Overview of the Chesapeake Bay

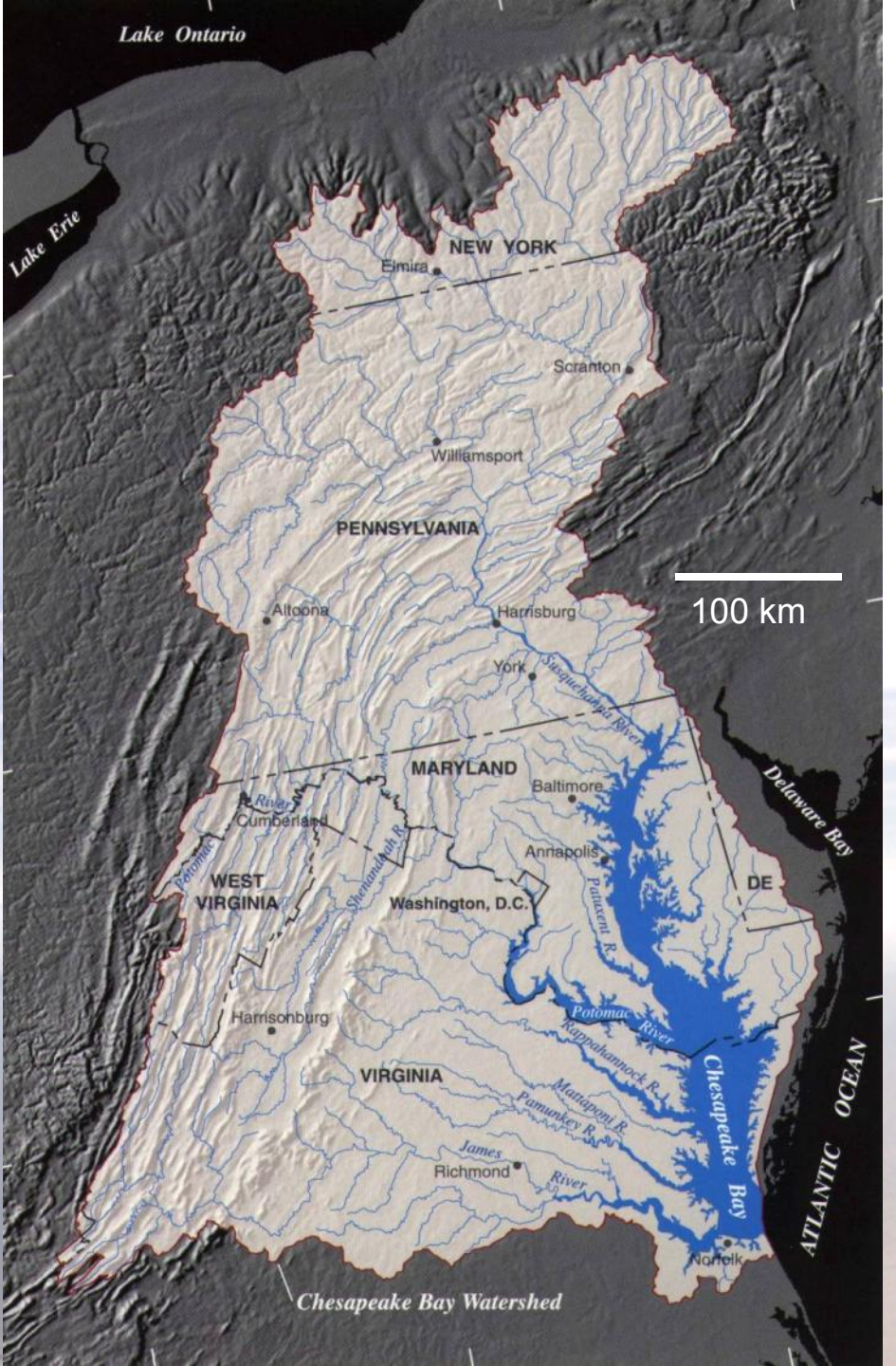
Partnership Meeting of Guanabara Bay and Chesapeake Bay
July 29, 2013

Donald F. Boesch
President, University of Maryland Center for Environmental Science

GOVERNO DO Rio de Janeiro

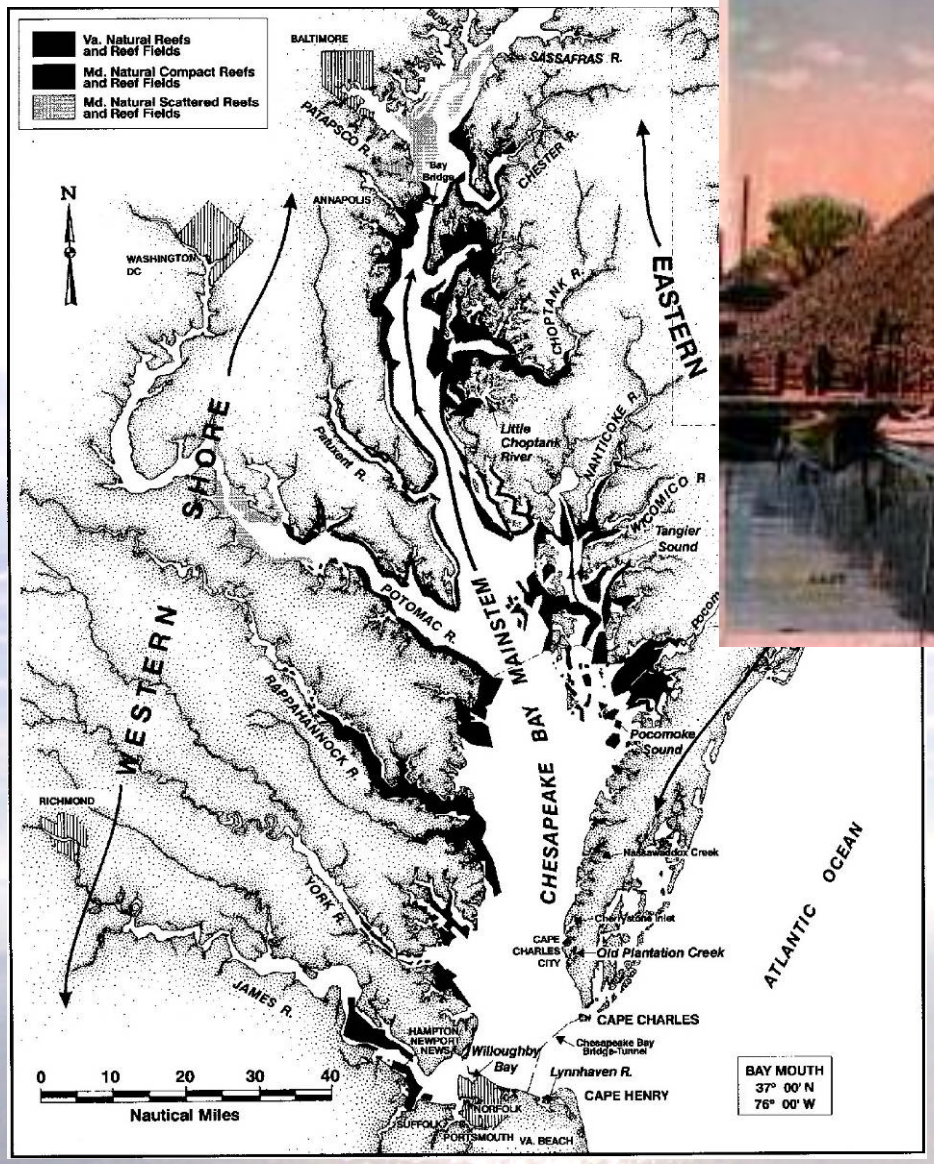
University of Maryland
CENTER FOR ENVIRONMENTAL SCIENCE

MARYLAND
Smart, Green & Growing

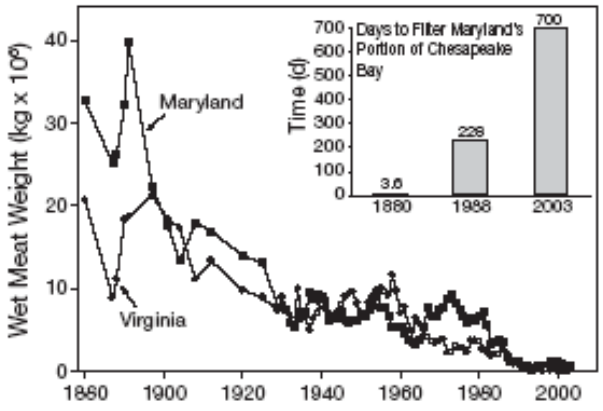


Chesapeake Bay

Maximum depth	**53 m**
Average depth	**7 m**
Total shoreline	**7,400 km**
Volume	**6.8×10^7 m^3**
Catchment area	**165,000 km^2**
Length	**322 km**
Average discharge	**2,500 m^3/sec**
Mean tidal range	**0.8 to 0.4 m**
Residence time	**~ 6 mo**
Age	**>10,000 y**
Tributaries	**150**

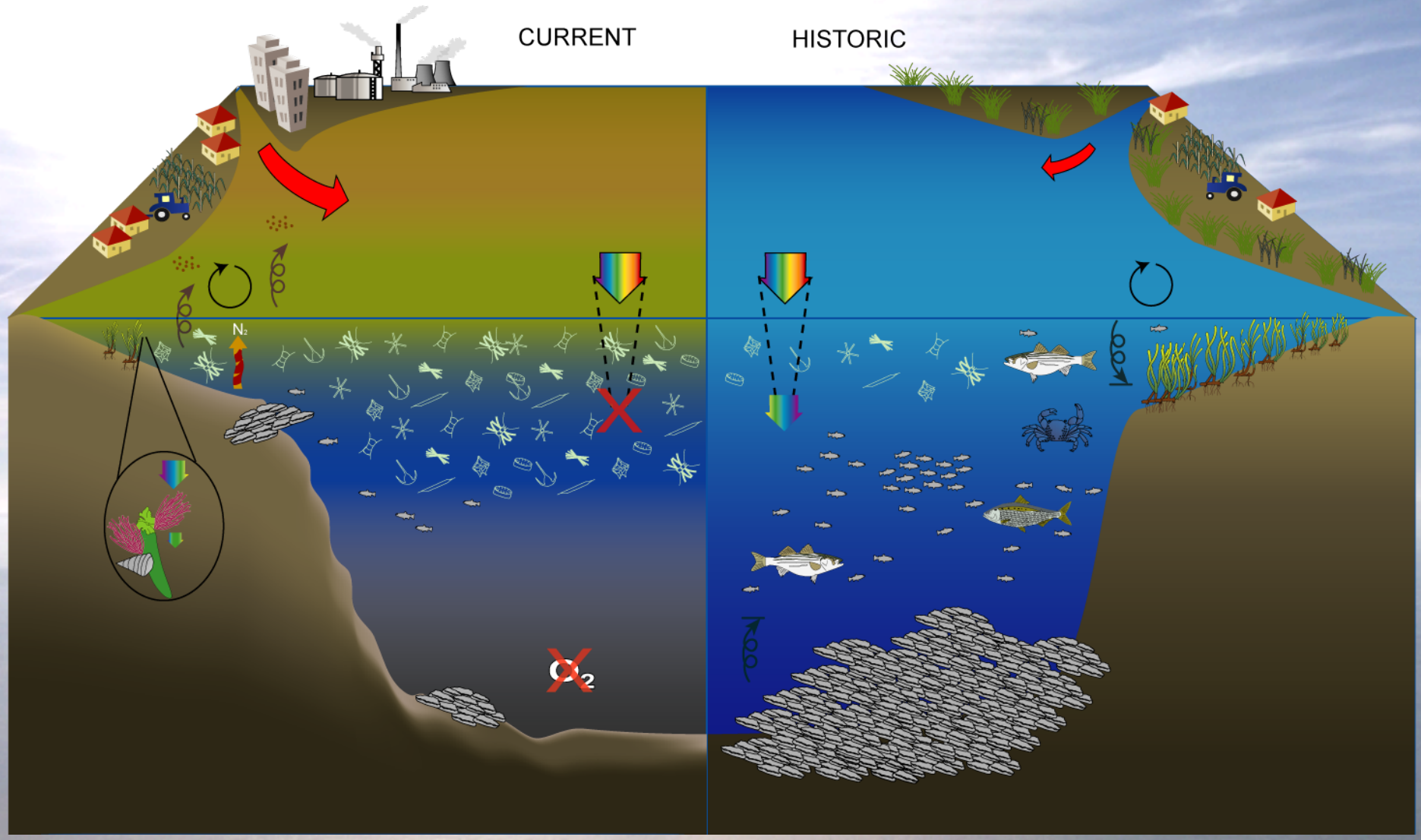


- ~ 1% of historic levels
- loss of habitat
- loss of filtration capacity

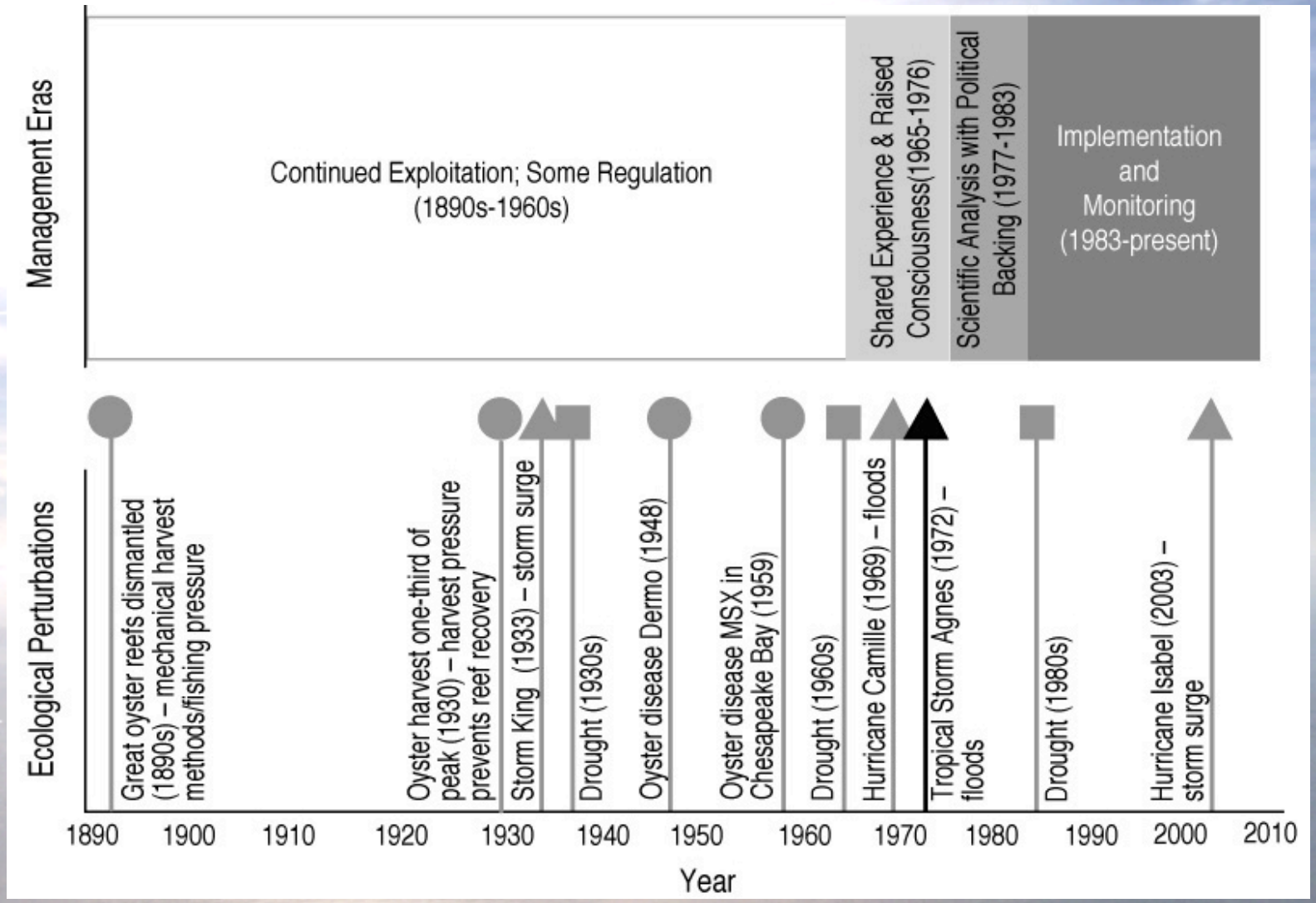


Historical Oyster Grounds

Eutrophication
Fundamental, pervasive alteration



Chesapeake Bay Management History



Boesch and Goldman 2009

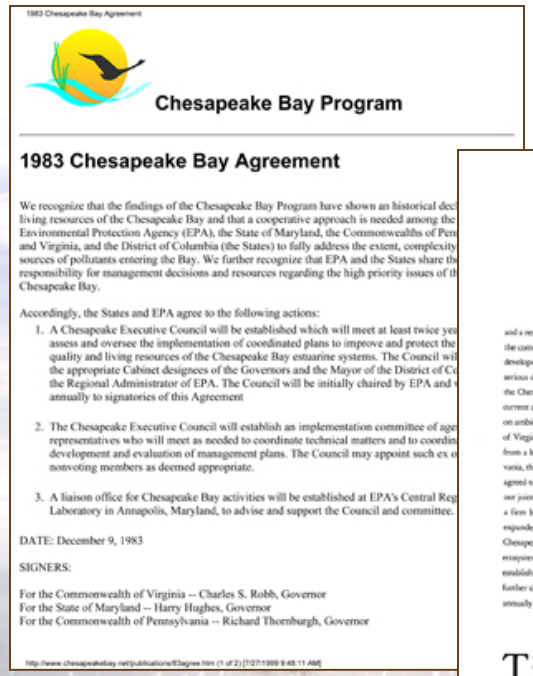
Chesapeake Bay Program

Chesapeake Bay Program

A Watershed Partnership

Progressive Restoration Agreements

1983 Agreement



1983 Chesapeake Bay Agreement

Chesapeake Bay Program

1983 Chesapeake Bay Agreement

We recognize that the findings of the Chesapeake Bay Program have shown an historical dec
living resources of the Chesapeake Bay and that a cooperative approach is needed among the
Environmental Protection Agency (EPA), the State of Maryland, the Commonwealths of Pen
and Virginia, and the District of Columbia (the States) to fully address the extent, complexity
sources of pollutants entering the Bay. We further recognize that EPA and the States share th
responsibility for management decisions and resources regarding the high priority issues of t
Chesapeake Bay.

Accordingly, the States and EPA agree to the following actions:

1. A Chesapeake Executive Council will be established which will meet at least twice yea
assess and oversee the implementation of coordinated plans to improve and protect the
quality and living resources of the Chesapeake Bay estuarine systems. The Council wil
the appropriate Cabinet designees of the Governors and the Mayor of the District of Co
the Regional Administrator of EPA. The Council will be initially chaired by EPA and
annually to signatories of this Agreement

2. The Chesapeake Executive Council will establish an implementation committee of age
representatives who will meet as needed to coordinate technical matters and to coordin
development and evaluation of management plans. The Council may appoint such ex o
nonvoting members as deemed appropriate.

3. A liaison office for Chesapeake Bay activities will be established at EPA's Central Reg
Laboratory in Annapolis, Maryland, to advise and support the Council and committee.

DATE: December 9, 1983

SIGNERS:

For the Commonwealth of Virginia -- Charles S. Robb, Governor
For the State of Maryland -- Harry Hughes, Governor
For the Commonwealth of Pennsylvania -- Richard Thornburgh, Governor

http://www.chesapeakebay.net/publications/83agree.htm (1 of 2) [7/27/1999 9:48:11 AM]

1987 Agreement

1987 CHESAPEAKE BAY AGREEMENT

THE CHESAPEAKE BAY IS A NATIONAL TREASU
and a resource of worldwide significance. Its ecological, economic, and cultural importance are felt far beyond its waters
the communities that line its shores. Man's use and abuse of its bounty, however, together with the continued growth
development of population in its watershed, have taken a toll on the Bay system. In recent decades, the Bay has suffe
serious declines in quality and productivity. ◊ *REPRESENTING* the Federal government and the States which surro
the Chesapeake Bay, we acknowledge our stake in the resources of the Bay and accept our share of responsibility for
current condition. We are determined that this decline will be reversed. In response, all of our jurisdictions have embarke
on ambitious programs to protect our shared resource and restore it to a more productive state. ◊ *IN* 1980, the legislatu
of Virginia and Maryland established the Chesapeake Bay Commission to coordinate interstate planning and progra
from a legislative perspective. In 1985, Pennsylvania joined the Commission. And, in 1985, Virginia, Maryland, Penns
vania, the District of Columbia, the U.S. Environmental Protection Agency and the Chesapeake Bay Commission form
agreed to a cooperative approach to this undertaking and established specific mechanisms for its coordination. Since 19
our joint commitment has carried us to new levels of governmental cooperation and scientific understanding. It has form
a firm base for the future success of this long-term program. The extent and complexity of our task now call for
expanded and refined agreement to guide our efforts toward the twenty-first century. ◊ *RECOGNIZING* that
Chesapeake Bay's importance transcends regional boundaries, we commit to managing the Chesapeake Bay as an integra
ecosystem and pledge our best efforts to achieve the goals in this Agreement. We propose a series of objectives that
establish a policy and institutional framework for continued cooperative efforts to restore and protect Chesapeake Bay.
further commit to specific actions to achieve those objectives. The implementation of these commitments will be review
annually and additional commitments developed as needed.

GOALS AND PRIORITY COMMITMENTS

THIS NEW AGREEMENT CONTAINS Goals and Priority Commitments for Living Resources, Water Quality, Population Growth and Development, Public Information, Education and Participation, Public Access, and Governance. ◊ The parties to this 1987 Agreement are the U.S. Environmental Protection Agency representing the Federal government, the District of Columbia, the State of Maryland and the Commonwealths of Pennsylvania and V
ginia (hereinafter the "States") and the Chesapeake Bay Commission. This Agreement may be amended and attachments added in the fut by unanimous action of the Chesapeake Executive Council.

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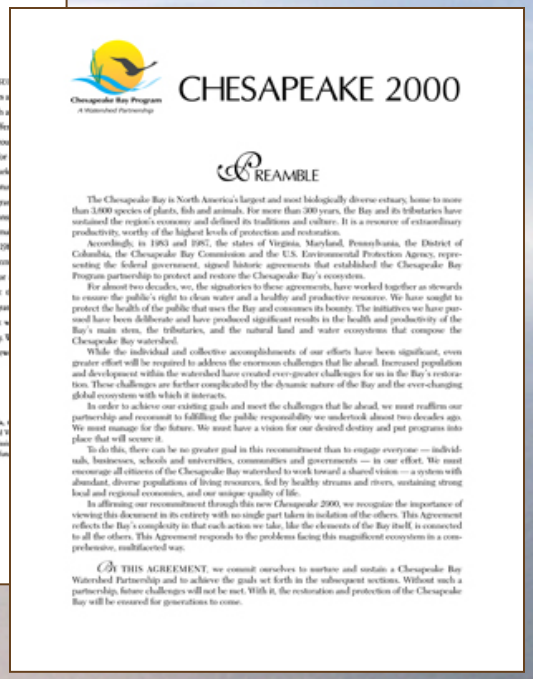


Chesapeake Bay Program
A Watershed Partnership

CHESAPEAKE 2000

PREAMBLE

The Chesapeake Bay is North America's largest and most biologically diverse estuary, home to more than 3,000 species of plants, fish and animals. For more than 300 years, the Bay and its tributaries have sustained the region's economy and defined its traditions and culture. It is a resource of extraordinary productivity, worthy of the highest levels of protection and restoration.

Accordingly, in 1983 and 1987, the states of Virginia, Maryland, Pennsylvania, the District of Columbia, the Chesapeake Bay Commission and the U.S. Environmental Protection Agency, representing the federal government, signed historic agreements that established the Chesapeake Bay Program partnership to protect and restore the Chesapeake Bay's ecosystem.

For almost two decades, we, the signatories to these agreements, have worked together as stewards to ensure the public's right to clean water and a healthy and productive resource. We have sought to protect the health of the public that uses the Bay and consumes its bounty. The initiatives we have pursued have been deliberate and have produced significant results in the health and productivity of the Bay's main stem, the tributaries, and the natural land and water ecosystems that compose the Chesapeake Bay watershed.

While the individual and collective accomplishments of our efforts have been significant, even greater effort will be required to address the enormous challenges that lie ahead. Increased population and development within the watershed have created ever-greater challenges for us in the Bay's restoration. These challenges are further complicated by the dynamic nature of the Bay and the ever-changing global ecosystem with which it interacts.

In order to achieve our existing goals and meet the challenges that lie ahead, we must reaffirm our partnership and recommit to fulfilling the public responsibility we undertook almost two decades ago. We must manage for the future. We must have a vision for our desired destiny and put programs into place that will secure it.

To do this, there can be no greater goal in this recommitment than to engage everyone — individuals, businesses, schools and universities, communities and governments — in our effort. We must encourage all citizens of the Chesapeake Bay watershed to work toward a shared vision — a system with abundant, diverse populations of living resources, fed by healthy streams and rivers, sustaining strong local and regional economies, and our unique quality of life.

In affirming our recommitment through this new Chesapeake 2000, we recognize the importance of viewing this document in its entirety with no single part taken in isolation of the others. This Agreement reflects the Bay's complexity in that each action we take, like the elements of the Bay itself, is connected to all the others. This Agreement responds to the problems facing this magnificent ecosystem in a comprehensive, multifaceted way.

BY THIS AGREEMENT, we commit ourselves to nurture and sustain a Chesapeake Bay Watershed Partnership and to achieve the goals set forth in the subsequent sections. Without such a partnership, future challenges will not be met. With it, the restoration and protection of the Chesapeake Bay will be ensured for generations to come.

40% reduction in N & P loads by 2000

Chesapeake 2000 Agreement

- **Living Resource Protection and Restoration**
  - Increase oysters 10 fold, multi-species management
- **Vital Habitat Protection and Restoration**
  - Restore historic abundance of submerged vegetation; restore 10,000 ha wetlands; forests; streams
- **Water Quality Protection and Restoration**
  - Reduce nutrient and sediment loadings to level needed to protect aquatic living resources
- **Sound Land Use**
  - Land conservation; reduce harmful sprawl
- **Stewardship and Community Engagement**
  - Education, community engagement, government by example

Chesapeake TMDL Process

1. Identify impaired waters
- Determine the pollutant of concern, e.g., sediment
- Document deviations from water quality standards
- Identify sources and their relative contributions

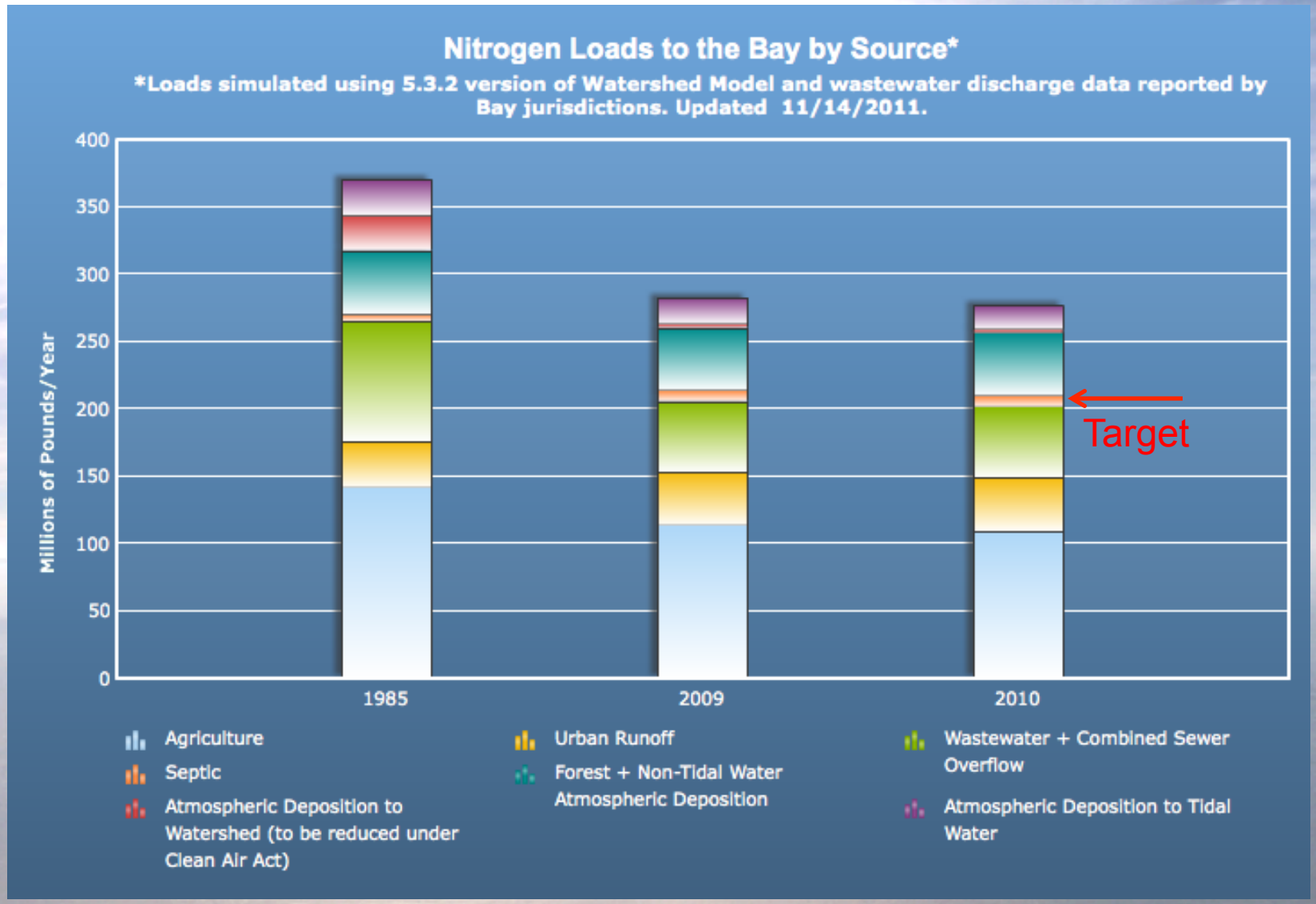
2. Develop TMDLs
- Define goals for pollution reductions over time
- Identify allowable loads for various pollution sources (e.g., stormwater)

Chesapeake Watershed Model Minor Basins

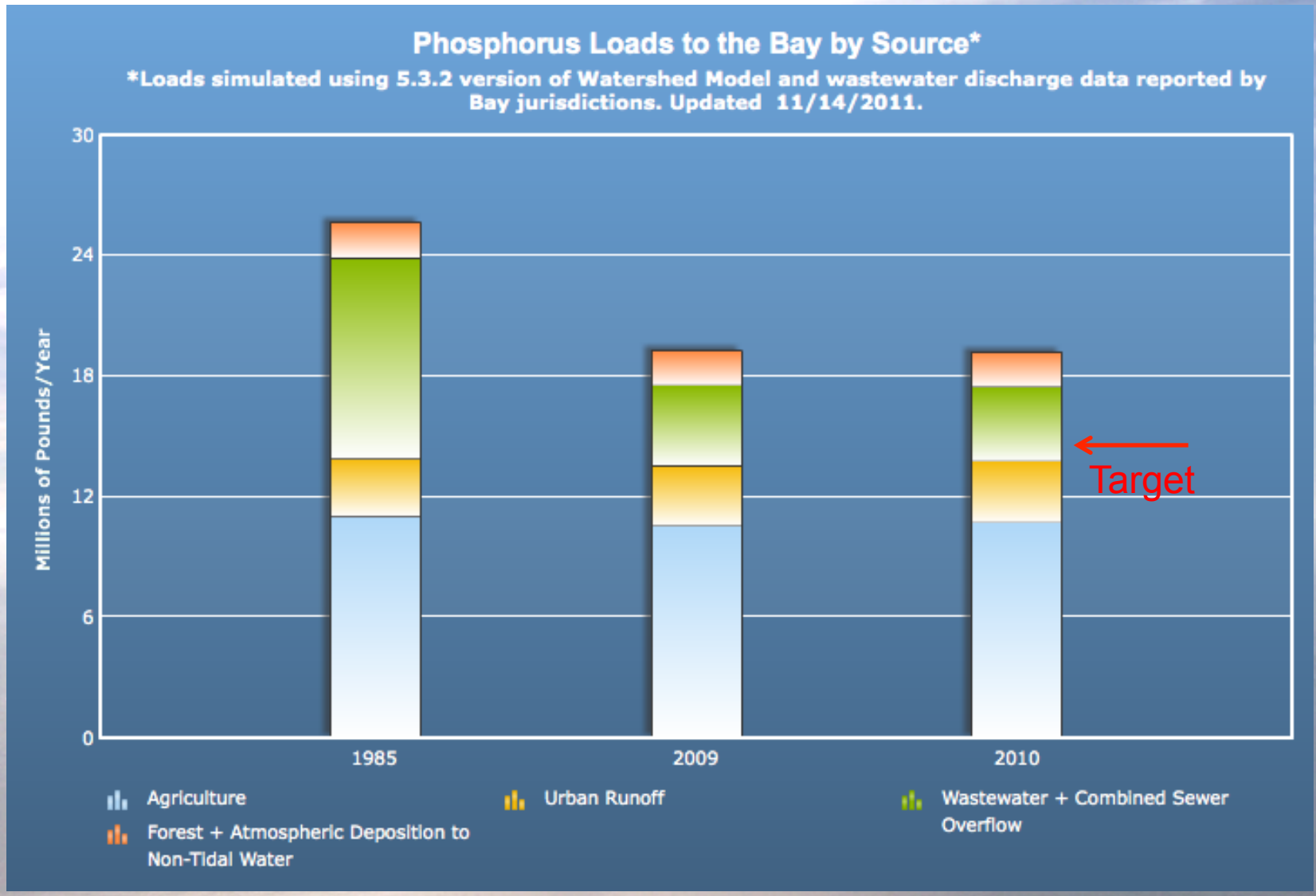
3. Implement management actions
- Issue water quality-based permits
- Implement restoration activities
- Facilitate best management practices, e.g., fencing

4. Monitor progress
- Monitor pollution and compare reductions to TMDL goals, e.g., filter water samples for sediment
- Measure the effectiveness and adjust implementation actions as needed

Reduction of Nitrogen Loads
Measured & Model Estimates



Reduction of Phosphorus Loads
Measured & Model Estimates



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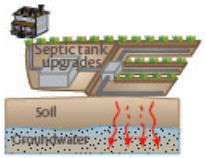
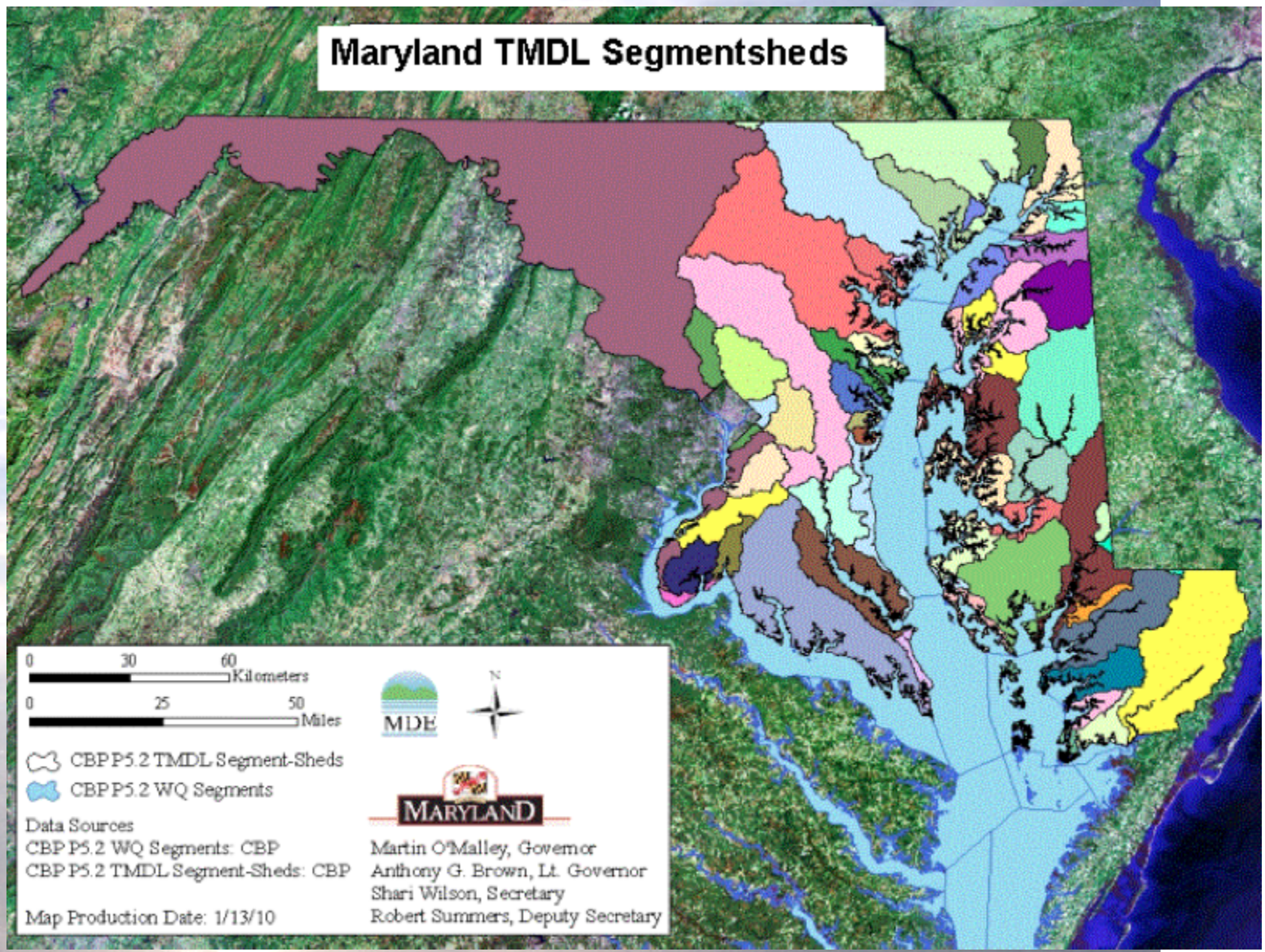
Watershed Implementation

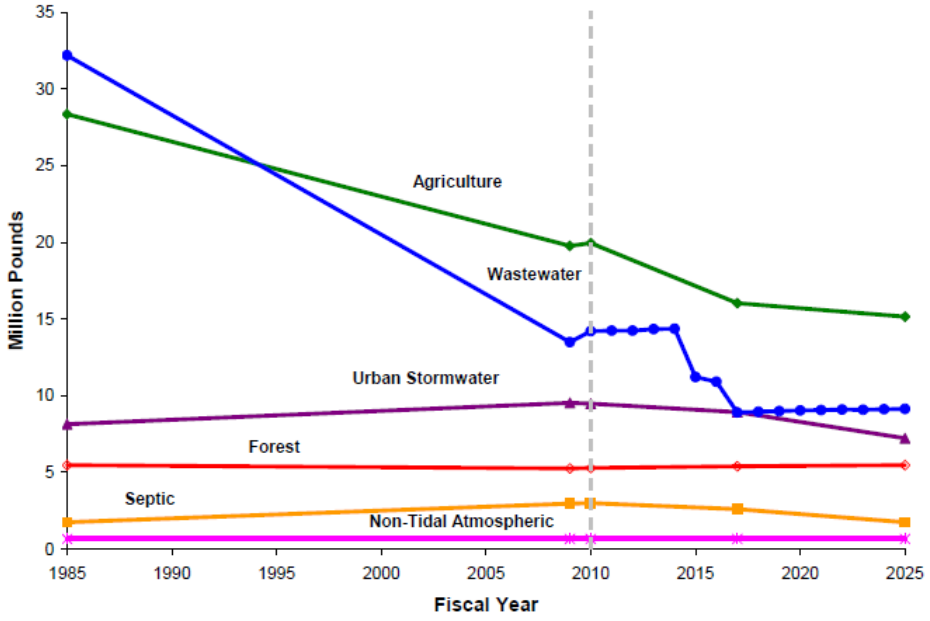
TMDL implementation actions	Example	
Upgrade wastewater treatment plants (WWTPs)	Upgrading plants' technology to enhanced nutrient removal will remove more nutrients from WWTP discharges	
Install green infrastructure	Green roofs reduce heating and cooling costs and also stormwater runoff.	
Retrofit septic systems	New technologies allow bacteria to break down organic material and convert nitrogen to harmless gas.	
Additional controls on animal operations	Poultry and livestock waste structures prevent waste from running into local streams	
Additional controls on crop agricultural	Water control structures, wetland restoration, and increased nutrient management plan compliance decreases nutrient runoff	
New development rules	Larger riparian buffers with infiltration practices along waterfront developments will help to filter pollutants and reduce runoff.	

Maryland's WIPs

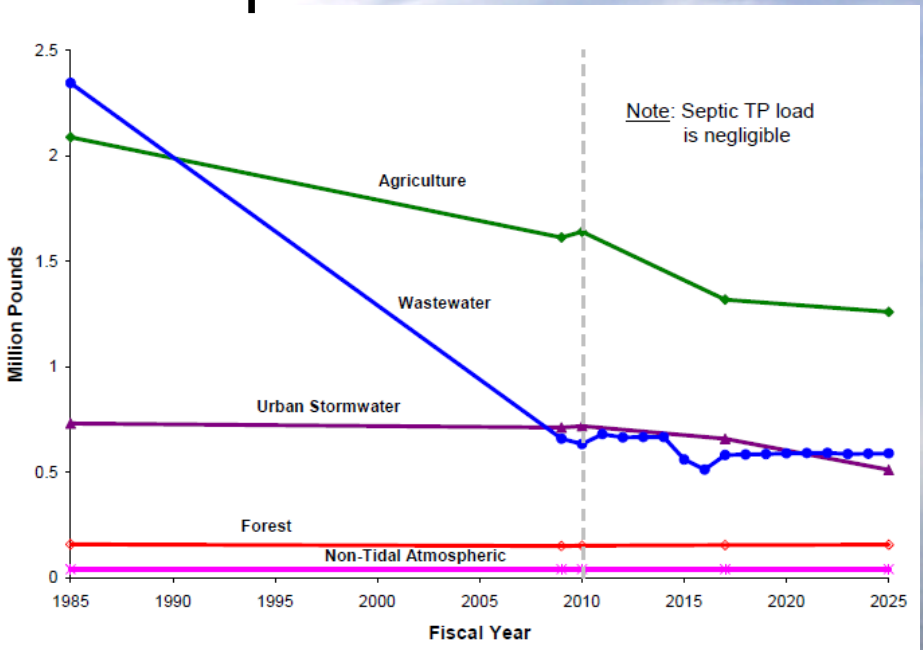


Maryland's WIP

Nitrogen



Phosphorus



Adaptive Management

www.baystat.maryland.gov

Current Health

Causes of the Problems

Solutions

Eyes on the Bay

Funding

Get Involved

Watershed Implementation Plan

How to Navigate Site

A Message from the Governor

Executive Order

Fact Sheet

News

FREE Email Newsletter

PARTICIPANTS

- Office of the Governor
- Department of Agriculture
- Department of the Environment
- Department of Natural Resources
- Department of Planning
- University of Maryland

BAY STAT
CHESAPEAKE
Governor Martin O'Malley

video transcript

Watershed Protection and Restoration Program FAQ

- Then smaller: CBF: The Truth about the "Tax on Rain"
- Baltimore Sun: The Rain Tax Sham

Maryland Stormwater Symposium

A discussion with elected officials and public works and planning staff from Maryland counties and Baltimore City to discuss innovative and cost-effective practices to manage stormwater runoff as part of the cooperative effort to restore the Chesapeake Bay and our local waterways. Learn more...

Reclaim the Chesapeake Bay Public Awareness Campaign

All of us who live in the Chesapeake Bay watershed are linked to the Bay by many pathways. Whether we live right on the water or miles from the Chesapeake, our actions have a profound effect on the Bay. Learn more...

Governor Martin O'Malley Announces Maryland Meets Milestone Goals to Protect and Restore Chesapeake Bay

Governor Martin O'Malley announced at the Chesapeake Executive Council Meeting announced that

BayStat in the News

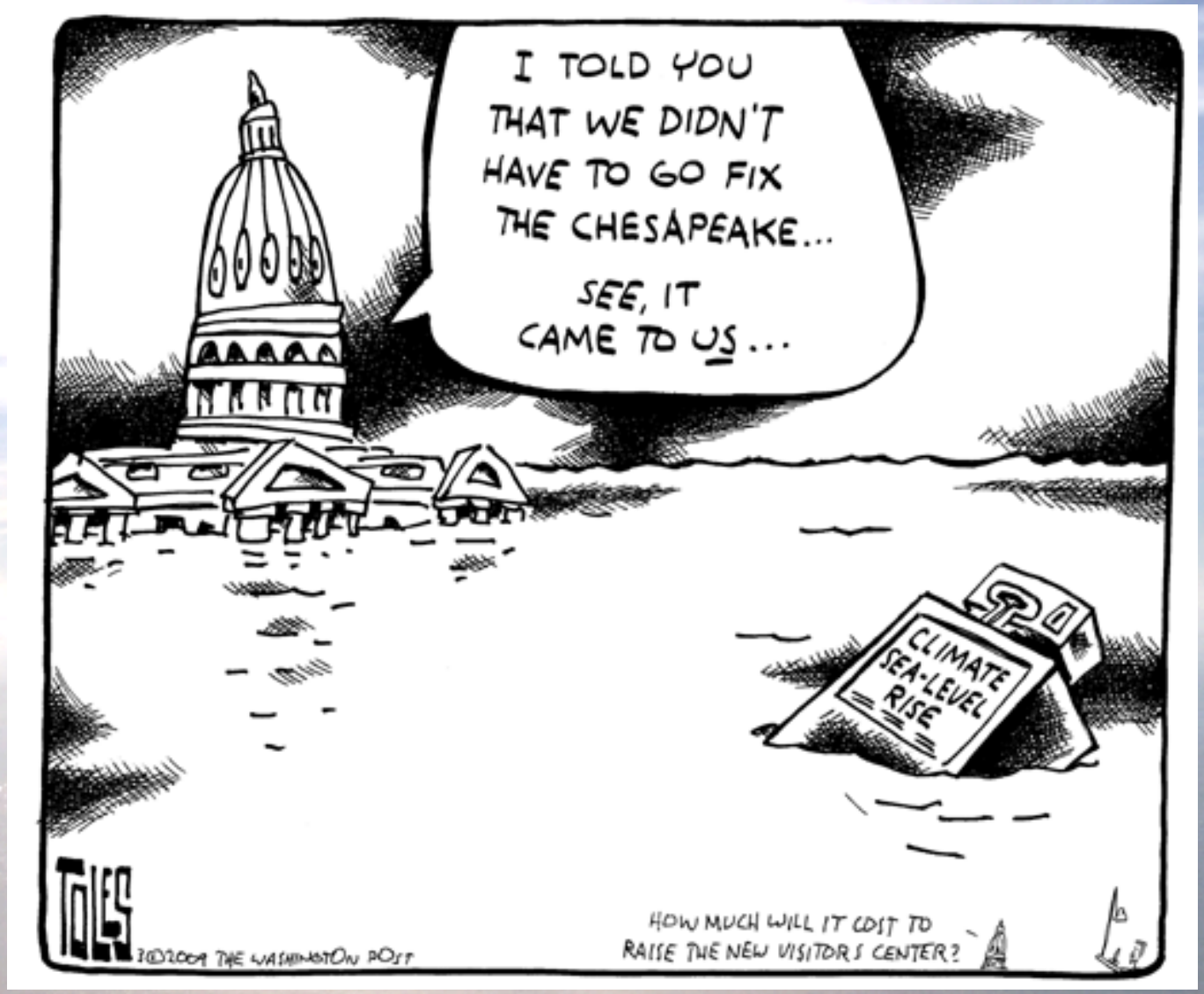
- Anne Arundel County Council overrides stormwater veto, seeks to cap some fees - *Capital Gazette 5/9/13*
- Eagle Cam Live-Streams Wild Bald Eagle Chicks in Washington - *National Geographic 4/16/13*
- Scientists create largemouth bass nesting areas - *Star Democrat 4/14/13*
- Rockfish Season Opens on the Chesapeake - *Southern Maryland News Net 4/13/13*
- MDA Encourages Homeowners to Protect the Bay - *Southern Maryland News Net 4/13/13*
- New DNR program extends to Southern Maryland - *SoMd News 4/12/13*

Economic benefits greater than costs

Maintaining Maritime Commerce

MARITIME ENVIRONMENTAL RESOURCE CENTER

Dealing With Climate Change



Obrigado!

Don Boesch

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