

Addressing the PSC Decisions Related to CAST from 8/22/22

MB Decisions at the 9/5 Meeting:

- **PSC Decision 1:** *Over the next year, as a partnership, we will figure out how the unaccounted additional loads are addressed post-2025, and on what timeframe, as we work to 'recalibrate' the goal line.*
 - Approve the method for defining unaccounted additional loads for presentation to the PSC. Unaccounted additional loads will be added to the existing Phase III WIP Planning Targets to create Interim Planning Targets. Unaccounted additional loads shall be addressed in Phase 7 along with 2035 Climate Change loads
 - Consensus: MB
- **PSC Decision 2:** *Convene a committee to develop short-term, interim resolutions to fertilizer data concerns before moving forward with CAST-23 as well as long-term resolutions for Phase 7 model.*
 - Approve the methods developed by the USWG nutrient task force, Agricultural Fertilizer Expert Group for incorporation into CAST-23 to be presented to the PSC for approval
 - Consensus reached at the USWG, Ag Workgroup (AgWG), WQGIT, & MB
- **PSC Decision 3:** *Refine the process to include additional safeguards to prevent data analysis variations and to assess reasonability of modeling results after Chesapeake Bay Program protocols are applied.*
 - Approve methods developed by the WTWG for addressing illogical model results to be presented to the PSC for approval
 - Consensus: WTWG, WQGIT, & MB
- **CAST Schedule:** *CAST-23 will be the last model update for Phase 6, Change from current schedule*
 - Approve the recommendation that CAST-23 be the last update to the phase 6 suite of models
 - Consensus: WQGIT & MB
- **Caveat on Eligibility and Timing:** *Several jurisdictions request changing all crop nutrient applications to be both manure and fertilizer eligible if the crop/land use allows it.*
 - A consensus decision will be requested at the September 21st AgWG with subsequent decision at the WQGIT contingent on AgWG decisions.
 - Deadline to decide and make the final change to CAST-23 is December 15, 2023
 - This is the only additional change that will be considered for CAST-23

Consensus Continuum



9/5/23: Management Board Votes

Voting Member	PSC Decision #1	PSC Decision #2	PSC Decision #3	CAST Schedule
DC	5	5	5	5
DE	4	3	5	3
MD	4	3	4	4
PA	4	4*	3*	4
NY	5	4	5	4
VA	5	4	5	4
WV	5	5	5	5
CBC	4	4	5	4
EPA	5	5	5	5

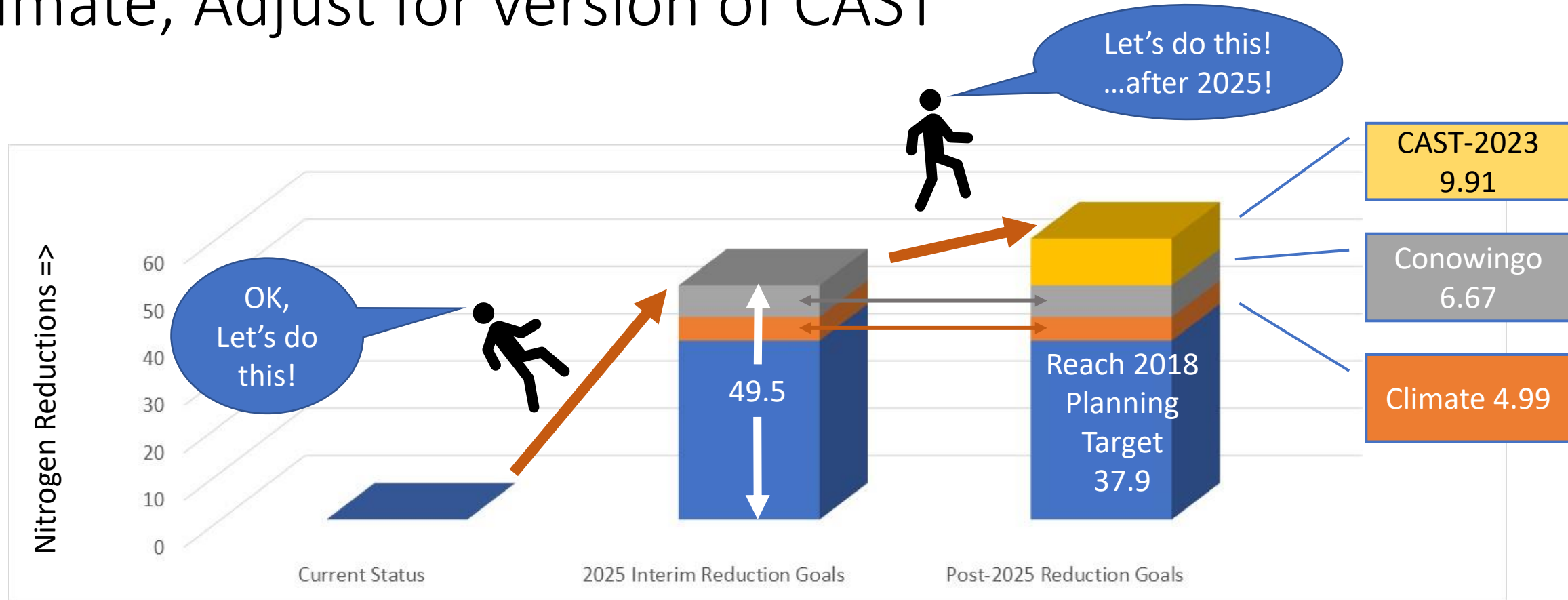
* Indicates additional comments with the vote.

Additional Comments and Caveat

- Pennsylvania
 - PSC Decision #2: Reservations are related to ensuring acceptable partnership review and evaluation of the eligibility and timing concerns.
 - PSC Decision #3: No plan for independent, unbiased, third-party review.
- **Caveat on Eligibility and Timing:** *Several jurisdictions request changing all crop nutrient applications to be both manure and fertilizer eligible if the crop/land use allows it.*
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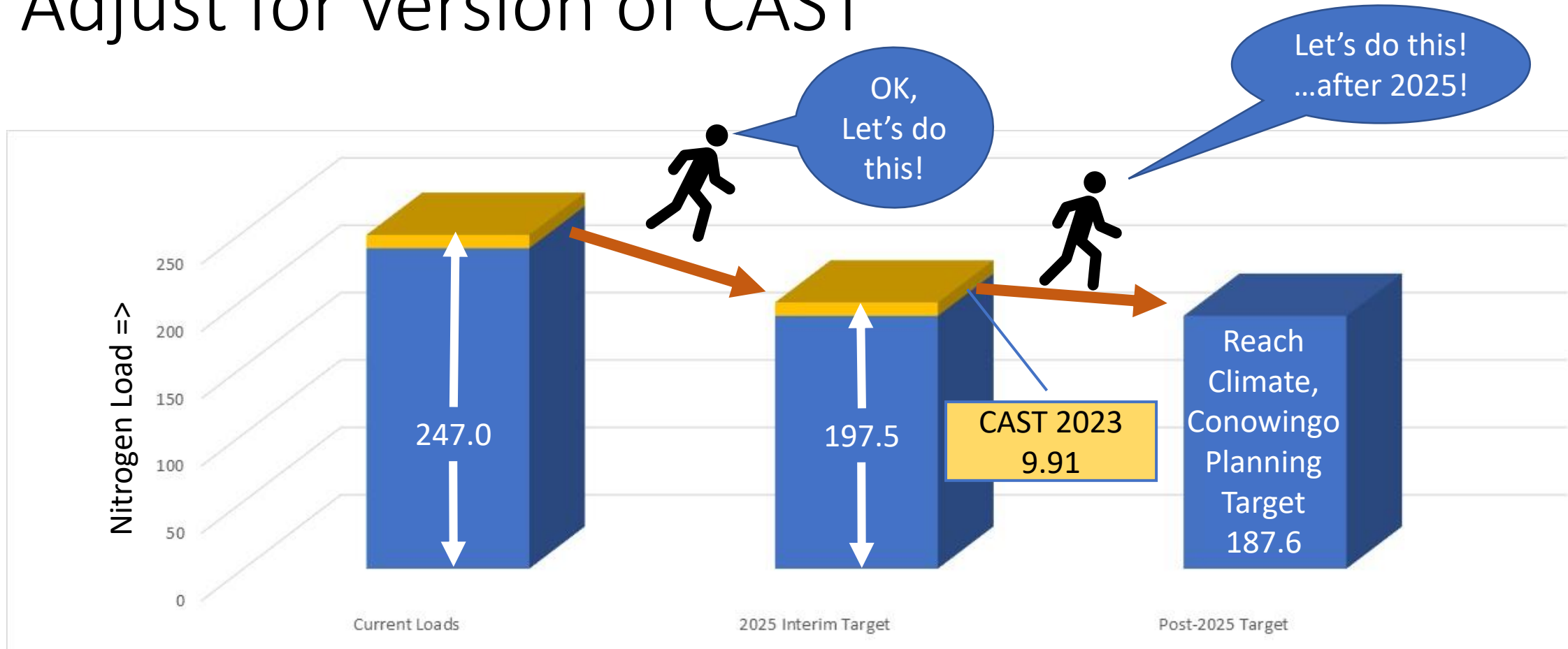
PSC Decision 1 Recommendation

Develop interim targets, Include reductions for climate, Adjust for version of CAST



Unaccounted Additional Loads are calculated as the positive difference between the latest version of the WIPs run on CAST-2023 and CAST-2017, after within-jurisdiction exchanges are performed.

Develop interim targets
Include reductions for climate
Adjust for version of CAST



Unaccounted Additional Loads are calculated as the positive difference between the latest version of the WIPs run on CAST-2023 and CAST-2017, after within-jurisdiction exchanges are performed.

Unaccounted Additional Loads (UALs)

- Unaccounted Additional Loads (UALs) are the **additional effort necessary to meet water quality standards** that is **due to model updates** between the latest version of CAST and the version of CAST that existed when the decision was made.
 - To find the UALs, the **WIPs are run** on the most recent and the original version of Phase 6 CAST and the **difference is added to the original planning targets**.
 - Where the latest version is lower, **exchanges are performed to preserve the level of effort** and avoid lowering the planning targets.
-

Draft Unaccounted Additional Loads

State	Nitrogen	Phosphorous
DC	0.000	0.000
DE	1.121	0.000
MD	1.813	0.000
NY	0.774	0.019
PA	5.357	0.054
VA	0.629	0.000
WV	0.217	0.004
Total	9.911	0.078

Unaccounted Additional Loads are calculated as the positive difference between the latest version of the WIPs run on CAST-2023 and CAST-2017, after within-jurisdiction exchanges are performed.

Questions?

Salient Points: PSC Decision #2



Data Updates

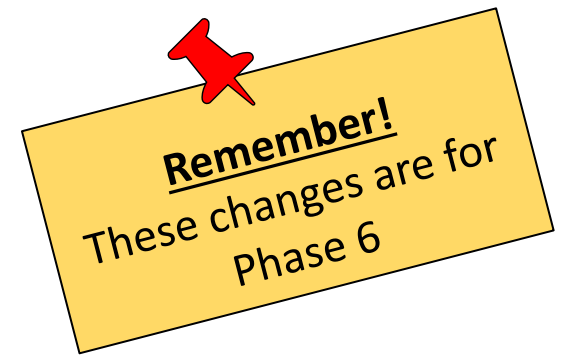


Urban Fertilizer



Agricultural Fertilizer

Urban Fertilizer: Where We Are



Spring 2023

Review
methods @
USWG

UNM Task Force
recommendations
@ USWG

WQGIT
approval

We Are Here
PSC



UNM Task Force
discussed proposed
methods changes

USWG approved
UNM Task Force
recommendations

Summer 2023

MB
approval

USWG = Urban Stormwater Workgroup
UNM = Urban Nutrient Management
WQGIT = Water Quality Goal Implementation Team

MB = Management Board
PSC = Principals' Staff Committee

Urban Stormwater Workgroup Decisions



Use AAPFCO data for the entire period of record

Use instead of NAWQA data



County-scale smoothing method



Remember!
These decisions are for
Phase 6



Incorporate data from states/jurisdictions, if possible

Takes care of latency with AAPFCO data

Fertilizer Expert Group (FEG) progress:

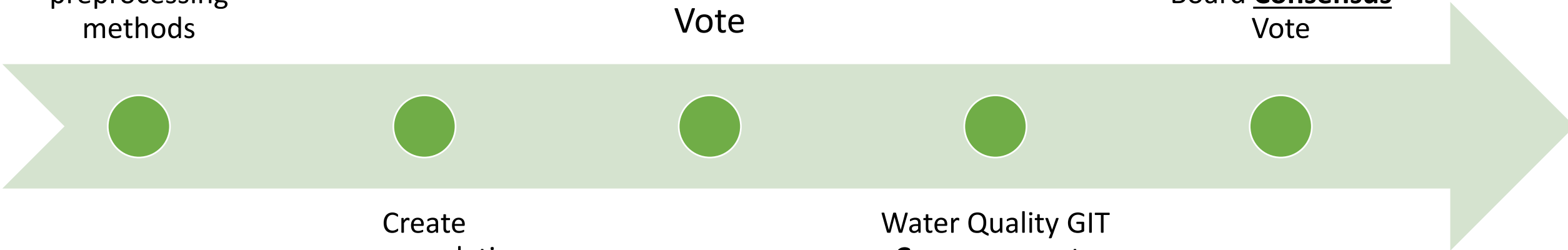
Complete review
of data and
preprocessing
methods

Agriculture
Workgroup
Consensus
Vote

Management
Board Consensus
Vote

Create
recommendations

Water Quality GIT
Consensus vote



What were the FEG's findings?

Direct state reported fertilizer sales tonnage data are an improvement over AAPFCO.

Alternative data sources and processing need further investigation for Phase 7.

What did the FEG recommend for Phase 6?

- 1) Incorporate the most up to date information possible
- 2) Do not alter existing data
- 3) Utilize directly reported state data
- 4) Updates should occur as often as new data coincides with CAST model updates

What did the FEG recommend for Phase 7?

1) Re-examine the processing methods used to calculate fertilizer use

2) Examine alternative data sources

Questions?

PSC Decision 3: Recommendations approved by WQGIT 7-24

- **August 2022 PSC Decision 3:** The partnership will **update the process for incorporating data into CAST to include additional safeguards to prevent data analysis errors and to assess reasonability of modeling results after CBP protocols are applied.**
- **WQGIT charged WTWG with developing recommendations for this charge**
- **WTWG broke charge into two parts: PRE (Track 1) and POST data processing (Track 2)**
 - **Pre-Data Processing:** Safeguards and protocols to prevent and protect against data input errors
 - **Post Data Processing:** A process/protocols to assess reasonability of results ("after protocols are applied" means "when we see results")
- **Evaluated each track separately; addressed both within the framework of a formalized *CAST Updates Review Process***
- **Presented *Draft CAST Updates Review Process Outline* and detailed recommendations to WQGIT for consideration, approved at July meeting**

QA- CAST Inputs

CBP IET and Source Sector Workgroups begin QA checks for all data inputs and methods

Jurisdictional Domain Data Due to CBP

Source Sector Workgroups approve new data and methods

WQGIT approves new data and methods

Development Team has incorporated new functionality into CAST

CAST output review by CBP IET is completed

WQGIT-Recommendations

- Update review process includes quality assurance review of data input sources, data preparation methods, model processing methods that inform loads, and corresponding documentation
 - Guided by source sector WG's and Implementation and Evaluation Team (IET)
-
- **Timely Partnership review supported by CBP IET staff**
 - **Anomalies:** appropriate source sector workgroup, scientifically supported and confirmed, resolution with IET support, confirmed by partnership, option to revert to previous model data and methods

QA- Outputs and Anomalies

Final BMP and wastewater submission for progress for July 1 to June 30 of previous year and for 1985 to June 30 of previous year for a new release of CAST

Partnership Review Begins**

Illogical Results Focus***

Final Partnership Comments****

CBP Response to Final CAST Comments*****

Release CAST

Summary PSC Decision 3 WQGIT Recommendation:

- To address the charge made in August 2022 by the PSC, the WQGIT has endorsed adopting a revised CAST Update Review Process.
- Revisions were made to address concerns with the quality assurance of model updates while balancing the commitment of the CBP partnership to:

**Use science-based decision-making to support sound management decisions in a changing system*

**Use an adaptive management approach to respond to changing conditions and better information*

**Ensure our goals are aligned with the best available science to attain restoration success*

Questions?

March 2022 Approved Phase 7 Development Schedule

Year	2022	2023	2024	2025	2026	2027	2028
Phase 6 CAST	CAST6-2021		CAST6-2023		CAST6-2025		
Phase III WIP evaluation	Implement				Evaluate and track with Phase 6		
Current Climate Plans	Build Models		Review CAST	Develop 2035 targets with P7 models, Review estuary model	P7 CAST25 Available for Use		
WQGIT Recommends	Build Models				Review Models	New 2035 climate targets with P7 models	P7 CAST27 Available for Use

Important Notes:

- CAST23 will be the model of record for the evaluation of 2025 Progress
- CAST23 will not include the FY22 Ag Census or the High-Resolution Land Use Data from 21/22
- CAST25 will introduce FY22 Ag Census or the High-Resolution Land Use Data from 21/22
- Schedule provides a full year of review for Phase 7 suite of tools
- Schedule results in Climate Targets at the end of 2027

New Option: CAST 2023 is last update for Phase 6

Year	2022	2023	2024	2025	2026	2027	2028
Phase 6 CAST	CAST6-2019		CAST6-2023				
Phase III WIP evaluation	Implement				Evaluate and track with Phase 6		
Current Climate Plans	Build Models		Review CAST		Develop 2035 targets	Track with Phase 7	
Phase 7 PSC Approved	Build Models that will also Address 2035 Climate Change Conditions				Review Models	New 2035 climate targets with P7 models	Track with Phase 7

Important Notes:

- CAST23 proposed release in Fall 2023
- CAST23 would be the model of record for the evaluation of 2025 Progress and all Progress scenarios post 2025 until Phase 7 is released
- Interim planning targets established based on the level of effort anticipated from Phase 3 WIPs, plus 2025 Climate Change loads, used for future progress evaluations
- This is the last update to CAST in the Phase 6 model period

Consolidated Timeline

PSC Decision	Draft to WQGIT	Final By WQGIT	Draft to MB	Final By MB	Presentation to PSC for approval
1 - Unaccounted Additional Loads			8/10/2023	9/5/2023	9/26/2023
2 - Fertilizer	6/26/2023	7/24/2023	8/10/2023	9/5/2023	9/26/2023
3 - Illogical Results	6/26/2023	7/24/2023	8/10/2023	9/5/2023	9/26/2023

Questions?

Nutrient application eligibility and timing:

The Chesapeake Assessment Scenario Tool (CAST) simulates nutrient applications onto Agricultural lands.



A **specific file** within this tool restricts the time in which applications can occur as well as the source of nutrients.



Some of the state inputs to this file have created unrealistic nutrient applications

Example application to a manure eligible land use:

-30 days before planting

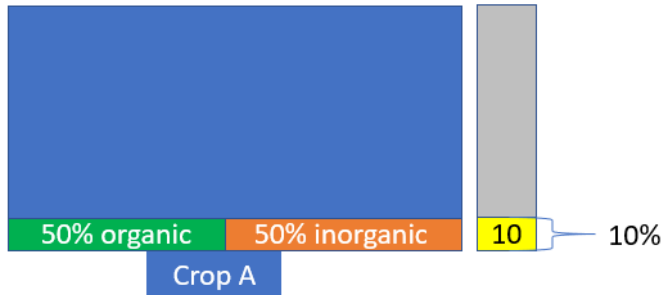
Planting

60 days after planting

Manure Stock

Fertilizer Stock

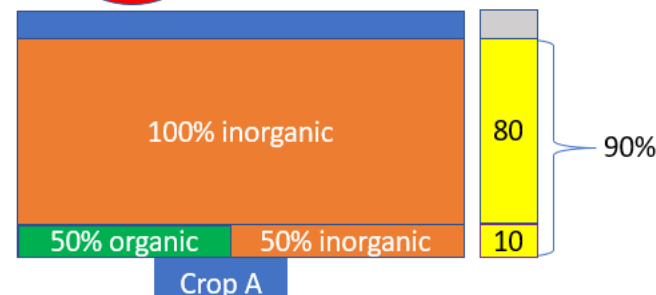
Percentage of crop need met



Manure Stock

Fertilizer Stock

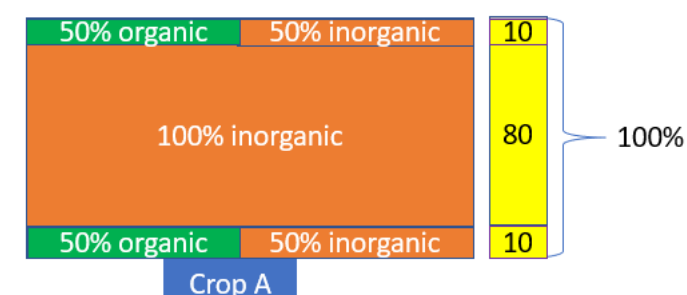
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Manure Stock

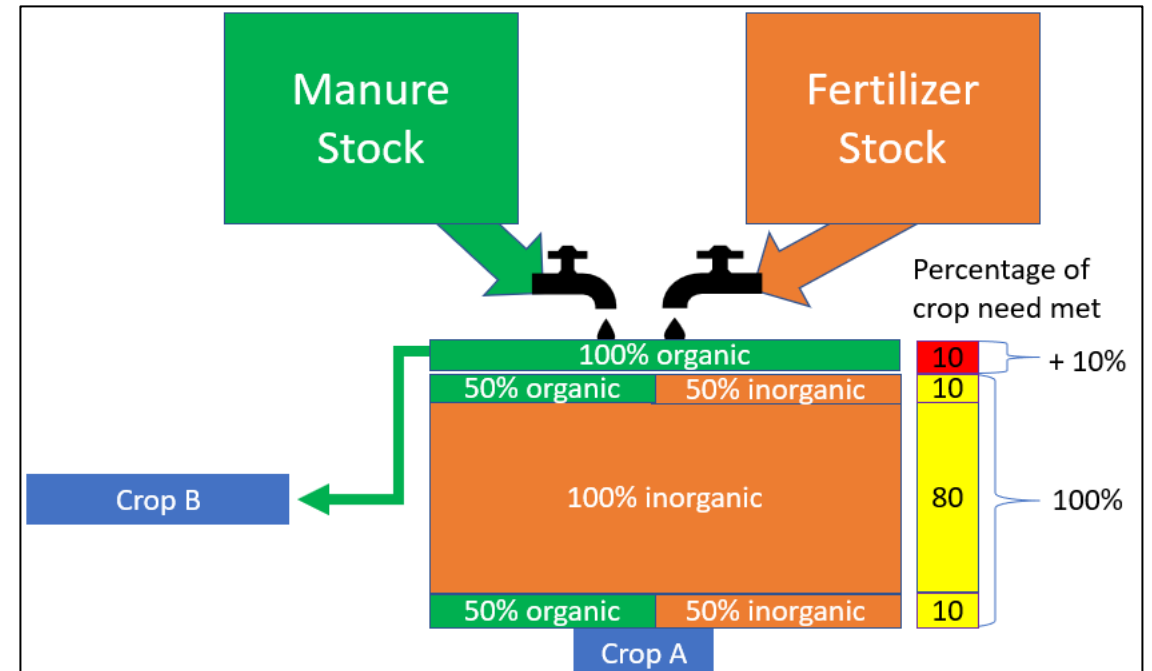
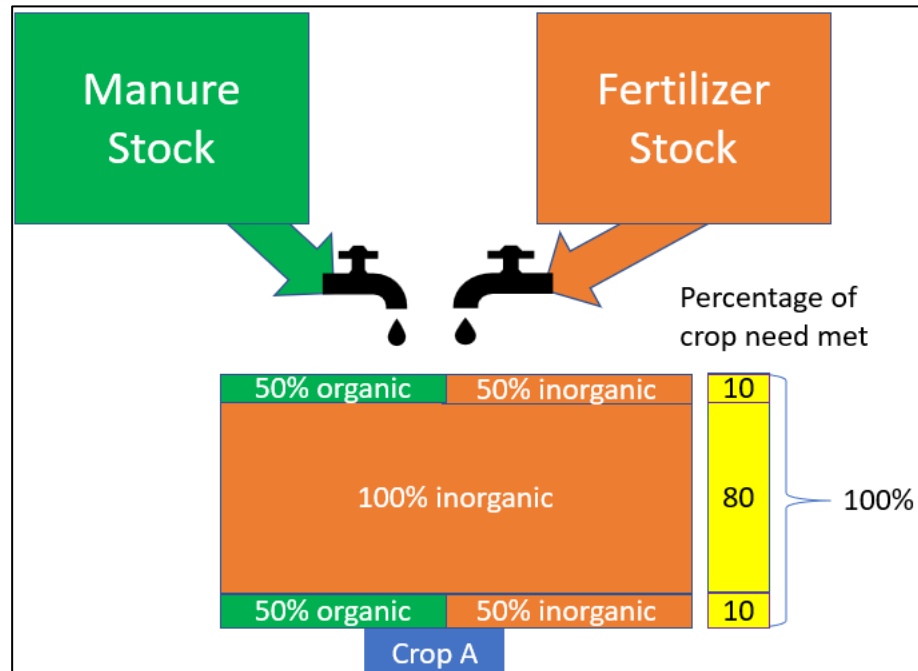
Fertilizer Stock

Percentage of crop need met



What happens if you still have manure?

- Manure must still be distributed within the county.
- Manure ends up going to other crops which do not normally receive manure in real life.



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PSC Requested Decisions:

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