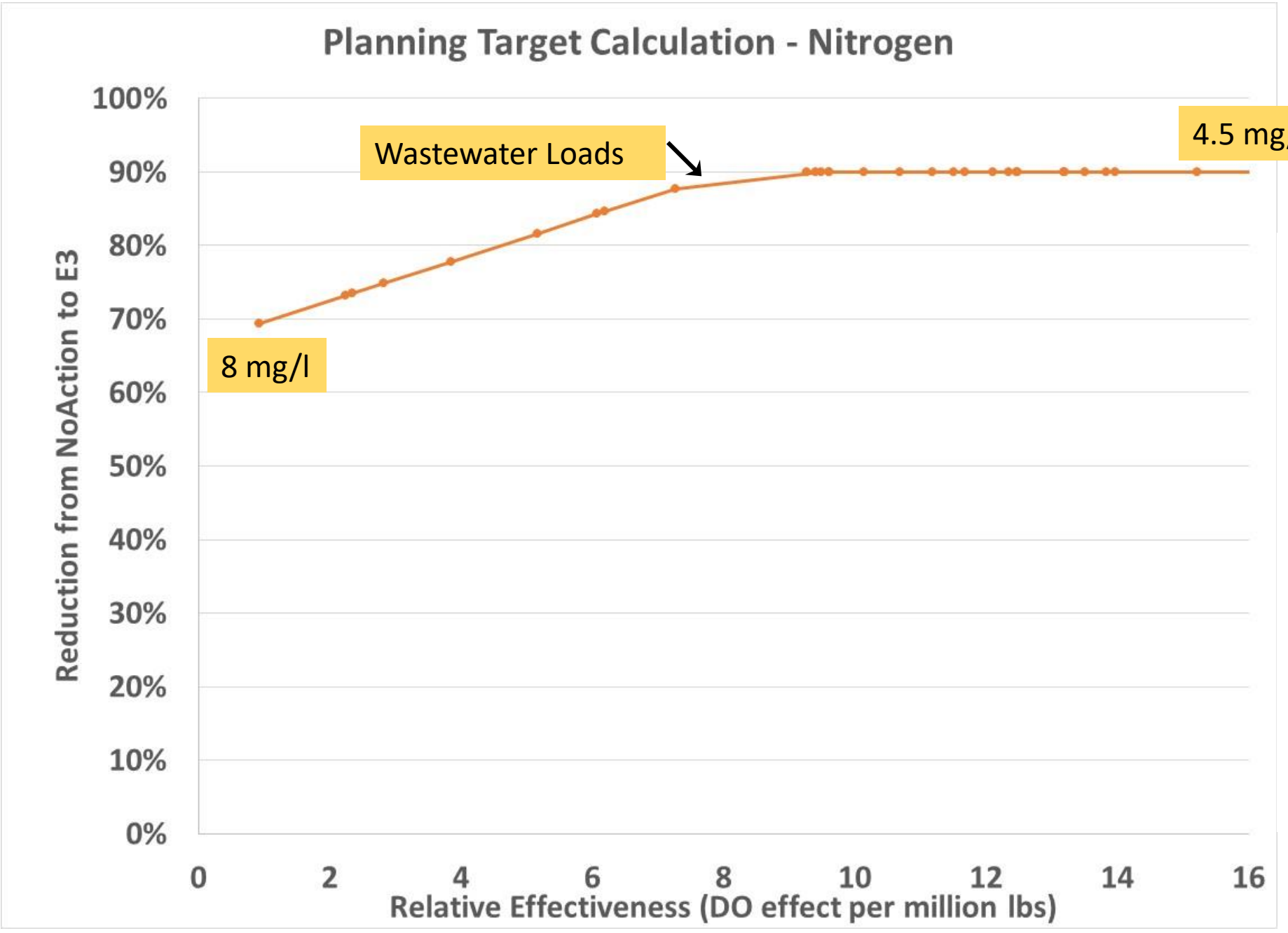
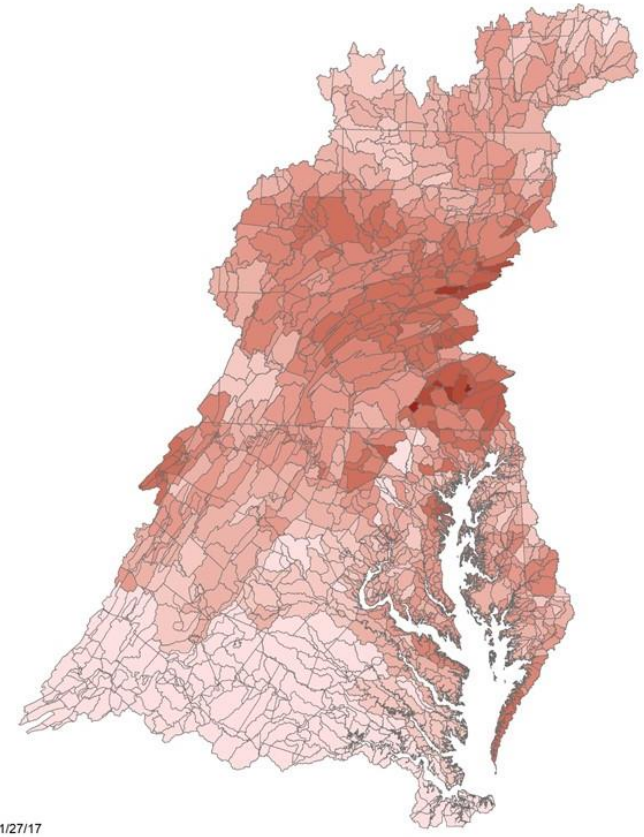
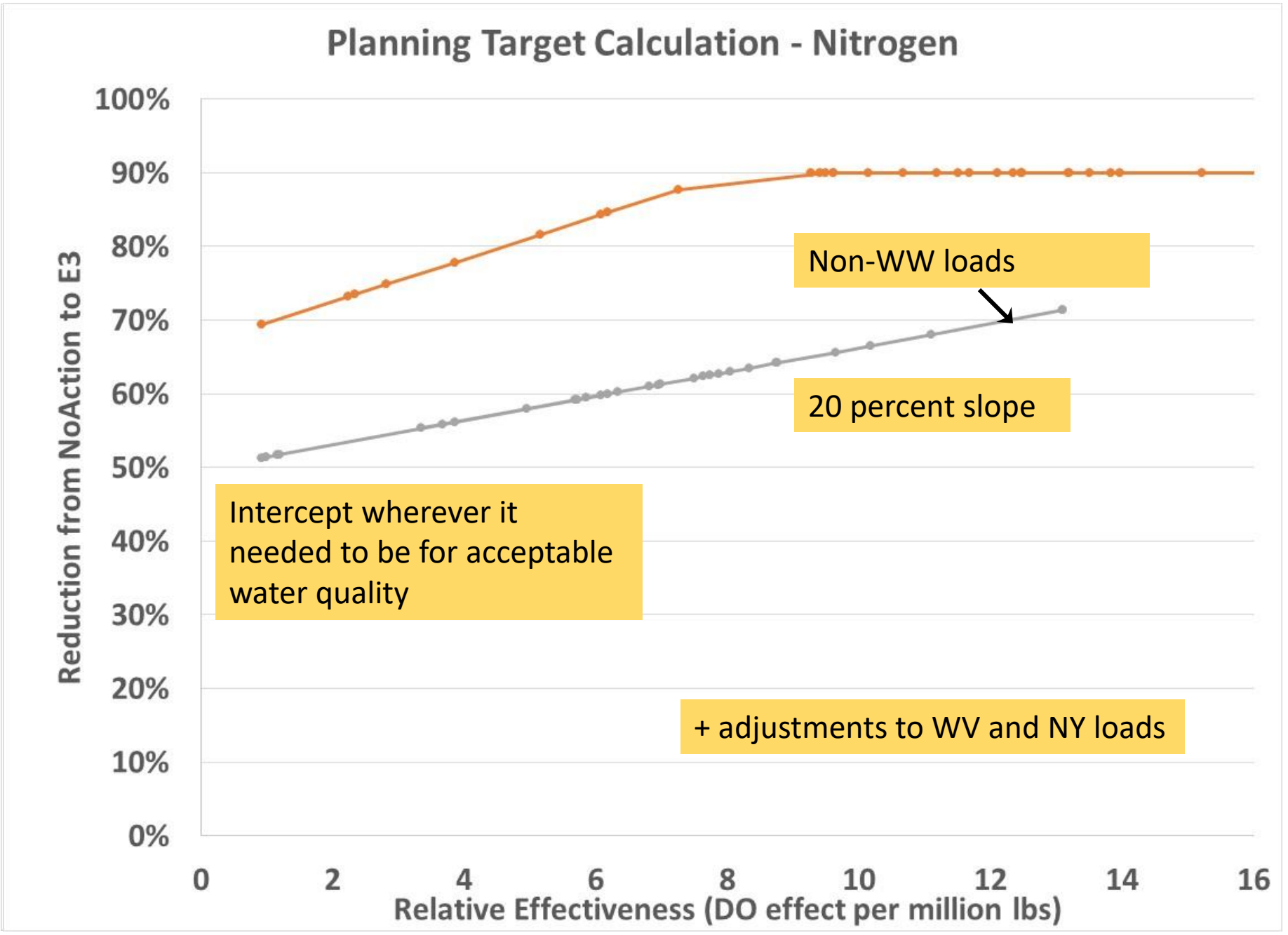
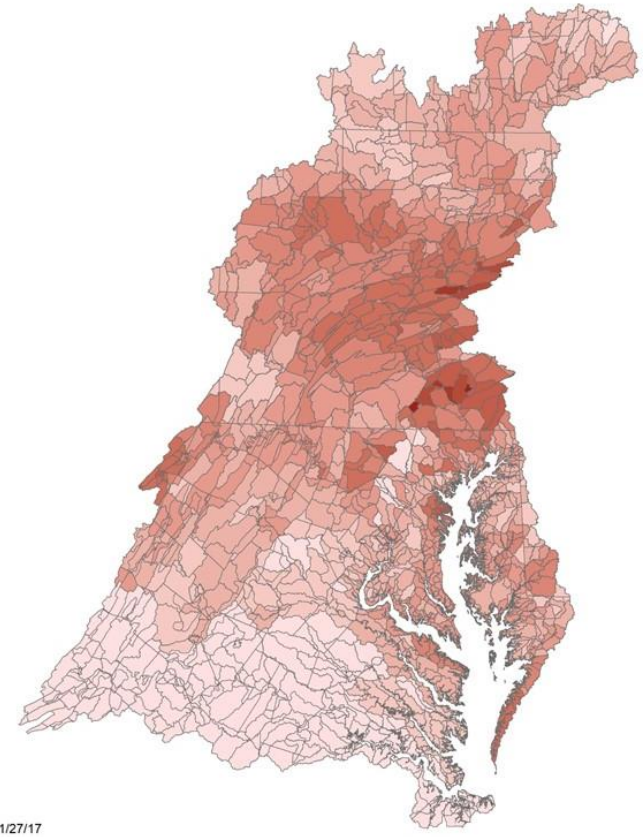
Climate Allocation Decisions

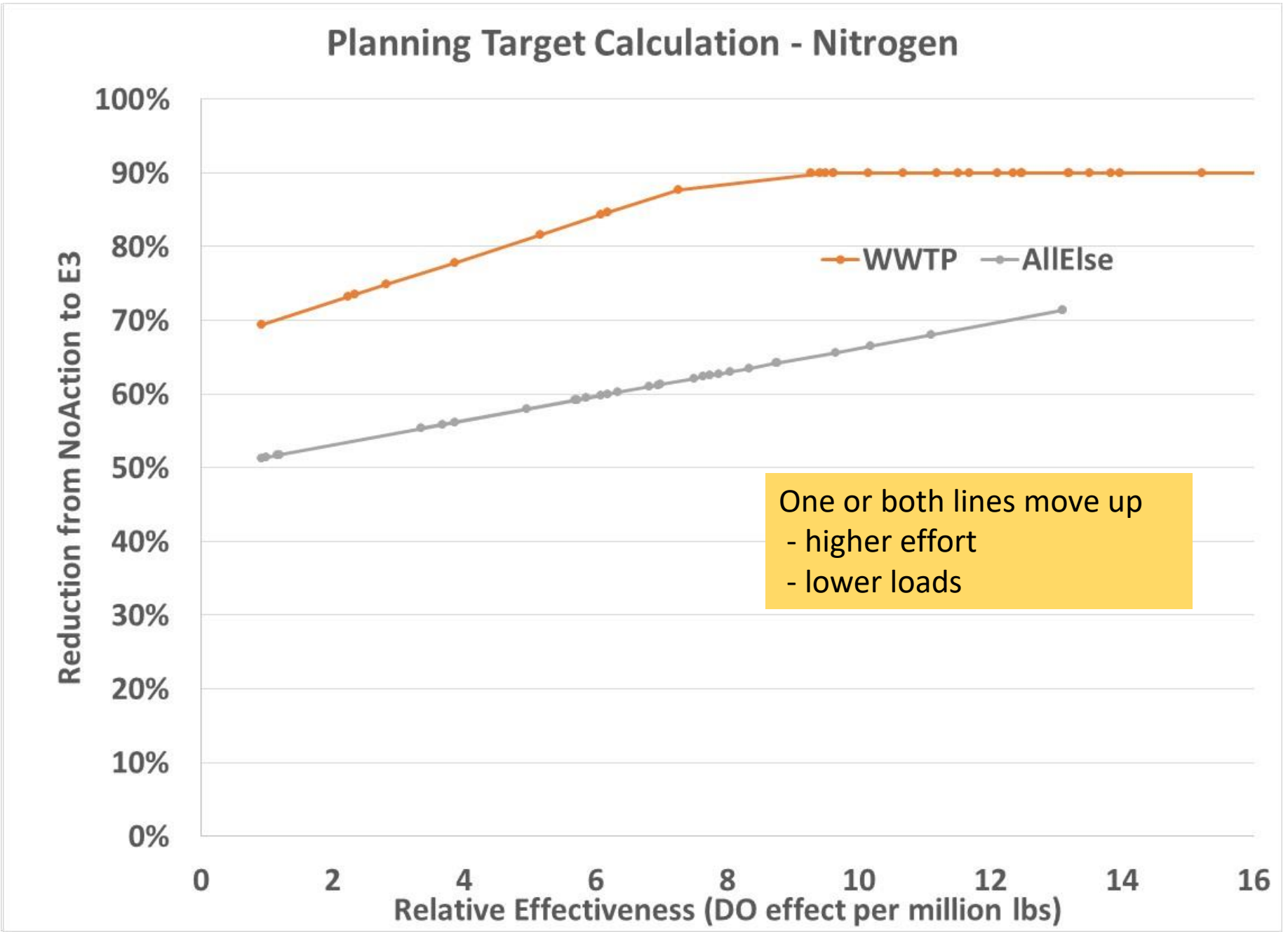
WQGIT 6/22/2020

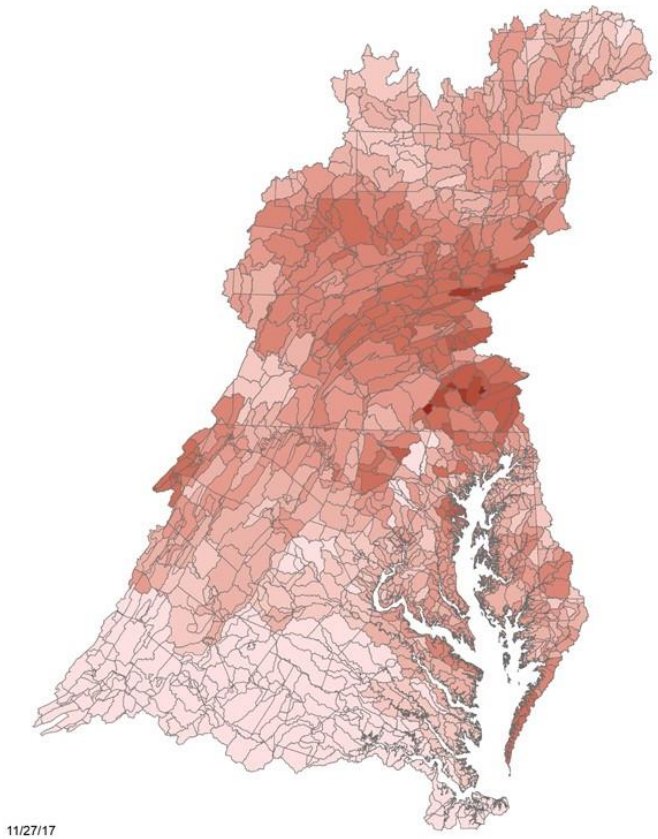

Planning Target Calculation - Nitrogen
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Reduction from NoAction to E3
Wastewater Loads
4.5 mg/l
8 mg/l
0
2
4
6
8
10
12
14
16
Relative Effectiveness (DO effect per million lbs)


11/27/17


Planning Target Calculation - Nitrogen
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Reduction from NoAction to E3
0
2
4
6
8
10
12
14
16
Relative Effectiveness (DO effect per million lbs)
Non-WW loads
20 percent slope
Intercept wherever it needed to be for acceptable water quality
+ adjustments to WV and NY loads


11/27/17


Planning Target Calculation - Nitrogen
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Reduction from NoAction to E3
WWTP
AllElse
One or both lines move up
- higher effort
- lower loads
0
2
4
6
8
10
12
14
16
Relative Effectiveness (DO effect per million lbs)


11/27/17

WQGIT Climate Allocation Decisions

- Year
  - 2025 or 2035?
  - Link target year and implementation?
- Watershed loads first
  - Allocate all necessary reductions through planning target method
    - or
  - Take out jurisdictional climate-related increases in loads first and allocate any remainder
- WWTP loads included in jurisdictional allocation calculations
  - Only non-WWTP sources
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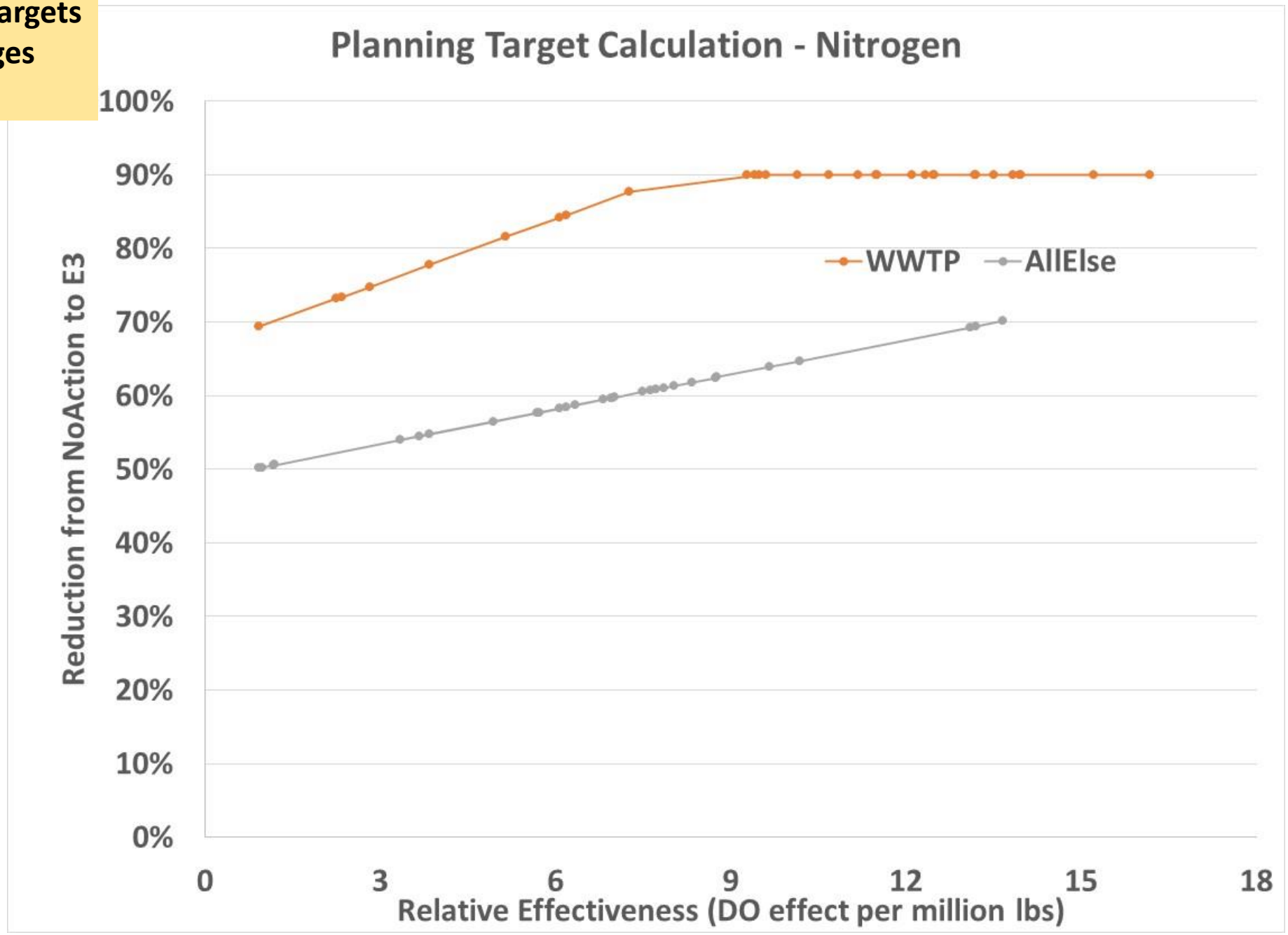
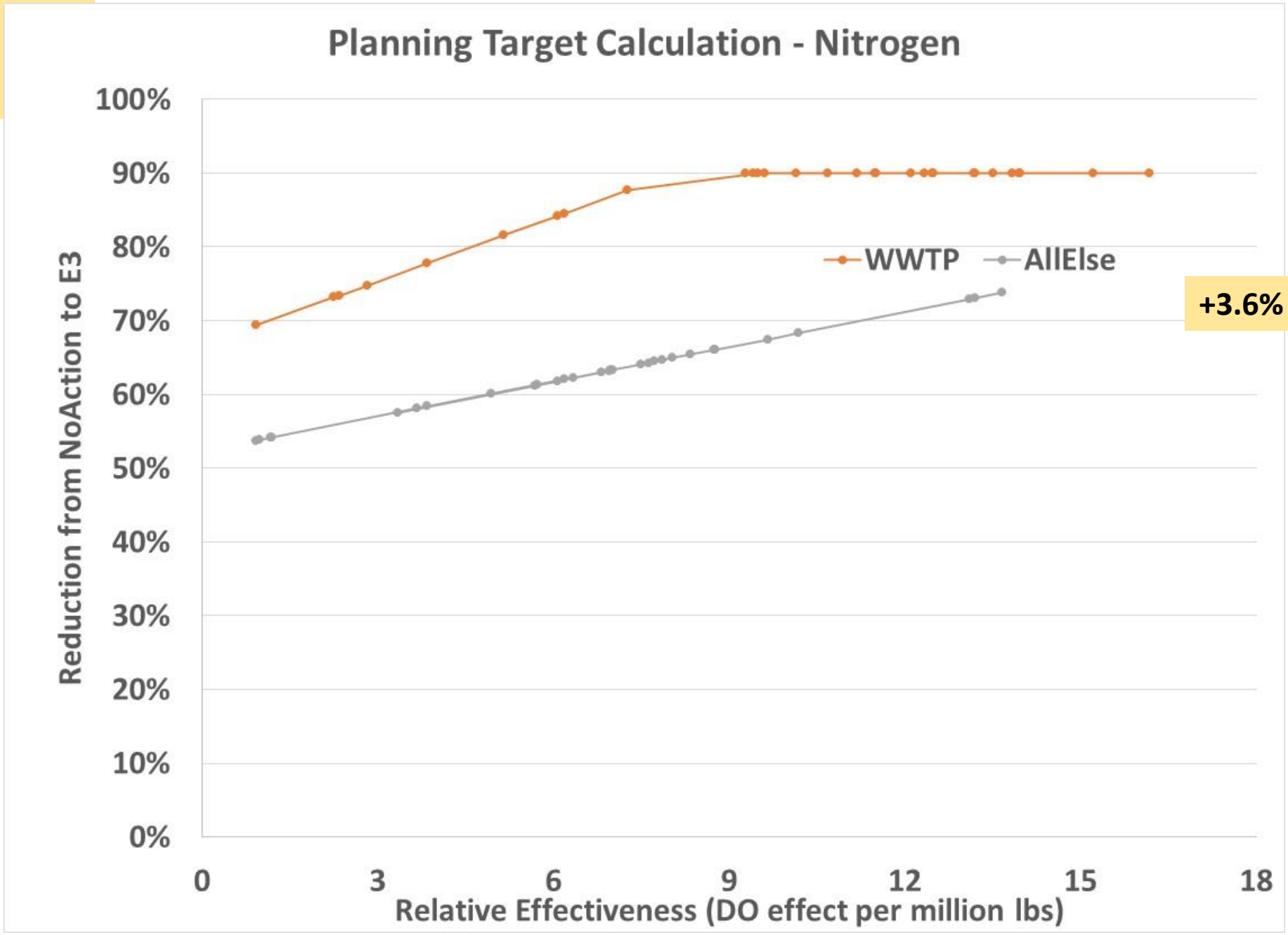
- Open Water
  - How do deal with open water violations in the lower Bay

2017 Planning Targets
Prior to exchanges and exceptions

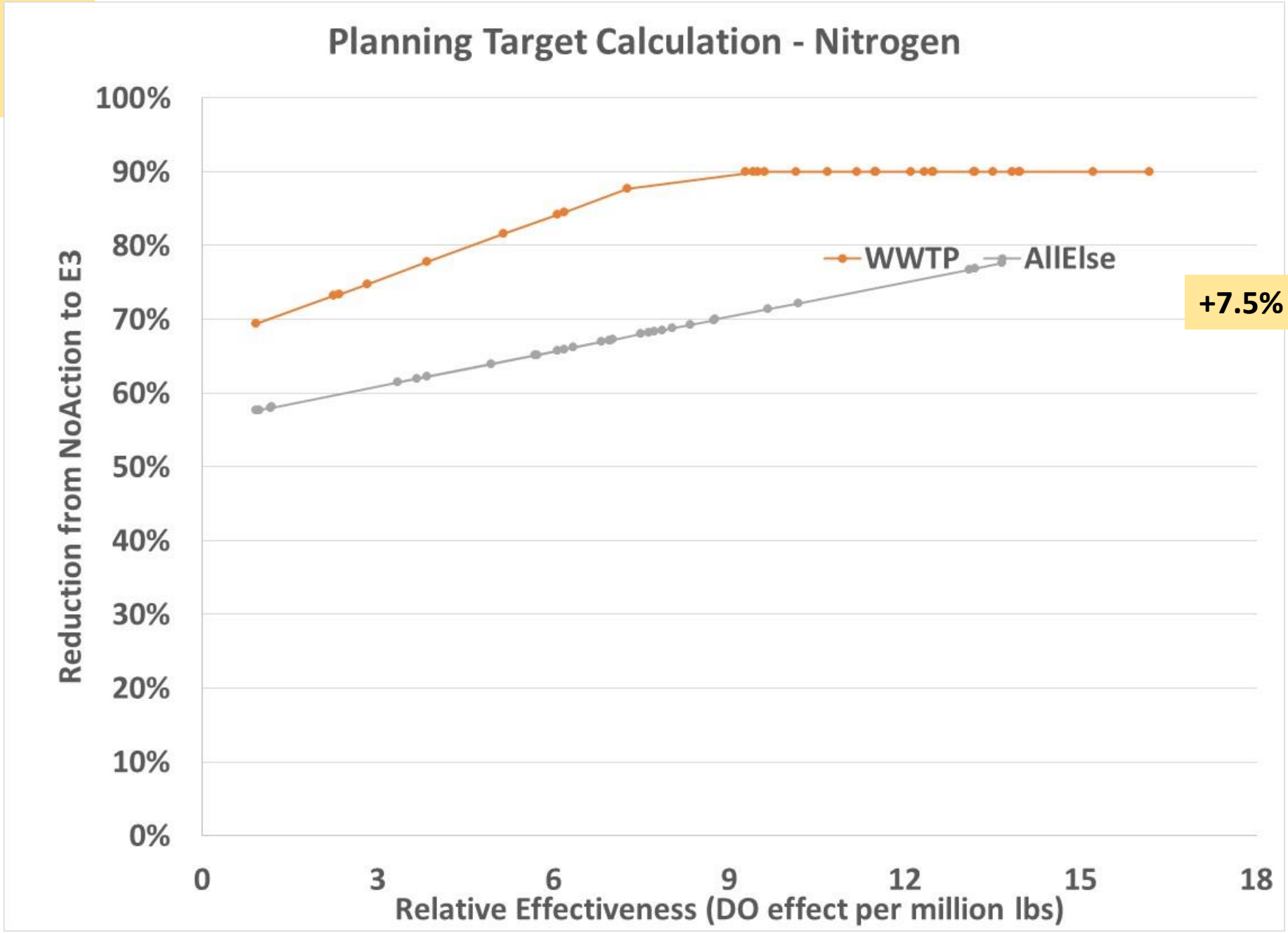


2025 climate
All Allocation
NPS only



+3.6%

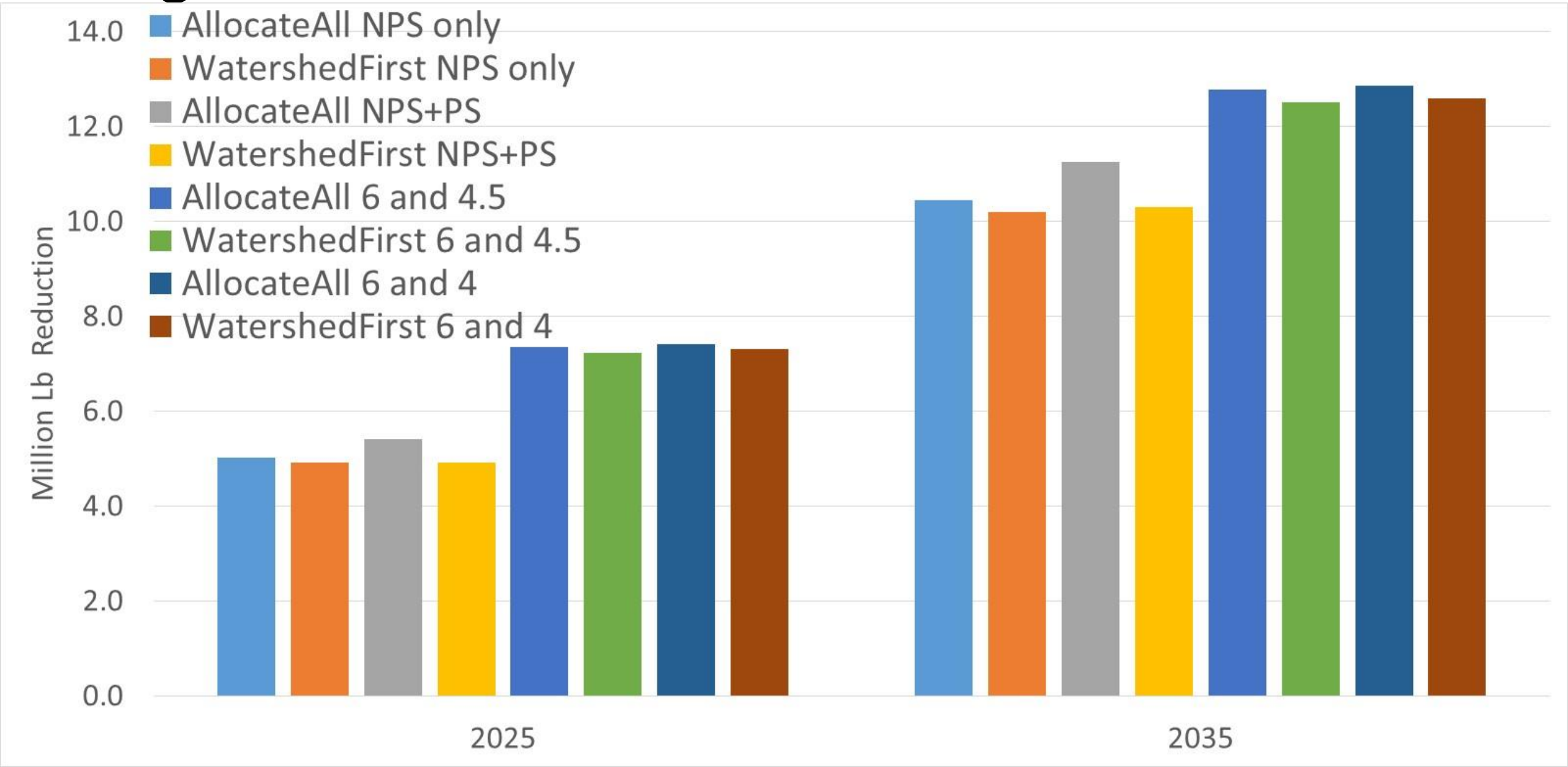
2035 climate
All Allocation
NPS only



+7.5%

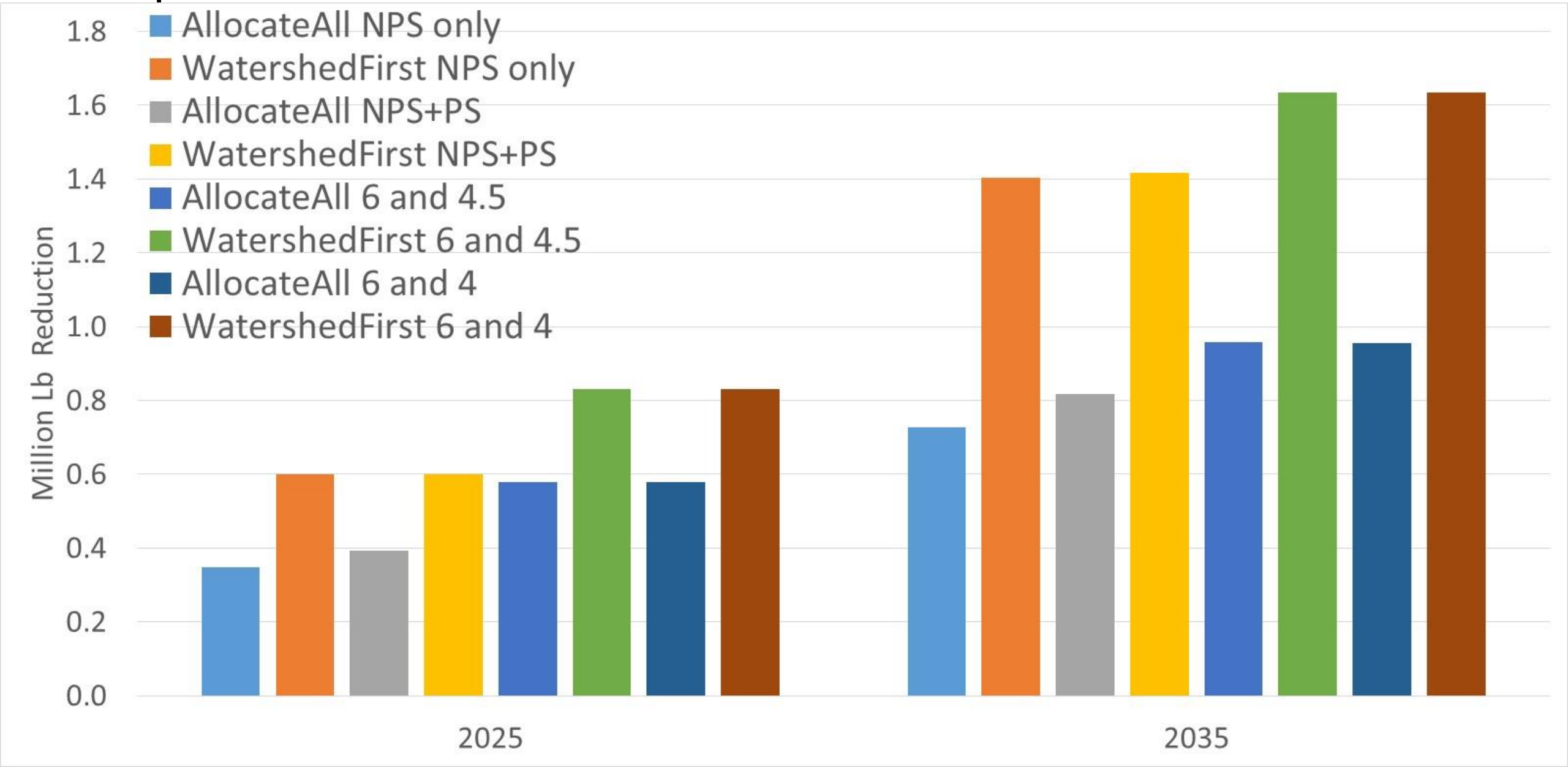
- 2035 increases effort from about 6 Mlbs to about 11 Mlbs

Nitrogen Total Reductions



- 2035 increases effort from about .5 Mlbs to about 1 Mlbs

Phosphorus Total Reductions



WQGIT Climate Allocation Decisions

- Year
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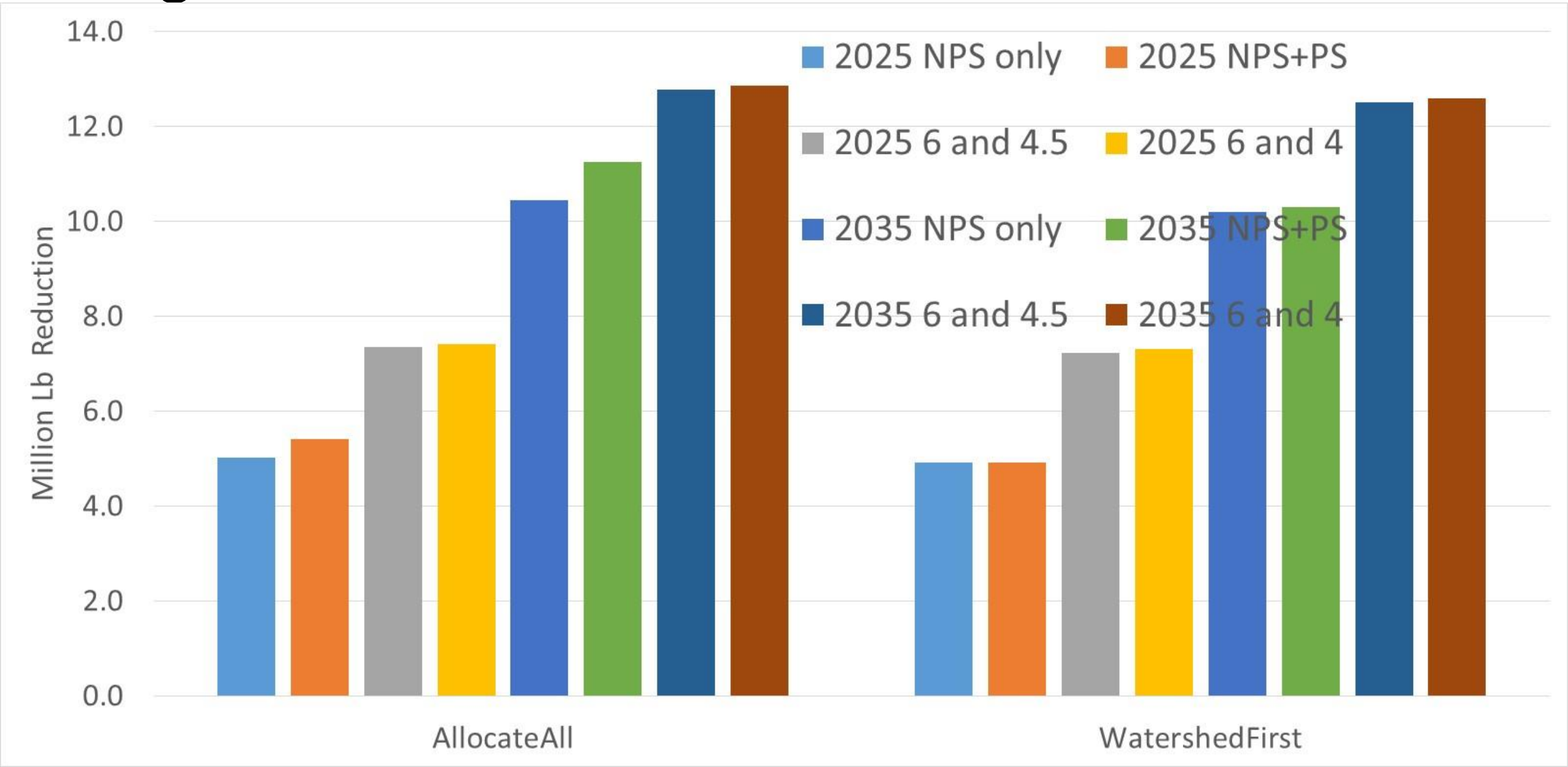
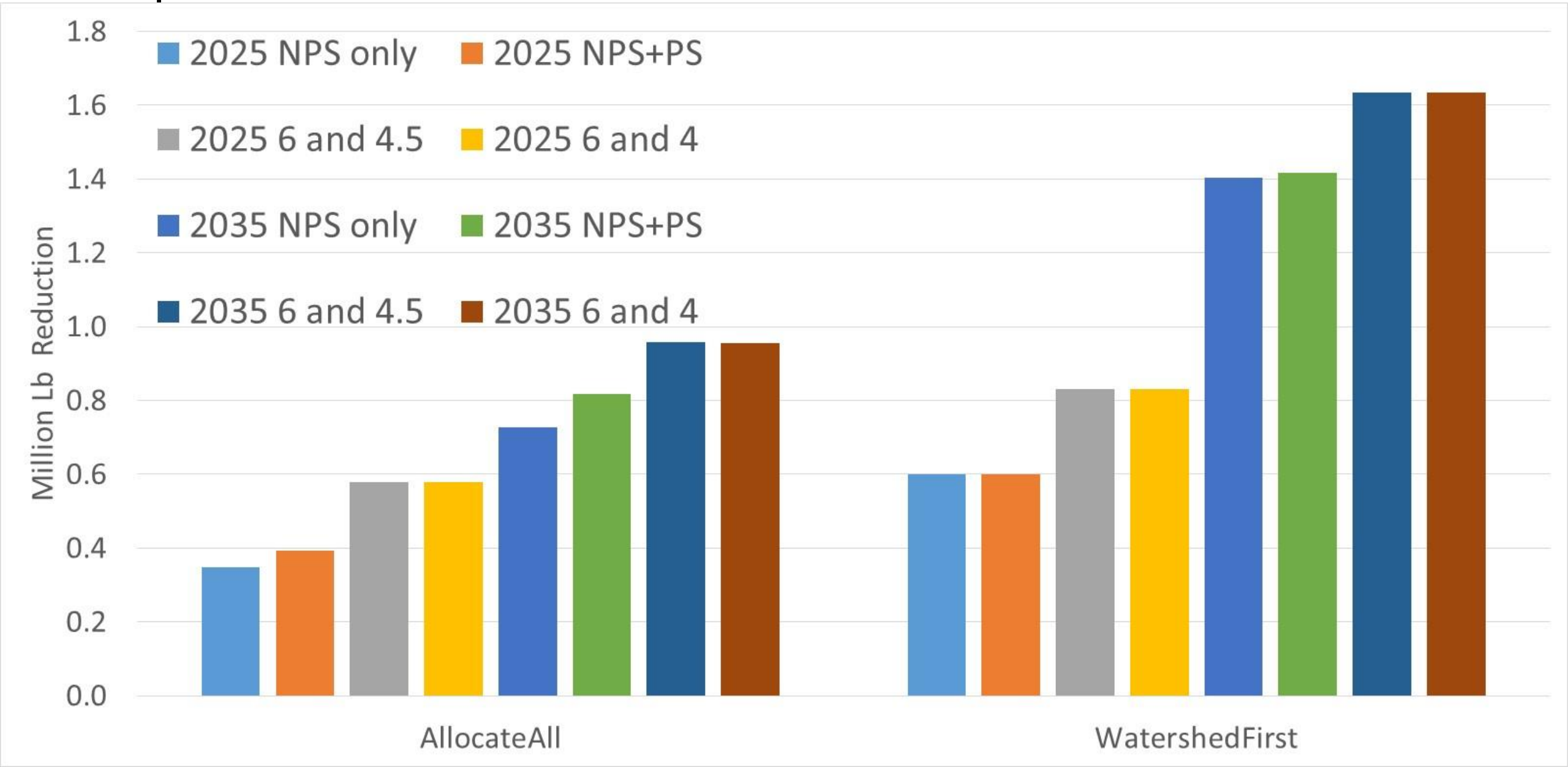
Nitrogen Total Reductions

- ‘Watershed first’ doesn’t make much difference for N at the CB watershed scale



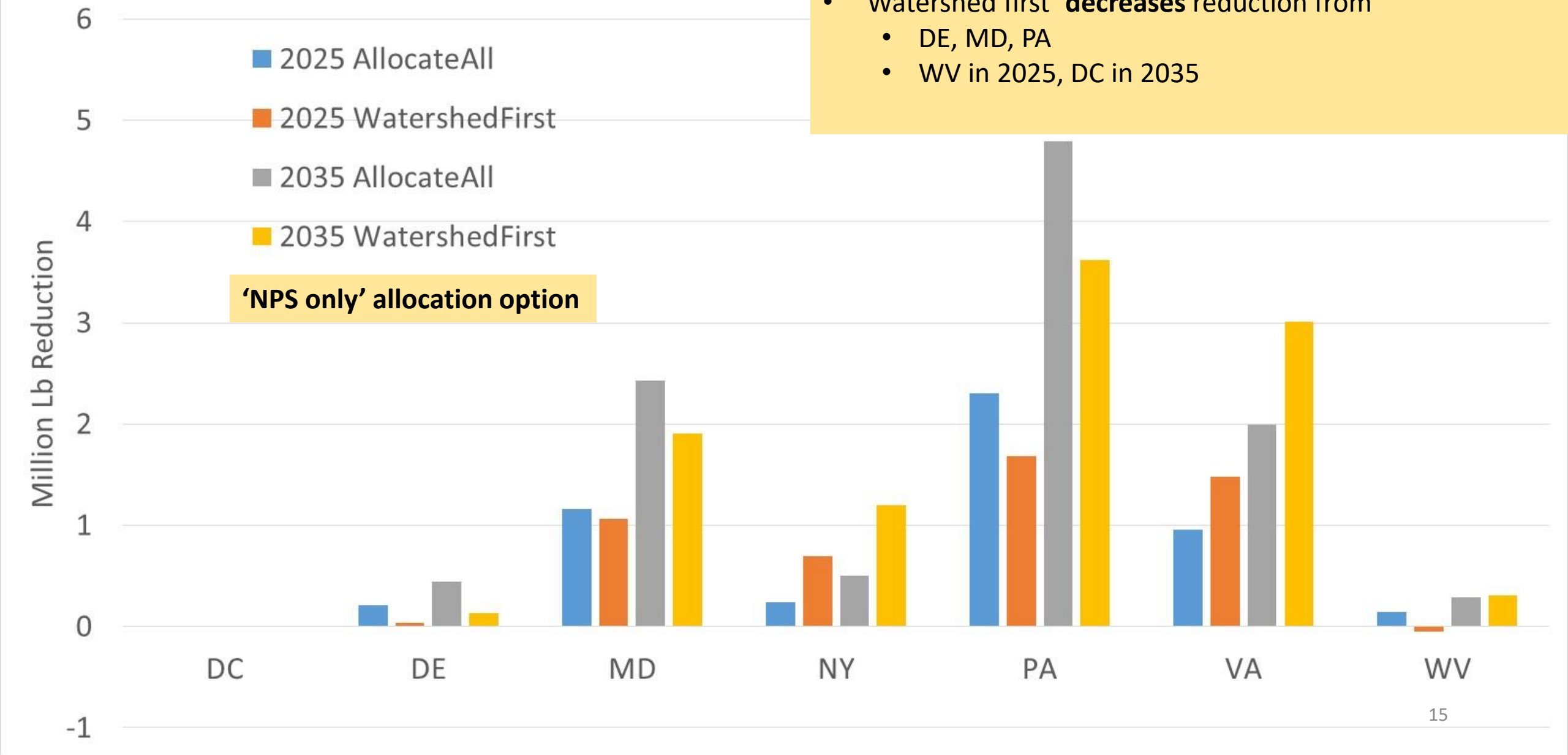
Phosphorus Total Reductions

- ‘Watershed first’ increases P reductions because P loads increase more from climate than N.



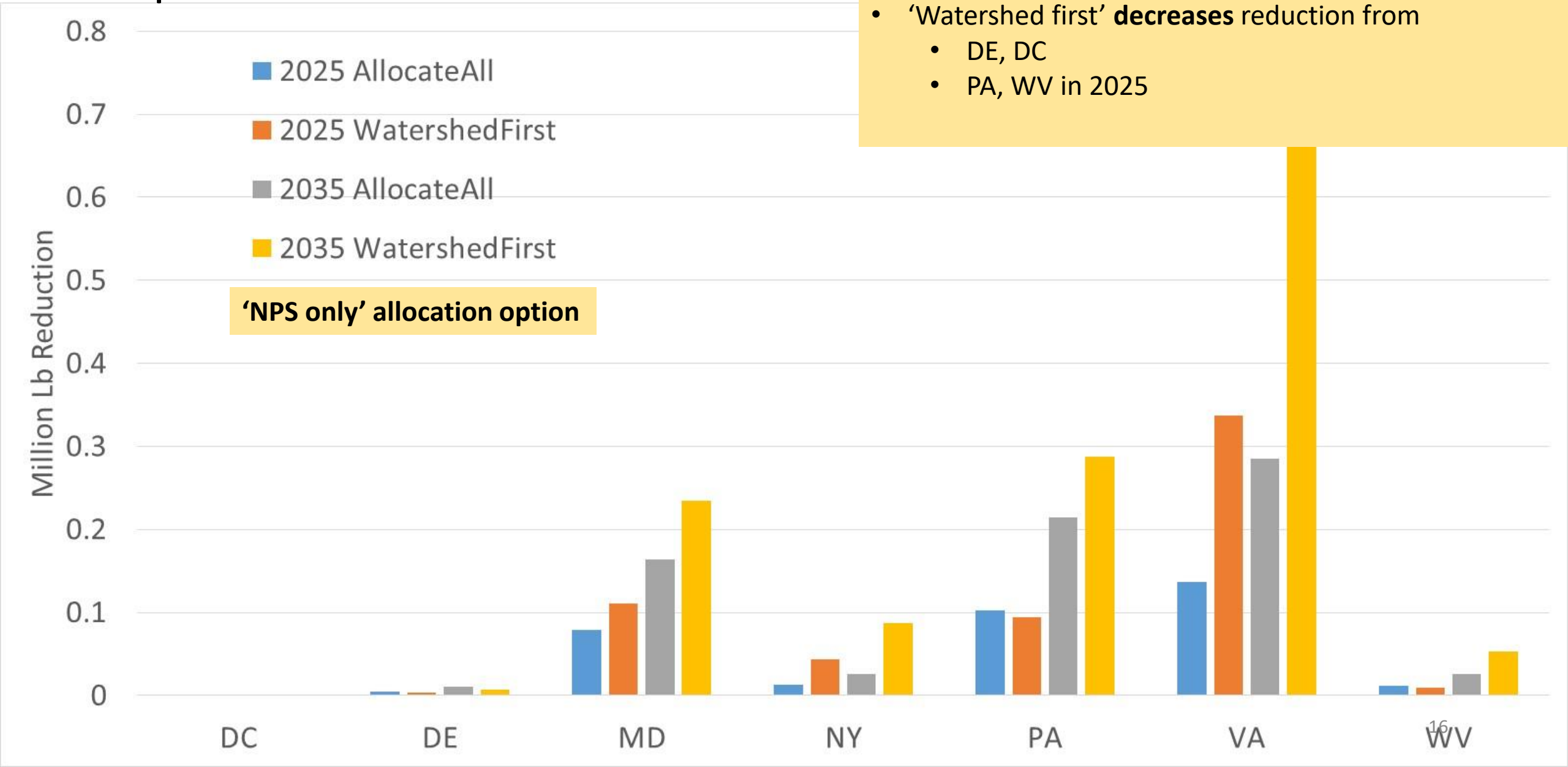
Nitrogen Total Reductions

- ‘Watershed first’ **increases** reduction from
  - NY, VA
  - DC in 2025, WV in 2035
- ‘Watershed first’ **decreases** reduction from
  - DE, MD, PA
  - WV in 2025, DC in 2035



Phosphorus Total Reductions

- 'Watershed first' **increases** reduction from
  - MD, NY, VA
  - PA, WV in 2035
- 'Watershed first' **decreases** reduction from
  - DE, DC
  - PA, WV in 2025



WQGIT Climate Allocation Decisions

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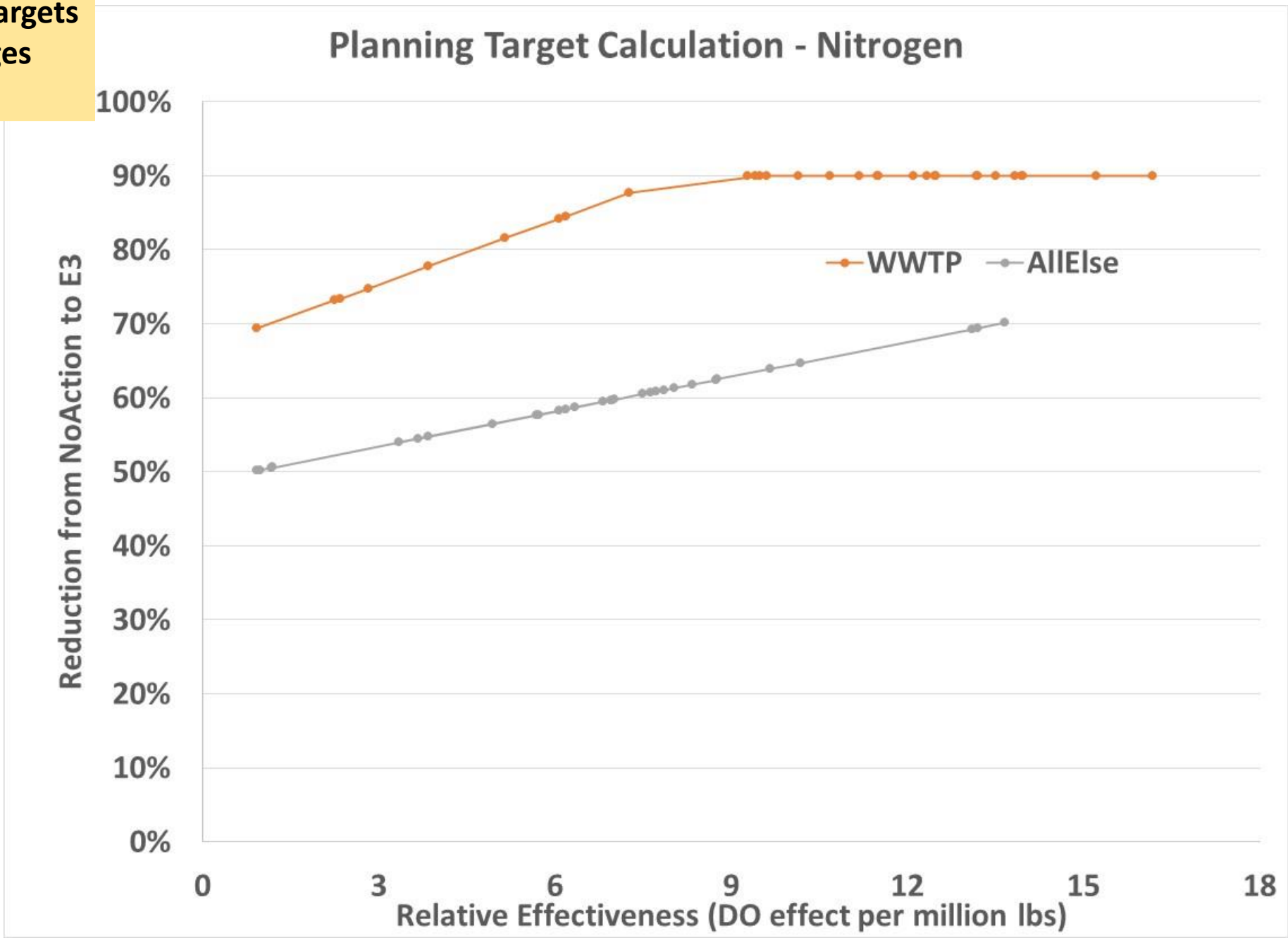
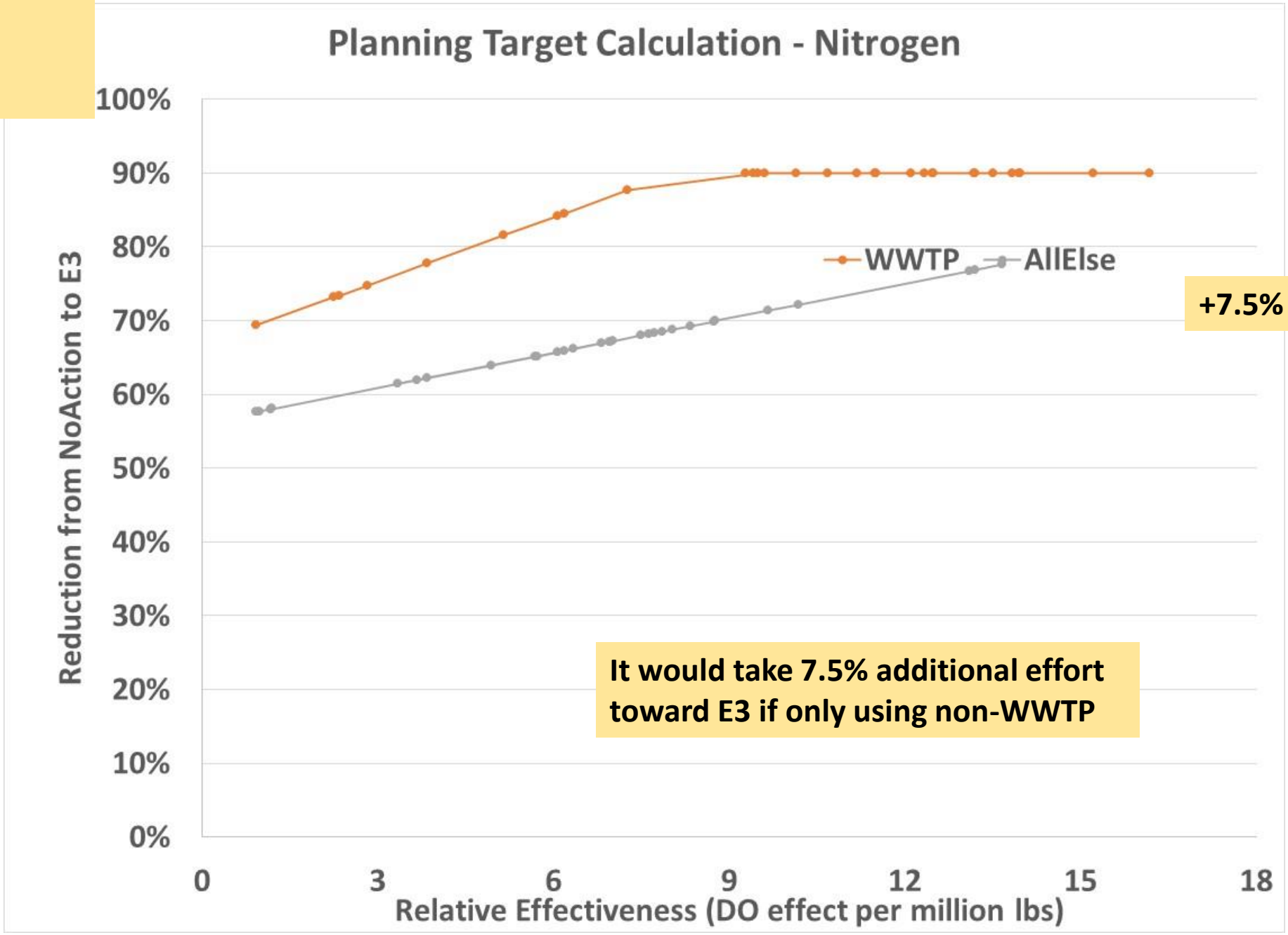
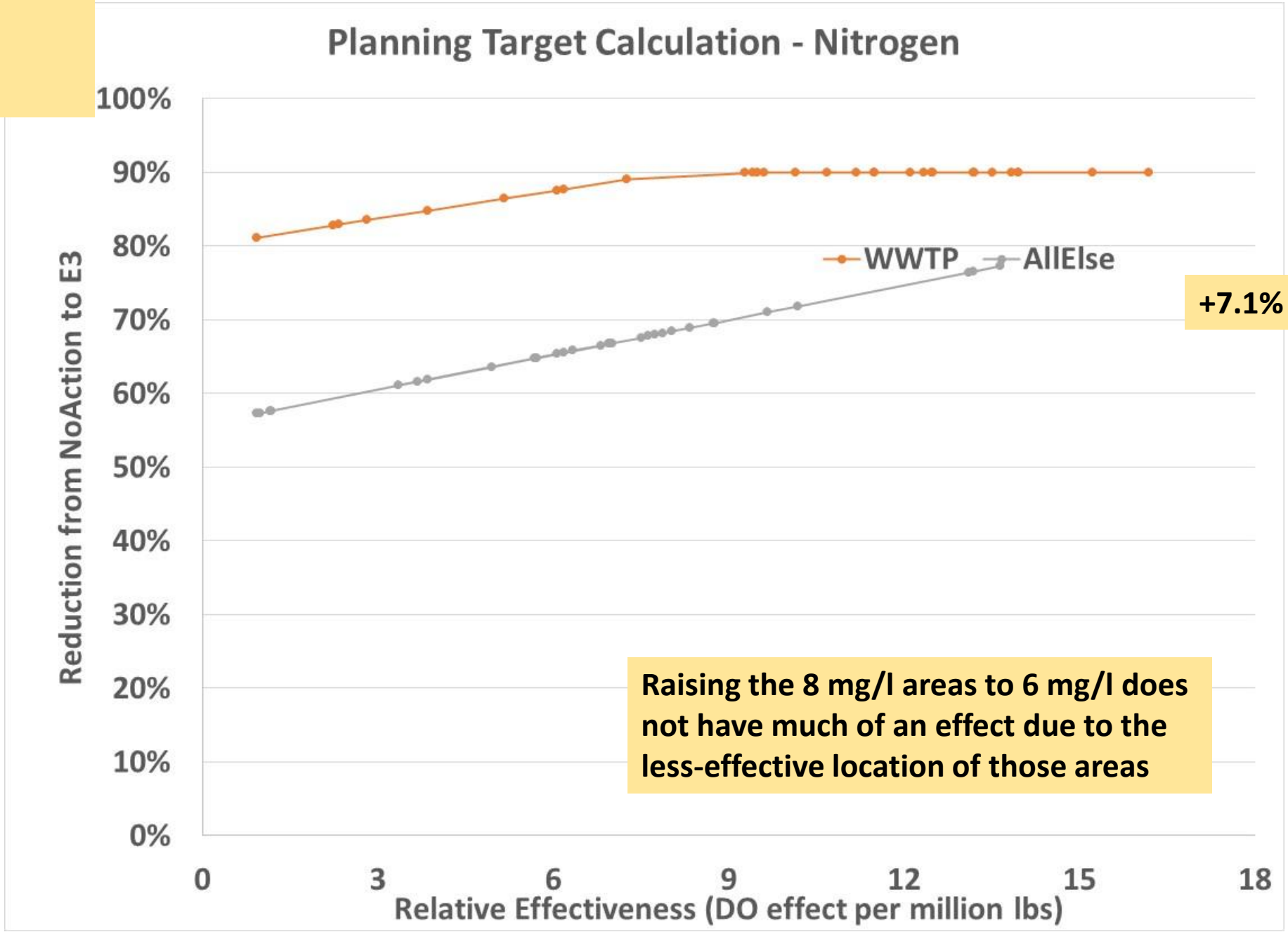
2017 Planning Targets
Prior to exchanges and exceptions



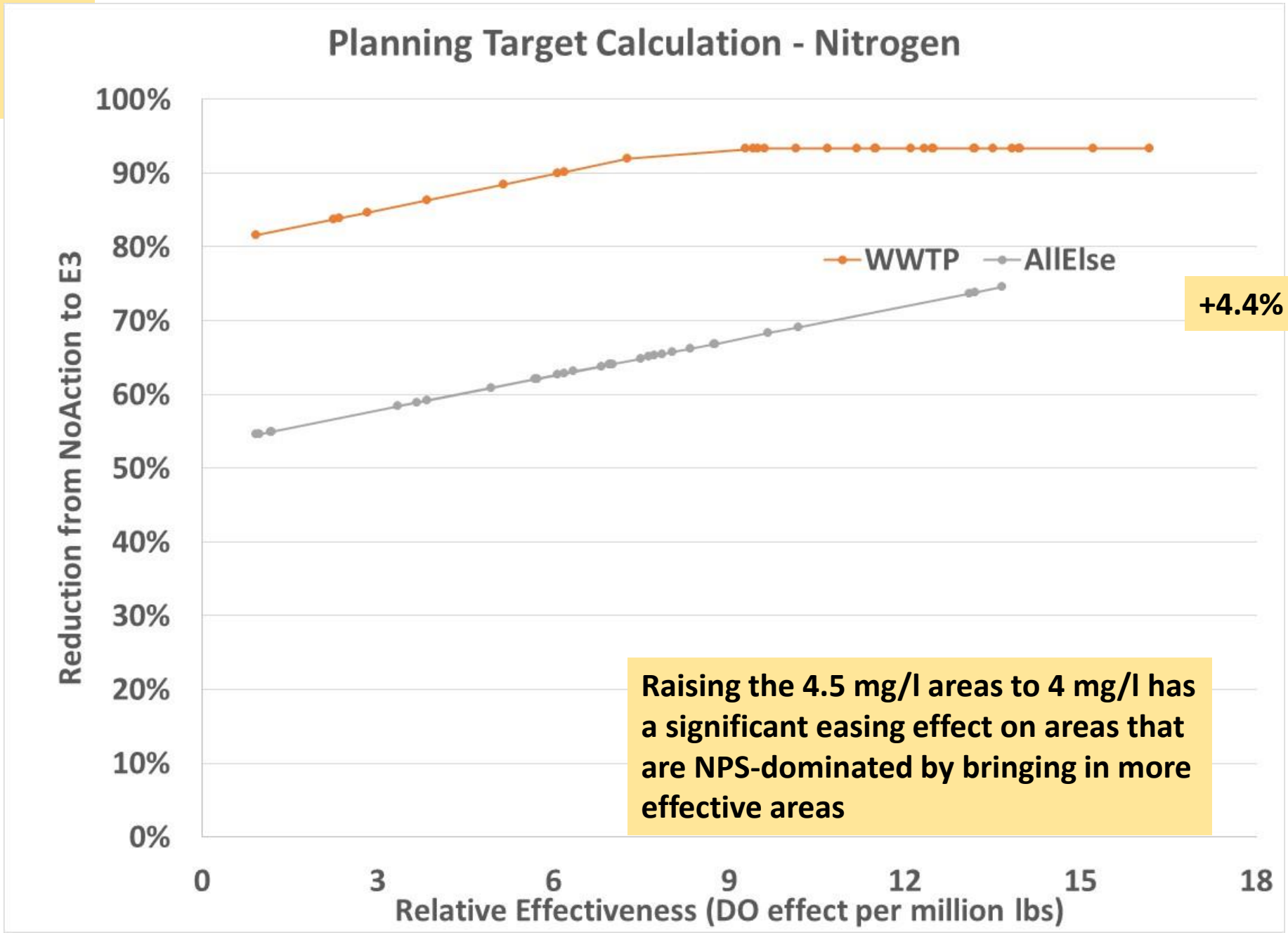
2035 climate
All Allocation
NPS only



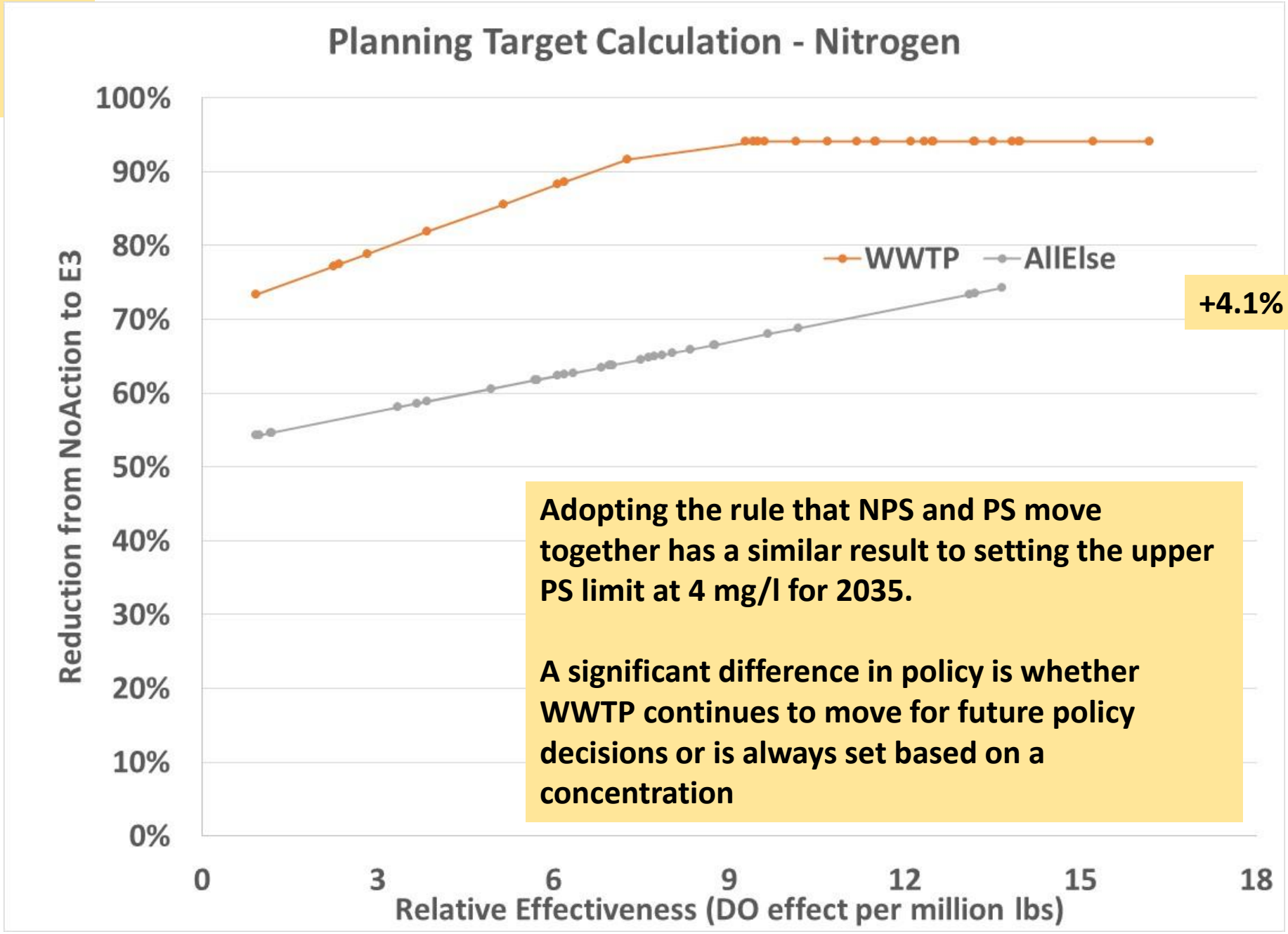
2035 climate
All Allocation
6 and 4.5 mg/l



2035 climate
All Allocation
6 and 4 mg/l



2035 climate
All Allocation
NPS + WWTP

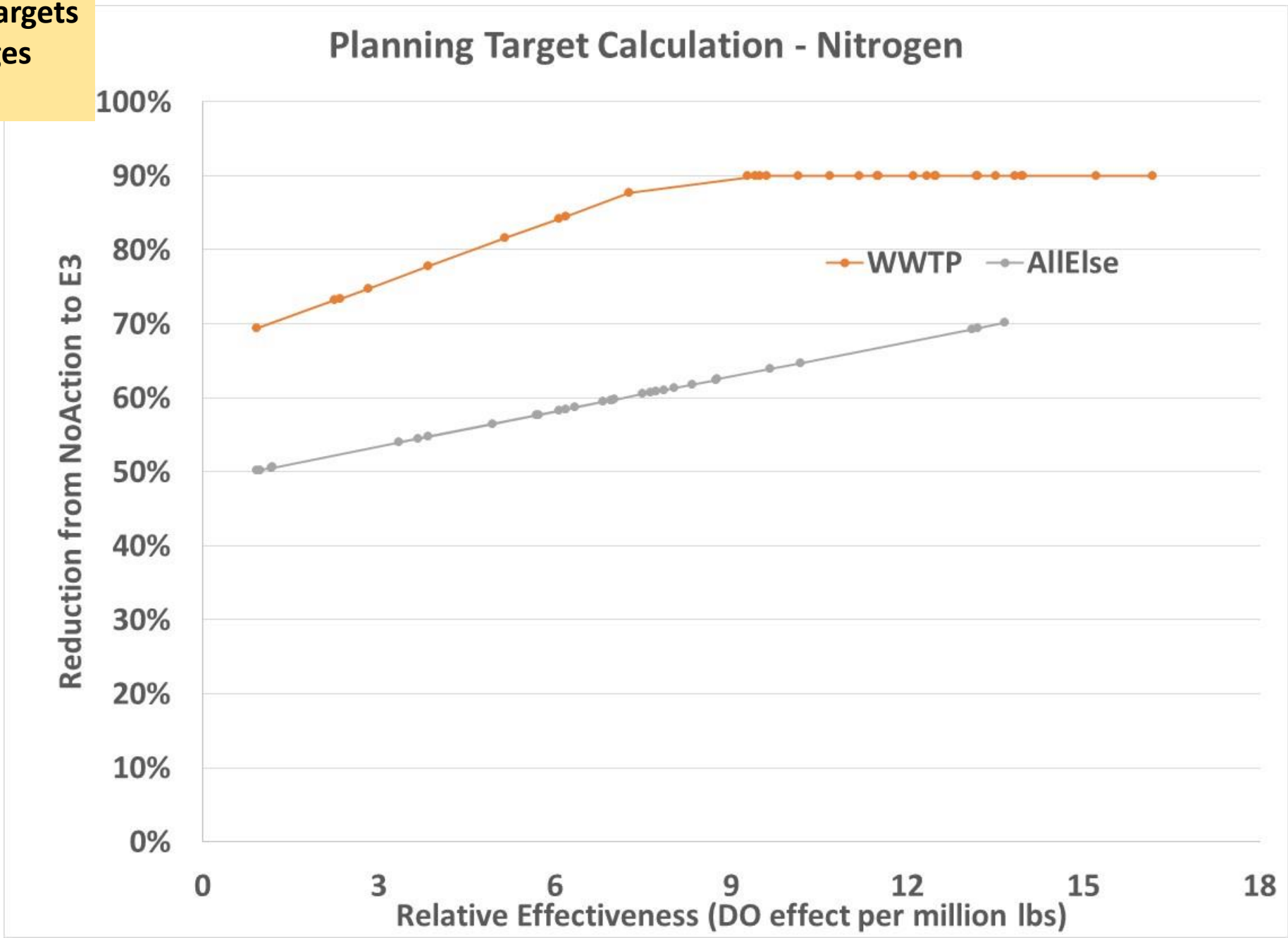


+4.1%

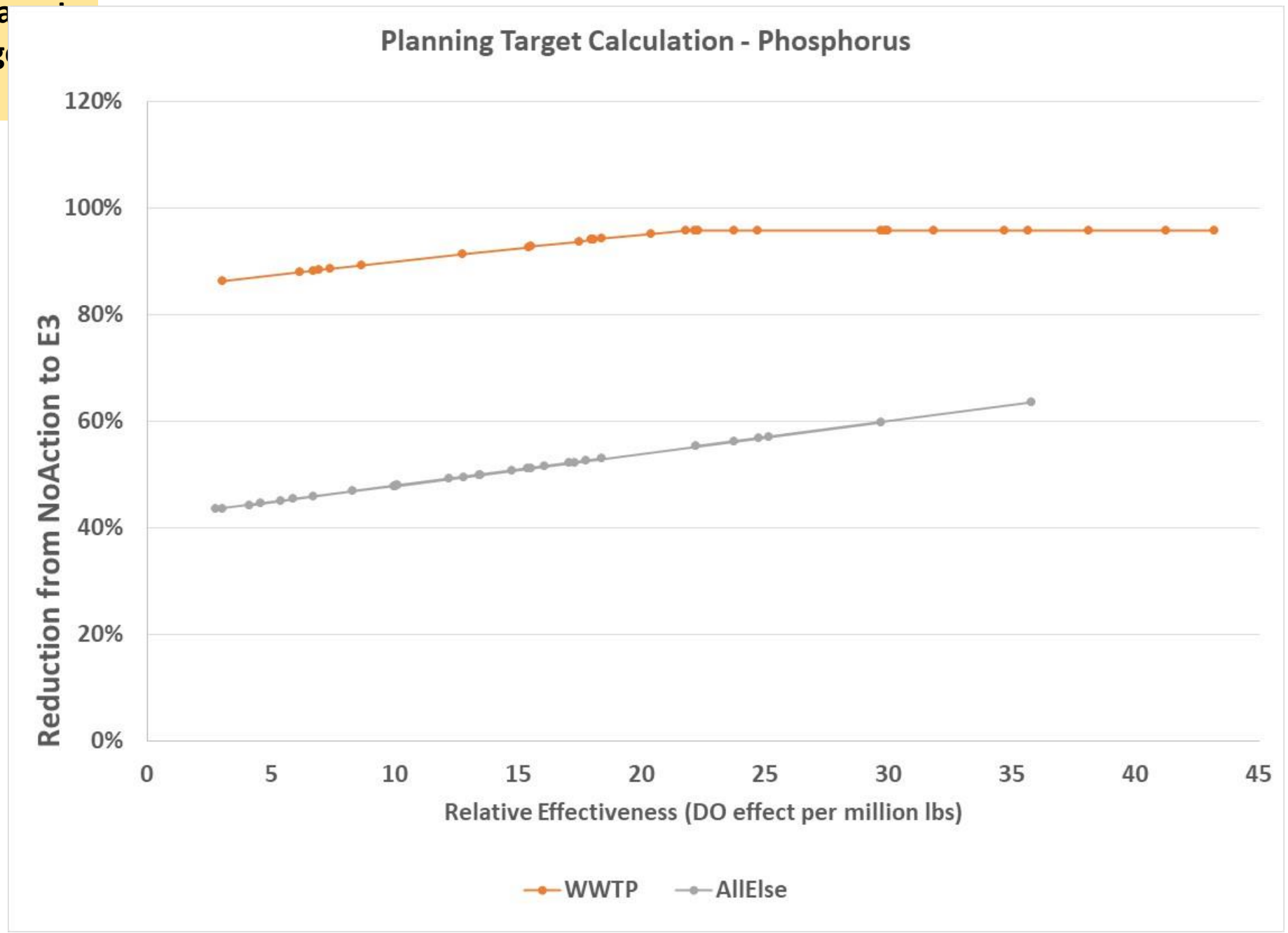
Adopting the rule that NPS and PS move together has a similar result to setting the upper PS limit at 4 mg/l for 2035.

A significant difference in policy is whether WWTP continues to move for future policy decisions or is always set based on a concentration

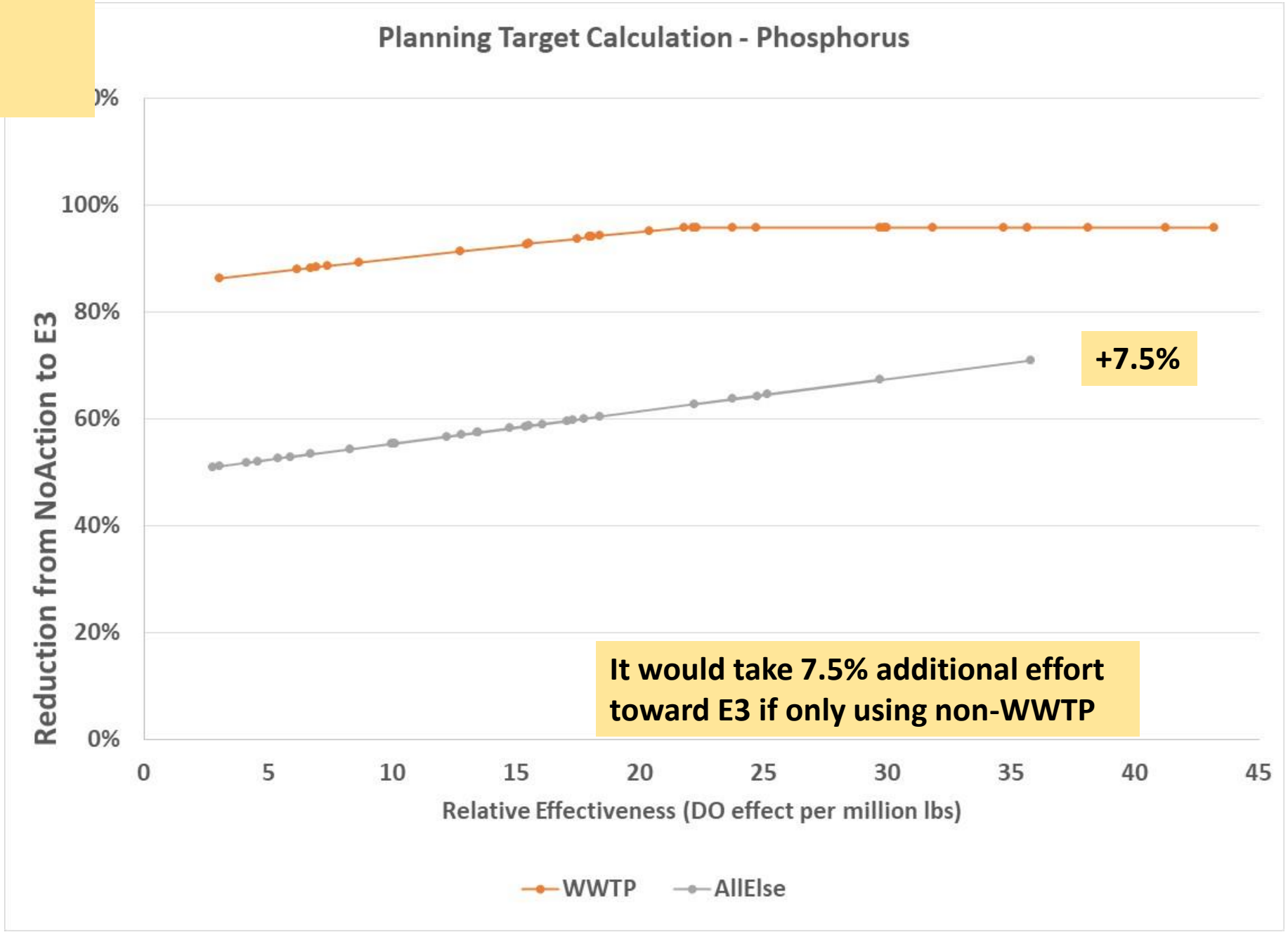
2017 Planning Targets
Prior to exchanges and exceptions



2017 Planning Ta
Prior to exchang
and exceptions

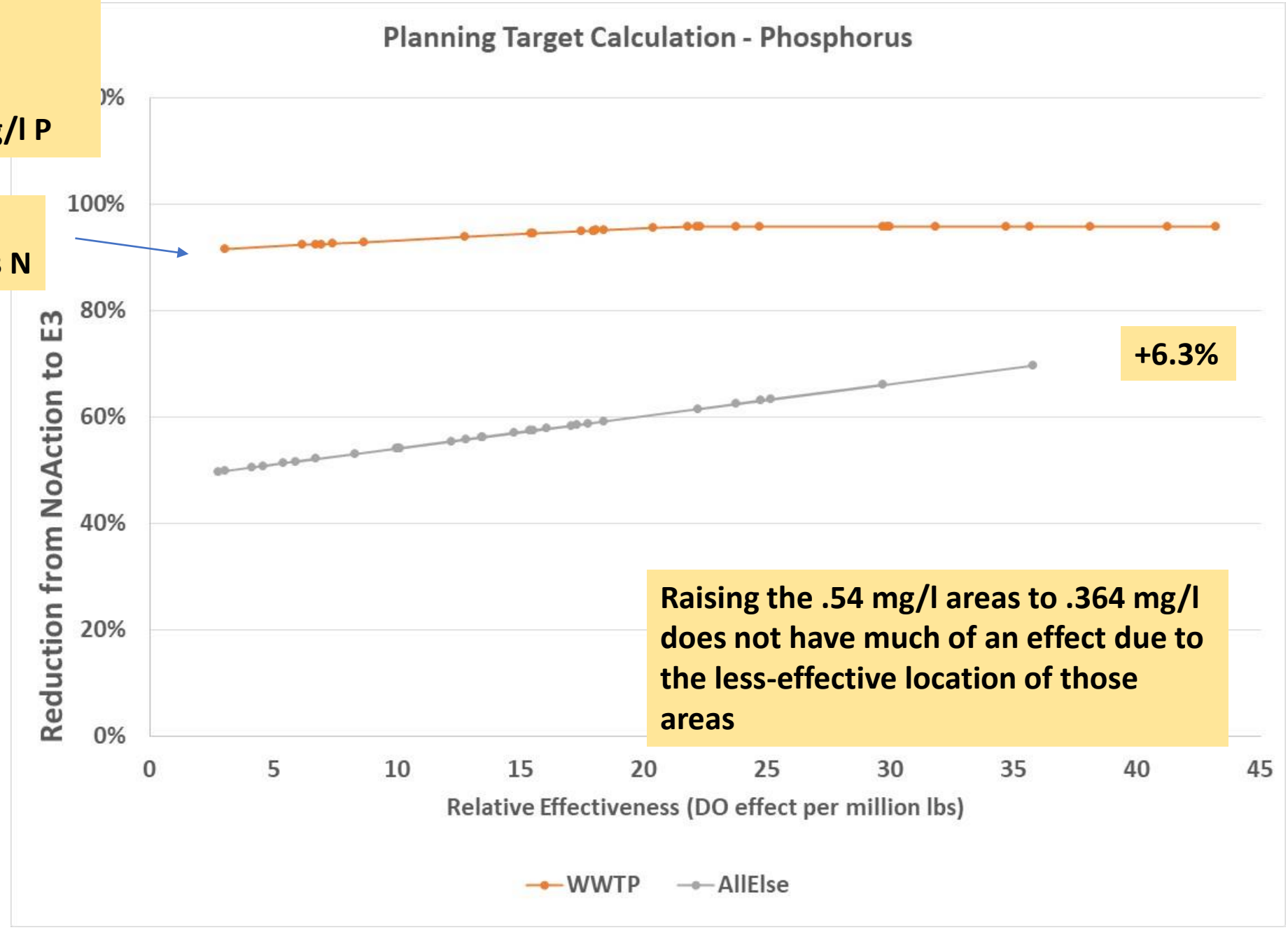


2035 climate
All Allocation
NPS only

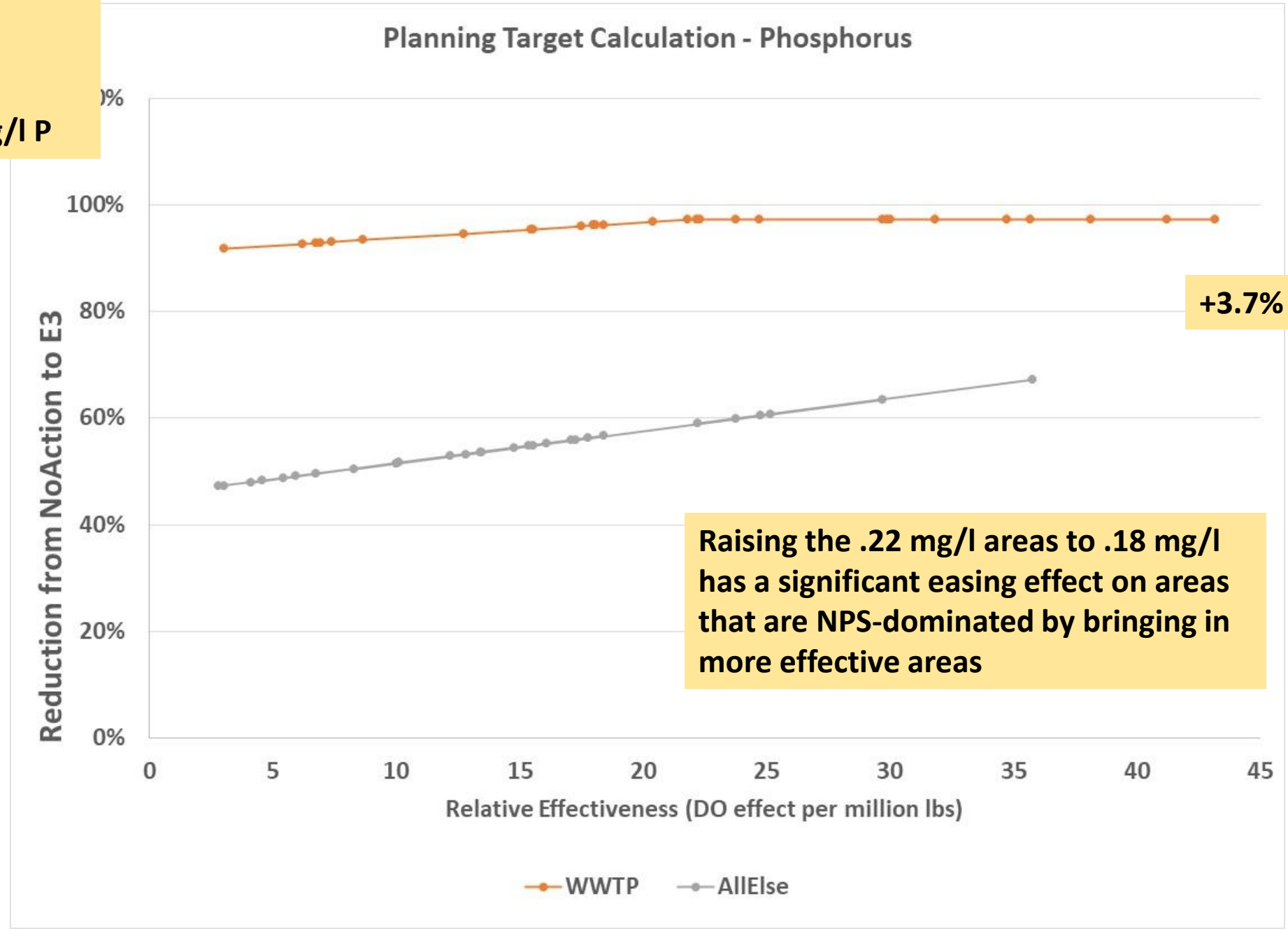


2035 climate
All Allocation
6 and 4.5 mg/l
.364 and .22 mg/l P

Same fraction toward 100% as N



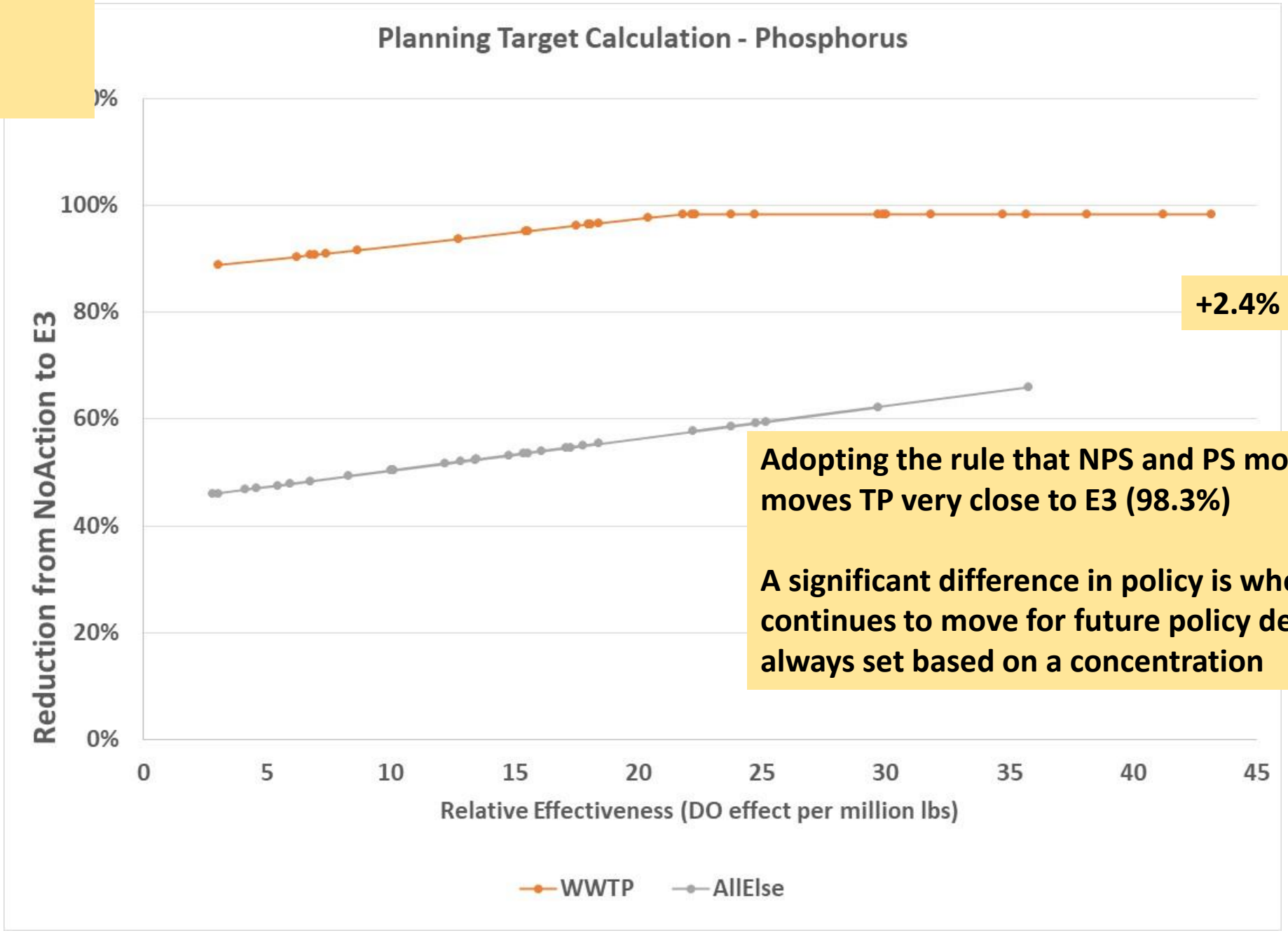
2035 climate
All Allocation
6 and 4 mg/l
.364 and .18 mg/l P



+3.7%

Raising the .22 mg/l areas to .18 mg/l has a significant easing effect on areas that are NPS-dominated by bringing in more effective areas

2035 climate
All Allocation
NPS + WWTP



+2.4%

Adopting the rule that NPS and PS move together moves TP very close to E3 (98.3%)

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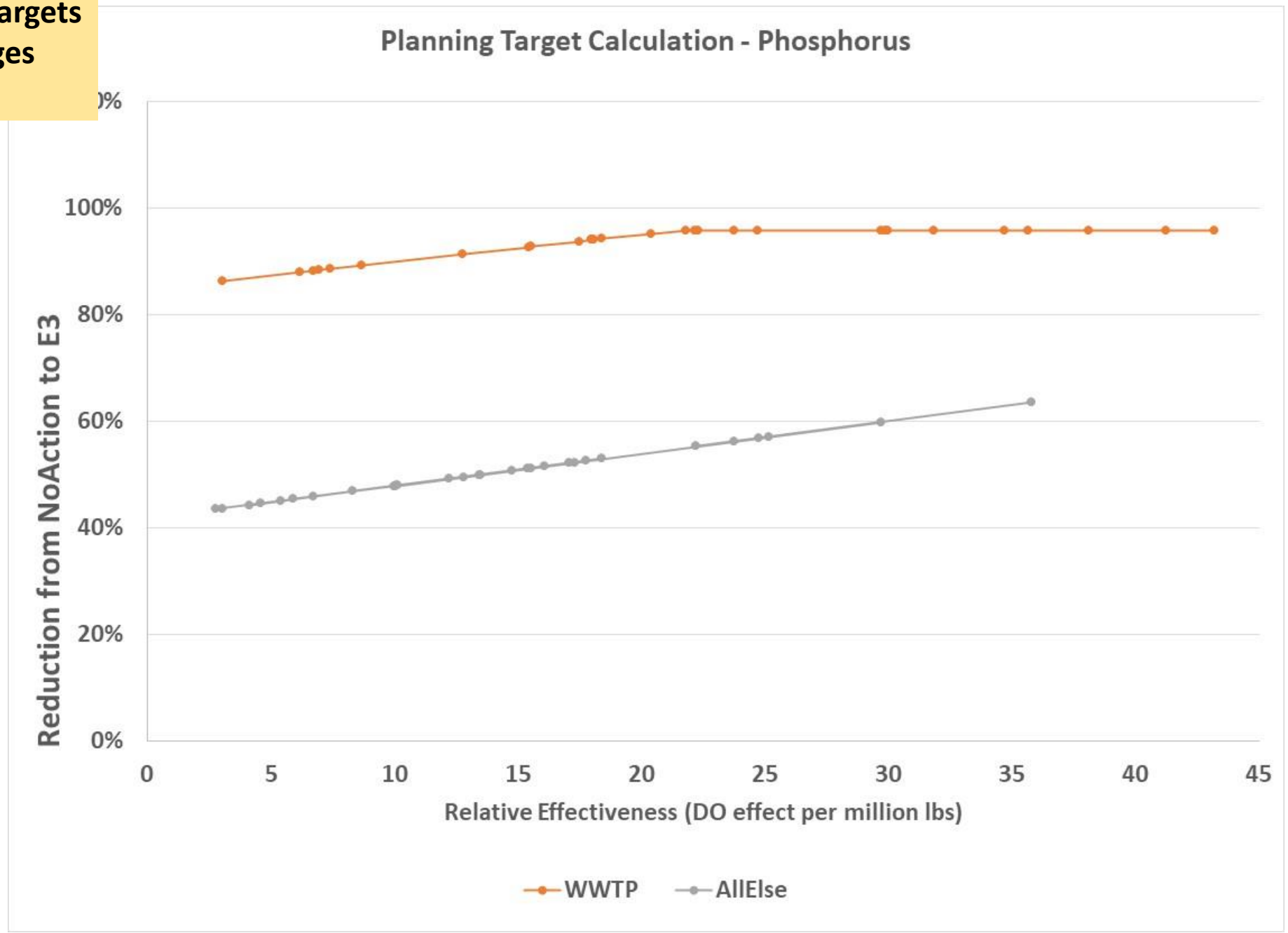
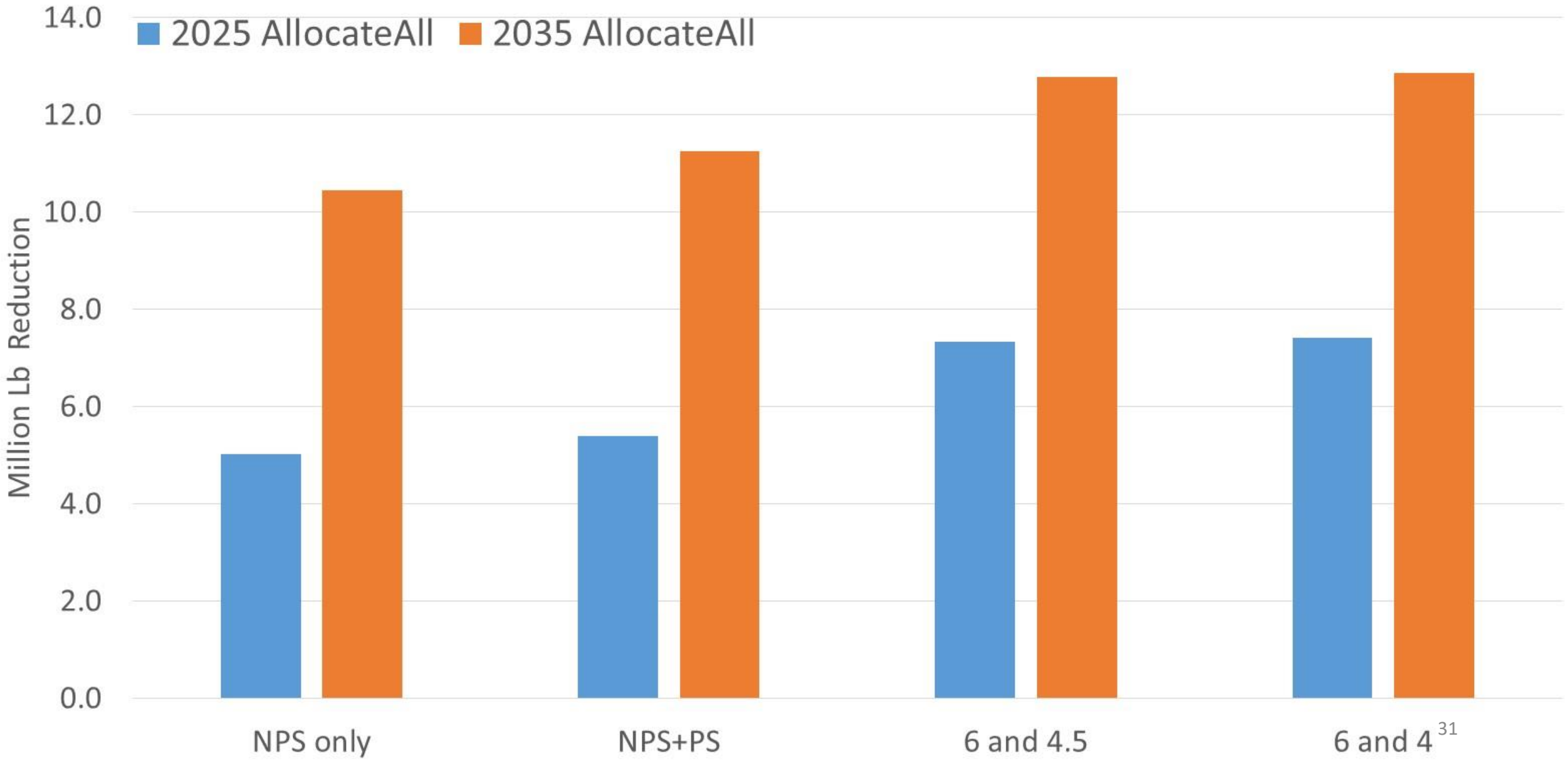


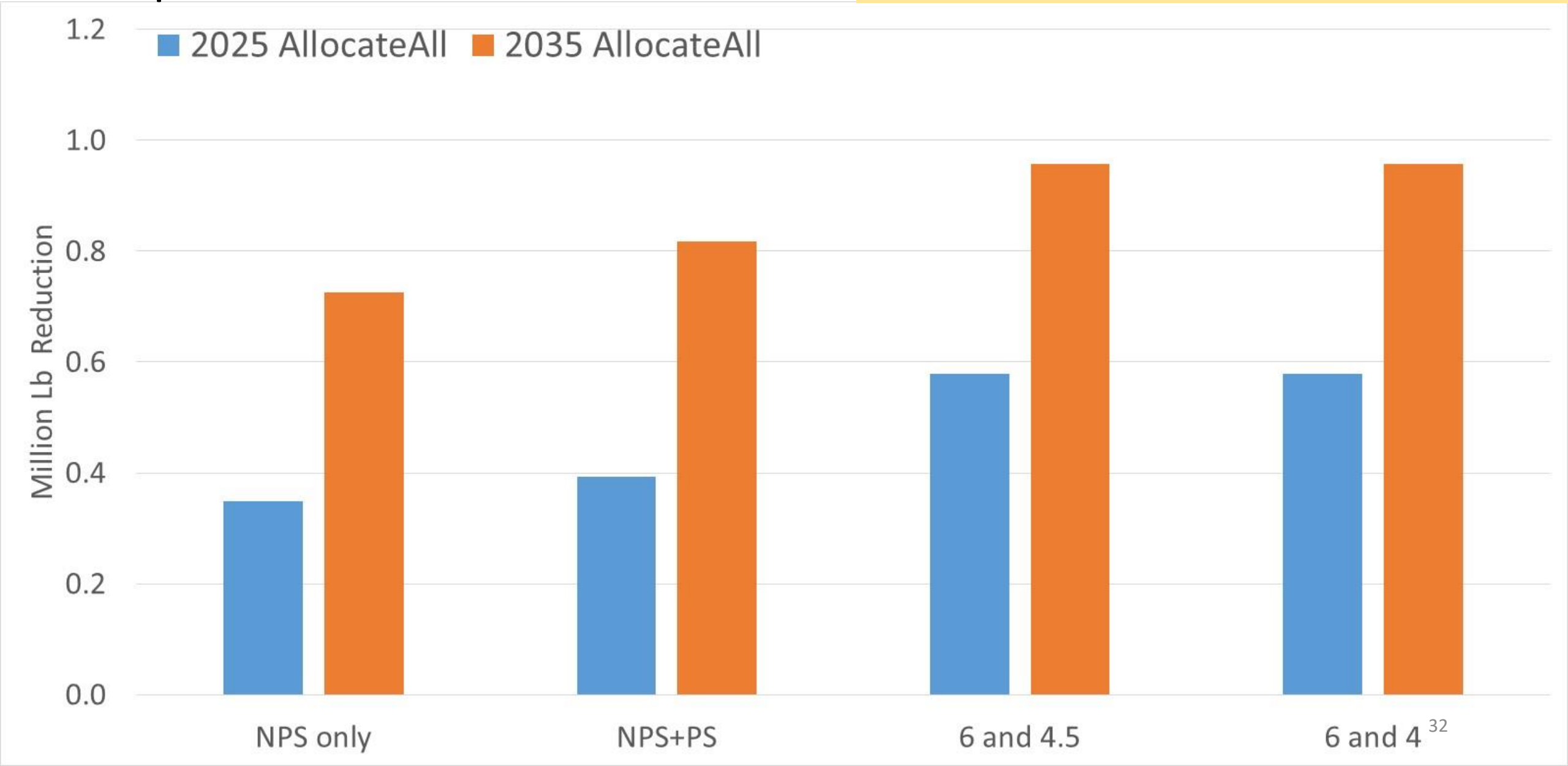
Nitrogen Total Reductions

- Bringing in WWTP adds load reduction
- Bringing the lower WWTP limit up to 6 mg/l adds a significant amount of reduction



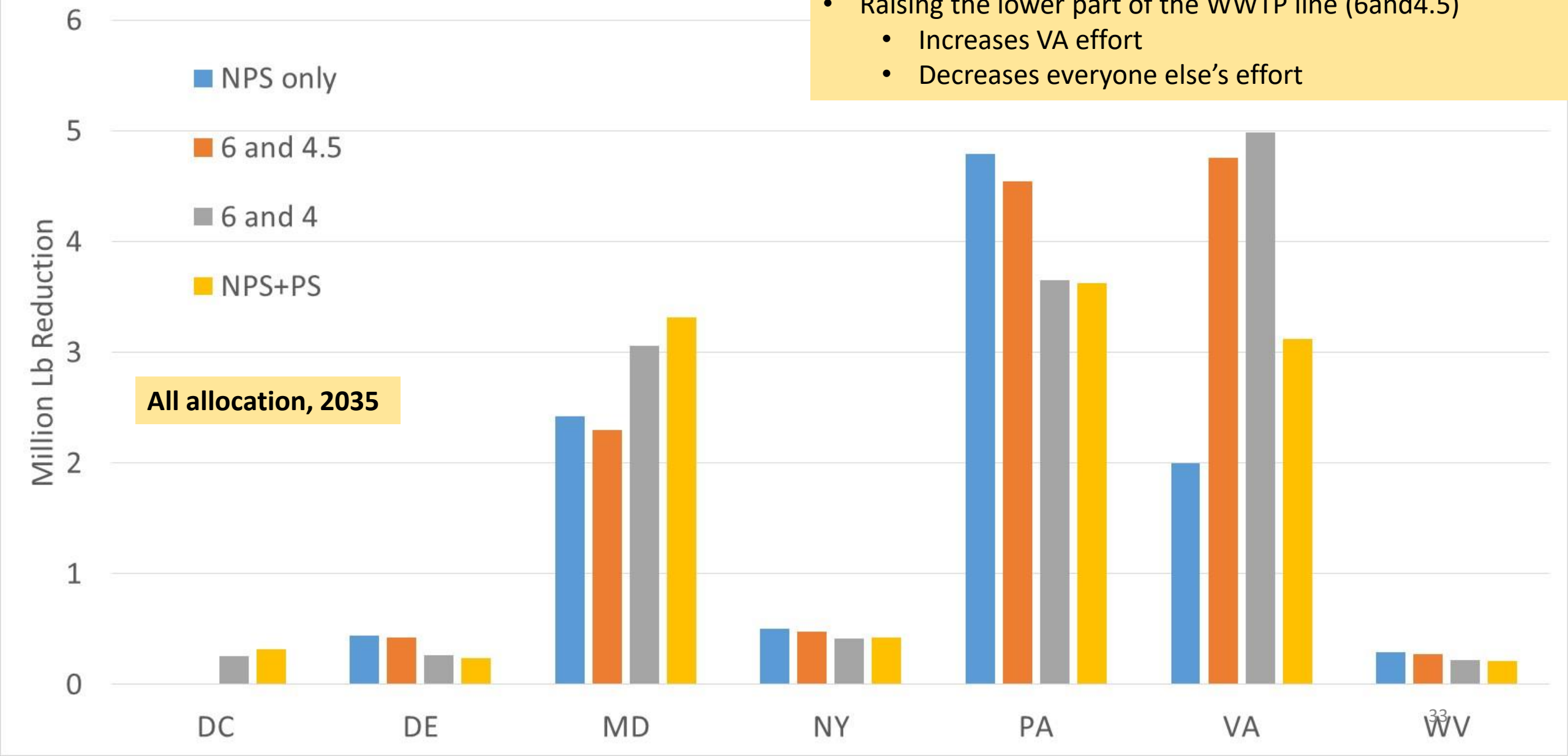
Phosphorus Total Reductions

- Bringing in WWTP adds load reduction
- Bringing the lower WWTP limit up to .364 mg/l adds a significant amount of reduction



Nitrogen Total Reductions

- Raising the upper part of the WWTP line (6and4, NPS+PS)
  - Decreases DE, NY, PA, WV effort
  - Increases DC, MD, VA effort
- Raising the lower part of the WWTP line (6and4.5)
  - Increases VA effort
  - Decreases everyone else's effort



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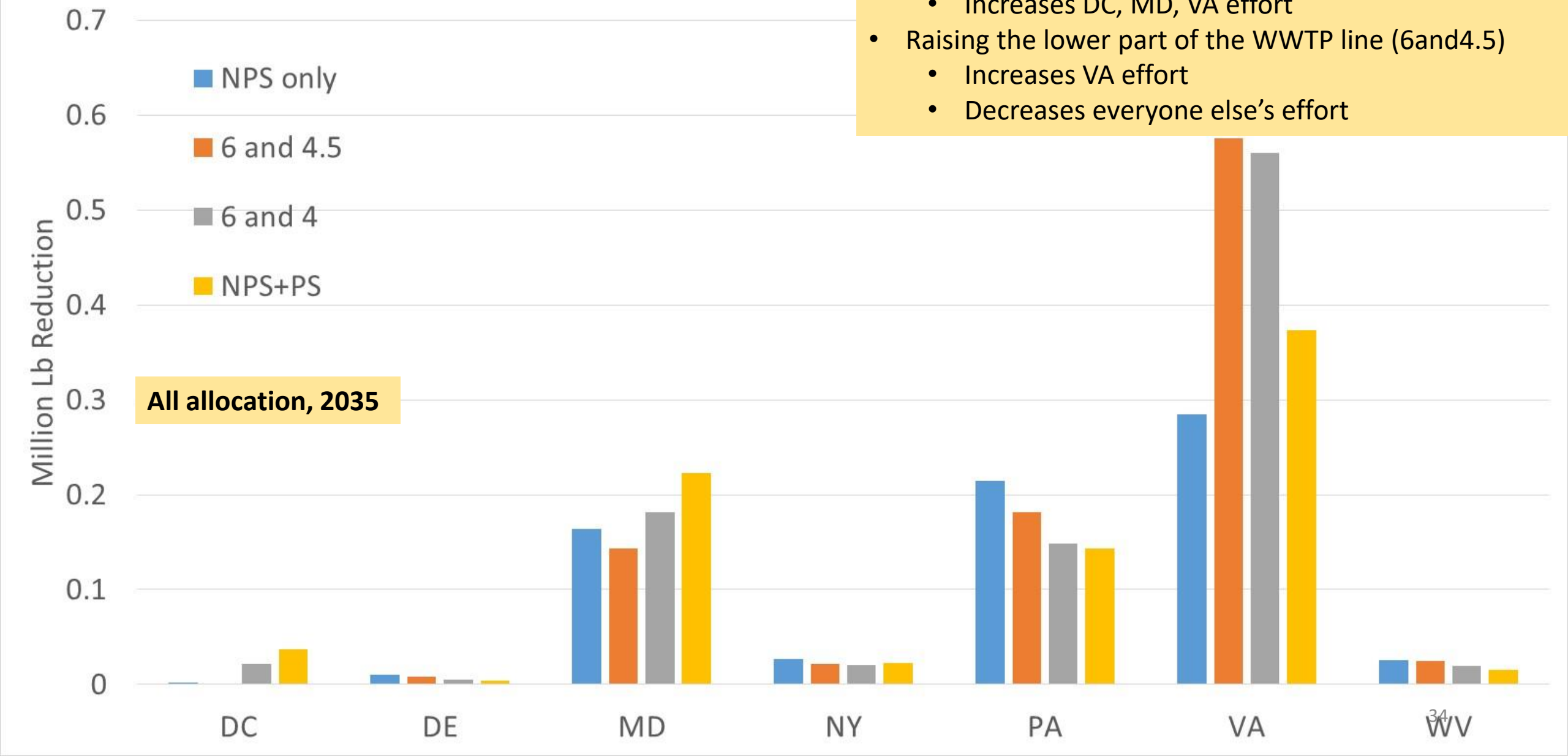

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WWTP Scenario	NPS only	NPS only	NPS only	NPS only	NPS only	NPS only	NPS only	NPS only	NPS+PS	NPS+PS	NPS+PS	NPS+PS	NPS+PS	NPS+PS	NPS+PS	NPS+PS
Year	2025	2035	2025	2035	2025	2035	2025	2035	2025	2035	2025	2035	2025	2035	2025	2035
Watershed First	No	No	L1st	L1st	No	No	L1st	L1st	No	No	L1st	L1st	No	No	L1st	L1st
State	TN	TN	TN	TN	TP	TP	TP	TP	TN	TN	TN	TN	TP	TP	TP	TP
DC	0.003	0.007	0.006	0.007	0.001	0.002	0.001	0.001	0.152	0.316	0.006	0.046	0.018	0.037	0.001	0.006
DE	0.212	0.442	0.036	0.138	0.005	0.010	0.003	0.007	0.116	0.242	0.036	0.112	0.002	0.004	0.003	0.007
MD	1.164	2.426	1.061	1.905	0.079	0.164	0.111	0.235	1.590	3.315	1.061	2.017	0.107	0.222	0.111	0.242
NY	0.242	0.504	0.699	1.202	0.013	0.026	0.044	0.087	0.201	0.420	0.699	1.191	0.011	0.023	0.044	0.087
PA	2.298	4.789	1.683	3.618	0.103	0.214	0.095	0.287	1.740	3.627	1.683	3.472	0.069	0.143	0.095	0.278
VA	0.957	1.995	1.476	3.009	0.137	0.285	0.337	0.733	1.497	3.121	1.476	3.151	0.179	0.374	0.337	0.745
WV	0.138	0.288	-0.054	0.308	0.012	0.025	0.009	0.053	0.103	0.214	-0.054	0.299	0.008	0.016	0.009	0.052
Total	5.015	10.451	4.908	10.187	0.348	0.726	0.599	1.404	5.400	11.255	4.908	10.288	0.393	0.818	0.599	1.416
			See Note1				See Note1				See Note1				See Note1	
Basin																
Eastern Shore	0.864417	1.801541	0.429677	0.81372	0.040342	0.084076	0.040226	0.075385	0.527777	1.099946	0.429677	0.72526	0.019116	0.039839	0.040226	0.069808
James	0.271387	0.5656	0.280561	0.925384	0.044023	0.091748	0.143634	0.342765	0.708524	1.476643	0.280561	1.040252	0.100295	0.209026	0.143634	0.357551
Patuxent	0.064831	0.135116	0.103577	0.13694	0.008464	0.01764	0.019284	0.029576	0.103372	0.215439	0.103577	0.147067	0.011453	0.023869	0.019284	0.030362
Potomac	1.047098	2.182267	0.707406	2.455677	0.111695	0.232785	0.122763	0.417721	1.402422	2.922803	0.707406	2.549047	0.128673	0.268168	0.122763	0.422182
Rappahannock	0.168514	0.351202	0.505335	0.686219	0.019954	0.041586	0.101875	0.14204	0.131813	0.274713	0.505335	0.676575	0.010994	0.022912	0.101875	0.139686
Susquehanna	2.358417	4.915202	2.430968	4.570716	0.103634	0.215984	0.132932	0.335222	1.817232	3.787311	2.430968	4.428507	0.073427	0.15303	0.132932	0.327285
Western Shore	0.128057	0.266885	0.290333	0.380077	0.010137	0.021127	0.020412	0.032539	0.605963	1.262893	0.290333	0.505657	0.039504	0.08233	0.020412	0.040256
York	0.112106	0.233641	0.159674	0.21824	0.010195	0.021248	0.017921	0.029137	0.103232	0.215146	0.159674	0.215908	0.00915	0.019069	0.017921	0.028862
Total	5.014827	10.45145	4.90753	10.18697	0.348443	0.726195	0.599046	1.404386	5.400335	11.2549	4.90753	10.28827	0.39261	0.818242	0.599046	1.415991
StateBasin																
DC Potomac	0.003406	0.007099	0.006281	0.006793	0.000779	0.001624	0.000707	0.001268	0.151712	0.316185	0.006281	0.045763	0.017542	0.03656	0.000707	0.005673
DE Eastern Shore	0.212187	0.442222	0.035813	0.137576	0.004837	0.010081	0.003065	0.007475	0.116319	0.242422	0.035813	0.112385	0.001873	0.003903	0.003065	0.006696
MD Eastern Shore	0.575263	1.198912	0.34271	0.587166	0.031274	0.065178	0.03191	0.058228	0.362282	0.755037	0.34271	0.531201	0.015135	0.031543	0.03191	0.053987
MD Patuxent	0.064831	0.135116	0.103577	0.13694	0.008464	0.01764	0.019284	0.029576	0.103372	0.215439	0.103577	0.147067	0.011453	0.023869	0.019284	0.030362
MD Potomac	0.351102	0.731736	0.197433	0.62567	0.02686	0.05598	0.03256	0.102778	0.493511	1.028532	0.197433	0.663091	0.039916	0.083189	0.03256	0.106209
MD Susquehanna	0.045854	0.095564	0.13016	0.18092	0.001825	0.003803	0.007059	0.011646	0.025786	0.053741	0.13016	0.175647	0.000648	0.001351	0.007059	0.011336

Load reduction options 2020 06 02.xlsx

WQGIT Climate Allocation Decisions

- Year
  - 2025 or 2035?
  - Link target year and implementation?
- Watershed loads first
  - Allocate all necessary reductions through planning target method
    - or
  - Take out jurisdictional climate-related increases in loads first and allocate any remainder
- WWTP loads included in jurisdictional allocation calculations
  - Only non-WWTP sources
  - Increase WWTP with non-WWTP
  - Set WWTP at 6 and 4.5 TN
    - .22 and .364 TP
  - Set WWTP and 6 and 4 TN
    - .18 and .364 TP
- Open Water
  - How do deal with open water violations in the lower Bay