

STAC review of Ph7 models and analytical tools

CBP Modeling Workgroup Quarterly Meeting, July 2026

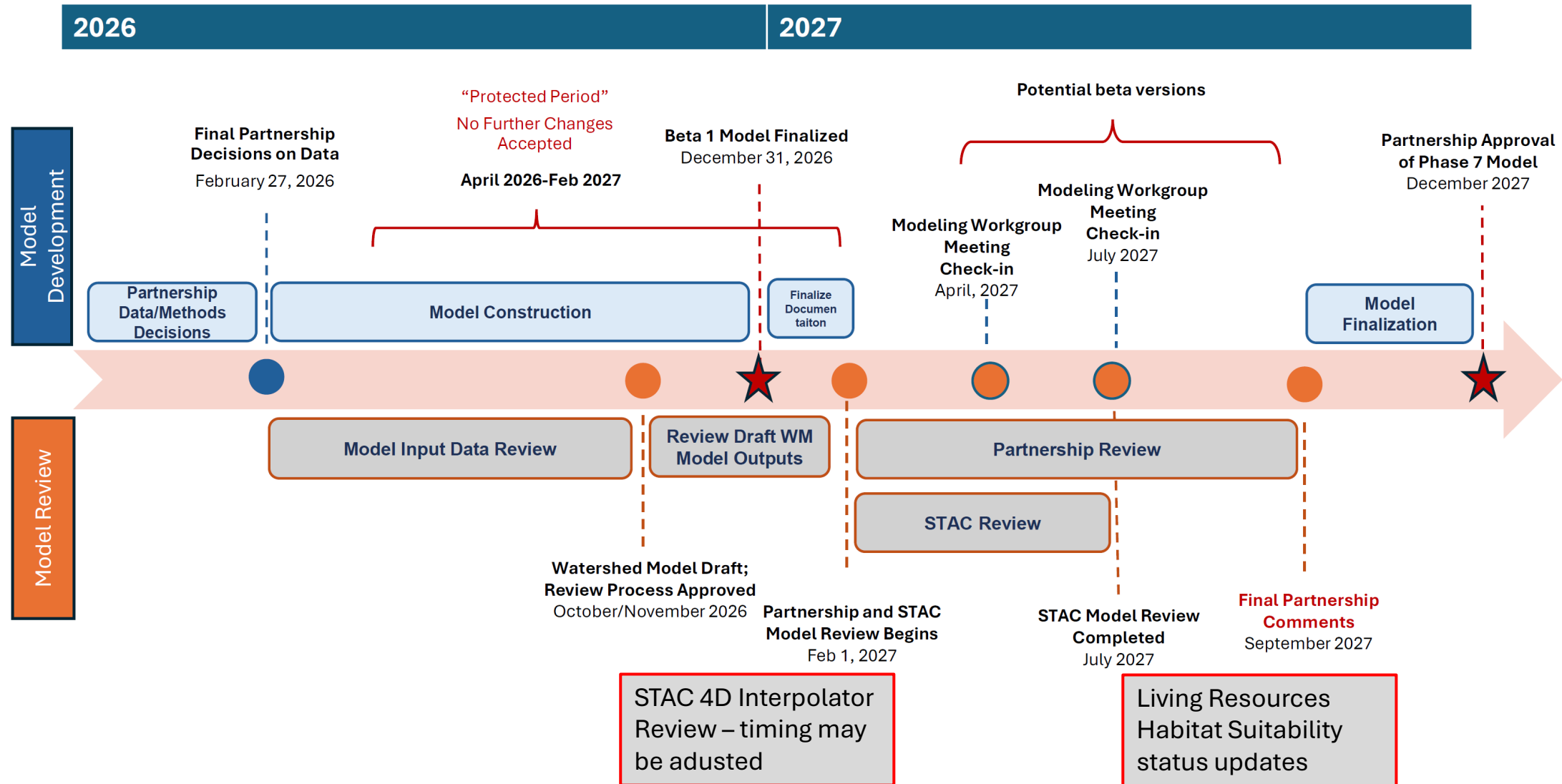
Larry Sanford (Chair, STAC reviews planning committee)

- Summary of review requests status
- Timing and planning of reviews
- Scope of reviews
- Charges and suggested questions
- Path forward

- As of early June 2026, STAC had received 4 requests for new CBP models and/or tool reviews
 - The new 4D Interpolator tool
 - The CBP has requested that STAC review begin in Oct 2026 and be completed by Mar 2027.
 - The Phase 7 Watershed and Estuary models
 - The CBP has requested that STAC review begin in Feb 2027 and be completed by July 2027.
 - A new Living Resources Habitat Suitability (LRHS) model
- At its annual retreat in mid-June, STAC discussed these requests and subsequently drafted and delivered a response letter to the CBP
 - STAC accepted the requests for the Phase 7 reviews and the 4D Interpolator review, with exact timing and formality contingent upon availability of support and review logistics
 - Both STAC and the model developers felt that STAC review of the LRHS model was premature, but that presentation of the LRHS status to the CBP community in late 2027 should be encouraged

Timing of the model suite reviews

from a presentation by Bo Williams 2/23/26



The 4D Interpolator

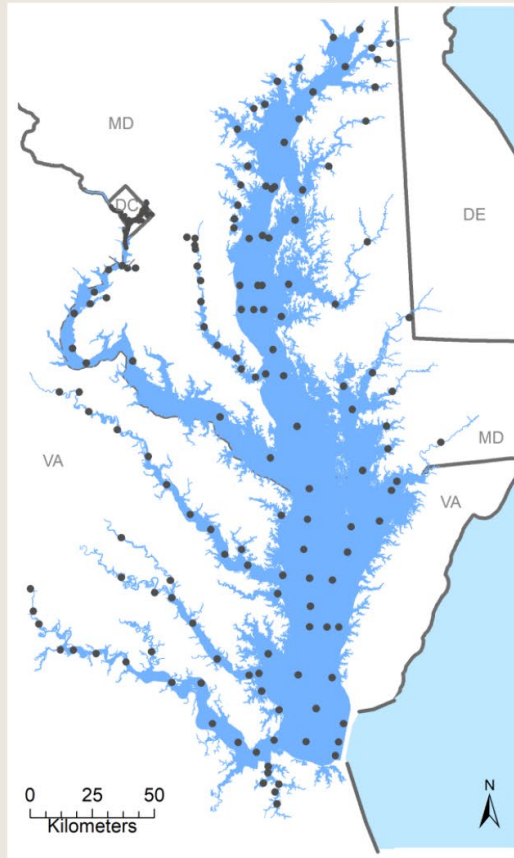
A new 4D (space and time) Interpolator is almost finalized and the CBPO has requested that STAC provide a technical review, which “will help inform decisions for multiple goals in the *Watershed Agreement* and address an assessment need that has existed for over 20 years across the Chesapeake Bay. The approach to be reviewed consists of the methods developed and assumptions made in the process to ensure the scientific integrity of the new tool as it stands.”

Why do we need a new method?

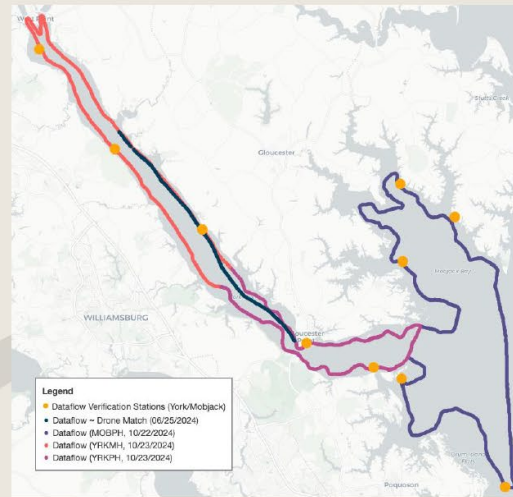
- The current interpolator (developed 20+ years ago) was not designed to interpolate through time or work effectively with unstructured data having mixed time scales and sampling patterns and sourced from multiple monitoring programs.
- There is more high frequency data now to fill in temporal gaps.
- A new interpolation will use all the data to fill in the gaps between data based on observed patterns to help accurately assess high frequency DO criteria.
 - Chesapeake Bay Program interest in 4D Interpolation started because water quality criteria for the 303d listing require assessments at finer space and time scales than current data can support.

Dissolved Oxygen data sets

Bi-weekly long-term sampling (DOEE, MDDNR, VADEQ, CBP)

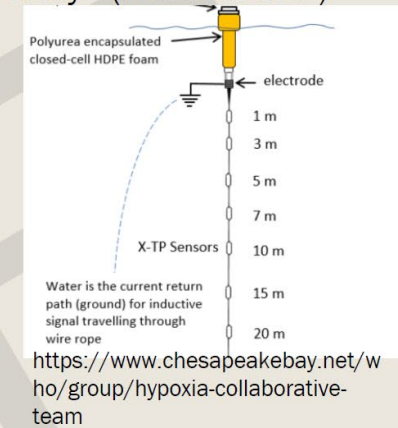


Dataflow (MDDNR and VECOS)

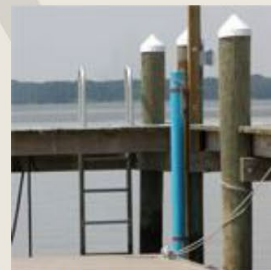


From <http://vecos.vims.edu/>

New continuous vertical arrays (NOAA & CBP)



Shallow water continuous monitoring (MDDNR and VECOS)



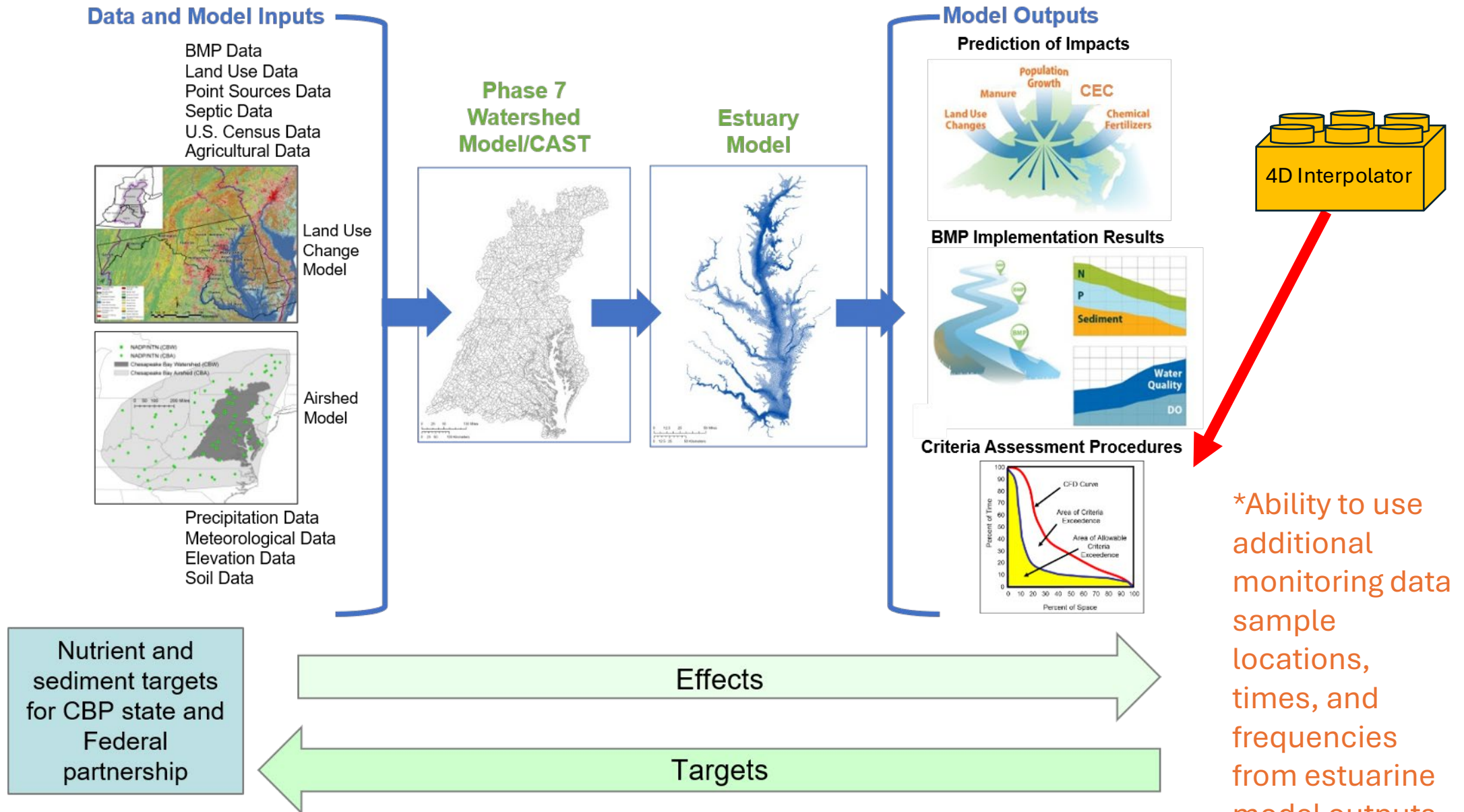
From <http://vecos.vims.edu/>



From <https://eyesonthebay.dnr.maryland.gov/>

And more Citizen science, riverkeepers, research data sets, and future data sets

Phase 7 Suite of Models with 4D Interpolator*



Basis for Review Planning

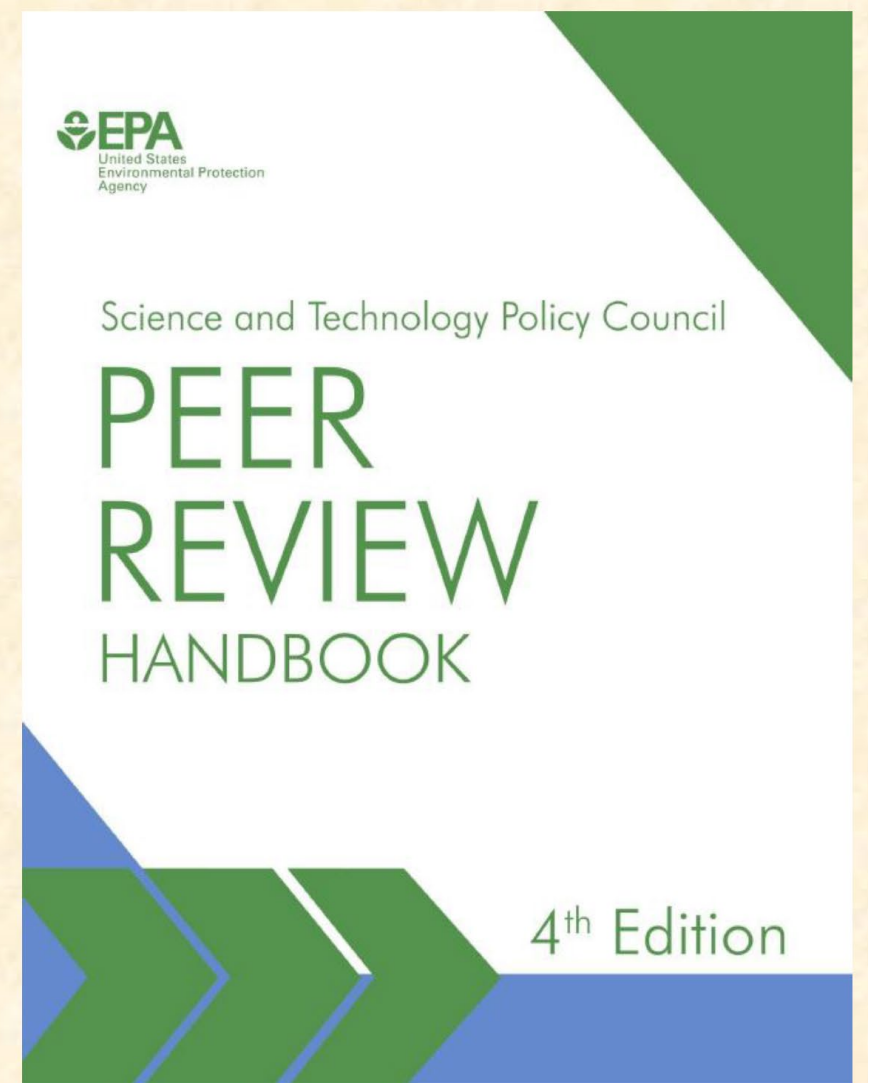
From a presentation by Lew Linker 7/8/25

EPA's Science Advisory Board (SAB) has provided recommendations for model peer review as part of its guidance on using and evaluating models for environmental decision making.

The recommendations are found in various EPA documents, such as the Peer Review Handbook and Guidance on Development, Evaluation, and Application of Environmental Models. The SAB regularly updates its recommendations.

U.S. Environmental Protection Agency
Peer Review Handbook 4th Edition October 2015

https://www.epa.gov/sites/default/files/2020-08/documents/epa_peer_review_handbook_4th_edition.pdf



Important Steps in planning a formal PR process include:

1. Deciding whether internal or external review is needed.
2. Starting documentation process.
3. Drafting the charge.
4. Ensuring adequate resources.
5. Setting timelines.
6. Identifying independent expertise while avoiding potential COI concerns.
7. Considering Public Input.
8. Preparing Materials for review.
9. THEN, finally carrying out the review, receiving and responding to the report, and disseminating the result.

Figure 1, the diagram of the peer review process, illustrates the Agency's overall peer review process for scientific or technical (including economic and social science) work products. The Agency process emphasizes early categorization of the work product—preferably at the conceptual stage—into one of three categories: Influential Scientific Information (ISI); Highly Influential Scientific Assessment (HISA), which is a subset of ISI; or other.

The ISI and HISA categories have been identified and defined by the Office of Management and Budget (OMB) in its *Final Information Quality Bulletin for Peer Review* (OMB Peer Review Bulletin) (Appendix B). Management approval and documentation of key decisions throughout the peer review process are emphasized. The EPA also demonstrates its commitment to transparency in the peer review process by providing opportunities for public participation.

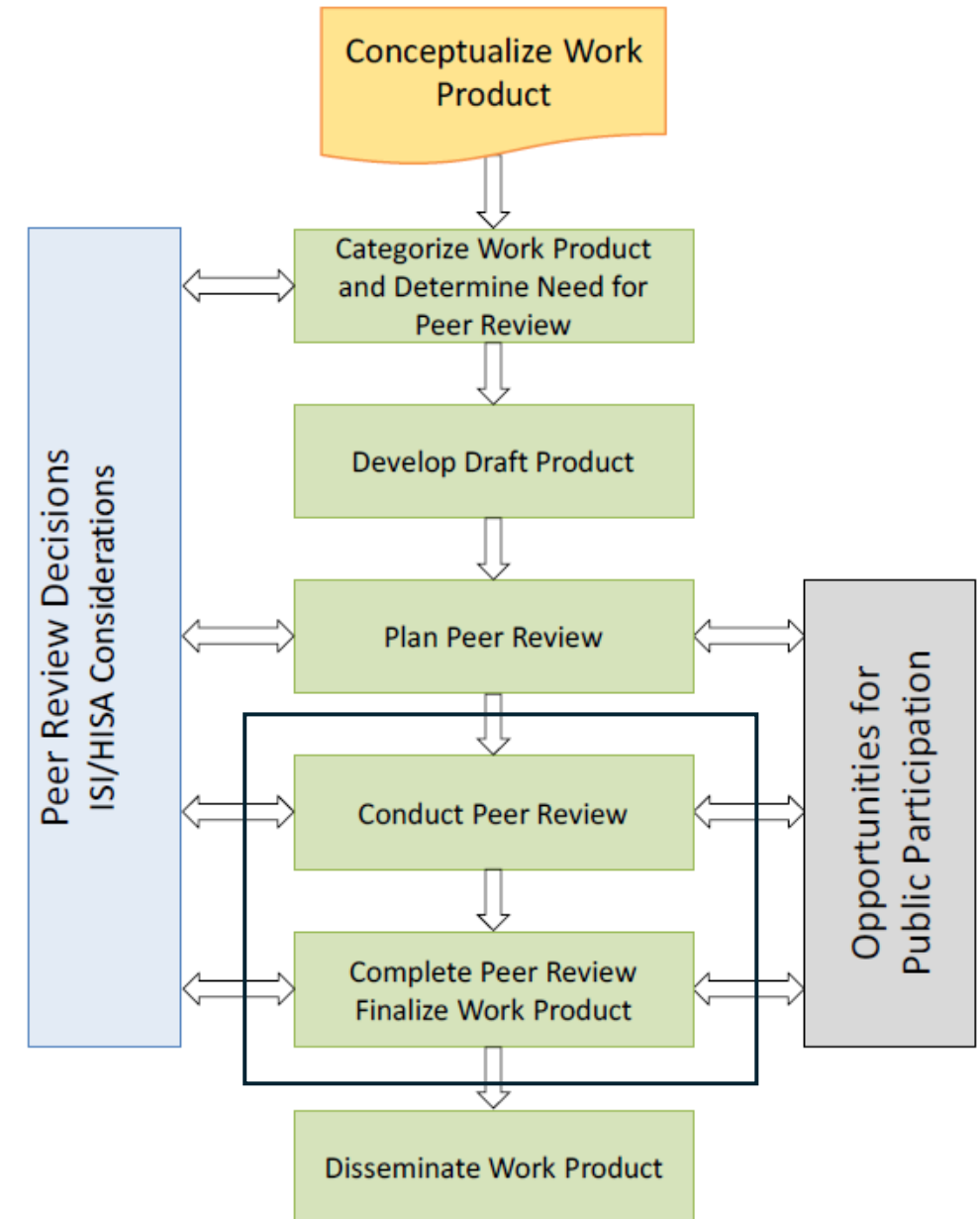


Figure 1. The Peer Review Process

Additional considerations from Lew's July 2025 Presentation

Consideration of application and limitations: The review should assess the model's application niche and the conditions under which its use is scientifically defensible, thereby helping users understand its limitations.

Key review elements: Critical elements of model peer review could include the modeling purpose, theoretical basis, parameter evaluation, data quality assumptions, performance measures, documentation, and retrospective analysis (backcast scenarios).

Planning integration: Peer review should be integrated into the planning and modeling timeline with adequate schedules and resources.

Options for Phase 7 Reviews

- The formality of each requested STAC review depends on
 - **Regulatory status** – if the model system in question is to be used for setting environmental regulations, it requires a high level of independent peer review with careful attention to avoiding conflict of interest
 - **Resource availability** – rigorous reviews (in keeping with past practice) involve at least 1-2 in-person panel meetings with CBP personnel available to provide context and answer questions. This implies significantly higher travel costs and much more logistical support.
 - **Partner confidence** – the greatest new tool will accomplish little without partner confidence in its validity.
 - **So – Cadillac or Chevy?** And for which reviews?

Additional Considerations - Topics and Complexity

- Watershed Model

- TMDL purposes only?
- New Hydrologic Long Term & Critical Period
- Consideration of additional factors and/or pollutants
- **Characterization of stream habitat suitability**

- Bay Model

- TMDL purposes only?
- New Hydrologic Long Term & Critical Period
- Consideration of additional factors and/or pollutants
- **Characterization of shallow water environments**

- 4D Interpolator

- Refinement and expansion of current criteria assessment protocols
- **Acceptance across partnership**

Current Status of Review Planning

- STAC has accepted the 3 review requests in principle.
 - All reviews will be rigorous, regardless of format. However, review utility and public confidence in models depend to some extent on review format, documentation, partnership response, and outreach.
 - Cadillac reviews will require financial support that is not yet in place (STAC's general funding was cut by more than 50%).
- Current overlap between end of 4D review and beginning of Ph7 reviews may be problematic.
- STAC and Partnership reviews of Phase 7 WSM and WQSTM will run concurrently, but with different objectives.
- CBP questions for review panels have been drafted but need more discussion; these questions will seed but not limit the panels' considerations.