Phase III WIP Planning Targets

E3 Scenario = "Everything, Everywhere by Everyone"

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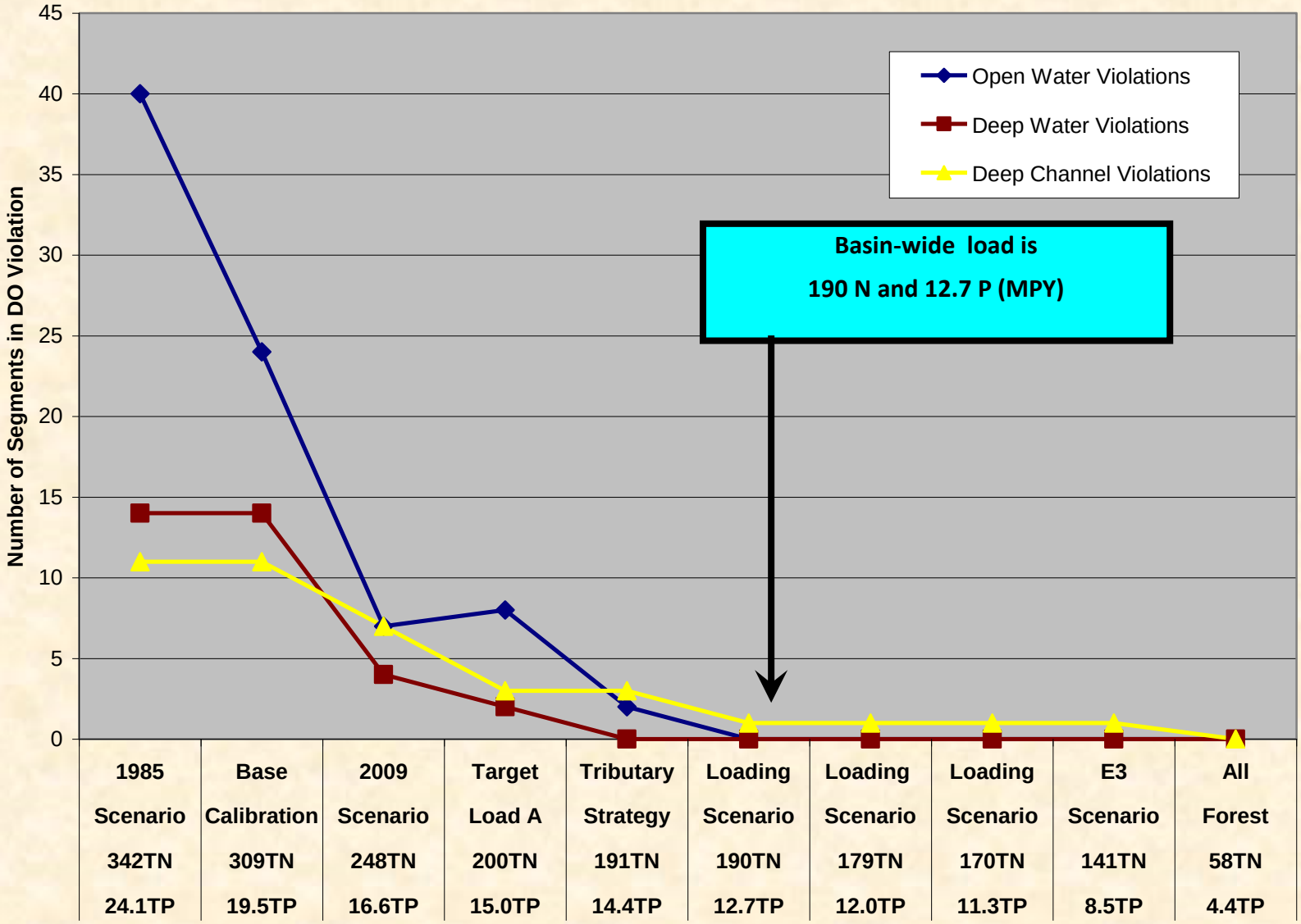
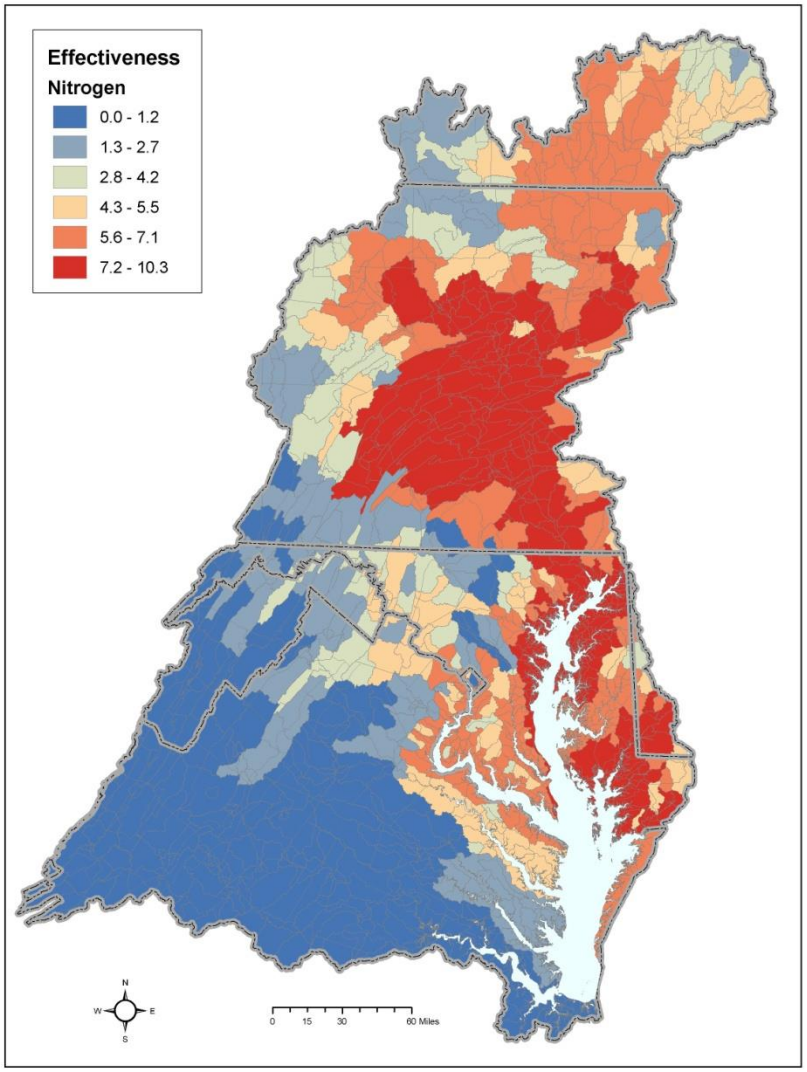
Principles of the Planning Target Methodology

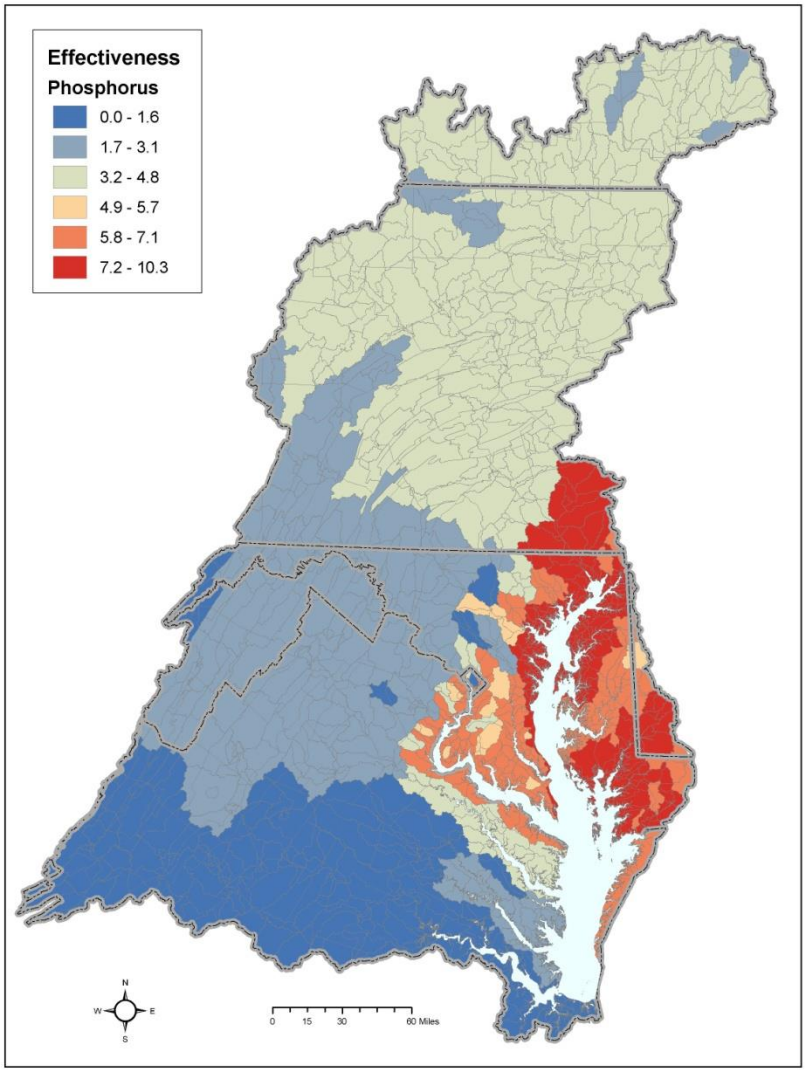
- Attain WQ Standards
- Areas that contribute the most to the Bay water quality problems must do the most to resolve those problems (on a pound-per-pound basis).
- All tracked and reported reductions in nitrogen and phosphorus loads are credited toward achieving final assigned loads.

Dissolved Oxygen Criteria Attainment

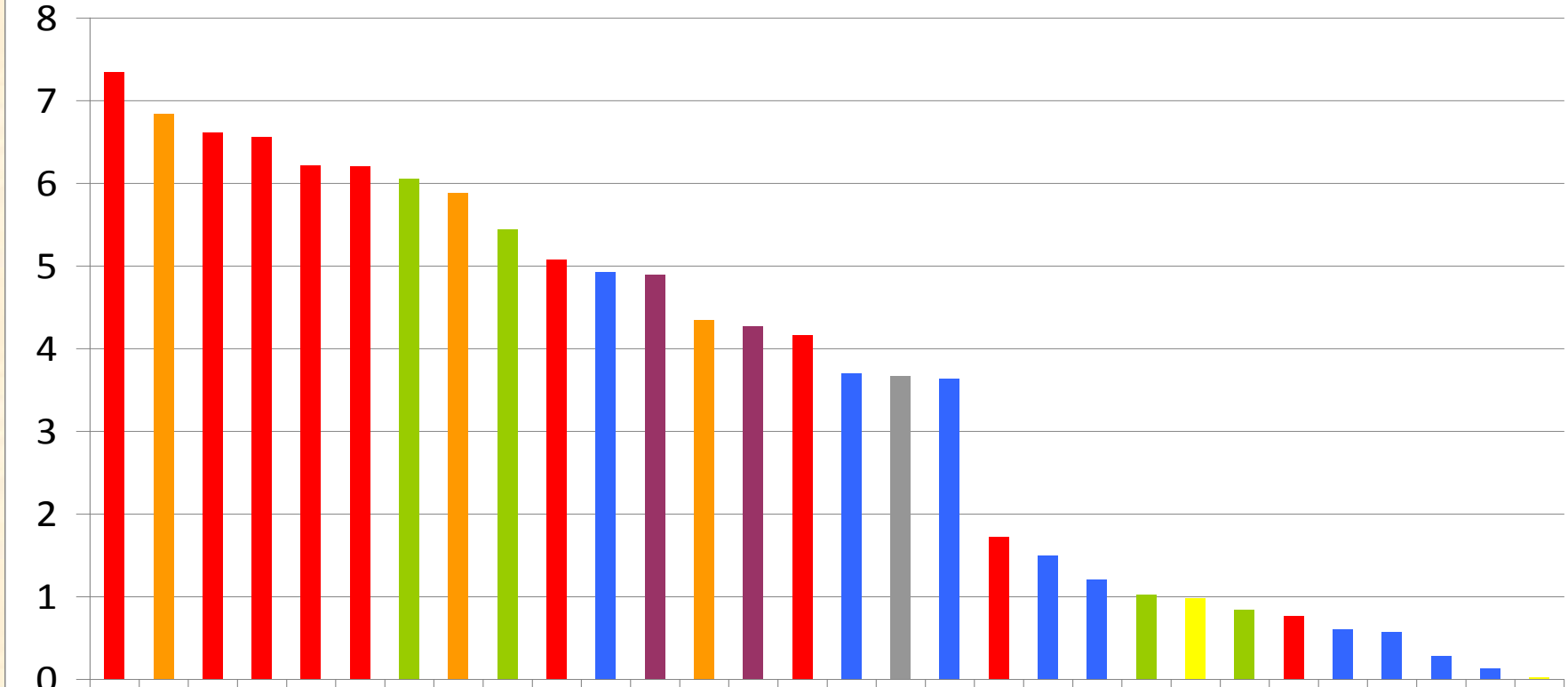


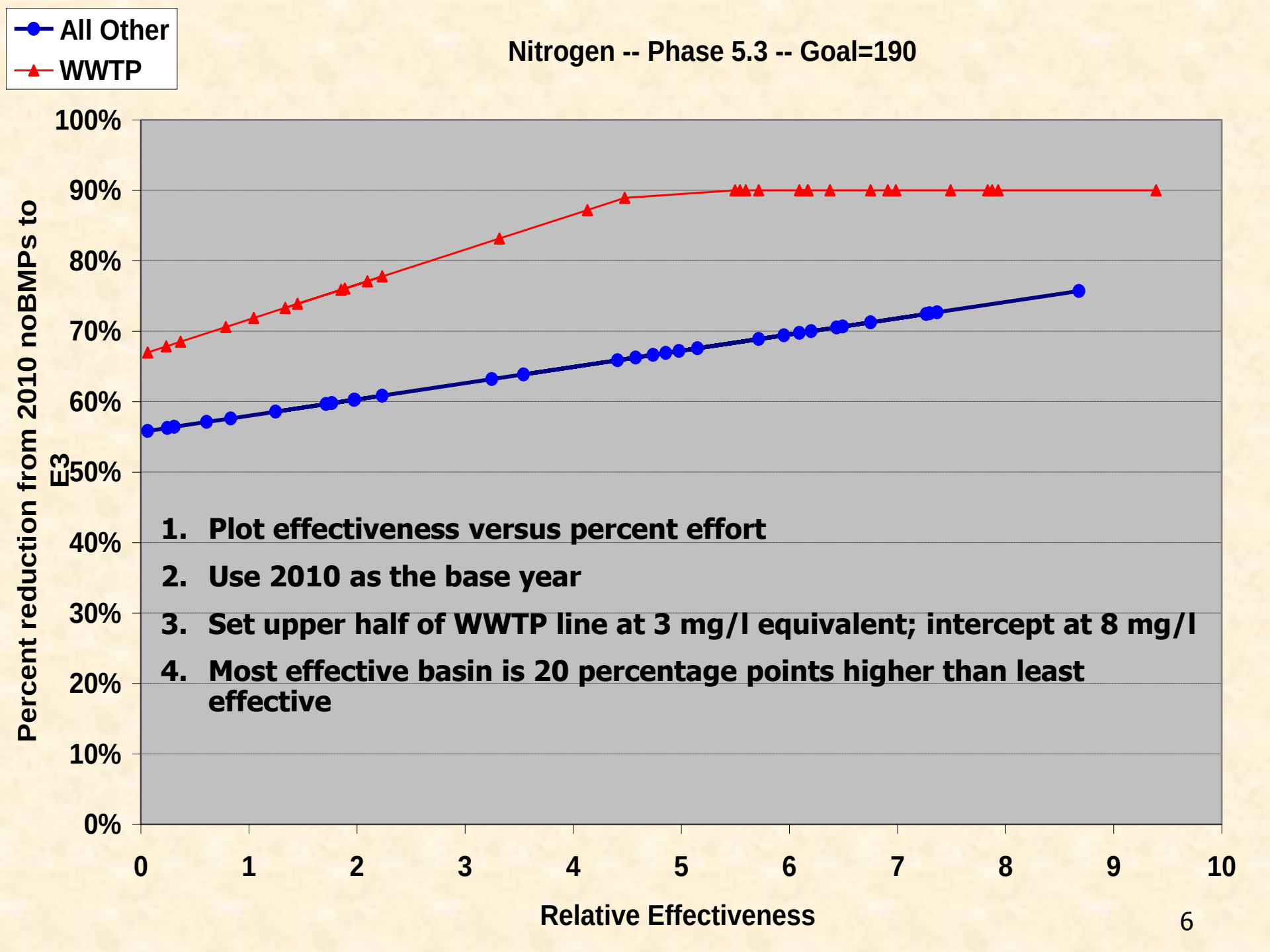
Relative Effect of a Pound of Pollution on Bay Water Quality

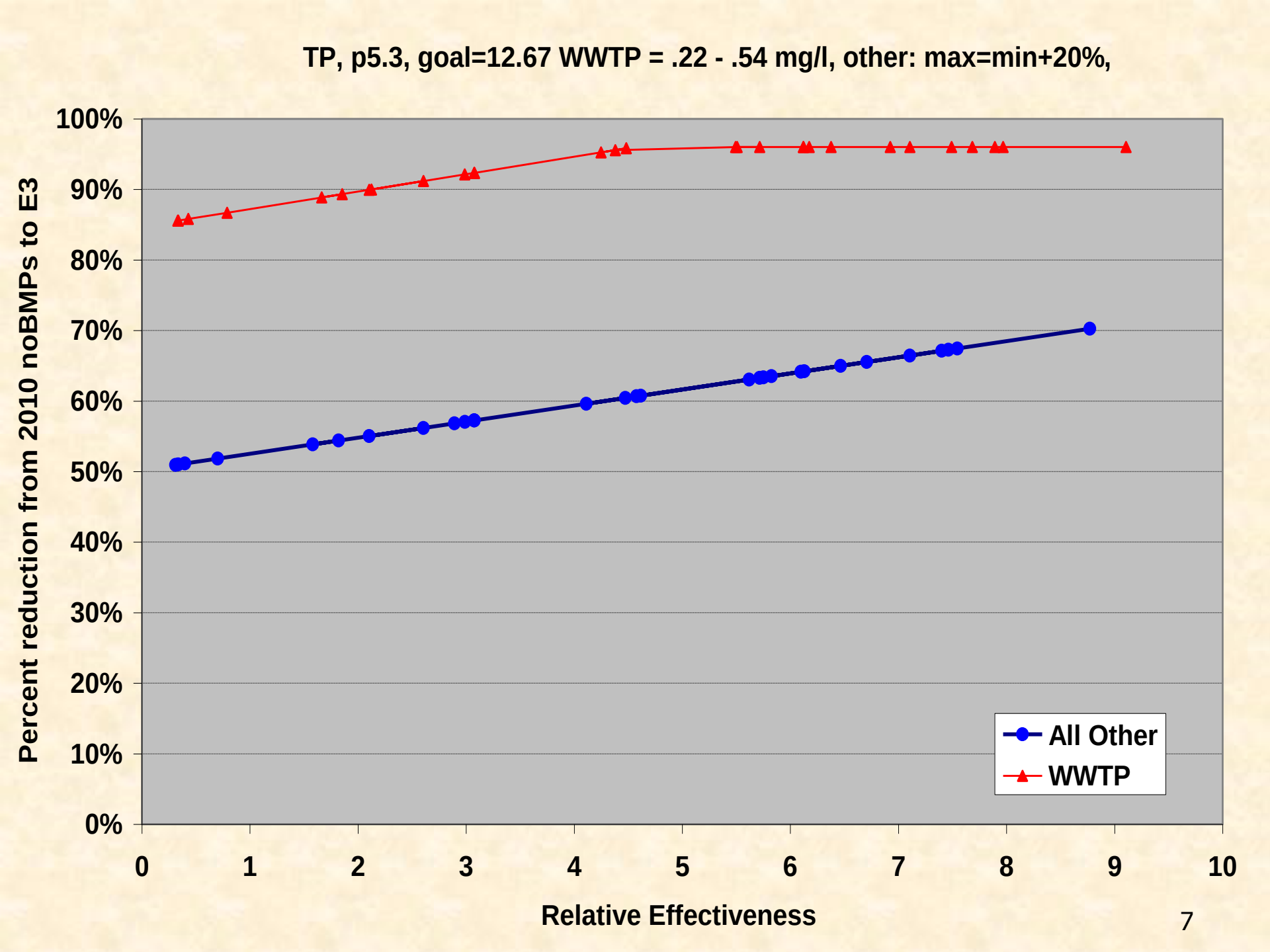




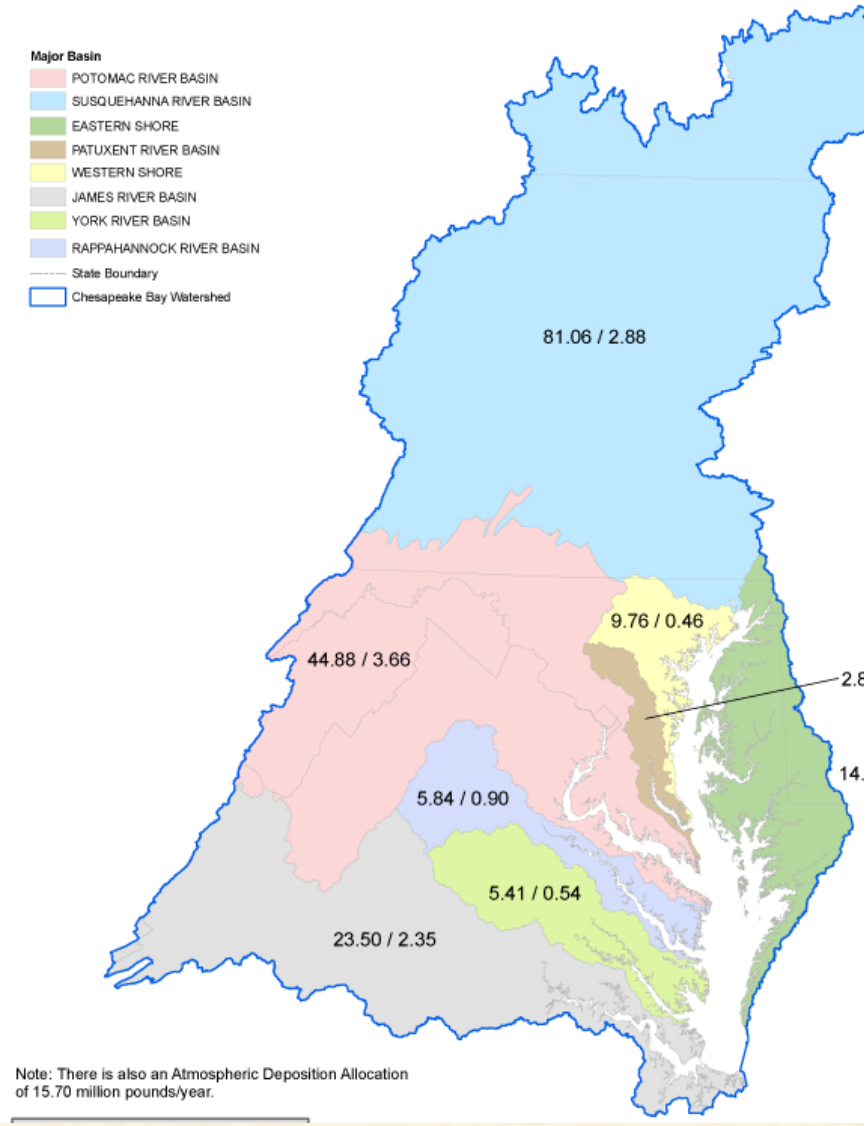
Major River Basin by Jurisdiction
Relative Impact on Bay Water Quality



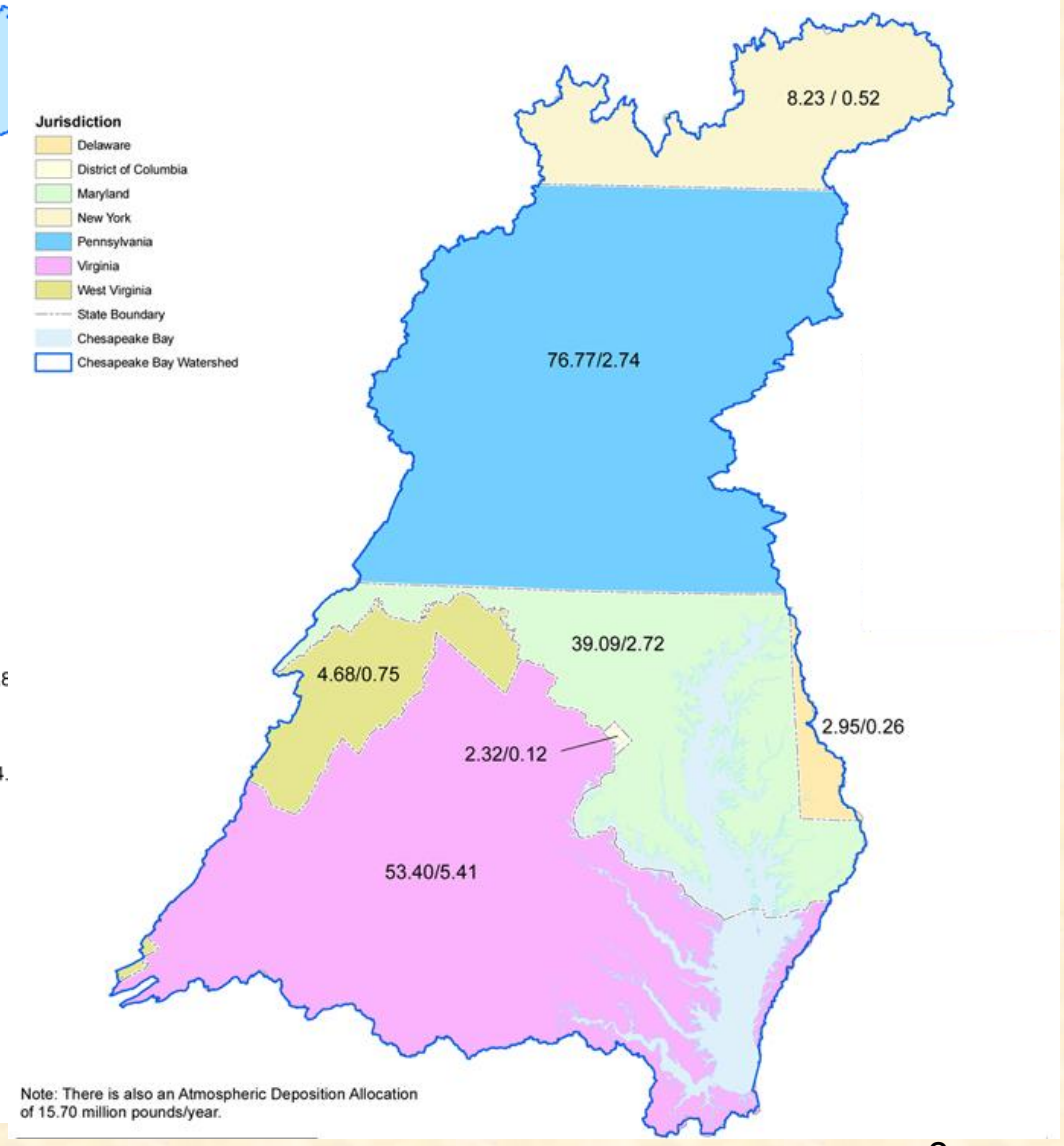

All Other
WWTP
Nitrogen -- Phase 5.3 -- Goal=190
Percent reduction from 2010 noBMPs to E3
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0
1
2
3
4
5
6
7
8
9
10
Relative Effectiveness
1. Plot effectiveness versus percent effort
2. Use 2010 as the base year
3. Set upper half of WWTP line at 3 mg/l equivalent; intercept at 8 mg/l
4. Most effective basin is 20 percentage points higher than least effective


TP, p5.3, goal=12.67 WWTP = .22 - .54 mg/l, other: max=min+20%,
Percent reduction from 2010 noBMPs to E3
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0
1
2
3
4
5
6
7
8
9
10
Relative Effectiveness
All Other
WWTP

Pollution Diet by River



Pollution Diet by State



E3 Scenario

- The E3 scenario is a "what-if" scenario of watershed conditions with theoretical maximum levels of managed controls on load sources.
  - There are no cost and few physical limitations to implementing BMPs for point and non-point sources in E3.
  - It's a "what-if" scenario, one of several reference points.
  - It is used with the No-Action scenario to define "controllable" loads, the difference between No-Action and E3 loads.
  - Planning targets also take into consideration the relative impacts of load reductions from regions throughout the watershed on water quality standards.

E3 Scenario

- Differences between No-Action and E3 scenario loads provide equity among regions of the CB watershed in that assumptions of point source controls and nonpoint source practice and program implementation levels for both scenarios are spatially universal.
  - Differences among regions occur because of more "inherent" differences in, for example:
    - animal and human populations,
    - number and types of wastewater facilities,
    - agricultural land types and areas,
    - urban land areas,
    - atmospheric deposition,
    - etc.

E3 Scenario

- Generally, E3 implementation levels and their associated reductions in nutrients and sediment could not be achieved for many practices, programs and control technologies when considering physical limitations and participation levels.

E3 Scenario

- E3 includes most technologies, practices and programs that have been reported by jurisdictions as part of annual model assessments, Milestones, and WIPs
  - For most BMPs outside of wastewater, it is assumed that the load from every available acre of the relevant land area is being controlled by a suite of existing or innovative practices.

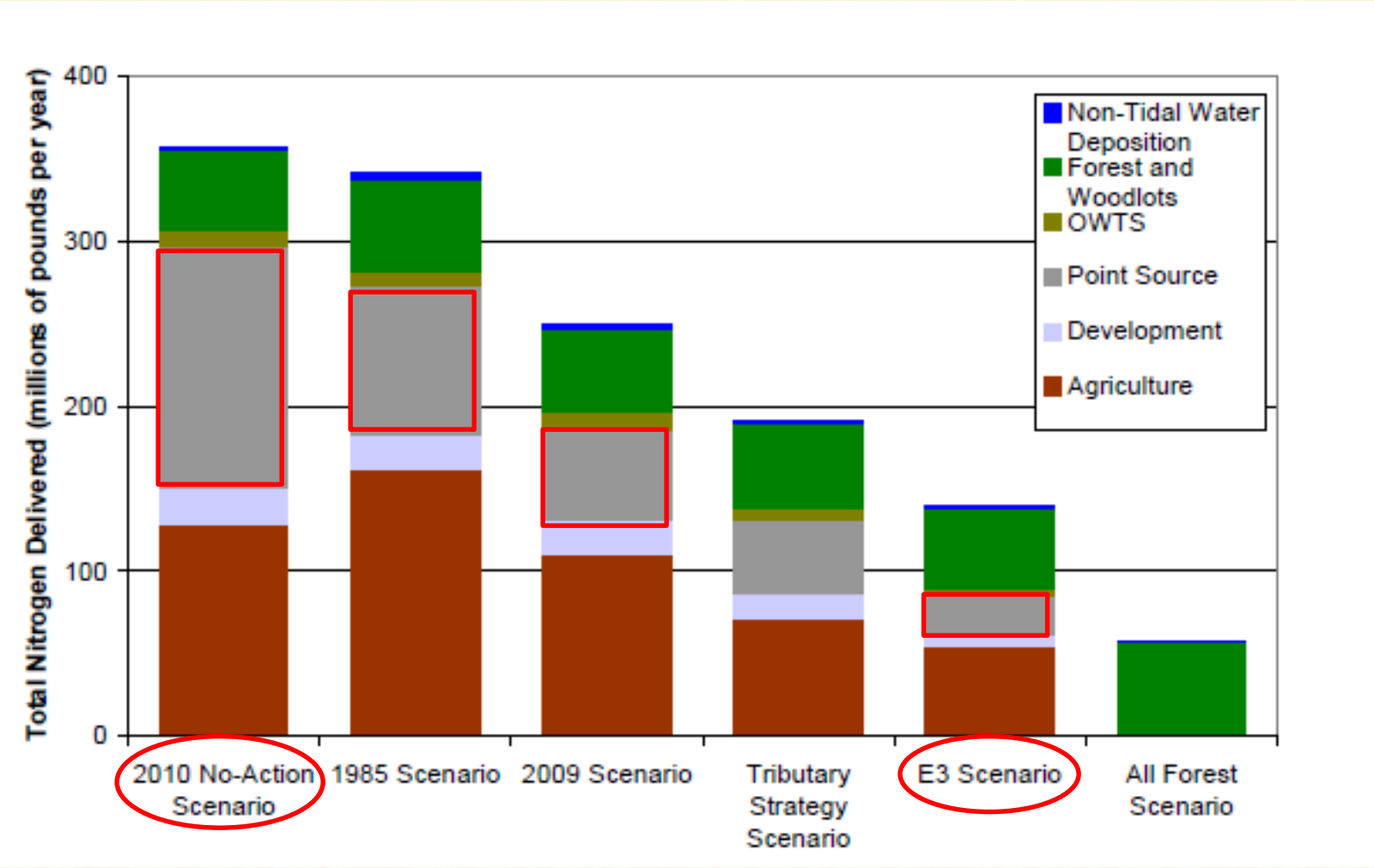
Wastewater Load Assumptions

Phase 5 No Action and E3 Scenarios

Scenario		Trib Strategy (TS)	E3	1985 No Action	2010 No Action
Definition		Latest state final or draft TS.	LOT Everywhere Tier 4 Level	Primary Treatment at the same level everywhere with 1985 flows	Primary Treatment at the same level everywhere with TS flows
Concentration	Sig Municipal Plants	Latest state final or draft TS. BOD=5 mg/l, DO=5 mg/l and TSS=5 mg/l	TN=3 and TP=0.1 BOD=3 mg/l, DO=6 mg/l and TSS=5 mg/l	TN=25 mg/l and TP =6 mg/l BOD=200 mg/l, DO=4.5 mg/l and TSS=45 mg/l	TN=25 mg/l and TP =6 mg/l BOD=200 mg/l, DO=4.5 mg/l and TSS=45 mg/l
	Sig Industrial Plants	Latest state final or draft TS. BOD=5 mg/l, DO=5 mg/l and TSS=5 mg/l	TN=3 and TP=0.1 or TS level if less for industrial plants BOD=3 mg/l, DO=6 mg/l and TSS=5 mg/l	Highest Loads on record, or TS loads if greater BOD=200 mg/l, DO=4.5 mg/l and TSS=45 mg/l	Highest Loads on record, or TS loads if greater BOD=200 mg/l, DO=4.5 mg/l and TSS=45 mg/l
	Non-sig Plan	2006 data or newly submitted non sig data. BOD=30 mg/l, DO=4.5 mg/l and TSS=25 or 45 mg/l	TN=8 and TP=2 or TS level if less for industrial plants BOD =5 mg/l, DO=5 mg/l and TSS= 8 mg/l	TN=25 mg/l and TP =6 mg/l BOD=200 mg/l, DO=4.5 mg/l and TSS=45 mg/l	TN=25 mg/l and TP =6 mg/l BOD=200 mg/l, DO=4.5 mg/l and TSS=45 mg/l
Flow		TS flows for sig plants 2006 data or newly submitted non sig data for non-sig plants	Same as TS scenario	1985 Flows	Same as TS scenario
DC CSO		Long Term Control Plan full Implementation	Long Term Control Plan full Implementation	TN=25 mg/l and TP =6 mg/l BOD=200 mg/l, DO=4.5 mg/l and TSS=45 mg/l current base condition flow	TN=25 mg/l and TP =6 mg/l BOD=200 mg/l, DO=4.5 mg/l and TSS=45 mg/l current base condition flow
Refinement from Phase 4.3 Scenarios		adding non-sig data and BOD, DO and TSS Defaults	adding non-sig data and BOD, DO and TSS Defaults	New Scenario	New Scenario

Scenario Source Loads

Phase 5 No Action and E3 Scenarios



Nitrogen loads delivered to the Chesapeake Bay and its tidal tributaries by source for all loading scenarios (Chesapeake Bay Watershed Model (TMDL version)

E3 Scenario

Wastewater Discharge Assumptions

- Significant municipal wastewater treatment facilities
  - Flow = Tributary Strategy flows where most are at design flows
  - Nitrogen effluent concentration = 3 mg TN/l
  - Phosphorus effluent concentration = 0.1 mg TP/l
  - BOD = 3 mg/l, DO = 6 mg/l and TSS = 5 mg/l
- Significant industrial dischargers
  - Flow = Tributary Strategy flows where most are at design flows
  - Nitrogen effluent concentration = 3 mg TN/l or Tributary Strategy concentration if less
  - Phosphorus effluent concentration = 0.1 mg TP/l or Tributary Strategy concentration if
  - less
  - BOD = 3 mg/l, DO = 6 mg/l and TSS = 5 mg/l
- Nonsignificant municipal wastewater treatment facilities
  - Flow = Design or 2006 flow if design is not available
  - Nitrogen effluent concentration = 8 mg TN/l or Tributary Strategy concentration if less
  - Phosphorus effluent concentration = 2 mg TP/l or Tributary Strategy concentration if less
  - BOD = 5 mg/l, DO = 5 mg/l and TSS = 8 mg/l
- Nonsignificant industrial wastewater treatment facilities
  - Applies the percentage of equivalent reduction from No-Action (18 mg/l TN, 3 mg/l TP) to E3 (3 mg/l TN, 0.1 mg/l TP) to the 2010 load estimates

E3 Scenario
CSO and Septic Assumptions

- Combined Sewer Overflows
  - 100 percent overflow reduction through storage and treatment, separation or other practices. Storage and treatment are assumed in current model scenarios
- Septic connections
  - 10 percent of septic systems connected to wastewater treatment facilities
- Septic denitrification and maintenance
  - Remaining septic systems after connections employ denitrification technologies and are maintained through regular pumping to achieve a 55 percent TN load reduction at the edge-of-septic-field
  - Septic systems are maintained by a responsible management entity or in perpetuity through a maintenance contract

Questions and Comments?