

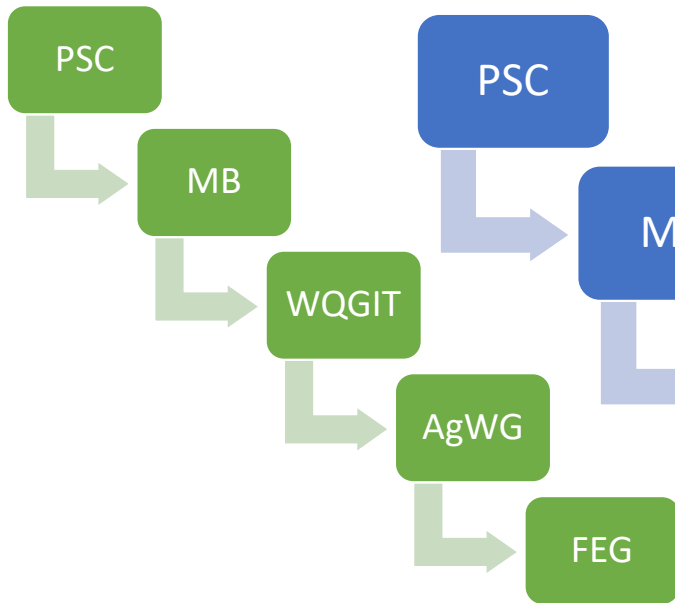
# Addressing the PSC Decisions Related to CAST from 08/22/22

# Decisions Requested at the 9/5 MB Meeting:

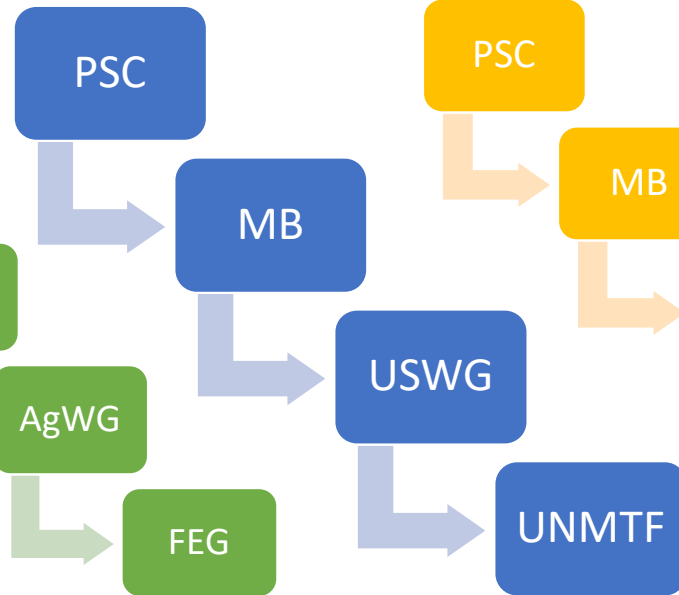
- **PSC Decision 2:** *Convene a committee to develop short-term, interim resolutions to fertilizer data concerns (Check in at next PSC meeting) before moving forward with CAST-23 as well as long-term resolutions for Phase 7 model.*
  - Approve the methods developed by the USWG nutrient task force, Agricultural Fertilizer Expert Group for incorporation into CAST-23 to be presented to the PSC for approval
  - Consensus reached at the USWG, Ag Workgroup, WQGIT
- **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
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- **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.
- **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

# PSC Decisional Directives

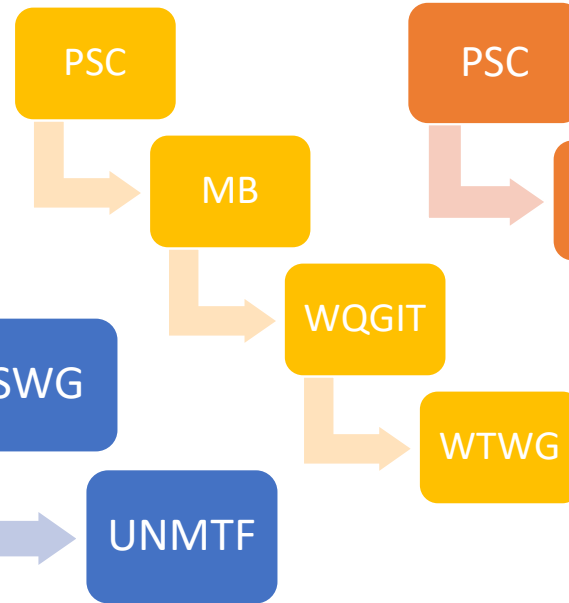
PSC Decision #2:  
Ag Fertilizer



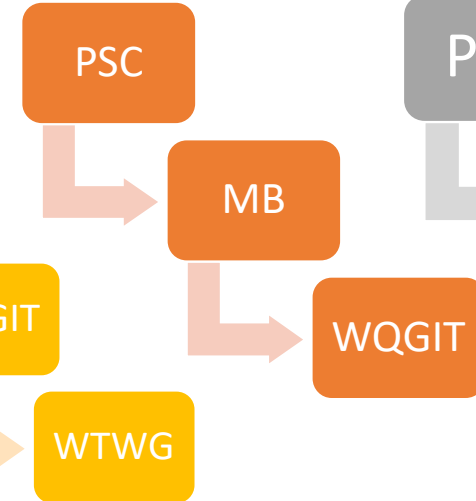
PSC Decision #2:  
Urban Fertilizer



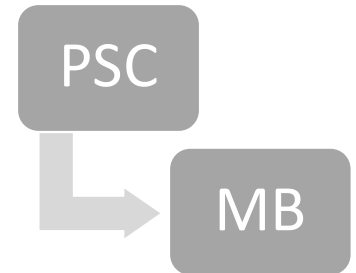
PSC Decision #3:  
Illogical Results



CAST  
Schedule



PSC Decision #1:  
Unaccounted Additional Loads



## Salient Points: PSC Decision #2



Data Updates

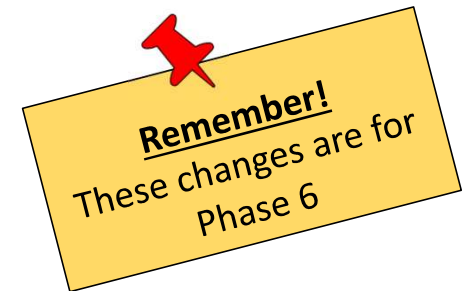


Urban Fertilizer



Agricultural Fertilizer

# Urban Fertilizer: Where We Are



Spring 2023

Review  
methods @  
USWG

UNM Task Force  
recommendations  
@ USWG

Inform  
WQGIT

Inform  
PSC

Inform  
PSC

UNM Task  
Force  
discussed  
proposed  
methods  
changes

USWG approved  
UNM Task Force  
recommendations  
Summer 2023

Inform  
MB

Inform  
MB  
We Are Here

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

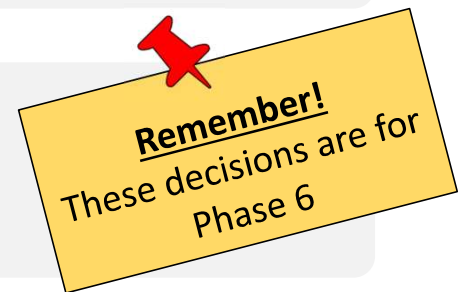


Use AAPFCO data for the entire period of record

Use instead of NAWQA data



County-scale smoothing method



Incorporate data from states/jurisdictions, if possible

Takes care of latency with AAPFCO data

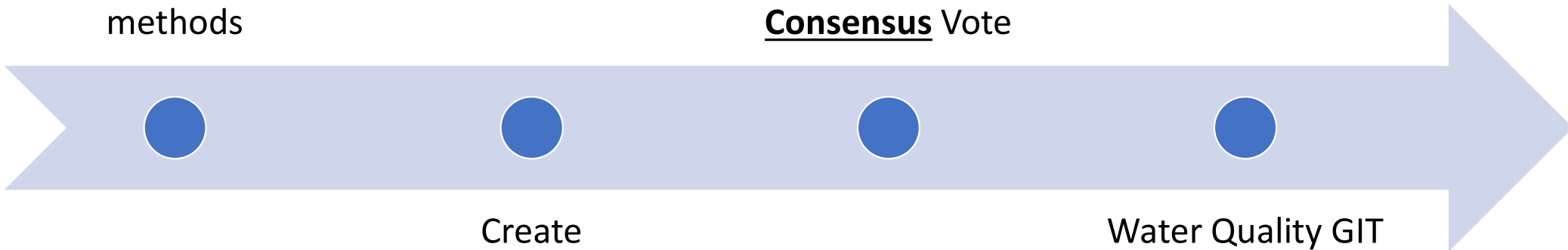
# Fertilizer Expert Group (FEG) progress:

Complete review  
of data and  
preprocessing  
methods

Agriculture  
Workgroup  
Consensus Vote

Create  
recommendations

Water Quality GIT  
Consensus vote



## What were the FEG's findings?

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

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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

Fertilizer Expert Group (FEG) next steps:

Management Board  
vote



PSC vote

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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*

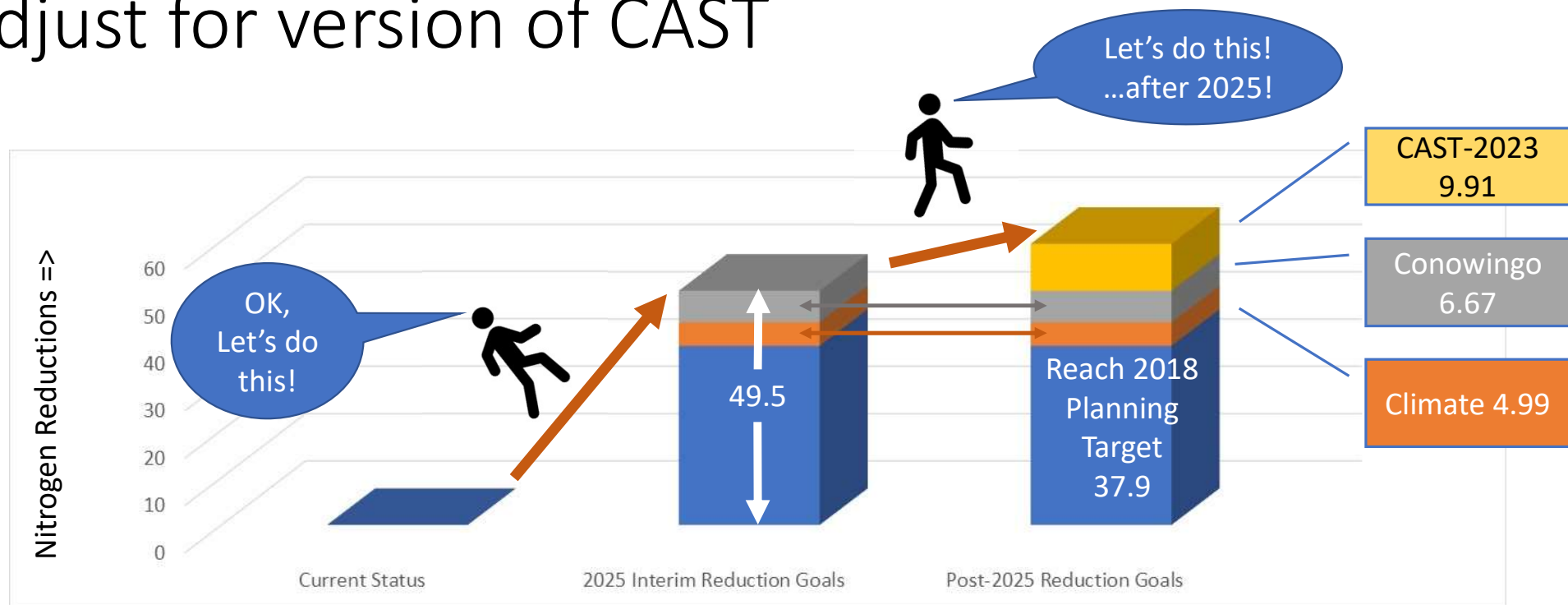
*\*Ensure our goals are aligned with the best available science to attain restoration success*

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Questions?

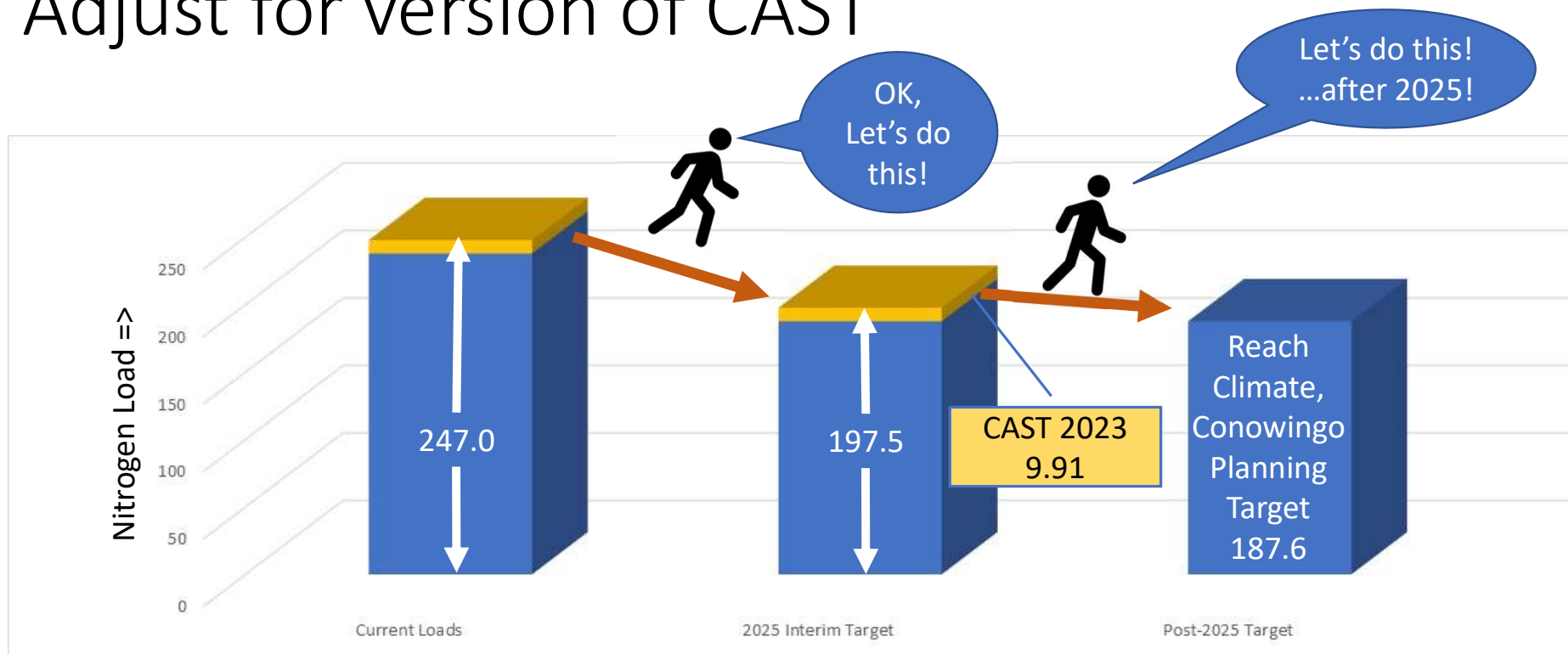


Develop interim targets  
Include reductions for climate  
Adjust for version of CAST



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.

# 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.

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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		
<del>Current Climate Plans</del>	<del>Build Models</del>		<del>Review CAST</del>		<del>Develop 2035 targets</del>	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**

## Pros/Cons for Each Option

	New Option:	Current Schedule:
	CAST-23 is final update for Phase 6; CAST-23 is used for 2025 Progress	CAST-23 plus CAST-25; CAST-23 is used for 2025 Progress
Pros:	<ul style="list-style-type: none"> <li>• Keeps focus on Phase 7</li> <li>• Ensures all priority items are reviewed and accurate because of time not spent on CAST25 update</li> <li>• In-Progress BMPs would be ready for incorporation in CAST-23 (i.e., Animal Mortality and Oysters)</li> <li>• There will be more dedicated personnel to Phase 7 model development</li> <li>• <i>Capacity for data comparisons (i.e., BMPS, Land Use, Fertilizer, Ag Census) for review</i></li> </ul>	<ul style="list-style-type: none"> <li>• Introduces new High-Res land use, Ag Census, and BMPs data into the CAST-25, <i>if available</i></li> </ul>
Cons:	<ul style="list-style-type: none"> <li>• No introduction of newly proposed BMPS.</li> <li>• Does not conform with jurisdictional agreed-to schedule of CAST releases in line with 2-year Milestone period.</li> </ul>	<ul style="list-style-type: none"> <li>• Difficult to provide a new version of CAST (i.e., CAST-25) and give proper attention to Phase 7 model</li> <li>• Time spent on Phase 7 is reduced due to focus on Phase 6</li> <li>• More resources might be expended addressing Phase 7 and CAST-25 simultaneously; unknown if those resources would be available</li> </ul>

## 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



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