Chesapeake Bay Program

Land Use Workgroup (LUWG)

Meeting Minutes

Wednesday, September 20th, 2023
1:00 PM to 3:00 PM
Meeting Materials

Summary of Actions and Decisions

Decision: The LUWG approved the June LUWG Quarterly Meeting Minutes.
Action: LUWG Members will provide feedback on the Menti questions via email, including those who didn't attend the meeting. Feedback is requested by **October 6th, 2023** and can be sent to Jackie Pickford (Pickford.jacqueline@epa.gov).
Action: LUWG Members will provide feedback to Peter Claggett (pclagget@chesapeakebay.net) on the draft Land Use Strategy for the Beyond 2025 group by **October 6th, 2023.**

Meeting Minutes

1:00 **Welcome, Roll Call, Review of Meeting Minutes, Action Item Update** – KC Filipino, Hampton Roads Planning District Commission (15 min).

Announcements:

- Welcome Sarah McDonald (USGS), new LUWG coordinator! Thank you for your leadership, Peter Claggett!
- **Decision:** The LUWG approved the June LUWG Quarterly Meeting Minutes.
- WQGIT Approval of LUWG Scope and Purpose – Sarah McDonald, USGS
    - The WQGIT will approve the updated LUWG Scope and Purpose at their September 25th meeting.
- Mid-Atlantic Planning Collaboration Webinar, Thursday November 9th: *"High-Resolution Land Use/Land Cover and its Applications to Land Use Planning"* – Sarah McDonald, USGS
- GIT Funding FY2023: on hold
- Reminder: The use-case survey is still open! Please submit responses and share if you know of any organizations using the high-resolution data:
    - Survey link
- Reminder: At-large nominations and chair nominations will be happening this winter. Please keep in mind potential nominees.
- **Next Meeting:** Wednesday, December 6th, 2023

1:15 **Major Class/Rule Changes in 2024 Edition of Chesapeake Bay Land Use Land Cover Data** – Katie Walker, Chesapeake Conservancy (45 min).

Katie gave a status update on the production of the 2021/2022 high-resolution LULC data and provided examples of major class and rule changes to illustrate improvements to the data.

Discussion:

KC Filipino: [Referring to "Tree Canopy over Turf – Large Parcels slide] When you say large parcels, what does that mean?

Katie Walker: Currently in the model I have it as greater than an acre, but that is one of many thresholds that we can potentially tweak. That's another knob to turn, but currently it's set at an acre. The biggest thing is noting that in a large parcel like this, the edges are likely less managed and maintained, the goal here being capturing more of that natural or unmanaged understory and making sure that tree canopy is treated as such. Hopefully that will show improvements in forest swatches and other tree canopy that gets filtered.

Sarah McDonald: I should have noted on these slides, but the next several slides where we go over the forest and tree canopy, all of these rules have been presented to and approved by the Forestry Workgroup.

KC Filipino: Was this also based on ground truthing, or something else? The decision.

Sarah McDonald: I think this was mostly from review from the last time. If you look at this area, it's a large warehouse on a large parcel which was definitely something that we got from stakeholder feedback last time. This is aimed to target around where we have development, where we have structures and driveways and things like that, we expect to be more managed than the edges of these large parcels. This was just one way to try and improve based on the feedback we've gotten on the last edition.

Dave Montali: [Referring to "FIA – TC over Turf is not Forest" slide] In the water quality modeling world, "Tree Canopy, Other" which is what's going to come out of this instead of "Tree Canopy over Turf" is..

Katie Walker: "Tree Canopy, Other" and "Forest" get rolled up to the same CAST water quality assignment. So that middle area from a water quality perspective will still filter the same amount for nutrient and sediment reduction modeling, but for other reasons or assessments, we won't be treating it as forest.

KC Filipino: [Referring to "FIA – Forest Width slide] This thought process of the different definitions as they relate to Forest really speaks to the evolution of these data. Not necessarily just fueling the CAST model, but also being useful outside of the water quality modeling world, and for other purposes like habitat. They still roll up to be the same loading rates, but as we're qualifying them as different types of forest or tree canopy its drawing attention to the fact that these data are useful for other reasons.

Katie Walker: A lot of these conversations with the Forestry Workgroup and trying to get in best alignment with the FIA, trying to have a consistent definition for forest with other authoritative groups. These data have been highly used by our partners at the Forest Service. They'll be using it for their upcoming report, the second phase of the State of the Chesapeake Forests. There's a lot of groups that are using it; wildlife habitat is one where this definition really matters. If the forest width gets too small it's really not forest, it's a corridor between two forests.

Dave Montali: [Referring to "FIA – Forests in Regenerating Patches" slide] When I was reviewing the past version, that was one issue that jumped out at me, that there were patches in forests that were obviously harvest patches, that through the rules before came out as turf. I don't know if that's what this slide is intended to address, but are there other improvements that would prevent that from happening?
Katie Walker: We are looking at improvements around turf confusion and the next couple of slides are focused specifically on forest gaps. I think we'll get there, and this one specifically is focused on areas surrounding natural succession, so this one specifically is in alignment with FIA. If it were up to our rules otherwise, if this was just patchy forest, it would probably get called "Tree Canopy, Other" but specifically because it's natural succession within a much larger forest, FIA does keep that call.
Sarah McDonald (in chat): This applies to harvested forest as well, as we assume it is in early stages of succession.
Dave Montali: [Referring to "Forest Gaps – Harvested" slide] I know that the harvest forest that we've provided over the years is not really spatially [accounted for], it's provided by county. Are we lining up to directly represent harvested forest in our Water Quality modeling, or is that an issue to be dealt with later?
Sarah McDonald: That's definitely a Phase 7 question, this is a discussion Peter and I have been having for quite a while. Katie Brownson and I are co-leading a Timber Harvest Task Force where we're focusing on how we want to deal with timber harvest in Phase 7. We're starting those conversations now, so that we can advise the Water Quality GIT in the next couple of years when the time comes. So that is a question that we've definitely thrown around and discussed; we don't have a resolution for that now, but we are having those discussions. There isn't a webpage for the Timber Harvest Task Force yet, it's currently me, Peter, and a lot of foresters. This is one issue, and another is the default harvest rate, if a jurisdiction doesn't supply harvested acres what should the default rate be. We meet about monthly.
KC Filipino: [Referring to "Solar Arrays" slide] I'm interested in how you calculate the acreage of [solar arrays]. You're only calculating based on how they were arranged when the image was taken – i.e., the acreage will change whether they're perpendicular or parallel to the ground. Is there any ancillary data that goes along to actually calculate those acres?
Katie Walker: Right now, we don't [have ancillary data]. In order to improve this call in the land cover data, the conservancy actually invested outside of this agreement in creating a data layer for solar arrays. We wanted to invest in this and made an ancillary data capturing solar arrays. My colleague Mike Evans led an effort focused on using advances in machine learning to help us identify where these solar arrays are so we can pass that information to UVM for the land cover process. Some of his data does look a little bit cleaner. It is something where if there was an interest, separately from if you're looking to calculate the land area underneath, that isn't something that the LULC data is currently accurately delineating but it is something that could be done outside of this process.
Sarah McDonald: We're also mapping that darker yellow, we're also mapping solar pervious which we're trying to restrict a bit better. The dark yellow, some of that is solar pervious, trying

to capture the field as a whole which can be used as some estimation, but as Katie said based on the direction of the panels, we have no way of isolating what that number would be.
Katie Walker: I would call this a slow improvement towards that goal and perhaps in a next iteration we could see even further refinement or improvement to the ancillary data that's available. That could help us really nail own and determine that, but there *is* a technical way that we could get there but that data doesn't currently exist.
KC Filipino: Maybe the magnitude of the difference isn't big enough but there's probably a way to calculate the number of solar arrays out there, the size of panels, and do the math of what the extent could be versus what's being mapped and see what the error is.
Deb Sward: I know these are being treated in the Land Use piece of it a little different than before. With it being categorized by itself in solar, in terms of being rolled up into developed versus undeveloped classifications, I know last time it was in production in the detailed and developed in the general class phase. Are there any different ways of thinking about how this rolls up into developed or undeveloped?
Sarah McDonald: Currently, this is planned to roll up in our pervious developed class and the arrays, we decided would roll up to other impervious, but that decision hasn't been finalized so we're open to suggestions on that.
Deb Sward: The other question I had was for the machine learning process, when the local jurisdictions are submitting Land Use data for this process, are any of the ancillary datasets from state or local jurisdictions being used in the machine learning process?
Katie Walker: Yes, there was significant training data that was used. I think for solar we had accumulated solar training data prior to the local jurisdiction call for this, but I would have to touch base with Mike Evans. There is training data from each state that was incorporated into the machine learning process.
KC Filipino: [Referring to "'Ghost' Parcels – Parcels planned for Development" slide] I have two questions. In the image on the top left, what are the white spots underneath, it almost looks like something was there and it's not?
Sarah McDonald: It looks like this is an area that's in the process of getting prepped for construction, that started getting prepped and then was left alone for a while. Parts of it got cleared and you can see it revegetating since it's been left alone for a while. In the change model we'll see some triggers of where we can see this change transition happening over time. The goal of this process is that this should be treated as a single field rather than individual parcels at this time and then we can use the context of the entire time series to determine what this land use should be. Obviously, what we have in here now is cropland, but once it runs through the change model, we can see that transition happening from active cropland to something more like pervious developed, which includes our construction classes. The goal of this ruleset is to homogenize things and figure out that these things should be treated as one, and when we get to change, we can incorporate time series rule sets which should help improve what the call itself is.
KC Filipino: I'm struggling with this being called Cropland too. The trees have been taken out, it's been graded, compacted, so I'm a little surprised.

Katie Walker: We haven't finalized all the incorporations of how we're looking at change to better improve the call. The takeaway for this slide is more about the homogenizing and making sure that the parcel data itself is not impacting the calls and arbitrarily segmenting the landscape. That's the issue being addressed more than the final determination. This *was* in the 2022 edition called Pasture, and I would imagine that this is one of the landscapes that will see a change or improved classification.

Mark Dubin (in chat): What is your protocol when the supporting infrastructure is in place, but the lots have not been developed, i.e., underground facilities which no longer support agricultural land use?

Sarah McDonald (in chat): It depends on what we see above ground. In this example, the "cropland" will be called pervious developed, which includes construction and suspended succession.

Mark Dubin: In some situations, it could be difficult to determine where you have a crop field that is now growing up in weeds because it's in the process of being converted; so, it's no longer in ag but its not developed either. That's probably a difficult visual signature, where we have that middle phase, it's pervious open or something like that, so I don't know how you're trying to deal with that issue.

Katie Walker: I would note two things. The more times the LULC data is produced, the better information contextually we'll have about previous calls and change over time, and that's one of the biggest things that's going to continuously improve, what we're calling landscapes that are in transition. The first, second, and even the third time that we're mapping these we don't have a lot of contextual information, so we're going to still be beholden to the accuracy of some of the ancillary data layers that we rely on. If CDL is calling this active agricultural land, unless our change process will detect that this is land in transition, the authoritativeness of the CDL layer is still a priority with us. It really depends on what information we have available, and hopefully we'll see a lot of improvement now that we have a third time step.

Sarah McDonald: One of the main things I'm going to be looking for in the change model to trigger analysis to handle this will be if we see construction of new roads on ag fields. That's a pretty big sign that it's no longer an ag field. We'll be working on workflows and testing things out to see if we can capture the field as a whole as an area of transition.

Mark Dubin: The other thing I know from the other work I've done on watersheds is, if you have the data on what is proposed for development, that can help you key in on areas to look at more closely.

Sarah McDonald: We don't have a separate layer [for proposed development], we just have parcels. As far as I know, there's no attribute that differentiates planned development versus existing. We're going to have to rely on the combination of parcels and our land cover; if we have a parcel and there's no house there it's probably planned.

Mark Dubin: One of the things we used was land ownership; where we saw land development companies owned the parcel, that indicated land development for the future, so that might be a source to think about.

Dave Montali: [Referring to "Land Use Classes in Animal Operations" slide] Would there be a way to distinguish poultry from livestock in these animal operations?

Katie Walker: Yes, the example we showed here is of a poultry operation. We're looking at all animal operations but not distinctly mapping them as poultry versus dairy versus other livestock. We are incorporating more than just poultry when we say animal operations, but through out LULC data right now it will not determine what type of animal operation. The 2024 edition does not have a reliable data layer that can help us make that determination at this time.

Sarah McDonald: In addition, that's something we've been advised not to do in the Land Use itself for a public facing product, in terms of privacy and things of that nature. We've had discussions on what pieces of this are internal use for the Bay Program to meet different needs that include water quality, versus what's part of a public facing product. The question you're asking now would have to be part of an internal process.

KC Filipino: [Referring to "Change – Timber Harvest over Time" slide] As we go through this and find things that were maybe inaccurate in the past, assuming those datasets get corrected in the past, we don't go back in and update CAST, right?

Sarah McDonald: Correct. We're locked in to Phase 6, what the starting point is, but we do incorporate our change data from that. So, whatever change we detect is what goes into the update from the baseline that starts in 2013.

Peter Claggett: Right now, the high-res data, the original version from 2013 is used in concert with the Ag Census to estimate acres in 2013. That sets the baseline and then we're using the high-res explicitly as is to go from 2013 to 2017. What hasn't been discussed yet is when we do the 2021 data, are we just updated to 2017 or will we update back to 2013 in CAST. I hope that we would update back to 2013. The differences would be minor, but for consistency to show that CAST reflects our high-res data, it would make sense to update both change periods from 2013 to 2017 and 2017 to 2021, but that has yet to be decided.

KC Filipino: I thought we weren't doing any CAST updates after this one?

Peter Claggett: We're going to produce output from the CAST model, whether it's with all of our new high-res data and new projections and everything. I don't think it's been decided that it's not going to be the official 2025 evaluation data set, but it will be a data set that gets analyzed and compared with what's currently in CAST so we can explore how things might change in Phase 7.

KC Filipino: How have we thought about handling these 'dynamic' updates for Phase 7? Is this iterative, we're always going to have updates in the model as we find improvements in the land use data?

Sarah McDonald: Now that we've done this a few times we're starting to level out and there's hopefully a lot less changes. The whole purpose of this is to be adaptive as we learn new things and new technology is discovered. We definitely want to be adaptable but in terms of Phase 7, my understanding is that it's going to function similarly. It'll use out 2024 edition product as baseline.

KC Filipino: Worst case scenario is that you go back and find out that 2013 was thousands of acres off in one category, but that's likely not what's happening right?

Sarah McDonald: I will say that those are two very different models as well. The model that we have now and the one we ran for the last edition, the technology is different, the number of

classes are very different. Because this product is adaptable and we continuously update it for all time periods, we will still have a consistent time series for whatever classification updates we make.
KC Filipino: As long as the bigger classification buckets stay the same, it doesn't matter.
Dave Montali: Are you guys doing any work along the lines of trying to improve the amount of turf associated with new development in rural areas? One of the things that we found last time was that it seemed like there were a lot of instances of a new house creating turf for an entire parcel that we would argue might not be the lawn for that house. I thought there was an overprediction of turf in some instances for that kind of setting.
Sarah McDonald: Do you mind providing a little bit more context in terms of what you would expect that lawn to be?
Dave Montali: My answer would be to try to create a factor for the new house impervious 1.x times or 2.x times around it would be turf.
Katie Walker: Obviously there are a number of improvements to the accuracy of individual classes that we're looking at across the board. What we focused on in today's presentation was where we thought there were significant changes to a rule, or what priority a call is in relation to other things. Confusion with agriculture and confusion with turf are two things that are going to be a really high priority for us over the next couple of months. Tweaking individual small thresholds like you said, where maybe we set something to be 10 meters, but it needs to be dropped to 5 meters. We'll be playing with these individual thresholds to try and increase accuracy, and if there were official comments made as part of the review process trust that we have them and we have looked at them and complied them into priorities to work on. One of the questions Sarah just asked would be an important answer to hear is if not turf, what else? The question is if we're looking at the house and you want a radius around it to be turf, what Land Use class would be most appropriate for the rest of the parcel?
Dave Montali: That's a tough question. I saw examples where someone purchased a parcel, timbered it and built a house down by the road. That parcel was previously forest and may in 10 years be some kind of succession except for the house and yard around it. Another example might be where you have a single house or scattered houses happening in what was previously ag land. I don't know how to deal with it, but the point is that it's not all turf. We need to talk about it and see if we can make an improvement.
Katie Walker: One of the questions that I have is would it be suspended succession herbaceous?
Sarah McDonald: It sounds like that's what we should potentially be aiming for. In the cases that its harvest then we should be pulling out harvest or natural succession in those areas. This is something that I know we've played with, and we went back and forth a few times in the last round, was having a parcel size threshold where if its over a certain size we won't call all the vegetation in it turfgrass. I can't recall if that rule is still in there or if it's just high. That's one of the knobs we plan to turn as well, but I do agree Katie. We should be aiming for turfgrass nearest the structure and then potentially suspended succession which rolls up in our pervious developed or in CAST world mixed open.
Deb Sward: I noticed in the first slide, where there was a discussion about changing the threshold to one acre or assuming that the understory was disturbed as tree canopy over turf,

and the threshold previously for turfgrass with a structure on it was 5 acres for parcels. I was curious if those two thresholds would be integrated. The other thing I wanted to know was that the Maryland Department of Planning for years has used 5 acres as a threshold for when the whole parcel or whole subdivision converts from rural uses to low density residential use. But of course, we're looking more from the perspective of rural to urban conversion or fragmentation of land rather than turfgrass, so I just wanted to throw that in there.
Sarah McDonald: That might be, or was the threshold, 5 acres, I need to verify if that's in there.

Action: LUWG Members will provide feedback on the Menti questions via email, including those who didn't attend the meeting. Feedback is requested by **October 6th 2023**.

2:00 **Re-envisioning the direction of the LUWG: Group Discussion and Activity** – Sarah McDonald and Peter Claggett, USGS (50 min).

Sarah led the group through a Mentimeter exercise on re-envisioning the direction of the LUWG. The group was asked to give feedback on changes to the meeting structure, what topics they'd like to hear more about, potential membership changes, and more.

Peter gave a brief explanation of the draft land use strategy for Beyond 2025 and asked for feedback from the group via email.

Action: LUWG Members will provide feedback to Peter Claggett on the draft Land Use Strategy for the Beyond 2025 group by **October 6th 2023**.

2:50 **Recap of Actions and Decisions** – Sushanth Gupta, CRC

3:00 **Adjourn**

NEXT MEETING: Wednesday, December 6th, 2023 from 1-3 PM.

Participants

Allie Wagner, NVRC
Arianna Johns, VA DEQ
Ashley Hullinger, PA DEP
Caitlin Bolton, MWCOG
Cassie Davis, NYS DEC
Dave Montali, Tetra Tech WV
Deb Sward, MDP
George Onyullo, DC DOEE
Helen Golimowski, Devereux Consulting
Jeff Sweeney, EPA
Katie Brownson, USFS
Katie Walker, Chesapeake Conservancy
KC Filipino, HRPDC
Lorenzo Cinalli, USFS
Lori Brown, DE DNREC
Mark Dubin, UMD
Mark Symborski, M-NCPPC
Mindy Neil, WV DEP
Norm Goulet, NVRC
Peter Claggett, USGS
Samuel Canfield, WV DEP
Sarah McDonald, USGS
Shannon McKenrick
Steven Guinn, Chesapeake Conservancy
Sushanth Gupta, CRC
Tyler Trostle PA DEP
Young Tsuei, DC DOEE

Acronym List

CBP – Chesapeake Bay Program
CRC – Chesapeake Research Consortium
DC DOEE – District of Columbia Department of Energy and the Environment
DE DNREC – Delaware Department of Natural Resources and Environmental Control
EPA – [US] Environmental Protection Agency
GIT – Goal Implementation Team
HRPDC – Hampton Roads Planning District Commission
LULC – Land Use/Land Cover
LUWG – Land Use Workgroup
MDP – Maryland Department of Planning
M-NCPPC – Maryland-National Capital Parks and Planning Commission
MWCOG – Metropolitan Washington Council of Governments
NVRC – Northern Virginia Regional Commission
NYS DEC – New York State Department of Environmental Conservation
PA DEP – Pennsylvania Department of Environmental Protection
UMD – University of Maryland
USFS – United States Forest Service
USGS – United States Geological Survey
VA DEQ – Virginia Department of Environmental Quality
WQGIT – Water Quality Goal Implementation Team
WV DEP – West Virginia Department of Environmental Protection