

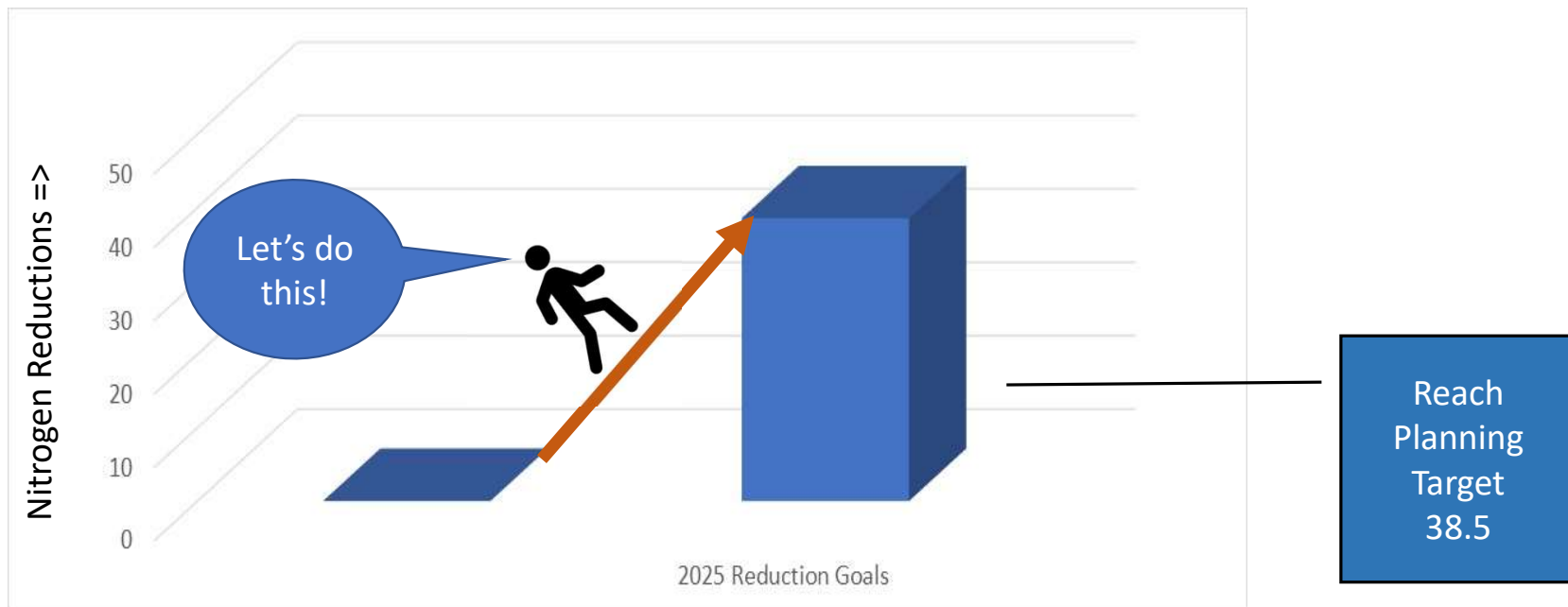
Addressing the PSC Decisions
Related to CAST from 08/22/22

Three PSC Decisions – CAST 2021

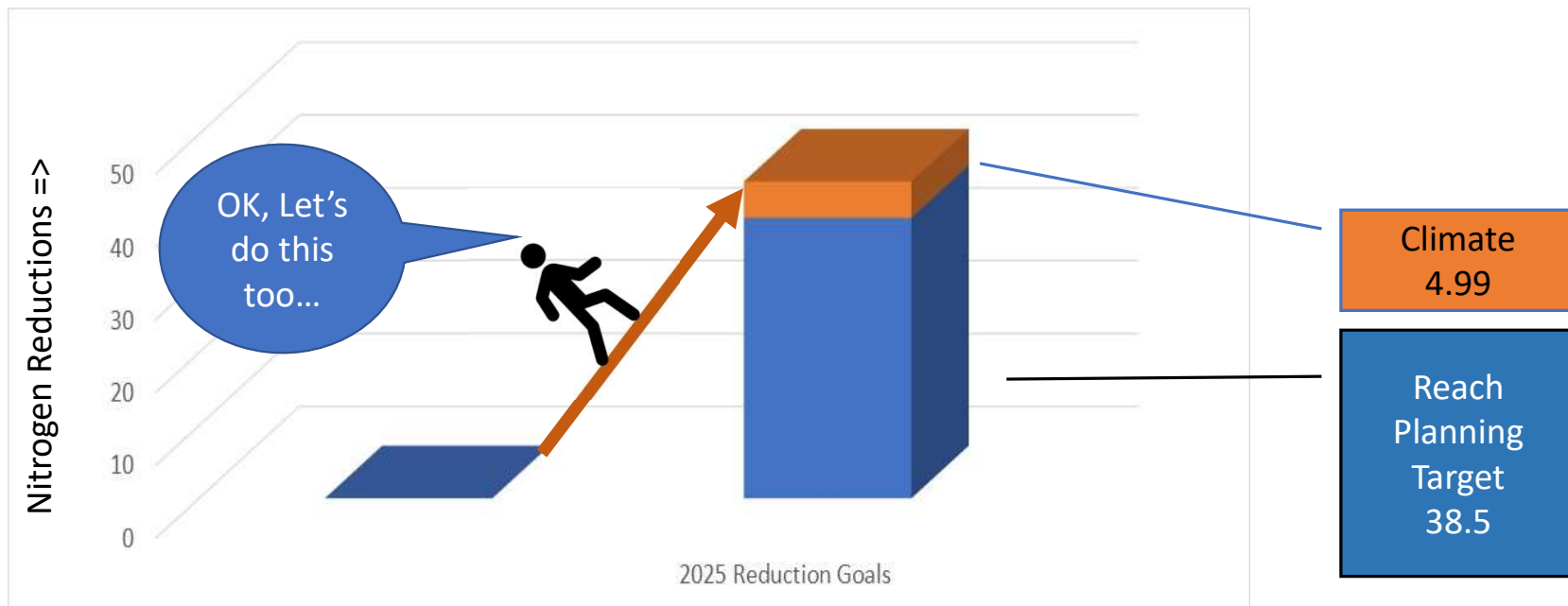
- **PSC Decision 1:** *Over the next year, as a partnership, we will figure out how the unaccounted additional loads are addressed post-2025, and on what timeframe, as we work to ‘recalibrate’ the goal line.*
- **PSC Decision 2:** *Convene a committee to develop short-term, interim resolutions to fertilizer data concerns (Check in at next PSC meeting) before moving forward with CAST 2021 as well as long-term resolutions for Phase 7 model.*
- **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.*

Addressing Unaccounted Additional Loads

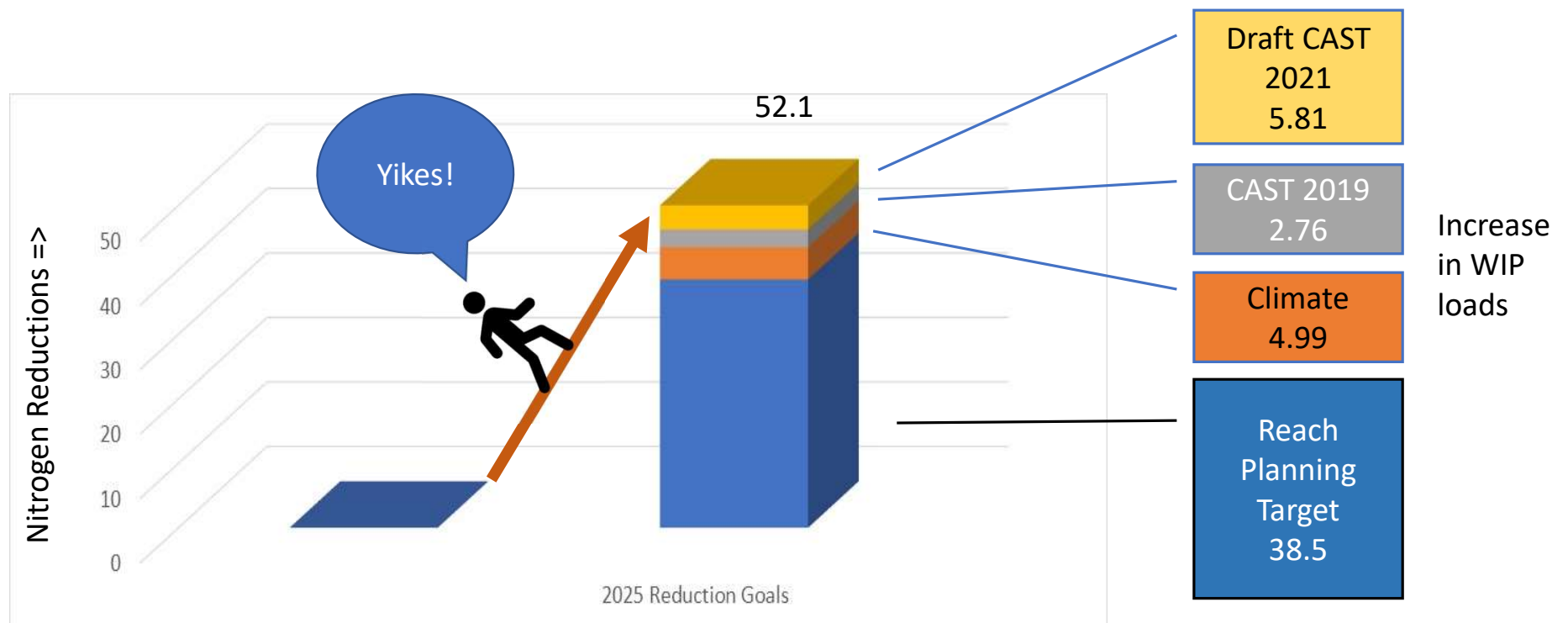
Original Phase 3 level of effort



...Plus Climate Change Effects

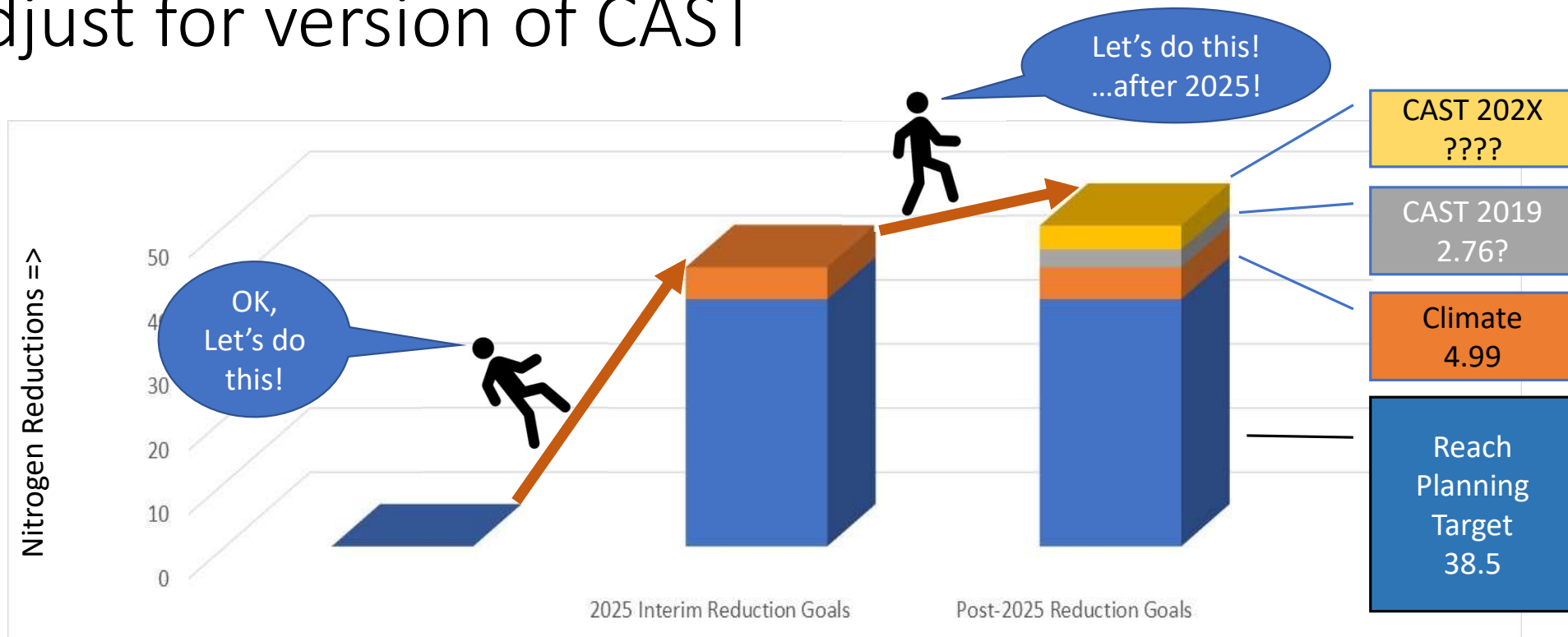


New versions of CAST raised the expected reduction effort even higher



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

Waiting on CAST-202X



AAPFCO Data

Association of American
Plant Food Control
Officials (AAPFCO)

Conversations between CBP and AAPFCO revealed that the Partnership-approved methods for processing AAPFCO fertilizer data needed to be updated



Methods Updates

Applies to Urban and Agricultural Data Processing

1) There are no unknown uses, only "Farm" and "Nonfarm"

2) Fertilizer records that include the letter "E" are equal to zero

3) 1997 data were imported incorrectly, and these data are no longer outliers

USW: Here's What We Learned

NAQWA took us down the wrong road




After further investigation, we learned:

NAWQA data, although sourced from AAPFCO data, are substantially different

Data processing methods are correct

Fertilizer sales data from AAPFCO needed to be updated



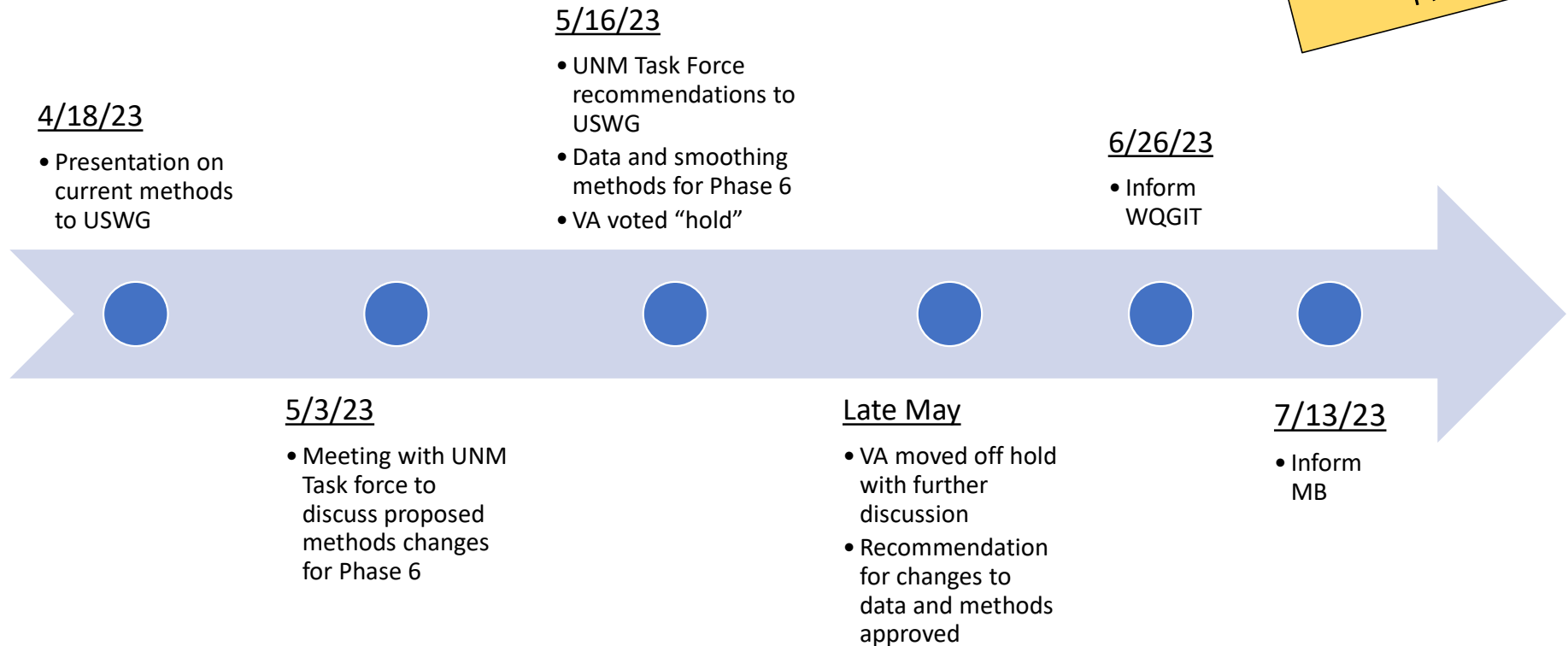
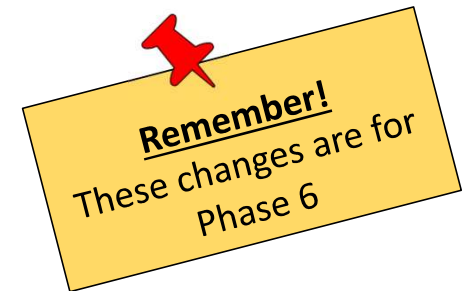
Big Issue: NAWQA data are very different from raw AAPFCO data

USW = Urban Stormwater Workgroup

AAPFCO = American Association of Plant Food Control Officials

NAWQA = National Water-Quality Assessment

Urban Fertilizer: Where We Are



USWG = Urban Stormwater Workgroup

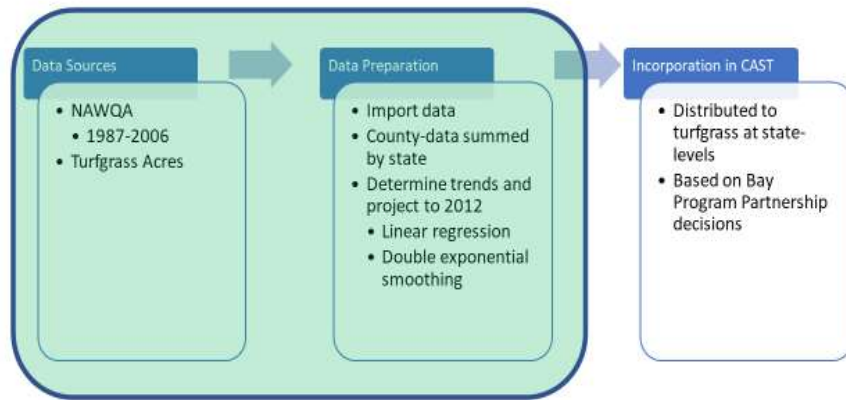
UNM = Urban Nutrient Management

WQGIT = Water Quality Goal Implementation Team

MB = Management Board

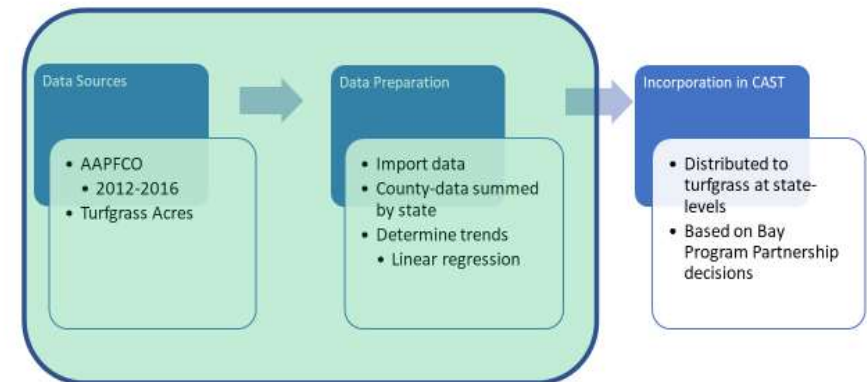
Previous Method For Turfgrass Application Rates

1) NAWQA Data Processing



National Water-Quality Assessment = U.S. Geological Survey (USGS) report with estimated county-level farm and non-farm nitrogen and phosphorus input from commercial fertilizer sales for 1987 – 2006. Based on American Association of Plant Food Control Officials (AAPFCO) data.

2) AAPFCO Data Processing

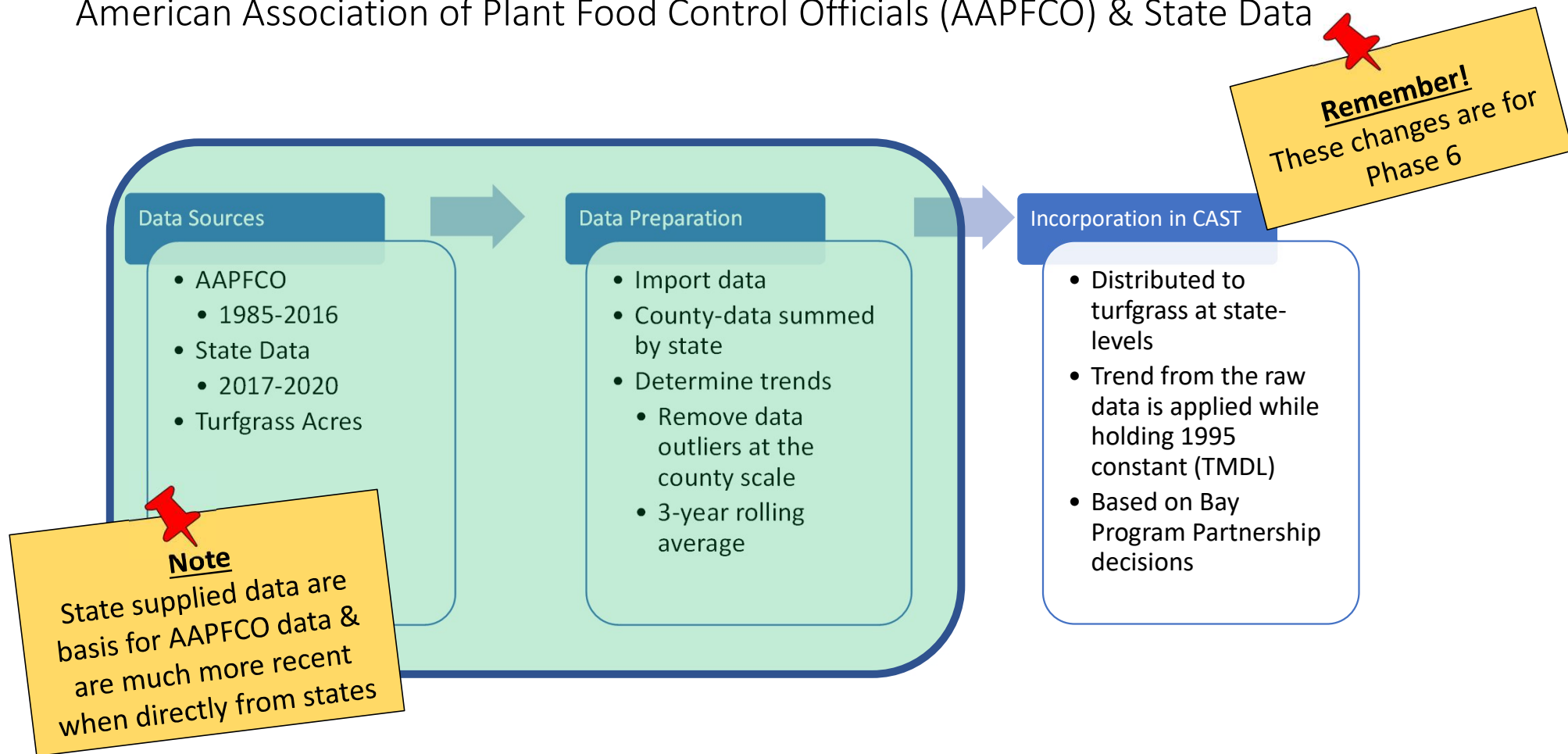


AAPFCO = American Association of Plant Food Control Officials commercial fertilizer sales data

Remember!
This method is from
Phase 6

New Method for Determining Turfgrass Application Rates

American Association of Plant Food Control Officials (AAPFCO) & State Data



Urban Stormwater Workgroup Decisions

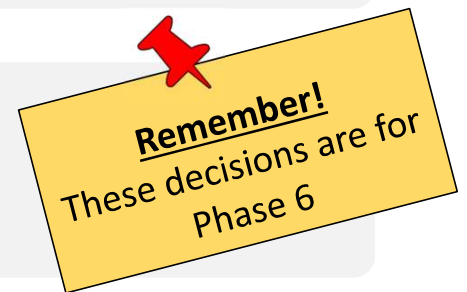


Use AAPFCO data for the entire period of record

Use instead of NAWQA data



County-scale smoothing method



Incorporate data from states/jurisdictions, if possible

If new information is not available, lock in last available year of data to at most, 2-years prior to the present date

Takes care of latency with AAPFCO data

What did the Fertilizer Expert Group do?

Solution	Activity	Completion	Comments	Total Percent Finished
Phase 6 short term (FEG)	Meet individually with jurisdictions to discuss data	X	Completed: Dec 2022	90
	Discuss initial findings with CBP advisory group	X	Completed: Feb 28th 2023	
	Hold first full group meeting of FEG	X	Completed: March 1st 2023	
	Complete data review of preprocessing methods and ag inputs	X	Completed: April 1st 2023	
	MB informal briefing	X	Happens monthly	
	USDA presentation to AgWG and WQGIT	X	Completed: AgWG- April 2023; WQGIT- May 2023	
	Analyze compatability of new data sources	X	Completed: June 5th 2023	
	Summarize investigation results and brief PSC		In Progress	
Phase 7 long term (AMT)	Participate in Phase 6 solutions	X	Completed: June 1st, 2023	
	Create living workplan document outlining order of tasks	X	Completed: March 13th 2023	
	Make decisions for Phase 7 model	~~~	In progress through 2025	

What potential sources were investigated?

States

- State tonnage reports
- Alternatives

USDA

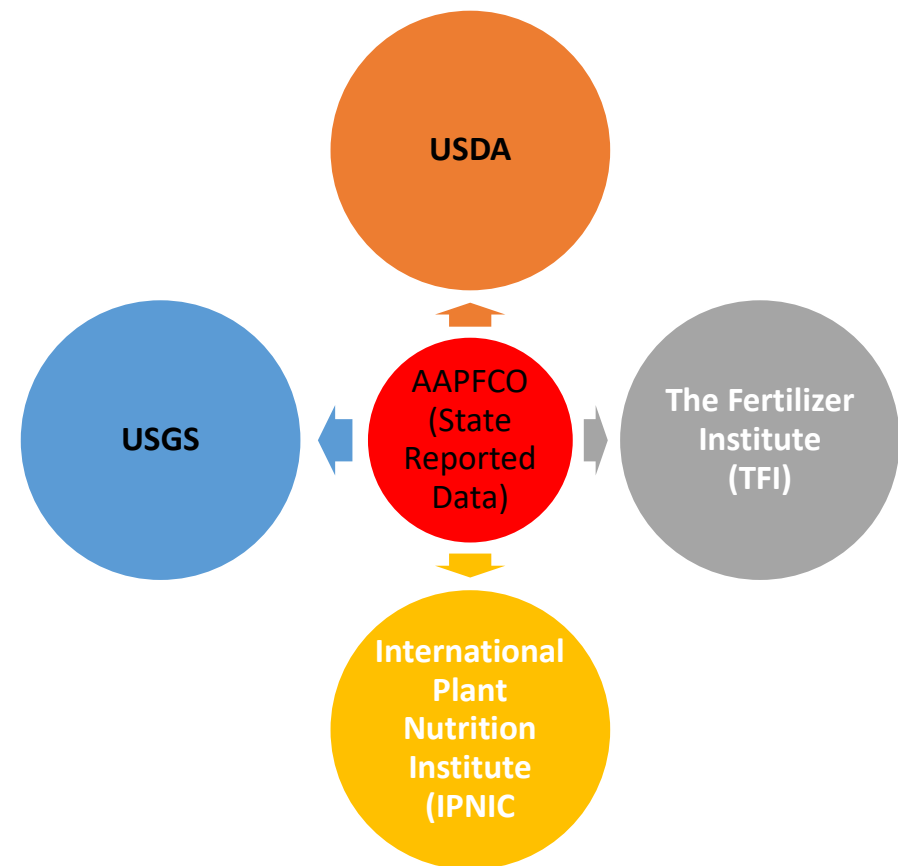
- Agriculture Research Management Survey (ARMS I)
- Agrochemical application surveys (ARMS II)
- National Resource Inventory - NRCS product
- Conservation Effects Assessment Project

Industry

- The Fertilizer Institute (TFI)
- International Plant Nutrition Institute Canada (IPNI)
- The Mill

What did the FEG find?

- Multiple lines of evidence leading back to AAPFCO.
- Recommendations discussions at the WQGIT.



Summary:

For Phase 6 and Phase 7:

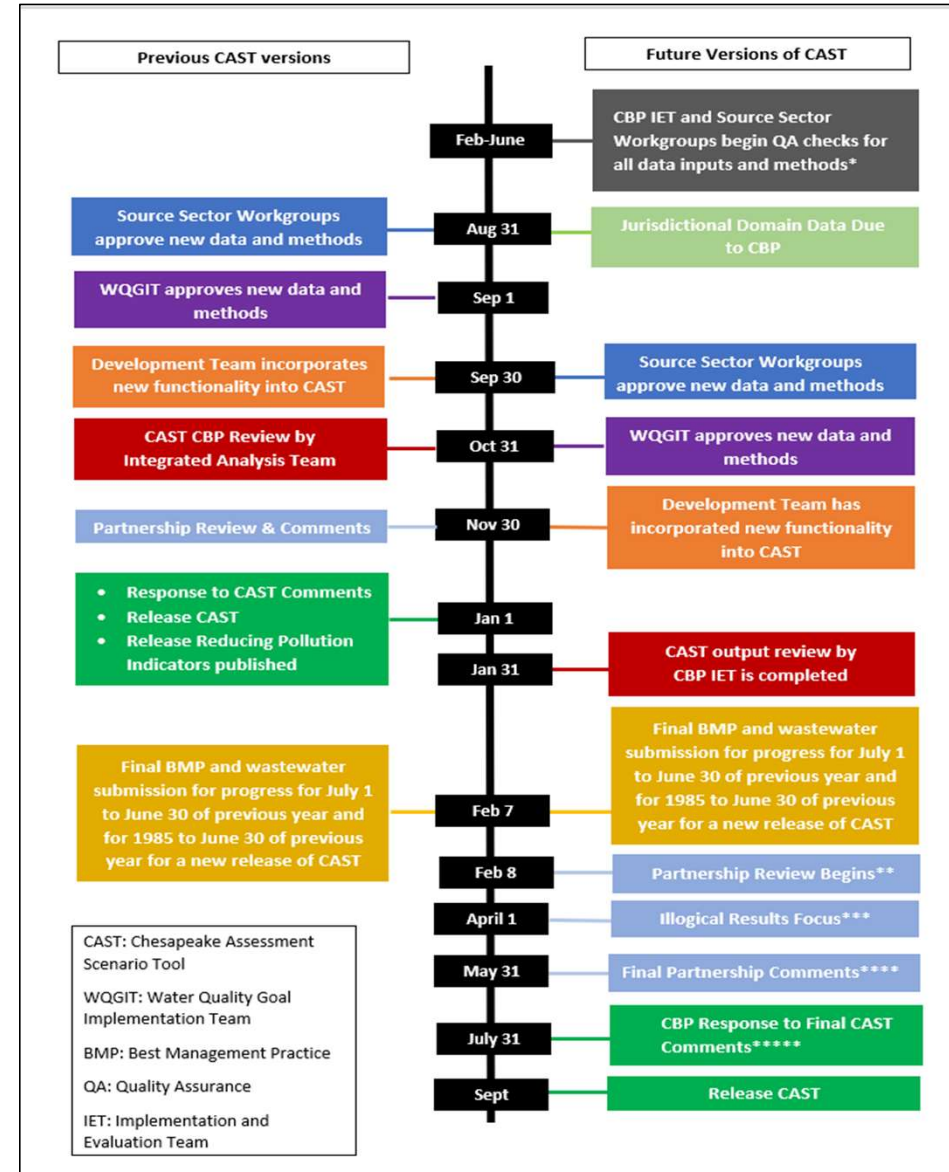
- Recommendations being brought to WQGIT for decision at their 7/24/23 meeting

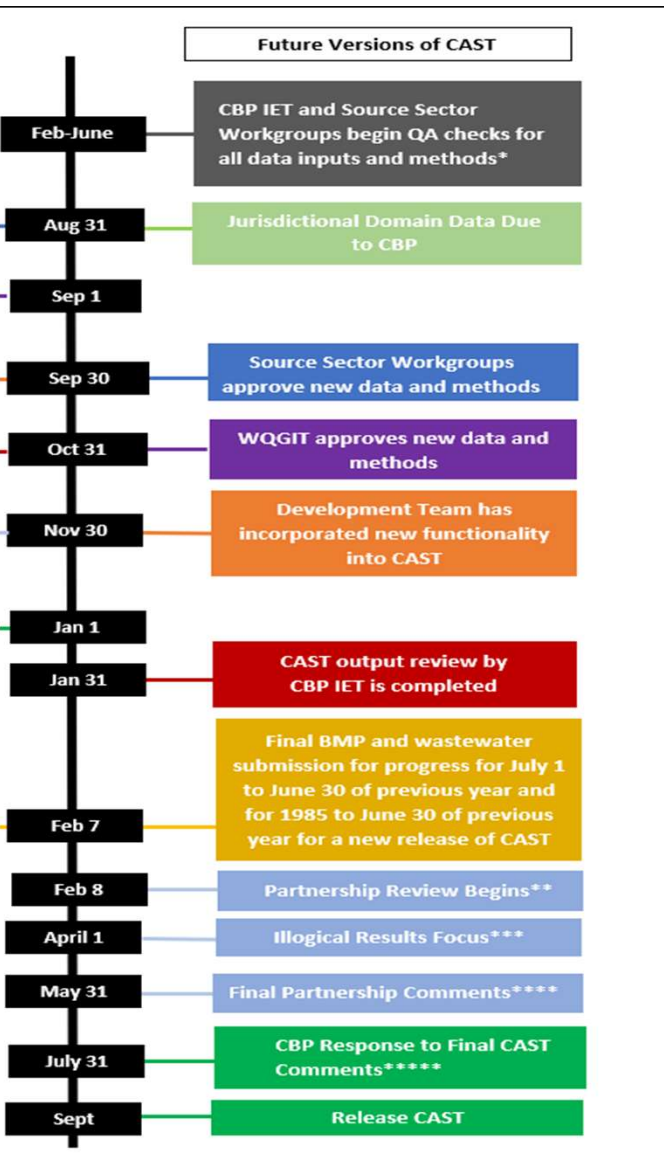
PSC Decision 3: **WTWG Recommendations to the WQGIT**

- **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 in June, expect a decision at the 7/24 WQGIT meeting

Revised **Phase 6 CAST Updates Review Process**- outlines a comprehensive quality assurance procedure and corresponding timeline for CAST data updates

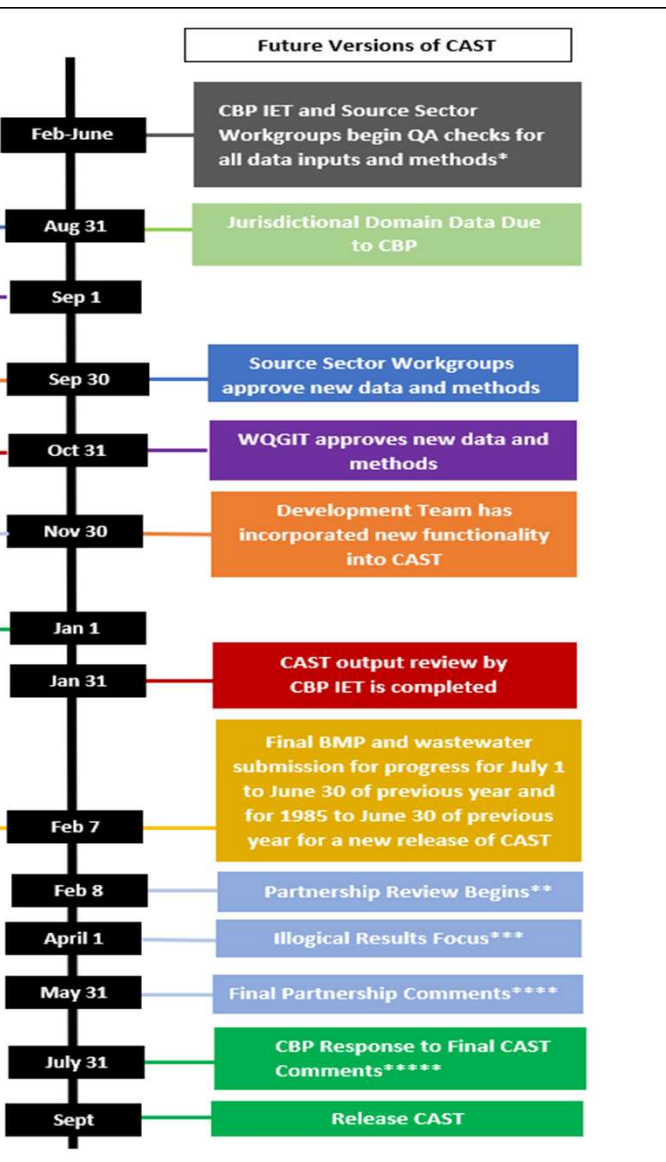
- Emphasizes and incorporates the initial data, methods, processes and documentation review into the timeline- jurisdictions, WG's & IET
- Lengthens IET and jurisdictional review periods
- Adjusts timing of the jurisdictional review
- Emphasizes IET support, communication and prioritization during jurisdictional review
- Addresses perceived anomalies in a timely, scientifically valid and consistent fashion
- Suggests recourse for unresolved issues





WTWG Recommendations: Quality assurance CAST inputs

- **Model update review process begins with a quality assurance review of data input sources, data preparation methods, model processing methods, and corresponding documentation**
- Process is guided by relevant source sector WG coordinators with Implementation and Evaluation Team support
 - Review of the processing of data that informs the load
 - Review of methods, processes and documentation
 - As new data becomes available a data specific quality assurance review begins
 - Workgroup coordinators initiate this process with support from the CBP IET to maximize the review period prior to the approval of new data and methods.



WTWG Recommendations: Quality Assurance Outputs and Anomalies

- **Timely jurisdictional review supported by CBP IET staff:**
 - Prioritize ongoing communication and technical support for analyses
 - **Anomalies:**
 - Within appropriate source sector workgroup- contender illustrates why data results are illogical with scientific support that the result is not representative of real change that has occurred from the previous model version
 - Workgroup confirms illogical results
 - Workgroup, supported by IET seeks resolution
- Path for unresolved anomalies:**
- Partnership confirms illogical results and lack of acceptable resolution
 - Continue to investigate options for addressing the anomaly
 - Option to revert to previous model data and methods related to the anomaly
 - CAST released

Summary PSC Decision 3 WTWG Recommendations to WQGIT:

- To address the charge made in August 2022 by the PSC, the WTWG has recommended 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*

*Source: TMDL Watershed Agreement and Governance Documents

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