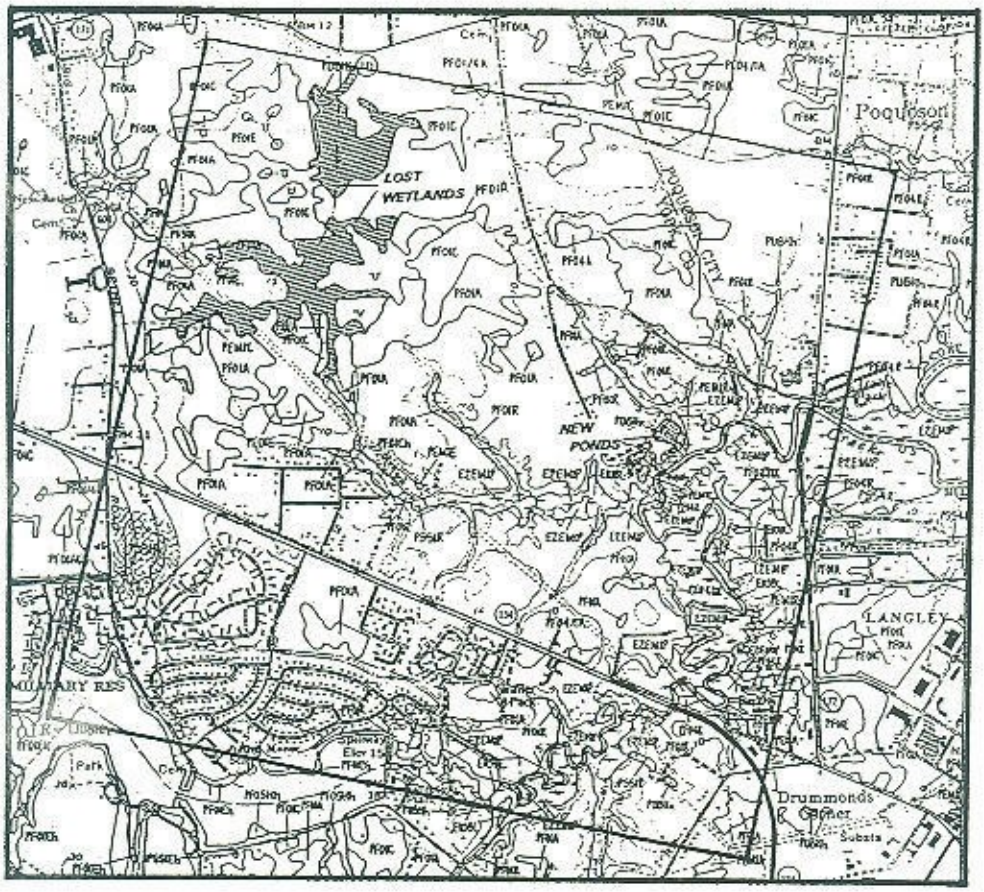
RECENT WETLAND STATUS AND TRENDS IN THE CHESAPEAKE WATERSHED (1982 to 1989): EXECUTIVE SUMMARY REPORT



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RECENT WETLAND STATUS AND TRENDS IN THE CHESAPEAKE WATERSHED (1982 to 1989): EXECUTIVE SUMMARY REPORT

by

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INTRODUCTION

This report summarizes major findings of a wetland status and trends study completed for the 63,000-square mile Chesapeake Bay Watershed. The study was conducted with funding support from the U.S. Fish and Wildlife Service and the Environmental Protection Agency at the request of the Living Resources Subcommittee of the interagency Chesapeake Bay Program. The results of this study have been published in a technical report entitled "Recent Wetland Status and Trends in the Chesapeake Watershed (1982 to 1989): Technical Report." This report is available from the Chesapeake Bay Program, 410 Severn Avenue, Annapolis, MD 21403 (800-968-7229).

STUDY METHODS

Conventional photointerpretation techniques were used to identify wetland trends in the Watershed by comparing changes in a given area's wetlands on two sets of aerial photography. Wetlands were defined and classified according to the U.S. Fish and Wildlife Service's official classification system (Cowardin et al. 1979). The results of this study were derived in two ways: (1) from a statistical sampling program where wetland changes in 760 4-square mile plots were evaluated to estimate the wetland trends between 1982 and 1989 for the entire Watershed, and (2) for selected geographic areas within the Watershed, detailed trends for these areas were determined. The former approach generated estimates of wetland acreages and wetland losses and gains between 1982 and 1989. The latter approach identified all photointerpretable changes in the subject areas. The highlights of both studies are summarized below, with numbers presented for the former study being estimated totals.

STATISTICAL SAMPLING STUDY HIGHLIGHTS

An estimated 5.2 million acres of wetlands and deepwater habitats existed in the Chesapeake Watershed in 1989. Wetlands accounted for roughly 1.7 million acres, covering about 4 percent of the Watershed. This amounts to an area about 1.4 times the size of Delaware or about one-quarter the size of Maryland. Freshwater (palustrine) wetlands are the predominant type occupying nearly 1.5 million acres, with forested wetlands alone representing 60 percent of the Watershed's wetlands (Figure 1). The Watershed's wetlands fell within six states: Delaware, Maryland, New York, Pennsylvania, Virginia, and West Virginia (Table 1). Approximately two-thirds of the Watershed's wetlands occur in two states: Virginia (40%) and Maryland (27%) (Figure 2). The distribution of wetland types are shown in Figure 3.

Between 1982 and 1989, palustrine vegetated wetlands (freshwater marshes, wet meadows, swamps, and bogs) declined by 2 percent. About 36,000 acres were converted to drylands and waterbodies: (1) 14,700 acres of forested wetlands, (2) about 10,600 acres of emergent wetlands, and (3) about 10,700 acres of scrub-shrub wetlands. These collective

losses equal an area about the size of the District of Columbia. In addition, about 18,000 acres of palustrine forests were harvested for timber. This, however, is not considered a loss, since these areas are still wetlands that will likely return to forested wetlands in time.

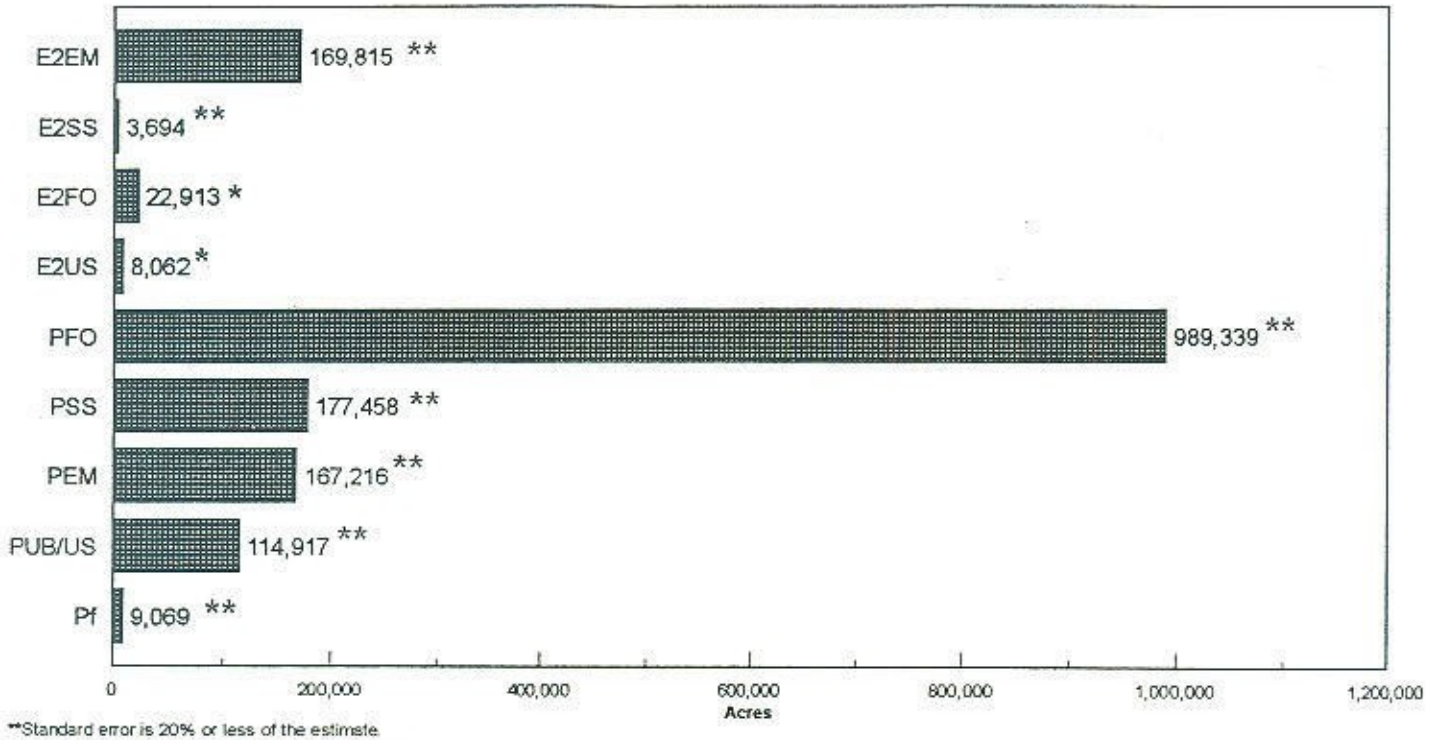
Virginia had the greatest palustrine vegetated wetland losses of any state, losing approximately 23,000 acres: about 4,000 acres of emergent wetlands, over 8,000 acres of scrub-shrub wetlands, and nearly 11,000 acres of forested wetlands during the study period. Maryland lost about 5,000 acres of the palustrine vegetated wetlands during this time: about 2,400 acres of emergent wetlands, about 500 acres of scrub-shrub wetlands and over 2,500 acres of palustrine forests. Pennsylvania lost almost 4,000 acres of these wetlands: mostly emergent wetlands (over 2,000 acres) and scrub-shrub wetlands (almost 1,700 acres). Causes of palustrine vegetated wetland losses are presented in Figures 4-6. Table 2 summarizes vegetated wetland trends for the Watershed based on wetland type.

Overall, the status of estuarine wetlands (salt and brackish tidal marshes) has improved. Prior to the enactment of state coastal or tidal wetland laws and strengthened Federal regulation under the Clean Water Act, these wetlands were dredged and/or filled at high rates. The current study suggests that increased state and Federal wetland regulation has improved the condition of these wetlands. They are no longer being wantonly destroyed. There is still pressure to convert them to alternative uses, but landowners, developers, and the general public realize the values of these wet areas and are fully aware of government programs to regulate activities in and/or protect these wetlands.

The situation for palustrine vegetated wetlands was quite different. These wetlands continue to be destroyed at alarming rates. Despite the existence of Federal regulations, nontidal freshwater wetlands continued to experience heavy losses. There was a 12-fold increase in the net annual loss rate of forested wetlands. From 1982 to 1989, the annual loss rate was about 2,000 acres versus almost 200 acres from an earlier period (mid 1950s - 1980s). Much of this forested wetland "loss" resulted from increased timber harvest during the study period. In managed forests, this "loss" of forested wetlands is usually <u>not</u> a loss of wetland, but simply a temporary change in the wetland type. The emergent and scrub-shrub wetlands resulting from timber harvest are successional types that eventually become forested wetlands. Other harvested forested wetlands, however, may be converted to other uses. Almost 15,000 acres of palustrine forests were destroyed through conversion to drylands and to open waterbodies (e.g., reservoirs and ponds). In addition, another 21,000 acres of vegetated wetland losses involved emergent and scrub-shrub wetlands. It is evident that wetland regulations must be improved if we are to protect our remaining wetlands.

Based on the statistical analysis, seven areas were identified as wetland loss hotspots where tremendous losses of certain wetland types occurred from 1982 and 1989: (1) southeastern Virginia, (2) Piedmont region of Virginia, (3) Eastern Shore of Maryland, (4) western Delaware, (5) Upper Coastal Plain of Virginia, (6) western Virginia - Blue Ridge and Appalachians, and (7) northeastern Pennsylvania (Susquehanna, Bradford, and Tioga Counties). These areas accounted for about 85 percent of the palustrine vegetated wetlands that were converted to drylands and waterbodies during the 7-year study period. Wetland protection efforts should be strengthened in these areas.

Figure 1. Estimated 1989 wetland acreages for the Chesapeake Watershed.



**Standard error is 20% or less of the estimate.
*Standard error is between 20 - 50% of the estimate.

Figure 2. Distribution of wetlands in the Chesapeake Watershed by state.

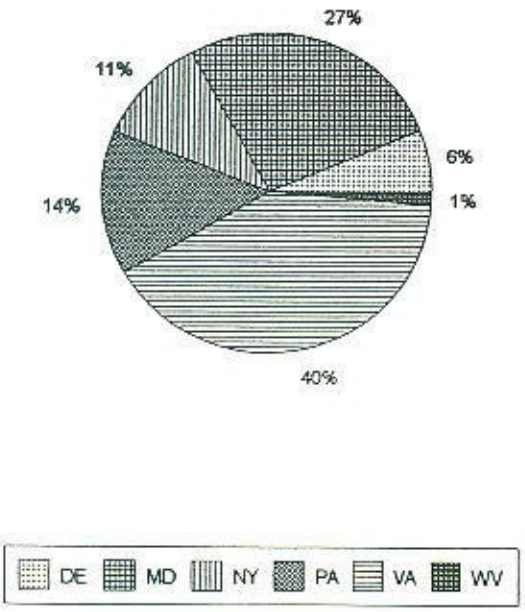


Figure 3. Distribution of wetland types for the Chesapeake Watershed.

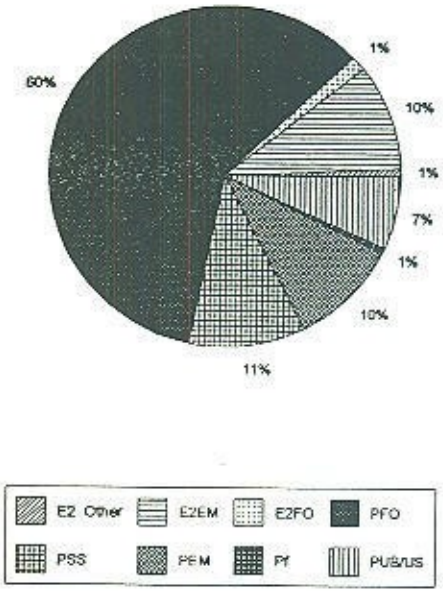


Figure 4. Causes of palustrine forest destruction in the Chesapeake Watershed. ***Note: Excludes about 18,000 acres that were harvested between 1982 and 1989.***

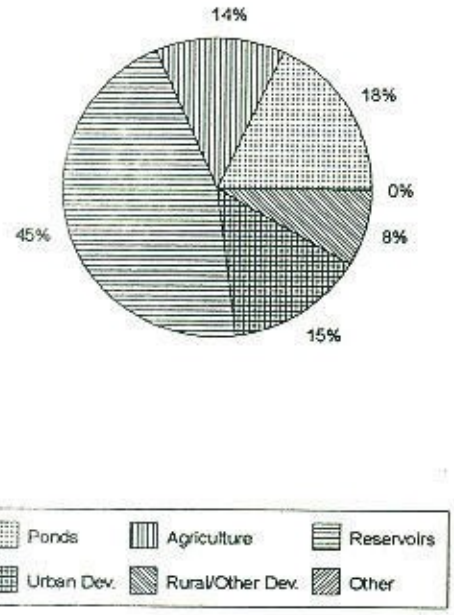


Figure 5. Causes of palustrine scrub-shrub wetland destruction in the Chesapeake Watershed.

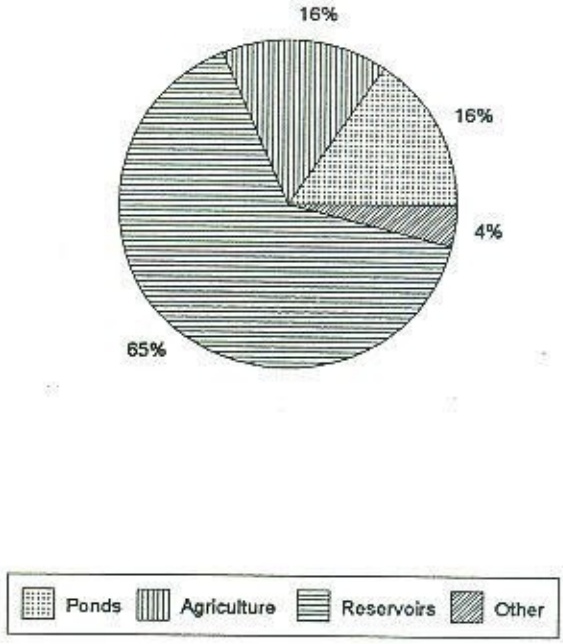


Figure 6. Causes of palustrine emergent wetland destruction in the Chesapeake Watershed.

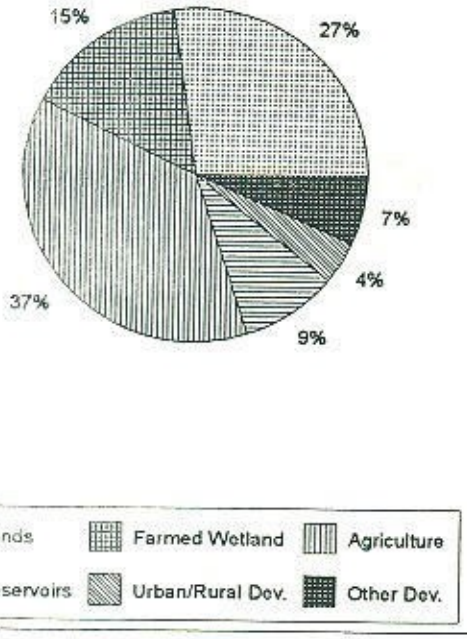


Table 1. Estimated 1989 wetland acreages in the Chesapeake Watershed by state.

Wetland Type	DE Acreage	MD Acreage	NY Acreage	PA Acreage	VA Acreage	WV Acreage
Estuarine Wetlands						
Emergent	---	96,453**	---	---	73,362**	---
Scrub-Shrub	---	2,396*	---	---	1,298*	---
Forested	---	18,227*	---	---	4,686	---
Unconsolidated Shore	---	2,933*	---	---	5,129*	---
Total	---	120,009**	---	---	84,475**	---
Palustrine Wetlands						
Forested	91,407**	262,128**	77,737	120,100**	430,013**	7,954*
Scrub-Shrub	5,580**	20,852**	45,594	46,050*	57,782**	1,600
Emergent	2,189*	20,243**	40,649*	42,459*	53,226**	8,450
Unconsolidated Shore	43	502*	---	955*	363*	---
Unconsolidated Bottom	1,108**	17,777**	17,110	30,574**	42,500**	3,985*
Farmed	4,564*	2,542*	---	131	1,640	192
Total	104,891**	324,044**	181,090	240,269**	585,524**	22,181*
Total Wetlands	**104,891****	**444,053****	**181,090**	**240,269****	**669,999****	**22,181***

** Standard error is equal to or less than 20 percent of the estimated acreage.

* Standard error is less than 50 percent of the estimate, but greater than 20 percent of the estimated acreage.

Note: Estimates without an asterisk have higher standard errors.

Table 2. Changes in specific types of vegetated wetlands in the Chesapeake Watershed (1982-1989).

Vegetated Wetland Type	1982 Acres	1989 Acres	Acres Changed To Other Veg Wetds	Acres Gained From Veg Wetds	Acres Destroyed	Acres Gained From Other Areas	Net Change
PFO	1,003,745 **	989,339 **	25,655 **	22,355 **	14,700 *	3,594	-14,406 *
PSS	178,424 **	177,458 **	26,673 **	35,193 **	10,693	1,207 *	-966
PEM	171,499 **	167,216 **	19,230 **	13,993 **	10,642 **	11,596 *	-4,283
E2EM	170,311 **	169,815 **	281 *	741	1,085 *	129 *	-496
E2SS	3,231 **	3,694 **	196 *	590 *	0	69	+463 *
E2FO	23,784 *	22,913 *	1,306	469 *	62	28	-871

** Standard error is equal to or less than 20 percent of the estimated acreage.

* Standard error is less than 50 percent of the estimate, but greater than 20 percent of the estimated acreage.

Note: Estimates without an asterisk have higher standard errors.

WETLAND TRENDS STUDY HIGHLIGHTS FOR SPECIFIC GEOGRAPHIC AREAS

Several areas were chosen by Federal and state agency representatives for detailed examination of recent wetland trends. These areas may reflect either highly vulnerable areas or other geographic areas of interest to the agencies. Fifteen areas were selected in three states (Virginia, Maryland, and Pennsylvania): (1) Norfolk-Hampton region (VA), (2) Chickahominy River area (VA), (3) northern Virginia, (4) Dorchester County area (MD), (5) Lower Eastern Shore (MD), (6) Western Shore (MD), (7) Kent Island area (MD), (8) North East (MD), (9) Fall Zone (MD), (10) Piedmont region (MD), (11) Northeast Glaciated region (PA), (12) Greater Harrisburg (PA), (13) Williamsport area (PA), (14) Hazelton (PA), and (15) DuBois and Falls Creek (PA). The more significant results of these studies are summarized in Table 3. Some areas where little wetland alteration occurred are not included in this table. For additional information, please refer to individual reports listed in the references section.

Table 3. Wetland trend highlights for selected areas in the Chesapeake watershed.

Study Area (# of 1:24K Quads)	Study Period	Wetland Type	Acres Converted to Upland	Acres Converted to Waterbody	Major Causes of Wetland Conversion to Upland (acres)
Norfolk-Hampton, VA (12)	1982-89/90	PFO PSS PEM	3,934 494 383	175 9 19	Housing (2,051), Agriculture (1,202), Sanitary Land Fill (397), Resort Develop. (267), Ditching (243), Roads/ Hwys. (131), and Commercial Dev. (127)
Chickahominy River area, VA (7)	1982/84-89/90	PFO PSS PEM	87 13 3	74 60 37	Sand/Gravel Pits (36), Ponds (21), Ditching (12), Housing (8), and Resort Develop. (6)
Northern Virginia (6)	1980/81-88/91	PFO PSS PEM	80 16 30	17 10 21	Commercial Dev. (42), Housing (28), and Roads/Hwys. (27)

Table 3 *(Continued)*

Dorchester County area, MD (6)	1981/82-88/89	PFO PSS PEM	608 111 63	63 4 38	Agriculture/Regulated Shooting Areas (711), Roads (18), and Housing/Commercial Development (15) (Note: Also lost 74 acres of estuarine forested wetlands to agric./regulated shooting areas and detected significant changes in estuarine wetlands due to sea level rise/coastal erosion.)
Lower Eastern Shore, MD (5)	1982-88/89	PFO PSS PEM	174 3 12	2 - -	Agriculture (106), Ditching (52), Public Facilities (14), and Housing (9)
Western Shore, MD (8)	1981-88	PFO PSS PEM	115 6 22	22 9 4	Housing (51), Unknown (32), Sand/Gravel Pits (23), Commercial Dev. (17), and Road Construction (12)
Kent Island area, MD (2)	1982-89	E2EM E2SS PFO PSS PEM	61 4 12 8 4	5 - - - -	Housing (43), Agriculture (13), Commercial Dev. (13), and Roads/Hwys. (10)
Piedmont region, MD (6)	1980/81-88/89	PFO PSS PEM	28 4 57	2 1 8	Agriculture (44), Roads/ Hwys. (29), and Housing (9)
Northeast Glaciated region, PA (13)	1981/82-87/88	PFO PSS PEM	7 13 38	9 34 117	Agriculture (30) and Housing (13)
Greater Harrisburg, PA (13)	1983/84-87/88	PFO PEM	3 12	1 9	Agriculture (10) and Housing (2)

RECOMMENDED ACTIONS

The following recommendations are offered to help improve the status of wetlands in the Chesapeake Watershed. Some of the suggestions are specific to the Watershed, while most are of a general nature applicable to many areas in the eastern U.S. and elsewhere.

1. Develop and adopt strategies to increase protection of palustrine vegetated wetlands, especially for seasonally saturated and temporarily flooded wetlands and isolated wetlands on the Coastal Plain and for the states of Virginia and Delaware. Such strategies must address agricultural uses of wetlands, since such activities have remained to be major causes of wetland loss in the Watershed. Other activities that need to be included in these strategies are aquaculture, regulated shooting areas, and forestry practices in wetlands.

2. Interpret the regulatory definition of wetland in a scientifically sound manner and use science-based techniques to identify these wetlands on the ground. Use policy to regulate uses of wetlands and not to define what a wetland is. It is more efficient and effective to change policy to meet current needs than to try to change established scientific principles and practices to satisfy a public policy need.

3. In southeastern Virginia where palustrine vegetated wetlands are disappearing at an alarming rate, it may be advisable to establish an intergovernmental committee (Federal, state, and local) to develop a regional strategy for reducing wetland losses while pursuing realistic economic growth. This is perhaps the greatest challenge for similar "wetland loss hotspots" in the Chesapeake Watershed and elsewhere in the country. It may require developing innovative tax incentives and wetland acquisition initiatives and establishing realistic land use options and growth/development limits that maintain and enhance existing environmental quality. The 1988 report entitled "Population Growth and Development in the Chesapeake Bay Watershed to the Year 2020" provides insight into the problems and the vision of how this may be accomplished. This report offers many specific recommendations that should be implemented to maintain a high quality environment in the Watershed.

4. Eliminate government-sponsored wetland channelization and ditching programs and seek other more environmentally acceptable means of reducing flood damages, e.g., natural valley storage approach.

5. Locate stormwater detention basins and agricultural sediment ponds outside of wetlands and of streams. With increasing urban development, stream flows increase leading to accelerated erosion of streambanks and streambeds. Proper location of these basins should minimize wetland and stream impacts.

6. Increase wetland acquisition to preserve functions of existing wetland systems. Identify large tracts of remaining wetlands and strive to connect them together, thereby linking presently isolated tracts into an interconnected network of wetlands. This effort attempts to minimize wetland fragmentation for improved wildlife habitat and should enhance other wetland functions as well.

7. Identify wetland landscapes in need of restoration and initiate large-scale restoration efforts to restore ecosystem functions.

8. Develop measures and programs to maintain and establish vegetated buffers around wetlands and along waterbodies. This could produce significant water quality benefits and enhance wildlife habitat values.

9. Instead of wetland trend studies, develop and initiate monitoring programs to provide more real-time assessment of wetlands for analyzing and modifying current policies before too much wetland destruction occurs.

10. Conduct research to increase our knowledge of the hydrology and functions of seasonally saturated wetlands and isolated temporarily flooded wetlands on the Coastal Plain.

11. Develop outreach programs to encourage private landowners to protect their wetlands and/or to minimize wetland alteration during activities such as timber harvest.

12. Continue to increase public education efforts. A well informed public will likely select environmentally sound approaches to land use in the future.

Wetlands are the vital link between land and water. As such, they help improve water quality, temporarily store water to prevent downstream flooding, stabilize shorelines, and provide numerous other functions that benefit society. If we are to continue to receive these benefits, action must be taken to reverse the trends observed in the 1980s and earlier. We must continue our efforts to conserve estuarine wetlands which significantly slowed the losses of these wetlands. Our attention must now focus on the nontidal palustrine wetlands which remain under heavy threat for development. The living resources of Chesapeake Bay also depend on the welfare of these wetlands which help filter out excess nutrients, sediments, and other pollutants, thereby preventing these potentially deleterious materials from reaching the Bay. Our quality of life is largely dependent on the abundance and condition of natural resources. We must strengthen wetland protection and initiate wetland restoration efforts to improve the quality of the Bay for its living resources, for ourselves, and for future generations. The significance of our land and water resources should not be underestimated. Based on the past experience of other civilizations, how we manage our natural environment will largely determine the fate of our society.

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