

INORGANIC FERTILIZER ACTION AND ACCOUNTING REPORT FRAMEWORK TO THE CHESAPEAKE
ASSESSMENT SCENARIO TOOL (CAST)
January 114, 2023

General Statement of Purpose:

The purpose of this is inorganic Fertilizer Action and Accounting Report Framework (Action Plan) is a plan for fulfillment of Decision 2 made by the Principals' Staff Committee during their August 29, 2022 special meeting on CAST.

"The partnership will convene a committee to develop short-term, interim resolutions to fertilizer data concerns before moving forward with CAST 2021 as well as long-term resolutions for Phase 7 model. The committee will report out on progress towards this action at the next PSC meeting."

The purpose of the Action Plan is to ensure that the Chesapeake Bay Program Partnership, including but not limited to signatory members, demonstrate commitment to ensuring that CAST includes the most current and defensible data reflective of land application of inorganic fertilizer. The Action Plan* will be updated on a monthly basis by the Agriculture Modeling Team (AMT) Fertilizer Expert Team Group coordinator, with monthly progress documented for each Action Item, reported by the Chesapeake Bay Program Office (CBPO) staff and/or a Management Board representative(s) to the Principals Staff Committee (PSC), quarterly, at a minimum.

Items contained in this the Action Plan plan, as well as the plan time frame, are subject to modification as decided by the Management Board, upon consensus. The Action Plan Schedule is subject to change, as appropriate. Documentation of any changes to the items and / or schedule will be recorded in the monthly progress report.

Specific tasks or responsibilities of the Fertilizer Expert Group:

Incorporation: Data stewards, State Chemists (or their proxies), USDA employees and members of the Agriculture Modeling Team (AMT) and Scientific and Technical Advisory Committee (STAC) should be invited to serve as experts and participants on the Fertilizer Expert Group. CBPO Staff will support the group which will be coordinated by the Agriculture Modeling Team (AMT) AMT coordinator. The Fertilizer Expert Group would be convened by March 1, 2023. Additionally, CBPO and the AMT will review data preprocessing methods and agricultural inputs to ensure that CAST-23 and Phase 7 Watershed Model (WSM) utilizes the best available information to reflect agricultural conditions in the watershed and how conditions change through time. Any changes made to the original data by CBPO or the data provider should be clearly documented in a Quality Assurance Project Plan (QAPP). The review of the data preprocessing methods will be complete by April 1, 2023.

Research Identify potential sources: The Fertilizer Expert Group will conduct a thorough review and research of alternative data sources of fertilizer application, including but not limited to USDA-NASS annual agrichemical application surveys and other national and state sources of fertilizer application. This review will also include identification and compilation of data, gaps in data, and costs to fill those gaps. The Fertilizer Expert Group will report out of research conducted at regularly to the AMT, Ag Workgroup, and Water Quality Goal Implementation Team (WQGIT) and coordinate with USDA agencies to identify model structures, analysis methods, and agricultural databases. Coordination with USDA should commence no later than March 1, 2023; ongoing coordination is expected, with the potential for USDA agencies, such as USDA-NASS, to be actively engaged with the Fertilizer Expert Group and AMT. USDA will be invited to provide at least one presentation to Ag Workgroup and Water Quality GIT to describe Agrichemical Application survey, no later than April 2023.

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Commented [A1]: Date for FEG start?

Commented [A2R1]: FEG is not a subgroup of the AMT, but does report to the AMT and then, Ag workgroup. Identified date of convening.

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Commented [A3]: 1/26 Management Board Ask: CBPO will provide the list of members – and MB can identify if there is any other representatives to add to the list. (such as USDA, etc.)

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Commented [A4]: Adjusted February 1 to April 1 to align with the convening of the FEG.

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Commented [A6]: Adjusted March to April to align with the "Incorporation" above.

Commented [A7]: Action 2 moved up to "Identify potential sources"

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Compare/Analyze Sources: New sources of data, raw AAPFCO data, and CBPO processed fertilizer data ~~should will~~ be compared for geographic and temporal consistency. ~~Any changes made to the original data by CBPO or the data provider should be clearly documented, understanding that n~~Not all jurisdictions can or will ~~be relying on~~supply the same fertilizer data sources. These sources should also ~~be compared to a baseline analyzed with respect to of expected annual cropland acreage loss and combined with crop yield increases changes~~ and adjusted for ~~by~~ estimated annual land applied manure. This should also include comparison of fertilizer quantities, temporal lag or data timeliness, geographic specificity, and land use/crop specificity. The Fertilizer Expert Group will work with USDA-NASS to determine costs ~~and feasibility~~ for regular (e.g. biennial) agrichemical application surveys. ~~The data stewards, State Chemists (or their proxies), the AMT and Scientific and Technical Advisory Committee (STAC) should serve as experts to the Ag Workgroup, WQGIT, and Management Board (with each groups concurrence).~~ Itemization and characterization of known sources should be available no later than April 30, 2023.

Results and Discussion Recommendations: ~~Gaps between these data sources and explanations for these gaps, as well as any A recommended path forward on Phase 6 and Phase 7 fertilizer data sources will be developed by the Fertilizer Expert Group. A additional funding or policy changes and recommendations necessary to fill those gaps, should be discussed as well as the robustness of the datasets.~~ This discussion should include the AMT and STAC as appropriate to inform implementation. This analysis should be completed with enough detail for a CBPO briefing to the Management Board ~~as an informational item~~ in April 2023~~**~~.

Implementation: A summary of the discussion and resulting proposed path forward in the near and long term should be presented by the CBPO ~~staff and / or~~ Management Board ~~representative(s)~~ to the ~~Principals Staff Committee~~ ~~PSC~~ by June 2023. A schedule of review and approval would be established ~~on by~~ or before June 2023. ~~Possible outcomes should include any recommended changes in data analysis to complete and approve CAST-21 and CAST-23 on existing data sources followed by a recommended framework for replacing data sources with broader forms of data on fertilizer and soil additives across the watershed.~~ ~~Phase 7.~~

- ~~CAST-21 and CAST-23 recommendations will be provided to the Ag Workgroup and by the AMT by no later than May 2023 and June 2023 for information and July 2023 for decision. Ag Workgroup decision will be presented to the WQGIT by August 2023. CAST-21 and CAST-23 recommendations will include: a comparison between AAPFCO provided data through 2015-2016 (used in CAST-21) and the most current state-provided fertilizer sales data; identification of new data sources to compare against fertilizer sales data; and pros and cons, based on the AMT expertise, to use state-derived fertilizer sales data only, or with multiple data sources.~~ ~~Phase 7 recommendations will be provided to the Ag Workgroup by and to the AMT no later than May 2025/2024 and June 2025/2024 for information and August 2025 for decision, and July 2024 for decision. Ag Workgroup decision will be presented to the WQGIT by August 2024. Phase 7 recommendations will include: a comparison between fertilizer sales data and other sources of fertilizer application data; identification of the different data sources that the AMT considered that are currently available and for which state(s); and pros and cons, based on the AMT expertise, to select one or more data sources of fertilizer application and to review of the current method of fertilizer distribution within the model, providing recommendations for distribution of materials identified in the newer data sources.~~

Commented [A8]: As written, this presupposed the outcome that we will use different sources for different states. In the past, we have strongly preferred consistency to promote fairness across states

Commented [A9]: Not sure what 'compared to a baseline' means. Does this mean that the calculation takes into consideration these things? CAST does this already

Commented [A10]: Is this what was meant? To me, cropland loss means nutrient runoff

From MDE) The comment about cropland acreage loss equating to nutrient runoff is incorrect. Instead there should be an adjustment factor when using older estimated fertilizer inputs, which may include larger acreages of cropland in the past, when we see decreasing acres in the model.

From MDA: In addition to comment above, I think that will be the crux of the Fertilizer Expert Group's decision/recommendation, i.e. the current AAPFCO data has significant lag in availability so we assume comparable inputs on less land even when crop yield holds fairly steady. Other data and/or more current data will need to reset the volume of the bucket. Distribution among states is TBD, but if state available data is allowed (not just what all states have) then we can explore a Maryland methodology. We will also need to tackle nutrient use efficiency to ensure crop uptake is improved in the simulation

Commented [A11]: Moved up to incorporation

Commented [A12]: Deleted stuff here is because it is covered above.

Commented [A13]: MD Comment: We believe the timeline for CAST 21/23 is extremely ambitious. May need to allow for adjustment.

Commented [A14]: Date TBD. Most likely closer to mid 2025 for inputs. Adjusted accordingly based on the 1/1/2026 estimated start date for testing.

Commented [A15]: Removed decisions because we already have a P7 decision deadline of 2025. The FEG work will inform the AMT's decision

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Commented [A16]: MD Comment: We would like to see the replacement of the "bucket system" of fertilizer application in the model to better reflect individual jurisdiction inputs.

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Sequence of Actions:

- ACTION (1):** CBPO and the AMT will review data preprocessing methods and agricultural inputs to ensure that CAST-23 and Phase 7 Watershed Model (WSM) utilizes the best available information to reflect agricultural conditions in the watershed and how conditions change through time. Any changes made to the original data by CBPO or the data provider should be clearly documented in a Quality Assurance Project Plan (QAPP). The review of the data preprocessing methods will be complete by February 1, 2023.
- ACTION (2):** Coordinate with USDA agencies to identify model structures, analysis methods, and agricultural databases. Coordination should commence no later than February 1, 2023; ongoing coordination is expected, with the potential for USDA agencies, such as USDA-NASS, to be actively engaged with the AMT. USDA will be invited to provide at least one presentation to Ag Workgroup and Water Quality GIT to describe Agrichemical Application survey, no later than March 2023.
- ACTION (3):** Review alternative data sources and their applicability to the current [Phase 6] WSM assumptions related to the quantification, distribution and applications of nutrients on agricultural lands and determine the changes that are appropriate for CAST-21/23 and Phase 7. This can include datasets that are available Baywide as well as those datasets that may be available only in specific states. Identify and analyze gaps between alternate sources, AAFPCO and WSM fertilizer data to qualitatively assess improvements and tradeoffs with respect to time and effort.
- ACTION (4):** The AMT will provide recommendations to the Agriculture Workgroup and WQGIT to make decisions on the most appropriate agricultural input data for CAST-23 and Phase 7. Recommendations will be broken down into two categories: CAST-23 and Phase 7.
 - CAST-23 recommendations will be provided to the Ag Workgroup by the AMT by no later than May 2023 and June 2023 for information and July 2023 for decision. Ag Workgroup decision will be presented to the WQGIT by August 2023. CAST-23 recommendations will include: a comparison between AAFPCO provided data through 2015-2016 (used in CAST-21) and the most current state-provided fertilizer sales data; identification of new data sources to compare against fertilizer sales data; and pros and cons, based on the AMT expertise, to use state-derived fertilizer sales data only, or with multiple data sources.
 - Phase 7 recommendations will be provided to the Ag Workgroup by the AMT no later than May 2024 and June 2024 for information and July 2024 for decision. Ag Workgroup decision will be presented to the WQGIT by August 2024. Phase 7 recommendations will include: a comparison between fertilizer sales data and other sources of fertilizer application data; identification of the different data sources that the AMT considered that are currently available and for which state(s); and pros and cons, based on the AMT expertise, to select one or more data sources of fertilizer application.

Commented [A17]: I found this to be somewhat redundant with the responsibilities section. I've tried to move the salient additions up into responsibilities

Commented [A18R17]: Moved Action 1 to "Incorporation" and Action 2 to "Identify Potential Sources." Action 3 remained deleted; Action 4 was already moved above to "Recommendations."

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Action Item	Responsible Party	Deadline	Progress/Notes

**The Action Plan will be updated monthly with progress documented for each Action Item, by no later than the 30th of the month, with the updated plan published to the Chesapeake Bay Agricultural Modeling Team webpage no later than the 1st of the following month.*

~~** The --the timing in this action planAction-Plan-Schedule is subject to change, as appropriate. should be noted as subject to change/revision, as appropriate?~~

Commented [A19]: Suggested Addition from MD

Commented [A20R19]: Removed this below and added more language about change in items and schedule above under the "General Statement of Purpose" section.