

Validity of Chesapeake Bay total maximum daily load upheld

J. David Aiken

On February 29, 2016, the US Supreme Court declined to hear the appeal of the American Farm Bureau Federation (Farm Bureau) from the Third Circuit Court of Appeals' decision approving the US Environmental Protection Agency's (USEPA's) total maximum daily loads (TMDLs) for the Chesapeake Bay (*Farm Bureau v. EPA*, 792 F.3d. 281 [3d Cir. 2015]; 136 S.Ct. 1247 [2016]). This decision means the ambitious Chesapeake Bay TMDL program can continue notwithstanding Farm Bureau legal claims that the program improperly forces states into implementing agricultural nonpoint pollution control requirements that USEPA cannot implement directly. The Court's decision also suggests that the USEPA strategy embedded in the Chesapeake Bay TMDL program can be implemented in other regions of the United States to address nonpoint agricultural pollution. This article explores the complexities of addressing agricultural nonpoint source water pollution under the Clean Water Act (CWA), how USEPA has developed an effective strategy to obtain cooperation in a multistate context to deal with agricultural nonpoint source pollution, and why the Chesapeake Bay TMDL was legally upheld in federal court.

For decades, the Chesapeake Bay has been polluted by excess nutrients and sediment from agricultural operations, municipal sewage treatment plants, and urban and suburban stormwater runoff. Agricultural discharges of nitrogen (N), phosphorus (P), and sediment are a major source of Chesapeake Bay contamination. This article focuses on the agricultural discharges, because they are a major nonpoint source of contamination, because they largely lie beyond USEPA's CWA direct regulatory authorities, and because they were the focus of the Chesapeake

Bay TMDL litigation. Significantly, four bay states have elected to regulate the use of manure by nonlivestock producers to reduce nutrient pollution, a crucial state policy development that has major water quality implications beyond restoration of the Chesapeake Bay.

AGRICULTURE AND THE CLEAN WATER ACT

Under the CWA sources of water pollution are either point sources or nonpoint sources. Point sources include direct waste discharges into surface water bodies, such as municipal sewage treatment plant discharges or industrial wastewater discharges. Point source discharges are required to be treated before they are discharged through the National Pollution Discharge Elimination System (NPDES) permitting program. Nonpoint sources include runoff associated with precipitation. Nonpoint sources are not regulated under the CWA but can be regulated by states if they choose to do so.

In addition to the regulation of point source discharges, the CWA includes a "water quality safety net" to deal with water bodies where regulation of point sources alone does not achieve the local water quality standards. This is the TMDL program. Under the CWA states must identify river or stream segments where water quality standards are not being met. This could be, for example, where growing municipalities' wastewater discharges have increased, where industrial discharges have increased, or because of nonpoint source pollution discharges. In these identified "impaired waters," the state is authorized to impose greater wastewater treatment requirements on the municipal or industrial facilities (point sources) discharging into the water quality limited stream. This is called the wasteload allocation process. USEPA or the state water quality agency allocates the reduced total pollution load that would meet water quality standards among the point sources discharging into the water quality limited stream. In the Chesapeake Bay TMDL, this wasteload allocation process is also called the

bay's "pollution diet." Wasteload allocation usually requires point source dischargers to upgrade their wastewater treatment capacity. As the quality of the point source wastewater discharges improve, the stream water quality may in time also improve sufficiently to meet its designated water quality standard. States may also choose to reduce nonpoint pollution to improve stream water quality, but cannot be directly required by USEPA to do so.

Nationally the USEPA TMDL program has been developed largely in response to citizen lawsuits. Under the CWA citizens may go to court to enforce CWA requirements where either USEPA or the state water quality agency do not do so. Local clean water groups have successfully sued to have rivers added to the state's impaired stream list and also to have TMDLs established through the wasteload allocation process for those impaired streams. In the absence of these citizen suits far fewer TMDLs would have been established.

Most agricultural sources of water pollution are nonpoint sources. The CWA specifically defines return flows from irrigated agriculture and agricultural stormwater runoff as not being point sources of water pollution. However, concentrated animal feeding operations (CAFOs) are regulated as point sources, and regulated CAFO operators must prepare and implement comprehensive nutrient management plans (CNMPs) to reduce pollution from manure application to cropland and pasture. CNMP requirements include soil sampling, manure sampling for nutrient content, manure application at agronomic rates, and reporting requirements.

USEPA has three CAFO categories: large, medium, and small. Large CAFOs are those containing 1,000 or more animal units (AUs), medium CAFOs contain 300 to 999 AUs, and small CAFOs contain fewer than 300 AUs (table 1). An AU represents 454 kg (1,000 lb) of live animal weight. Currently USEPA requires CNMPs only for large CAFOs, although nothing in the CWA precludes USEPA or states from requiring CNMPs for smaller CAFOs.

J. David Aiken is a professor of agricultural economics and a water and agricultural law specialist at the University of Nebraska-Lincoln, Lincoln, Nebraska.

Table 1

US Environmental Protection Agency numeric thresholds for small, medium, and large concentrated animal feeding operations (CAFOs) (USEPA 2010, 4-26).

Animal sector	Size threshold (number of animals)		
	Large CAFOs	Medium CAFOs	Small CAFOs
Cattle or cow/calf pairs	1,000 or more	300 to 999	Less than 300
Mature dairy cattle	700 or more	200 to 699	Less than 200
Veal calves	1,000 or more	300 to 999	Less than 300
Swine (weighing over 25 kg [55 lb])	2,500 or more	750 to 2,499	Less than 750
Swine (weighing less than 25 kg [55 lb])	10,000 or more	3,000 to 9,999	Less than 3,000
Horses	500 or more	150 to 499	Less than 150
Sheep or lambs	10,000 or more	3,000 to 9,999	Less than 3,000
Turkeys	55,000 or more	16,500 to 54,999	Less than 16,500
Laying hens or broilers (liquid manure handling systems)	30,000 or more	9,000 to 29,999	Less than 9,000
Chickens other than laying hens (other than a liquid manure handling system)	125,000 or more	37,500 to 124,999	Less than 37,500
Laying hens (other than a liquid manure handling system)	82,000 or more	25,000 to 81,999	Less than 25,000
Ducks (other than a liquid manure handling system)	30,000 or more	10,000 to 29,999	Less than 10,000
Ducks (liquid manure handling systems)	5,000 or more	1,500 to 4,999	Less than 1,500

State sediment and erosion control programs are an example of traditional state nonpoint source regulation programs. USEPA regulations defining agricultural stormwater discharge as requiring farmers applying manure to farmland to follow best management practices (BMPs) in order to qualify for the agricultural stormwater exemption are an apparent but legally untested exception to USEPA's lack of direct agricultural nonpoint source regulatory authority. It will remain unclear whether this definition of agricultural stormwater discharge is legal until it is challenged in court. While USEPA's authority to regulate non-CAFO agricultural producers applying manure to agricultural land is legally uncertain, states clearly can regulate them if they choose to do so.

CHESAPEAKE BAY WATER POLLUTION

The Chesapeake Bay is the largest estuary in North America, home to over 3,600 plant and animal species. The bay is drained by portions of Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, and Washington, DC. The bay's water quality has been deteriorating since the 1930s. Agriculture is the largest single contributor of N, P, and sediment loadings to the bay and its tributaries (figure 1). Twenty-two percent of the Chesapeake Bay watershed is agricultural land, and agriculture accounts for approximately 44% of N and P loads and 65% of sediment loads

(USEPA 2010, 4-29). Land application of manure is an important N and P recycling process in agriculture. Because manure is so extensively used as a source of N and P, it is considered as important as inorganic fertilizer and also is a significant source of nonpoint source pollution. Other major pollution sources of the bay include municipal wastewater treatment plants, industrial wastewater discharges, urban and suburban stormwater runoff, and septic tanks.

THE ROAD TO THE CHESAPEAKE BAY TOTAL MAXIMUM DAILY LOAD

The 2010 USEPA Chesapeake Bay TMDL is the result of over three decades of cooperative state and federal efforts to reduce nonpoint pollution of the Chesapeake Bay watershed. The original 1983 Chesapeake Bay Agreement between Maryland, Virginia, Pennsylvania, the District of Columbia, the Chesapeake Bay Commission, and the USEPA was the first multistate coordinated effort to restore bay water quality. The 1983 agreement established a process for the states and USEPA to begin developing programs to reduce the bay pollution load (CBP 1983). The 1987 Chesapeake Bay Agreement established a key objective to "reduce and control point and nonpoint sources of pollution to attain the water quality necessary to support the living resources of the Bay." The 1987 agreement also established the first numeric goal for water quality

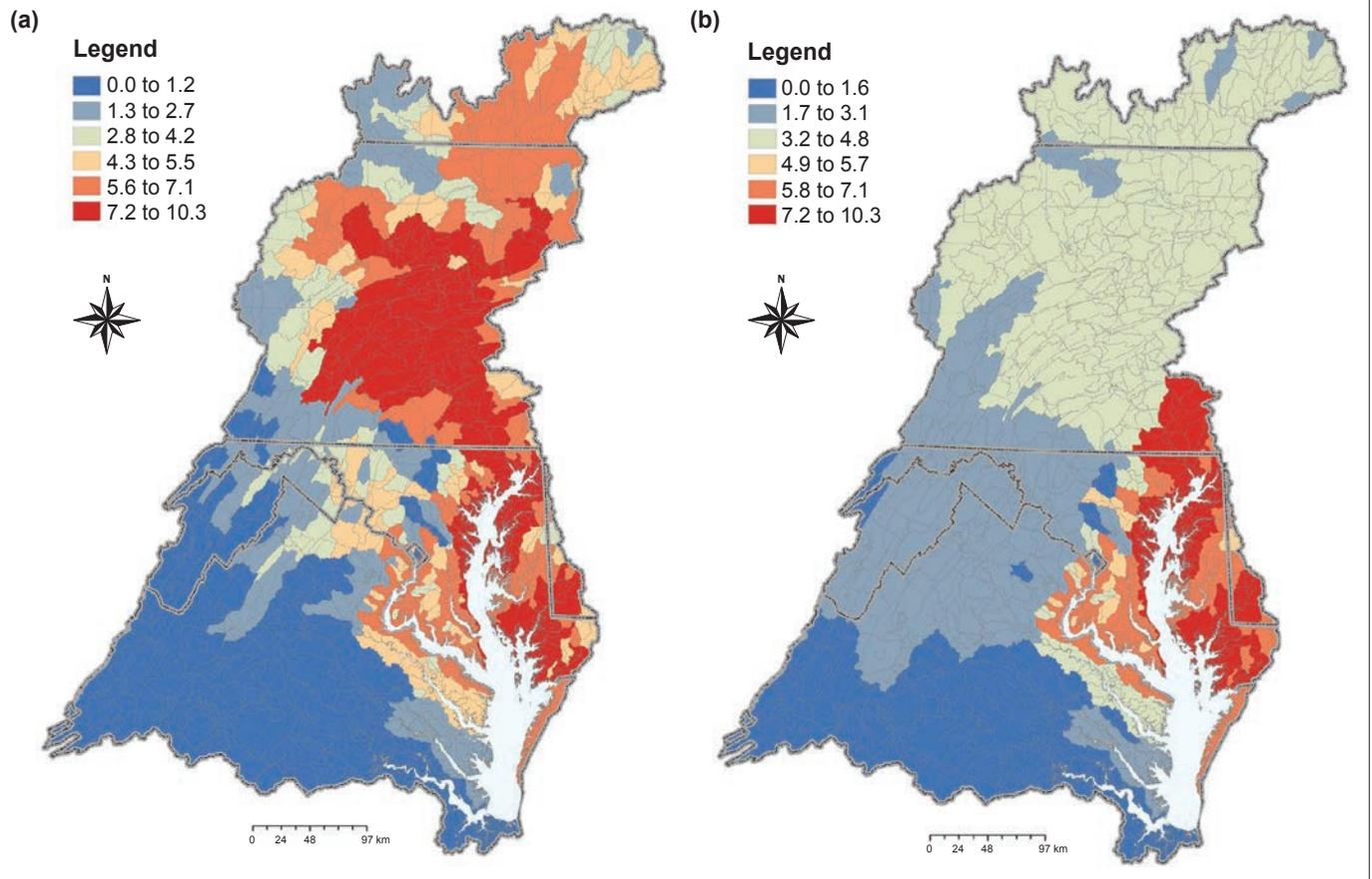
improvement: a 40% reduction in N and P entering the bay by 2000 (CBP 1987). By 2000 N and P had been reduced, but only by 13% for N and 25% for P. This was accomplished primarily through the states banning phosphates in detergents and municipal wastewater treatment plant upgrades (CBP 1997; Houck 2011).

In the Chesapeake 2000 agreement, the states pledged to reduce N, P, and sediment pollution loads such that water quality standards would be met by 2010 as well as the 40% N and P reduction from the 1987 agreement (CBP 2000). In 2007 bay leaders realized that they were only about halfway toward accomplishing these objectives and formally requested USEPA to establish a TMDL for the Chesapeake Bay (CBP 2008).

Bay leaders understood that in order to meet the 40% nutrient reduction goal they would need to control agricultural runoff and nutrient discharges. Moving from the model of education, cost-share assistance, and voluntary BMPs to more robust nutrient controls was well understood to be a major and politically contentious step. Nonetheless four states took that major policy step before the bay TMDL was established. This important step was extending mandatory manure application BMPs to all or most agricultural manure users, not simply to those livestock operations that qualified as large CAFOs. Pennsylvania's 1993 livestock

Figure 1

Subbasins across the Chesapeake Bay watershed with the highest (red) to lowest (blue) pound for pound (a) nitrogen (USEPA 2010, ES-6) and (b) phosphorus (USEPA 2010, 6-22) pollutant loading effect on Chesapeake Bay water quality.



facility legislation would lead to regulation of manure application by end users in 2006 (PDEP 2017). Nutrient management laws adopted in Maryland in 1998 and Delaware in 1999 both require manure end users to develop and implement nutrient management plans to reduce N and P runoff (MDA 2017; DDA 2017). In 2010 Virginia's nutrient management plan requirements were extended by regulation to poultry waste end users (VDCR 2017). These very significant state water quality policy developments were all taken before the TMDL was established, indicating state accepting responsibility for agricultural nonpoint pollution control.

THE CHESAPEAKE BAY TOTAL MAXIMUM DAILY LOAD

In the Chesapeake Bay TMDL, USEPA and the states established the total quantity of N, P, and sediment that could be discharged in the basin (USEPA 2010, ES-1). USEPA and the states then broke down

these totals by river basins and subbasins, and among point sources and nonpoint sources. Each state (and the District of Columbia) received a list of subbasins and associated pollutant loads, allocated to point sources and nonpoint sources. The states then developed Phase I watershed implementation plans (WIPs) to describe how each state intended to achieve the N, P, and sediment load reductions. The Phase I WIPs identified schedules, programs, and actions for pollutant reduction, including identifying new regulatory authorities to be authorized and implemented, improving compliance with existing regulations, obtaining increased funding for agricultural cost-share programs, and issuing point source NPDES permits with more stringent waste discharge requirements. Phase II WIPs would take the load reductions down to the subbasin level.

The part of the TMDL program that led to the *Farm Bureau v. EPA* litigation

is the USEPA "reasonable assurance" requirement. When pollution loads are distributed between point and nonpoint sources, USEPA has legal authority to—in the extreme—take over state point source permitting programs if the state programs aren't meeting water quality requirements. USEPA has no similar authority for nonpoint sources. So in the TMDL program USEPA requires "reasonable assurance" from states that they will control nonpoint pollution loads. If USEPA is persuaded by the states' reasonable assurances, then pollution control requirements for point sources can be geared to remedy only the point source share of the total pollution load. In the absence of state reasonable assurances of effective nonpoint pollution control, USEPA's only recourse is to require point source pollution control requirements to accomplish water quality standards for the total pollution load, point and nonpoint. In river basins where much or even most of the pollution load is from

nonpoint sources, the failure to control nonpoint sources (agricultural runoff and urban and suburban stormwater runoff) means that pollution load reduction falls completely on point source dischargers (municipal and industrial wastewater discharges) (USEPA 2010, 7-1). This sets up an interesting political dynamic. Municipal and industrial dischargers have an incentive to see that the state controls nonpoint water pollution in order to avoid expensive upgrades to municipal and industrial wastewater treatment systems.

States have some choices in dealing with nonpoint agricultural N and P discharges. Under current USEPA regulations, only large CAFOs are considered point sources and potentially subject to USEPA regulation in the absence of effective state regulation. Small and medium CAFOs are not subject to CNMP requirements unless states elect to so regulate them. Because land receiving manure applications can over time become oversaturated with nutrients, some manure eventually will need to be applied to non-CAFO land, i.e., agricultural land not directly associated with the CAFO producing the manure. In the Chesapeake Bay region, this has become an issue with poultry production, where the CAFO may be on a relatively small amount of land and generates much more manure than can be agronomically applied to the CAFO's cropland or pasture. Thus the manure must be applied to other lands that have the capacity to utilize the nutrients. So states could elect to regulate smaller livestock operations as CAFOs, or they could focus their efforts directly on the manure application itself, which is a principal cause of agricultural nonpoint nutrient pollution. As mentioned earlier, the states of Maryland, Delaware, Pennsylvania, and Virginia have all evolved nutrient control policies such that the principal regulatory focus is farmers who apply manure to agricultural land, rather than exclusively on large CAFOs (MDA 2017; DDA 2017; PDEP 2017; VDCR 2017). This is not something that USEPA can directly require states to do but something that states can do if legislatively authorized. These programs regulating manure application by end users go a long way in providing reasonable assur-

ance to USEPA that these four states will effectively regulate agricultural nonpoint nutrient discharges so that point sources in those states are required to clean up their discharges only to the extent necessary to meet their proportion of the total pollution load. These programs in effect protect point sources of municipal and industrial wastewater discharges from having to shoulder a disproportionate amount of water pollution reduction needed to improve the bay's water quality. This regulatory dynamic of essentially requiring agriculture to bear responsibility for its share of the bay water quality cleanup is what was challenged in the courts.

THE CHESAPEAKE BAY TOTAL MAXIMUM DAILY LOAD IN THE COURTS

The USEPA Chesapeake Bay TMDL was challenged in federal court by a coalition of state and national farming and agribusiness groups, led by the Farm Bureau (*Farm Bureau v. EPA*, 984 F.Supp.2d 289 [M.D. Pa. 2013]). Defendants, besides the USEPA, included municipal water treatment associations and clean water groups. Interestingly, none of the bay states themselves joined the legal challenge to the bay TMDL. Farm Bureau had two major legal challenges. The first challenge was that the CWA authorized USEPA only to establish a single TMDL for N, P, and sediment for the entire Chesapeake Bay and left it to the states to divide the pollution load between point and nonpoint sources, to allocate the point and nonpoint pollution loads among the 92 stream segments identified in the TMDL (or otherwise as each state might elect), and to allocate nonpoint pollution loads among different nonpoint sectors (agriculture, urban, and suburban runoff, etc.). The second challenge is that because USEPA was not legally authorized to directly regulate nonpoint agricultural nutrient and sediment pollution under the CWA, it could not indirectly do so through the reasonable assurance requirement.

In analyzing the pollution load allocation issue, the courts began with the legal definition of TMDL (984 F.Supp.2d 313-315; 792 F.3d. 294-298). The term TMDL is not defined by Congress in the CWA, and the term could be interpreted several ways. Consequently, under the

1984 *Chevron v. Natural Resources Defense Council* (104 S. Ct. 2778) rule of judicial interpretation, a court reviewing a contested administrative regulation limits its consideration to whether the administrative definition is reasonable, considering the entire statute as a whole. The court does not consider whether the administrative interpretation is the one that the judge (or justices) would have arrived at, but whether the administrative decision is reasonable. Under this approach administrative agencies usually have a fair degree of permissible discretion; federal district courts and courts of appeal usually defer to reasonable administrative decisions.

Regarding the Chesapeake Bay TMDL, both the district court and the court of appeals found USEPA's detailed breakdown of N, P, and sediment loads among point and nonpoint sources, nonpoint discharge sectors, and bay tributaries and watersheds to be reasonable. The courts noted that the TMDL quantities had been developed iteratively with the states, and that the TMDL specificity simplified state NPDES permitting to meet the TMDL. Since the ultimate goal of the TMDL process is to achieve the water quality objectives for the bay watershed, the courts determined that the bay TMDL was reasonably structured to achieve that overarching objective (984 F.Supp.2d 315-324; 792 F.3d. 298-300).

The second major issue was whether USEPA's reasonable assurance requirements were in effect illegal USEPA regulation of nonpoint sources beyond the legal limits of the CWA, or whether they impermissibly intruded onto a state's authority to regulate land use. Here the courts noted the operational and political challenges in getting several states to agree to a common objective—improving the bay's water quality. It is important for each state to be confident that if it takes politically controversial steps to reduce agricultural nonpoint pollution, all the other states will have similar obligations to satisfy. USEPA essentially is the referee that keeps all the states honest in meeting the bay TMDL. In this context, both courts found the reasonable assurance requirements a reasonable way for ensuring that each state met its obligation to satisfy the

bay TMDL (984 F.Supp.2d 325-327; 792 F.3d. 300-301). The court of appeals further found that because the Chesapeake Bay was an interstate water body, it was clearly within the federal government's broad interstate commerce clause regulatory authority (792 F.3d. 304-306).

Two additional issues were raised in the district court but not on appeal: whether there had been adequate public notice and opportunity to comment on the bay TMDL and whether USEPA's modeling support of the TMDL was adequate. The district court ruled in favor of USEPA on both issues. Even though the formal 45 day notice and comment period would have made it challenging to thoroughly evaluate and comment on the TMDL if one started from scratch, the TMDL had been in the works for years with numerous opportunities for public participation in that process along the way. Consequently, the court concluded there was adequate public notice and opportunity to comment on the proposed TMDL (984 F.Supp.2d 333-334). Regarding the USEPA modeling results supporting the TMDL, the district court noted that USEPA has wide discretion in its scientific modeling efforts and that a model will be rejected only if it "bears no rational relationship to the reality it purports to represent." The court deferred to USEPA's scientific and technical expertise, and concluded that USEPA's modeling efforts were not arbitrary or capricious (948 F. Supp.2d 340-343).

Neither court opinion referred to the Maryland, Delaware, Pennsylvania, or Virginia manure restrictions. However, these programs are strong evidence of a state understanding what is needed to make a meaningful improvement in the bay's water quality and of the political commitment to take those necessary steps, challenging as they may be. Of course enacting laws or regulations alone are not enough to improve manure utilization or reduce nutrient pollution. Regulations must be enforced; databases of end user reports must be created and analyzed; and cost share assistance for CNMPs, riparian buffers, soil and manure testing, and so on can be provided. Adoption of manure application control legislation and regulations are a crucial first step. However, they

are only that first step and must be coupled with administrative oversight and enforcement, and—at least for now—cost share assistance to ease the costs for regulated manure users. The states have stepped up, so far, to the challenge of improving bay water quality, but there is no doubt that USEPA oversight and reasonable assurance requirements helped nudge states to get where they are now. Hopefully the current impressive progress will be maintained and the ultimate bay water quality improvement objectives achieved.

CONCLUSIONS AND IMPLICATIONS

The US Supreme Court declined to entertain an appeal to the court of appeals' ruling in favor of the USEPA. This means that the Chesapeake Bay TMDL is legally authorized and that any Supreme Court consideration of the legal issues raised in the *Farm Bureau v. EPA* litigation will occur if ever relative to a different lawsuit, perhaps in a different watershed. This adverse result for the Farm Bureau is in contrast to a series of earlier successful lawsuits where agricultural interests defeated USEPA CAFO regulations, notably in the 2014 *Alt v. EPA* (758 F.3d 588) case regarding poultry house dust and the 2005 *Waterkeeper Alliance v. EPA* (399 F.3d 486) and 2011 *National Pork Producer Council v. EPA* (635 F.3d 738) duty to apply decisions. However, *Farm Bureau v. EPA* should not be interpreted as meaning USEPA can force states to adopt and implement nonpoint source controls on agricultural pollutants where states are unwilling to do so. Indeed, clean water groups seeking to force USEPA to establish TMDLs to control nutrient pollution of the Gulf of Mexico lost their case in 2015 (*Gulf Restoration Network v. McCarthy*, 783 F.3d 227). Reading between the lines in that case, one can infer that USEPA elected not to pursue the TMDL option in part because states were not committed to implementing the type of agricultural nonpoint pollution controls that are being pioneered in the Chesapeake Bay. Clearly USEPA could have elected to adopt a Gulf of Mexico TMDL, but so far the courts have ruled that it cannot be forced to do so, or force agricultural nonpoint pol-

lution controls upon states unwilling to implement them.

Anyone reviewing the history of the Chesapeake Bay water quality protection efforts must be impressed with the high degree of cooperation and collaboration between state and federal officials and policymakers. While clean water advocates have chafed at the—to them—slow pace of agricultural nonpoint pollution control adoption and implementation (Perez et al. 2009), it is nonetheless clear that the Maryland, Delaware, Pennsylvania, and Virginia manure application control programs are important models for other states to consider.

ACKNOWLEDGEMENTS

This work is supported by the USDA National Institute of Food and Agriculture, Hatch Project NEB-24-174.

REFERENCES

- CBP (Chesapeake Bay Program). 1983. Chesapeake Bay Agreement—1983. Annapolis, MD: Chesapeake Bay Program. http://www.chesapeakebay.net/publications/title/chesapeake_bay_agreement_-_1983.
- CBP. 1987. 1987 Chesapeake Bay Agreement. Annapolis, MD: Chesapeake Bay Program. http://www.chesapeakebay.net/publications/title/chesapeake_bay_agreement_-_1987.
- CBP. 1997. Chesapeake Bay Nutrient Reduction Progress and Future Directions. Annapolis, MD: Chesapeake Bay Program. http://www.chesapeakebay.net/publications/title/chesapeake_bay_nutrient_reduction_progress_and_future_directions_1997.
- CBP. 2000. Chesapeake 2000 Agreement. Annapolis, MD: Chesapeake Bay Program. http://www.chesapeakebay.net/publications/title/chesapeake_2000_agreement.
- CBP. 2008. Chesapeake Bay 2007 Health and Restoration Assessment. Annapolis, MD: Chesapeake Bay Program. http://www.chesapeakebay.net/publications/title/chesapeake_bay_2007_health_and_restoration_assessment.
- DDA (Delaware Department of Agriculture). 2017. Nutrient Management. Dover, DE: Delaware Department of Agriculture. <http://dda.delaware.gov/nutrients/index.shtml>.
- Houck, O. 2011. The Clean Water Act returns (again): Part I, TMDLs and the Chesapeake Bay. *Environmental Law Reporter* 41(3):10208-10228.

- MDA (Maryland Department of Agriculture). 2017. Agricultural Nutrient Management. Annapolis, MD: Maryland Department of Agriculture. http://mda.maryland.gov/resource_conservation/Pages/nutrient_management.aspx.
- PDEP (Pennsylvania Department of Environmental Protection). 2017. Manure Management. Harrisburg, PA: Pennsylvania Department of Environmental Protection. <http://www.dep.pa.gov/Business/Water/CleanWater/AgriculturalOperations/ManureManagement/Pages/default.aspx>.
- Perez, M., C. Cox, and K. Cook. 2009. Facing facts in the Chesapeake Bay. Washington, DC: Environmental Working Group. <http://www.ewg.org/research/facing-facts-chesapeake-bay>.
- USEPA (US Environmental Protection Agency). 2010. Chesapeake Bay total maximum daily load for nitrogen, phosphorus and sediment. Washington, DC: US Environmental Protection Agency. <https://www.epa.gov/chesapeake-bay-tmdl/chesapeake-bay-tmdl-document>.
- VDCR (Virginia Department of Conservation and Recreation). 2017. Virginia's Nutrient Management Program. Richmond, VA: Virginia Department of Conservation and Recreation. <http://www.dcr.virginia.gov/soil-and-water/nutmgt>.