

## Phase 7 Office Hours Recaps

### BMP Excess – [Aug 15, 2025](#)

- Auston Smith gave an overview of the issue of "excess" in CAST i.e. BMPs that are submitted but not credited and what is being discussed at WTWG to minimize this. Tom Butler elaborated on the specific concerns being discussed at the AMT about Animal Waste Management Systems, Mortality Disposal, and Riparian Fencing.
- **Discussion**
  - Distinctions between excess due to BMP data being faulty vs. issues in other model assumptions. Need for ensuring related parts of the model and work from the land use team are looped in and updated as well.
    - This is an attempt to ensure all of the verification protocols that improved data quality across the board are reflected in that data, so when there is still excess in 2025 Progress it allows us for Phase 7 to really ensure we're looking at the difference due to old assumptions and model things.
  - Reminder of work done in [2022 by WTWG](#), which produced recommendations. Some of those recommendations were implemented (e.g. how BMPs were reported as lat/longs) but higher level partnership things were not.
  - Clarification that the discussion on exclusion fencing is about revisiting the default conversion values, not upland credit.
  - A way to determine what the threshold for excess is for different BMPs and geographies.
    - The amount of a BMP not credited because it is in excess of the land available is in the BMP Credited vs. Submitted report on CAST. Also, there is a [webinar](#) and [FAQ](#) on CAST on this topic.
  - Concern over equity across the watershed on verification methodologies given the variation across the watershed.
    - Part of considering how they should inform "incorrectly" informed/modeled land uses or animal populations into the future would need to include discussing equity across jurisdictions, in the same way we consider other input data that informs the baseline of the model.
  - How widespread of an issue is excess?
    - It varies by practice, submission year, etc.
  - Clarifications on what scale BMPs are applied to land in the model (vs. how they are reported) and what impact that might have in that "downscaling" process.
    - In terms of geographic scale, all BMPs are processed at the land-River Segment scale, no matter how they're initially submitted, since that is the smallest scale in the model.

- There has been suggestions to the committee to look at scale with CBPO and adjust as needed. Some discussion of allowing submissions at HUC 8 or 10 instead of 12.
- For animal BMPs specifically, a methodology is needed to downscale to the Land-River Segment scale.
  - Done as a percentage of Ag. Feed space acres is created and put at the Land-River Segment scale because the TMDL has regulated and unregulated load allocations, so need regulated agriculture for that permitted space.
  - Non-CAFO/AFO animals have the same process for both.
- VACS AWMS is reported at HUC12 scale, USDA at county or statewide scales.
- Desire to adjust the ratio for access to riparian areas for Phase 7.
  - That can be worked on and updated for Phase 7.
  - Jess Rigelman will follow up with Elizabeth Hoffman on this.
- AMT will discuss conversion factors further at their interim meeting on Aug 27.
- **Additional Resources**
  - [Aug 15 Office Hours Recording](#)
  - [Slides](#) from Office Hours presentation
  - [Slides](#) from WTWG 2022 meeting on excess in 2020 Progress
  - BMP Verification Ad-hoc Action Team Final [webpage](#) and [final report](#)
  - CAST webinar on [Understanding Submitted vs. Credited BMPs](#) (listed under Scenario Analysis)

## Land Use Loading Rate Ratios – [Aug 15, 2025](#)

- Tom Butler gave an overview of the discussions occurring at the AMT around two additional land uses created for Phase 7 – managed pasture and managed hay – to make pasture and hay applications representation more realistic. Ongoing discussions are being held to improve the proposed loading rate ratios for these land uses. Tom showed a table with an overview of all the CAST Ag Land Uses and their loading rates.
- **Discussion**
  - Clarification that none of the ratios have changed for other CAST Ag Land Uses.
  - Confirmation that the loading rates ratios for the new land uses is consistent with the process used for all other ag land uses.
  - Elaboration on this process for how the loading rate ratios were determined, which is the same as was done in Phase 6.
  - What are the non-nutrient management multipliers are for each land use?

- They are consistent with what we had for Phase 6. Jess Rigelman shared the below table.

LoadSource	NonNMNitrogenFactor	NonNMPhosphorusFactor
Ag Open Space	1	1
Full Season Soybeans	1.2	1.5
Grain with Manure	1.3	3
Grain without Manure	1.2	1.5
Leguminous Hay	1.2	1
Silage with Manure	1.4	3
Silage without Manure	1.2	1.5
Small Grains and Grains	1.2	1.5
Double Cropped Land	1.2	1.5
Specialty Crop High	1.3	2
Specialty Crop Low	1.2	2
Other Agronomic Crops	1.1	1.5
Other Hay	1	1
Pasture	1	1
Managed Hay	1.2	1.5

- Discussion on what pasture BMPs the new land uses would be eligible for.
  - These new ones would be eligible for all pasture BMPs including nutrient management, which was a focal point of that discussion. Current pasture gets the other BMPs but cannot get nutrient management.
- Note that mappings to BMPs and load sources will have to go to WTWG.
- Question on whether a new land use of managed developed could be added to account for Chapter 102 Post-Construction Stormwater Management regulations since 2010. This discussion continued offline.
- **Additional Resources**
  - [Aug 15 Office Hours Recording](#)
  - [Slides](#) from Office Hours presentation
  - [CAST Documentation](#) Section 3: Terrestrial Inputs.
    - Table 3-13: Non-nutrient management application goal multipliers
  - A small group is meeting again to discuss the loading rates on August 21st, and it will come back to the AMT for further discussion in September.

**Land Use Back-Cast, Phase 7 Aggregation, and CAST Load Sources Overview – [Aug 18, 2025](#)**

- Sarah McDonald, USGS, gave an overview of the Phase 7 aggregate land use data and explained how land use is assessed over time through the back-cast (historical land use) and forecast (future land use). Sarah focused primarily on the back-cast data, which uses NLCD to identify changes through time, and walked the group through these back-cast methods. Additionally, Jess walked the group the tabular crosswalk of the high-resolution land use land cover data, mapped aggregate land uses, and the CAST load sources from the base land use acres, and explained changes from Phase 6 and how the CAST load sources are derived.
- **Discussion**
  - How is the agricultural footprint mapped throughout time?
    - AMT agreed to use mapped cropland versus pasture from the high-resolution data, so the Ag Census is not being used to separate crop versus pasture, but is being used to separate crop into other CAST cropland load sources. There will be two review periods for this data where people can provide feedback on the detailed methods. Back through time, Sarah will just map agriculture footprints using NLCD data, map the ag footprint back through time, and use the Ag Census every five years and interpolate it linearly to determine how much of that should be cropland versus pasture.
  - Will programmatic/regulatory upgrades regarding post construction, stormwater BMPs, and development will be reflected in the back-cast effort?
    - The land data team will be able to identify where development has occurred each year, using the mapped change in land use. Estimating how much development has occurred each year is something that will be highlighted in the back-cast project.
  - The land use data review process including format, available materials, and what will be presented to the LUWG/other groups for review.
    - It is anticipated that the back-cast data will be available to LUWG members prior to their next meeting, likely at the county scale. The September LUWG meeting will also include a comparison of trends. The LUWG will be asked to approve the final aggregation/roll-up for the 56 classes. However, the LUWG will not be asked to approve the Phase 6/Phase 7 crosswalk.
  - What's different between Phase 6 and Phase 7?
    - The rollups/aggregations are different in terms of what high resolution classes go to the interim mapped classes. But, also the interim classes are different. Solar infrastructure and solar pervious have been added. We are now explicitly mapping harvested forest and construction. Mixed open has been renamed to compacted pervious. There are also some changes in terms of where each of the mapped classes go. Anything that has changed has been approved by a sector workgroup, and LUWG will make a final approval of the rollup.

- How septic/sewer and agricultural animals factor into feed space acres. Should MS4 impervious areas and CSS not be used to calculate permitting feed space acres? Should we consider a state-based decision rule or universal solution?
  - CSS are not part of it. Those acres need to stay intact and only change with the data reported through the point source app for CSO connections.
  - The way MS4s are designated vary state by state. In MD, there are several counties designated as MS4s, so they would include agricultural land. In PA, MS4s are the Census urban areas, so they are less likely to contain agricultural land. You can't make a generalization across the watershed that MS4s are exclusive of agriculture.
  - Sarah, Jess, and Peter are currently investigating this issue and will ideally come up with a universal approach. However, it is possible a state by state approach is needed.
- Clarity on construction acres
  - If the acres that you report are more than what is mapped, reported acres will be used to create more construction by proportionately taking it out of the other developed land uses. If you report less than what is mapped, then reported acres will be used and the mapped acres that are in excess of what you reported will be turned into compacted pervious.
  - If your state reports a general construction, then it is proportioned based on the relative acres that exist. Some states in the past have reported acres of regulated construction versus CSS construction separately. If you don't, the factor will be the ratio of CSS compacted pervious to non-CSS compacted pervious and then that factor is used for however many acres need to be moved.
- Is compacted pervious a new class?
  - That is the old mixed open. The old mixed open is now called compacted pervious.
- Where is solar pervious data is coming from?
  - Solar classes come from the mapped data.
- How do septic/sewer and the distribution of animals work in the back-cast and forecast?
  - Jackie Pickford, USGS, has been working with the WWTWG to update the maps of sewer service areas and to map every septic as a point on the landscape, using parcel data and other information. It's a level of precision that was never had in Phase 6, with mapping every sewer septic system and then having the most up to date sewer service area. This information will be back-cast through time so there is a record of number of septic systems, septic population, and sewer back through time. It's also built into the forecast model as urban growth is modeled.

- Buildings within a parcel are used to approximate the location of the septic system, and they're approximated within the parcel. So, there is point data for all septs, and Jackie has compared it with the information state/jurisdictional data to validate the approach.
- **Additional Resources**
  - [Aug 18 Office Hours Recording](#)
  - Phase 6 and Phase 7 Land Use Crosswalk ([available on CAST Model Documentation](#))
    - [Jess' Breakout of the Crosswalk](#)
  - [Presentation](#) on the Incorporation of Mapped Land Use and Ag Census in CAST from the June AMT

### Land River Segmentation Overview- [Aug 18, 2025](#)

- Alex Gunnerson, Arlluk/CBPO Contractor, provided a recap of the takeaways from the June and July WQGIT decisions and the changes that have been made to implement that feedback. In particular, takeaways included eliminating slivers and small polygons along ridgelines and adjacent to tidal waters, a desire to maintain HUC 12 boundaries, and a willingness to tweak segmentshed boundaries when presented with better data and to delete slivers. Alex walked the group through the steps taken to address these takeaways and included visual examples of such changes.
- **Discussion**
  - How members want to treat edge cases where LRSEGs are smaller than 14 acres and whether or not they should be included in the land river segmentation.
    - There was a general sense of agreement that these cases should be removed.
  - A note was left in the chat for clarification on the statement “percent of a county’s ag in each LRSEG”.
- **Additional Resources**
  - [Aug 18 Office Hours Recording](#)
  - [Office Hours Presentation](#)
  - [June , July, August](#) WQGIT Meeting Slides on Phase 7 CAST Segmentation

### Sanitary Sewer Exfiltration – [Sep 15, 2025](#)

- Joseph Delesantro, EPA ORISE/CBPO presented the sanitary sewer exfiltration (SSE) estimation method for the Phase 7 model, including background on the importance of this update for the model in order to more accurately attribute the sources of the load. Joseph outlined the main elements in the estimation method, and rationales for those elements, which include a few optional values. Attenuation in soil and groundwater was developed by

modifying the existing framework and values for onsite wastewater attenuation. Joseph finally shared some preliminary results for testing and development using Phase 6 inputs.

- **Discussion**
  - Why is the exfiltration load calculated at Edge of Stream since the delivery is not at a point source?
    - It is considered a “direct load” in the model, where the workgroup defines attenuation through a separate process unlike normal non-point source attenuation. This is similar to how on-site wastewater (septic) is treated.
- **Additional Resources**
  - [Sep 15 Office Hours Recording](#)
  - [Presentation Slides](#)
  - [May](#), [June](#) and [July](#) WWTWG meeting presentations and discussion minutes on SSE

### Sewer/Septic Model – [Sep 15, 2025](#)

- Jackie Pickford, USGS gave an overview of the methods for the sewer/septic model, which has been approved by the WWTWG. Jackie shared an updated map of the sanitary sewer areas, which includes updated information from counties with more accurate data and a final scale than Phase 6 by using parcels instead of census blocks. Jackie then presented updates on the new estimation techniques for septic system counts, population on septic, and population on sewer. Parcels with buildings outside the sewer service area are included in the count of septic systems, with 1 septic system per developed parcel. More detailed comparisons of septic count estimates from local data, Phase 6, and Phase 7 at a county scale were presented at the [July WWTWG meeting](#). Jackie briefly noted that she will present at the [September WWTWG meeting](#) some potential improvements to the method based on feedback received from jurisdictions for consideration by the workgroup.
- **Discussion**
  - Do the sewer service areas include federal lands?
    - There are no septic loads accounted for on federal lands in the model.
  - Do you get any data on homes that have holding tanks instead of septic systems?
    - If it's within the sewer service areas then it is not accounted for in the model, similar to legacy septic tanks.
  - Discussion about what mapped data may exist from prior model phases that could be included to support the backcast methodology.
    - There is not a complete enough record of historic data on sewer service areas to use. While data exists from some jurisdictions, there was not a good response rate previously. Also, the methodologies have changed over time which makes it difficult to apply numbers from previous phases of the model. Data from jurisdictions could help validate the method and is welcome, though.

- One of the proposed methodologies for backcast sewer area is using 1990 census data, which will be discussed with the WWTWG at their Sept meeting.
  - How were multi-family septic systems accounted for?
    - The new rule of one septic system per parcel should mostly account for and offset this. The method was also updated to include commercial systems.
- **Additional Resources**
  - [Sep 15 Office Hours Recording](#)
  - July WWTWG meeting [presentation](#) and [minutes](#)

#### **Other Wastewater Items – [Sep 15, 2025](#)**

- Joseph Delesantro, EPA ORISE/CBPO shared the WWTWG’s consideration of including sanitary sewer overflows (SSOs) as a load in the Phase 7 model. The process was to identify data sources of SSOs and define what is a “chronic” SSO that would want to be captured, then estimate the contribution of SSOs to nutrient loading. The WWTWG decided not to pursue incorporating SSOs in the Phase 7 model due to limited data and their small contributions to loads.
  - [Presentation Slides](#)
- Petra Baldwin, WWTWG Staffer briefly shared the WWTWG’s decision to table the Boat Pump-out BMP. She shared the document summarizing the rationale behind this decision and factors that could result in future consideration.
  - [Rationale for Tabling the Proposed Boat Pump-Out BMP](#)
  - [Timeline of Review of Proposed Boat Pump-Out BMP](#)