State Water Board is not verifying monitoring reports in most cases.[194] Further, ASBS compliance monitoring for toxicity[195] could be improved by following the proper protocol to ensure protection of marine life from neurotoxic insecticides.[196]

---

184 This baseline monitoring data was compiled into a report as part of the state-funded South Coast MPA Baseline Program. *See* ROCKY INTERTIDAL SNAPSHOT REPORT, http://oceanspaces.org/rocky-intertidal-snapshot-report (last visited Jan. 9, 2018).

185 The Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) is a long-term monitoring and research program designed to understand the California Current Large Marine Ecosystem. http://www.piscoweb.org/ (last visited Jan. 9, 2018).

186 The Multi Agency Rocky Intertidal Network (MARINe) is a large consortium of research groups conducting long-term monitoring and biodiversity surveys at sites ranging from Southeast Alaska to Mexico. *See* http://www.pacificrockyintertidal.org (last visited Jan.11, 2018).

187 Long-term Monitoring Program and Experiential Training for Students (LiMPETS) is an environmental monitoring and education program for students, educators, and volunteer groups developed to monitor the ocean and coastal ecosystems of California's National Marine Sanctuaries. http://limpets.org/ (last visited Jan. 11, 2018).

188 *See MPA Monitoring,* OCEANSPACES [hereinafter *MPA Monitoring*], http://oceanspaces.org/monitoring (last visited Jan. 16, 2018).

189 OST is an independent non-profit created in 2000 under the California Ocean Resources Stewardship Act that serves as a liaison between state agencies, scientific institutions, and communities to support healthy ocean and coastal ecosystems. *See* http://www.oceansciencetrust.org/about-us/.

190 The Statewide MPA Monitoring Action Plan will identify the key sites and metrics for Phase 2 long-term monitoring once approved. *See MPA Monitoring, supra* note 188.

191 *Id*.

192 *See* OCEAN PORTAL ROADMAP, *supra* note 179, at 27.

193 *Id.* at 25.

194 Telephone Interview with Sara Aminzadeh, *supra* note 96.

195 *See, e.g.*, CENTRAL COAST REGIONAL ASBS MONITORING PROGRAM, FINAL REPORT 2013-2016.

196 Telephone Interview with Brian Anderson, UC Davis (Nov. 1, 2017) (noting that the State Water Board protocol for monitoring toxicity in marine waters requires the use of organisms susceptible to pesticides of concern, such as the mysid *Americamysis bahia*).

In addition, the State and Regional Water Boards conduct and oversee various monitoring programs relevant to coastal water quality and ocean health.[197] These programs include TMDL implementation monitoring, ambient monitoring under the state NPS program, MS4 and publicly owned treatment works (POTW) discharge monitoring, ambient and effectiveness monitoring under various grant projects, and monitoring conducted through California's Surface Water Ambient Monitoring Program (SWAMP).[198] Much of this data is uploaded to the California Environmental Data Exchange Network (CEDEN), a water quality database linked to the U.S. Environmental Protection Agency's Water Quality Exchange and the U.S. Geological Survey.[199]

The Southern California Coastal Water Research Project (SCCWRP) investigates how to more effectively monitor and protect Southern California's ocean and coastal watersheds as well as how to bridge the gap between water quality research and sound management decisions.[200] The Southern California Bight Regional Monitoring Programs serve as comprehensive assessments of receiving water conditions by assessing reference locations (including ASBSs) and locations influenced by urban runoff for water quality during storm events, as well as bioaccumulation of potential pollutants.[201] These assessments occur every five years,[202] with the next planned for 2018 (Bight '18). SCCWRP and OST house a joint post-doctoral fellowship program focused on integrating water quality and MPA science and management, with direct funding from the State Water Board and OPC.[203]

Numerous other state and local agencies, environmental groups and citizen-monitoring groups conduct relevant monitoring, with data hosted on various websites.[204] The Department of Pesticide Regulation's (DPR) Surface Water Protection Program monitors both agricultural and nonagricultural sources of pesticide residues in surface waters.[205] The Department of Public Health conducts monitoring and assessment through the Marine Biotoxin Monitoring Program, and the California Clean Beaches Program provides guidance and methods for monitoring beaches.[206] Monitoring is also performed by county health

---

197 *See* OCEAN PORTAL ROADMAP, *supra* note 179, at 27.

198 WATER QUALITY MONITORING COUNCIL, INVENTORY OF MONITORING PROGRAMS 2 (2008) [hereinafter INVENTORY OF MONITORING PROGRAMS].

199 INCREASING EFFICIENCY AND EFFECTIVENESS, *supra* note 180, at 8.

200 *About SCCWRP*, SO. CAL. COASTAL WATER RESEARCH PROJECT, http://www.sccwrp.org/AboutSCCWRP.aspx (last visited Jan. 11, 2018).

201 *Research Areas, Regional Monitoring, Bight '13 Regional Monitoring*, SO. CAL. COASTAL WATER RESEARCH PROJECT, http://www.sccwrp.org/researchareas/RegionalMonitoring/Bight13RegionalMonitoring.aspx (last visited Jan. 11, 2018).

202 The 2013 assessment was integrated with MPA baseline monitoring. *Id*.

203 Telephone Interview with Olivia Rhoades, Science Integration Fellow, SCCWRP/OST (Oct. 19, 2017).

204 For example, Reef Check volunteers conduct monitoring relevant to the assessment of potential water quality impacts on protected areas, with survey results available on a Google Earth-based online database, http://data.reefcheck.us/ (last visited Jan. 11, 2018).

205 However, this monitoring focuses on freshwater and largely ignores marine waters. Telephone Interview with Brian Anderson, *supra* note 196.

206 INVENTORY OF MONITORING PROGRAMS, *supra* note 198, at 6–7.

agencies in seventeen different coastal and San Francisco Bay Area counties.[207] For example, Los Angeles County's Recreational Waters Program routinely collects ocean water samples in the surf zone and tests for total coliform, E. coli and enterococcus bacteria.[208]

Despite the existence of these many monitoring initiatives, understanding the water quality impacts and ecosystem response in protected areas has been difficult because the lack of coordination between distinct management regimes, monitoring programs, and databases precludes the necessary analysis.[209] These monitoring programs were developed over time to address various site-specific issues or to fulfill different regulatory compliance mandates. As a result, inconsistent objectives and methods inhibit the integration and synthesis of data that is necessary to support informed decision making.[210]

Opportunity: Promote Regional Coordination of Monitoring and Assessment

Participants at the January 2017 Roundtable recognized that significant opportunities exist for coordinating monitoring and assessment efforts relevant to coastal water quality and ecosystem health, including MPA and ASBS monitoring. In Southern California alone, more than sixty agencies routinely monitor the condition of local aquatic and marine environments, collectively spending over $31 million per year.[211] These uncoordinated efforts only focus on small areas and do not provide sufficient information to assess the health of the environment as a whole.[212]

Successful regional monitoring programs in California include the San Francisco Bay Regional Monitoring Program, the Stormwater Monitoring Coalition Regional Bioassessment Monitoring Program, the Southern California Bight Regional Monitoring Program, and the Unified Beach Water Quality Monitoring and Assessment Program. As described below, these programs and the processes used in their development and implementation provide useful lessons and models for agencies and stakeholders to use in their efforts to improve monitoring and assessment.

1. The San Francisco Bay Regional Monitoring Program (RMP) is an innovative collaborative effort between the San Francisco Estuary Institute, the Regional Water Board and the regulated discharger community.[213] Monitoring determines spatial patterns and long-term trends in contamination through sampling of water, sediment, bivalves, bird eggs, and fish, and evaluates toxic effects on sensitive

---

207 *Water Issues, Programs, Beaches, Beach Water Quality,* STATE WATER RES. CONTROL BD., http://www.swrcb.ca.gov/water_issues/programs/beaches/beach_water_quality/beaches_program.shtml (last visited Jan. 11, 2018).

208 *Recreational Waters Program, Ocean Monitoring*, COUNTY OF LOS ANGELES, DEPT. OF PUBLIC HEALTH, http://www.publichealth.lacounty.gov/eh/ep/rw/rw_oc_description.html (last visited Jan. 11, 2018).

209 OCEAN PORTAL ROADMAP, *supra* note 179, at 26.

210 *Id*. at 3.

211 *Research Areas, Regional Monitoring,* SO. CAL. COASTAL WATER RESEARCH PROJECT, http://www.sccwrp.org/ResearchAreas/RegionalMonitoring.aspx (last visited Jan. 11, 2018).

212 When these agencies cooperate with regional assessments, many benefits are achieved including identification of problem areas, prioritizing resources, and targeting areas where mitigation actions are most needed. *Id*.

213 *See Regional Monitoring Program for Water Quality in San Francisco Bay*, SAN FRANCISCO ESTUARY INSTITUTE, http://www.sfei.org/programs/sf-bay-regional-monitoring-program (last visited Jan. 16, 2018).

organisms and chemical loading to the Bay. The Program also combines RMP data with data from other sources to provide for comprehensive assessment and information targeted at the highest priority questions faced by managers of the Bay.[214] The RMP has established a climate of cooperation and a commitment to participation among a wide range of regulators, dischargers, industry representatives, NGOs, and scientists.[215] In addition, stable funding has enabled the RMP to develop long-term plans and adapt to changing management priorities and advances in scientific understanding.[216]

2. The Southern California Stormwater Monitoring Coalition (SMC) was formed in 2001 by cooperative agreement of Phase I municipal stormwater NPDES lead permittees, the NPDES regulatory agencies in southern California and SCCWRP.[217] Prior to the initiation of this collaborative effort, monitoring was conducted by numerous organizations, each with disparate programs that varied in design and frequency. The Regional Bioassessment Monitoring Program has defined specific monitoring questions, assesses how well monitoring programs are answering those questions, and developed a recommended stormwater monitoring infrastructure in order to increase comparability among programs throughout Southern California.[218] Recent efforts to develop standardized assessments of water quality and aquatic ecosystem condition will help to answer critical monitoring questions such as whether beneficial use is impacted and identifying the cause and source of impairment.[219] Through collaboration, SMC and its project partners fill knowledge gaps and improve how dischargers and regulators address the challenge of urban runoff.[220]

3. The Bight '13 MPA/Rocky Reefs Project developed monitoring indices of fishing pressure and pollution intensity to determine the relative impacts of each on overall ecological health of rocky reefs.[221] It also concluded that managers should continue to aim for integrated collaborations with regional monitoring programs focused on water quality and natural resources, including the Southern California MPA Monitoring and ASBS monitoring. It was an integrated, collaborative effort, successfully coordinating numerous organizations, including CDFW, Regional Water Boards, SCCWRP, Ocean Science Trust,

---

214 *Id*. A recent study of microplastic contamination in the Bay found that aquatic organisms ingest these particles and that wastewater is a major source of this pollution. *See* Lindsay Hoshaw, *Hunting for Plastic in California's Protected Ocean Waters*, KQED Science (Sep. 21, 2017) (noting that researchers suspect particles are drifting into Northern California's three national marine sanctuaries and could be affecting marine life there).

215 Philip Trowbridge et al., *The Regional Monitoring Program for Water Quality in San Francisco Bay: Science in Support of Managing Water Quality* 4 REGIONAL STUDIES IN MAR. SCI. 21, 33 (2016).

216 *Id*.

217 *About SMC*, SOUTHERN CALIFORNIA STORMWATER MONITORING COALITION, http://socalsmc.org/about/ (last visited Jan. 16, 2018).

218 *See* STORMWATER MONITORING COALITION BIOASSESSMENT WORKING GROUP, REGIONAL MONITORING OF SOUTHERN CALIFORNIA'S COASTAL WATERSHEDS (2007).

219 *See* SO. CAL. STORMWATER MONITORING COALITION, ANNUAL REPORT 4-8 (2017).

220 Cumulatively, SMC and its project partners have expended over $9 million to fill these data gaps. *Id*. at iii.

221 The project found that water quality remains a significant concern of degradation for nearshore rocky reef habitats and that the twin stressors of fishing extraction and pollutant loading tend to co-occur and exert cumulative effects, especially across the highly urbanized portions of the South Coast. SO. CAL. COASTAL WATER RESEARCH PROJECT, TECHNICAL REPORT 932: SOUTHERN CALIFORNIA BIGHT 2013 REGIONAL MONITORING PROGRAM (2016).

academic institutions and County sanitation districts.[222] This type of coordinated water quality and ecosystem monitoring and resulting integrated data set leverages limited resources and provides for informed assessments and management decisions regarding fishing and water quality regulations.[223] The project also received meaningful funding from the State Water Board and OPC for a joint SCCWRP/OST science integration fellow. As preparations for Bight '18 move forward, there are plans to expand the study to incorporate MPA and ASBS research questions and coordinate efforts with existing MPA and ASBS monitoring programs.[224]

4. The Unified Beach Water Quality Monitoring and Assessment Program is the result of recent efforts in Orange County to coordinate beach water quality monitoring through the formation of a joint stakeholder group.[225] Historically, NPDES permit requirements, including monitoring locations, frequencies, types of microbial analyses and reporting criteria, were established without regard to the potential integration of regional monitoring needs.[226] This created redundancy and ineffective use of limited resources, with each entity conducting beach water quality monitoring individually and for different reasons (the sanitation districts for their NPDES permits, the County Health Department for AB 411 requirements,[227] and the County Stormwater Division for TMDL requirements), sometimes within feet of each other at the same time.[228] Although operating under disparate mandates, these entities recognized their shared objectives and the advantages of coordinating these diverse monitoring programs, including saved time and money and the ability to aggregate data sets to allow for improved assessments and management decisions.[229] The unified beach water quality monitoring and assessment program developed by the workgroup aligns with a new approach adopted by the San Diego Regional Water Board, which also emphasizes the need for question-driven, beneficial use-oriented monitoring and assessment with a focus on water body conditions rather than on discharges.[230] This program serves as a model to other coastal counties that could similarly benefit by forming a coastal water quality monitoring task force

---

222 *See* SO. CAL. COASTAL WATER RESEARCH PROJECT, *supra* note 221.
223 Telephone Interview with Ken Schiff, *supra* note 88.
224 Telephone Interview with Olivia Rhoades, *supra* note 203.
225 These efforts were initiated in 2009 when the County put together a stakeholder group that included all of the monitoring entities and the Regional Water Board along with representatives from SCCWRP, Surfrider Foundation and coastal cities to work out a coordinated monitoring program. Email communication with Ray Hiemstra, Assoc. Dir. Programs, OC Coastkeeper, (Mar. 23, 2017).
226 *See* WORKGROUP RECOMMENDATION FOR A UNIFIED BEACH WATER QUALITY MONITORING AND ASSESSMENT PROGRAM IN SOUTH ORANGE COUNTY (2014).
227 In 1997, AB 411 mandated that beaches with storm drains that discharge during dry weather and visited by more than 50,000 people per year be monitored at least weekly from April through October by the local environmental health agency. AB 411 allocates over $1 million a year to Counties based on program size and expense.
228 Email communication with Ray Hiemstra, *supra* note 225.
229 *Id*.
230 The primary purpose of the unified program is to answer the question "Does beach water quality meet standards for the beneficial use of water contact recreation?" See WORKGROUP RECOMMENDATION FOR A UNIFIED BEACH WATER QUALITY MONITORING AND ASSESSMENT PROGRAM, *supra* note 226, at 2.

(including representatives from coastal cities, County agencies that conduct monitoring, the Regional Water Board, and NGOs) to identify opportunities for improved coordination.[231]

These examples illustrate a number of factors that can promote effective coordination of monitoring and assessment that allows for efficiency gains as well as more robust data sets, which can then support more informed management decisions. These include:

- a systematic assessment identifying knowledge gaps, redundancies and shared interests;
- careful research and program design that aligns participant objectives and methods and allows for data comparison;
- cultivation of widespread and committed participation and cooperation; and
- stable and meaningful funding.

The MPA Statewide Leadership Team can play a critical role in promoting these and similar regional monitoring programs by helping identify potential synergies, endorsing and transmitting these benefits, and fostering enhanced coordination among state and local-level member agencies involved in MMA management. This opportunity is particularly ripe as CDFW and OPC develop the Statewide MPA Monitoring Action Plan to help identify Phase 2 long-term monitoring priorities across the state. The Leadership Team, which includes the State Water Board, should form a working group specifically tasked with integrating water quality and MPA monitoring and management efforts.[232] As part of the development of the Statewide MPA Monitoring Action Plan, the Leadership Team and OPC-SAT should collaborate with SWAMP to integrate water quality into MPA monitoring and management efforts. They should also collaborate with the State Water Board's Clean Water Team to integrate citizen science water quality monitoring data into MPA monitoring and management efforts.

Additionally, data collection through MMA monitoring could be integrated with data collection under state and federal water quality mandates. Despite the presence of multiple parallel monitoring programs that alternatively examine MPAs, ASBSs, other control areas outside protected areas, or other aspects of coastal water quality, there has historically been little focused effort on direct examination of potential water quality impacts on marine ecosystems.[233] As such, the Monitoring Council identified ocean and coastal ecosystem health as a prime area for bridging water quality and ocean resource management through coordination of monitoring and assessment activities.[234] Moreover, the Monitoring Council initiated a scoping group to chart a roadmap for developing ocean-related water quality resources, with the overarching goal of providing targeted data and information to support decision making.[235] Though still an ongoing effort, the scoping group has created a case study illustrating that the synthesis of MPA and ASBS

---

231 Telephone interview with Michael Gjerde, Ocean Standards Unit, State Water Bd, (Nov. 2, 2017) (noting that while there have been internal discussions, other Counties have not yet adopted an integrated program).

232 As mentioned previously, this objective is included in their current work plan. *See* LEADERSHIP TEAM WORK PLAN, *supra* note 73, at 7.

233 OCEAN PORTAL ROADMAP, *supra* note 179, at 27–28.

234 *Id*. at 3.

235 Other goals are to promote integration and collaboration among monitoring programs. *Id.* at 3.

monitoring with water quality monitoring can be useful in informing the respective management programs and increasing their capacity to address questions about the effects of pollution on living marine resources.[236] As preparations are underway for Bight '18, an opportunity exists to build on the ecosystem health index developed for the Bight '13 Rocky Reefs project as a useful tool to learn more about the impacts of discharges and fishing pressures on protected areas and inform management decisions.[237] The Leadership Team should seek opportunities for collaboration with the Monitoring Council to facilitate and expand the work initiated by this scoping group.

Opportunity: Promote Access to and Dissemination of Data

To address the challenge of finding relevant data, the Monitoring Council created an online platform for streamlined access to water quality information. In addition, interagency workgroups have developed a variety of web portals addressing specific topics, such as the health of aquatic ecosystems,[238] seafood consumption safety, and swimming safety. These are all now accessible through a single point of entry at MyWaterQuality.ca.gov.[239] However, the complexity of issues surrounding ocean data management and assessment, as well as a lack of focused institutional and financial support, has hindered progress toward a comprehensive ocean data portal.[240]

Participants at the January Roundtable noted that while a large body of MPA monitoring data is publicly accessible on OceanSpaces in raw format, the water quality components, including at least five state-funded projects, are currently housed in disparate portals across the state.[241] Encouragingly, OPC and CDFW have begun to explore what a unified data system—including physical, chemical, and biological data—should look like. In addition, funding is designated for the development and launch of a comprehensive data management system that connects to existing data platforms, provides access to raw data, and depicts datasets through a map-based interface.[242] Roundtable Participants recognized that although it may be complicated to bring different types of data together, it is crucial for observing patterns in abundance and diversity and identifying the variables driving these patterns. This requires the use of baseline data, including reference sites, and overlaying other data, such as water quality data. Some participants noted that it may nonetheless be impractical to put all data in one location, suggesting that the best online data sets are created with a specific purpose or question(s) they are trying to answer.[243]

---

236 *Id.* at 8.
237 Telephone Interview with Olivia Rhoades, *supra* note 203.
238 Recognizing their long-term collaborative efforts to coordinate monitoring and reporting of rocky intertidal coastal habitats along the west coast of North America, the Monitoring Council partnered with MARINe to produce a web portal highlighting that organization's California data and information.
239 INCREASING EFFICIENCY AND EFFECTIVENESS, *supra* note 180, at 10.
240 OCEAN PORTAL ROADMAP, *supra* note 179, at 5.
241 January 2017 Roundtable, *supra* note 19.
242 *See MPA Monitoring, supra* note 188.
243 January 2017 Roundtable, *supra* note 19.

As OPC and CDFW develop a data management system, an opportunity exists to coordinate with the Monitoring Council. OPC and/or OST should join the Monitoring Council and support development of a marine environment data portal. As suggested by the Monitoring Council's scoping group, the California Wetland Monitoring Workgroup (CWMW) might be a model for the ocean data workgroup efforts.[244] By focusing on shared regulatory drivers and decision-making needs, the CWMW developed and promoted the use of standardized monitoring and assessment frameworks and improved transparent, web-based access to credible raw data and assessment tools.[245]

Also of interest is the approach the California Central Coast Healthy Watersheds Project has taken to create a web-based data navigator and report card system that can be used for efficient aquatic assessments to guide resource management.[246] A similar scoring approach for multiple measures of health, including chemical, biological, and physical habitat data, could be developed for MMAs.

In theory, combining multiple data types together into a single spatial and analytical framework will allow for more informed decisions about the impacts of water quality on overall ecosystem health. However, some caution that data harmonization can be very difficult because the structures of the data will vary by discipline—whether examining geophysical processes (such as the temperature or salinity within an ASBS), ecological processes (such as information characterizing the bioweb integrity within a given MPA), or chemical discharges from the end of a stormwater pipe.[247] While it may not be feasible or even desirable to consolidate all water quality and marine resource monitoring data in a central repository, a properly designed and better coordinated data management system can increase efficiency and promote better management.

III. Countering Resource Challenges

PROBLEM: LIMITED RESOURCES

The costs to achieve sustained water quality improvements and protect coastal ecosystems are escalating, and there is increasing competition for the use of limited public funds.[248] Local agencies absorb a majority of these costs, with a heavy reliance on bond funding, as State expenditures from the general fund have

---

244 The CWMW includes representatives of state, federal, and local agencies as well as NGOs. OCEAN PORTAL ROADMAP, *supra* note 179, at 3.

245 *Id*.

246 *See* Karen R. Worcester et al., CALIFORNIA CENTRAL COAST HEALTHY WATERSHEDS PROJECT, REPORT CARDS FOR SCORING WATER QUALITY DATA TO CHARACTERIZE HEALTH AND CHANGE (2015).

247 Email communication with Tony Hale, Dir. Env. Informatics, S.F. Estuary Inst., (Oct. 27, 2017).

248 For example, to meet new MS4 requirements, stormwater costs to LA County Basin Cities are estimated at $120 billion for full compliance. *See* TreePeople, MOVING TOWARDS COLLABORATION: A NEW VISION FOR WATER MANAGEMENT IN THE LOS ANGELES REGION 18 (2015) [hereinafter, MOVING TOWARDS COLLABORATION].

decreased.[249] Unfortunately, virtually all the programs specifically designed to address coastal water quality and/or ecosystem health in California are affected by the problem of insufficient resources. The MPA Partnership Plan specifically identified monitoring, the Collaborative Network, compliance and enforcement, and Tribal coordination as four priority gaps that will require adequate funding.[250] As detailed earlier, the Coastal Commission's CCA program has suffered in recent years due to the absence of dedicated funding.[251] Similarly, the State and Regional Water Boards face funding challenges that some feel have impaired their ability to effectively carry out their full mission.[252] Indeed, the State Water Board's recently adopted Water Quality Enforcement Policy acknowledges that enforcement prioritization is necessary to leverage their scarce enforcement resources and "to achieve the general deterrence needed to encourage the regulated community to anticipate, identify, and correct violations."[253] However, self-reporting is the primary method used by the Water Boards to identify violations, and even among known violations enforcement is selective due to resource limitations.[254] Unsurprisingly, the many monitoring initiatives discussed in this report are limited by a lack of reliable funding as well.[255]

It is important to note that improving resource use efficiencies should, in addition to promoting a more drought and climate resilient California,[256] also alleviate these resource challenges. Yet significant resource limitations for promoting marine water quality protection are expected for the foreseeable future.

---

249 *See* PAYING FOR WATER IN CALIFORNIA, *supra* note 155, at 14.

250 PARTNERSHIP PLAN, *supra* note 39, at 20–24, App. F. The Plan also identifies a mix of federal, state and local government and private sources of funding to fill those gaps. *Id.*

251 *See* OCEAN UNIT, DIV. OF WATER QUALITY, STATUS REPORT AREAS OF SPECIAL BIOLOGICAL SIGNIFICANCE, *supra* note 101.

252 Email communication with Matt O'Malley, *supra* note 128. Telephone Interview with Barbara Barry, Santa Ana Regional Bd. (Oct. 20, 2017) (noting that MS4 enforcement has suffered due to delays in renewing the NPDES permit for Orange County).

253 See STATE WATER RES. CONTROL BD., WATER QUALITY ENFORCEMENT POLICY (2017) (stating that the Water Boards shall rank violations, then prioritize cases for formal discretionary enforcement action to ensure the most efficient and effective use of available resources).

254 Telephone Interview with Chiara Clemente, Santa Ana Regional Bd. (Oct. 23, 2017) (noting that if the Water Boards don't know a violation exists the enforcement policy will not function as intended).

255 For example, although the MLPP intends to engage in some monitoring for water quality within MPAs (2016 MASTER PLAN, *supra* note 6, at 36–37), it remains to be seen how the Statewide MPA Monitoring Action Plan allocates limited monitoring funds. Prop 84 funding provided support for Phase 1 baseline MPA monitoring, but these funds terminate as of 2018. *See* PARTNERSHIP PLAN, *supra* note 39, at 22. The State has committed an annual General Fund allotment of $2.5 million for Phase 2 long-term monitoring, beginning in FY 2015/2016. Similarly, while the Monitoring Council's work to develop an ocean data portal shows progress, it faces significant capacity challenges as the founding legislation did not include dedicated funding. INCREASING EFFICIENCY AND EFFECTIVENESS, *supra* note 180, at 10. Efforts to build the ocean data portal thus have generally stalled. Telephone Interview with Kristopher Jones, Cal. Water Monitoring Council (Dec. 15, 2016) (noting that implementation has thus far been largely reliant on volunteer efforts). A recent legislative bill recognizes the need for data integration and sharing in open data format, but this bill also would not provide funds to do so. *See* AB 1755, *The Open and Transparent Water Data Act*, promotes integration and sharing of water data and associated ecological data through an open-source data platform. *See* https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160AB1755 (last visited Jan. 9, 2018); Telephone Interview with Kristopher Jones, *supra* note **Error! Bookmark not defined.**.

256 Stormwater capture as a means of augmenting local water supplies can lead to significant energy savings. The State Water Project, which pumps water over the Tehachapi Mountains to Los Angeles, is the single greatest

OPPORTUNITY: COORDINATION MIGHT ENHANCE COST EFFECTIVENESS

Despite these limitations, opportunities exist to leverage existing resources more effectively. Most current water planning occurs using a single-purpose cost-benefit approach—in essence, the costs and benefits to any one agency.[257] This can lead to decisions that rule out certain multi-benefit projects if costs and benefits are not identified for other agencies. In the context of stormwater, most investment decisions do not currently weigh benefits to the City, County, watershed, or region, or reliably make the case for the co-investments that could make stormwater projects more economically feasible.[258] This lack of integration of stormwater management with water supply and wastewater treatment and the failure to treat stormwater as a resource can waste already scarce resources from stormwater treatment and capture and lead to more polluted runoff and higher cleanup costs.

Some local agencies recognize this and are moving toward enhanced integration. For example, the Irvine Ranch Water District in Orange County recently changed its charter to incorporate stormwater clean-up responsibilities; the district now uses revenues from the top tiers of its water rate structure to capture and treat polluted runoff from landscape overwatering within its service area to help protect water quality in the Newport Bay watershed, which includes a CCA, ASBS and MPA. Further, the Santa Ana Watershed Project Authority's (SAWPA) IRWM plan integrates water supply, water quality, recycled water, stormwater management, water use efficiency, land use, energy, climate change, habitat, and disadvantaged communities and tribes to effectively leverage limited resources.[259] Several other local agencies are leading efforts toward holistic water management, such as the City of San Diego's Pure Water program[260] and the Los Angeles Department of Water and Power's Stormwater Capture Master Plan.[261]

Similarly, enhanced interagency coordination in implementation, monitoring, and enforcement could improve the efficiency of MMA management, even without increased funding. The MPA Statewide Leadership Team's work plan includes action items targeted to link together existing statewide ocean monitoring programs, including ASBS and MPA monitoring programs.[262] Designed correctly, as discussed previously, the formation of a working group within the Leadership Team focused on identifying opportunities to leverage existing programs and implement coordination measures could lead to cost savings. Additionally, as new threats arise, such as plastic pollution or ocean acidification, coordinated efforts may be better situated to secure state, federal, and private funds dedicated to monitor and address

---

consumer of energy in California. *See* NATURAL RESOURCES DEFENSE COUNCIL & PACIFIC INSTITUTE, ENERGY DOWN THE DRAIN v (2004). Runoff and pollution can be addressed through aggressive water conservation programs, increasing recycled water usage and working to increase stormwater capture.

257 *See* MOVING TOWARDS COLLABORATION, *supra* note 248, at 14.

258 TreePeople has created a cost-benefit analysis tool for multi-benefit watershed projects, and organized projects with other partners that demonstrated the feasibility of building distributed green infrastructure at the individual parcel, school, park, and street levels. *Id*. at 16.

259 *See* SAWPA, ONE WATER ONE WATERSHED 2.0 PLAN (2014).

260 *See* COOPERATIVE AGREEMENT IN SUPPORT OF PURE WATER SAN DIEGO, *supra* note 167.

261 Initial results indicate that the City could capture between thirty and forty-five percent of LA's current water demand if the required infrastructure, programs and policies are funded. *See* LADWP, STORMWATER CAPTURE MASTER PLAN (2015).

262 *See* LEADERSHIP TEAM WORK PLAN, *supra* note 73, at 7.

these emerging threats. For example, OPC is funding research regarding the issue of nutrient runoff as it affects ocean acidification which requires monitoring to identify OA hotspots.[263] Through partnerships, this monitoring is being leveraged to determine how these hotspots align with MPAs and ASBSs.

OPPORTUNITY: EFFECTIVELY LEVERAGING AVAILABLE TOOLS AND RESOURCES

Prevent Pollution at the Source

Some of the most cost-effective approaches for stormwater pollution prevention involve source control and hence may require action at the state level rather than at the level of the municipal authorities. For example, rather than attempt prohibitively expensive (and not fully effective) treatment to remove highly toxic copper from run-off in some areas, efforts have focused on removing the problem at the source by changing the composition of automobile brakepads.[264] In many cases, preventing pollution at the source costs much less than capturing and treating polluted runoff before it enters the affected water body. Of course, source controls may require stricter state standards, enhanced monitoring, and more reliable enforcement to ensure compliance.[265]

A source-control approach may also be necessary for substances that escape wastewater treatment, such as microplastics, nano-particles, and other micropollutants originating from the use of substances such as pharmaceutical products for human use, veterinary drugs, personal hygiene products or household chemicals. For example, California recently banned plastic microbeads in personal care products after studies showed they were rapidly accumulating in California waters, including protected areas.[266]

---

263 *See* FRANCIS CHAN ET AL., THE WEST COAST OCEAN ACIDIFICATION AND HYPOXIA SCIENCE PANEL: MAJOR FINDINGS, RECOMMENDATIONS, AND ACTIONS (2016); Telephone Interview with Erin Meyer, Senior Scientist, OST (Nov. 28, 2016).

264 SB 346, enacted in 2010, established a program that will lead to the near elimination of copper in brake pads by 2025. The law grew out of a collaborative effort among brake pad manufacturers, government agencies, environmental organizations, and the California Association of Stormwater Quality Agencies. *See* PAYING FOR WATER IN CALIFORNIA, *supra* note 155, App. B at 13.

265 For example, in 2013 USEPA developed new handling instructions to reduce over-applications of harmful pyrethroid pesticides (used primarily to keep ants out of buildings) after they were identified in sediments of water bodies adjacent to residential/urban areas. *See* USEPA, *Pyrethrins and Pyrethroids Reregistration and Labeling*, https://www.epa.gov/ingredients-used-pesticide-products/pyrethrins-and-pyrethroids-reregistration-and-labeling (last visited Jan. 16, 2018). However, recent water quality monitoring results indicate that these voluntary measures have not been effective in reducing levels of pyrethroid pesticides found in aquatic ecosystems. Telephone interview with Brian Anderson, *supra* note 196. Further, new classes of pesticides, including neonicotinoids, continue to enter into use and cause widespread harm to aquatic ecosystems. *See* Francisco Sanchez-Bayo et al., *Contamination of the Aquatic Environment with Neonicotinoids and its Implication for Ecosystems* 4 FRONT. ENVIRON. SCI. 71 (2016). Since the use of seeds treated with neonicotinoids is responsible for most of the soil and aquatic contamination, one obvious solution is to stop the use of seeds coated with these insecticides and use alternative and carefully targeted methods for pest control in agriculture such as integrated pest management. *Id*.

266 *See* Phil Willon, *California Lawmakers Approve Ban on Plastic Microbeads*, L.A. TIMES (Sep.8 2015); *see also* Hoshaw, *supra* note 214.

Develop Targeted Regulatory Fees

Entities whose activities or facilities could adversely affect conditions in coastal waters should be increasingly relied upon to help provide the resources needed for water body-oriented monitoring and assessment programs.[267] Surcharges on water use, chemical use (e.g., fertilizers and pesticides), and road use (e.g., fuels and vehicle license fees) could help to close critical funding gaps.[268] For example, recognizing that road use is a major source of stormwater pollution, San Mateo County's surcharge on vehicle registration fees helps fund the countywide stormwater program, an effective way to ensure that road and highway users contribute to the costs of stormwater discharge prevention.[269] While a small surcharge on chemical sales supports the operations of the state's regulatory oversight programs, surcharges are not currently being used to help fund programs to mitigate the harmful impacts of agricultural pesticides and other chemicals on public health or ecosystems.[270]

Until recently, stormwater systems did not have utility status like water supply and wastewater treatment, and municipal stormwater programs primarily had to rely on allocation from the general fund.[271] However, the recent passage of Senate Bill 231 gives agencies an important new tool to fund these programs by expanding the definition of "sewer" to include systems for the collection, treatment, or disposition of stormwater.[272] This allows local agencies to include at least some stormwater programs in their current water or sewer fees, or to adopt new fees to fund stormwater projects, including those that will remove pollutants in stormwater runoff or collect dry-weather flows to increase groundwater recharge.[273]

Leverage State and Local Funding Opportunities

Participants identified multiple current and potential future sources of state and local funding for coastal water quality and ecosystem protection efforts, noting that opportunities to leverage these sources and improve their effectiveness remain.[274] Two notable recent state bond initiatives include funding for coastal water quality and infrastructure improvement, and these have begun to be leveraged to integrate marine

---

267 *See* FRAMEWORK FOR MONITORING AND ASSESSMENT IN THE SAN DIEGO REGION, *supra* note 178, at 15.

268 *See* PAYING FOR WATER IN CALIFORNIA, *supra* note 155, at 44.

269 *Id*.

270 *Id*. at 52.

271 The passage of Proposition 218 in 1996 required that new or increased property-related fees must be approved by voters, with the exception of water, sewer, and refuse fees. A 2002 California appellate court decision determined that a stormwater fee did not fall within the exemption for "sewers" and required voter approval before it could be adopted. *See* PAYING FOR WATER IN CALIFORNIA, *supra* note 155, at 9.

272 SB 231 was signed by Governor Brown on Oct. 6, 2017. https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB231 (last visited Feb. 6, 2018).

273 *See* Bob Hertzberg, *Capturing Stormwater and Planning for California's Future*, LOS ANGELES DAILY NEWS (Apr. 21, 2017).

274 Environmental mitigation fees are one such source. For example, approximately $5.4 million in once-through cooling (OTC) mitigation money over time may be available for monitoring MPAs. Email communication with Becky Ota, Habitat Cons. Prog. Mgr., CDFW (Mar. 23, 2017).

resource and water quality management. Proposition 84 (Prop 84), approved in 2006,[275] provided approximately $32 million in matching grants to assist local public agencies to comply with the discharge prohibition into ASBSs contained in the Ocean Plan, and the State Water Board approved 14 separate grants that included several projects directly benefiting MPAs.[276] In addition, tens of millions in Prop 84 funds have been directed to projects that advance MPA management, including over $20 million to MPA monitoring.[277]

Proposition 1 (Prop 1), approved in 2014,[278] allocates a portion of funds to the California Ocean Protection Trust Fund and, when authorized by OPC, may be used for projects that fulfill the purposes of COPA such as improving coastal water quality.[279] In June 2016, OPC approved $7.4 million in Prop 1 funds with most of the funding going to projects that will directly benefit MPAs or ASBSs.[280] The State Water Board also allocates Prop 1 grant funds for stormwater management projects, integrated regional water management, water conservation, wastewater treatment, and water recycling,[281] with many projects targeting particular watersheds such as the San Diego River and the Los Angeles River.[282]

Local funding measures designed to address particular watersheds are also a potential source of revenue. For example, the San Francisco Bay Restoration Authority was created by the California Legislature in 2008 to find solutions to the need for local funding for Bay restoration.[283] The Restoration Authority placed a regional parcel tax measure, the first in California's history, on the June 2016 ballots of the nine-county

---

275 Proposition 84-The Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act §75060 (2006). Prop 84 allocates $540 million for the protection of beaches, bays and coastal waters and watersheds, including projects to prevent contamination and degradation of coastal waters and watersheds.

276 *Prop 84 ASBS Grant Program*, CAL. STATE WATER RES. CONTROL BD., https://www.waterboards.ca.gov/water_issues/programs/grants_loans/asbs/#fundprojects. For example, the Irvine Coast Infiltration Project at Crystal Cove SMCA treats polluted stormwater runoff from a beach parking lot using a combination of best management practices (BMPs), such as porous pavement, biotreatment, and an infiltration gallery. *See* Kenneth Schiff & Jeff Brown, *Proposition 84 Grant Evaluation Report: Assessing Pollutant Reductions to Areas of Biological Significance* (2015) [hereinafter *Proposition 84 Grant Evaluation Report*].

277 Several of these projects address water quality. *See Funding Opportunities, Prop 84,* CAL. OCEAN PROTECTION COUNCIL, http://www.opc.ca.gov/category/funding-opportunities/ (last visited Feb. 6, 2018).

278 Proposition 1-The Water Quality, Supply, and Infrastructure Improvement Act §79730 (2014). Prop 1 authorizes $7.545 billion in general obligation bonds to fund ecosystems and watershed protection and restoration, water supply infrastructure projects, including surface and groundwater storage, and drinking water protection.

279 Prop 1 allocates $30 million to OPC for a competitive grant program for multi-benefit ecosystem and watershed protection and restoration projects in accordance with statewide priorities.

280 *See* CAL. OCEAN PROTECTION COUNCIL, Agenda for June 29, 2016 and related documents, http://www.opc.ca.gov/2016/06/ocean-protection-council-meeting-wednesday-june-29th-2016/ (last visited Jan. 16, 2018).

281 The State Water Board will administer funds for five programs, including $200 million for green infrastructure, rainwater and stormwater capture projects and storm water treatment facilities, $260 million for wastewater treatment projects and $625 million for water recycling projects. CAL. NATURAL RESOURCES AGENCY, *Proposition 1 Overview*, http://bondaccountability.resources.ca.gov/p1.aspx (last visited Jan. 9, 2018).

282 Approximately $1.5 billion was allocated toward protecting rivers, lakes, streams, coastal waters and watersheds under Prop 1 and approximately $1 billion has been committed to date. *Id*.

283 *See* SAN FRANCISCO BAY RESTORATION AUTHORITY, http://sfbayrestore.org/ (last visited Dec. 13, 2017).

San Francisco Bay Area. The measure passed with 70% approval across the region, and the net revenue coming to the Restoration Authority will be approximately $25 million per year, as projected.[284]

According to some participants, enhanced integration of marine resource and water quality protection efforts is one of the most effective ways to leverage limited funds.[285] Several agencies involved in coastal water protection have developed funding frameworks that include considerations for MPAs and ASBSs in the award process and integrate ways to encourage applicants to address both water quality and ecosystem health and develop indices to measure both. For example, the State Water Board Prop 1 Storm Water Grant Program Guidelines take MMAs into account.[286] In addition, OPC Prop 1 Grant Program guidelines give higher priority to water quality projects that address discharges that have historically and measurably impacted designated MMAs.[287] The OPC Prop 1 scoring criteria rewards projects that provide multiple benefits in OPC Key Priority Areas, including MPAs and Water Quality. OPC is also examining how best to use remaining Prop 84 funds to amplify benefits to both water quality and marine resources.[288] The MPA Statewide Leadership Team can help guide these efforts and encourage similar efforts by other granting agencies.

Leverage Stakeholders to Promote Monitoring, Assessment and Enforcement

Involving interested parties in management is essential for improving cost-effectiveness and achieving multiple benefits with scarce financial resources. Recognizing that water quality and ecosystem protection requires stakeholder engagement, regulators such as the San Diego Regional Water Board are moving toward a collaborative approach to monitoring and assessment to carry out their mission more strategically and more effectively.[289] The San Diego Water Board found that much of the monitoring and assessment it required other entities to conduct was not water body-oriented and, consequently, in many cases there was considerable room for improvement.[290] The Board also found that citizen monitoring groups can make significant contributions to water body-oriented monitoring and assessment with the help of community

---

284 Measure AA, or the San Francisco Bay Clean Water, Pollution Prevention and Habitat Restoration Measure, proposed a 20-year, $12 parcel tax to raise approximately $25 million annually, or $500 million over twenty years, to fund restoration projects in the Bay. *Id*.

285 *See supra* note 223 and accompanying text.

286 STATE WATER RES. CONTROL BD., *Proposition 1 Storm Water Grant Program Guidelines* (Dec. 15, 2015), App. B and App. C (considering whether the proposed project is included in an ASBS Compliance Plan or whether the applicant has solid understanding of ASBS requirements applicable to the watershed).

287 The OPC's Grant Guidelines for the Prop 1 Grant Program awards bonus points to applicants if their project advances the management of individual MMAs or the statewide MMA network. *Grant Guidelines, Ocean Protection Council Proposition 1 Grant Program,* CAL. OCEAN PROTECTION COUNCIL (2017).

288 Email communication with Holly Wyer, OPC (Jan. 3, 2018).

289 *See* S.D. REGIONAL WATER QUALITY CONTROL BD., *supra* note 178, at 6 (stating the first step to developing and implementing an effective program is assembling a representative workgroup comprised of regulators, dischargers, and others with an interest in the beneficial use of waters in the region).

290 *Id.*at 23-24 (noting that the total amount spent on monitoring and assessment required by the San Diego Water Board is estimated to be several million dollars per year).

volunteers.[291] For example, water quality data collected by San Diego Coastkeeper volunteers augments the limited data collected by local governments and allows regulators to better assess more comprehensive water resources data to make more effective decisions on how to reduce sources of pollution.[292]

Citizen science also plays an important role in the MPA monitoring program and contributes useful information for adaptively managing the MPAs.[293] Programs such as MPA Watch, led by members of the Collaborative Network, underscore the value of these partnerships in coordinating monitoring efforts and supporting compliance and enforcement. A recent study to quantify the annual value of in-kind contributions from non-state Orange County MPA Collaborative (OCMPAC) members to Orange County MPA and ASBS management found that these contributions totaled more than $4 million over the two-year study period.[294] For example, coastal cities and NGOs have trained hundreds of docents who have logged thousands of volunteer hours in local MMAs providing tidepool education and enhancing MPA compliance.[295] The report determined that without these contributions, which are highly dependent on the ongoing interest and capacity of individuals participating in the Collaboratives, MPA management may suffer.[296]

Further, the Monitoring Council was tasked with ensuring that theme-specific workgroups identify and achieve the cost savings possible through increased coordination, efficiency, and access to data.[297] It noted that the Southern California Bight Program funds its periodic large-scale monitoring through a combination of compliance monitoring offsets, direct funding by participants, in-kind staff support, and core funding to SCCWRP from the State Water Board. Also, the San Francisco Bay RMP is funded by direct contributions from a wide range of participants. In both of these examples, regulatory compliance monitoring was reduced, and the resources were redirected to strengthen regional monitoring efforts.[298]

Finally, as mentioned previously, CWA citizen suits brought against polluters can also generate mitigation payments to help repair the damage to the ecosystem from their past pollution. For example, San Francisco Baykeeper has generated more than $10 million in funding for projects that are reducing pollution and

---

[291] *Id*. *See also* Ashlee Jollymore et al., *Citizen science for water quality monitoring: Data implications of citizen perspectives* 200 J. ENVT. MGMT. 456-67 (2017) (noting that citizen science can dramatically expand data collection and analysis at a fraction of the cost of traditional scientific campaigns and augment project scope and improve the statistical power of data sets as well as facilitate the observation of otherwise difficult to quantify phenomena).

[292] San Diego Coastkeeper collects and analyzes water samples for basic chemistry, nutrients, bacteria, and toxicity from nine out of eleven watersheds in San Diego County on a monthly basis. *See San Diego Watersheds*, SD COASTKEEPER, http://www.sdcoastkeeper.org/learn/swimmable/san-diego-water-quality (last visited Dec. 6, 2017).

[293] Scientific benefits include broad spatial and temporal coverage, data from hard-to-access private land, and labor-intensive data collection that would otherwise be prohibitively expensive to collect. *See Citizen Science and Ocean Resource Management in California: Guidance for forming productive partnerships* OST (2014).

[294] BLUE EARTH CONSULTANTS, VALUATION OF IN-KIND CONTRIBUTIONS MADE BY MEMBERS OF THE ORANGE COUNTY MARINE PROTECTED AREA COUNCIL (OCMPAC) TO ORANGE COUNTY MPA MANAGEMENT ACTIVITIES 3 (2016).

[295] *Id*. at 4.

[296] *Id*. at 12.

[297] *See* CAL. WATER QUALITY MONITORING COUNCIL, A COMPREHENSIVE MONITORING PROGRAM STRATEGY FOR CALIFORNIA 40 (2010).

[298] *Id*. at 42.

helping to restore San Francisco Bay ecosystems.[299] Participants noted that untapped opportunities exist for interested community groups and organizations to supplement scarce public enforcement resources through similar citizen enforcement activities.

Enhance Accountability through Reporting Standards and Statewide Metrics

Finally, funding initiatives could be improved by integrating systematic tools that promote learning.[300] In a 2009 report, the Little Hoover Commission specifically called for greater oversight and transparency for natural resource bonds.[301] A 2017 follow-up report found improvements.[302] However, Participants noted several ongoing problems regarding grant management practices for Prop 84 and Prop 1 funds, including a lack of guidance on what questions the monitoring data needs to answer and lack of accountability in how funds are being used. For example, a recent study assessed the efficacy of the Prop 84 grant program that allocated $32 million to local agencies to reduce or remove discharges to ASBSs, discussed above.[303] The study found of the 14 grants awarded, only eight grantees completed their construction and monitoring requirements in a timely manner.[304] Several grantees were unaware monitoring to address pollutant load reduction was a program goal.[305] One grantee used their funds largely on public education, rather than a full-scale load reduction BMP. Of the various BMPs evaluated, the study found varying degrees of effectiveness. The study also noted that it will require ongoing maintenance for most BMPs to ensure that they are performing at initial design standards. However, currently monitoring is not specifically required or planned to ensure maintenance or to quantify future pollutant reductions.[306]

At a minimum, these grant programs should be adjusted to foster grantee accountability and thus promote meaningful water quality improvements. Recipients should be required to report on the costs and efficacy of adopted remediation efforts, and to report on past effectiveness in subsequent proposals. In addition, a portion of grant funding should go toward education and training of grant recipients as to best practices and oversight of implementation.[307] Participants also suggested the need for a statewide metric to judge how well the funds are being used. For example, the State Water Board should clearly delineate what questions they want grant recipients to answer, such as the volume of pollutants entering the waterways and volume of pollutants kept out due to project funds.

Moreover, granting agencies should integrate more adaptive approaches to their respective grant programs. Participants noted that funding under both Prop 84 and Prop 1 is released in rounds, which presents an opportunity to learn from previous rounds and improve grant management practices.[308]

---

299 *See About Baykeeper*, SF BAYKEEPER, https://baykeeper.org/content/2016-funds-bay-restoration-generated-baykeeper-lawsuits (last visited Dec. 6, 2017).

300 *Cf. generally* Camacho, *supra* note 10.

301 *See* LITTLE HOOVER COMMISSION, BOND SPENDING: EXPANDING AND ENHANCING OVERSIGHT (2009) (finding that because bond funds were spread across so many departments, policies sometimes worked at cross purposes).

302 *See* LITTLE HOOVER COMMISSION, BORROWED MONEY: OPPORTUNITIES FOR STRONGER BOND OVERSIGHT (2017) (noting that the Natural Resources Agency now has information available on its bond accountability website on past bond measures, as well as detailed information on Prop 1 programs and projects).

303 *See* Prop 84 ASBS Grant Program, *supra* note 276.

304 See *Proposition 84 Grant Evaluation Report*, *supra* note 276, at i (finding that grantees that already had well-developed engineering designs and processes and had experience with monitoring were best able to accomplish their grant requirements).

305 *Id*. at 8.

306 *Id*. at 101.

307 Participants noted that SCCWRP and OST are appropriate trainers.

308 January 2017 Roundtable, *supra* note 19 (noting that the first Prop 1 proposals went out in 2015 and now is a good time to report back to the various agencies managing Prop 1 monies).

Granting agencies should, individually and in concert, review lessons learned from past grants and develop a uniform set of best practices for grant awards and management that can be adjusted over time. OPC and/or the MPA Statewide Leadership Team should help spearhead this effort.

Conclusions

Coastal water quality management is complex, and inevitably challenges exist to coordinate across regulatory and ecosystem boundaries. However, MMAs can be leveraged to direct funding, research, and resources to bridge across agency jurisdictions to promote water quality and ecosystem health. Although more comprehensive programmatic reforms might ultimately be required to address the regulatory fragmentation and institutional and resource deficiencies that limit water quality protections in MMAs, CLEANR's stakeholder dialogues and research have identified a number of more near-term and concrete opportunities for improving coordination that are practicable within the current management framework.

Improving Coastal Water Quality and Ocean Health Protection	
Support and Expand Emerging Coordination Efforts	p.10
Promote Designation of MPAs as Protected Areas under State Water Quality Program	
Leverage MPA Collaborative Network and other stakeholders	pp.12-13
State Water Board should direct Regional Boards to work with stakeholders to identify candidate areas	p.13
Enhance ASBS Program	
State Water Board should better quantify "natural ocean water quality" and take action to avoid shifting baselines	pp.13-14
State and Regional Boards should commit more resources to ASBS monitoring and enforcement.	pp.14-15
State Water Board should incorporate ecosystem health into ASBS permit obligations	pp.15-16
Make Better Use of Coastal Act Restrictions on Land Use	
Condition permits on measures to avoid impacts to MMAs	pp.19-20
Develop watershed assessments and customized action plans for each CCA	pp.20-21
Department of Water Resources and State Water Board should require IRWM programs to include consideration of MMAs and dedicated funding to support local watershed councils	p.21
Jettison "Safe Harbors" for Municipal CWA Violations	pp.22-23
Better Leverage Stakeholders in Coastal Water Quality Program	
Promote stakeholder opportunities in implementation, education and enforcement	p.23
OPC and coastal Regional Water Boards should develop statewide network of regional coastal watershed councils akin to Network of Oregon Watershed Councils	pp.23-24

Better Integrating Coastal Water Quality and Health Monitoring and Assessment	
Promote Regional Coordination of Monitoring and Assessment	
MPA Statewide Leadership Team should establish a working group to better integrate water quality and MPA monitoring in the development of the Statewide MPA Monitoring Action Plan, drawing on successful pilot programs	pp.28-31
OPC and the State Water Board should integrate data collection from MMA monitoring with those under state and federal water quality mandates	pp.31-32
MPA Statewide Leadership Team should collaborate with the Monitoring Council to facilitate and expand the work initiated by the ocean data portal scoping group	pp.31-32
Promote Access to and Dissemination of Data	
OPC, OST and CDFW should work with the Monitoring Council in the development of a comprehensive marine environment data portal and standardization of monitoring, assessment, and data organization protocols	p.33

Countering Resource Challenges	
Better Integrate Stormwater Management with Water Supply and Wastewater Treatment	
Water Districts should use tiered rates to pay for efforts to capture and treat polluted runoff from landscape overwatering	p.35
Local agencies should move toward holistic water management, drawing on pioneering programs in San Diego, Los Angeles, and Orange County	p.35
Leverage Available Tools and Resources	
Adopt measures that prevent pollution at its source, including banning products that escape wastewater treatment	pp.36-37
Use targeted regulatory fees, such as surcharges on water, chemical, and road use	p.37
Pursuant to SB 231, local agencies should fund stormwater programs using their current water or sewer fees, or adopt new fees	pp.37-39
State granting agencies should consider MMA benefits in their award process	p.39
Leverage stakeholders to promote monitoring, assessment, enforcement	pp.39-41
Granting agencies should require reports on costs and efficacy by grantees	pp.41-42
Incorporate into grant processes systematic review and assessment of the efficacy of funded water quality and ecosystem improvement projects	pp.41-42

With the stresses of climate change on marine ecosystems being accompanied by a reduction in federal support for conservation programs under the Trump administration, it is critical that action be taken to leverage other resources and opportunities for improvements in coastal water quality and MMA management. The recommendations detailed above present such opportunities for state and local authorities as well as private stakeholders. The successful coordination of these efforts will be vital for tackling not only existing harms to coastal water quality, but also helping to conserve the ecological health of California's coastal marine resources in the face of daunting future challenges.