Base Year, Land Use and Wastewater Flow Assumptions for the Chesapeake Bay TMDL

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Presentation D

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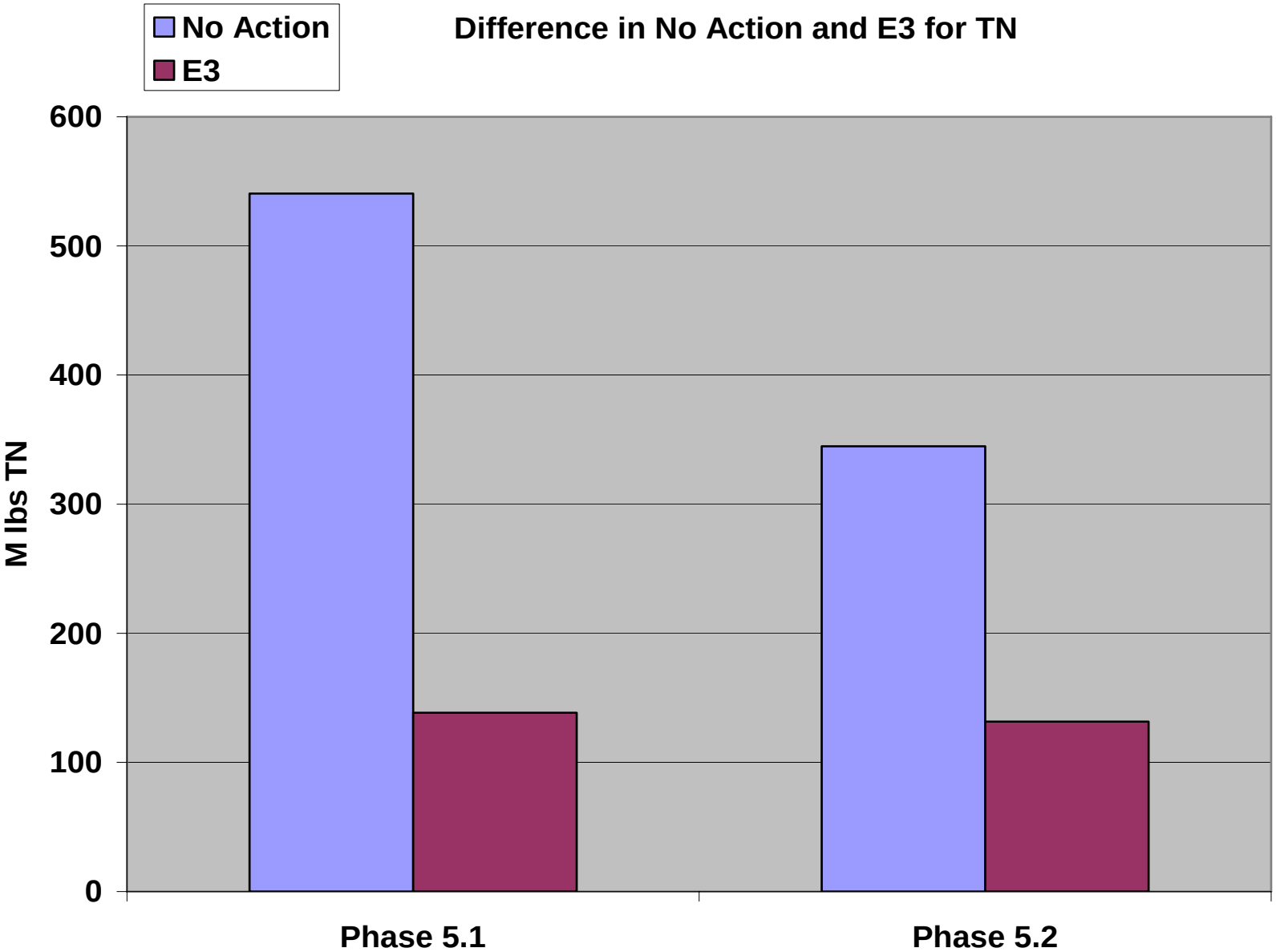
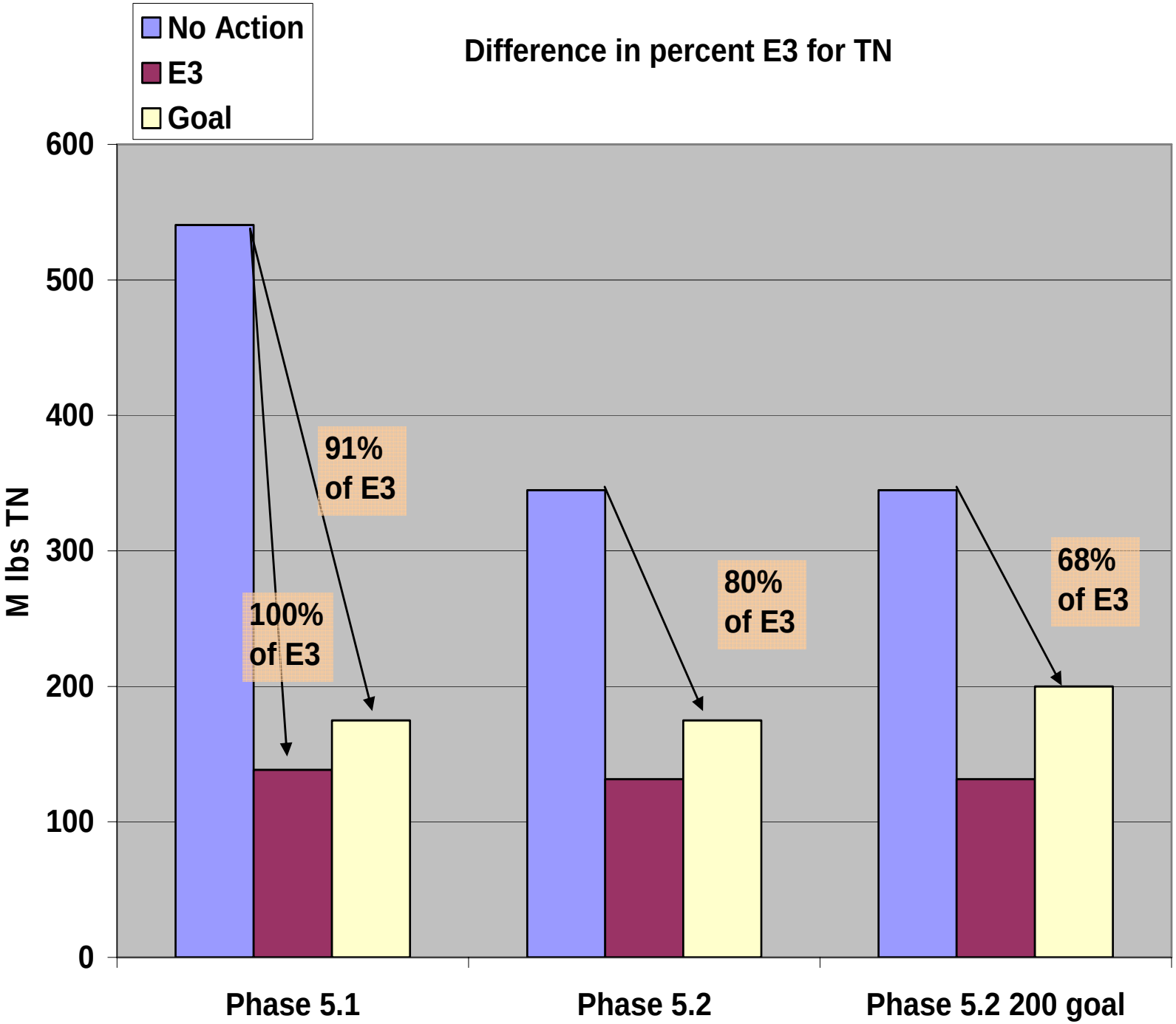
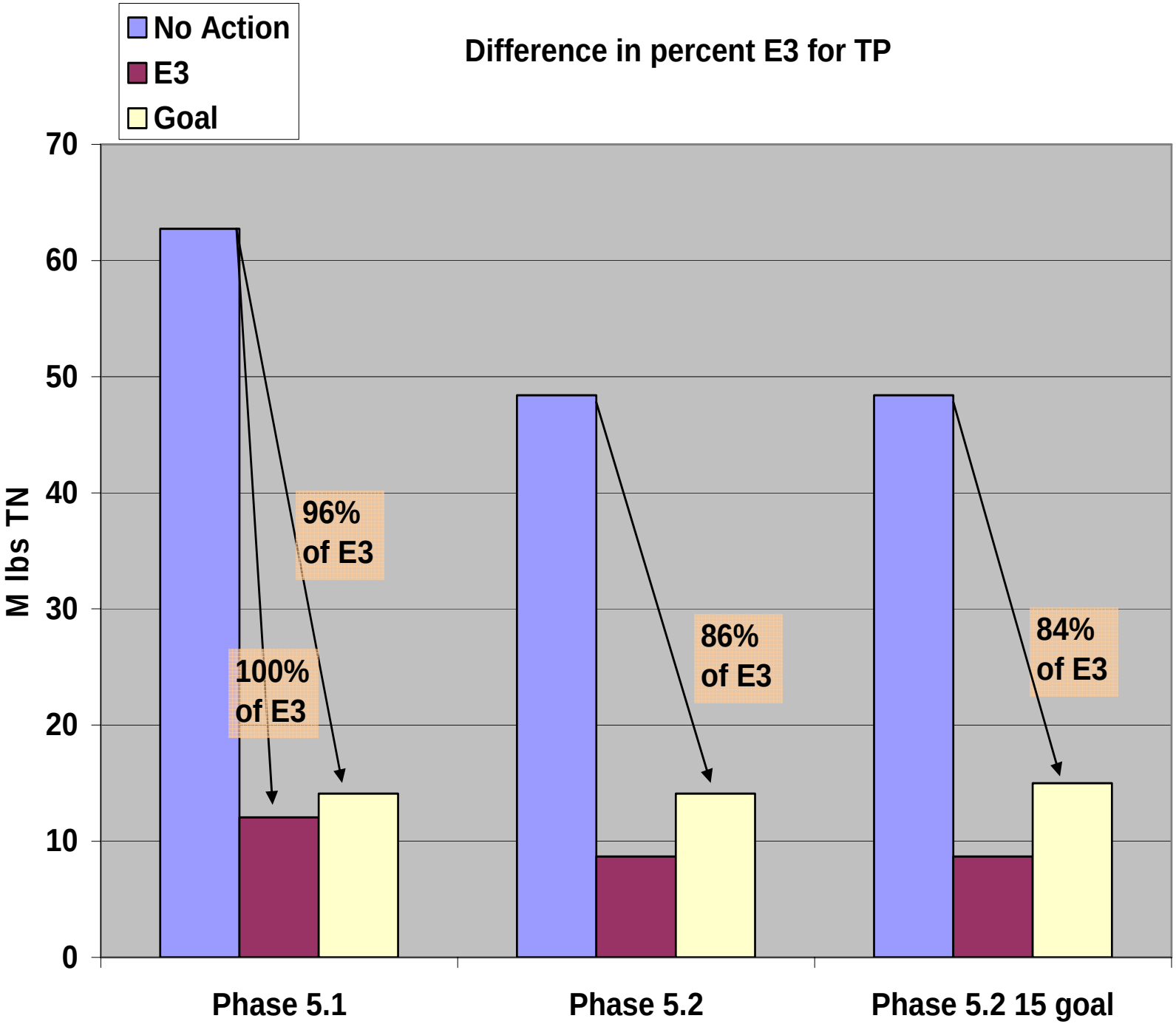
U.S. EPA Chesapeake Bay Program Office

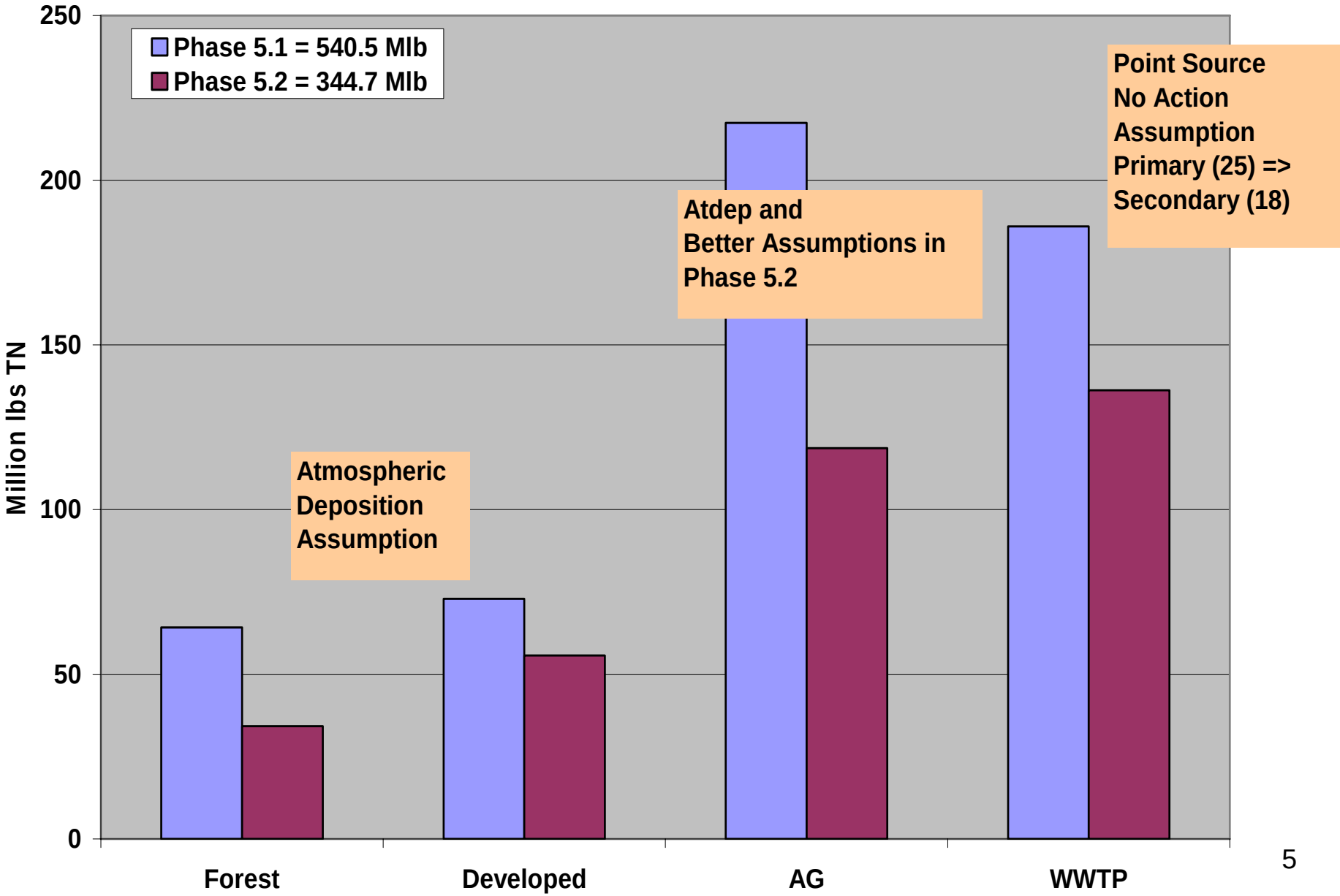
First: Changes Between P5.1 and P5.2



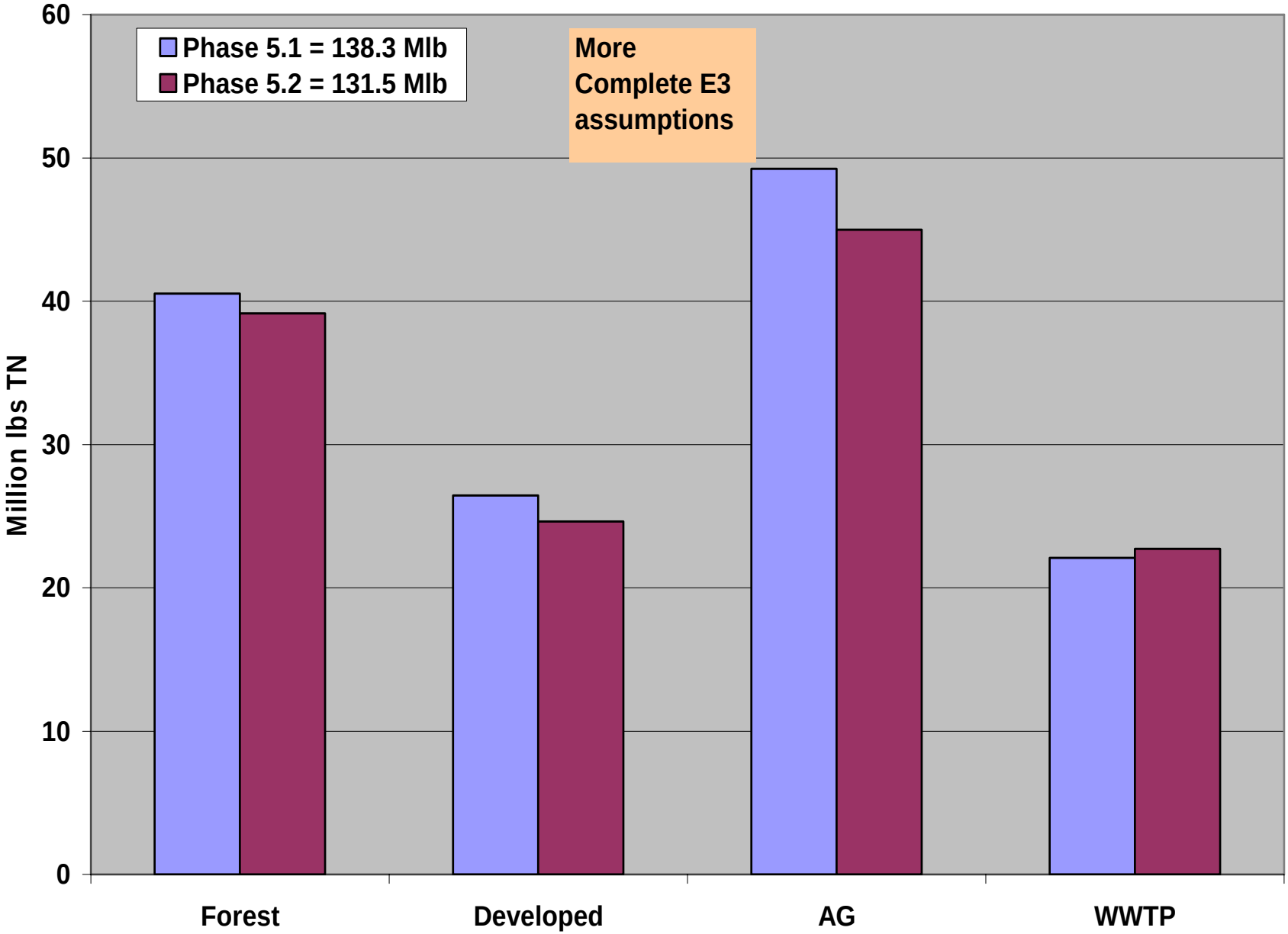

No Action
E3
Goal
Difference in percent E3 for TN
600
500
400
300
200
100
0
M lbs TN
91%
of E3
100%
of E3
80%
of E3
68%
of E3
Phase 5.1
Phase 5.2
Phase 5.2 200 goal


No Action
E3
Goal
Difference in percent E3 for TP
M lbs TN
70
60
50
40
30
20
10
0
96%
of E3
100%
of E3
86%
of E3
84%
of E3
Phase 5.1
Phase 5.2
Phase 5.2 15 goal

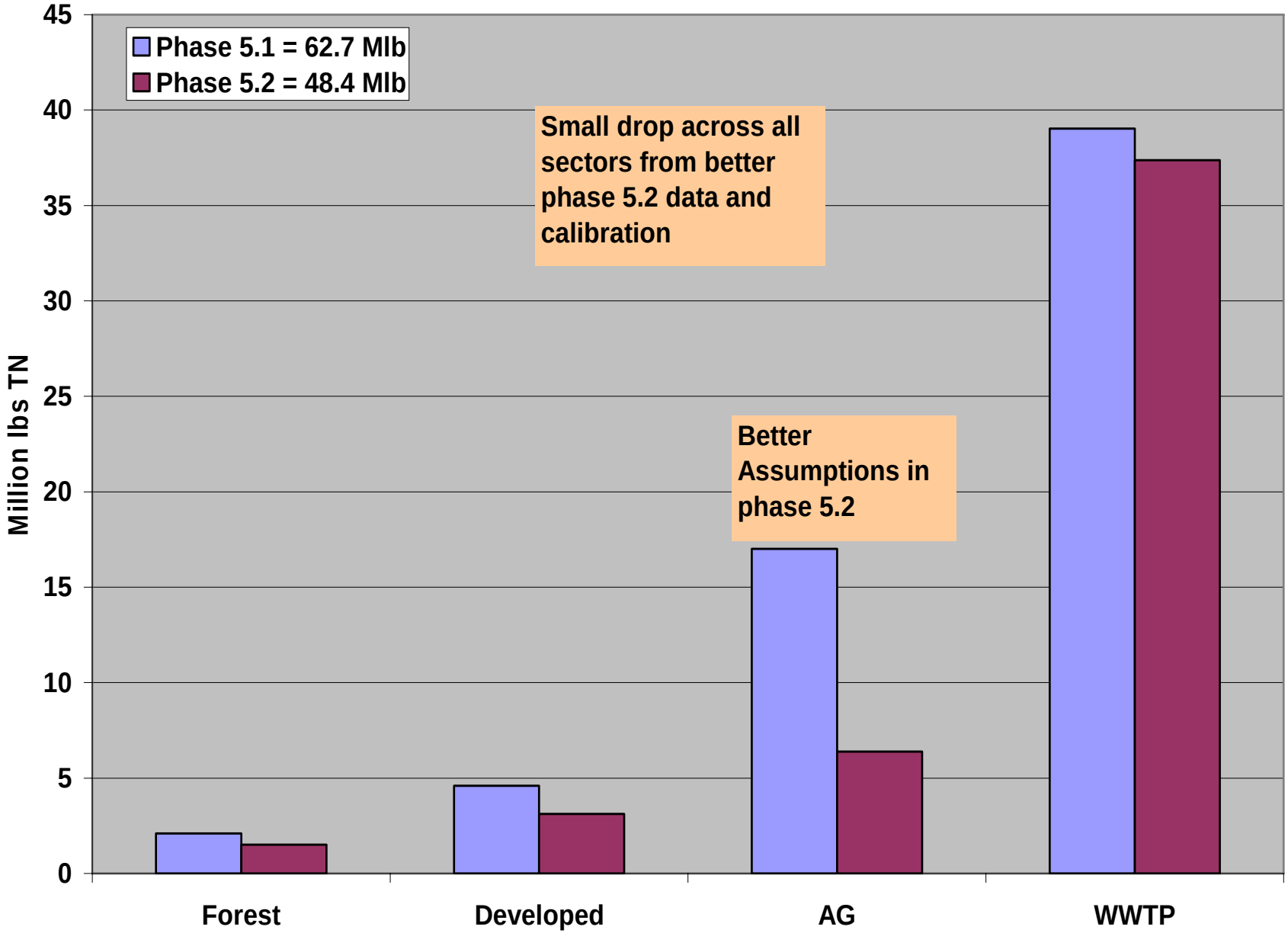
Phase 5.2 Change in No Action TN



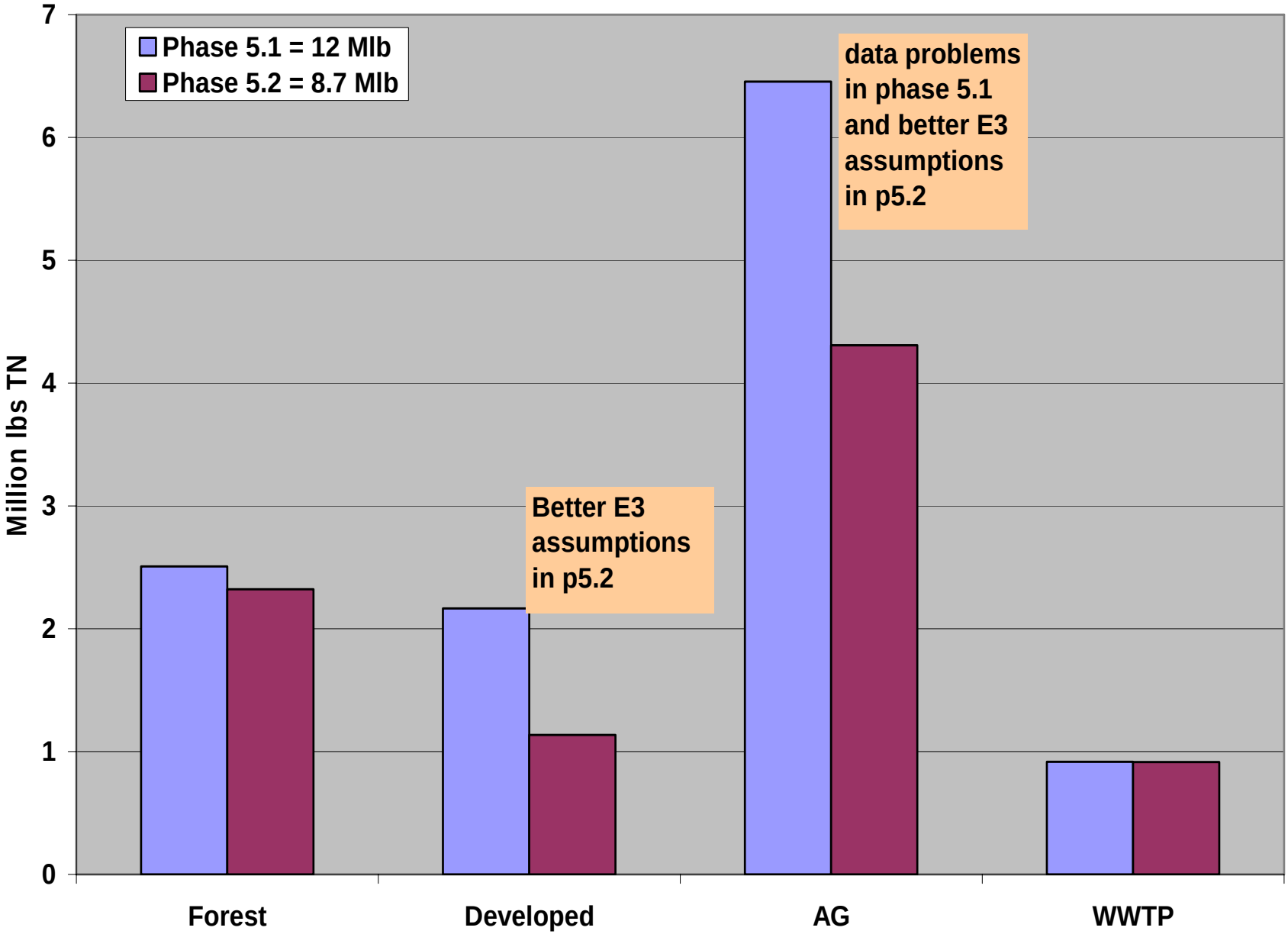
Phase 5.2 Change in E3 TN



Phase 5.2 Change in No Action TP



Phase 5.2 Change in E3 TP



Observations

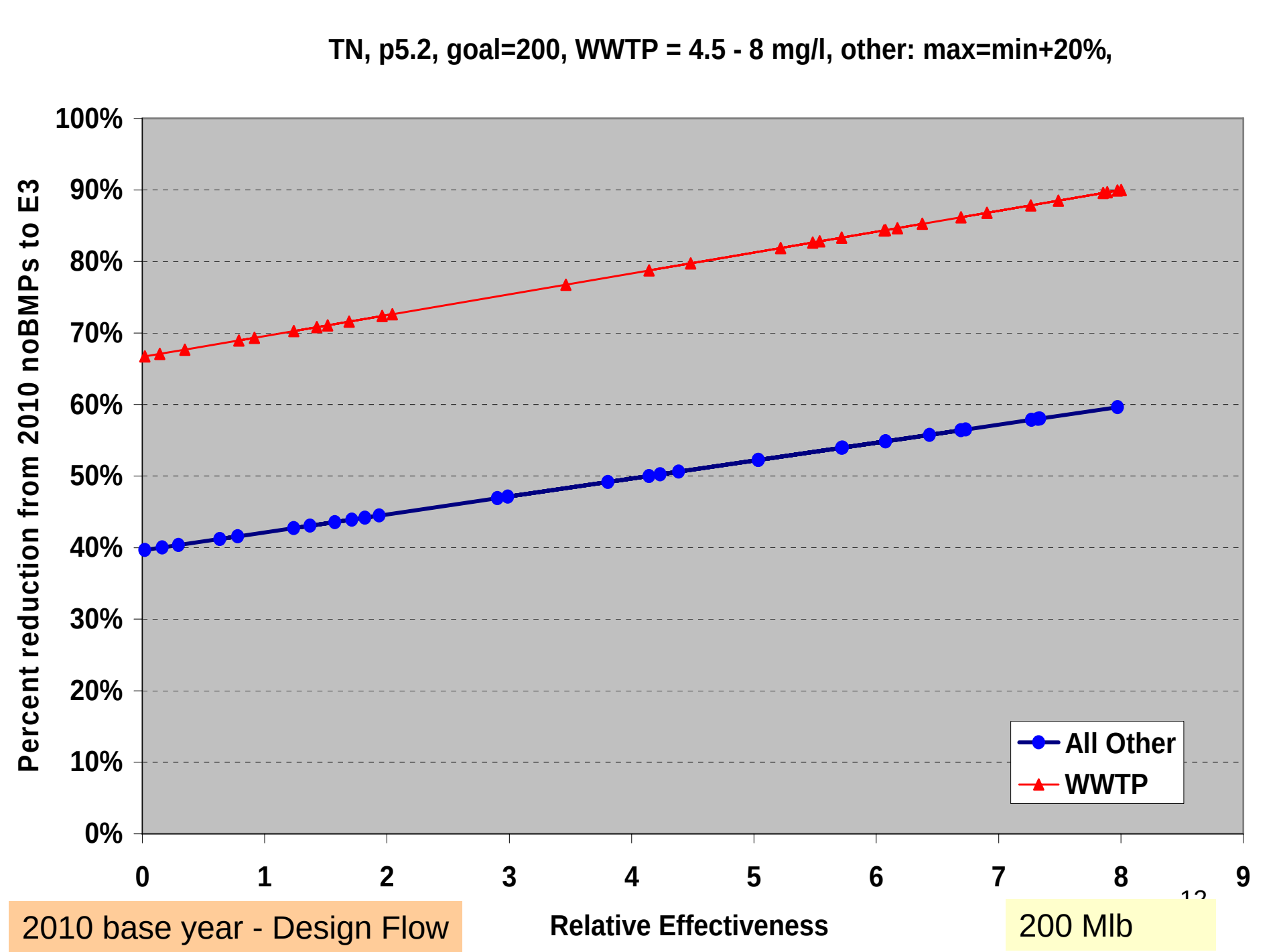
- Major changes from phase 5.1 to 5.2
  - Atmospheric deposition assumption
  - Point Source No Action N assumptions
  - Data issues in both scenarios, more severe in phase 5.1
- Necessary load reductions more feasible
- Phase 5.3 will probably have higher Ag No Action Scenario
  - Target Loads will still shift.

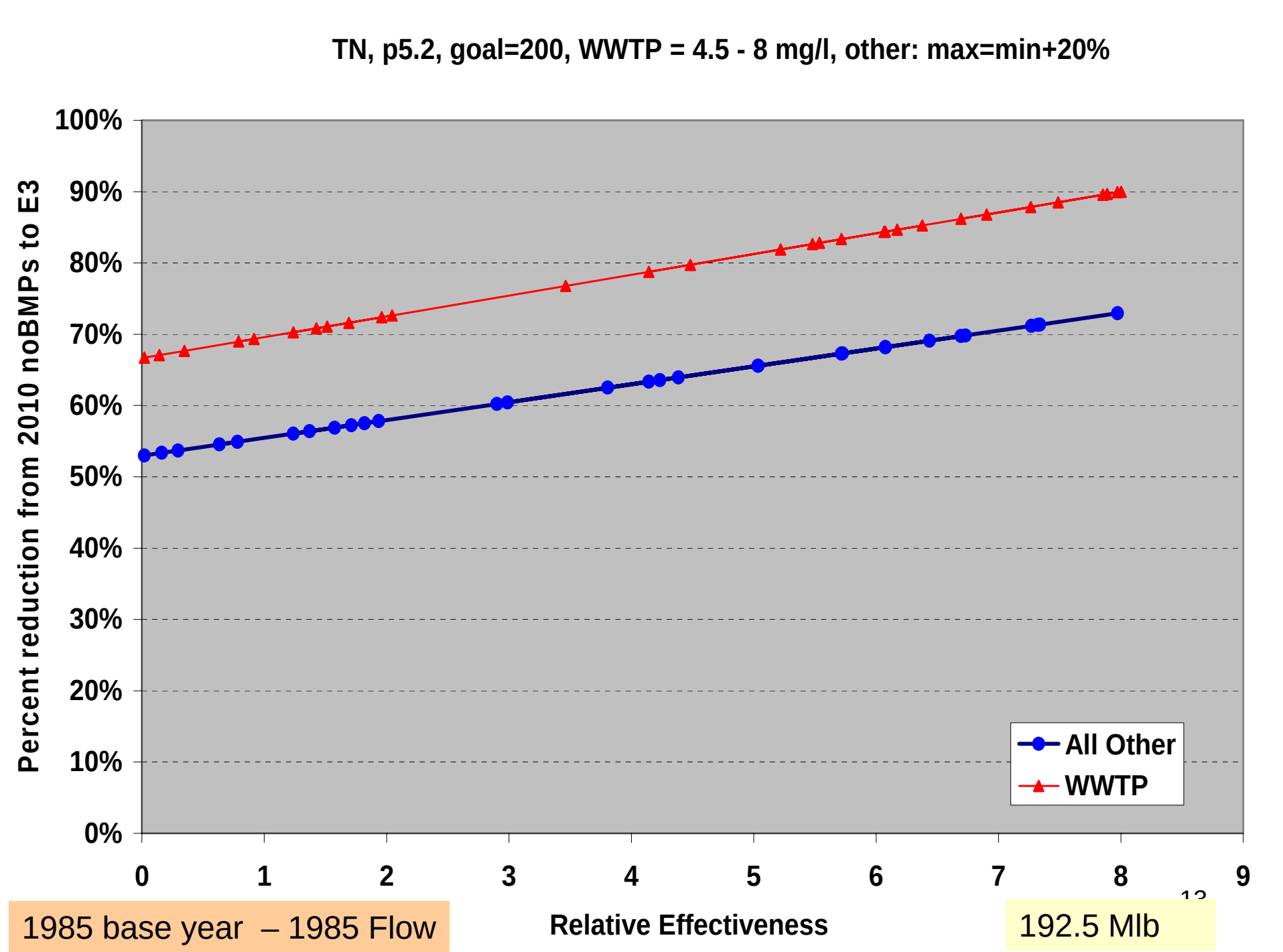
Evaluate WWTP flow assumption

- Ran 2010 no action and 2010 E3 with three flow assumptions
  - Design
  - Current
  - 1985
- Calculate Targets on 1 straight, flat line at 175 and 14.1

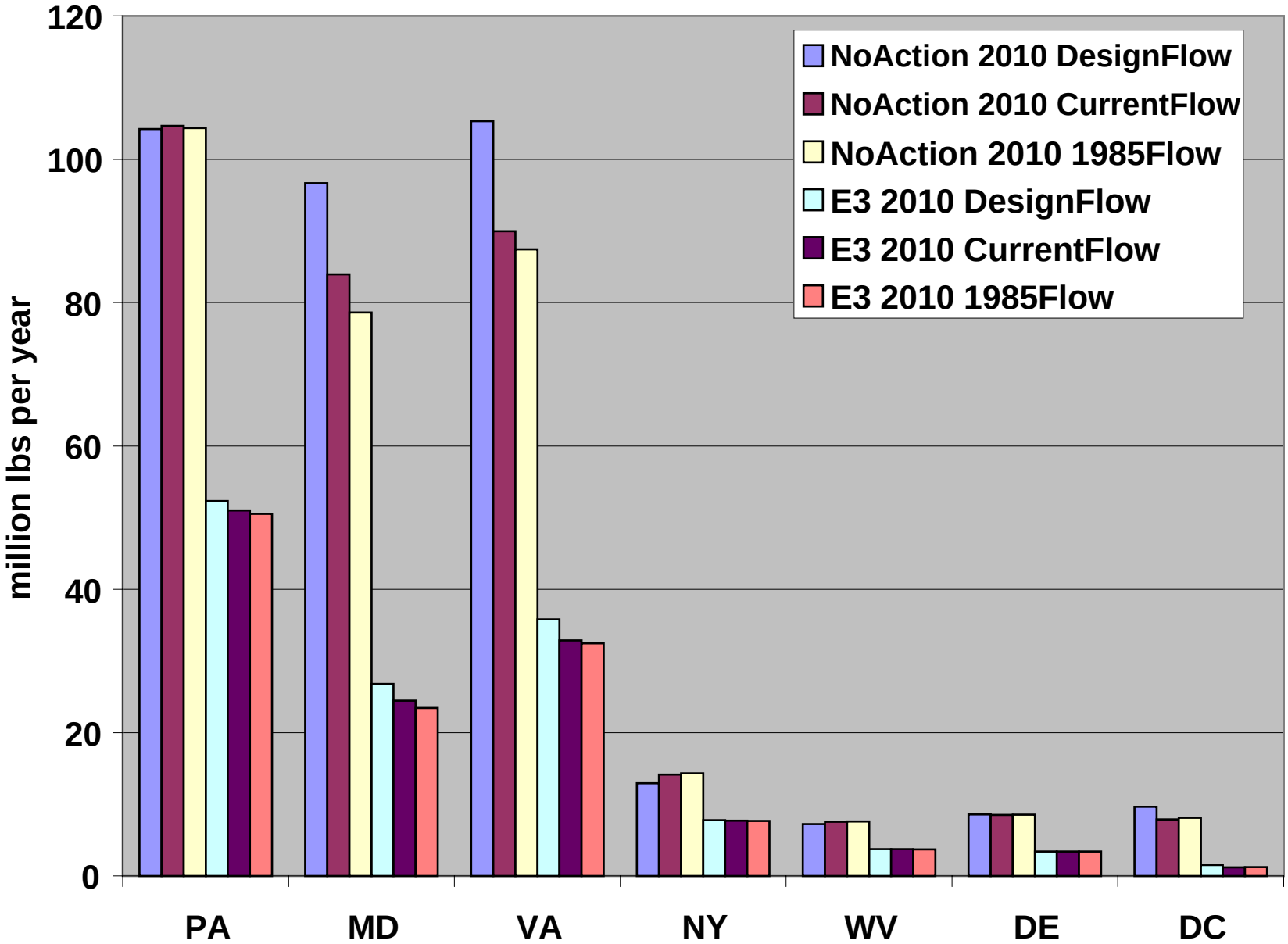
Calculate targets based on:

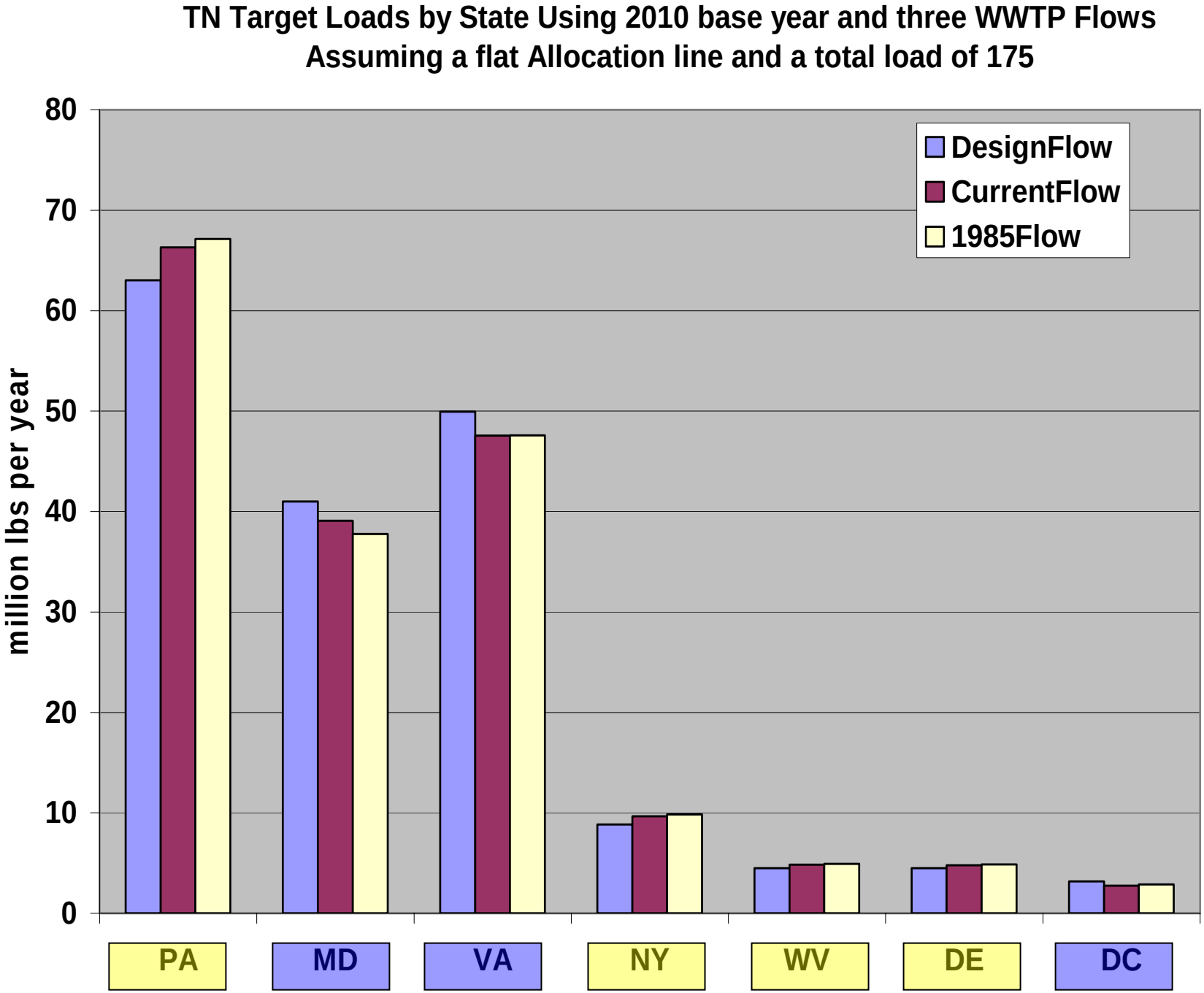
- 2 straight lines
- 200 TN and 14 TP
- TN
  - WWTP
    - High Effective at 4.5 mg/l
    - Low Effective at 8 mg/l
  - Other Loads
    - High Effective 20% higher than low effective
- TP
  - WWTP
    - High Effective at .34 mg/l
    - Low Effective at 1 mg/l
  - Other Loads
    - High Effective 20% higher than low effective


TN, p5.2, goal=200, WWTP = 4.5 - 8 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
All Other
WWTP
2010 base year - Design Flow
Relative Effectiveness
200 Mlb

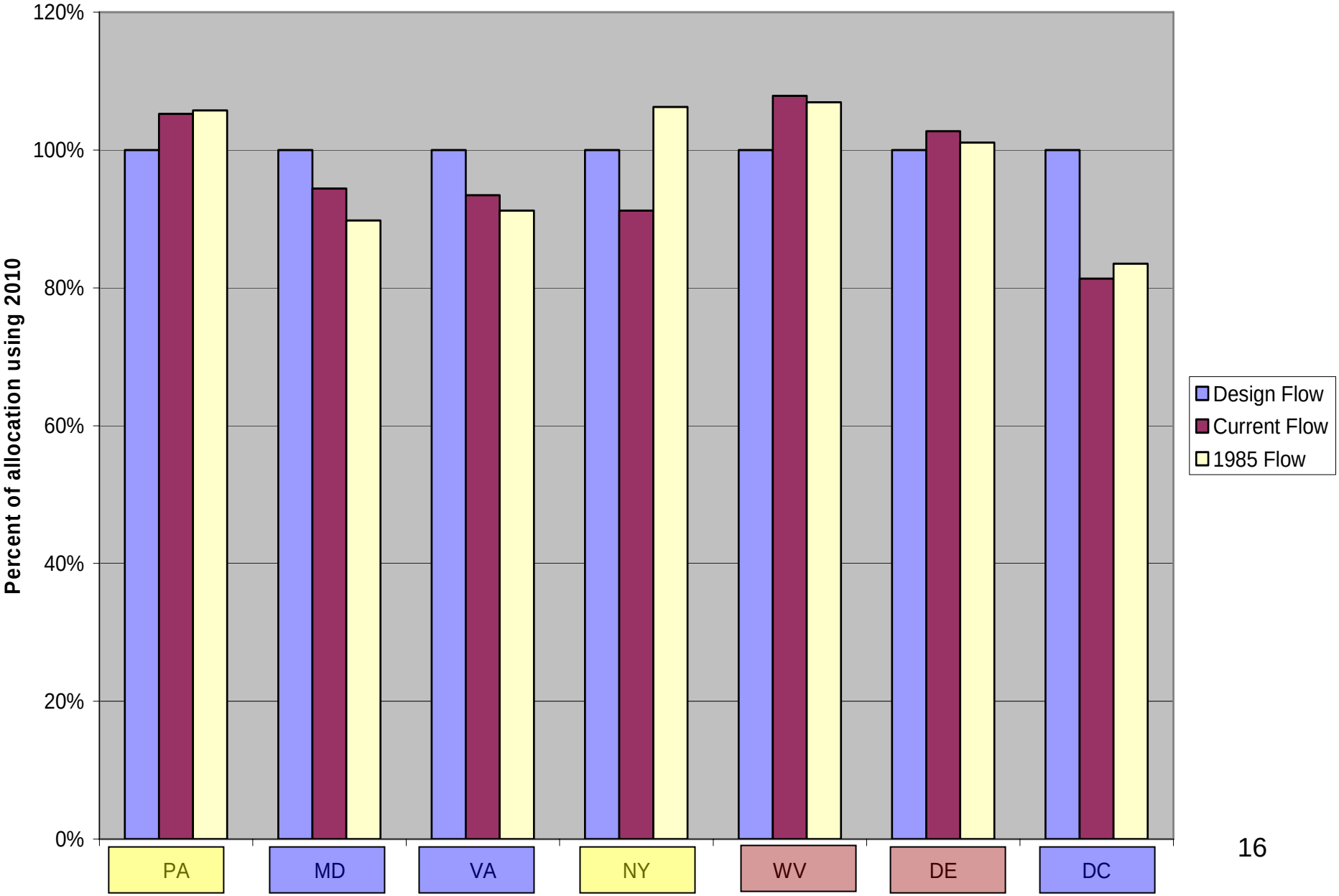

TN, p5.2, goal=200, WWTP = 4.5 - 8 mg/l, other: max=min+20%
Percent reduction from 2010 noBMPs to E3
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0
1
2
3
4
5
6
7
8
9
All Other
WWTP
Relative Effectiveness
1985 base year – 1985 Flow
192.5 Mlb

No Action and E3 Total Delivered TN Loads for different WWTP Flow Assumptions

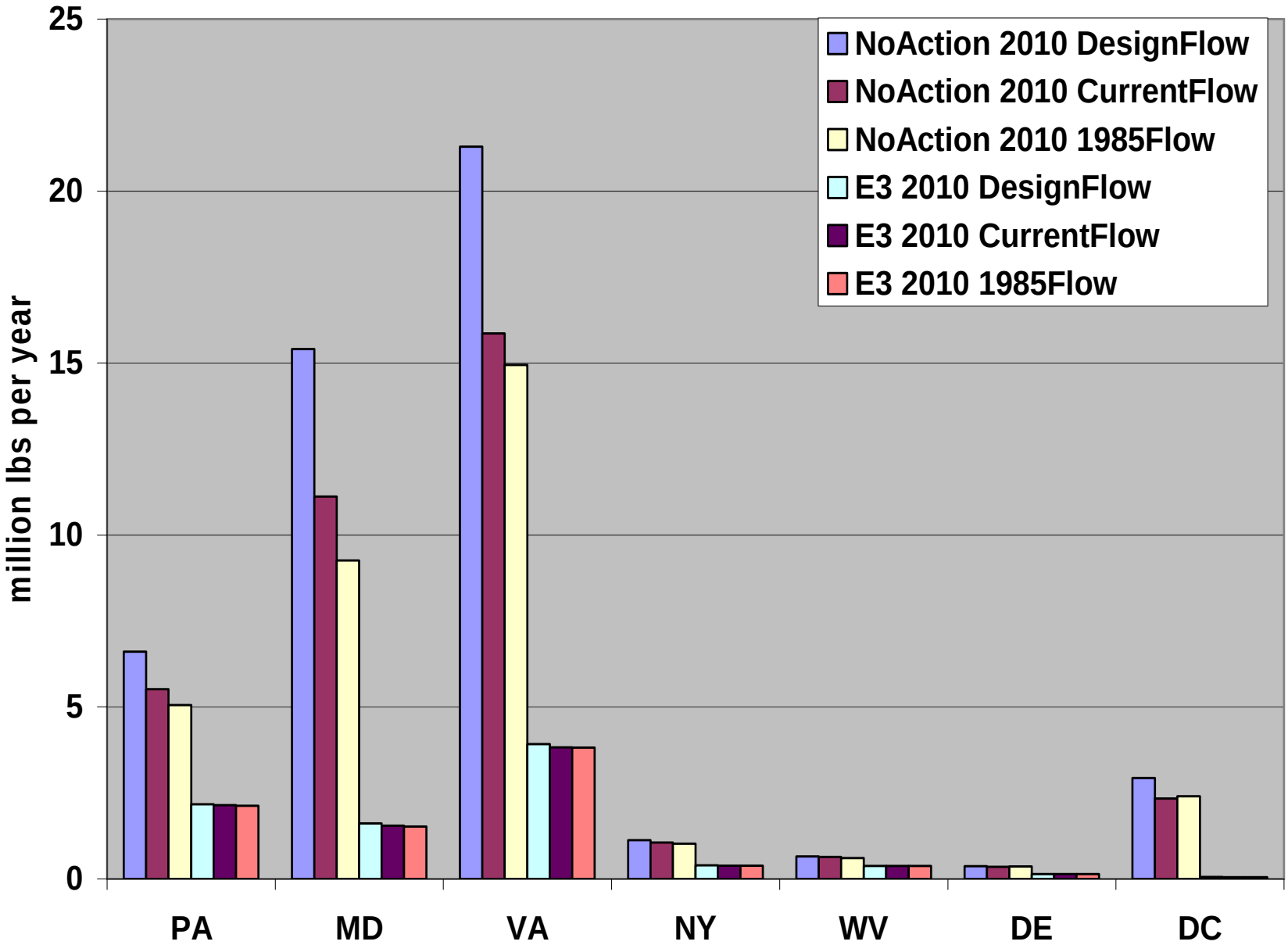



TN Target Loads by State Using 2010 base year and three WWTP Flows
Assuming a flat Allocation line and a total load of 175
million lbs per year
80
70
60
50
40
30
20
10
0
DesignFlow
CurrentFlow
1985Flow
PA
MD
VA
NY
WV
DE
DC

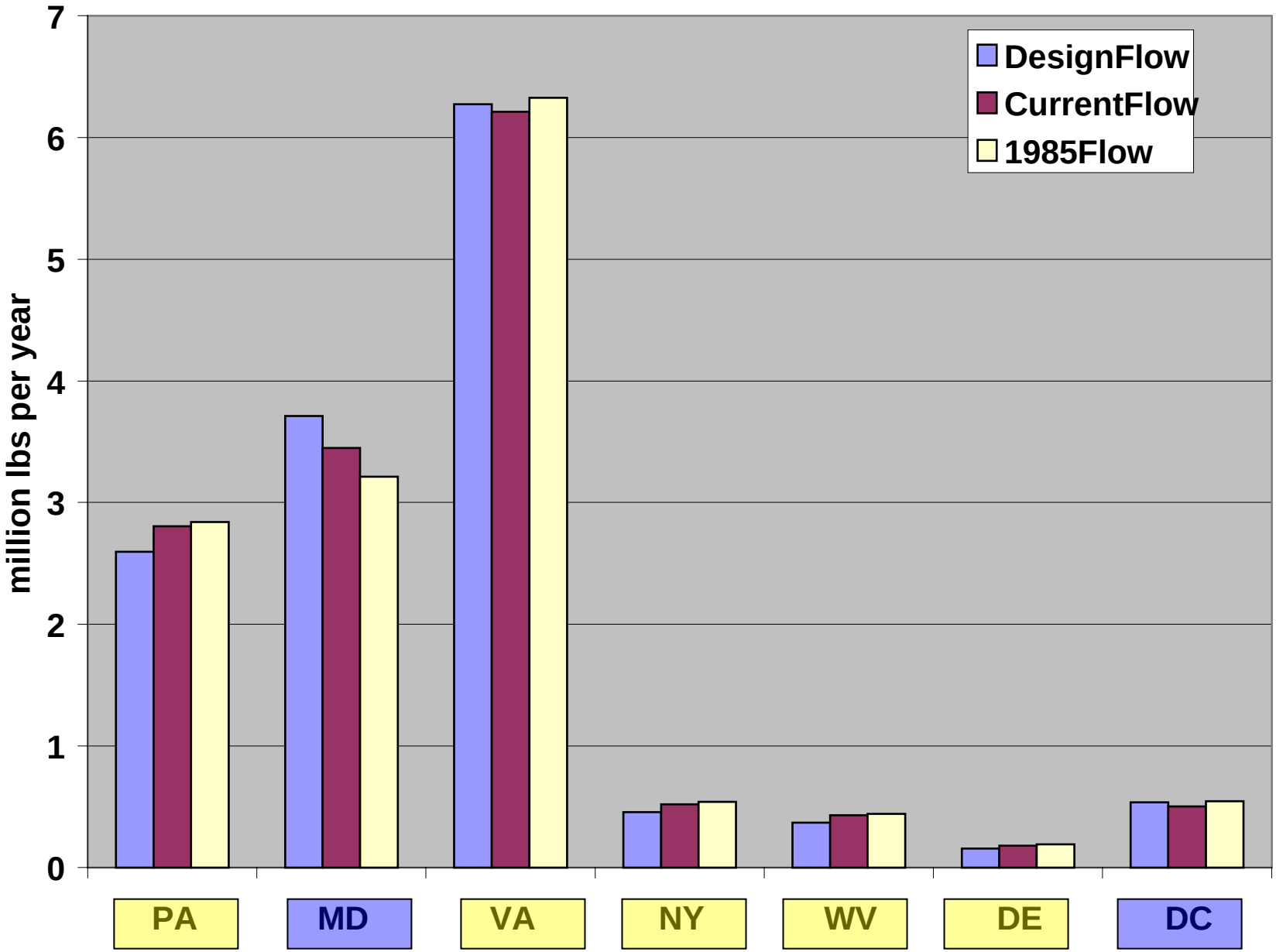
Allocation Percent of Design Flow 2010 TN



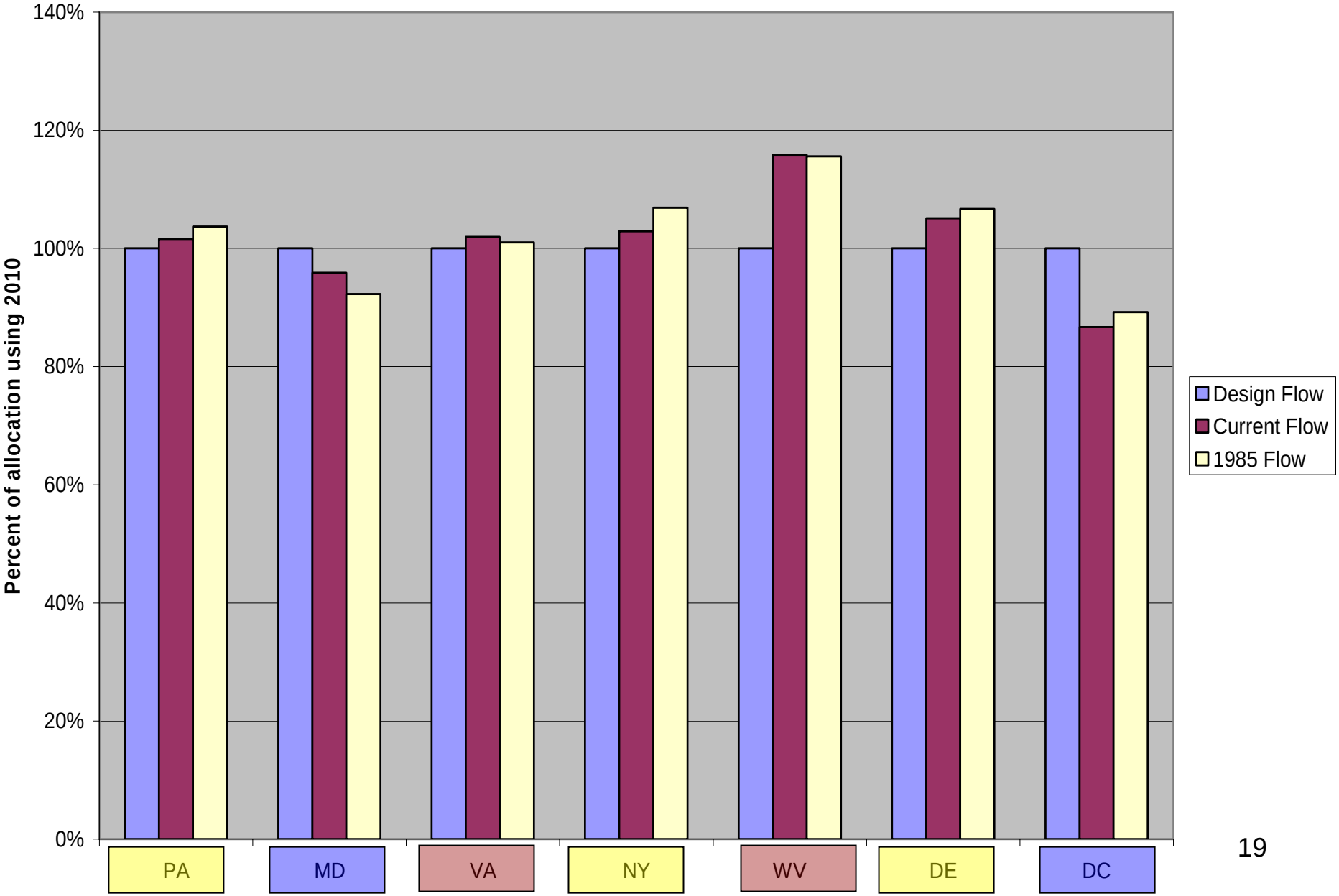
No Action and E3 Total TP Loads for different WWTP Flow Assumptions



TP Target Loads by State Using 2010 base year and three WWTP Flows Assuming a flat Allocation line and a total load of 14.1



Allocation Percent of Design Flow TP



Evaluate Base Year

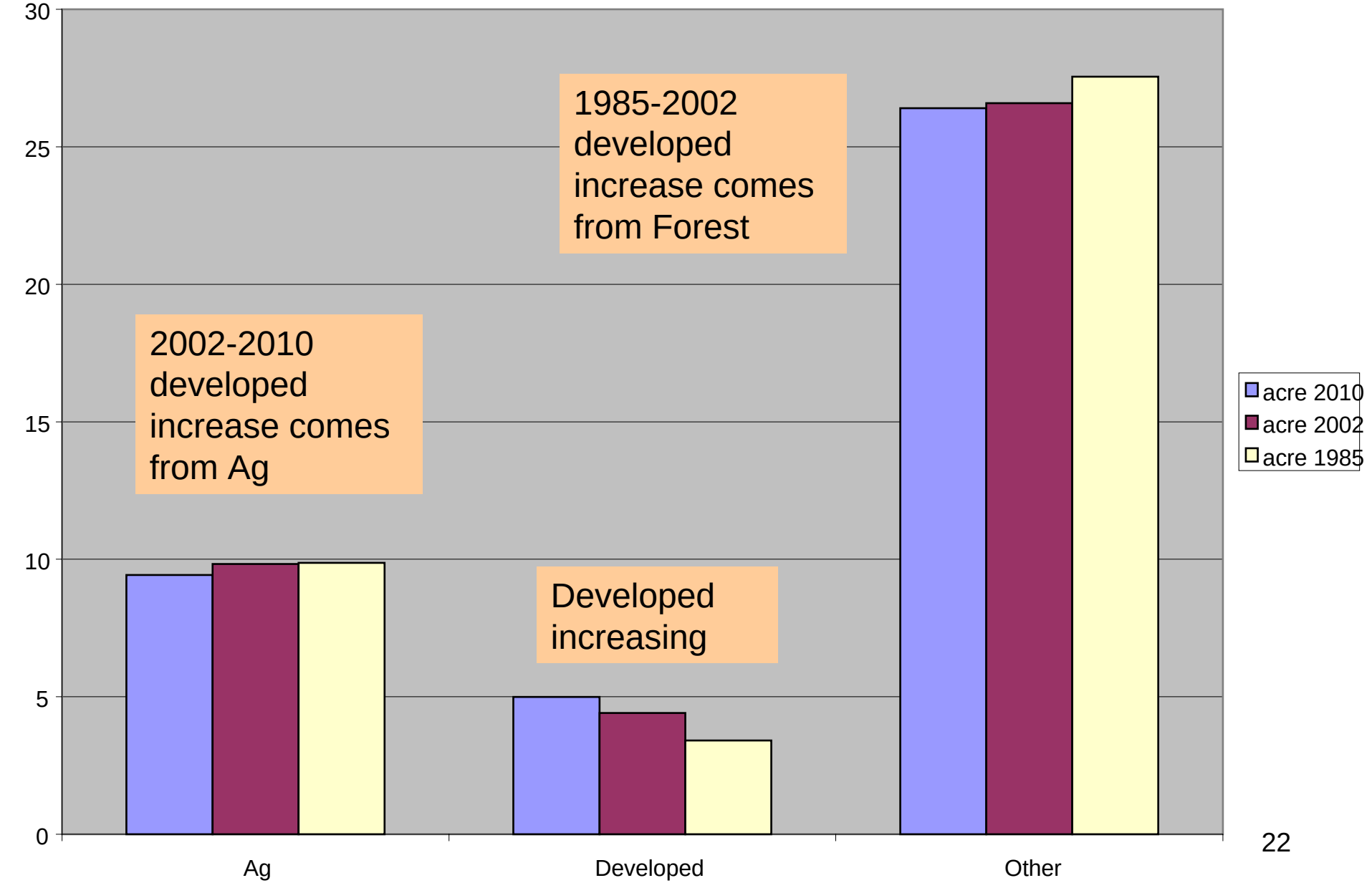
- Ran 1985, 2002, and 2010 base years for No Action and E3 with design flow in WWTP
- Calculate Targets on 1 straight, flat line at 175 and 14.1

- 1985 has lower ag census acreages

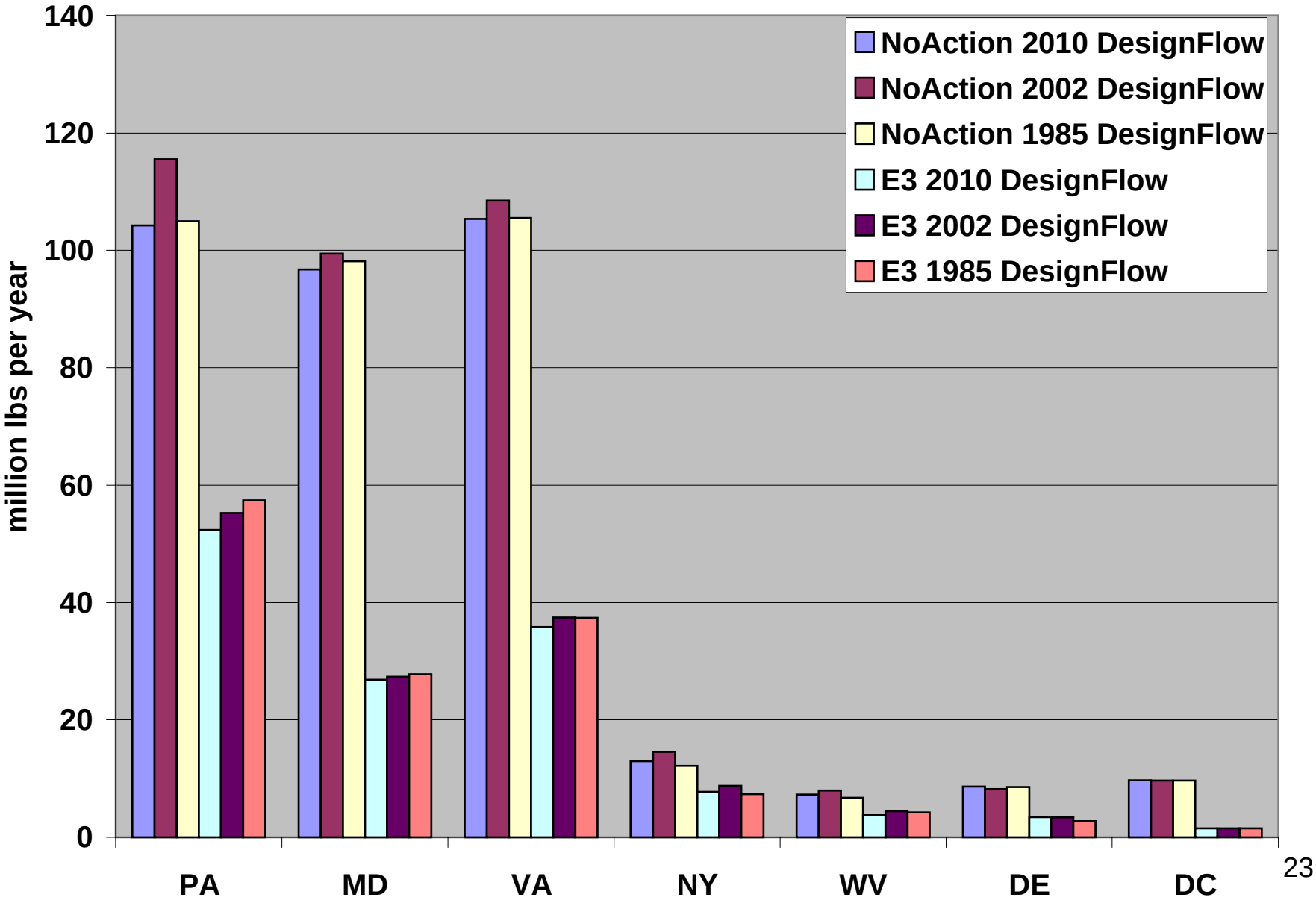
Calculate targets based on:

- 2 straight lines
- 200 TN and 14 TP
- TN
  - WWTP
    - High Effective at 4.5 mg/l
    - Low Effective at 8 mg/l
  - Other Loads
    - High Effective 20% higher than low effective
- TP
  - WWTP
    - High Effective at .34 mg/l
    - Low Effective at 1 mg/l
  - Other Loads
    - High Effective 20% higher than low effective

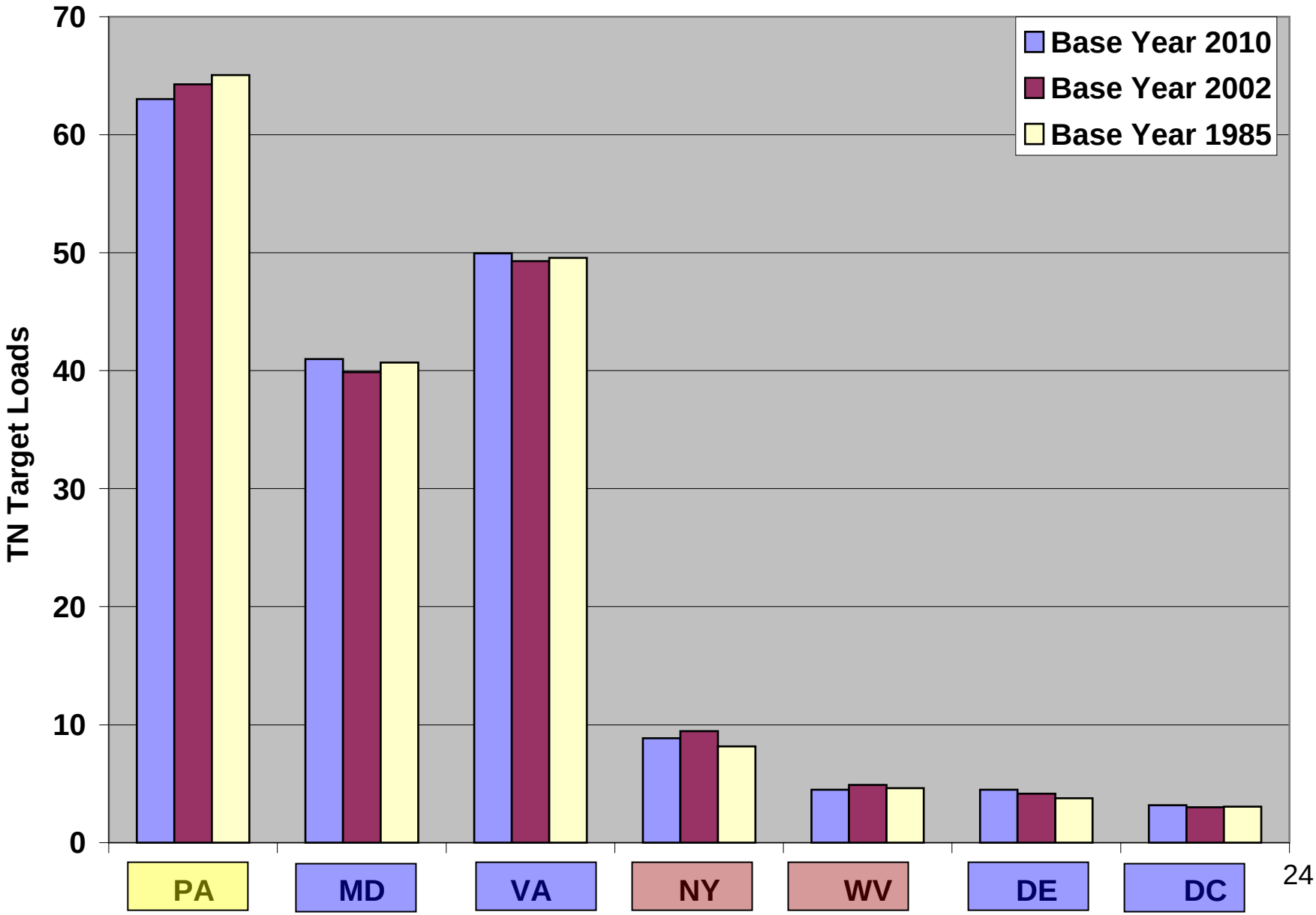
Acres for Various No Action Year Scenarios

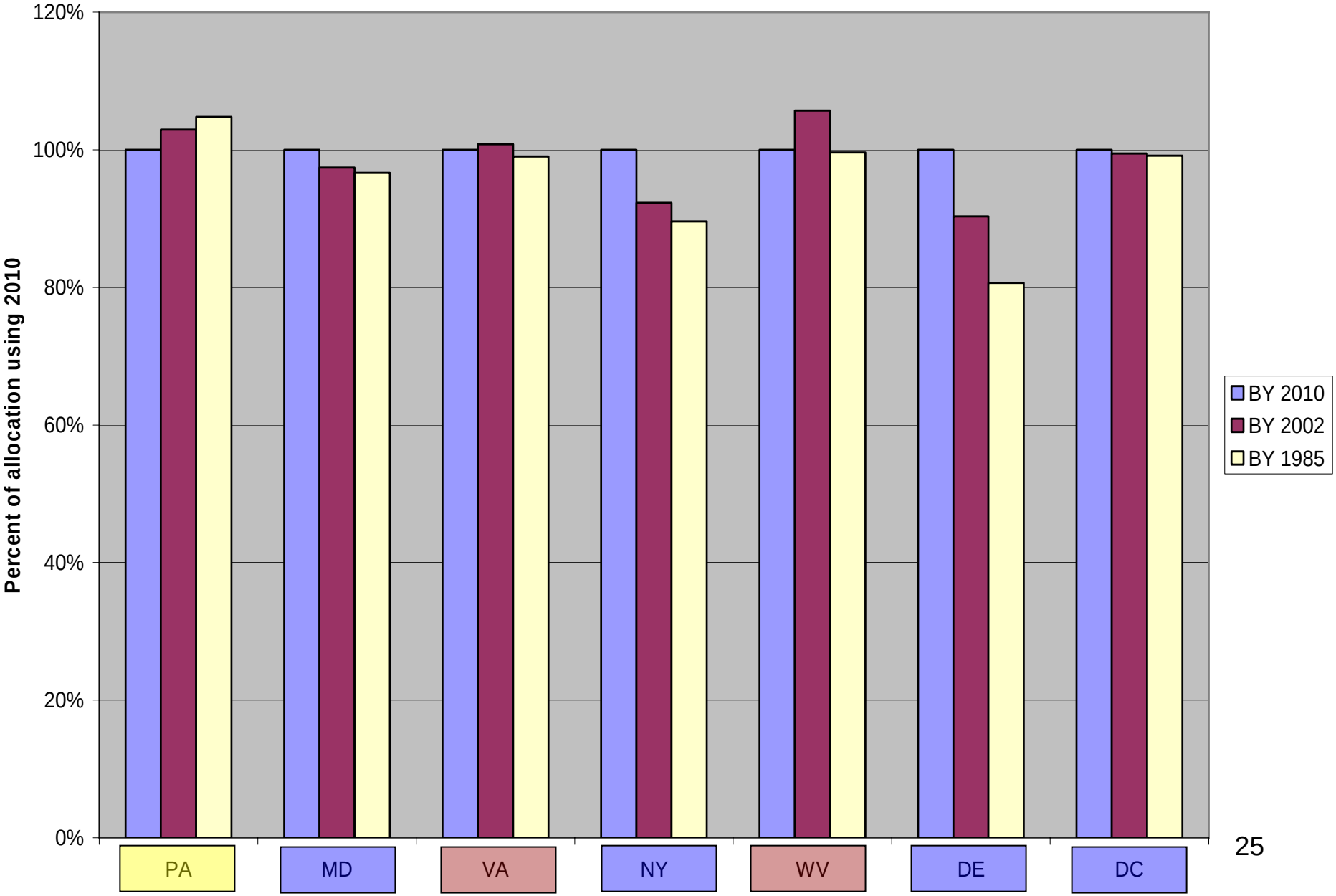


No Action and E3 Total TN Loads for Various Year Assumptions

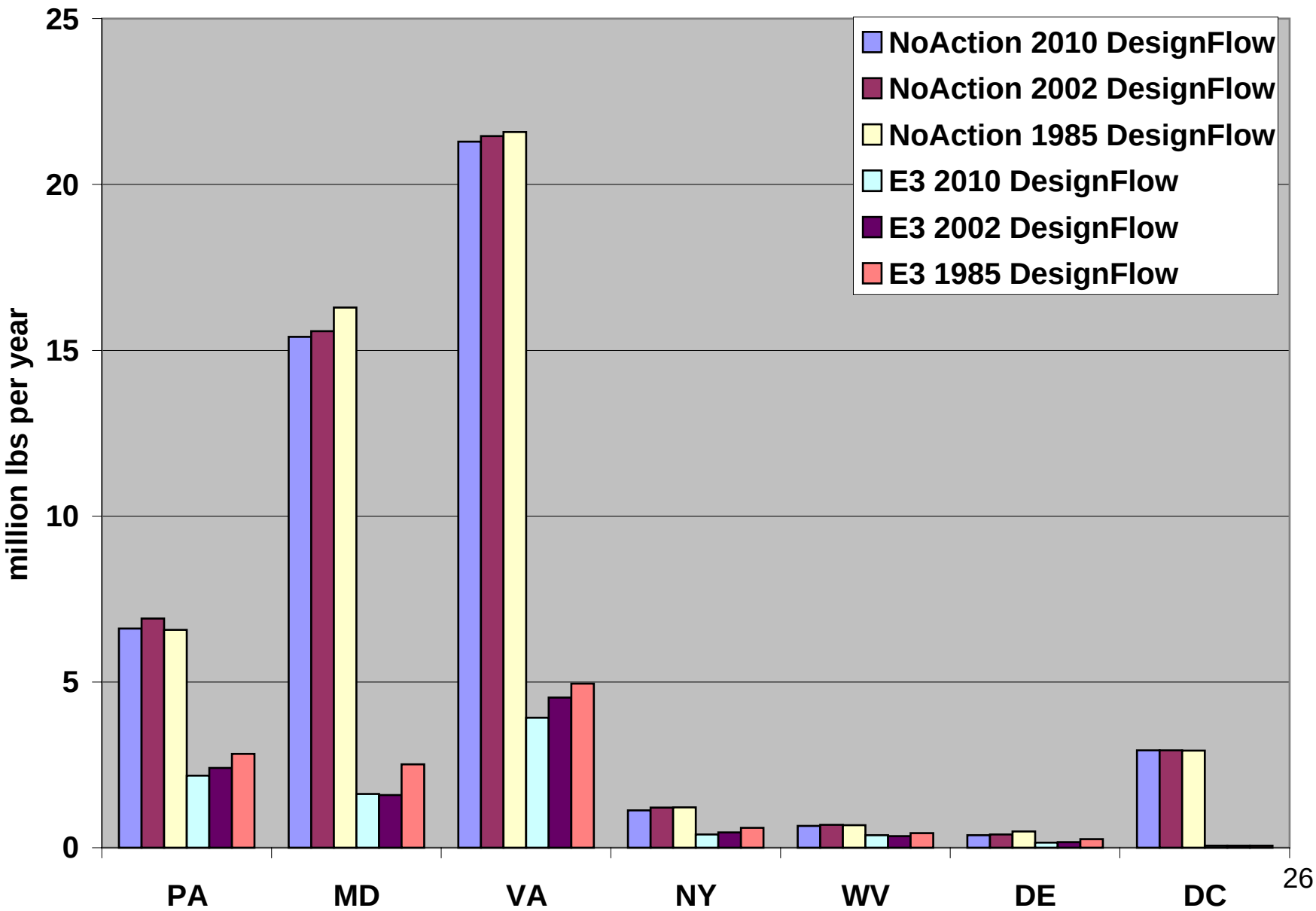


TN Target Loads by State Using a Base Year of 2010, 2002, or 1985
Assuming a flat Allocation line and a total load of 175

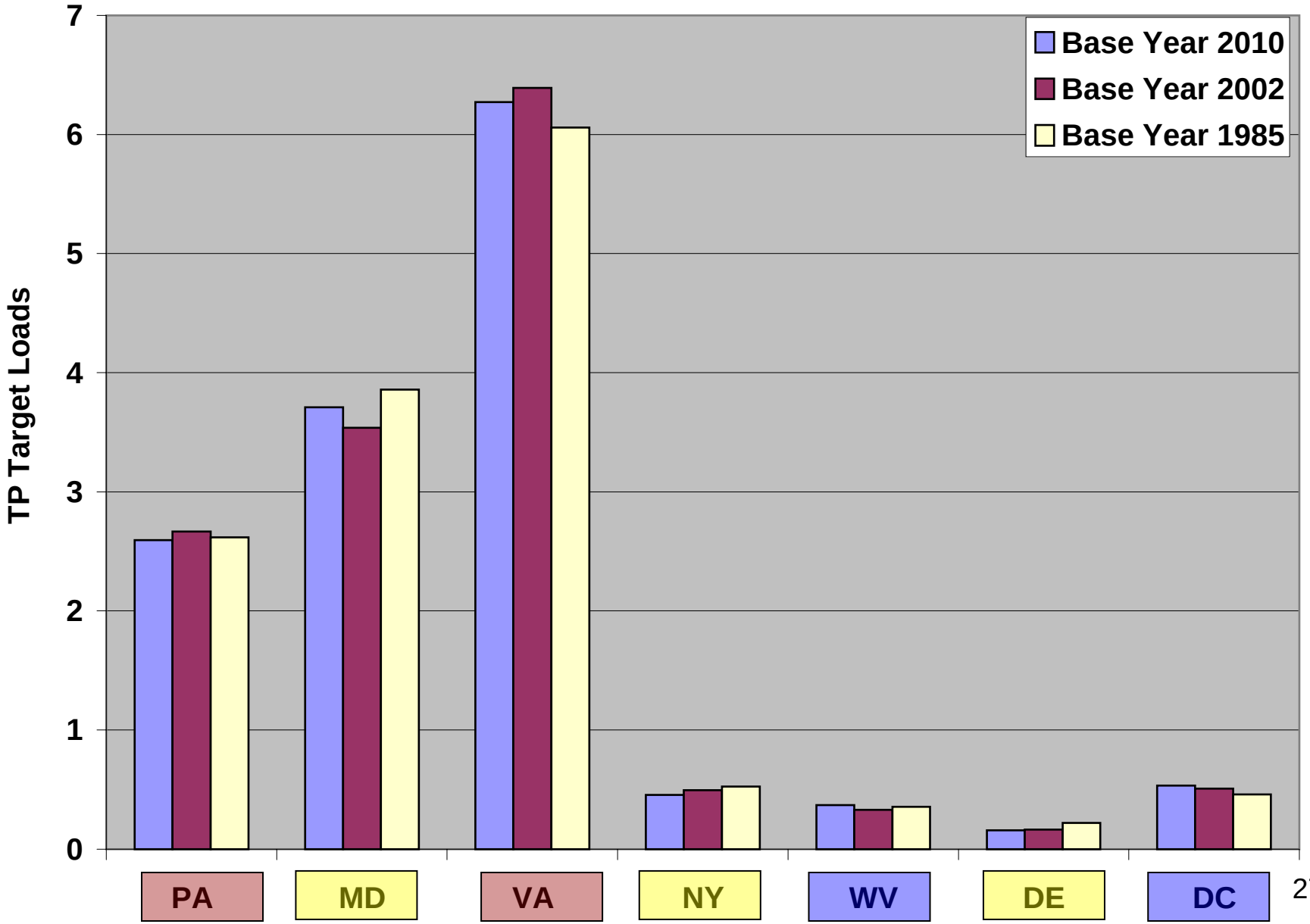


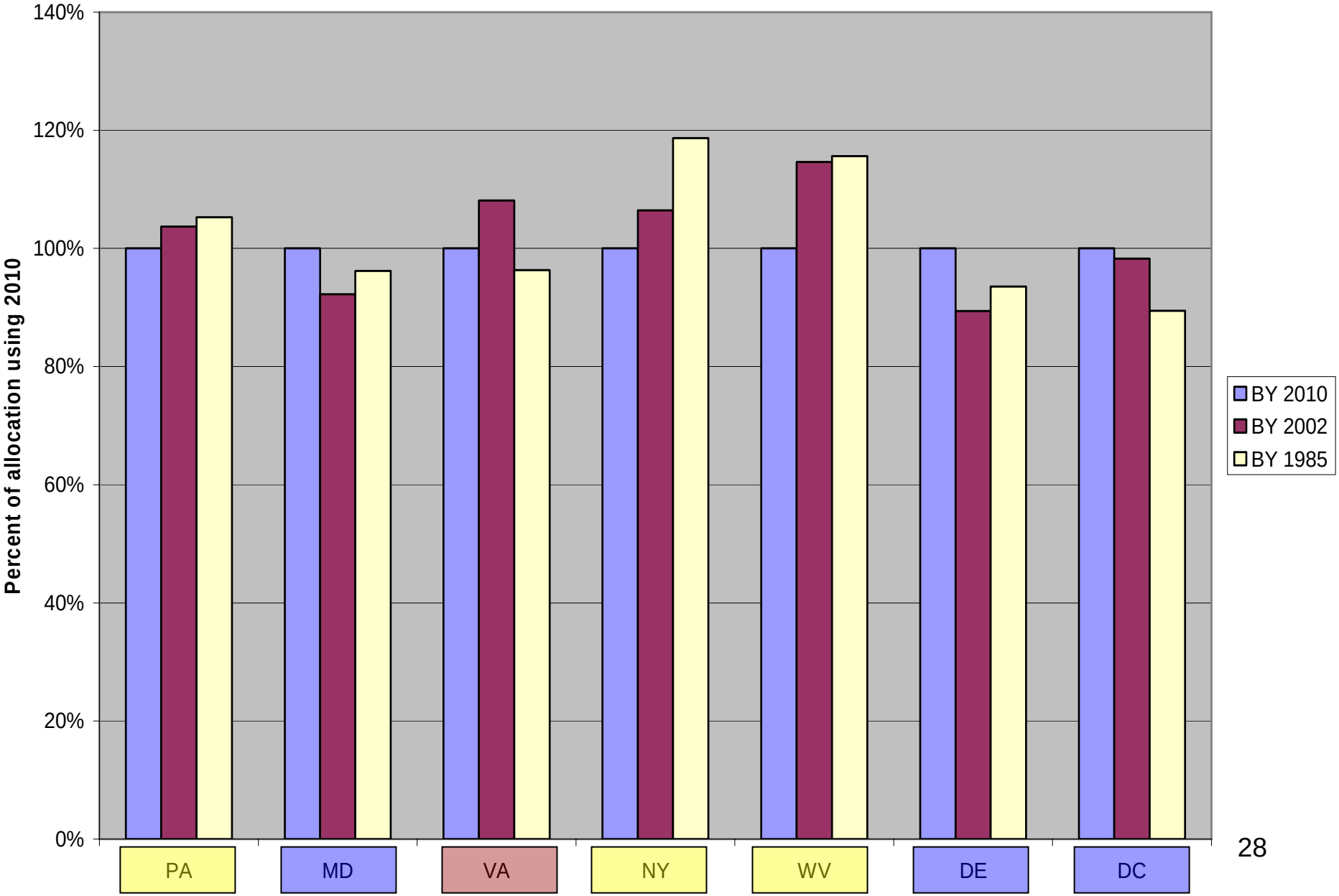

TN Allocation Percent of Base Year 2010
Percent of allocation using 2010
120%
100%
80%
60%
40%
20%
0%
PA
MD
VA
NY
WV
DE
DC
BY 2010
BY 2002
BY 1985

No Action and E3 Total TP Loads for Various Year Assumptions



TP Target Loads by State Using a Base Year of 2010, 2002, or 1985
Assuming a flat Allocation line and a total load of 14.1




Allocation Percent of Base Year 2010 TP
Percent of allocation using 2010
140%
120%
100%
80%
60%
40%
20%
0%
PA
MD
VA
NY
WV
DE
DC
BY 2010
BY 2002
BY 1985

Regional Practices – Base Year

- No specific EPA guidance
- Most current data available or present day estimates is consistent with most States' current practice
  - Corresponds to 2010
- Under allocation scenarios, what land uses do States employ?
  - All states typically use the most recent land use data from 2002 or 2007 depending upon state information
  - WV has employed more recent land use modification information for certain transient land uses (i.e., mining)
  - For PCBs, NY considers historical sources (including NPS data) in their approach to baseline year
    - NY does not assess land use as a way of determining load

Regional Practices – Wastewater Flow

- No EPA guidelines
- Design flow/concentrations for allocations (PA, MD, DE, VA, WV, and DC)
- DC uses modeled design flow/concentrations for allocations
- Precipitation induced sources get allocations based on modeled flow (WV, VA)
- Industrial Wastewater get allocations based on production based maximum flow and permit concentrations (MD, VA, and PA)
- NY starts with measured data (may go to level of technology). Design flow is used as a backstop
- Initial inclination from most states is to use design flow for target load distribution and allocations, consistent with majority of current practices

Decisions Requested:

1. Water Quality Goal Implementation Team approval of a **base year** for use in the Chesapeake Bay TMDL

2. Water Quality Goal Implementation Team approval of **wastewater flow assumption** for use in the Chesapeake Bay TMDL