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Nonpoint Source Pollution and Chesapeake Bay Pfiesteria Blooms: The Chickens Come Home to Roost

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NOTES

NONPOINT SOURCE POLLUTION AND CHESAPEAKE BAY PFIESTERIA BLOOMS: THE CHICKENS COME HOME TO ROOST

I. INTRODUCTION

In August 1997, thousands of fish thrashed on the surface of various Chesapeake Bay tributaries in the sudden and inexplicable throes of death, and entire schools died en masse.[1] Prior to the dramatic fish kills, fishermen had been finding a variety of fish with lesions and raw sores on their bodies.[2] In addition to the mysterious deaths and injuries to the fish, local fishermen complained of unusual health problems, including "confusion and short-term memory loss, nausea and flu-like symptoms, breathing difficulties, rashes and lesions."[3] Scientists soon linked the mysterious human health problems, the injured fish, and the massive fish kills to a toxic microorganism known as Pfiesteria piscicida.[4] Following the discovery of Pfiesteria, a debate erupted

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[1] Adam Cohen, *Massacre on the Bay*, TIME, Sept. 29, 1997, at 60, 60 (discussing fish kills in Chesapeake Bay tributaries).

[2] *Id.*

[3] Bill Lambrecht, *Human Memory Loss, Fish Kills Linked to Mysterious Flesh-Eating Organism*, ST. LOUIS POST-DISPATCH, Sept. 22, 1997, at 1A.

[4] Pfiesteria is a complex algae described as an "ambush-predator" dinoflagellate, a microorganism that undergoes many transformations in its life cycle and will "swarm up from benthic dormant cysts when they detect the prey, kill and consume it, and then rapidly re-encyst." Joann M. Burkholder & Howard B. Glasgow Jr., *Interactions of a Toxic Estuarine Dinoflagellate with Microbial Predators and Prey*, 145 ARCHIV FUR PROTISTEN KUNDE 177, 177 (1995). When Pfiesteria detects fish in the vicinity, it produces a potent toxin "which immobilizes and kills the fish," and the algae will then "attach to, and feed upon, sloughed fish epidermis." Alan J. Lewitus et al., *Discovery of the "Phantom" Dinoflagellate in Chesapeake Bay*, ESTUARIES, June 1995, at 374, 374. According to Maryland physicians who

in the region pitting agricultural interests against environmentalists and Chesapeake watermen concerned with protecting the water quality of the Bay. Pfiesteria, the environmentalists and watermen argued, is a toxic microorganism that is thriving in the estuaries of the region because of runoff from chicken farms.[5] This runoff provides a nutrient-rich environment which allows populations of algae-like Pfiesteria to explode in population and threaten other species trying to live in the water. The environmentalists and watermen, therefore, advocated regulation of chicken farms to reduce this harmful runoff.[6] Chicken farmers, whose enterprises constitute an estimated $2.1 billion portion of the Maryland economy, complained that they were being unfairly singled out and that new regulations would destroy their industry.[7]

Once the infestation of Pfiesteria in the Chesapeake Bay tributaries was linked to this agricultural pollution, the issue of nonpoint source pollution quickly moved to the center of the water quality debate. Nonpoint source pollution (NSP) is a term used to describe diffuse water pollution that comes from sources that are difficult to identify, such as rainwater runoff from parking lots, roads, farms, and construction sites.[8] Because it is difficult to pinpoint the source of pollutants that enter and contaminate water resources in this manner, and because the harmful effects of such pollution often only arise from the accumulation of multiple

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have examined human exposure to the Pfiesteria-produced toxins, these toxins have been linked with human neurological illness as well. Marcia Myers, *State's Closing of Rivers Justified, Medical Team Says*, BALTIMORE SUN, Sept. 18, 1997, at 1A.

[5] *See* Dan Fesperman & Timothy B. Wheeler, *Chicken Waste Linked to Toxin in Pocomoke*, BALTIMORE SUN, Sept. 7, 1997, at 1A (exploring political battles between farmers and environmentalists over Pfiesteria disaster).

[6] *Id.*

[7] *See* Douglas M. Birch, *Microbe vs. Chicken Little*, BALTIMORE SUN, Sept. 17, 1997, at 1A (discussing poultry industry of Chesapeake region and reporting reactions of farmers to public outcry for stricter regulation of their industry); Fesperman & Wheeler, *supra*, note 5, at 1A (examining economic impact of poultry industry following Pfiesteria outbreak).

[8] *See* OFFICE OF WATER, ENVIRONMENTAL PROTECTION AGENCY, CONTROLLING NONPOINT SOURCE RUNOFF POLLUTION FROM ROADS, HIGHWAYS, AND BRIDGES 1 (1995) (explaining nature of contaminants in runoff pollution); Clare F. Saperstein, *State Solutions to Nonpoint Source Pollution: Implementation and Enforcement of the 1990 Coastal Zone Amendment Reauthorization Act Section 6217*, 75 B.U. L. REV. 889, 889-90 (1995) (describing diffuse nature of nonpoint source pollution).

minimal sources,[9] such pollution has been difficult to regulate and, consequently, neither federal, state, nor municipal programs have adequately addressed the issue. This failure to regulate has had dire environmental consequences on water resources, compromising the chemical quality and biological integrity of American waters.[10] Additionally, severe health effects have been linked to this largely unregulated agricultural runoff—from "blue baby" syndrome to increased cancer levels associated with high levels of nitrates in drinking water.[11]

This Note examines the Pfiesteria outbreak to explore the possibilities and limitations of current legal and regulatory mechanisms for dealing with the water quality deficiencies nonpoint source pollution (NSP) causes. Part II of this Note describes the current federal regulatory framework for addressing the national problem of NSP and explains how the current national political climate and trends in the Supreme Court ensure that the solution will not derive from an overarching federal program. Part III examines the current management plans in Maryland, Virginia, and Pennsylvania. Part IV reviews the recent successful management of the Atlantic striped bass as an example of interstate regulation of an important regional resource. Using the striped bass efforts as a model, Part IV proposes an interstate, regional NSP regulatory body as a mechanism to address the underlying problems of the current regulatory scheme. Part IV argues that

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[9] *See* Daniel R. Mandelker, *Controlling Nonpoint Source Water Pollution: Can It Be Done?*, 65 CHI.-KENT L. REV. 479, 480-82 (1989) (discussing difficulty in addressing diffuse problems of nonpoint source pollution).

[10] *See generally* OFFICE OF WATER, ENVIRONMENTAL PROTECTION AGENCY, ENVIRONMENTAL INDICATORS OF WATER QUALITY IN THE UNITED STATES 17, 21 (1996) (reporting that states identify nonpoint source pollution as greatest source of water quality degradation and that nearly half of American estuaries were susceptible to eutrophication, the "process by which a body of water begins to suffocate from receiving more nutrients, such as nitrogen and phosphorus, than it can handle"); Roy A. Hoagland & Jean G. Watts, *Federal Minimums: Insufficient to Save the Bay*, 29 U. RICH. L. REV. 635, 641-44 (1995) (describing impact of nutrients, toxic substances, and sediments on indicators of Chesapeake estuarine health); Curt Anderson, *Few Regulations Curb Farm Runoff Pollution*, CHARLESTON SUNDAY GAZETTE MAIL, Sept. 21, 1997, at 5C (discussing overgrowth of undesirable aquatic plants and organisms that has resulted from farm runoff pollution).

[11] *See* George A. Gould, *Agriculture, Nonpoint Source Pollution, and Federal Law*, 23 U.C. DAVIS L. REV. 461, 467 (1990) (discussing severe health effects arising from agricultural runoff).

such an interstate regulatory body would best enable individual states to manage NSP that is affecting resources shared by different states.

II. FEDERAL EFFORTS TO ADDRESS NSP

Federal law has effectively dealt with point sources[12] of water pollution. Unfortunately, however, federal law has not yet fully addressed the growing concerns over NSP so that the issue remains, for the most part, at the state level where no adequate solutions have been forthcoming. This Section examines the current federal regulatory mechanisms in place to address NSP in Chesapeake Bay and concludes that none of these efforts adequately address the NSP problem.

A. THE CLEAN WATER ACT AND NONPOINT SOURCE POLLUTION

Congress recognized and addressed the national problem of water quality degradation in the early 1970s with the Federal Water Pollution Control Act of 1972 (also known as the Clean Water Act).[13] The Clean Water Act (CWA) articulated the ambitious goal "that the discharge of pollutants into the navigable waters be eliminated by 1985" in order to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[14] The Act created a national permitting program requiring point source discharges to achieve limits that reflect the application of the "best practicable control technology currently available."[15] The Act also established water quality standards to supplement the technology-based limits, as well as a grant program for state and municipal waste treatment facilities.[16]

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[12] The Clean Water Act defines a point source as "any discernible, confined and discrete conveyance." 33 U.S.C. § 1362(14) (1994). Such sources include pipes, ditches, channels, and tunnels. *Id.*

[13] 33 U.S.C. §§ 1251-1387.

[14] *Id.* § 1251(a).

[15] *Id.* § 1311(b)(1)(A)(i).

[16] Water quality based effluent limitations are applied when the discharge of pollutants from a point source would jeopardize water quality even with the application of the best available technology. *Id.* § 1312. The CWA grant and loan program for waste treatment facility construction and operation is presented in *id.* §§ 1281-1299.

Absent from the CWA's national program for water quality standards and regulation of pollution, however, were equivalent measures to address the problem of NSP. The CWA targeted industrial and municipal discharges from identified point sources, but the Act provided exceptions to the permit requirements for runoff from agriculture, mining operations, and oil production.[17] The Act did not prohibit or restrict nonpoint sources of pollution, thus delegating the problem to the states.

Because the NSP problem was unresolved when Congress reexamined the CWA in 1987,[18] Congress incorporated an NSP management program into the CWA regulatory scheme.[19] This program, however, still effectively avoided the NSP problem. In fact, besides articulating a desire to remove the scourge of NSP from the nation's waters as a national priority, the amendments merely formalized delegation of the issue to the states by authorizing states to implement nonpoint source control programs.[20] The CWA did not involve a major federal effort, and if the states chose not to develop a management plan, the Act did not force them to do so.[21] Thus, the 1987 NSP management amendments essentially gave states what they had all along—total discretion in deciding whether to regulate or simply ignore the increasing problem of NSP. While the CWA did not address NSP, it provided citizen suit provisions which were used to address some sources of NSP.

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[17] *Id.* § 1342(l).

[18] Senator Baucus noted that "[t]he problem of nonpoint source pollution is a national problem requiring a national solution." 133 CONG. REC. S744 (1987). Representative Nowak stated that "[s]ince as much as 50 percent of the pollution in our waters is estimated to be caused by nonpoint source pollution it is imperative that this pollution be addressed promptly." 133 CONG. REC. H175 (1987).

[19] 33 U.S.C. § 1329.

[20] The 1987 amendments required governors to present reports to the administrator of the United States Environmental Protection Agency on nonpoint source pollution affecting navigable waters in their states and to describe the management measures that the states would take to remedy the problems. The amendments provided grants for the state management programs, but only general guidance to the governors on how NSP should be approached. *See id.* § 1329 (presenting Clean Water Act nonpoint source management programs).

[21] *See* Saperstein, *supra* note 8, at 896-98 (describing federal delegation of nonpoint source pollution management).

B. CLEAN WATER ACT CITIZEN SUITS

Under the current federal regulatory scheme, the CWA's citizen suit provisions are key to addressing the degradation of Chesapeake Bay water quality from agricultural NSP. This section of the CWA allows individuals or states to bring a civil action against other individuals, municipalities, state agents or the administrator of the EPA for the violation of effluent limitations or standards.[22] While the CWA's effluent limitations technically only address point source pollution and the Act's definition of "point source" specifically excludes "agricultural stormwater discharges,"[23] CWA citizen suits have successfully targeted agricultural pollution.[24] These successful suits are especially relevant to the Pfiesteria situation, where much of the blame for the problem has been placed on runoff from chicken farms in the area.[25]

In successful suits against nonpoint, agricultural violations of the CWA, courts have found "[t]he definition of a point source is to be broadly interpreted."[26] The most likely targets of a CWA citizen suit in the Chesapeake region are large chicken farms that use manure on their fields and are designated concentrated animal feeding operations (CAFOs).[27] CAFOs are considered point

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[22] The Clean Water Act sets out the citizen suit provisions in 33 U.S.C. § 1365. The Supreme Court has recognized that a state falls within the meaning of "citizen" under the CWA. United States Dep't of Energy v. Ohio, 503 U.S. 607, 616-18 (1992).

[23] 33 U.S.C. § 1362(14).

[24] *See* Concerned Area Residents for the Env't v. Southview Farm, 34 F.3d 114, 119 (2d Cir. 1994) (finding that liquid manure spreading operation of dairy farm operation was point source under Clean Water Act); United States v. Oxford Royal Mushroom Prods., Inc., 487 F. Supp. 852, 854 (E.D. Pa. 1980) (holding that spray irrigation system designed to spray waste water onto fields can be point source).

[25] Farmers frequently use chicken manure as fertilizer on their lands. This practice has been blamed for excessive nitrogen levels in nearby water bodies, and excessive nutrient levels have been implicated in algal blooms. *See* W.R. Boynton et al., *Inputs, Transformations, and Transport of Nitrogen and Phosphorus in Chesapeake Bay and Selected Tributaries*, 18 ESTUARIES 285, 286 (1995) (examining nutrient saturation in Chesapeake Bay); Fesperman & Wheeler, *supra* note 5, at 1A (discussing role of chicken farms in Pfiesteria blooms).

[26] Dague v. City of Burlington, 935 F.2d 1343, 1355 (2d Cir. 1991) (citing United States v. Earth Sciences, Inc., 599 F.2d 368, 373 (10th Cir. 1979)).

[27] For a chicken farm to be considered a CAFO, the farm must confine 100,000 chickens. A chicken farm is also considered a CAFO if the facility confines 30,000 chickens and discharges pollutants directly into water, or discharges through a manmade ditch or flushing

sources under the CWA,[28] and any discharge of pollutants from point sources without a National Pollution Discharge Elimination System (NPDES) permit is unlawful.[29]

In one such successful suit, *Concerned Area Residents for the Environment v. Southview Farm*,[30] the Second Circuit held the use of liquid manure as fertilizer on a CAFO's fields that discharged into water was a point source violation of the CWA.[31] This court thus expanded the definition of a point source from the animal feeding operation itself to the use of the operation's manure for fertilizer.[32] A successful suit against chicken farms in the Chesapeake region for similar discharges would likely prompt increased care to prevent such discharges and reduce the resulting nutrient overload that they cause.

Unfortunately, CWA citizen suits are severely limited in scope. These suits were designed as an enforcement measure aimed at stopping point source pollution—pollutants entering the water from pipes and other conveyances, not running off fields, lawns, and roads. Even though courts have recognized an expansive definition of point source, it may prove difficult to force the issue of agricultural NSP into a framework designed for point source pollution, especially given that the CWA explicitly excludes "agricultural stormwater discharges and return flows from irrigated agriculture."[33] These types of suits may be useful in targeting larger chicken farms in the region, but not runoff from smaller chicken farms or other farms.

C. ADDRESSING STATE MANAGEMENT PROGRAMS WITH THE CLEAN WATER ACT

Part of the difficulty in addressing the NSP affecting the Chesapeake Bay region is the multistate nature of the problem.

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system, or has a liquid manure system. 40 C.F.R. § 122 app. B (1997).

[28] 33 U.S.C. § 1362(14).

[29] City of Milwaukee v. Illinois, 451 U.S. 304, 310-11 (1981) (stating that under Clean Water Act, "it is illegal for anyone to discharge pollutants into the Nation's waters except pursuant to a permit").

[30] 34 F.3d 114, 119 (2d Cir. 1994).

[31] *Id.*

[32] *Id.* at 118-19.

[33] 33 U.S.C. § 1362(14).

There are no uniform guidelines for states outside the effluent limitations and water quality standards of the NPDES program, yet the problems arising from NSP do not recognize state borders. As a possible solution, the CWA provides interstate management conferences as a mechanism by which states whose water resources are affected by other states' NSP can convene an interstate management conference.[34]

In the Chesapeake Bay region, for example, if Virginia considers that Maryland's failure to regulate runoff from chicken farms is affecting the water quality of Virginia resources, Virginia's governor could ask the EPA Administrator to convene a conference between the two states to address the issue. The purpose of such a conference is to develop agreements between the states to reduce the level of pollution and improve water quality.[35] States could use this mechanism to encourage a regional dialogue on the role of NSP in the Pfiesteria outbreak.[36] This mechanism is a useful tool for states to keep tabs on other states' efforts, but given the recent conditional approval of the Coastal Zone Management NSP programs of Pennsylvania, Maryland, and Virginia, it is unlikely that the Administrator of the EPA would consider any of these state programs deficient enough to convene a conference.[37]

D. THE COASTAL ZONE MANAGEMENT ACT

The Coastal Zone Management Act of 1972[38] (CZMA) is another federal statute providing limited NSP regulation. Like the CWA, CZMA originally gave states total discretion in their management

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[34] A state unable to meet water quality standards or goals because of "pollution from nonpoint sources in another State" can petition the EPA administrator to convene "a management conference of all States which contribute significant pollution resulting from nonpoint sources." *Id.* § 1329(g)(1).

[35] *Id.*

[36] Maryland's Governor Parris N. Glendening convened a six-state conference in September 1997 to discuss the Pfiesteria outbreak but the focus of the discussion was on coordinated notification of future outbreaks and pooling information about Pfiesteria. *See* Michael Dresser, *Governor Wants Action on Pfiesteria*, BALTIMORE SUN, Sept. 23, 1997, at 1B (reporting on conference).

[37] *See infra* note 41 and accompanying text (reporting status of state coastal nonpoint programs).

[38] 16 U.S.C. §§ 1451-1464 (1994).

of NSP in their coastal regions. When Congress reexamined CZMA in 1990, however, the states had clearly failed to resolve NSP adequately. In the Coastal Zone Management Act Reauthorization Amendments of 1990 (CZMARA), Congress attempted to compel state action by declaring that states in the Coastal Zone Management (CZM) program "shall prepare and submit . . . a Coastal Nonpoint Pollution Control Program for approval pursuant to this section" for the purpose of developing and implementing "management measures for NSP to restore and protect coastal waters."[39] Unlike the CWA, however, the CZMA would withhold Coastal Zone Management grants if "a coastal State has failed to submit an approvable program as required by this section."[40] Additionally, federal grants for other state coastal concerns were tied to satisfactory NSP management programs.[41]

It is important to note, however, several limits to the federal government's involvement in NSP through the Coastal Zone Management program. While the CZMA now ties grants for other areas of coastal concerns to adequate nonpoint source management programs, only coastal states have this incentive from the federal government, and even this incentive is tied to voluntary entrance

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[39] *Id.* § 1455b(a)(1).

[40] *Id.* § 1455b(c)(3).

[41] The Coastal Zone Management Act of 1972 provided states who choose to enter the program with grants to effectuate a national policy "to preserve, protect, develop, and where possible to restore or enhance the resources of the Nation's coastal zone." *Id.* § 1452(1). This wide-ranging policy is reflected in the CZM grants that states may receive for such varied programs as the preservation of coastal recreational resources, the redevelopment of deteriorating waterfronts and ports, and access to public beaches. *Id.* § 1455a(b). When states lose grant money for inadequate water pollution programs, they automatically lose grants for these other coastal management areas as well.

The National Oceanic and Atmospheric Administration (NOAA) and the United States Environmental Protection Agency (U.S. EPA) are reviewing state CZM NSP plans. At this time EPA and NOAA have conditionally approved the coastal nonpoint programs Pennsylvania, Maryland, and Virginia submitted pursuant to Section 6217(a) of the Coastal Zone Act Reauthorization Amendments of 1990. *Id.* § 1455b; *see* UNITED STATES ENVTL. PROTECTION AGENCY & NAT'L OCEANIC & ATMOSPHERIC ADMIN., PENNSYLVANIA COASTAL NONPOINT PROGRAM FINDINGS AND CONDITIONS (1997) (approving Pennsylvania's Coastal Nonpoint Pollution Control Program); UNITED STATES ENVTL. PROTECTION AGENCY & NAT'L OCEANIC & ATMOSPHERIC ADMIN., VIRGINIA COASTAL NONPOINT PROGRAM FINDINGS AND CONDITIONS (1997) (approving Virginia's Coastal Nonpoint Pollution Control Program); UNITED STATES ENVTL. PROTECTION AGENCY & NAT'L OCEANIC & ATMOSPHERIC ADMIN., MARYLAND COASTAL NONPOINT PROGRAM FINDINGS AND CONDITIONS (1996) (approving Maryland's Coastal Nonpoint Pollution Control Program).

into the federal CZM program. Furthermore, while the state management plans only need to address NSP in the defined coastal zone, pollution in areas outside the defined zone can negatively impact coastal resources as well.[42] Finally, under CZM programs, as with the CWA, the management of the NSP issue ultimately remains a state, not a federal, activity.

E. CURRENT POLITICAL AND LEGAL TRENDS

Given the current climate in Congress and the Supreme Court, it seems unlikely that an overarching federal program will remedy the NSP problems currently facing the Chesapeake region. Thus, NSP will likely remain a concern that states must address. Since the "Republican Revolution" of the 1994 elections, Congress has retreated from the New Deal view of extensive federal involvement in problems facing the nation, leaving the states to create solutions.[43] Recent Supreme Court decisions complement Congress's shift of perspective on the national dynamic by raising federalism and Tenth Amendment concerns as a potential limitation on federal regulation.[44]

The Court's recent treatment of the Commerce Clause is one example of the resurgence of federalism as a limit on federal

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[42] Pennsylvania's Coastal Zone Management plan is an example of coastal resources affected by areas outside the defined coastal zone. The Susquehanna River is not within Pennsylvania's defined coastal zone, yet nearly one half of the fresh water poured into Chesapeake Bay comes from this river. *See infra* notes 96-97 and accompanying text (discussing Pennsylvania's Coastal Zone Management program).

[43] While the trend has arguably been building since the mid-1970s, Congress has recently acted in dramatic ways to shift the decisionmaking dynamic from the federal to state government. This can be seen in the Unfunded Mandates Reform Act of 1995, which requires the federal government to pay for most mandates that the government imposes on state or local governments costing over $50 million per year. Pub. L. No. 104-4, 109 Stat. 48 (1995). Such a requirement limits Congress's ability to create national standards or regulations. For examples of recent efforts in Congress to reduce the federal government's role in environmental regulation, see Stephen M. Johnson, U.S. v Lopez*: A Misstep, but Hardly Epochal for Federal Environmental Regulation*, 5 N.Y.U. ENVTL. L.J. 33, 40 (1996).

[44] The Tenth Amendment to the United States Constitution provides that "The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people." U.S. CONST. amend X.

regulatory power. In the landmark case of *United States v. Lopez*,[45] the Supreme Court declared the Gun-Free School Zones Act of 1990 invalid and showed an unwillingness to defer to Congress's judgment regarding the connection between the regulated activity and its effect on interstate commerce. *Lopez* articulated the Court's concerns for state sovereignty over issues of truly local (as opposed to national) concern.[46] Other recent cases also reveal the Court's current concern with federalism and the Tenth Amendment. In *New York v. United States*,[47] the Court ruled part of the Low-Level Radioactive Waste Policy Amendments Act of 1985 invalid for "commandeer[ing] the legislative processes of the States by directly compelling them to enact and enforce a federal regulatory program."[48] In *Seminole Tribe of Florida v. Florida*,[49] federalism issues arose again as the Court ruled that the Indian Commerce Clause cannot be used to force a state to give up sovereign immunity from suits in federal court.

These cases clearly indicate that the Supreme Court is now more willing to impose constitutional limits on congressional action; therefore, this new judicial ideology must be considered before any major federal legislation can be enacted. Should future federal legislation on NSP justify its existence under the Commerce Power (as both the CZMA and the CWA did), Congress must consider the newfound limitations articulated in these cases. For example, under *Lopez*, NSP regulation may be characterized as a subject matter of local concern because the inherent need to regulate land use is a traditional area of state interest.[50] Also, should Congress's regulatory agenda move beyond the voluntary approach of the CZMA to require states to act on the issue, such a mandate

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[45] 514 U.S. 549, 551 (1995). The Court's unwillingness to defer to Congress's determination that the possession of weapons within a school zone affects interstate commerce in a sufficient manner to justify federal involvement is a historic event. For the first time since the 1936 *Carter v. Carter Coal Co.* decision, the Court invalidated legislation created under the commerce power. 298 U.S. 238 (1936) (invalidating Bituminous Coal Conservation Act of 1935).

[46] 514 U.S. at 567-68 (expressing federalism concern for maintaining "distinction between what is truly national and what is truly local").

[47] 505 U.S. 144 (1992).

[48] *Id.* at 176 (citation omitted).

[49] 517 U.S. 44, 47 (1996).

[50] *Lopez*, 514 U.S. at 568.

could be deemed invalid under *New York v. United States* as a program that commandeers the states' legislative role.[51] Further, the *Seminole* decision could limit Congress's ability to provide a federal forum for citizen-suit measures against states violating federally created NSP programs as infringing on state sovereign immunity.[52] Thus, under the current political conditions, any real action on the issue of NSP must come from the states.

III. STATE MANAGEMENT OF NONPOINT SOURCE POLLUTION

The issue of NSP is inherently tied to local activities like land development and farm operation which individual states have historically regulated. Because the many factors that must be considered to resolve the NSP issue vary from region to region, the local expertise and knowledge of state and municipal government agents are invaluable for effectively addressing the problem. For example, in the Chesapeake region NSP problems arise from a staggering variety of sources—agriculture, highways, parking lots, suburban housing subdivisions, and industrial air pollution.[53]

Maryland, Pennsylvania and Virginia, states in the Chesapeake region, participate in the federal Coastal Zone Management program, and consequently must have NSP management programs in place that comply with the federal goals and policies for NSP.[54] Despite the presence of these programs, the water quality of the Bay has not improved and, following the Pfiesteria outbreak, NSP (particularly nutrient pollution) is arguably worsening water conditions in the area.[55] This Section summarizes the regulatory

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[51] 505 U.S. at 176.

[52] 517 U.S. at 77 (Stevens, J., dissenting) (discussing ramifications of Court's overruling *Pennsylvania v. Union Gas Co.*, 491 U.S. 1 (1989), and Court's precluding ability of Congress to abrogate state sovereign immunity from federal suits).

[53] *See generally* Hoagland & Watts, *supra* note 10, at 642-44 (discussing sources of pollutants impacting health of Chesapeake Bay).

[54] The CZMA's NSP content requirements allow states much flexibility in developing management programs. For example, the management measures criteria only call for implementation of measures "necessary to achieve and maintain applicable water quality standards." 16 U.S.C. § 1455b(b) (1994).

[55] *See* Dresser, *supra* note 36, at 1B (examining causes of Pfiesteria outbreak and how recent increased nutrient pollution from Chesapeake Bay's Eastern Shore nonpoint sources have contributed to the problem).

schemes of Virginia, Maryland, and Pennsylvania that address the issue of NSP and discusses the limitations of each state's approach.

A. VIRGINIA

Virginia's statutory scheme regulating the water quality of Chesapeake Bay includes the Chesapeake Bay Preservation Act and the Agricultural Stewardship Act. Chesapeake Bay Preservation Act manages land use that affects Chesapeake Bay water quality. The Agricultural Stewardship Act addresses agricultural NSP management for all farms in the state, not just those in the Chesapeake area.

1. Chesapeake Bay Preservation Act. Virginia's Chesapeake Bay Preservation Act addresses land use management and water quality issues for the Bay with a scheme of cooperative regulation between state and local governments to manage defined categories of resource areas.[56] The Act established the Chesapeake Bay Local Assistance Board which assists local authorities in designating Chesapeake Bay Preservation Areas[57] consisting of Resource Protection Areas (RPAs) and Resource Management Areas (RMAs).[58] Development in Chesapeake Bay Preservation Areas must meet general performance criteria to minimize erosion and NSP.[59] In addition to these performance requirements, development in an RPA is limited to "water-dependent" projects or to valid "redevelopment."[60] RPAs include a one hundred foot buffer area within which no agricultural activity can occur without a soil and water quality conservation plan which must be implemented where the agricultural operation seeks to reduce the size of the RPA buffer.[61]

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[56] VA. CODE ANN. §§ 10.1-2100 to -2116 (Michie 1993).

[57] *Id.* §§ 10.1-2102 to -2103.

[58] Va. Regs. Reg. 173-02-01 § 3.1. The RPA areas are those needing protection to reduce nonpoint source pollution and include all tidal wetlands, nontidal wetlands connected to tidal wetlands or tributary streams, tidal shores, and other areas "necessary to protect the quality of state waters." *Id.* § 3.2(A)-(B). The RMA is defined as an extension of the RPA, areas "contiguous to the entire inland boundary of the Resource Protection Area" that are of secondary importance to runoff reduction. *Id.* § 3.3(A)-(B).

[59] *Id.* § 4.2.

[60] *Id.* § 4.3(A)(1).

[61] *Id.* § 4.3(B)(4)(b).

Virginia's Chesapeake Bay Preservation Act manages development and agriculture in ways that address NSP, but the program has deficiencies that reduce its effectiveness in addressing the issue of NSP. First, the establishment of RPAs and RNAs is up to local government discretion,[62] and the statute has no provision for the state Chesapeake Bay Local Assistance Board (CBLAB) to designate areas if local governments fail to do so.[63] Also, local authorities may grant exceptions from the regulations, and the CBLAB has no power to review or reject such exemptions.[64] Consequently, developers and landowners are likely to exert pressure on local authorities to avoid designating areas they wish to develop as RPAs and RMAs in order to avoid corresponding limits on land use, and local authorities are likely to be more susceptible to such pressure than officials of the statewide CBLAB.[65] This total delegation of discretionary authority by the state is similar to the CWA in that both regulatory regimes do not require action on the issue of NSP.[66] As with the CWA, local governments are also unlikely to address the issue realistically without some pressure from higher levels of government.

Even in a designated Chesapeake Bay Preservation Area, an agricultural producer must implement a soil and water quality conservation plan only when the producer seeks to reduce the size of a Resource Protection Area buffer area.[67] Therefore, unless a farmer requests a reduction of this area, the erosion, nutrient, pesticide, and grazing management measures that make up a soil and water quality conservation plan are totally voluntary.

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[62] VA. CODE ANN. § 10.1-2109(A).

[63] The structure of the Act places much of the responsibility with local governments, stating that "[l]ocal governments have the initiative for planning and for implementing the provisions of this chapter, and the Commonwealth shall act primarily in a supportive role . . . ." *Id.* § 10.1-2100(B).

[64] Va. Regs. Reg. 173-02-01 § 4.6.

[65] *See* Paul D. Barker, Jr., Note, *The Chesapeake Bay Preservation Act: The Problem with State Land Regulation of Interstate Resources*, 31 WM. & MARY L. REV. 735, 757-58 (1990) (discussing allocation of regulatory power in Virginia's Chesapeake Bay Preservation Act between state and local governments and how local authorities are more susceptible to pressure against resource protection).

[66] *See supra* notes 17-21 and accompanying text (discussing 1987 Clean Water Act NSP amendments which left issue to states' discretion).

[67] Va. Regs. Reg. 173-02-01 § 4.3(B)(4).

2. The Agricultural Stewardship Act. An important new NSP management measure in Virginia is the Agricultural Stewardship Act which addresses water quality problems caused by agricultural activities.[68] Under this Act, citizens may complain to the state Commissioner of Agriculture that an agricultural operation is causing pollution.[69] Upon receiving a complaint, the Commissioner must request that the director of the district in which the farm lies investigate the complaint's validity.[70] If the district does not act on the Commissioner's request, the Commissioner must investigate the complaint.[71] To investigate these complaints, the Act gives the Commissioner or district the right to enter land which is the subject of a complaint after notice has been given to the owner or operator.[72]

When a district or the Commissioner finds substantial evidence proving that an agricultural operation is polluting, notice is sent to the owner or operator requiring the owner to create an agricultural stewardship plan which includes measures to prevent or cease the pollution.[73] The owner or operator must begin implementing the plan within six months of receiving notice from the Commissioner or district.[74] If the owner does not begin implementing the plan within six months, the Commissioner shall, after a hearing, issue a corrective order requiring the owner or operator to complete implementation of the plan within a stated period of time.[75] The Commissioner may petition the circuit court of the county or city in which the land is located to issue an order requiring the owner or operator to comply if the plan is not implemented within the time frame of the initial corrective order.[76] If the owner or operator fails to implement the measures specified in the court order, the Commissioner or his representative may enter the land and implement the measures.[77] Any person violating a corrective

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[68] VA. CODE ANN §§ 10.1-559.1 to -559.11 (Michie Supp. 1996).
[69] *Id.* § 10.1-559.3(A).
[70] *Id.*
[71] *Id.* § 10.1-559.3(B).
[72] *Id.* § 10.1-559.5(A).
[73] *Id.* § 10.1-559.3(C).
[74] *Id.*
[75] *Id.* § 10.1-559.4(A)-(B).
[76] *Id.* § 10.1-559.5(B).
[77] *Id.*

order or refusing to allow the district or Commissioner entry to investigate a complaint may be subject to fines up to $5000 per day for each day a violation continues.[78]

The Agricultural Stewardship Act has great potential for addressing agricultural runoff pollution in Virginia. For example, the Act could reduce agricultural runoff at feeding operations with fewer animals than required for consideration under the NPDES[79] and farms without animals that use manure from other farms. Furthermore, in light of the Pfiesteria outbreak and the harm it has caused to fish and human health,[80] the Commissioner of Agriculture could use the Act's emergency provisions to issue a corrective order immediately,[81] allowing the more urgent problems to be addressed more quickly. Failure to comply with a corrective order carries the threat of civil penalties and the potential that state agents could enter private property to implement stewardship measures;[82] therefore, the sooner these state actions are threatened, the sooner farmers must implement stewardship measures.

Despite the potential that these Acts provide to address the issue of NSP in Virginia, both present shortcomings. For example, the Agricultural Stewardship Act aims to prevent only one of the many sources of NSP—agricultural runoff. While agricultural runoff is a major problem, only singling out agriculture for land use measures is not likely to solve the overall problem. The management scheme of the Chesapeake Bay Preservation Act, on the other hand, seems to leave too much discretion in the hands of politically vulnerable local officials to ensure that Chesapeake resources will be protected. Consequently, Virginia must take additional action if the NSP problem is to be solved.

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[78] *Id.* § 10.1-559.7(A).

[79] *See supra* note 27 (defining CAFO).

[80] *See supra* notes 1-4 and accompanying text (examining impact of Pfiesteria blooms on natural resources and human health).

[81] The Act considers an emergency condition to be one in which agricultural runoff causes or is likely to cause an imminent or substantial danger to the health of fish or aquatic life. VA. CODE ANN. § 10.1-559.4(D). Without an emergency condition, a corrective order cannot be issued until six months of noncompliance after the Commissioner initially notified the owner or operator. *Id.* § 10.1-559.4(A).

[82] *Id.* § 10.1-559.7(A), -559.5(B).

B. MARYLAND

Much like Virginia, Maryland has instituted a two-pronged statutory attack on NSP. First, similar to Virginia, Maryland's Chesapeake Bay Critical Area Protection Program addresses land use to protect the quality of Chesapeake water resources. Second, Maryland's Agricultural Sediment Control Law acts as a statewide measure to prevent agricultural runoff into state waters.

1. The Chesapeake Bay Critical Area Protection Program. The Chesapeake Bay Critical Area Protection Program, Maryland's major environmental management program for Chesapeake resources, operates cooperatively between state and local governments.[83] Local authorities enforce this regulatory scheme over an initial planning area of particular significance to the water quality of the Chesapeake.[84] Within this area, local authorities are required to identify Resource Conservation Areas (RCAs), Limited Development Areas (LDAs), and Intensely Developed Areas (IDAs) within their jurisdiction.[85] With these designations come corresponding restrictions on development and use.[86] While local authorities identify the areas in their region for the designations, statewide standards in the statute define the RCA, LDA, and IDA.[87]

Once local authorities develop a critical area program, the statute provides program approval procedures by Maryland's Critical Area Commission,[88] as well as enforcement mechanisms for the local

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[83] MD. CODE ANN., NAT. RES. II § 8-1801 (1990 & Supp. 1997).

[84] *Id.* § 8-1807(a).

[85] MD. REGS. CODE tit. 14, § 15.02.02 (1994).

[86] An RCA is strictly regulated such that new development must comply with strict water quality controls. *Id.* § 15.02.05(B)-(C). Development within an LDA is limited to preserve the area's status quo for development density and land use while also conforming to water quality criteria. *Id.* § 15.02.04(B)(3)(a)-(b), (C). An IDA is the least regulated area for development, but there are requirements for new developments to reduce urban and stormwater runoff and to enhance tree growth. *Id.* § 15.02.03(C)-(D).

[87] The statute defines the initial parameters for the Critical Area Program as "all waters and lands under the Chesapeake Bay and its tributaries to the head of tide as indicated on the State wetlands maps, and all State and private wetlands designated under Title 9 of this article," and also includes all "land and water areas within 1000 feet beyond the landward boundaries of State or private wetlands and the heads of tides designated under Title 9 of this article." MD. CODE ANN., NAT. RES. II § 8-1807(a).

[88] *Id.* § 8-1808.

authority, the Critical Area Commission, and Maryland's Attorney General.[89] If the Commission is aware of a local jurisdiction failing to enforce the program's requirements, the Commission shall refer the matter to Maryland's Attorney General who is authorized to prosecute or sue the violator.[90] The Act also requires the Commission to develop a program designating Critical Areas for any locality that fails to implement its own plan.[91]

Unlike Virginia's Chesapeake Bay Preservation Act, the Critical Area Commission's review of local plans, required development of plans for local governments, and enforcement provisions for state government officials all provide an incentive for local governments to engage in the program more effectively. Such provisions give local officials a plethora of reasons to resist pressure from local developers, land owners, and agricultural operators to relax environmental standards on their property. Thus, the Chesapeake Bay Critical Area Protection Program is a more effective state tool for combatting NSP.

2. The Agricultural Sediment Control Law. As a more general, statewide NSP regulation, Maryland's Agricultural Sediment Control Law prohibits agricultural operations from adding sediment or soil into state waters or placing soil or sediment in a condition or location where it is likely to be washed into waters by precipitation.[92] Maryland's Department of Natural Resources is responsible for investigating reports of agricultural sediment pollution and may order farmers to develop a Soil Conservation and Water Quality (SCWQ) plan.[93] Farmers who implement and maintain approved SCWQ plans are exempt from the civil and criminal penalties of the provisions.[94] In addition to these regulatory measures that encourage farmers to adopt practices that will reduce water degradation, SCWQ plans are required for agricultural operations in the Chesapeake Bay Critical Areas.[95]

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[89] *Id.* § 8-1815.

[90] *Id.*

[91] *Id.* § 8-1809(b).

[92] MD. CODE ANN., ENVIR. I § 4-413 (1996).

[93] MD. REGS. CODE tit. 26 § 9.03.05 (1994).

[94] MD. CODE ANN., ENVIR. I § 4-413(b).

[95] Buffer areas are required along shorelines within which agriculture is only permitted if best management practices are used. MD. CODE ANN., NAT. RES. II § 8-1808(c)(6).

Maryland's Sediment Control Law does not address NSP with the specificity which Virginia's Agricultural Stewardship Act takes on the issue of agricultural runoff. Maryland's scheme lacks the specific enforcement procedures for violations that Virginia has. Also, the exemption from civil and criminal penalties for agricultural operations that adopt SCWQ plans removes the statute's effectiveness for addressing violations within the most critical and sensitive Chesapeake Bay Critical Areas, where all agricultural operations must have SCWQ plans. Thus, the Sediment Control Law is not a very effective tool in the fight against NSP.

Maryland seems similar to Virginia in its approach to NSP, but the two states have differing strengths and weaknesses. Maryland's NSP scheme seems to provide for better Chesapeake-specific management measures than Virginia, but Maryland has weaker statewide measures for agricultural pollution. This disparity in different aspects of the state NSP programs is one reason why there remains such a problem for Chesapeake Bay.

C. PENNSYLVANIA

Pennsylvania's regulatory scheme, unlike those in Virginia and Maryland, does not focus a planning regime entirely upon priority Chesapeake areas, but rather approaches the problem on a uniform, statewide basis. While Pennsylvania's Coastal Zone Management NSP program only encompasses the Delaware River and Lake Erie,[96] state laws regulating NSP apply in the state's Susquehanna River watershed, the source of over one-half of the fresh water poured into the Chesapeake Bay.[97]

First, Pennsylvania's Nutrient Management Act addresses runoff from animal manure by requiring nutrient management planning

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[96] *See* NATIONAL OCEAN SERV., U.S. DEP'T OF COMMERCE, COMMONWEALTH OF PENNSYLVANIA COASTAL NONPOINT POLLUTION CONTROL PROGRAM ENVIRONMENTAL ASSESSMENT 9 (1996) (discussing geographic boundaries of CZM program).

[97] *See* NATIONAL OCEAN SERV., U.S. DEP'T OF COMMERCE, STATE OF MARYLAND COASTAL NONPOINT POLLUTION CONTROL PROGRAM ENVIRONMENTAL ASSESSMENT 9 (1996) (discussing physical environment of Chesapeake Bay).

for farms with over two animal equivalent units per acre.[98] Nutrient management plans incorporate design and operation requirements that will reduce runoff and overuse of manure.[99] It should be noted that the Nutrient Management Act circumscribes nitrogen loads, but not phosphorus, which also plays a role in eutrophication.[100]

Second, the Conservation District Law established the statewide State Conservation Commission, as well as local Districts[101] which act together to reduce agricultural sediment and erosion.[102] The District officials perform site inspections, problem assessments, educational programs, and erosion and sediment control plan reviews.[103]

Finally, Pennsylvania has developed a Chesapeake Bay Nonpoint Source Pollution Abatement Program which targets Chesapeake water sources that originate in Pennsylvania, including the Susquehanna River system.[104] This program recognizes the problem of runoff pollutants from improper agricultural practices in Pennsylvania and the effects of these pollutants on the Chesapeake.[105] This program attempts to promote better land management practices through education, financial and technical assistance to landowners and governmental officials.[106] While these programs may provide regulatory structures which can be used to address NSP in Pennsylvania, they lack the teeth that Maryland's and Virginia's programs provide.

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[98] PA. STAT. ANN. tit. 3, § 1706 (West 1995). An animal equivalent unit is 1000 pounds live weight of livestock or poultry animals. *Id.* § 1706(a). This program does little more to address NSP than the Clean Water Act's National Pollution Discharge Elimination System's (NPDES) concentrated animal feeding operation (CAFO) permitting requirements. *See supra* notes 22-32 and accompanying text (discussing NPDES CAFO program).

[99] 25 PA. CODE § 101.8 (1998).

[100] *Id.* § 83.293; *see* Boynton et al., *supra* note 25, at 286 (stating that "occurrences of persistent algal blooms . . . are typically associated with eutrophying systems, although the cause and effect linkages for some of these manifestations are not well understood").

[101] PA. STAT. ANN. tit. 3, § 853.

[102] *See id.* § 850 (stating policy of Pennsylvania to control and prevent soil erosion).

[103] *Id.* § 857.

[104] 25 PA. CODE § 83.101(a).

[105] *Id.*

[106] *Id.* § 83.101(b).

IV. AN INTERSTATE AGREEMENT TO ADDRESS CHESAPEAKE NSP

Indeed, even a cursory glance at the extent of pollution in the Bay and its devastating effects drives home the fact that Bay resources need stronger NSP management than the states have provided in the past, and that these states should examine the effectiveness of their regulatory efforts on these resources. For purposes of facilitating such an examination, Section IV analyzes a successful interstate management scheme that addressed the catastrophic decline of the Atlantic striped bass stocks in the 1970s and 1980s and advocates a similar approach for the current NSP problem in the Bay.

A. THE SUCCESSFUL INTERSTATE ATLANTIC STRIPED BASS MANAGEMENT PROGRAM AS AN EXAMPLE FOR THE PFIESTERIA CRISIS

During the late 1970s and early 1980s the Atlantic striped bass population appeared doomed.[107] Historically, the migratory striped bass played an important role as a coastal commercial and recreational resource, but suddenly and without warning, fishermen reported catastrophic decreases in their catches during the 1970s and 1980s.[108] Today, however, the Atlantic striped bass population has been fully replenished; indeed, fishermen along the east coast report catching fish in amounts unheard of in years.[109] The

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[107] Commercial landings averaged 10.9 million pounds in the period from 1966 to 1974. By the early 1980s the catch had astonishingly fallen to only a few million pounds. Mark R. Gibson, *Prepared Statement by Mark R. Gibson, Principal Fisheries Biologist Rhode Island Division Fish and Wildlife Before the Senate Committee on Environment and Public Works*, FEDERAL NEWS SERVICE, Dec. 12, 1995. The situation was so dire, in fact, that one plan proposed listing Chesapeake Bay stocks of the striped bass as either threatened or endangered under the Endangered Species Act. H.R. REP. NO. 98-1029, at 7 (1984), *reprinted in* 1984 U.S.C.C.A.N. 5501, 5506. For a seminal account of the declining striped bass stocks, the effects on commercial seine net fishermen in New York, and the personal struggles of these fishermen, see JOHN N. COLE, STRIPER (1978).

[108] A study by the United States Fish and Wildlife Service and the National Marine Fisheries Service reported that a decline in commercial and recreational fishing "may have cost the Northeast approximately 7000 jobs and over $220 million in economic activity in 1980." H.R. REP. NO. 98-1029, at 6, *reprinted in* 1984 U.S.C.C.A.N. at 5504-05.

[109] According to the National Marine Fisheries Service, in 1996 fishermen from Maine through North Carolina recorded the largest catch of striped bass since 1979 with an increase of 32% from 1995. Joel Arrington, *Striped Bass a Fisheries Management Success Story*, NEWS AND OBSERVER, Dec. 21, 1997, at C18.

remarkable recovery of the striped bass is due, in large part, to the mobilization of an interstate management effort. Because of its unparalleled success in reversing such an environmental disaster, analysis of the striped bass efforts may well foster an ideal solution to the NSP debacle in the Chesapeake Bay.

In the late 1970s, the Atlantic States Marine Fisheries Commission (ASMFC) developed an interstate fishery management plan (ISFMP) for the striped bass, recognizing that the population was on the verge of a drastic decline.[110] In 1981, the ASMFC member states unanimously adopted the management measures the Commission recommended.[111] The states were slow to implement the recommendations and provisions of the plan,[112] however, and as a result, Congress enacted the Atlantic Striped Bass Conservation Act in 1984.[113] The Act gave the Atlantic States Marine Fisheries Commission the power to determine whether each individual state's striped bass management plan and subsequent enforcement was adequate for the recovery of the species.[114] If not, the Commission could impose a moratorium on the deficient state,[115] which would prevent any recreational or commercial harvesting of the species.[116] The United States Secretary of Commerce would enforce this moratorium with civil penalties and forfeitures.[117]

The significance of this scheme for resource management is in the regulatory authority that the Atlantic States Marine Fisheries

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[110] H.R. REP. NO. 98-1029, at 6, *reprinted in* 1984 U.S.C.C.A.N. at 5504.

[111] The plan, which recommended minimum size limits for taking striped bass and other measures, was unanimously adopted by the interested ASMFC member states of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina. *Id.*

[112] *Id.*; *see also* Betty Mitchell Gray, *Restrictions on Striped Bass Fishing Are Being Eased Significantly This Fall*, VIRGINIAN-PILOT, Oct. 5, 1995, at B1 (discussing how ASMFC's voluntary plans had little effect on population declines).

[113] In the Findings and Purposes section, the statute states that "Because no single government entity has full management authority throughout the range of the Atlantic striped bass, the harvesting and conservation of these fish have been subject to diverse, inconsistent, and intermittent State regulation that has been detrimental to the long-term maintenance of stocks of the species." Pub. L. No. 98-613, § 2(a)(3), 98 Stat. 3187 (1984).

[114] *Id.* § 4(a)-(b), 98 Stat. at 3188.

[115] *Id.* § 4(d), 98 Stat. at 3188.

[116] *Id.* § 5, 98 Stat. at 3189.

[117] *Id.* § 5(c)-(e), 98 Stat. at 3189.

Commission exercised. The Commission began in 1942 as an interstate compact among Atlantic coastal states to provide recommendations to member states regarding shared fishery resources.[118] In 1950, the member states amended the agreement, allowing the member states involved to designate the Commission as a joint regulatory agency for the regulation of fishing operations of citizens and vessels with respect to fisheries in which the states have a common interest.[119] When the striped bass disaster struck, it was addressed by the Commission; however, the individual states did not uniformly follow the Commission's non-binding recommendations.[120] The bass was an important resource to the coastal states, and individual states feared losing out on their harvest of the resource if they implemented strict management measures.[121] State by state management had thus failed. As a result, the striped bass population continued to decline until every member state gave the Commission unfettered authority to manage the rehabilitation of the species.

Successful striped bass management came when the states mounted a common effort by giving the Commission the final word on management of the species.[122] This effort was ultimately

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[118] Act of May 4, 1942, Pub. L. No. 539, 56 Stat. 267 (granting Congress's consent to interstate compact relating to better fisheries utilization).

[119] Act of Aug. 19, 1950, Pub. L. No. 721, 64 Stat. 467 (granting consent to amendment of Atlantic States Marine Fisheries Compact allowing member states to designate Commission as joint regulatory agency).

[120] H.R. REP. NO. 98-1029, at 6 (1984), *reprinted in* 1984 U.S.C.C.A.N. 5501, 5504.

[121] Historically, the striped bass played a major role in the economy of the Atlantic region. This has been true from as early as 1669, when the leaders of Plymouth Colony decided that funds from the sale of striped bass would be used to construct the first public schools in North America. COLE, *supra* note 107, at 33. The annual value of the striped bass harvest in the 1970s was estimated at several hundred million dollars. *Id.* at 226-27. In addition, it was estimated that striped bass fishing accounted for over one-third of all recreational fishing on the East Coast, which represents a sizable share of the over two billion dollars spent by the nation's recreational surfcasting fishermen in their pursuit of game. This staggering figure does not even take into account the money spent by recreational boat fishermen on motors, gear, and ancillary expenditures like bait, gasoline, and hotels. *Id.* at 157, 224.

[122] The director of the Office of Fisheries Conservation and Management of the National Marine Fisheries Service cited the Atlantic Striped Bass Conservation Act as the "single most important instrument responsible for the recovery of the stock," and further cited the need for cooperative efforts in the management of interjurisdictional fisheries. Richard H. Schaefer, *Prepared Testimony of Richard H. Schaefer, Director, Office of Fisheries Conservation and Management National Marine Fisheries Service, National Oceanic and*

successful for three reasons. First, with the moratorium mechanism, the states knew that while they implemented a management plan, they did not need to worry about other states irresponsibly devastating the stocks—such states would suffer a federally enforced moratorium on striped bass fishing in their waters.[123] Second, if all states developed effective and somewhat uniform management plans then all the states would be sharing the costs simultaneously. Third, the states developed the striped bass plan working through the ASMFC. The Atlantic Striped Bass Conservation Act provided a mechanism by which the states could shape a recovery of the stocks, and the moratorium threat took away any individual state's ability to "race to the bottom."

B. AN INTERSTATE JOINT REGULATORY NSP AGREEMENT

The NSP problem in Chesapeake Bay is similar in many respects to the striped bass crisis of the early 1980s. Indeed, just as state-by-state management efforts failed with regard to the striped bass crisis, it has not fared any better in the Chesapeake water quality disaster. Because the economically powerful poultry industry is considered one of the causes of nutrient pollution, individual states may refrain from acting out of the realistic fear of losing this industry to neighboring states that do not regulate.[124] On the other hand, the identity of the region and the success of the regional economy is tied to a vital Bay.[125] As with the striped

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Atmospheric Administration, United States Department of Commerce Before the Subcommittee on Fisheries, Wildlife and Oceans Committee on Resources, U.S. House of Representatives, FEDERAL NEWS SERVICE, Mar. 16, 1995.

[123] The House Report on the Atlantic Striped Bass Conservation Act discussed this issue, saying that the states' failure to act collectively in a uniform and timely manner on the striped bass ISFMP illustrated the lack of incentive for the states to avoid a "tragedy of the commons." H.R. REP. NO. 98-1029, at 8, *reprinted in* 1984 U.S.C.C.A.N. at 5506.

[124] *See* Fesperman & Wheeler, *supra* note 5, at 1A (discussing economically powerful poultry industry in region).

[125] In Maryland alone, the total economic impact of the 1996 commercial seafood harvest was approximately $134 million (including processing, wholesaling and retailing), and the total value of the state's recreational harvest was $118.5 million. These figures do not include expenditures made by fishermen or revenues for businesses supporting fishing and boating. Businesses tied to tourism and recreation include hotels, inns, restaurants, boat and kayak rentals, and bait and tackle shops. When national and regional stories reported that Chesapeake waterways were closed following the Pfiesteria outbreak, tourism

bass, an insular and short-term view of economic health could devastate valuable shared resources that require a healthy Chesapeake Bay.[126]

A joint effort is needed to tackle the NSP issue in the Chesapeake region to prevent avoidance of the problem from states seeking short-term economic advantage by weaker environmental regulation. Pennsylvania, Virginia, and Maryland should approach the problem fairly, not just singling out poultry farmers, but rather by examining all sources of runoff pollution in the region that affect the Bay. The states must look at agriculture, but also at golf courses, over-fertilized suburban lawns, sprawling parking lots, new development, roads, and other causes of NSP. When the states determine the sources of problems, they should take appropriate collective measures.

As with the striped bass management program, the states involved here need assurance that their efforts to address the water quality of the Bay will not leave them at an economic disadvantage. To assure that the other states will take prompt, effective steps to solve the issue, the agreement between the states should tie use of the Bay's resources to their NSP management efforts. First, the agreement should provide a mechanism for some penalty (like the striped bass moratorium) against states failing to deal with the problem.[127] Second, states receiving more benefit from a healthy Chesapeake should be expected to pay more to reach this goal, as happened with the ASMFC where state contributions to support the Commission were based on the market value of state fisheries catches.[128]

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businesses as well as recreational and commercial fishing revenues may have been affected. Aquatic Pathology Center, University of Maryland, *Economic Facts Related to Maryland's Seafood and Tourism Industry in the Chesapeake Bay Region* (last modified Sept. 30, 1997, visited Jan. 18, 1998) <http://www.mdsg.umd.edu/fish-health/pfiesteria/economic.html>; *see also* John H. Cushman Jr., *Another Waterway Is Closed in Maryland*, N.Y. TIMES, Sept. 15, 1997, at A12. (exploring economic impact of Pfiesteria outbreak on region).

[126] In August and September of 1997, sections of the Pocomoke River, King's Creek, Manokin River, and Chicamacomico River were closed to recreational and fishing uses. *See* Cushman, *supra* note 125, at A12 (discussing closures of waterways). If Pfiesteria blooms become a frequent and more widespread occurrence, other waterways could be closed to recreation and fishing as well.

[127] *See supra* notes 115-117 and accompanying text.

[128] "The states party hereto agree to make annual appropriations to the support of the Commission in proportion to the primary market value of the products of their fisheries, exclusive of cod and haddock, as recorded

Interstate agreements among the states are already in place to address the management of Chesapeake resources. Like the Atlantic States Marine Fisheries Commission when it was first created in 1942,[129] the states entered into these Chesapeake agreements to evaluate problems of mutual concern, to encourage cooperative resource planning, and to recommend improvements in managing resources.[130] The states must modify these Chesapeake agreements, as the ASMFC was in 1950, to give an interstate body the authority to serve as a joint regulatory body on the issue of NSP.[131]

Recognizing the important role of the states in addressing their individual NSP issues, the interstate agency should not attempt to create an all-encompassing regulatory scheme, but rather should articulate water quality goals and measures that states can use to reach these goals. The states should pursue these goals using their own regulatory structures. If, however, states should fail to implement effective management measures relative to the other member states, they should pay a higher proportion of the interstate body's operating costs.[132]

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in the most recent published reports of the Fish and Wildlife Service of the United States Department of the Interior . . . ."

Act of May 4, 1942, Pub. L. No. 539, Art. XI, 56 Stat. 267, 269.

[129] *Id.*

[130] The tristate agreement between Maryland, Virginia and Pennsylvania creating the Chesapeake Bay Commission gave the Commission the authority to collect data, publish reports, advise member states on interstate concerns, and serves as an advisory mediator in disputes between or among states. The agreement, however, does not give regulatory authority to the Commission and maintains the primary role of the states and their agencies in managing the resources of the area. MD. CODE. ANN., NAT. RES. II § 8-301 Art. II (1990 & Supp. 1997). The agreement establishing the Chesapeake Executive Council in 1983 articulated the purpose of the Council, to "assess and oversee the implementation of coordinated plans to improve and protect the water quality and living resources of the Chesapeake Bay," but did not create the Council as "a new super agency." William Eichbaum, *The Chesapeake Bay: Major Research Program Leads to Innovative Implementation*, 14 ENVTL. L. REP. 10,237, 10,244 n.15 (1984).

[131] *See supra* note 119 and accompanying text (discussing amendment to Atlantic States Marine Fisheries Commission allowing states to designate Commission as joint regulatory body).

[132] Another approach, closer to the Atlantic Striped Bass Conservation Act's moratorium mechanism, could tie state use of a Chesapeake Bay resource that requires healthy water quality to an effective state NSP program. *See supra* notes 114-117 and accompanying text (discussing ASMFC striped bass conservation authority); *see also infra* Appendix: Model Chesapeake Interstate Compact § IV. For example, should Virginia fail to reach goals on

V. CONCLUSION

NSP remains a major threat to the health of American waters. In the summer of 1997, the spectacle of a toxic algal bloom in Chesapeake Bay revealed the frightening consequences of NSP to one of America's ecological treasures. This episode brings attention to the inadequacy of current state and federal regulatory measures addressing NSP and the failure of state-by-state management of shared natural resources.

The recent success story of the Atlantic striped bass recovery shows that resources shared by multiple states can be managed successfully when the states have a shared incentive for responsible use of the resource. NSP is not as dramatic an issue as the threatened extinction of a popular gamefish species, but the Pfiesteria blooms in Chesapeake Bay show that the results of NSP can be as dramatic as dying schools of fish or fishermen experiencing neurological injury. Moreover, the identity of the region is also threatened, an identity historically linked to healthy Chesapeake resources.

The federal regime of water pollution protection has delegated the issue of NSP to the states, and the states have failed to address the issue seriously. In light of the dramatic Pfiesteria outbreak, Virginia, Maryland, and Pennsylvania should create a regulatory body that will address NSP with measures that will make a difference to water quality in the Bay.

Proposed is an agreement that will establish the Executive Council for Chesapeake Bay as a joint regulatory agency for NSP for the states of Pennsylvania, Maryland, and Virginia. The Council will conduct a study on Chesapeake water quality, develop a plan to reduce regional runoff pollution, and articulate specific measures that will help achieve improved water quality. A state's contribution for the Council's funding would be proportional to the value of Chesapeake natural resources harvested and adjusted in relation to the state's actual implementation of measures to reduce NSP in accordance with the Council's Regional Nonpoint Source

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reducing NSP, the interstate agency could vote to impose a moratorium on the state's oyster harvest in the Chesapeake. This would represent a true link between pollution management and enjoyment of natural resources.

Pollution Management Plan.

By entering into the agreement, the states will also be subject to a moratorium measure. States that consistently fail to address NSP in their state will be subject to a moratorium on their harvesting of shared Chesapeake resources. By tying use of Bay resources to responsible NSP measures, the states will have strong incentive to act as effectively as their neighboring states. Perhaps through unified efforts such as these, the states can control NSP and rid the Chesapeake of the Pfiesteria menace.

APPENDIX
MODEL CHESAPEAKE INTERSTATE COMPACT

I. FINDINGS AND DECLARATIONS OF POLICY

a) Following the outbreak of the algae Pfiesteria piscicida, it has become clear that nutrient saturation is threatening the waters of Chesapeake Bay and that nonpoint source pollution is jeopardizing this valued regional resource and national treasure.

b) After twenty-five years of the national Clean Water Act program, the problem of nonpoint source pollution remains a major obstacle to attaining a healthy Bay.

c) Recognizing the importance of a healthy Bay to regional economic prosperity, there must be a regional commitment to reducing nonpoint source pollution.

d) The purpose of this compact is to designate the Executive Council for Chesapeake Bay as a joint regulatory agency for the states of Pennsylvania, Maryland, and Virginia to provide effective interstate measures for improving the water quality of the Bay.

II. COUNCIL FUNCTIONS

a) The Council shall study the issue of eutrophication in the Bay in light of the proliferation of harmful algae such as Pfiesteria piscicida. The Council will conduct initial surveys of water quality throughout the Bay with the cooperation of state agencies and the Environmental Protection Agency and shall develop water quality standards that will reduce eutrophication in the Bay. The Council shall perform biannual surveys to provide progress reports.

b) The Council shall draft a Regional Nonpoint Source Pollution Management Plan (or Plan) to reduce regional runoff pollution from agricultural operations, lawn fertilizers, pesticides, parking lots, lawns, and other sources of runoff pollution harming the quality of Chesapeake water resources and shall articulate specific measures that will help achieve improved Bay water quality.

c) After the Council drafts its Plan, the Council shall examine each state's nonpoint source pollution management programs to decide whether each state has adopted regulatory measures necessary to implement the Council's Plan. The Council shall notify each state's governor as to the adequacy of that state's plan.

d) The Council shall monitor state enforcement of nonpoint source pollution programs. Enforcement will be considered

unsatisfactory if it is carried out in a way that will not advance the goals articulated in the Council's Plan. The Council shall make annual determinations of state enforcement progress and communicate these to state governors. The Council shall receive petitions from citizens regarding state management of nonpoint source pollution and shall consider such petitions in considering state enforcement.

e) The Council shall have the authority to provide grants to states or individuals in the region for the purpose of implementing nonpoint source pollution management measures articulated in the Plan.

f) No action shall be taken by the Council except by the affirmative vote of a majority of the members of the Council. The Council shall consist of the Regional Administrator of the United States Environmental Protection Agency and representatives from Maryland, Pennsylvania, and Virginia. Each state in the Council shall appoint five representatives. One shall be an executive officer of an administrative agency charged with the management of environmental quality. One shall be an executive officer of an administrative agency charged with the management of agriculture. One shall be an executive officer of an administrative agency charged with state commerce. One shall be a citizen with a knowledge and interest in Chesapeake fisheries. One shall be a citizen with a knowledge and interest in construction and development.

III. FUNDING FOR THE COUNCIL

a) The states of Pennsylvania, Maryland, and Virginia shall make appropriations to support the Council. The initial determinations of appropriations for the Council shall be made in proportion to the dollar amount of natural resources harvested from state Chesapeake waters as recorded by reports of the United States Departments of Commerce and Interior. Subsequent adjustments shall be made on the basis of changes in harvest of natural resources.

b) Annual determinations of state contribution shall be adjusted so that states who receive unsatisfactory ratings of enforcement and/or lack adequate nonpoint source pollution regulatory programs shall contribute a higher proportion of funds to support the Council.

IV. MORATORIUM

a) A state that receives unsatisfactory ratings of enforcement and/or lacks adequate nonpoint source pollution regulatory programs for three successive annual ratings shall be subject to a moratorium on that state's use of Chesapeake resources.

b) The Council shall determine the object of the moratorium upon the second unsatisfactory rating of enforcement and/or finding of inadequate nonpoint source pollution regulatory programs and shall notify the state of the object of the moratorium prior to any subsequent annual determination on the state's progress.

c) The moratorium shall prohibit a state from harvesting a Chesapeake Bay resource that is shared by several states or traverses state lines in its life cycle.

JOHN P. ALMEIDA