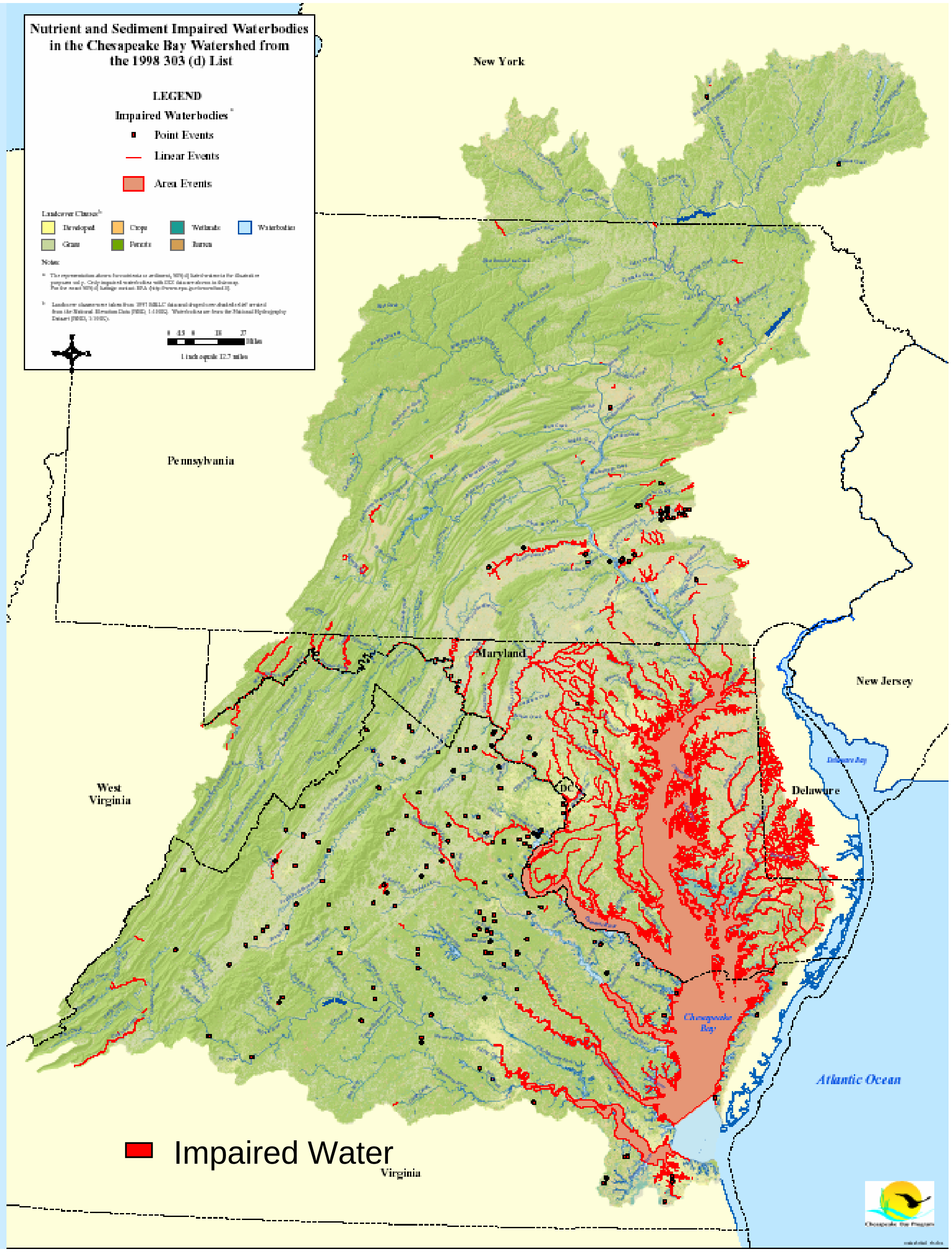
ONE BUREAUCRAT’S GUIDE TO A PERFECT UNIVERSE

- DEFINE THE PROBLEM
- CULTIVATE A PARTNERSHIP
- ESTABLISH COMMITMENT
- DESCRIBE A VISION
- SYNTHESIZE THE SCIENCE
- SET MEASURABLE GOALS WITH TIMELINES
- DEVELOP AND IMPLEMENT PLANS
- MEASURE AND REPORT PROGRESS

DEFINE THE PROBLEM

Impaired Waters and Clean-up Plans

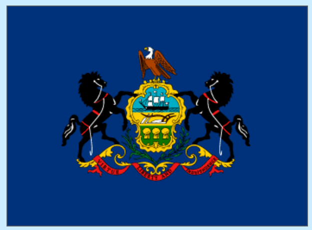
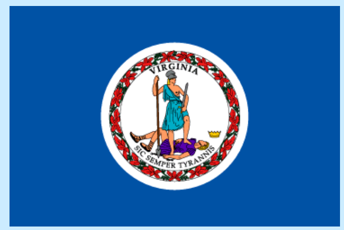
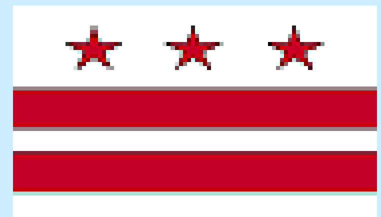
Portions of the Chesapeake Bay and its tidal rivers are listed under the Clean Water Act as "impaired waters" largely because of low dissolved oxygen levels and other problems related to nutrient pollution.



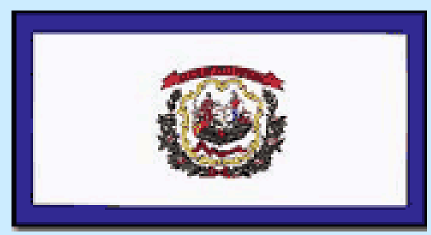
CULTIVATE A PARTNERSHIP

Chesapeake Bay Watershed Partners

- Signatories to the Chesapeake Bay agreement
  - EPA (representing the Federal government)
  - Jurisdictions of MD, PA, VA and DC
  - Chesapeake Bay Commission (representing MD, PA and VA state legislatures)


- Headwater states
  - DE, NY and WV
  - Memorandum of Understanding linked to water quality goals

ESTABLISH COMMITMENT

Chesapeake 2000: The New Agreement

In June 2000, the Chesapeake Bay Program partners signed a new agreement to guide the restoration and protection of the Bay through the next decade and beyond.

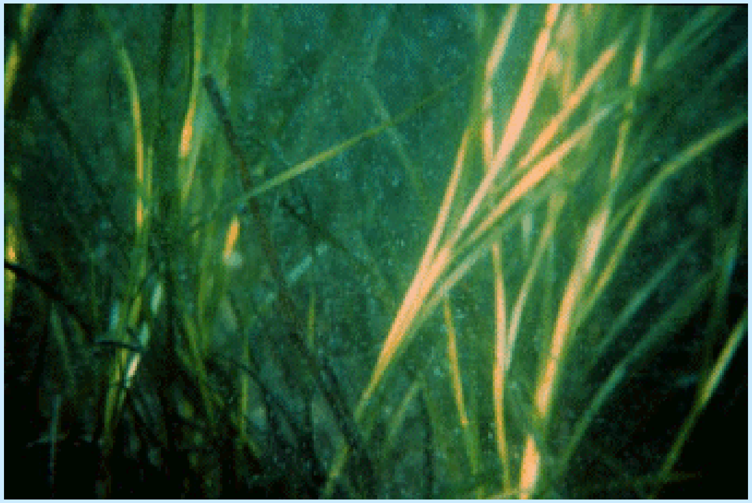
In *Chesapeake 2000*, the partners agreed that:

Improving water quality is the most critical element in the overall protection and restoration of the Chesapeake Bay and its rivers.

DESCRIBE A VISION

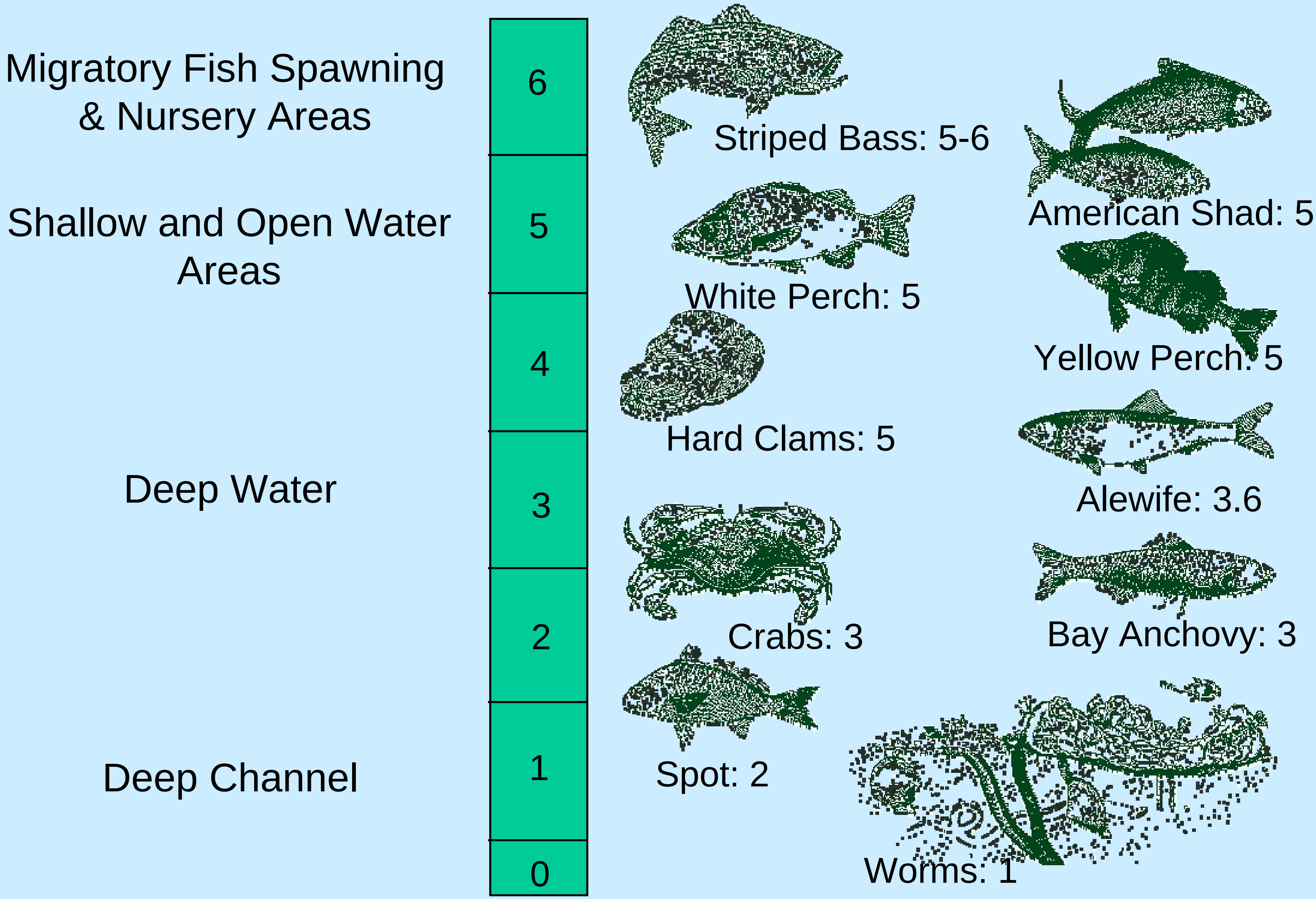
Restored Tidal Water Quality Means:

- Fewer algae blooms and better fish food.
- Clearer water and more underwater Bay grasses.
- More oxygen and improved habitat for more fish, crabs and oysters.



SYNTHESIZE THE SCIENCE

Oxygen Requirements (mg/L) of Bay Species



SET GOALS

QUANTATIVE AND PRACTICAL TO MEASURE, WITH TIMELINES

Chesapeake Bay Dissolved Oxygen Criteria

Designated Use	Dissolved Oxygen
Migratory Spawning and Nursery (Feb. – May)	6 mg/L (7-day mean) 5 mg/L (instantaneous minimum)
Shallow Water (SAV growing seasons)	Same as open water
Open Water (year round)	5.5 mg/L in lower salinity waters and 5 mg/L in higher salinity waters (30-day mean) 4 mg/L (7-day mean) 3.2 mg/L (instantaneous min)[1]
Deep Water (June – Sept.)	3 mg/L (30-day mean) 2.3 mg/L (1-day mean) 1.7 mg/L (instantaneous minimum)
Deep Channel (June – Sept.)	1 mg/L (instantaneous minimum)

1. At temperatures >29ºC, dissolved oxygen concentrations above instantaneous minimum of 4.3 mg/L will protect shortnose sturgeon.

DEVELOP AND IMPLEMENT PLANS

- STAKEHOLDER OUTREACH AND “BUILD-IN” VS “BUY-IN”
- PRIORITIZE MEASURABLE OBJECTIVES
- PROPOSE A BUDGET

STAKEHOLDER OUTREACH
"BUILD-IN" VS "BUY-IN"

MEASURABLE OBJECTIVES: Preliminary Nutrient Cap Load Allocations

Jurisdiction-Basin	Nitrogen (million pounds per year)				Phosphorus (million pounds per year)			
	Preliminary Load Distribution	Allocation	Percent Reduction of Anthropogenic Load	Tiers	Preliminary Load Distribution	Allocation	Percent Reduction of Anthropogenic Load	Tiers
Eastern Shore VA - VA	1.16	1.16	64.6	2.40	0.08	0.08	74.42	3.40
Susquehanna - MD	0.85	0.85	64.6	3.30	0.0295	0.03	74.42	3.40
Susquehanna - PA	61.06	**69.08**	**55.4**	**3.00**	1.46	**2.20**	**58.25**	**3.00**
Susquehanna - NY	10.95	**12.58**	**47.2**	**3.00**	0.29	**0.59**	**39.11**	**3.00**
Western Shore MD - MD	11.47	11.47	64.6	2.90	0.94	**0.94**	**74.42**	**2.40**
Western Shore MD - PA	0.02	0.0192	64.6	n/a	0.00	0.0000	n/a	n/a
Patuxent - MD	2.50	2.50	64.6	3.55	0.23	0.23	74.42	3.10
"High Impact" Basin Total	88.00	97.65	-	-	3.03	4.06	-	-
Eastern Shore MD - MD	11.05	11.05	61.6	2.60	0.88	0.88	71.42	3.40
Eastern Shore MD - VA	0.06	0.0642	61.6	3.10	0.01	0.0100	71.42	3.10
Eastern Shore MD - DE	2.88	2.88	61.6	3.00	0.35	0.35	71.42	1.00
Eastern Shore MD - PA	0.24	**0.27**	**54.5**	**3.00**	0.01	**0.03**	**49.93**	**3.00**
Potomac - D.C.	2.80	2.80	61.6	2.90	0.39	0.39	71.42	2000 Progress
Potomac - MD	11.99	11.99	61.6	3.20	1.14	1.14	71.42	1.90
Potomac - VA	12.84	12.84	61.6	3.20	1.40	1.40	71.42	3.00
Potomac - PA	3.73	**4.02**	**57.5**	**3.00**	0.21	**0.33**	**52.80**	**3.00**
Potomac - WV	4.18	**4.71**	**53.0**	**3.00**	0.24	**0.36**	**49.29**	**3.00**
"Medium Impact" Basin T.	49.77	50.62	-	-	4.65	4.90	-	-
Rappahannock - VA	5.24	5.24	58.6	2.70	0.48	**0.62**	**57.79**	**3.40**
York - VA	5.18	**5.70**	**52.5**	**TS/2.4**	0.6791	**0.48**	**78.47**	**TS/3.5**
James - VA	26.79	**27.90**	**56.5**	**TS/2.0**	3.9228	**3.71**	**70.25**	**TS/3.0**
James - WV	0.03	**0.03**	**31.1**	**3.00**	0.0055	**0.01**	**n/a**	**n/a**
"Low Impact" Basin Total	37.23	38.87	-	-	5.08	4.82	-	-
BAY-WIDE TOTOAL	175.00	187.15	-	-	12.76	13.78	-	-

Preliminary allocation fell short by 12 million pounds of nitrogen and 1 million pounds of phosphorus ("orphaned loads").

“NOBODY EVER FUNDED ANYTHING

THAT WASN’T FIRST

PROPOSED”

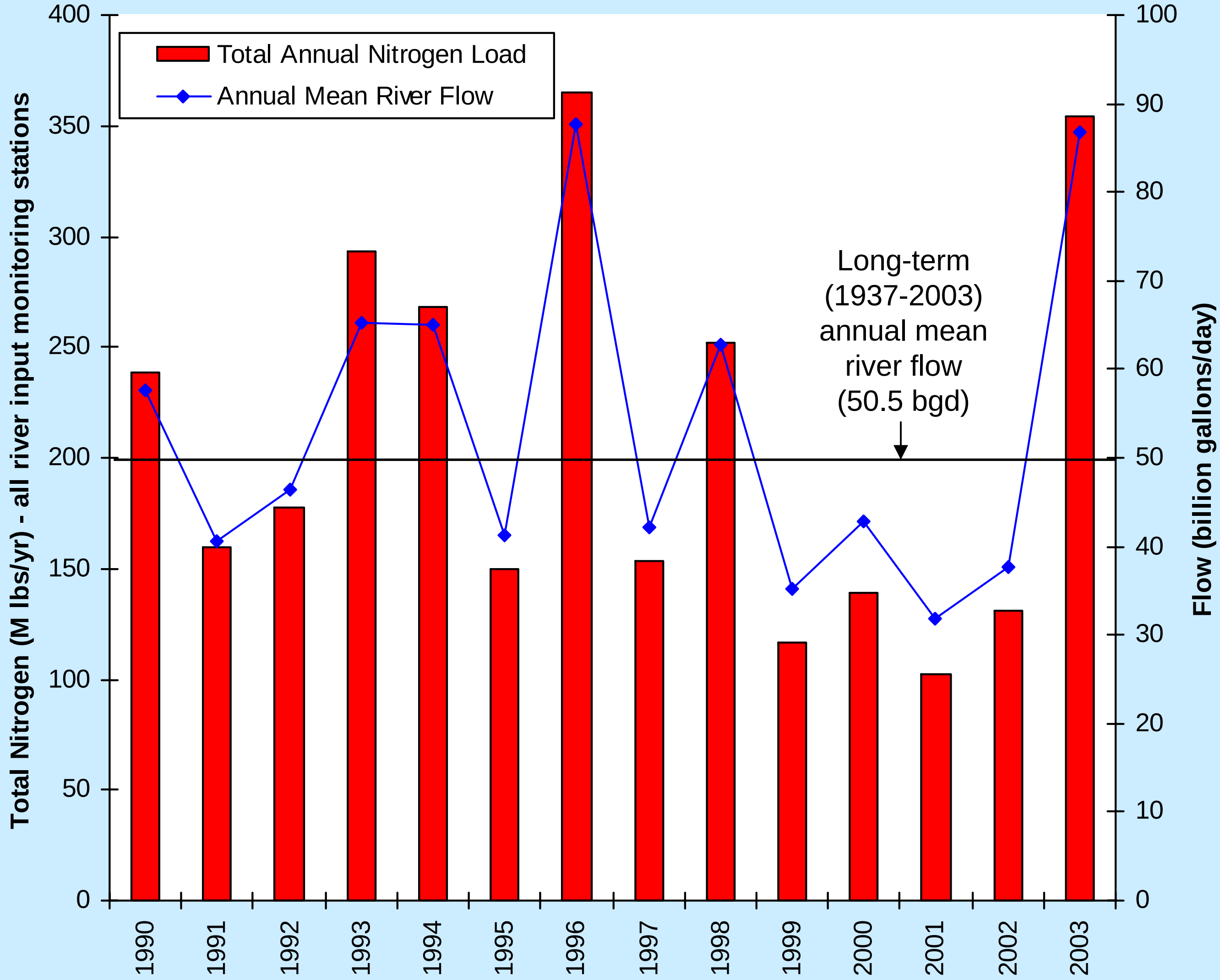
MEASURE AND REPORT PROGRESS

STRESSOR AND RESPONSE

STRESSOR: Nontidal Nitrogen Loads and River Flow To the Chesapeake Bay

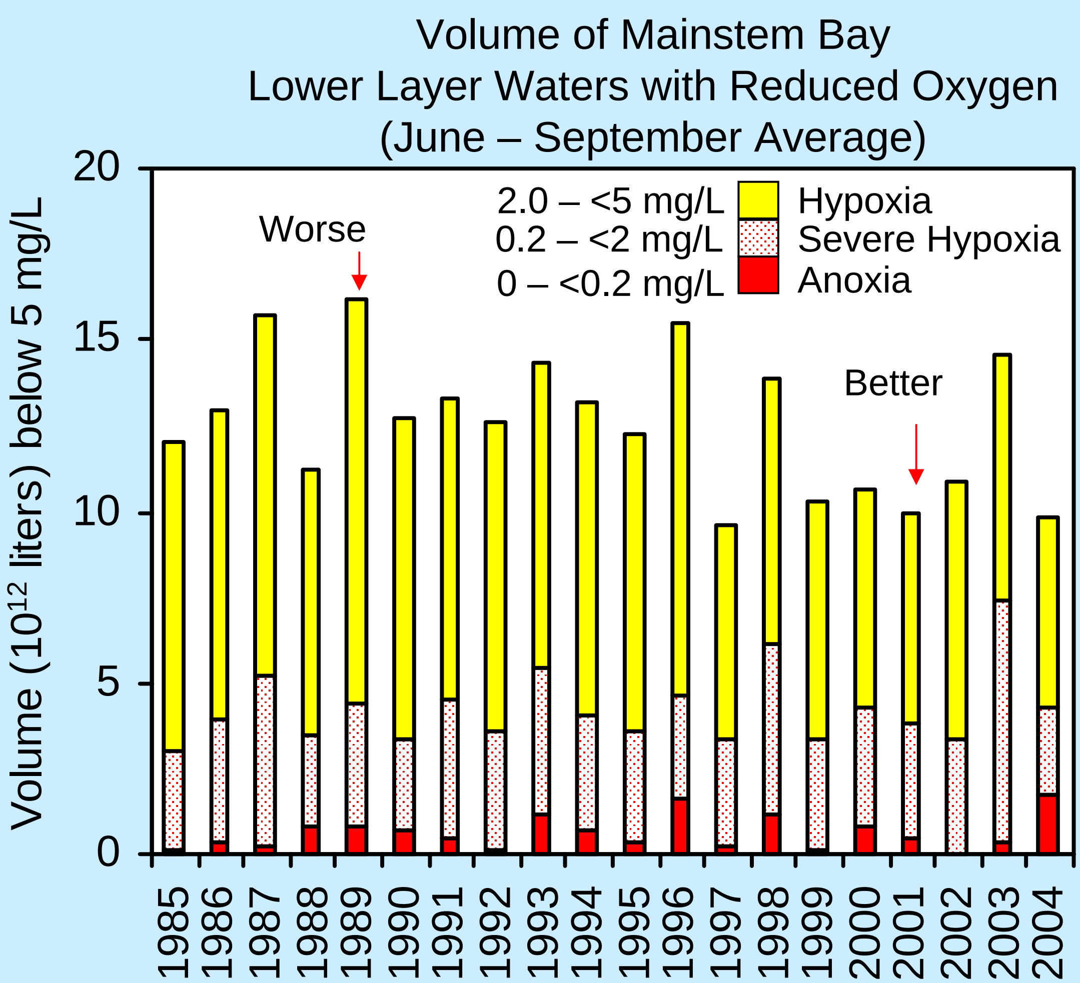
In 2003, nitrogen loads entering the tidal waters of the Chesapeake Bay from its principal rivers, were the second highest since 1990.

The loads were influenced by near-record river flow to the Bay in 2003.



Source: USGS, Baltimore, MD.

RESPONSE: Mainstem Bay Summer Dissolved Oxygen Concentrations



Source: Chesapeake Bay Program

TRENDS: No statistically significant increasing or decreasing trends could be identified in any categories (hypoxia, severe hypoxia and anoxia) for the June-September period, 1985 through 2004.

STATUS: In 2004, low oxygen (less than 5 mg/L) water volume was small relative to measurements since 1985, but there was a large volume of anoxic water (less than 0.2 mg/L). Hypoxic conditions are stressful for aquatic life and sometimes lethal if severely hypoxic. If no oxygen is present in bottom water, nutrients tied up in sediments are released to overlying waters, fueling eutrophication.

SUMMARY OF SUGGESTIONS

- EXPLOIT THE POWER OF CONSENSUS
- EXPLOIT THE POWER OF SCIENCE
- PROPOSE GOALS AND BUDGETS
- COMMUNICATE IN TERMS THAT RESONATE WITH STAKEHOLDER VALUES