



Chesapeake Bay Program
Science. Restoration. Partnership.

October 1st, 2026

Model Update Frequency: CWGT Request of the WTWG

Watershed Technical Workgroup

Background

- At the August 24th CWGT meeting, ***the 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 three 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 1993-1995 critical period; or 2) alter the base conditions (land uses, septics, animals, etc.) from 1984 through 2024. 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*

Considerations

- Transition to P7 – 2030 – 2030 annual progress utilizing P7 suite of tools.
- Milestones – currently a 2-year cycle unless we change it, also no longer tied to input decks for CAST
- High-Res Land Use – Currently created/curated every 4-5 years. (updates 2029/2034)
- Ag Census – Created every 5 years by USDA (updates 2022, 2027, 2032)
- Fertilizer data
- Possibility of industry data to supplement existing data sets
- New BMPs – when can they be incorporated?
 - Updated BMP expert panel protocol
 - Ability for new BMPs without history to be incorporated
 - When/how new BMPs with history are added

[illegible]

Proposed Options- For Group Discussion

Update CAST every two years

- Maintain the status quo and continue to update CAST every two years.

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

Update CAST as specific data sets become available

- Make an update to CAST between 2030-2040 that is contingent upon the availability of the specified data sets, as opposed to a specific year
- For example, the year when the Ag Census, High Res Land Use, and relevant annual fertilizer data sets are available. 2036?

Others?



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Historical Background

Sources

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

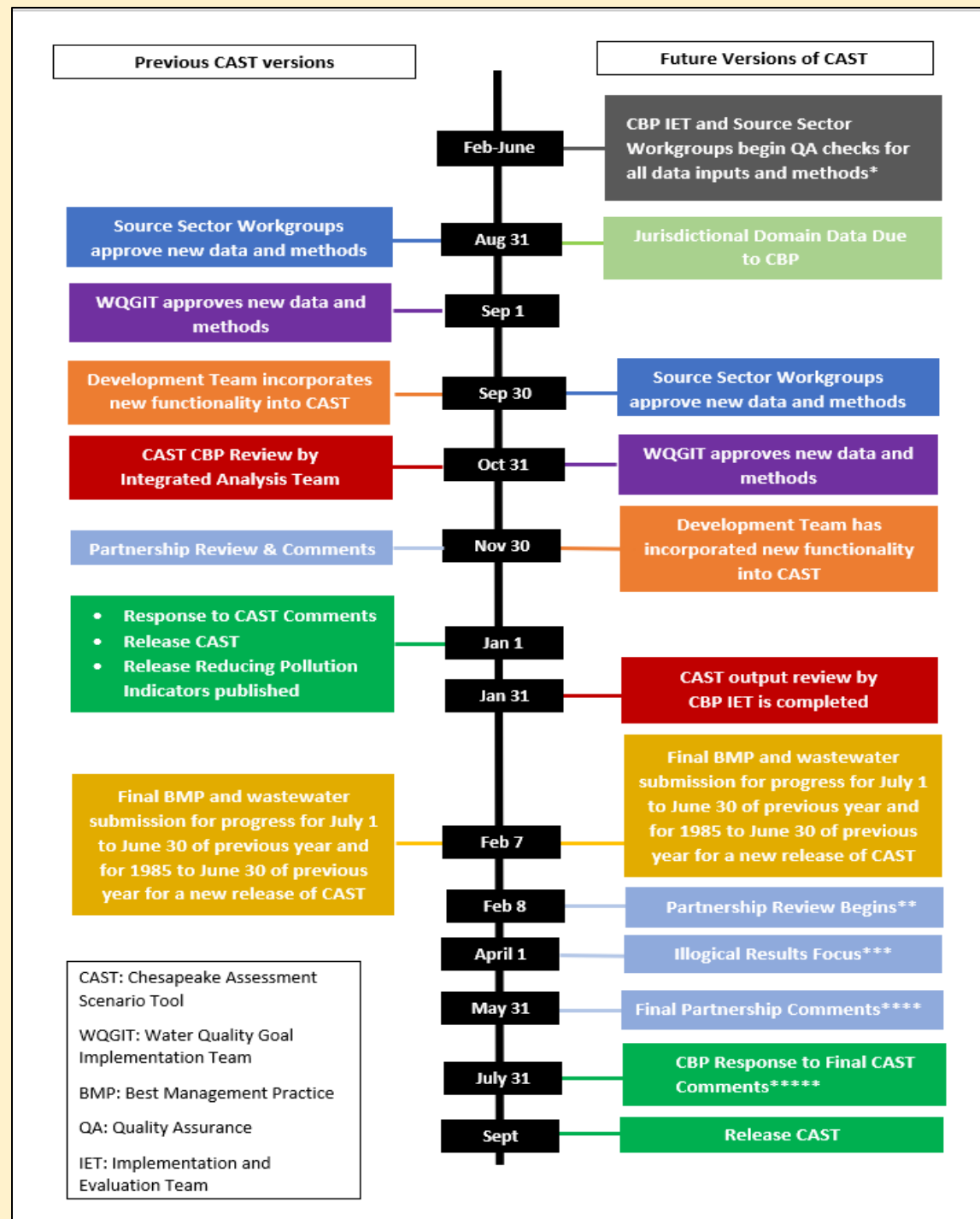
https://www.chesapeakebay.net/files/documents/PSC-Decision-3-Charge-WQGIT_7_24.pdf

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

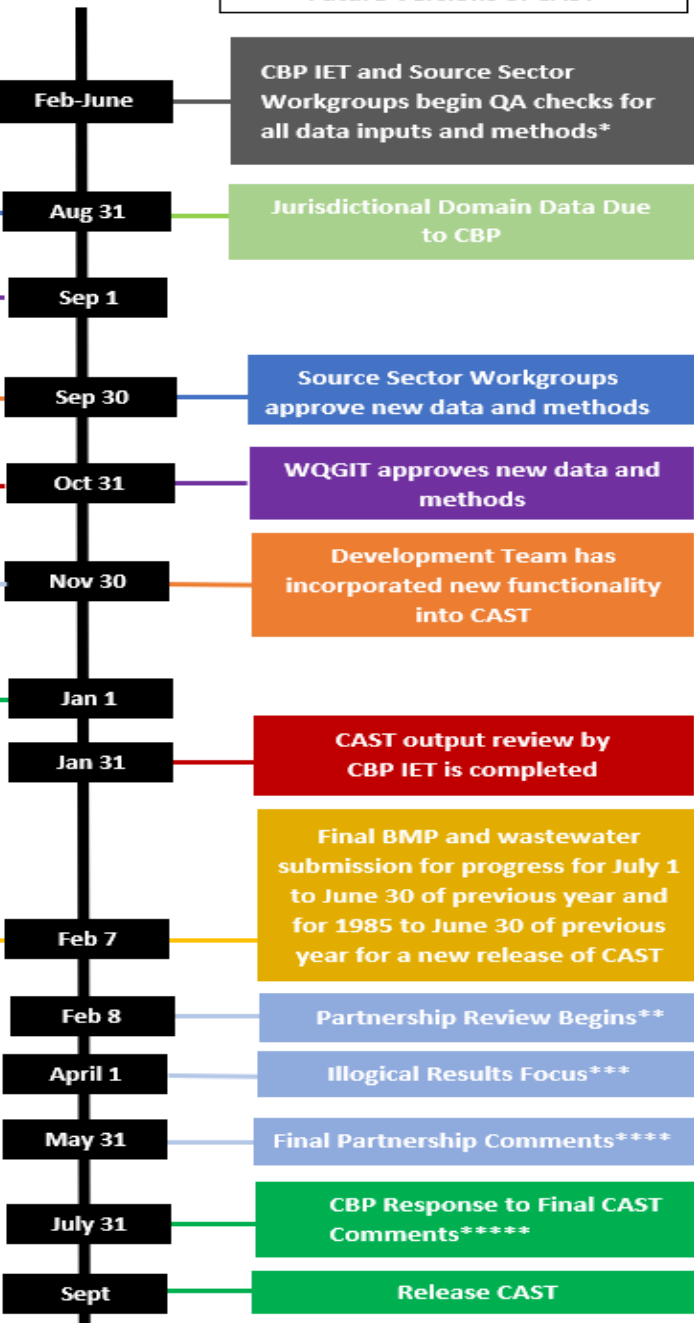
- **August 2022 PSC Decision 3:** The partnership will **update the process for incorporating data into CAST to include additional safeguards to prevent data analysis errors and to assess reasonability of modeling results after CBP protocols are applied.**
- **WQGIT charged WTWG with developing recommendations 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



Future Versions of CAST



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.

Future Versions of CAST

Feb-June
CBP IET and Source Sector Workgroups begin QA checks for all data inputs and methods*

Aug 31
Jurisdictional Domain Data Due to CBP

Sep 1
Sep 30
Source Sector Workgroups approve new data and methods

Oct 31
WQGIT approves new data and methods

Nov 30
Development Team has incorporated new functionality into CAST

Jan 1
Jan 31
CAST output review by CBP IET is completed

Feb 7
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

Feb 8
Partnership Review Begins**

April 1
Illogical Results Focus***

May 31
Final Partnership Comments****

July 31
CBP Response to Final CAST Comments*****

Sept
Release CAST

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*