

## A FEDERAL ACT TO PROMOTE INTEGRATED WATER MANAGEMENT: IS THE CZMA A USEFUL MODEL?

BY

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*Water management in the United States currently suffers from both substantive fragmentation (with different agencies handling different aspects of water management) and geographic fragmentation (with watersheds and water basins divided among multiple agencies). This Article examines whether the federal Coastal Zone Management Act (CZMA) could provide a model for federal legislation promoting greater integration of water management by the states. The CZMA successfully addressed similar fragmentation plaguing coastal management in the early 1970s by encouraging but not mandating statewide management plans, raising the possibility that a similar approach could help reduce fragmentation in the water field. Just as in the coastal context, the federal government has a significant interest in ensuring effective state water management, but a federal mandate that states adopt a more integrated approach to water management would appear unnecessary, unwise, and politically impossible.*

*The Article begins by examining the problem of fragmentation in water management, possible solutions such as Integrated Water Resource Management (IWRM), and the CZMA's value as a role model for federal legislation addressing the problem. The Article then examines the potential provisions of such a law, dubbed the Sustainable Water Integrated Management Act (SWIM). SWIM would need to address a number of difficult issues, ranging from how to deal with interstate rivers to the appropriate geographic scale for integration. The Article concludes by evaluating a number of incentives that SWIM might provide to states to encourage integrated*

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*management, including matching funds, federal consistency, technical assistance, streamlined permitting of water projects, and delegation of federal authority over key water issues.*

I.	INTRODUCTION .....	202
II.	FRAGMENTATION AND INTEGRATION .....	205
	A. <i>The Problem of Fragmentation</i> .....	205
	B. <i>State Efforts to Promote Integration</i> .....	211
III.	THE CZMA AS A POTENTIAL MODEL.....	218
	A. <i>The History and Provisions of the CZMA</i> .....	218
	B. <i>Should the National Government Take a CZMA-Like Approach to         Integrated Water Management?</i> .....	222
IV.	STATUTORY PROVISIONS.....	226
	A. <i>What Federal Agency Should Administer SWIM?</i> .....	226
	B. <i>Management by States or Water Basins</i> .....	228
	C. <i>The Best Geographic Scale for Integration</i> .....	229
	D. <i>Substantive Integration</i> .....	231
	E. <i>Interstate Integration</i> .....	232
V.	INCENTIVES .....	234
	A. <i>Federal Funding</i> .....	235
	B. <i>Federal Consistency</i> .....	236
	C. <i>Federal Technical Assistance</i> .....	237
	D. <i>Streamlined Permitting</i> .....	237
	E. <i>Federal Delegation</i> .....	238
VI.	CONCLUSIONS.....	239

## I. INTRODUCTION

This Article examines whether the federal Coastal Zone Management Act (CZMA)<sup>1</sup> provides a useful model for national encouragement, support, and oversight of more integrated management of freshwater resources in the United States. The last several decades have seen increasing interest in such management, from informal watershed planning to the more formal and ambitious concept of integrated water resource management (IWRM).<sup>2</sup> Such approaches have sought to surmount the significant fragmentation that

<sup>1</sup> Coastal Zone Management Act of 1972, 16 U.S.C. §§ 1451–1466 (2006).

<sup>2</sup> See Barton H. Thompson, Jr., *Water Federalism: Governmental Competition and Conflict over Western Waters*, in ENVIRONMENTAL FEDERALISM 175, 214–15 (Terry L. Anderson & Peter J. Hill eds., 1997) (discussing the growing interest in watershed-based management). For general overviews of the concept of IWRM, see INTEGRATED WATER RESOURCES MANAGEMENT (Miguel A. Mariño & Slobodan P. Simonovic eds., 2001); GORDON YOUNG, UN-WATER, STATUS REPORT ON INTEGRATED WATER RESOURCES MANAGEMENT AND WATER EFFICIENCY PLANS (2008), available at [http://www.unwater.org/downloads/UNW\\_Status\\_Report\\_IWRM.pdf](http://www.unwater.org/downloads/UNW_Status_Report_IWRM.pdf). For a more skeptical look at IWRM as a workable approach, see Asit K. Biswas, *Integrated Water Resources Management: A Reassessment*, 29 WATER INT'L 248 (2004).

historically has existed in the water arena and sometimes stymied effective water governance. This fragmentation is both substantive—with separate agencies holding responsibility over different but often closely related substantive issues—and geographic—with a single watershed or water basin often crisscrossed by multiple geopolitical boundaries.

The fragmentation that has historically plagued water management resembles the state of coastal management prior to the CZMA. Critics of mid-twentieth century coastal management worried that the nation's coasts were at risk and would remain at risk so long as control over coastal zones remained highly fragmented.<sup>3</sup> In response, Congress in 1972 passed the CZMA to promote the development and implementation of comprehensive state-level coastal plans.<sup>4</sup> The CZMA differed from other major national environmental laws passed during the same period, such as the Clean Air Act<sup>5</sup> and Clean Water Act,<sup>6</sup> by not mandating any specific state action but instead encouraging *voluntary* state planning through two principal incentives: matching federal funds and a promise of federal consistency.<sup>7</sup>

The history of the CZMA suggests that it might be a model for similar national legislation encouraging more integrated management of water resources. The national government would appear to have as much of an interest today in enabling and ensuring sustainable management of water resources throughout the United States as it did in promoting effective coastal management in 1972. Because of the national government's existing role in water management, integrated management requires the participation of the national government.<sup>8</sup> Poor water planning in one region, moreover, can impact national water needs, the water management of neighboring areas, and national economic markets.<sup>9</sup> However, Congress is unlikely to pass a national directive for integrated, regional water management in today's political landscape. Not only has Congress shown little interest over the last two decades in adopting major new legislation addressing either water or the environment,<sup>10</sup> but states have always carefully and generally successfully guarded their discretion over nonquality issues in water management.<sup>11</sup> The need for a direct and universal congressional mandate is

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<sup>3</sup> See, e.g., COMM'N ON MARINE SCI., ENG'G & RES., OUR NATION AND THE SEA: A PLAN FOR NATIONAL ACTION 56–57 (1969).

<sup>4</sup> For discussion in more detail of the CZMA and its provisions, see *infra* notes 134–62 and accompanying text.

<sup>5</sup> 42 U.S.C. §§ 7401–7671q (2006).

<sup>6</sup> Federal Water Pollution Control Act, 33 U.S.C. §§ 1251–1387 (2006).

<sup>7</sup> See *infra* text accompanying notes 147–61.

<sup>8</sup> See David H. Getches, *The Metamorphosis of Western Water Policy: Have Federal Laws and Local Decisions Eclipsed the States' Role?*, 20 STAN. ENVTL. L.J. 3, 17–18 (2001).

<sup>9</sup> See *infra* text accompanying notes 177–83.

<sup>10</sup> Congress has passed neither major new environmental legislation nor significant water reform measures for almost two decades. Nationally, the last major environmental legislation was arguably the Clean Air Act Amendments of 1990, Pub. L. No. 101-549, 104 Stat. 2399. The last major water legislation was the Central Valley Project Improvement Act, Pub. L. No. 102-575, 106 Stat. 4706 (1992).

<sup>11</sup> For example, virtually all major federal water legislation provides that states shall retain control of water-allocation decisions. See, e.g., 33 U.S.C. § 1251(g) (2006) (“It is the policy of

also unclear. The complexity and cost of integrated watershed planning in many regions may exceed the benefits, undermining any argument for a universal requirement.<sup>12</sup> And many watersheds have already voluntarily embarked on integrated planning, undermining the need for a direct mandate.<sup>13</sup> In this setting, voluntary incentives might be both an attractive and the only available approach. Matching funds and federal consistency could be attractive incentives for more integrated water management, just as it was for coastal planning.<sup>14</sup> Given the significant role of federal agencies in water management, federal consistency also is necessary to effective and integrated management, just as it was in the coastal context.<sup>15</sup>

The superficial attractiveness of the CZMA as a model for federal support and encouragement of more integrated watershed management disguises several important issues that any new federal legislation would need to address. First, what type and scope of integration would the legislation require? While the CZMA had a fairly clear goal in mind—state management of coastal zones<sup>16</sup>—IWRM is a vague and complex concept that has proven difficult to define and equally difficult to implement.<sup>17</sup> In promoting more integrated management, Congress would need to address such questions as the required geographic scale of integration and the issues to be integrated. Second, would the type of incentives offered by the CZMA—matching funds and consistency assurances<sup>18</sup>—be enough in today's environment to convince a significant number of states to embark on more integrated planning and management of their water resources?

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Congress that the authority of each State to allocate quantities of water within its jurisdiction shall not be superseded, abrogated or otherwise impaired by [the Clean Water Act].”)

<sup>12</sup> See, e.g., Wietske Medema et al., *From Premise to Practice: A Critical Assessment of Integrated Water Resources Management and Adaptive Management Approaches in the Water Sector*, 13 *ECOLOGY & SOC'Y* 29, 33–34 (2008).

<sup>13</sup> See, e.g., Jay R. Lund, *Most Excellent Integrated Water Management from California*, in *OPERATING RESERVOIRS IN CHANGING CONDITIONS: PROCEEDINGS OF THE OPERATIONS MANAGEMENT 2006 CONFERENCE* 196, 199–201 (Darell D. Zimbleman & Werner C. Loehlein eds., 2006) (providing an overview of integrated and spatially extensive water management in California).

<sup>14</sup> See Ronald J. Rychlak, *Coastal Zone Management and the Search for Integration*, 40 *DEPAUL L. REV.* 981, 987–88 (1991).

<sup>15</sup> The federal government, for example, regulates water quality through the Clean Water Act. 33 U.S.C. § 1313 (2006). The federal government additionally regulates water quality and potability through the Safe Drinking Water Act (SDWA). 42 U.S.C. §§ 300f–300j-26 (2006). Flood policy is shaped by the Federal Emergency Management Agency. National Flood Insurance Act of 1968, 42 U.S.C. § 4011(a) (2006) (authorizing the Federal Emergency Management Agency to carry out a national flood insurance program). The Bureau of Reclamation and Army Corps of Engineers construct and maintain major water infrastructure. CLAUDIA COPELAND ET AL., *CONG. RESEARCH SERV.*, RL 30478, *FEDERALLY SUPPORTED WATER SUPPLY AND WASTEWATER TREATMENT PROGRAMS* 5, 9 (2010).

<sup>16</sup> Coastal Zone Management Act of 1972, 16 U.S.C. §§ 1452 (2006); H.R. REP. NO. 96-1012, at 14 (1980) (stating the Act's purpose to “encourage and assist States in developing and implementing management programs to preserve, protect, develop, and where possible, to restore or enhance the resources of our nation's coast by the exercise of planning and control with respect to activities occurring in their coastal zones”).

<sup>17</sup> Medema et al., *supra* note 12, at 33.

<sup>18</sup> 16 U.S.C. §§ 1455(a)–(b), 1456(c) (2006).

Commentators have criticized the CZMA for failing to provide sufficient incentives to fully encourage widespread and effective state coastal management.<sup>19</sup> Federal funding today is far more limited, and Congress has already instructed many federal agencies to defer to state policies. To promote more integrated water management, Congress therefore may need to look beyond the CZMA for other potential incentives.

This Article considers these and other questions in evaluating the potential for new CZMA-like legislation to promote more integrated and effective management of water resources. Part II of the Article overviews the fragmentation that historically has plagued freshwater management, particularly in the western United States, and the need for more integrated management. Part II also looks at the effort by some states, such as California, to encourage such management. Part III then considers the opportunity for using the CZMA as a model for new federal legislation—what I will refer to as the Sustainable Water Integrated Management Act, or SWIM for short—to encourage greater use of integrated water management in the United States and ensure effective implementation. Part IV looks in more detail at the potential provisions of such legislation, with a particular emphasis on the required scope of integration. Part V considers the question of what, if any, incentives the national government might provide beyond matching funds and federal consistency. Finally, Part VI provides a brief conclusion.

## II. FRAGMENTATION AND INTEGRATION

### A. *The Problem of Fragmentation*

Fragmentation, both substantive and geographic, has long undermined effective water management in the United States, particularly in the West.<sup>20</sup> Governments ideally would manage water resources on a holistic basis. Decisions regarding surface water and groundwater withdrawals would account for the fact that surface water and groundwater are often interlinked.<sup>21</sup> In deciding whether or not to permit water diversions, water managers would consider the potential impact on water quality. They also

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<sup>19</sup> See, e.g., Linda A. Malone, *The Coastal Zone Management Act and the Takings Clause in the 1990's: Making the Case for Federal Land Use to Preserve Coastal Areas*, 62 U. COLO. L. REV. 711, 714 (1991); Sam Kalen, *The Coastal Zone Management Act of Today: Does Sustainability Have a Chance?*, 15 SOUTHEASTERN ENVTL. L.J. 191, 204, 220 (2006).

<sup>20</sup> See, e.g., ELLEN HANAK ET AL., *MANAGING CALIFORNIA'S WATER: FROM CONFLICT TO RECONCILIATION* 195, 358–61 (2011); Mark Lubell & Lucas Lippert, *Integrated Regional Water Management: A Study of Collaboration or Water Politics-as-Usual in California, USA*, 77 INT'L REV. ADMIN. SCI. 76, 80 (2011); A. Dan Tarlock, *Putting Rivers Back in the Landscape: The Revival of Watershed Management in the United States*, 6 HASTINGS W.-NW. J. ENVTL. L. & POL'Y 167, 182 (2000); Thompson, *supra* note 2, at 214.

<sup>21</sup> See THOMAS C. WINTER ET AL., U.S. GEOLOGICAL SURVEY, CIRCULAR 1139, *GROUND WATER AND SURFACE WATER: A SINGLE RESOURCE* 3–5 & figs.2, 4 & 5 (1998), available at <http://pubs.usgs.gov/circ/circ1139/pdf/circ1139.pdf> (describing how surface and groundwater interact).

would look at options for using reclaimed wastewater or storm water to supplement other local or imported supplies. Land-use managers would examine the impact of their decisions on water demand, groundwater infiltration, water quality, and other water-related concerns. Flood control and water supply would be closely integrated. Despite the need for such integration, different governmental agencies handle these various substantive issues in most jurisdictions today, and the varying agencies often do not work together to solve problems on a more holistic basis.<sup>22</sup> Within any one watershed, moreover, multiple agencies often divide authority geographically, making it difficult to integrate management across the entire watershed.<sup>23</sup>

To see the problems of substantive fragmentation, consider the physical connection between groundwater and surface water.<sup>24</sup> Groundwater and surface water are often hydrologically coupled.<sup>25</sup> Groundwater provides approximately 40% of the nation's surface water flows, and surface water in turn often feeds groundwater aquifers.<sup>26</sup> As a result, groundwater withdrawals can reduce surface water supplies, and surface diversions can reduce groundwater availability.<sup>27</sup> Groundwater also supports the healthy functioning of a variety of aquatic, coastal, and terrestrial ecosystems, supporting the fish, fauna, birdlife, and vegetation reliant on them.<sup>28</sup> Groundwater-dependent ecosystems (GDEs) include such diverse

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<sup>22</sup> HANAK ET AL., *supra* note 20, at 358–59, 60 & fig.8.1, 61; Jared L. Cohon & D. Tyler Gourley, *Lessons of the Flood: Too Much Water, Too Many Agencies*, PITTSBURGH POST-GAZETTE, Aug. 28, 2011, <http://www.post-gazette.com/pg/11240/1170116-109-0.stm> (last visited Feb. 18, 2012) (describing the substantial fragmentation of water management in southwestern Pennsylvania, whose 11 counties boast nearly 1000 different government entities with some role in water and sewer management).

<sup>23</sup> J.B. Ruhl et al., *Proposal for a Model State Watershed Management Act*, 33 ENVTL. L. 929, 938 & n.46 (2003).

<sup>24</sup> For a general discussion of the need to pay closer attention to the connections between groundwater and surface water in the United States, see Barton H. Thompson, Jr., *Beyond Connections: Pursuing Multidimensional Conjunctive Management*, 47 IDAHO L. REV. 273 (2011).

<sup>25</sup> *Id.* at 274–75.

<sup>26</sup> *Id.* at 274, 279.

<sup>27</sup> *Id.*

<sup>28</sup> See, e.g., Jeanette Howard & Matt Merrifield, *Mapping Groundwater Dependent Ecosystems in California*, PLoS ONE, June 23, 2010, at 2, <http://www.plosone.org/article/info:doi/10.1371/journal.pone.0011249> (last visited Feb. 18, 2012) (click on “Download: PDF” to access PDF version); Heather MacKay, *Protection and Management of Groundwater-Dependent Ecosystems: Emerging Challenges and Potential Approaches for Policy and Management*, 54 AUSTRALIAN J. BOTANY 231, 231–32 (2006); W. WATER PROJECT, TROUT UNLIMITED, GONE TO THE WELL ONCE TOO OFTEN: THE IMPORTANCE OF GROUND WATER TO RIVERS IN THE WEST 6 (2d prt. 2007), available at [http://www.tu.org/atf/cf/%7B0D18ECB7-7347-445B-A38E-65B282BBBD8A%7D/ground%20water%202ed\\_lores.pdf](http://www.tu.org/atf/cf/%7B0D18ECB7-7347-445B-A38E-65B282BBBD8A%7D/ground%20water%202ed_lores.pdf).

freshwater systems as wetlands, springs, seeps, and fens.<sup>29</sup> Overpumping of groundwater can harm or destroy GDEs.<sup>30</sup>

Effective water management thus requires the integrated administration of both groundwater and surface water. Conjunctive management of surface water and groundwater, in which users can switch from one source to another and in which surface water can be stored in groundwater aquifers, can significantly increase overall yield and thus water availability.<sup>31</sup> However, many state agencies with responsibility over surface water historically managed groundwater only in the limited circumstances where courts concluded that the groundwater constituted the “subflow” of a surface waterway—a purely legal construct with no hydrologic relevance.<sup>32</sup> While this caused few problems so long as groundwater extractions were minimal, growth in groundwater use has increasingly brought groundwater and surface water users into conflict in the West, particularly during prolonged droughts.<sup>33</sup> As water has grown increasingly scarce, conjunctive management and its promise of increased yield also have increased in importance.

About two-thirds of the eighteen western states have responded by integrating a broader set of groundwater and surface water rights at the statewide level, either through legislation or judicial action.<sup>34</sup> However, other states, including California and Texas, have relegated groundwater management largely to local agencies that sometimes may have no authority over surface water.<sup>35</sup> No state has comprehensively integrated groundwater and surface water in all watersheds, and exceptions often exist to the state rules.<sup>36</sup> As a result, one resource—water—that should be managed as an

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<sup>29</sup> See, e.g., Howard & Merrifield, *supra* note 28, at 2; MacKay, *supra* note 28, at 232; Marios Sophocleous, *Ecological Impacts of Conjunctive Use: The Role of Environmental Flows*, GROUND WATER NEWS & VIEWS, Nov. 2007, at 6, 6, available at <http://aquadoc.typepad.com/waterwired/files/newsviewsnov07.pdf>.

<sup>30</sup> See, e.g., Andrew J. Boulton, Editorial, *Recent Progress in the Conservation of Groundwaters and Their Dependent Ecosystems*, 19 AQUATIC CONSERVATION: MARINE & FRESHWATER ECOSYSTEMS 731, 733 (2009); MacKay, *supra* note 28, at 231–32; MAURICE HALL, NATURE CONSERVANCY, WRITTEN TESTIMONY ON CALIFORNIA WATER GOVERNANCE TO THE LITTLE HOOVER COMMISSION: THE IMPORTANCE OF IMPROVED GROUNDWATER MANAGEMENT IN SUSTAINABLE WATER MANAGEMENT FOR CALIFORNIA’S PEOPLE AND ECOSYSTEMS 2 (2010), available at <http://www.lhc.ca.gov/studies/201/watergovernance/HallJan10.pdf>.

<sup>31</sup> Allison Evans, *The Groundwater/Surface Water Dilemma in Arizona: A Look Back and a Look Ahead Toward Conjunctive Management Reform*, 3 PHOENIX L. REV. 269, 275 (2010).

<sup>32</sup> See, e.g., *Hudson v. Dailey*, 105 P. 748, 753 (Cal. 1909) (treating the subflow of a stream the same as a surface waterway); *Hale v. McLea*, 53 Cal. 578, 584 (1879) (discussing underground streams).

<sup>33</sup> John Bredehoeft, *Conjunctive Use of Ground Water and Surface Water—Success or Failure?*, GROUND WATER NEWS & VIEWS, Nov. 2007, at 1, 1, 3, available at <http://aquadoc.typepad.com/waterwired/files/newsviewsnov07.pdf>.

<sup>34</sup> Barbara Tellman, *Why Has Integrated Management Succeeded in Some States but Not in Others?*, WATER RESOURCES UPDATE, Winter 1996, at 13, 14–16, available at <http://opensiuc.lib.siu.edu/cig/viewcontent.cgi?article=1295&context=jcwre>.

<sup>35</sup> See Thompson, *supra* note 24, at 322.

<sup>36</sup> See, e.g., W. WATER PROJECT, *supra* note 28, at 8 (discussing exceptions to Colorado’s integration of surface water and groundwater).

integrated whole is often managed as two—groundwater and surface water—by different entities.

Similarly, state agencies with the authority to protect aquatic ecosystems from surface disruptions may not enjoy similar authority over groundwater withdrawals. In California, for example, the State Water Resources Control Board enjoys statutory authority to reduce water diversions or require dam operations to install fish ladders to protect freshwater fish species.<sup>37</sup> However, the Board does not possess similar authority over groundwater withdrawals, so groundwater users can literally suck rivers dry.<sup>38</sup> Local groundwater districts may have the ability to protect GDEs from groundwater pumping, but they seldom do.<sup>39</sup> Once again, fragmentation of authority can undermine a major aspect of water management—the protection of aquatic ecosystems.

Similar fragmentation exists in the management of water quantity and water quality.<sup>40</sup> Decisions about water quality are effectively a decision about water quantity. If the government permits the contamination of a groundwater aquifer, the government effectively is allocating the water of the aquifer to waste disposal rather than to consumptive use by cities, farmers, or others. Water quantity decisions similarly can impact water quality. Where significant water is extracted from a river or other waterway, the extraction can concentrate any pollutants in the waterway—whether natural or discharged into the stream by humans—and also, in the case of coastal waterways, lead to saltwater intrusion into the waterway.<sup>41</sup> Withdrawals from aquifers similarly can lead to saltwater intrusion or otherwise worsen contamination that already exists in the aquifer.<sup>42</sup> The construction of dams or other modifications to a waterway can impact downstream water quality.<sup>43</sup>

Water quality and quantity decisions therefore should be coordinated. Otherwise, managerial decisions can lead to unexpected and inefficient results. However, in most of the United States, different governmental

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<sup>37</sup> See HANAK et al., *supra* note 20, at 38, 321–22, 378–79.

<sup>38</sup> *Id.* at 322–24.

<sup>39</sup> See *id.* at 324, 326–27.

<sup>40</sup> For a general discussion of the connections between water quality and quantity, see JOSEPH L. SAX ET AL., *LEGAL CONTROL OF WATER RESOURCES: CASES AND MATERIALS* 1039–40, 1045–46, 1055, 1074–75 (4th ed. 2006).

<sup>41</sup> JAMES SALZMAN & BARTON H. THOMPSON, JR., *ENVIRONMENTAL LAW AND POLICY* 148 (3d ed. 2010); SAX ET AL., *supra* note 40, at 1012, 1064.

<sup>42</sup> Patricia A. Maurice, *The Hydrologic Cycle*, in *EARTH SYSTEMS: PROCESSES AND ISSUES* 135, 144 & fig.9.11 (W.G. Ernst ed., 2000); Barton H. Thompson, Jr., *Water Allocation and Protection: A United States Case Study*, in *EARTH SYSTEMS: PROCESSES AND ISSUES*, *supra*, at 476, 489.

<sup>43</sup> Hydrological modifications are major contributors to water pollution and are the second most important source of water pollution in rivers and streams. See SALZMAN & THOMPSON, *supra* note 41, at 149 fig.6-2 (citing U.S. ENVTL. PROT. AGENCY, NATIONAL WATER QUALITY INVENTORY: REPORT TO CONGRESS, 2004 REPORTING CYCLE (2009)); SAX ET AL., *supra* note 40, at 1011 fig.10-1, 1012 (citing U.S. ENVTL. PROT. AGENCY, NATIONAL WATER QUALITY INVENTORY: 2000 REPORT TO CONGRESS (2002)). An early study by the United States Environmental Protection Agency found that dams contributed to significant water quality problems in 15% of the nation's water basins. See SALZMAN & THOMPSON, *supra* note 41, at 148.

agencies govern water quality and water quantity.<sup>44</sup> For example, in most western states, state engineers or water agencies decide on water quantity allocations, while state environmental agencies hold responsibility for protecting water quality.<sup>45</sup> California is one of the few states in the nation to place water quantity and water quality decisions under the same agency—the State Water Resources Control Board—but even California’s integrated decision-making approach fails to fully integrate a number of water quantity decisions, including most groundwater withdrawals.<sup>46</sup> Other states take an even more restrictive approach. Colorado, for example, prohibits its water quality agency from imposing instream flows in order to protect water quality.<sup>47</sup> Further fragmenting decision making, states take the principal responsibility for water quantity decisions, while the national government, through the federal Environmental Protection Agency (EPA), has ultimate responsibility over most water quality questions.<sup>48</sup>

A final example of substantive fragmentation is the division of responsibility between water management and land-use planning.<sup>49</sup> Land-use decisions can affect both the demand for water in a region and the availability of supply. The connection between land-use planning and demand is obvious. However, land use and land cover also can affect the amount of groundwater recharge in an area and the quality of that water. Many urban and suburban land uses, such as highways, gasoline stations, and commercial and industrial facilities, can introduce hazardous and other contaminants.<sup>50</sup> The spread of impervious surfaces not only can degrade groundwater quality, but also can reduce recharge into an aquifer by preventing surface water from percolating down into the aquifer, and can increase flood risks.<sup>51</sup> A 2002 study prepared by American Rivers, the Natural Resources Defense Council, and Smart Growth America concluded that the impact on recharge has already been substantial in many regions of the United States—reducing recharge in the Seattle area by enough water to

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<sup>44</sup> See, e.g., SAX ET AL., *supra* note 40, at 1055–56.

<sup>45</sup> See *id.*

<sup>46</sup> *Id.* at 1055.

<sup>47</sup> COLO. REV. STAT. § 25-8-104(2)(b) (2011); see also *id.* § 25-8-104(1) (stating that no water quality provision “shall be interpreted so as to supersede, abrogate, or impair rights to divert water and apply water to beneficial uses”).

<sup>48</sup> See SAX ET AL., *supra* note 40, at 1009.

<sup>49</sup> For discussions of the connections between land use and water, see generally Craig Anthony (Tony) Arnold, *Introduction: Integrating Water Controls and Land Use Controls: New Ideas and Old Obstacles*, in WET GROWTH: SHOULD WATER LAW CONTROL LAND USE? 1, 1–55 (Craig Anthony (Tony) Arnold ed., 2005); Barton H. Thompson, Jr., *Water Management and Land Use Planning: Is It Time for Closer Coordination?*, in WET GROWTH: SHOULD WATER LAW CONTROL LAND USE?, *supra*, at 95, at 95–118.

<sup>50</sup> Arnold, *supra* note 49, at 29–31.

<sup>51</sup> *Id.* at 28–29; Thompson, *supra* note 24, at 289–90.

serve almost 650,000 people.<sup>52</sup> Urban development also can modify the infiltration of storm water.<sup>53</sup>

In most areas, however, different agencies are typically responsible for land-use decisions, water provision, and water quality protection.<sup>54</sup> Cities and counties generally handle land-use decisions through planning commissions and their staff.<sup>55</sup> Local water districts or agencies often supply the water; even where cities handle the responsibility, a different division within the city handles water supply issues.<sup>56</sup> Finally, as just noted, environmental agencies generally deal with water quality.<sup>57</sup> This does not mean that the connection between land use and water management is ignored. A growing number of local jurisdictions are taking at least water quality into account in planning land uses.<sup>58</sup> But such decisions require more active coordination than would be needed if a single agency handled all issues.

Geographic fragmentation further complicates effective water management.<sup>59</sup> For example, consider the situation in California. Statewide, thousands of different agencies—local governments, water companies, and others—manage water at a local level; a single watershed can be split between scores of agencies.<sup>60</sup> Several dozen water “wholesalers” sell water to retailing agencies.<sup>61</sup> About 400 large retailers and several thousand smaller, more rural retailers, then supply water to individual customers.<sup>62</sup> Several dozen agencies manage groundwater or oversee adjudicated groundwater basins.<sup>63</sup> Hundreds of agricultural water districts provide surface water to the state’s farming communities.<sup>64</sup> Almost 600 local wastewater utilities collect and treat sewage.<sup>65</sup> Hundreds of cities and local governments take responsibility for land-use decisions, as well as ensuring the quality of storm water runoff under the Clean Water Act.<sup>66</sup> Dozens of counties and special districts oversee local flood management.<sup>67</sup>

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<sup>52</sup> BETSY OTTO ET AL., AMERICAN RIVERS, PAVING OUR WAY TO WATER SHORTAGES: HOW SPRAWL AGGRAVATES DROUGHT 4-5 (2002), available at <http://www.smartgrowthamerica.org/PavingOurWay.pdf>.

<sup>53</sup> Thompson, *supra* note 24, at 302.

<sup>54</sup> For a detailed discussion of the fragmentation in management, see Arnold, *supra* note 49, at 34-44.

<sup>55</sup> *See id.* at 34-35.

<sup>56</sup> SAX ET AL., *supra* note 40, at 685-86.

<sup>57</sup> *Id.* at 1009.

<sup>58</sup> Thompson, *supra* note 24, at 303.

<sup>59</sup> *See, e.g.*, Barton H. Thompson, Jr., *Institutional Perspectives on Water Policy and Markets*, 81 CALIF. L. REV. 671, 754 (1993) (observing that “regions susceptible to common water planning are often divided into scores of small institutions that have little coordination with each other”).

<sup>60</sup> HANAK ET AL., *supra* note 20, at 107.

<sup>61</sup> *Id.*

<sup>62</sup> *Id.* at 107-08.

<sup>63</sup> *Id.* at 108.

<sup>64</sup> *Id.*

<sup>65</sup> *Id.*

<sup>66</sup> *See, e.g., id.* (noting that over 600 local governments share responsibility for storm water runoff); Tom Hogen-Esch, *Fragmentation, Fiscal Federalism, and the Ghost of Dillon’s Rule*:

*B. State Efforts to Promote Integration*

States have taken several different approaches to date to try to overcome the problems that fragmentation presents. Some states have created new agencies designed to bridge specific divides and provide for integrated management in a limited context.<sup>68</sup> Thus California has created a number of regional water agencies with authority to conjunctively manage both groundwater and surface water.<sup>69</sup> The Santa Clara Valley Water Agency is illustrative: it both imports surface water and manages groundwater storage and withdrawals on an integrated basis in order to “provide a flexible and reliable water system.”<sup>70</sup> Such agencies can be highly effective in reducing fragmentation within their substantive and geographic jurisdictions.<sup>71</sup> However, such agencies solve only part of the fragmentation problem that confronts water management in most regions of the United States and, by creating yet another entity, actually can add to the overall fragmentation in water management.

Over the last several decades, a growing number of states also have authorized and encouraged local water and land-use agencies and their stakeholders to engage in watershed planning and management.<sup>72</sup> As a result, hundreds of watershed planning efforts have taken place or are underway in the form of informal watershed groups, watershed planning councils, and interagency working groups.<sup>73</sup> However, most such efforts again have been limited both in scope and authority. Watershed planning, for example, has focused more on water quality protection than on other forms of integrated management.<sup>74</sup> Moreover, most watershed planning efforts have been ad hoc efforts involving single watersheds, rather than comprehensive schemes to improve the way in which water is managed.<sup>75</sup> Few have provided watershed planning groups with the legal authority needed to implement the resulting

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*Municipal Incorporation in Southern California, 1950–2010*, CAL. J. POL. & POL’Y, Jan. 2011, at 1, 7 (2011) (discussing fragmentation of municipalities in Southern California).

<sup>67</sup> HANAK ET AL., *supra* note 20, at 108.

<sup>68</sup> See William Blomquist et al., *Institutions and Conjunctive Water Management Among Three Western States*, 41 NAT. RESOURCES J. 653, 654, 659 (2001); Thompson, *supra* note 24, at 303.

<sup>69</sup> Thompson, *supra* note 24, at 318.

<sup>70</sup> JEANETTE L. MICKO, SURFACE WATER AND GROUNDWATER CONJUNCTIVE USE MANAGEMENT: SANTA CLARA COUNTY, CALIFORNIA I (1991), available at [http://www.rlch.org/WWPP/archives/publications/1991/91\\_CFD\\_Micko.PDF](http://www.rlch.org/WWPP/archives/publications/1991/91_CFD_Micko.PDF).

<sup>71</sup> See Thompson, *supra* note 24, at 318 (citing Blomquist et al., *supra* note 68, at 670).

<sup>72</sup> See, e.g., Ruhl et al., *supra* note 23, at 930–31; Tarlock, *supra* note 20, at 167. See generally Thompson, *supra* note 2, at 214–15 (discussing the modern interest in watershed-based management).

<sup>73</sup> William Blomquist & Edella Schlager, *Political Pitfalls of Integrated Watershed Management*, 18 SOC’Y & NAT. RESOURCES 101, 103 (2005); see also Mark Lubell et al., *Watershed Partnerships and the Emergence of Collective Action Institutions*, 46 AM. J. POL. SCI. 148, 150 (2002).

<sup>74</sup> Thompson, *supra* note 24, at 321; Ruhl et al., *supra* note 23, at 932.

<sup>75</sup> Tarlock, *supra* note 20, at 187; Thompson, *supra* note 24, at 321; see also Matthew D. Davis, *Integrated Water Resource Management and Water Sharing*, 133 J. WATER RESOURCES PLAN. & MGMT. 427, 438 (2007).

plans.<sup>76</sup> Instead, the emphasis has been on the process of sharing information and eliciting new ideas from a broad set of stakeholders.<sup>77</sup> As one set of experts has concluded, “[o]n a spectrum from ‘strong’ to ‘weak,’” most watershed planning has been “at the ‘weaker’ end.”<sup>78</sup>

A growing number of governmental agencies, nongovernmental organizations, and academic experts have shown interest in trying to solve the fragmentation challenges through IWRM.<sup>79</sup> Under IWRM, multiple agencies—local, state, and national, and with different substantive jurisdictions—work together in a region to address a range of water issues on an integrated basis.<sup>80</sup> IWRM, for example, may take an integrated approach to supplying water (including surface water, groundwater, and other forms of water “supply” such as recycled or desalinated water), improving water quality, protecting aquatic environments, and managing land use, among other related functions. The ideal geographic scope of IWRM varies but generally encompasses an entire watershed or groundwater basin.<sup>81</sup> Participating agencies work to manage these issues together, in consultation with local stakeholders, and in a manner that maximizes regional objectives.<sup>82</sup> Not only does IWRM integrate across the hydrologic cycle, but it also attempts to integrate across multiple objectives.<sup>83</sup>

The claims for IWRM go beyond overcoming the problems of substantive and geographic fragmentation in a region to also encompass improving both the decision making process and the decisions themselves. In the view of proponents, IWRM can promote healthy collaboration among stakeholders by giving them a forum in which to discuss common issues,

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<sup>76</sup> Blomquist & Schlager, *supra* note 73, at 103 (highlighting that only a few watershed planning efforts have led to the “establishment of powerful autonomous entities with comprehensive functional responsibilities and broad implementation powers” (quoting Liane Nakamura & Stephen M. Born, *Substate Institutional Innovation for Managing Lakes and Watersheds: A Wisconsin Case Study*, 29 WATER RESOURCES BULL. 807, 808 (1993))); Davis, *supra* note 75, at 438; Thompson, *supra* note 24, at 321; *see also* Tarlock, *supra* note 20, at 187–89.

<sup>77</sup> Liane Nakamura & Stephen M. Born, *Substate Institutional Innovation for Managing Lakes and Watersheds: A Wisconsin Case Study*, 29 WATER RESOURCES BULL. 807, 808 (1993); *see also* Blomquist & Schlager, *supra* note 73, at 103.

<sup>78</sup> Blomquist & Schlager, *supra* note 73, at 103 (citing Nakamura & Born, *supra* note 77, at 808).

<sup>79</sup> For more on IWRM, *see* YOUNG, *supra* note 2, at 1; Davis, *supra* note 75, at 433. The UNESCO International Conference on Water in 1977 provided IWRM with its first official endorsement. Medema et al., *supra* note 12, at 30.

<sup>80</sup> *See* Medema et al., *supra* note 12, at 39 tbl.1. According to the Global Water Partnership, “IWRM is a process which promotes the co-ordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems.” TECHNICAL ADVISORY COMM., GLOBAL WATER P’SHIP, TAC BACKGROUND PAPER NO. 4, INTEGRATED WATER RESOURCES MANAGEMENT 22 (2000), *available at* [http://www.icp-confluence-sadc.org/sites/default/files/GWP\\_IWRM\\_TAC\\_No4.pdf](http://www.icp-confluence-sadc.org/sites/default/files/GWP_IWRM_TAC_No4.pdf).

<sup>81</sup> *See* OFFICE OF WATER, U.S. ENVTL. PROT. AGENCY, EPA 841-R-95-004, WATERSHED PROTECTION: A STATEWIDE APPROACH 4, 18 (1995), *available at* [http://www.epa.gov/owow/watershed/state/state\\_approach\\_1995.pdf](http://www.epa.gov/owow/watershed/state/state_approach_1995.pdf).

<sup>82</sup> *See* YOUNG, *supra* note 2, at 5.

<sup>83</sup> *See* Medema et al., *supra* note 12, at 32.

encouraging reciprocity, and allowing them to learn from each other and, hopefully, develop empathy for each other's positions.<sup>84</sup> Proponents often see broader and more meaningful stakeholder involvement as promoting procedural fairness and thus an end in itself.<sup>85</sup> But such involvement can also lead to better decisions.<sup>86</sup> By involving multiple stakeholders in planning and implementation, IWRM can increase the amount of information and ideas brought to bear on a problem, as well as encourage broader and less ideological approaches to decision making.<sup>87</sup> At least in theory, all of these factors should lead not only to more integrated plans, but also to better planning and decisions.<sup>88</sup>

Despite these potential advantages, few local agencies are likely to adopt IWRM, or any other variant of more integrated water management, without external incentives or mandates. First, IWRM is typically complicated, difficult, time consuming, and expensive.<sup>89</sup> Second, IWRM threatens vested political interests by moving decisions from existing local agencies to a more regional process or forum.<sup>90</sup> The boundaries and powers of local agencies help define "communities of interest, identity, and place," which are difficult to overcome without outside involvement.<sup>91</sup> For these reasons, there are few examples of successful IWRM in the United States today.<sup>92</sup>

California has recently tried to promote IWRM, although in a confusing twist, California has decided to name its specific approach "Integrated Regional Water Management" (IRWM), rather than IWRM.<sup>93</sup> According to California, IRWM is a "collaborative effort to manage all aspects of water resources in a region. IRWM crosses jurisdictional, watershed, and political boundaries; involves multiple agencies, stakeholders, individuals, and groups; and attempts to address the issues and differing perspectives of all the entities involved through mutually beneficial solutions."<sup>94</sup> In authorizing IRWM, the California legislature found that "[l]ocal agencies can realize

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<sup>84</sup> Lubell & Lippert, *supra* note 20, at 81.

<sup>85</sup> *Id.* at 82.

<sup>86</sup> *See id.*

<sup>87</sup> *Id.* at 81–82; *see also* Mark Lubell, *Cognitive Conflict and Consensus Building in the National Estuary Program*, 44 AM. BEHAV. SCIENTIST 629, 643 (2000) (arguing that the link between advocacy coalition influence and fairness evaluations suggests that it is increasingly important to identify and include all stakeholders as early as possible in environmental decision making).

<sup>88</sup> *See* Lubell & Lippert, *supra* note 20, at 82.

<sup>89</sup> Davis, *supra* note 75, at 427, 442; Thompson *supra* note 24, at 320–21; *see also* Medema et al., *supra* note 12, at 33–34, 38–41 (discussing the barriers that exist in implementing successful IWRM); Lubell & Lippert, *supra* note 20, at 92 tbl.4 (showing that participants in integrated water management in California found that it was "too time consuming").

<sup>90</sup> *See generally* Thompson, *supra* note 2, at 214–15 (noting that local agencies resist giving up power in watershed agreements).

<sup>91</sup> Blomquist & Schlager, *supra* note 73, at 105.

<sup>92</sup> Thompson, *supra* note 24, at 320; *see also* Medema et al., *supra* note 12, at 34.

<sup>93</sup> California is the first state to promote IWRM, although a number of foreign countries and the European Union have done so. *See* Lubell & Lippert, *supra* note 20, at 76, 82.

<sup>94</sup> Cal. Dep't of Water Res., *Integrated Regional Water Management Grants*, <http://www.water.ca.gov/irwm/> (last visited Feb. 18, 2012).

efficiencies by coordinating and integrating their assets and seeking mutual solutions to water management issues.<sup>95</sup>

California has promoted IRWM first by authorizing integrated regional planning and second by providing matching funds for both the planning effort and projects that result from the planning.<sup>96</sup> California first authorized IRWM in the Integrated Regional Water Management Planning Act of 2002 (IRWM Act).<sup>97</sup> The IRWM Act authorizes regional water management groups to “prepare and adopt an integrated regional water management plan” addressing any matters over which any of the agencies participating in the group has authority.<sup>98</sup> The Act lists a broad set of issues that a regional plan can address, including urban water management, water recycling, agricultural water management, groundwater management, water conservation, water quality, ecosystem health, and flood control.<sup>99</sup> The primary purpose of the IRWM Act is to authorize IRWM, and the Act sets out little in the way of either procedural or substantive requirements for agencies interested in pursuing more integrated management.<sup>100</sup>

California also has provided more than \$350 million in matching grants for both 1) IRWM planning efforts, and perhaps more importantly, 2) implementation of projects adopted as part of an IRWM plan.<sup>101</sup> The funding comes from three bond measures passed by California voters following legislative adoption of the IRWM Act.<sup>102</sup> Less than 10% of the funding goes to support planning grants, which can provide up to \$500,000 toward the

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<sup>95</sup> Integrated Regional Water Management Planning Act of 2002, CAL. WATER CODE § 10531(b) (West Supp. 2012); *see also id.* § 10531(e) (“Water management is integrally linked to public health and the health of all natural resources within our watersheds. It is the intent of the Legislature that water management strategies and projects are carried out in a way that promotes these important public values.”). In passing the original IRWM legislation, the California legislature also found that increased coordination is “necessary to maximize the quality and quantity of water available to meet the state’s agricultural, domestic, industrial, and environmental needs.” *Id.* § 10531(b) (West 2008).

<sup>96</sup> *See* Lubell & Lippert, *supra* note 20, at 83–84.

<sup>97</sup> CAL. WATER CODE § 10530 (West Supp. 2012).

<sup>98</sup> *Id.* § 10540(a).

<sup>99</sup> *Id.* § 10540(b), (c).

<sup>100</sup> The Act requires any group of agencies interested in engaging in IRWM to publish a notice on the proposal. *Id.* § 10543. The Act also disavows any intent to modify existing water rights. *See id.* § 10549 (“This part does not authorize a regional water management group to define, or otherwise determine, the water rights of any person.”).

<sup>101</sup> Thompson, *supra* note 24, at 319; CAL. DEP’T OF WATER RES. & STATE WATER RES. CONTROL BD., INTEGRATED REGIONAL WATER MANAGEMENT GRANT PROGRAM GUIDELINES 3–4 (2004), available at [http://www.swrcb.ca.gov/water\\_issues/programs/grants\\_loans/irwmgp/docs/r1\\_guidelines.pdf](http://www.swrcb.ca.gov/water_issues/programs/grants_loans/irwmgp/docs/r1_guidelines.pdf). More than \$2 billion in funding from state bonds has been allocated to date. HANAK ET AL., *supra* note 20, at 259.

<sup>102</sup> Proposition 50, passed by California voters in November 2002, provides \$500 million to fund competitive grants for projects consistent with an adopted IRWM plan. CAL. DEP’T OF WATER RES. & STATE WATER RES. CONTROL BD., *supra* note 101, at 3. Proposition 84, passed in November 2006, provides \$1 billion “for IRWM Planning and Implementation.” Cal. Dep’t of Water Res., *supra* note 94. Finally, Proposition 1E, passed in the same month as Proposition 84, provides \$300 million for “IRWM Stormwater Flood Management.” *Id.*

development or modification of an IRWM plan.<sup>103</sup> The principal requirement for planning grants is broad integration of local decision making across the spectrum of water issues. Thus, plans “must address major water related objectives and conflicts within the region, including, *at a minimum*, water supply, groundwater management, ecosystem restoration, and water quality.”<sup>104</sup> The state leaves issues of scale and participation initially up to the sponsoring agencies, although the agencies must demonstrate in their application that all agencies and stakeholders “necessary to address the objectives and water management strategies of the Plan” are involved, and must explain why the chosen region “is an appropriate area for integrated regional water management.”<sup>105</sup> Local agencies also must have financial skin in the game, providing 25% of total planning costs.<sup>106</sup>

While planning grants help defray the cost to local agencies of developing IRWM plans, the prospect of implementation grants provide an even greater incentive. Agencies that have developed IRWM plans are eligible for implementation grants of up to \$50 million for projects included in IRWM plans.<sup>107</sup> While local agencies must provide 25% of planning costs, they need furnish only 10% of project costs.<sup>108</sup> To qualify for state funding, projects must be part of plans that meet the standards just described for planning grants.<sup>109</sup> The underlying plan also must have at least considered a broad set of water management strategies, including water supply reliability, groundwater management, water quality protection and improvement, water recycling, water conservation, storm water capture and management, flood control, recreation and public access, ecosystem restoration, wetlands enhancement and creation, *and* environmental and habitat protection and improvement.<sup>110</sup> In choosing which projects to fund, the state has established a variety of substantive priorities, including “integrated projects with multiple benefits,” projects to improve water supply reliability, and water quality projects.<sup>111</sup>

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<sup>103</sup> See CAL. DEP’T OF WATER RES. & STATE WATER RES. CONTROL BD., *supra* note 101, at 4–5 (noting that out of \$160 million in first-cycle funding, only \$12 million was available for planning grants).

<sup>104</sup> *Id.* at 14 (emphasis added).

<sup>105</sup> *Id.* Sponsoring agencies also have broad discretion in what strategies to adopt as part of the plan. See *id.* at 15 tbl.A-1. In applying for a planning grant, the agencies also must discuss the “added benefits of integration of multiple water management strategies” and identify the advantages of a regional versus individual local approach. *Id.*; see also Lubell & Lippert, *supra* note 20, at 84 (noting that applicants can define their own regions).

<sup>106</sup> CAL. DEP’T OF WATER RES. & STATE WATER RES. CONTROL BD., *supra* note 101, at 5.

<sup>107</sup> *Id.* The vast majority of IRWM funds have gone to implementation grants. See *id.* at 4 (noting that approximately \$148 million of the \$160 million will be provided for first-cycle funding to implementation grants).

<sup>108</sup> CAL. DEP’T OF WATER RES. & STATE WATER RES. CONTROL BD., *supra* note 101, at 5.

<sup>109</sup> For a project to be eligible, “at least three agencies, two of which have statutory authority over water management,” must have participated in the development of the IRWM plan. *Id.* at 16.

<sup>110</sup> *Id.* at 16–17.

<sup>111</sup> *Id.* at 5.

One of the most successful examples of IRWM is the Santa Ana Watershed Project Authority's development of a "One Water One Watershed" plan.<sup>112</sup> The Santa Ana watershed, which covers 2650 square miles of Southern California and is home to over five million residents and continues to grow, is an excellent opportunity for testing the promise of more integrated water management.<sup>113</sup> The watershed historically illustrated the problems of fragmentation. More than 100 local, regional, state, and federal agencies in three different counties, including five large water districts and a number of smaller districts, shared jurisdiction over various aspects of the watershed.<sup>114</sup> This fragmentation made it extremely difficult for the agencies to jointly pursue complex integrated projects.<sup>115</sup>

In 1974, however, the local agencies formed the Santa Ana Watershed Project Authority (SAWPA) to help overcome the fragmented authority that confronted them.<sup>116</sup> SAWPA has broad authority to address not only traditional water functions, but also habitat restoration, invasive species management, and flood control, in recognition that these functions are integral to water supply and quality management.<sup>117</sup> In response to California's efforts to promote IRWM, SAWPA created a planning group to develop an integrated water resource plan for its watershed.<sup>118</sup> Consistent with the IRWM planning rules, SAWPA convened a diverse stakeholder group to identify regional values, goals, and objectives in an "integrated and multi-beneficial manner."<sup>119</sup> Building on these goals and objectives, the planning group then developed its One Water One Watershed Plan. According to SAWPA, the IRWM plan is a "living document" that will permit ongoing integration and coordination among the multiple agencies working in the watershed.<sup>120</sup>

SAWPA's One Water One Watershed Plan is one of the most successful and frequently highlighted results of California's efforts to promote IRWM.<sup>121</sup> Questions remain how well IRWM has succeeded in truly changing the way

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<sup>112</sup> See Thompson, *supra* note 24, at 319–21 (discussing the Santa Ana Watershed and efforts to manage it on a more integrated basis); see also SANTA ANA WATERSHED PROJECT AUTH., ONE WATER ONE WATERSHED: 2010 INTEGRATED REGIONAL WATER MANAGEMENT PLAN (2010), <http://www.sawpa.org/owow-generalinfo.html> (last visited Feb. 18, 2012) (click on "Chapter 1 One Water One Watershed" to access PDF and relevant information).

<sup>113</sup> Thompson, *supra* note 24, at 320. The watershed is the largest urban watershed in Southern California. HANAK ET AL., *supra* note 20, at 308.

<sup>114</sup> Thompson, *supra* note 24, at 320; see also SANTA ANA WATERSHED PROJECT AUTH., *supra* note 112, at 1–4 (click on "Chapter 1 One Water One Watershed" to access PDF and relevant information).

<sup>115</sup> Thompson, *supra* note 24, at 320.

<sup>116</sup> Local agencies formed SAWPA in 1974 to manage water supply and quality issues in the Santa Ana watershed. HANAK ET AL., *supra* note 20, at 308.

<sup>117</sup> *Id.*

<sup>118</sup> See SANTA ANA WATERSHED PROJECT AUTH., *supra* note 112, at 4 (click on "Chapter 1 One Water One Watershed" to access PDF and relevant information).

<sup>119</sup> *Id.* at 12–14.

<sup>120</sup> *Id.* at 16.

<sup>121</sup> See, e.g., HANAK ET AL., *supra* note 20, at 308 (spotlighting SAWPA as "one of California's best models for integrated water management").

water decisions are planned and made in California.<sup>122</sup> Multiple local agencies have adopted IRWM plans in response to California's efforts.<sup>123</sup> However, in the view of many students of the California effort, most agencies that have pursued IRWM in the state have done so principally to obtain funding for infrastructure projects that they wish to pursue and that can receive state funds only as part of a successful planning effort under IRWM, not for the value of the integrated planning in and of itself.<sup>124</sup> Indeed, some have joked that IRWM stands not for "Integrated Regional Water Management," but instead for "I really want mine."<sup>125</sup>

IRWM efforts do not appear to have led in most cases to systematic integration of water-related decision making at the watershed or comparable scale.<sup>126</sup> One recent study of IRWM in the San Francisco Bay Area found that those who had participated in IRWM believed that it had increased "collaborative implementation" and integration, but only slightly.<sup>127</sup> Less than a quarter of the project partners reported that IRWM had promoted functional and geographic integration.<sup>128</sup> Participants, moreover, did not appear to believe that the higher degree of collaboration had improved the fairness of decision making or the ability to solve problems.<sup>129</sup>

Some scholars, moreover, have begun to question the value of IWRM more generally.<sup>130</sup> Part of the problem is that, despite years of scholarly and governmental analysis, the concept remains exceptionally vague.<sup>131</sup> Disagreements loom, in particular, over the appropriate objectives, geographic boundaries, and processes.<sup>132</sup> However, the need for greater integration both substantively and geographically continues, even if IWRM remains formally elusive.

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<sup>122</sup> SAWPA's One Water One Watershed Plan was only recently adopted, so its ultimate effectiveness is still uncertain. *Id.*

<sup>123</sup> *Id.* at 307.

<sup>124</sup> *Id.*

<sup>125</sup> *Id.* at 307 n.33. As is often the case with public funding, there is also evidence that the allocation of available planning and implementation grants sometimes has been highly political. Lubell & Lippert, *supra* note 20, at 84.

<sup>126</sup> HANAK ET AL., *supra* note 20, at 365.

<sup>127</sup> Lubell & Lippert, *supra* note 20, at 88–90. The California guidelines for implementation grants might be part of the problem. According to one survey of San Francisco Bay Area participants in IRWM, the "short time frame for developing the implementation grants prevented initiation of new projects with more integration than existing projects." *Id.* at 84.

<sup>128</sup> *Id.* at 94. Of the projects that resulted from the IRWM planning, "69 percent of the projects were classified as only providing a single benefit, while 29 percent were classified as providing two benefits. Twenty-seven of the 33 flood control projects also claimed habitat benefits; these constituted the vast majority of the projects that claimed two benefits." *Id.* at 95.

<sup>129</sup> *Id.* at 89–90.

<sup>130</sup> See Medema et al., *supra* note 12, at 30–31; Biswas, *supra* note 2, at 250–52.

<sup>131</sup> As one set of scholars has noted, ambiguity by itself can be an obstacle: "[W]hy should there be an institutional change in water resource management if the form and benefits of integration cannot be unambiguously articulated and compared?" Medema et al., *supra* note 12, at 33.

<sup>132</sup> See *id.*

## III. THE CZMA AS A POTENTIAL MODEL

The value of increased integration raises the question of whether there is a role for the federal government and, if so, what that role should be. Given the states' primary role in managing water allocation decisions, states clearly have the authority, expertise, and responsibility for promoting greater integration. California's effort to encourage IRWM shows one state's progress in this regard, and scholars have suggested numerous other steps that states could take to better pursue integrated management.<sup>133</sup> However, as explained below, the federal government also has an interest in increased integration. To the degree that the federal government wishes to promote more integrated management, the CZMA provides a potential model for federal involvement. After reviewing the history and substance of the CZMA, this part examines in more detail both whether federal involvement is justified and the appropriateness of the CZMA as a model.

*A. The History and Provisions of the CZMA*

Congress enacted the CZMA in 1972 to promote more effective state-level protection of the nation's coast.<sup>134</sup> Congress and other supporters of national legislation believed that the national government had a strong interest in effective management of the coastal zone.<sup>135</sup> According to the Stratton Commission, which President Lyndon Johnson had commissioned in 1967 to examine coastal and ocean issues in the United States, management of the coastal zone inevitably touched on such "vital" federal interests as navigation, military security, and environmental protection and restoration.<sup>136</sup> Because many national agencies operate in coastal waters, moreover, the Stratton Commission concluded the national government has a responsibility to ensure that states can effectively address problems to which the national government might contribute.<sup>137</sup>

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<sup>133</sup> See HANAK ET AL., *supra* note 20, at 411, 417–25 (suggesting changes in water policy to redress environmental decline, adjust to increasing scarcity of water supplies, and rehabilitate flood protection).

<sup>134</sup> According to Congress, the purpose of the CZMA is to "encourage and assist States in developing and implementing management programs to preserve, protect, develop, and where possible, to restore or enhance the resources of our nation's coast by the exercise of planning and control with respect to activities occurring in their coastal zones." H.R. REP. NO. 96-1012, at 14 (1980) (emphasis added).

<sup>135</sup> See Coastal Zone Management Act of 1972, 16 U.S.C. § 1451(a) (2006) (stating the congressional finding that there is a "national interest in the effective management" of the coastal zone).

<sup>136</sup> COMM'N ON MARINE SCI., ENG'G & RES., *supra* note 3, at 60–61; JOHN JUSTUS ET AL., CONG. RES. SERV., IB10132, OCEAN COMMISSIONS: OCEAN POLICY REVIEW AND OUTLOOK, at CRS-1 (2005), available at <http://www.fas.org/sgp/crs/misc/IB10132.pdf>. Congress also identified the federal interest in using the coastal zone to provide greater energy sufficiency. 16 U.S.C. § 1451(j) (2006).

<sup>137</sup> COMM'N ON MARINE SCI., ENG'G & RES., *supra* note 3, at 60.

Congress also believed that local management of the nation's coast, which was the norm at the time, could not work for several reasons.<sup>138</sup> First, coastal management at the time suffered from fragmentation similar to that confronting water management today. Multiple governments and agencies often shared overlapping authority over coastal regions and their varied uses.<sup>139</sup> Such fragmentation impeded integrated and effective management, particularly by local governments that suffered from limited authority over the issues and conflicts confronting them, and who had to coordinate with multiple state and federal agencies in carrying out their responsibilities.<sup>140</sup> Second, local governments often had parochial interests that conflicted with the broader public's interest in coastal protection.<sup>141</sup> According to Congress, the solution was comprehensive state-level management of the coastal zone: "The key to more effective protection and use of the land and water resources of the coastal zone is to encourage the states to exercise their full authority . . . including unified policies, criteria, standards, methods, and processes for dealing with land and water use decisions of more than local significance."<sup>142</sup>

While recognizing the need for state-level management, there was question whether the United States should—or even could—require states to take over the management of their coastal zones.<sup>143</sup> As the Stratton Commission noted after calling for state management, the "Federal Government cannot and, of course, should not compel a State to develop a special organization to deal with its coastal management problems."<sup>144</sup> The appropriate federal role was to encourage and assist state management, if a state chose to create a state-level agency to manage its coastal zone, and to ensure that federal authority did not interfere with such management.<sup>145</sup>

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<sup>138</sup> Congress found that "present state and local institutional arrangements for planning and regulating land and water uses in [the coastal zone] are inadequate." 16 U.S.C. § 1451(h) (2006).

<sup>139</sup> See Kalen, *supra* note 19, at 198 (quoting STAFF OF S. COMM. ON COMMERCE, 94TH CONG., LEGISLATIVE HISTORY OF THE COASTAL ZONE MANAGEMENT ACT OF 1972, AS AMENDED IN 1974 AND 1976 WITH A SECTION-BY-SECTION INDEX 2 (Comm. Print 1976)).

<sup>140</sup> COMM'N ON MARINE SCI., ENG'G & RES., *supra* note 3, at 56.

<sup>141</sup> See Kalen, *supra* note 19, at 199 n.42.

<sup>142</sup> 16 U.S.C. § 1451(i) (2006). In 1969, the Stratton Commission had reached a similar conclusion:

After reviewing the various alternatives . . . the Commission finds that the States must be the focus for responsibility and action in the coastal zone. The State is the central link joining the many participants, but in most cases, the States now lack adequate machinery for that task. An agency of the State is needed with sufficient planning and regulatory authority to manage coastal areas effectively and to resolve problems of competing uses. Such agencies should be strong enough to deal with the host of overlapping and often competing jurisdictions of the various Federal agencies. Finally, strong State organization is essential to surmount special local interests, to assist local agencies in solving common problems, and to effect strong interstate cooperation.

COMM'N ON MARINE SCI., ENG'G & RES., *supra* note 3, at 56–57.

<sup>143</sup> COMM'N ON MARINE SCI., ENG'G & RES., *supra* note 3, at 57

<sup>144</sup> *Id.*

<sup>145</sup> According to the Stratton Commission, the federal government could encourage states to create new organizations to manage coastal resources on a statewide basis, "provide guidelines

The main functions of the CZMA therefore are to provide incentives for states to engage in more comprehensive and integrated management of their coasts and to promise federal coordination with such efforts.<sup>146</sup> Unlike other federal environmental legislation passed during the same time period, such as the Clean Air Act and Clean Water Act, the CZMA does not require states to do anything; states are free to ignore coastal issues entirely without any federal penalty.<sup>147</sup> Instead, the emphasis is on federal encouragement of voluntary state action. According to Congress, the purposes of the CZMA are to “encourage and assist the states to exercise effectively their responsibilities in the coastal zone”<sup>148</sup> and to “encourage coordination and cooperation with and among the appropriate Federal, State, and local agencies.”<sup>149</sup>

One major incentive is funding. The CZMA provides matching financial assistance for the administration of state coastal management programs that the Secretary of Commerce has approved as meeting the requirements of the Act.<sup>150</sup> These requirements are relatively minimal. The chosen state management authority must have the authority to “administer land use and water use regulations to control development[,] to ensure compliance with the management program, and to resolve conflicts among competing uses.”<sup>151</sup> The plan must also specify relevant boundaries, define permissible land uses and water uses, inventory areas of particular concern, and identify means by which the state will exert control.<sup>152</sup> Finally, the state must have given “Federal agencies, State agencies, local governments, regional organizations, port authorities, and other interested parties and individuals, public and private,” a full opportunity to participate in the development of the management plan,<sup>153</sup> and the state must provide an “effective mechanism for continuing consultation and coordination.”<sup>154</sup> In using funding as an incentive to encourage states to achieve a federal goal, the CZMA was not breaking

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for the functions of such organizations, facilitate Federal cooperation with State authorities, and provide appropriate assistance.” *Id.*

<sup>146</sup> See 16 U.S.C. § 1452(2) (2006).

<sup>147</sup> Compare *id.* § 1452(2), (4)–(5) (providing for federal encouragement of voluntary state action), with Federal Water Pollution Control Act, 33 U.S.C. § 1342 (2006) (allowing states to issue National Pollutant Discharge Elimination System permits if they meet certain requirements, but ensuring federal regulatory authority if the state either fails to meet the requirements or chooses not to regulate), and Clean Air Act, 42 U.S.C. § 7410(c)(1) (2006) (requiring the EPA to promulgate a federal implementation plan for a state that either refuses to submit a state implementation plan or fails to comply with federal requirements).

<sup>148</sup> 16 U.S.C. § 1452(2) (2006).

<sup>149</sup> *Id.* § 1452(5).

<sup>150</sup> *Id.* § 1455(a)–(b). Prior to 1990, states had to match federal funding on a 1:1 basis. *Id.* § 1455(a)(1). In 1990, Congress established new matching standards that rewarded quickly acting states with a 4:1 federal-state matching ratio and then fell every subsequent year, ultimately reaching 1:1 again. *Id.* § 1455(a)(2).

<sup>151</sup> *Id.* § 1455(d)(10)(A).

<sup>152</sup> *Id.* § 1455(d)(2)(A)–(D).

<sup>153</sup> *Id.* § 1455(d)(1).

<sup>154</sup> *Id.* § 1455(d)(3)(B).

new ground but using a traditional congressional method for shaping state and local action.<sup>155</sup>

In a novel step, the CZMA also held out as an incentive a promise of federal consistency with approved state plans.<sup>156</sup> Under the CZMA, federal agencies that carry out activities in the coastal zone must proceed “in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved state management programs.”<sup>157</sup> In undertaking any development project in the coastal zone, federal agencies similarly must act “to the maximum extent practicable, consistent with . . . approved state management programs.”<sup>158</sup> Finally, applicants for federal licenses or permits that affect land or water use in a coastal zone must certify to the governing agency that the applicant’s proposed activity both complies with and will be conducted “in a manner consistent with” any relevant state management program.<sup>159</sup> To protect federal interests, the CZMA requires that the Secretary of Commerce consult with federal agencies “principally affected” by state coastal programs before approving them,<sup>160</sup> and also provides for a variety of exceptions.<sup>161</sup> Under the CZMA, these requirements for federal consistency play two roles. First, they provide an incentive to encourage state action. Second, however, they ensure federal cooperation with state efforts, a necessary precondition of integrated coastal management.

The CZMA also seeks to assist the states in developing and implementing comprehensive coastal management plans. One area in which the federal government enjoys economies of scale compared to the states, for example, is in the development and use of scientific information. Section 310 of the CZMA thus provides that the Secretary of Commerce “shall conduct a program of technical assistance and management-oriented research necessary to support the development and implementation of State coastal management program[s].”<sup>162</sup>

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<sup>155</sup> For example, the Clean Water Act used federal grants to encourage local wastewater agencies to achieve higher water quality standards. Federal Water Pollution Control Act, 33 U.S.C. §§ 1381–1384 (2006).

<sup>156</sup> 16 U.S.C. § 1456(c) (2006); *see also* Thomas J. Schoenbaum & Frank Parker, Jr., *Federalism in the Coastal Zone: Three Models of State Jurisdiction and Control*, 57 N.C. L. REV. 231, 238–39 (1979) (labeling federal consistency an “unprecedented inducement”).

<sup>157</sup> 16 U.S.C. § 1456(c)(1)(A) (2006).

<sup>158</sup> *Id.* § 1456(c)(2).

<sup>159</sup> *Id.* § 1456(c)(3)(A).

<sup>160</sup> *Id.* § 1456(b).

<sup>161</sup> For example, if a court finds that a particular federal agency action is inconsistent with a state management plan under the CZMA, the “President may, upon written request from the Secretary, exempt from compliance [the action] . . . if the President determines that the activity is in the paramount interest of the United States.” *Id.* § 1456(c)(1)(B).

<sup>162</sup> *Id.* § 1456(c)(a).

*B. Should the National Government Take a CZMA-Like Approach to Integrated Water Management?*

The national government has at least three reasons to enact a law that would facilitate and promote more integrated water management. All have parallels to arguments made forty years ago for the CZMA. First, because of the national government's significant role in the management of freshwater in the United States, efforts to integrate water management are likely to be less effective and complete without national legislation instructing national agencies to cooperate in integration efforts and promising national consistency with state or local plans arising from such cooperative efforts. The national government plays a major role in water management. For example, surface water quality is the ultimate province of the national EPA under the Clean Water Act,<sup>163</sup> although states also play a major role under the Act's cooperative federalism.<sup>164</sup> EPA also enjoys authority over some forms and sources of groundwater contamination through the Resources Conservation and Recovery Act,<sup>165</sup> Safe Drinking Water Act,<sup>166</sup> and the Superfund program.<sup>167</sup> Both the Fish and Wildlife Service and the National Marine Fisheries Service regulate diversions or other hydrologic actions that could injure fish protected under the national Endangered Species Act.<sup>168</sup> The Federal Energy Regulatory Authority licenses and oversees hydroelectric facilities.<sup>169</sup> The Army Corps of Engineers promotes navigation, constructs flood control projects, provides freshwater to both rural and urban regions, manages scores of reservoirs, and has primary responsibility for protecting wetlands.<sup>170</sup> The Bureau of Reclamation provides water to over 20% of the irrigated acreage in the seventeen western states and over 30 million western residents.<sup>171</sup> National lands, generally under the management of agencies in either the United States Department of the Interior or Department of Agriculture, frequently form critical upstream reaches of

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<sup>163</sup> See Federal Water Pollution Control Act, 33 U.S.C. §§ 1251(d), 1342(a)(1) (2006) (providing that the Administrator of the EPA may issue permits for the discharge of pollutants into waterways).

<sup>164</sup> For more on the Clean Water Act's use of cooperative federalism, see SALZMAN & THOMPSON, *supra* note 41, at 150–53, 161–66.

<sup>165</sup> Resource Conservation and Recovery Act of 1976, 42 U.S.C. §§ 6924, 6934 (2006); 40 C.F.R. §§ 264.92, 264.97 (2011).

<sup>166</sup> Safe Drinking Water Act, 42 U.S.C. § 300h(b)(1) (2006).

<sup>167</sup> Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. §§ 9601(16), 9607(a)(4)(C) (2006).

<sup>168</sup> See Endangered Species Act of 1973, 16 U.S.C. § 1536(a)(2) (2006).

<sup>169</sup> See Michael C. Blumm, *Federalism, Hydroelectric Licensing and the Future of Minimum Streamflows After California v. Federal Energy Regulatory Commission*, 21 ENVTL. L. 113, 115–17, 121 (1991) (discussing the potential role of FERC in ensuring minimum streamflows); SAX ET AL., *supra* note 40, at 672–73 (discussing the importance of FERC in the issue of dam removal).

<sup>170</sup> See A. Dan Tarlock, *A First Look at a Modern Legal Regime for a "Post-Modern" United States Army Corps of Engineers*, 52 U. KAN. L. REV. 1285, 1285–86 (2004) (describing the responsibilities of the Corps).

<sup>171</sup> SAX ET AL., *supra* note 40, at 747.

major western watersheds.<sup>172</sup> Any attempt to integrate freshwater management across substantive issues and at a watershed or similar scale must therefore incorporate these national agencies, responsibilities, and programs. Although most national agencies can already participate in integrative efforts, legislation can help remove existing statutory obstacles, encourage greater cooperation, and promise consistency in implementation.

Second, the national government has strong interests in how states and local governments manage water resources. Public federal lands not only are a source of water but also depend on both instream flows and adequate quantities of consumptive water.<sup>173</sup> For this reason, the national government and Indian reservations enjoy a variety of federal reserved water rights.<sup>174</sup> A variety of federal energy facilities, ranging from nationally managed hydropower plants to energy projects on national lands, also require significant and reliable water resources.<sup>175</sup> The achievement of various federal energy goals, such as increased uses of biofuels, similarly depends on adequate and sustainable supplies of water.<sup>176</sup> The national government thus is not only an essential player in more integrated water management, but also can benefit from more effective water management.

Finally, poor water management can impact not only the state in which the poor management occurs but also broader interstate regions and interstate markets. The transboundary impacts are clearest in the case of interstate waterways. Interstate rivers and aquifers provide over 95% of the available freshwater in the United States.<sup>177</sup> As in much of the world, rivers often form the boundaries between states, inevitably linking the water policies of the two states.<sup>178</sup> Poor management by one state obviously can

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<sup>172</sup> See George Cameron Coggins, *Watershed as a Public Natural Resource on the Federal Lands*, 11 VA. ENVTL. L.J. 1, 1 (1991) (“Since the 19th century, Congress has decreed that protection of the watershed resource is an important if not overriding priority in federal land management.”).

<sup>173</sup> See generally Frank J. Trelease, *Uneasy Federalism—State Water Laws and National Water Uses*, 55 WASH. L. REV. 751 (1979) (noting that the national government “often has need to use water on its own land”). The federal government either owns or, in the case of Indian reservations, has trust responsibilities over some 45% of the water in the western United States. Thompson, *supra* note 2, at 175; see also *id.* at 212 (noting the water needs of national lands).

<sup>174</sup> For an overview of federal reserved water rights, see SAX ET AL., *supra* note 40, at 903–96.

<sup>175</sup> See U.S. GEN. ACCOUNTING OFFICE, GAO/RCED-97-48, FEDERAL POWER: ISSUES RELATED TO THE DIVESTITURE OF FEDERAL HYDROPOWER RESOURCES 20 (1997), available at <http://www.gao.gov/assets/160/155814.pdf> (“The federal government owns and operates numerous multipurpose water projects, many of which generate electric power.”); Peter H. Gleick, *Water and Energy*, 19 ANN. REV. ENERGY & ENV’T 267, 278–95 (1994) (discussing the water needs of various means of energy production).

<sup>176</sup> See, e.g., R. Dominguez-Faus et al., *The Water Footprint of Biofuels: A Drink or Drive Issue?*, 43 ENVTL. SCI. & TECH. 3005, 3005 (2009) (discussing the relationship of biofuel mandates and water resources).

<sup>177</sup> Noah D. Hall, *Interstate Water Compacts and Climate Change Adaptation*, 5 ENVTL. & ENERGY L. & POL’Y J. 237, 239 (2010).

<sup>178</sup> *Id.* at 255; see also Thompson, *supra* note 2, at 175 (noting importance of interstate rivers to the western United States).

directly affect the water conditions of other states sharing the waterway.<sup>179</sup> As discussed later, integration efforts should themselves be interstate where appropriate.<sup>180</sup> Transboundary impacts, however, do not stop with interstate rivers and watersheds. Where regions exhaust the limits of their local water supplies, they typically look farther away for additional freshwater.<sup>181</sup> Although regions tend to look within their own states for such supplies—partly because of historic impediments to interstate transfers of water—some regions have looked to supplies in other states.<sup>182</sup> Because water is critical to virtually all business enterprises, water management also impacts interstate commerce, although this last effect is generally likely to be far less important than the other impacts.<sup>183</sup>

Despite the arguments for some form of national legislation, the case for national *mandates* is weak. States historically have enjoyed primary jurisdiction over water management—and for good reason.<sup>184</sup> Water conditions and demands vary tremendously from state to state.<sup>185</sup> As discussed later, the appropriate scale and scope of integration is likely to vary among states.<sup>186</sup> More importantly, the relative importance of integration, and the difficulty of achieving effective integration, also can vary.<sup>187</sup> A national mandate would force all states to engage in similar integration, with the degree of enforced uniformity depending on the exact terms of the legislation.

Moreover, none of the arguments for national legislation on integrated water management would seem strong enough to justify national mandates,

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<sup>179</sup> See Thompson, *supra* note 2, at 205–06 (noting that interstate rivers dictate at least some degree of national intervention).

<sup>180</sup> See *infra* notes 233–39 and accompanying text.

<sup>181</sup> See SAX ET AL., *supra* note 40, at 682 (describing cities' importation of water from distant watersheds after the cities reached the limits of their local supplies).

<sup>182</sup> North Texas, for example, has considered importing water from Oklahoma. Matthew Tresaugue, *Texas Water Supply for the Future Is Uncertain*, HOUSTON CHRON., Nov. 13, 2011, <http://www.chron.com/news/houston-texas/article/Texas-water-supply-for-the-future-is-uncertain-2266277.php> (last visited Feb. 18, 2012) (noting plans of North Texas to import water from Oklahoma).

<sup>183</sup> The role of water in interstate commerce forms one of the bases for the Clean Water Act. JAY E. AUSTIN & D. BRUCE MYERS, JR., ANCHORING THE CLEAN WATER ACT: CONGRESS'S CONSTITUTIONAL SOURCES OF POWER TO PROTECT THE NATION'S WATERS 1–2 (2007), available at <http://www.acslaw.org/files/Clean%20Water%20Act%20Issue%20Brief.pdf>.

<sup>184</sup> As noted earlier, virtually all major federal water legislation provides for retention of state control over water-allocation decisions. See *supra* note 11 and accompanying text; Thompson, *supra* note 2, at 196 (“Although there have been significant national incursions into western water policy, particularly over the past quarter-century in the environmental arena, states still retain a surprising degree of supremacy over western water policy.”).

<sup>185</sup> Thompson, *supra* note 2, at 198–99 (noting that there are differences among states in comparative water supply and demand, the mix of groundwater and surface water use, key characteristics of water sources, threats, and policy preferences).

<sup>186</sup> See *infra* Part IV.C–D.

<sup>187</sup> As in other federalism contexts, there also is benefit in the opportunity for experimentation. Thompson, *supra* note 2, at 199. As discussed earlier, the ultimate verdict is still out on various types of integrative water management, such as IWRM. See *supra* Part II.B. By promoting rather than mandating greater integration, the national government can permit natural experiments in the advantages and disadvantages of different approaches.

no matter the cost or local conditions.<sup>188</sup> The first argument—the importance of national agencies in any integrated scheme—calls for legislation promoting national involvement in integration efforts and promising national consistency, but does not justify state mandates. And while poor state management can impact both the national government and other states, the likely impact is not so severe as to clearly outweigh the historic preference and arguments for state control over water management.<sup>189</sup>

Even if a national mandate were justified, Congress would be unlikely, particularly in today's political climate, to impose such a mandate. Congress has passed neither major new environmental legislation nor significant water reform measures for almost two decades. Nationally, the last major environmental legislation was arguably the Clean Air Act Amendments of 1990.<sup>190</sup> The last major water legislation was the Central Valley Project Improvement Act, passed in 1972.<sup>191</sup> Moreover, a congressional mandate imposing some form of integrated water resource management on states, which would directly interfere with state water policy, would be a far more dramatic shift in national policy than other national water legislation of the 1980s and 1990s, which focused on reforms to the federal reclamation program. Tellingly, virtually all past federal statutes dealing with water issues, from the 1902 Reclamation Act<sup>192</sup> to the 1972 Clean Water Act, have provided that states would retain control of water-allocation decisions.<sup>193</sup> Thus, section 8 of the Reclamation Act specifies that nothing in the Act should be construed to “affect or to in any way interfere with the laws of any State or Territory relating to the control, appropriation, use, or distribution of water used in irrigation . . . and the Secretary of the Interior, in carrying out the provisions of this Act, shall proceed in conformity with such laws.”<sup>194</sup> And the Wallop Amendment to the Clean Water Act notes: “It is the policy of Congress that the authority of each State to allocate quantities of water within its jurisdiction shall not be superseded, abrogated or otherwise impaired by” the Act.<sup>195</sup> In light of this history and Congress's recent disinterest in promulgating any major new environmental or water reforms, mandated integration seems highly unlikely.

Just as arguments for reform of coastal management led to the CZMA, the strongest legislation that proponents of greater integration in water management could hope for would seem to be similar legislation that promotes and enables, but does not mandate, greater integration. The

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<sup>188</sup> See Thompson, *supra* note 2, at 200–01 (noting that the argument for greater national control over water resources generally is weak).

<sup>189</sup> See *id.* (setting out arguments for state control of water management).

<sup>190</sup> Clean Air Act Amendments of 1990, Pub. L. No. 101-549, 104 Stat. 2399.

<sup>191</sup> Central Valley Project Improvement Act, Pub. L. No. 102-575, 106 Stat. 4706 (1992).

<sup>192</sup> Act of June 17, 1902, ch. 1093, 32 Stat. 388.

<sup>193</sup> See Thompson, *supra* note 2, at 196 (noting that Congress has been hesitant to assert significant national authority over water-allocation decisions).

<sup>194</sup> Reclamation Act, 43 U.S.C. § 383 (2006).

<sup>195</sup> Federal Water Pollution Control Act, 33 U.S.C. § 1251(g) (2006); Jan G. Laitos, *Water Rights, Clean Water Act Section 404 Permitting, and the Takings Clause*, 60 U. COLO. L. REV. 901, 914 (1989).

remainder of this Article therefore looks at what such legislation might provide. Two questions are key. First, what type of integration should such legislation encourage? And second, what types of incentives can and should the national government provide?

#### IV. STATUTORY PROVISIONS

What would new federal legislation designed to encourage more integrated water management actually provide? This and the following Parts of this Article consider the potential provisions of a Sustainable Water Integrated Management Act (SWIM). This Part examines five major questions. First, which federal agency should administer SWIM? Second, should SWIM, like the CZMA, operate through the states, or should it operate through regional structures that better reflect hydrologic reality? Third, at what geographic scale should SWIM require integration? Fourth, what substantive integration should SWIM mandate? Finally, if SWIM operates through the states, how should SWIM deal with interstate waterways? Part V examines what incentives SWIM could and should provide to encourage integration.

As discussed below, many of these questions are not easily answered. The concepts of IWRM and watershed planning have long been amorphous and prove difficult to reduce to readily defined rules and structures. Nonetheless, the basic contours of SWIM are relatively straightforward and flow directly from the provisions of the CZMA. SWIM seeks to encourage existing units of governance, at the federal, state, and local levels, to cooperate in managing water resources in a more integrated fashion. And SWIM seeks to do so through voluntary incentives, including funding for planning and implementation, as well as a promise of federal consistency, rather than through federal mandate.

##### *A. What Federal Agency Should Administer SWIM?*

Even the simplest question—which national agency should administer SWIM—presents complexities. Like all other water management, national management of freshwater is fractured among a number of different agencies as discussed earlier. The Department of the Interior manages the federal reclamation program, administers the Endangered Species Act for most freshwater fish species, and holds trust responsibility for Indian water rights.<sup>196</sup> The EPA governs surface and groundwater quality.<sup>197</sup> The Army Corps of Engineers, within the Department of Defense, constructs and administers a wide variety of water-related projects, ranging from dams to navigation projects to flood-control efforts, and also protects the nation's wetlands.<sup>198</sup> The independent Federal Energy Regulatory Commission

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<sup>196</sup> See *supra* notes 168–74 and accompanying text.

<sup>197</sup> See *supra* text accompanying notes 163–67.

<sup>198</sup> Tarlock, *supra* note 170, at 1285–86.

oversees hydroelectric projects and thus many major dams.<sup>199</sup> In total, more than thirty national agencies, commissions, and boards share responsibility for water-related issues.<sup>200</sup> Many of these, as well as other agencies, hold federal lands with significant water needs or have other national interests in effective state and local water policy.<sup>201</sup> In order to be effective, whatever agency administers SWIM will need to speak on behalf of all these national entities and ensure that they carry out their responsibilities in compliance with approved integration plans.

Of the more than thirty entities that could administer SWIM, the Department of the Interior (DOI) would seem the most appropriate manager. DOI probably has the broadest national scope. It not only has major water responsibilities noted above, but also has long engaged in a variety of efforts to improve national and regional water policy.<sup>202</sup> DOI is currently conducting a national water census, leading a national water-conservation effort known as WaterSMART, and developing a climate change policy that includes water.<sup>203</sup> DOI also has arguably the broadest scientific expertise, based largely in the United States Geological Survey (USGS), needed to facilitate and evaluate more integrated water management.

SWIM can protect the interests of other federal agencies by requiring the Secretary of the Interior to consult with and consider their views both in deciding whether to approve a state integration plan and in carrying out other activities under SWIM. The CZMA again provides a model. Under the CZMA, the Secretary of Commerce must “consult with, cooperate with, and, to the maximum extent practicable, coordinate his activities with other interested Federal agencies.”<sup>204</sup> Moreover, the Secretary cannot approve a coastal management plan without having “adequately considered” the “views of Federal agencies principally affected” by the plan.<sup>205</sup> Such consultative approaches appear to work well in ensuring that agencies take broader views into account in their implementation of federal legislation.<sup>206</sup>

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<sup>199</sup> See *supra* note 169 and accompanying text.

<sup>200</sup> *Recommendations to Congress for Fundamental Changes in National Water Policy: Hearing on Opportunities and Challenges to Address Domestic and Global Water Supply Issues Before the Subcomm. on Water and Power of the S. Comm. on Energy and Natural Res.*, 112th Cong. 9 (2011) (statement of Dr. Peter H. Gleick, President, Pacific Institute), available at [http://www.pacinst.org/publications/testimony/new\\_national\\_water\\_policy.pdf](http://www.pacinst.org/publications/testimony/new_national_water_policy.pdf).

<sup>201</sup> See *supra* notes 172–73 and accompanying text.

<sup>202</sup> For example, DOI created the Western Water Policy Review Advisory Commission during the Clinton Administration. See Shannon Clark, *American Geological Institute: Government Affairs Program: Update on Western Water Policy (7-16-98)*, AM. GEOSCIENCES INST., July 16, 1998, <http://www.agiweb.org/legis105/wwprac.html> (last visited Feb. 18, 2012).

<sup>203</sup> For an overview of the Department of the Interior’s current water programs, see U.S. Dep’t of the Interior, *Water Challenges*, <http://www.doi.gov/whatwedo/water/index.cfm> (last visited Feb. 18, 2012).

<sup>204</sup> Coastal Zone Management Act of 1972, 16 U.S.C. § 1456(a) (2006).

<sup>205</sup> *Id.* § 1456(b).

<sup>206</sup> See J.R. DeShazo & Jody Freeman, *Public Agencies as Lobbyists*, 105 COLUM. L. REV. 2217 (2005) (analyzing the role of other federal agencies in proceedings before the Federal Energy Regulatory Commission).

*B. Management by States or Water Basins*

The next question is the appropriate unit of government for managing the integration effort and serving as the distributor of national funding for local planning efforts. Who, in other words, should put together the plans that the national government will fund and approve? Integration ultimately will need to occur in thousands of local watersheds and other regions where on-the-ground water decisions are made. However, using watersheds or other local areas as the unit of governance under SWIM would be administratively complex because the national government might ultimately need to deal with thousands of local units. More importantly, local watersheds and other areas may be too small to achieve effective integration, which will require coordination not only among units at one level but also between different levels of administration.

The CZMA model suggests that the most logical management units would be states.<sup>207</sup> States could develop a statewide plan for greater water integration within and among their local regions and then apply for national funding and approval of a comprehensive plan. State management would have several advantages. As noted earlier, states historically have been the ultimate unit of power for management of most water decisions.<sup>208</sup> Indeed, many states by either constitutional provision or statute provide that they hold all freshwater resources within their boundaries on behalf of their respective publics.<sup>209</sup> Moreover, all states have existing agencies with authority over state and local water policy that could be used to design and administer the program. Many of these agencies already have programs in place to encourage local or regional water integration that either could form the basis of a nationally approved program or should be integrated into such a program.<sup>210</sup>

In the nineteenth century, John Wesley Powell famously proposed that the United States should organize and manage water resources in the western United States by drainage basin rather than by the types of artificial

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<sup>207</sup> States are the administrative unit under the CZMA. *See* 16 U.S.C. § 1454 (2006). The analogy to the CZMA, however, is not perfect. The very goal of the CZMA was to encourage statewide coastal plans. *See id.* § 1451(i) (noting the congressional finding that “[t]he key to more effective protection and use of . . . the coastal zone is to encourage the states to exercise their full authority over the lands and waters in the coastal zone”). By contrast, much of the integration under SWIM would take place at the local level.

<sup>208</sup> *See* Thompson, *supra* note 2, at 196 (“[S]tates still retain a surprising degree of supremacy over western water policy.”).

<sup>209</sup> *See, e.g.*, COLO. CONST. art. XVI, § 5 (“[W]ater of every natural stream . . . is hereby declared to be the property of the public, and the same is dedicated to the use of the people of the state . . .”).

<sup>210</sup> California’s IRWM program is the best example. *See supra* notes 93–106 and accompanying text. Over 20 other states, however, have also adopted various statewide programs that use or encourage watershed approaches. OFFICE OF POLICY, ECON. & INNOVATION, U.S. ENVTL. PROT. AGENCY, EPA-100-F-03-005, IMPROVING EPA’S PERFORMANCE WITH PROGRAM EVALUATION: A REVIEW OF STATEWIDE WATERSHED MANAGEMENT APPROACHES (2003), *available at* [http://www.epa.gov/evaluate/pdf/01\\_ow.pdf](http://www.epa.gov/evaluate/pdf/01_ow.pdf).

state borders that Congress ultimately drew.<sup>211</sup> SWIM similarly could promote more integrated water management not through individual states but through hydrologically defined areas such as the twenty-one water regions used by the USGS.<sup>212</sup> Such an approach would have several advantages. First, this approach would avoid many of the problems of interstate rivers, discussed below, posed by structuring the administration of SWIM around existing state borders that often ignore or create interstate waterways.<sup>213</sup> Second, the approach would focus planning efforts on more hydrologically logical geographic boundaries.<sup>214</sup>

Basin commissions, however, carry a number of disadvantages that in the end arguably outweigh their benefits. Because basin commissions do not exist today, their use in SWIM would require states to form them—a likely time-consuming, complex, and difficult process. States would remain the ultimate source of most authority over freshwater resources, requiring difficult coordination efforts over time. Moreover, basin commissions would add yet another unit of government that could duplicate and overlap existing state authority and thus further magnify rather than reduce coordination problems. For these reasons, state management, while imperfect, would appear to be the best approach.

### C. The Best Geographic Scale for Integration

Assuming that states administer SWIM, at what level of governance should SWIM require the states to integrate management? A common policy assumption is that water should be managed at the watershed level, suggesting that SWIM should mandate that integration also take place at the watershed level.<sup>215</sup> However, watersheds prove a difficult concept around which to build an integrative scheme for at least three reasons. First, the

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<sup>211</sup> See Donald Worster, *Watershed Democracy: Recovering the Lost Vision of John Wesley Powell*, 23 J. LAND RESOURCES & ENVTL. L. 57, 58 (2003). For a map of what western borders would have looked like for water-management purposes had Powell's approach been adopted, see J. W. POWELL, U.S. GEOLOGICAL SURVEY, ELEVENTH ANNUAL REPORT OF THE DIRECTOR OF THE UNITED STATES GEOLOGICAL SURVEY: PART II—IRRIGATION fig.PL. LXIX, available at [http://pubs.er.usgs.gov/djvu/AR/ar\\_11\\_2.djvu](http://pubs.er.usgs.gov/djvu/AR/ar_11_2.djvu).

<sup>212</sup> For an overview of the 21 regions used by the USGS, see U.S. Geological Survey, *Hydrologic Unit Maps*, <http://water.usgs.gov/GIS/huc.html> (last visited Feb. 18, 2012). Some of the regions are defined by the drainage basin of a single river, such as the Missouri River, while others combine the basins of a number of major rivers. See *id.* The USGS regions, compared to other potential hydrologic areas, would have several advantages for administering SWIM. First, the regions are well defined, and the USGS has developed massive information resources organized by regions. See, e.g., U.S. Geological Survey, *Start with Science: USGS Programs*, [http://www.usgs.gov/start\\_with\\_science/programs.asp](http://www.usgs.gov/start_with_science/programs.asp) (last visited Feb. 18, 2012). Second, the number of regions is reasonably manageable.

<sup>213</sup> See discussion *infra* Part IV.E.

<sup>214</sup> Other authors also have recognized the potential value of organizing water management through interstate basin commissions. See, e.g., Marc J. Roberts, *River Basin Authorities: A National Solution to Water Pollution*, 83 HARV. L. REV. 1527, 1544–46 (1970) (proposing that Congress create a series of basin authorities to manage water quality on an integrated basis).

<sup>215</sup> See, e.g., Blomquist & Schlager, *supra* note 73, at 101 (noting a common policy prescription that “the watershed is the appropriate scale for organizing water management”).

concept of the watershed is itself underdefined. Watersheds, for example, are nested.<sup>216</sup> The watershed of a major river, such as the Ohio or even the Sacramento, itself consists of innumerable smaller watersheds.<sup>217</sup> The appropriate watershed for integrated management can vary from issue to issue and typically will involve a careful balance of multiple policy considerations.<sup>218</sup> Second, although watersheds often fully encompass all elements of a water problem, the geographic extent of a specific problem—the “problemshed”<sup>219</sup>—can sometimes extend beyond any individual watershed, no matter how broadly the watershed is defined. Major cities and counties, for example, may incorporate or affect multiple watersheds.<sup>220</sup> Looking at the appropriate level at which to manage water quality issues, EPA has noted that sometimes the appropriate level is the watershed, but in others it can be an entire basin, while in others the state as a whole might be the most appropriate managerial level.<sup>221</sup> In other cases, watersheds might be much larger than the area needed for effective integrated management.<sup>222</sup> Integration ideally should occur at the level of the problemshed, but problemsheds can vary from water problem to water problem.<sup>223</sup> Finally, geopolitical and agency borders can impact the effectiveness of integrative efforts and thus cannot be ignored in favor of purely natural boundaries.<sup>224</sup>

Defining clear and prescribed borders for integration, in short, is probably impossible.<sup>225</sup> SWIM therefore ultimately may need to leave the exact details of geographic integration up to individual states, settling instead for general guidelines for the types of areas chosen for integration. SWIM, for example, could require generally that state plans provide for integration at an “appropriate scale and geography” for the water issues to

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<sup>216</sup> *Id.* at 104.

<sup>217</sup> See U.S. Geological Survey, *Water Science for Schools: What is a Watershed?*, <http://ga.water.usgs.gov/edu/watershed.html> (last visited Feb. 18, 2012) (“Larger watersheds contain many smaller watersheds.”).

<sup>218</sup> See Blomquist & Schlager, *supra* note 73, at 105 (noting that tradeoffs are frequently required in the choice of the appropriate “watershed” for management).

<sup>219</sup> See Bureau of Reclamation, U.S. Dep’t of the Interior, *Reclamation’s Decision Process Guide: Terms*, <http://www.usbr.gov/pmts/economics/guide/terms.html#probshed> (last visited Feb. 18, 2012) (defining “problemshed” as “[t]he content and context of a problem: a geographical, social, or conceptual area of related actions, influences, and needs”).

<sup>220</sup> Los Angeles County in California, for example, encompasses at least eight major watersheds. Dep’t of Pub. Works, L.A. Cnty., *Watershed Management Division: Watersheds*, <http://ladpw.org/wmd/> (last visited Feb. 18, 2012) (listing as watersheds: Los Angeles River, Sun Valley, San Gabriel River, Ballona Creek, Santa Monica Bay, Dominguez, Santa Clara River, and Antelope Valley).

<sup>221</sup> OFFICE OF WATER, U.S. ENVTL. PROT. AGENCY, *supra* note 81, at 4, 18.

<sup>222</sup> See Blomquist & Schlager, *supra* note 73, at 104 (noting that watersheds can be as large as the Amazon Basin).

<sup>223</sup> See Thompson, *supra* note 2, at 214 (noting that the appropriate geographic boundaries for resolving water issues often vary).

<sup>224</sup> See Blomquist & Schlager, *supra* note 73, at 105 (noting that geopolitical and governmental boundaries, while arbitrary initially, come to “define [] communities of interest, identity, and place”).

<sup>225</sup> See *id.* (“[P]romise of easily defined and sensible boundaries that would promote integrated management cannot be realized.”).

be addressed. Appropriateness would be determined based on an area's ability to accomplish the ultimate goal of the legislation to promote improved water management. SWIM also could provide that, in determining the appropriate scale and boundaries for integration, states should consider natural hydrologic boundaries in addition to existing geopolitical borders. SWIM even could provide a rebuttable presumption that watersheds will generally provide the appropriate scale and boundaries for integration.

A separate but related question is whether SWIM should require states to integrate management of all their waters or alternatively allow states to decide that integration does not make sense for some waters. As noted earlier, not all waterways or watersheds may justify the cost and complexity of integrated management.<sup>226</sup> SWIM could require that state plans, to qualify for approval, either provide for integrated management of all waters of the state—but leave open, subject to specified criteria, at what scales integration takes place—or provide for integration of specifically chosen waters—in which case the other waters would not qualify for federal consistency or other incentives.

Both the CZMA and California's IRWM program provide precedent for using general substantive guidelines to determine the appropriate geographic unit for integration, rather than setting out a one-size-fits-all prescription. Although the CZMA provides for statewide management of the coastal zone, the Act does not explicitly define the geographic extent of the managed area—for example, the number of miles inland that management must extend. Instead, the CZMA requires that each state, in its application for federal approval, set out “the boundaries of the coastal zone subject to management” under the state's program and show that the program is “adequate to carry out the purposes” of the Act.<sup>227</sup> As noted earlier, California's IRWM guidelines also do not mandate any specific unit of integration, but instead simply require local agencies to explain why a region chosen for integration “is an appropriate area for integrated regional water management.”<sup>228</sup>

#### *D. Substantive Integration*

SWIM must also address what substantive issues to include in an integrated management plan. As described in Part II, water management in many jurisdictions fragments questions of surface water and groundwater; water quality and water quantity; water supply and land-use planning; water supplies, storm water, and wastewater; and ecological protection.<sup>229</sup> Must states integrate all of these subjects in all settings? And how should states integrate these functions—by merging entities or by creating coordinating entities on top of existing institutions?

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<sup>226</sup> See *supra* notes 185–87 and accompanying text.

<sup>227</sup> Coastal Zone Management Act of 1972, 16 U.S.C. § 1455(d)(1)–(2)(A) (2006).

<sup>228</sup> CAL. DEPT' OF WATER RES. & STATE WATER RES. CONTROL BD., *supra* note 101, at 14; see also Lubell & Lippert, *supra* note 20, at 84 (noting that applicants can define their own regions).

<sup>229</sup> See *supra* Part II.A.

Given the wide variety of situations and settings that states will encounter, the question of which substantive issues to include in an integrated plan again does not lend itself to a single, uniform answer. As in the choice of the appropriate geography for integration, SWIM at most can establish guidelines and minimum requirements for substantive integration. This is the approach taken by the CZMA and by California in its effort to promote IRWM. The main requirement of the CZMA, for example, is again that the program be “adequate to carry out the purposes” of the Act.<sup>230</sup> The CZMA also provides that the state program must provide the state with authority to “administer land use and water use regulations to control development[,] to ensure compliance with the management program, and to resolve conflicts among competing uses.”<sup>231</sup> As noted earlier, California’s IRWM rules similarly provide that local plans “must address major water related objectives and conflicts within the region, including, *at a minimum*, water supply, groundwater management, ecosystem restoration, and water quality.”<sup>232</sup>

Using this approach, SWIM could require at a general level that state plans integrate those issues necessary to ensure effective water management. At a more specific level, SWIM could require integration of a basic set of issues likely to be relevant in all watersheds and basins. For example, SWIM could require that all state plans integrate:

- Allocation of both groundwater and surface water;
- Water quality;
- Ecological protection;
- Water-related land-use planning; and
- Storm water, and wastewater disposal and reclamation.

What other issues, if any, to integrate would be left up to the states, unless the administering national agency determines that such integration is critical to effective water management. If a state does not believe that integration of the entire list of minimum issues is necessary in particular settings, SWIM could give the administering national agency the authority to grant an exemption upon an appropriate showing.

### *E. Interstate Integration*

Providing for management at the state level poses the difficult problem of what to do about interstate watersheds and groundwater basins, which, as noted earlier, provide 95% of the freshwater in the United States.<sup>233</sup> Not

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<sup>230</sup> 16 U.S.C. § 1455(d)(1) (2006).

<sup>231</sup> *Id.* § 1455(d)(10)(A).

<sup>232</sup> CAL. DEP’T OF WATER RES. & STATE WATER RES. CONTROL BD., *supra* note 101, at 14 (emphasis added).

<sup>233</sup> See *supra* text accompanying note 177. As the Supreme Court of the United States has noted, “[i]nterstate waters have been a font of controversy since the founding of the Nation.” *Arkansas v. Oklahoma*, 503 U.S. 91, 98 (1992).

surprisingly, interstate coordination is a problem that faces most federal environmental statutes that delegate authority to state governments.<sup>234</sup> But the problem is especially critical in the context of SWIM both because of the critical scale and importance of interstate watersheds and groundwater basins in the United States, and because the purpose of SWIM is to promote greater integration in water management.

Several approaches are possible. First, SWIM could require interstate integration for watersheds and groundwater basins that cross state borders.<sup>235</sup> States could accomplish such integration through either formal interstate compacts, such as the Delaware River Basin Compact that provides for the management of the basin's water supply through an interstate commission,<sup>236</sup> or more informal administrative agreements.<sup>237</sup> In either case, the goal would be to ensure that states integrate their planning and management of interstate watersheds and groundwater basins across state lines. SWIM could provide that state plans would not qualify for federal approval if states did not provide for such integrated interstate management of their interstate water resources, or SWIM could provide for approval of a limited state plan that addressed only intrastate waters—with federal consistency and other incentives only applying to those latter waters. An exception could be provided where a state can show that interstate integration would be of marginal importance—for example, in the case of an interstate groundwater basin where one state's activities are unlikely to affect water planning or management in another state.

The principal problem with requiring an interstate agreement for integrated management of interstate waters is that states may often find it difficult to negotiate such an agreement. States often have taken years to negotiate interstate compacts allocating the waters of interstate rivers. An agreement for coordinated and integrated management might be easier because allocation of water need not be an issue, and the principal focus would be on procedure rather than substantive result. This is particularly so if states do not seek to embed the agreement in a formal compact. On the

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<sup>234</sup> See, e.g., Federal Water Pollution Control Act, 33 U.S.C. § 1253 (2006) (providing for interstate cooperation and uniform laws); Clean Air Act, 42 U.S.C. § 7426 (2006) (providing for interstate pollution abatement).

<sup>235</sup> Some federal environmental statutes authorize states to enter into interstate agreements. See, e.g., 33 U.S.C. § 1253(b) (2006) (providing congressional consent for states to negotiate and enter into interstate compacts for the management of water pollution). However, no such statute requires an interstate agreement in order to qualify for federal incentives or the delegation of federal authority. See, e.g., *id.*

<sup>236</sup> For a description of the Delaware River Basin Compact, the Delaware River Basin Commission, and the Commission's authority and work under the compact, see SAX ET AL., *supra* note 40, at 853–58. Congressional approval is needed for formal interstate compacts. See U.S. CONST. art. I, § 10, cl. 3. SWIM ideally would provide advance congressional authority for states to negotiate and agree to any relevant compact, just as the Clean Water Act does in the context of water pollution. 33 U.S.C. § 1253(b) (2006).

<sup>237</sup> See Ann O'M. Bowman, *Horizontal Federalism: Exploring Interstate Interactions*, 14 J. PUB. ADMIN. RES. & THEORY 535, 536–38 (2004) (discussing states' use, over time, of both interstate compacts and administrative agreements, as well as various other forms of interstate cooperation).

other hand, negotiation of an interstate could sometimes be harder because of the larger number of issues involved. If a state is unable to reach an agreement with its neighbors on interstate waters, SWIM might still wish to promote and reward intrastate integration for those portions of the interstate waters found within the state.

An alternative approach therefore would be to allow states to submit plans that involve only intrastate integration of interstate waters, if the plans provide for interstate notice, consultation, and coordination for actions involving such waterways. This approach would be a variant of provisions of the Clean Air Act and Clean Water Act that require states administering the statutes to both notify neighboring states if their actions might impact air or water quality in the other state, and refrain from taking any action that could interfere with the neighboring state's pollution standards.<sup>238</sup> Similarly, SWIM could require that a state, even where it has not reached a formal integration agreement with another state that shares a waterway or groundwater aquifer, seek better integration by agreeing to notify other states of actions that might impact their water management or policy, allow them to comment on the proposed actions, and take the other state's comments into account in deciding what to do. SWIM also could require the national agency administering the statute to work with states to promote more formal agreements for interstate integration in the management of interstate waters.<sup>239</sup>

#### V. INCENTIVES

Federal incentives would be key to the success of SWIM or any comparable statute designed to promote greater integration of water management. As discussed earlier, greater integration can be costly and complex and must overcome significant political hurdles. SWIM therefore would need to provide sufficient incentives to overcome these obstacles. This Part examines a number of potential incentives, the first two of which have been used by the CZMA to promote statewide coastal planning, to evaluate what might be effective and politically realistic in promoting integrated water management. The potential incentives are: 1) federal funding for the planning and implementation of greater integration, 2) a promise of federal consistency, 3) federally supplied information and

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<sup>238</sup> For example, EPA has concluded under the Clean Water Act that a state that has been granted the authority to issue permits cannot issue a permit for a facility if the discharges from that facility would lead to a violation of the water quality standards of downstream states. See SALZMAN & THOMPSON, *supra* note 41, at 171–72 (discussing the provisions of the Clean Water Act dealing with interstate water pollution); see also 42 U.S.C. § 7410(a)(2)(D)(i)(I) (2006) (providing that states should not permit air pollution discharges that “contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to any such national primary or secondary ambient air quality standard”).

<sup>239</sup> The Clean Water Act includes similar provisions. See 33 U.S.C. § 1253(a) (2006) (“[EPA] shall encourage cooperative activities by the States for the prevention, reduction, and elimination of pollution . . . and encourage compacts between States for the prevention and control of pollution.”).

technical assistance, 4) accelerated and simplified federal approvals of actions needed to carry out plans resulting from the integrated management, and 5) delegation to states of authority to implement federal regulatory statutes where integrated state water programs are adequate to substitute for the relevant federal regulatory programs.

#### A. Federal Funding

The most tried and true incentive in the federal arsenal is funding.<sup>240</sup> Matching funds for both the planning and implementation of state coastal plans has been the central incentive under the CZMA.<sup>241</sup> Other federal environmental statutes, from the Clean Water Act to the Endangered Species Act, have also used funding to successfully spur action by state and local governments in support of national objectives.<sup>242</sup> As noted earlier, California has enticed many of its local governments to engage in IRWM through the promise of significant bond funding for both the planning of integrated regional plans and the implementation of projects developed through those plans.<sup>243</sup> No other possible federal incentive is likely to speak more effectively and loudly to states than the promise of matching federal funds.

The question is whether Congress today would be willing to invest the level of federal funds needed to encourage states to participate in a national scheme for more integrated water management. Congress has shown less willingness to fund state and local environmental efforts over the last several decades than it did in the early 1970s when Congress passed most of the modern federal environmental statutes, including the CZMA.<sup>244</sup> Some analysts criticized even the original CZMA for not providing sufficient funds to create an effective incentive.<sup>245</sup> Today, moreover, national budget concerns are leading to the scaling back of existing federal funding

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<sup>240</sup> See, e.g., Susan Welch & Kay Thompson, *The Impact of Federal Incentives on State Policy Innovation*, 24 AM. J. POL. SCI. 715, 717 (1980) (noting the extensive use of federal incentives, particularly since the New Deal, to encourage states to promote national goals).

<sup>241</sup> See *supra* notes 7–19 and accompanying text.

<sup>242</sup> For example, the Clean Water Act not only encourages the creation of interstate agencies to manage water quality for interstate rivers, but also originally provided grants to help support the work of such agencies. COMM. ON THE MISS. RIVER & CLEAN WATER ACT, NAT'L RESEARCH COUNCIL, MISSISSIPPI RIVER WATER QUALITY AND THE CLEAN WATER ACT: PROGRESS, CHALLENGES, AND OPPORTUNITIES 85–86 (2008). The Endangered Species Act provides for federal cost sharing of cooperative agreements with states to protect listed species. Endangered Species Act of 1973, 16 U.S.C. § 1535(d)(1), (i) (2006). The Fish and Wildlife Service has successfully used this funding to encourage all 50 states to participate in this cooperative agreement program. See Kaush Arha & Barton H. Thompson, Jr., *Federalism Under the Endangered Species Act*, in THE ENDANGERED SPECIES ACT AND FEDERALISM: EFFECTIVE CONSERVATION THROUGH GREATER STATE COMMITMENT 3, 10–11 (Kaush Arha & Barton H. Thompson, Jr. eds., 2011).

<sup>243</sup> See *supra* notes 93–115 and accompanying text.

<sup>244</sup> Thus, in the face of budget constraints and other considerations, Congress replaced its original program of federal grants for municipal sewage system enhancement with a rotating loan fund. SALZMAN & THOMPSON, *supra* note 41, at 154. Congress also stopped providing federal funding for interstate water-pollution agencies in 1973. COMM. ON THE MISS. RIVER & CLEAN WATER ACT, *supra* note 242, at 86.

<sup>245</sup> See *supra* text accompanying note 19.

programs, making it unlikely that Congress would embark on a major new funding scheme unless it believed that the ultimate goal was critical to the United States.<sup>246</sup> In short, although Congress might be willing to provide some federal subsidies as part of a SWIM-like statute, it is doubtful that Congress would be willing to invest the scale of funds needed by itself to motivate states that are not already engaged in integration efforts.<sup>247</sup>

### *B. Federal Consistency*

The other major incentive in the CZMA, as discussed already, was the promise of federal consistency. States who developed an approved statewide coastal management plan could demand that federal agencies and permittees generally follow the requirements and other policies of the state plan in taking discretionary actions.<sup>248</sup> The promise of federal consistency was a major incentive for states wishing to have control over their coastal zone.<sup>249</sup> In theory, a similar promise of federal consistency could be an important incentive in SWIM, ensuring states that federal agencies and their permittees would not be able to take discretionary actions that were inconsistent with policies or programs adopted as part of an integrated water management program.

In practice, however, the federal government already acts consistently with state water laws, regulations, and policies in a broad range of its activities, reducing the potential incentive of a more comprehensive promise of consistency. As discussed earlier, states have long asserted their supremacy in the water field, and the federal government has frequently responded by promising to comply with state law—or at least not to do anything inconsistent with state law. In the Reclamation Act of 1902, for example, the federal government agreed to carry out its activities in “conformity with” state laws “relating to the control, appropriation, use, or distribution of water used in irrigation.”<sup>250</sup> The Clean Water Act permits states to condition federal licenses and permits so as to ensure that federal projects do not violate state water quality standards.<sup>251</sup>

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<sup>246</sup> See generally ALAN J. AUERBACH & WILLIAM G. GALE, (STILL) TEMPTING FATE (2011), available at <http://www.urban.org/uploadedpdf/1001551-Post-Budget-Deal-Update.pdf> (providing a general overview of the budget outlook and its implications for federal spending policy).

<sup>247</sup> See Welch & Thompson, *supra* note 240, at 717–18 (noting that most federal funding to states has gone for activities that states were already pursuing).

<sup>248</sup> See *supra* text accompanying notes 156–59.

<sup>249</sup> See Tim Eichenberg & Jack Archer, *The Federal Consistency Doctrine: Coastal Zone Management and “New Federalism”*, 14 *ECOLOGY L.Q.* 9, 14 (1987) (concluding that the federal consistency requirements in the CZMA “provide a major incentive to states to enter into partnership with the federal government”).

<sup>250</sup> Reclamation Act of 1902, 43 U.S.C. § 383 (2006). The Supreme Court of the United States has held that this provision requires the federal Bureau of Reclamation to act consistently with state law except where there is a clear congressional directive to the contrary. *California v. United States*, 438 U.S. 645, 678–79 (1978).

<sup>251</sup> See Federal Water Pollution Control Act, 33 U.S.C. § 1341(a)(1), (d) (2006) (requiring state certification for federal licenses and permits); *PUD No. 1 of Jefferson Cnty. v. Wash. Dep’t of Ecology*, 511 U.S. 700, 713–14 (1994) (upholding the right of states to condition federal

No matter what the incentive value, SWIM should contain a federal consistency requirement because it is necessary to ensure full integration of water management across all levels of government. Because there are many federal statutes that do not explicitly require compliance with state water policies, a federal consistency requirement would still encourage states to participate in SWIM. However, because of the high level of consistency that federal law already requires, it is unlikely that a promise of federal consistency would prove to be as significant of an incentive as it has been under the CZMA.

### *C. Federal Technical Assistance*

Because funding may be more limited and promises of federal consistency less additive, SWIM may need additional incentives to encourage states to participate. Another potential incentive that the federal government could provide is technical assistance in planning and managing water resources on an integrated basis. The CZMA today provides for technical assistance, but only for amendments to plans already adopted and approved under the CZMA; the original CZMA did not anticipate such assistance or offer it as an incentive for states to participate.<sup>252</sup> Technical challenges pose a substantial hurdle to the effective management of many water issues on an integrated basis, including the integration of surface water and groundwater rights.<sup>253</sup> An offer of federal assistance for technical information and models needed in such management could be attractive, particularly to those states with more limited technical capabilities of their own. USGS, in particular, could help significantly in the development of hydrologic information and models.<sup>254</sup>

### *D. Streamlined Permitting*

Various actions that states might wish to take in implementing more integrated water management might require permits from the federal

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licenses and permits to achieve broad state water quality goals); *S.D. Warren Co. v. Me. Bd. of Env'tl. Prot.*, 547 U.S. 370, 374 n.1 (2006).

<sup>252</sup> The CZMA currently requires the National Oceanic and Atmospheric Administration to provide a "program of technical assistance and management-oriented research necessary to support the development and implementation of State coastal management program amendments." Coastal Zone Management Act of 1972, 16 U.S.C. § 1456c(a) (2006). The original CZMA did not include a provision for technical assistance. Amendments to the CZMA in 1976 added a provision for technical assistance to coastal management plans, which was replaced in 1986 by the current provision. *See* Coastal Zone Management Act Amendments of 1976, Pub. L. No. 94-370, § 9, 90 Stat. 1013, 1029 (codified at 16 U.S.C. § 1465c (2006)); Consolidated Omnibus Budget Reconciliation Act of 1985, Pub. L. No. 99-272, § 6045(1), 100 Stat. 82, 127 (adding the current provision) (codified at 16 U.S.C. § 1465c (2006)).

<sup>253</sup> *See, e.g.,* Thompson, *supra* note 24, at 279-86 (discussing the challenges involved in merging groundwater and surface-water systems).

<sup>254</sup> As noted earlier, this is one of the reasons why the Department of the Interior might be the best federal agency to oversee SWIM. *See supra* notes 202-03 and accompanying text.

government or agencies enjoying delegated federal authority—for example, improvements to wetlands or reclamation of storm waters. Local agencies often complain that one of the greatest obstacles to such projects is the complexity and time involved in obtaining the requisite federal approval.<sup>255</sup> SWIM, therefore, could also encourage states to participate in developing more integrated water management by promising to streamline and simplify any federal permits or approvals needed for projects developed through integrated planning efforts.

### *E. Federal Delegation*

More controversially, SWIM might consider delegating various types of federal authority to state governments that develop integrated water management programs that the federal government approves. Such programs, particularly when they provide for active participation by federal agencies, could be viewed as the functional equivalent of federal regulatory authority. States, of course, already exercise significant delegated authority in some settings, such as the implementation and enforcement of the Clean Water Act.<sup>256</sup> In the case of other federal statutes with water relevance, however, federal agencies either do not have clear authority to delegate their authority or infrequently exercise that authority. For example, although section 6 of the Endangered Species Act arguably provides for the delegation of regulatory authority to states that have established functionally equivalent programs, the federal government has not actively delegated that authority.<sup>257</sup> This is also the case under section 404 of the Clean Water Act, which protects and regulates wetlands.<sup>258</sup> SWIM could play an important role, and create a significant incentive for states to participate in integrated water

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<sup>255</sup> See, e.g., Robert L. Glicksman, *From Cooperative to Inoperative Federalism: The Perverse Mutation of Environmental Law and Policy*, 41 WAKE FOREST L. REV. 719, 720–21, 778–800 (2006) (discussing the obstacles that the federal government can pose to innovative environmental initiatives by the states).

<sup>256</sup> See SALZMAN & THOMPSON, *supra* note 41, at 152–53 (discussing the role of states in administering the National Pollutant Discharge Elimination System permits for point sources of pollution); J.B. Ruhl, *Cooperative Federalism and the Endangered Species Act: A Comparative Assessment and Call for Change*, in THE ENDANGERED SPECIES ACT AND FEDERALISM: EFFECTIVE CONSERVATION THROUGH GREATER STATE COMMITMENT, *supra* note 242, at 35, 43–44 (describing the cooperative federalism elements of the Clean Water Act).

<sup>257</sup> See Robert P. Davison, *The Evolution of Federalism Under Section 6 of the Endangered Species Act*, in THE ENDANGERED SPECIES ACT AND FEDERALISM: EFFECTIVE CONSERVATION THROUGH GREATER STATE COMMITMENT, *supra* note 242, at 89, 111 (discussing the arguments for state delegation under section 6 of the Endangered Species Act); Kaush Arha & Barton H. Thompson, Jr., *Toward Greater State and Local Commitment*, in THE ENDANGERED SPECIES ACT AND FEDERALISM: EFFECTIVE CONSERVATION THROUGH GREATER STATE COMMITMENT, *supra* note 242, at 307, 316–17 (arguing for greater use of section 6 to encourage a greater state role in protecting and recovering listed species).

<sup>258</sup> See generally Oliver A. Houck & Michael Rolland, *Federalism in Wetlands Regulation: A Consideration of Delegation of Clean Water Act Section 404 and Related Programs to the States*, 54 MD. L. REV. 1242 (1995) (discussing why delegation has not been broadly exercised under section 404).

management, by authorizing and encouraging the delegation of greater federal regulatory authority over water-related issues.

Increased delegation of federal authority over regulatory programs such as the Endangered Species Act and section 404 of the Clean Water Act is certain to be controversial because of the greater discretion that states would then have over the substantive protections of these laws. However, SWIM could provide for delegated authority only where an approved state program provides the functional equivalence of the federal authorities that would be delegated pursuant to the Act. SWIM also could provide for the reclaiming of federal authority where states prove unable to provide functional equivalence. Such protections would not satisfy everyone, since state authority and discretion would still be the default rule, changing the dynamics by which those laws are implemented. However, delegated authority would not only serve as another major incentive but also help both to integrate management and to encourage states to play a more active role in key aspects of water management.

## VI. CONCLUSIONS

The federal government has both an interest in promoting more integrated management of the nation's waters and the ability to encourage such management. Geographic and substantive fragmentation has long plagued effective water management in the United States and elsewhere in the world. More integrated management approaches, such as watershed planning and integrated water resource management, can help overcome this fragmentation and, in the process, improve water management along multiple dimensions. Integrated water management, however, also faces significant political, administrative, and economic obstacles, which helps explain why it has not been adopted more widely. While some states such as California have played an increasingly active role in promoting such management, other states have not, and there is a limit to what states by themselves can accomplish, in part because states have no authority over federal regulation. By agreeing to act consistently with integrated water management programs developed by states and by providing other incentives for states interested in doing so, the federal government can both ensure more complete integration and encourage greater integration.

The CZMA provides a useful model for federal legislation designed to encourage and enable more integrated water management. As set out above, a "Sustainable Water Integrated Management Act" (SWIM) would provide matching funds to states wishing to develop a statewide, locally implemented program for more integrated water management. If the federal government approves a state plan after review, SWIM would require federal agencies and their permittees to act in a manner consistent with plans developed as part of the program. SWIM also could provide additional incentives for state participation, including federal technical assistance, a streamlined permitting process for projects implemented as part of the state program, and perhaps even delegation of federal authority where the state

program provides functionally equivalent protection to federal environmental or other interests.