Chesapeake Bay Program
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Model Update Frequency: CWGT Request of the WTWG

November 5th, 2026

Watershed Technical Workgroup

Background

- At the August 24th CWGT meeting, t***he CWGT agreed to direct the WTWG to develop options for "when to update CAST" and to present those options to the CWGT at the November CWGT meeting.***

- Today: Revisit with the WTWG initial discussion surrounding Model update frequency and produce the final options.

ASSIGNMENT FOR WATERSHED TECHNICAL WORKGROUP

Develop options for when to perform data updates to CAST between 2030-2040

- Provide 3 options with rationale for each option and present those options at the November CWGT
- Utilize information that has been discussed widely with the Partnership
- Evaluate success/failure of previous attempts to standardize the update process

***Slide initially from CWGT August 24th Presentation**

Definition of a CAST Update

A CAST update is the incorporation of changes to data and BMPs existing within CAST between the established phases of the CBP suite of modeling tools. Formerly, it was determined (PSC 2018) that these CAST model updates would be every two years. All changes incorporated will be agreed to by the CWGT and its workgroups. The changes are limited in scope so that they do not: 1) impact modeled runoff during the 2004-2006 critical period; or 2) alter the base conditions (land uses, septics, animals, etc.) from 1998-2007. Preservation of these estimates enables a consistent assessment of how new management actions and changes in base conditions have influenced loads over time.

**Draft definition for discussion purposes, updated with new hydrologic/critical periods as decided at September 28-29 CWGT meeting.*

Model Update Data Set Specifications

1. **High-Res Land Use – Currently created/curated every 4-5 years. (updates 2029/2034)**
2. **Ag Census – Created every 5 years by USDA (updates 2022, 2027, 2032) with data available within 2 years following creation**
3. **New BMPs – when can they be incorporated?**
    a. **Updated BMP expert panel protocol**
    b. **Ability for new BMPs without history to be incorporated**
    c. **When/how new BMPs with history are added**
4. **State supplied fertilizer- supplied in variable years depending on partner**
5. Possibility of industry data to supplement existing data sets
6. Anything else?

	MS Develop. (up to 18 months)	Management Strategy (6 yrs)			Management Strategy (6 yrs)				Agreement Revision					
		Program Evaluation & Strategy Updates												
	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Phase 7															
Planning Targets															
WIPS															
Transition to P7															
Mile-stones															
High Res Land use															
Ag Census															
New BMPs															
Model Updates												PHASE	PHASE	PHASE	PHASE

Proposed Options- For Group Discussion

Update CAST in 2035

- Make CAST update in 2035 as it is half way between 2030-2040 and would address multiple considerations/ incorporate available data sets shortly after they become available for processing.
  - Consideration: Phrase the update to CAST that occurs between 2030-2040 to be contingent upon the availability of the specified data sets, as opposed to a specific year.

Update CAST in 2032 and 2037

- Make CAST updates in both 2032 and 2037 to more frequently incorporate available land use data sets.

Update CAST in 2033 and 2037

- Make CAST updates in both 2033 and 2037 to more frequently incorporate available land use data sets but allow for more time for data refinement opportunities and messaging in 2033.

Others?

Note on Proposed Options

- **Additional updates require major time commitments from both the Partnership and especially the CBPO Modeling Team.**

- The years provided in the proposals are when the model update period would begin, with the exception of necessary ramp up activities.

- The PSC approved timeline for a CAST model review and update period is ~1.5 years. (See historical background slides below)

Decision

- Does the WTWG support providing the following options and considerations to the Clean Water Goal Team for 2030-2040 model update frequency?

- **Update CAST in 2035**
  - **2035**
    - Incorporates 2034 Land Use (based on ~2029/30 imagery) and 2032 Ag Census data
    - BMP and State fertilizer data set updates as available

- **Update CAST in 2032 and 2037**
  - **2032**
    - Incorporates 2029 Land Use (based on 2025/26 imagery) and 2027 Ag Census data
    - BMP and State fertilizer data set updates as available
  - **2037**
    - Incorporates 2034 Land Use (based on ~2029/30 imagery) and 2032 Ag Census data
    - BMP and State fertilizer data set updates as available

- **Update CAST in 2032 and 2037**
  - **2033**
    - Incorporates 2029 Land Use (based on 2025/26 imagery) and 2027 Ag Census data
    - BMP and State fertilizer data set updates as available
    - Additional time for messaging and data refinement(s) as needed
  - **2037**
    - Incorporates 2034 Land Use (based on ~2029/30 imagery) and 2032 Ag Census data
    - BMP and State fertilizer data set updates as available

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Historical Background

Sources

https://www.chesapeakebay.net/files/documents/PSC-Decisions-with-Details_8-4-23.pdf

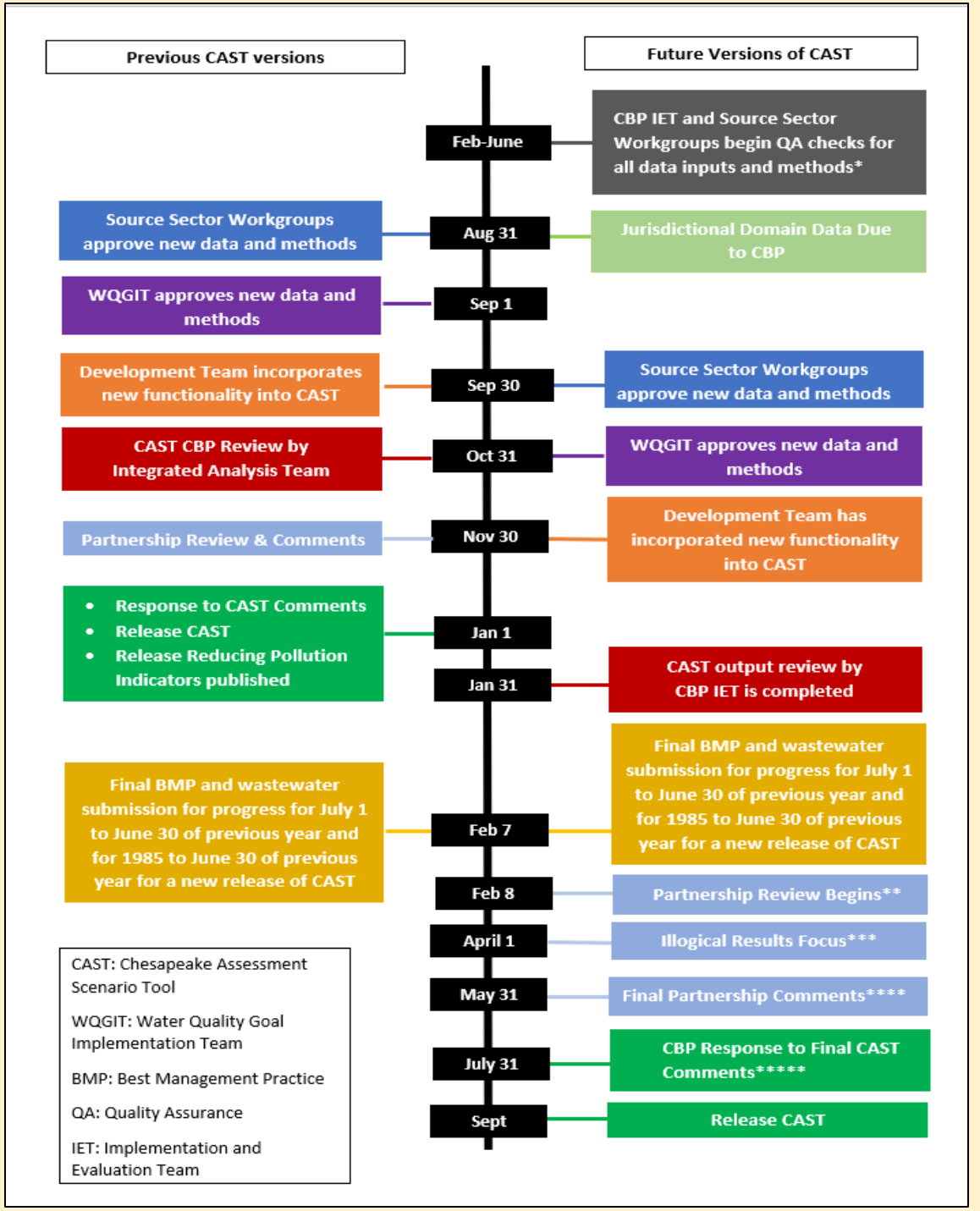
https://www.chesapeakebay.net/files/documents/PSC-Decision-3-Charge-_WQGIT_7_24.pdf

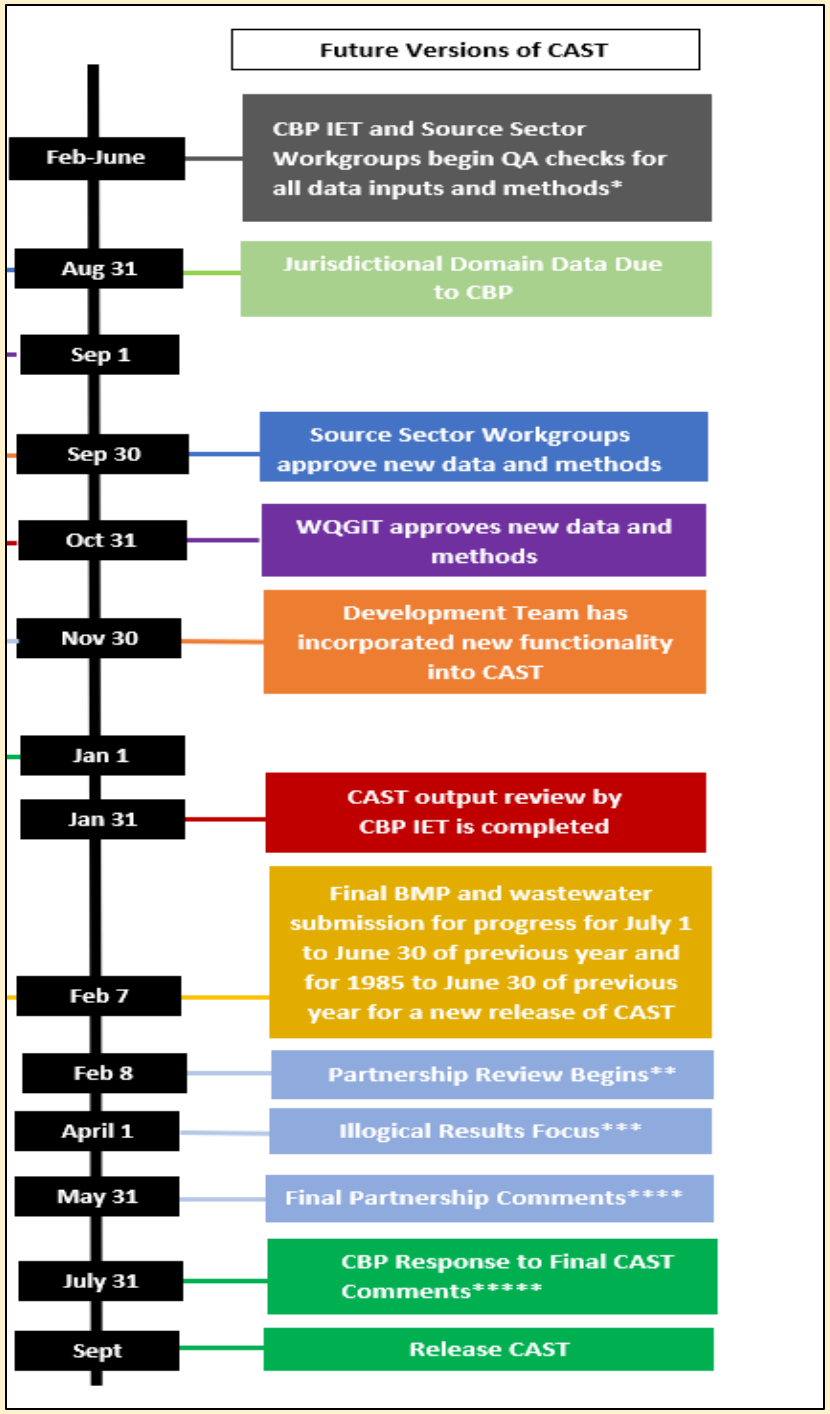
PSC Decision 3: WTWG Recommendations to the WQGIT

- **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 7/2024 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- partnership, WG's & IET
- Lengthens IET and partnership review periods
- Adjusts timing of the partnership review
- Emphasizes IET support, communication and prioritization during partnership review
- Addresses perceived anomalies in a timely, scientifically valid and consistent fashion
- Suggests recourse for unresolved issues

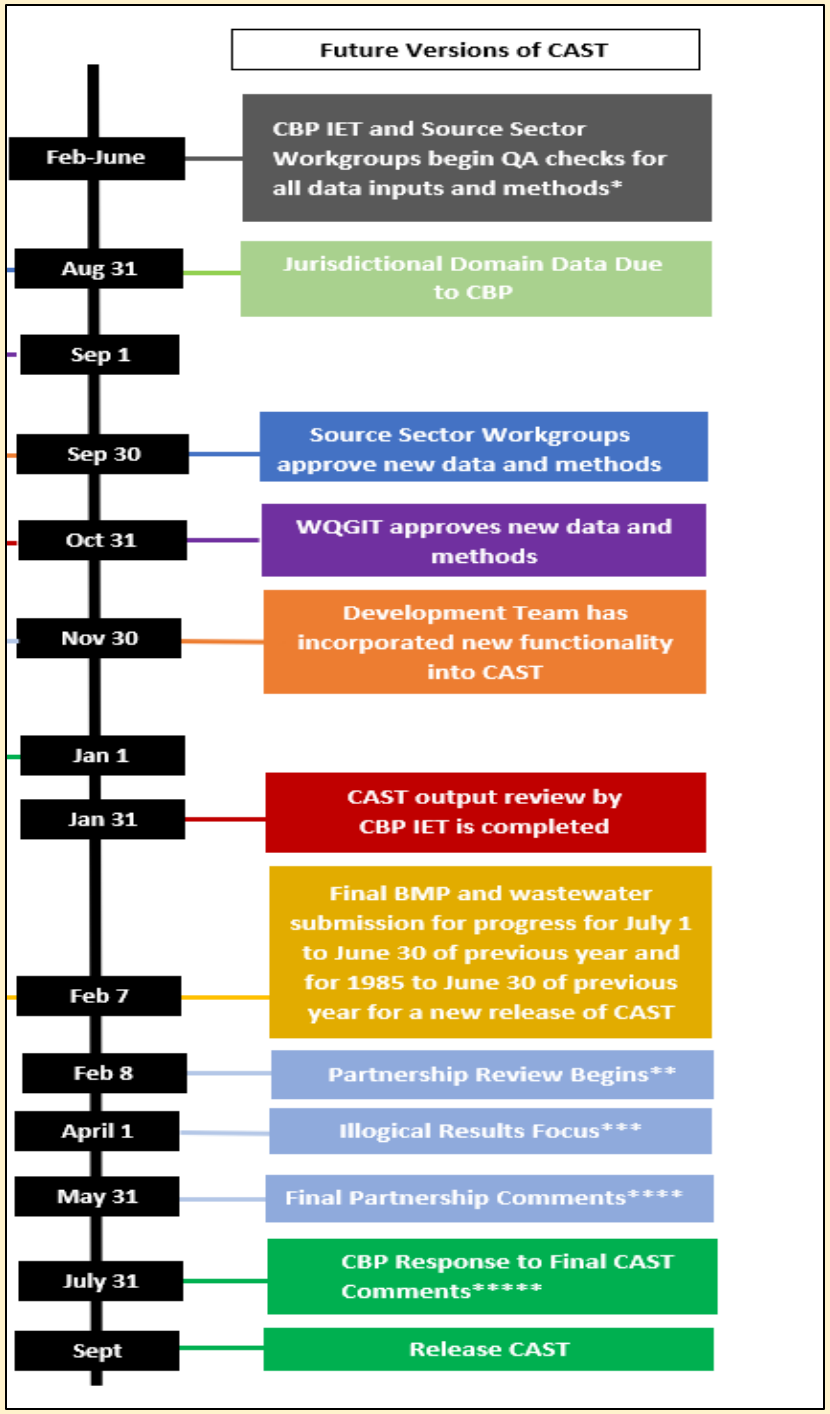




WTWG Recommendations: Quality assurance CAST inputs

- **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 CBP Implementation and Evaluation Team support (IET)

  - 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 Partnership 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: WQGIT

- 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