CHESAPEAKE BAY PROGRAM LAND USE WORKGROUP

Face-to-Face Meeting Summary
April 5, 2017
10:00AM-3:00PM

Meeting Materials: http://www.chesapeakebay.net/calendar/event/24792/

Actions & Decisions:

ACTION: Lindsey Gordon will distribute the Chesapeake Conservancy report on error rates of the mapped Phase 6 land cover data, as well as the proposed accuracy values for the Phase 6 land use.

DECISION: The LUWG agreed to proceed with the proposed error rate methodology as presented, with the understanding that Virginia representatives will work with the CBP to develop an alternative methodology reconciling VA's 3rd party accuracies for crop and pasture land uses.

ACTION: Peter Claggett and Lindsey Gordon will distribute information on Maryland Department of Planning's land use forecasting model to the LUWG. Workgroup members will be asked to review and provide comments on using the MDP model for Maryland's Phase 6 2025 forecasted land use. The LUWG will be asked to approve the use of this model during their June meeting.

ACTION: LUWG members should submit proposals for alternative future scenarios to Peter Claggett (pclagget@chesapeakebay.net) in advance of the June 7th forum with LGAC. Workgroup members should also provide any input on the metrics and data sources informing these scenarios to Peter Claggett.

Welcome and introductions/Review of meeting minutes – K. Berger, MWCOG
The LUWG approved the minutes from the March 1st conference call.

Mapping High-Resolution Streams in the Chesapeake Bay Watershed
- D. Saavedra and Cassandra Pallai, Chesapeake Conservancy,
- M. Baker, UMBC
The Chesapeake Conservancy presented their proposed work with UMBC to map high-resolution streams throughout the Chesapeake Bay Watershed, as part of the Healthy Watersheds GIT FY 2016 funding project.

Discussion:

- Karl Berger: In some future iteration of the land use development, could this protocol be used to improve the mapped streams in the watershed?
    - Peter Claggett: Yes – they would develop the methodology, and then it would be up to us to implement the methodology watershed-wide. This would likely coincide with when we update the land use.
    - Karl Berger: There's thousands of first-order streams in the watershed, but are 10 sites sufficient to achieve the level of confidence that you're seeking?
    - Cassandra Pallai: So we have 10 sites across the Chesapeake Bay to be representative of the different physiographic regions. We're shooting for a total sample size of 30 sites, and so far the academic literature has suggested we could have some confidence in our results from this sample size. In the meantime, we can work with other academics or USGS to compile other datasets throughout the watershed where folks have gone out in the field and mapped channel head.
- Gary Shenk: What constitutes a site? Is it multiple channel heads in one area?
    - David Saavedra: It's not going to be only one channel head – it will be a small catchment, potentially the size of a HUC12 or smaller, with the goal of it taking a day to survey the whole catchment. Ideally this would capture a few NHD blue-lines in a catchment, but then we will explore tributaries and channels that are within the catchment that aren't mapped in the NHD.
- Peter Claggett: So you're starting at the 24k NHD terminus, and then if your unit is close to a HUC12, then there could be up to ~15 termini in that HUC12 – so you could select a subset of those to investigate?
    - David Saavedra: Right.
    - Gary Shenk: So when you're in the field, what data are you collecting?
    - David Saavedra: We'll be taking lots of photographs with geotags, notes describing channel features, and handheld GPS coordinates.
- Mark Symborski: Your definition of intermittent stream includes streams normally defined as ephemeral, which are generally those that respond only and directly to a rain event. Intermittent streams tend to have base flow more frequently. Can you explain further?
    - David Saavedra: Intermittent streams are as you described, but for sake of simplicity in this presentation we used that term to cover both ephemeral and intermittent.
    - Mark Symborski: Perhaps you could clarify in your final protocol, or clarify the term that you use in your work.
- Darold Burdick: How will this study take into account seasonal variation?
    - Saavedra: Our aim was to visit these field sites in early spring based on the geography – but we'll essentially try to visit these sites as soon as possible. We're trying to capture seasonal high flows in early spring.
- Fred Irani: You have one site on the lower eastern shore – are you making any effort to include ditch drainages?

    - Cassandra Pallai: We're working on a separate project, with a test site in PA, to develop a protocol to map roadside drainage ditches. The goal with this workflow would be to avoid the roadside ditches as being included in the dataset, because the topographic signatures that generally indicate streams would ideally preclude roadside ditches from being captured.
    - Fred Irani: I ask because in the lower eastern shore they're very interested in mapping agricultural ditch drainage systems.
- Peter Claggett: Regarding ditches, what you've presented is a natural analysis of how best to map high-res streams, but with other forms of infrastructure, I imagine this method may not work as well in urban areas. Even in more rural landscapes, the road network may route water in such a way that the stream network is disrupted. So will you be taking into account the road network?
    - Cassandra Pallai: That's something we can take into consideration and explore incorporating, but you're correct in that the methods we've outlined focus on identifying channel heads in more forested areas.
- Gary Shenk: There's a lot of uncertainty in qualitative stream metrics, and I'm wondering if it's not more useful information in the long run to look at characteristics of the channel – if there is some relationship between all these metrics, then that information might be useful later on for someone to apply a functional definition.
    - David Saavedra: We're planning to do a test-run of stream identification in the field, and we found some literature that is essentially a field-guide for identifying streams – it takes into account a lot of what you said.
    - Gary Shenk: I'm recommending more a product that contains the characteristics of the stream as attributes, as opposed to a binary stream classification layer.
    - Cassandra Pallai: That's a great suggestion, and the goal of this work is to do better than our methods have provided in the past. Our goal wasn't necessarily to incorporate underlying features of the stream bed into the attribute table of the mapping protocol that we're developing. Perhaps it could be done in a future statistical analysis, based on the information David is collecting in the field.
- Bill Keeling: Have you considered how you will get access to the sites you select?
    - David Saavedra: That's a big factor influencing our site selection process.
    - Bill Keeling: It may influence the representativeness of your sites.
    - Renee Thompson: I maintain a data layer of agricultural easements, so we may be able to facilitate a connection there.
        - Jennifer Herzog also offered assistance.
- Matt Baker: One distinction I want to clarify is the concept of QA/QC on the watershed scale, versus the selection of representative sites that have a broad degree of variation in the processes that form streams, and comparing mapping methods using that data. The rationale for this field campaign is not to QA/QC the method per se, but to compare mapping methods to understand how well they do under very different initiation processes.
- Fred Irani: This isn't to map the floodplain, correct?
    - Peter Claggett: The floodplain won't be included, but channel width will be captured in this methodology.

Error Rates in Phase 6 Land Use – P. Claggett, USGS

Peter presented minor changes in the land use error rates used to conflate the Census of Agriculture with mapped land uses in the Phase 6 model.

Discussion:

- Norm Goulet: How much land are we talking about in the watershed?
    - Peter Claggett: This new condition where ag land has to expand – it could be 15-20% of the watershed. Now remember the ag census will not expand to fill the entire space, and mixed open will also change a lot.
- Karl Berger: What's the magnitude of the difference between mapped ag and ag census in these affected counties?
    - Peter Claggett: It depends on the error of the ag census – if the accuracy is 70%, it could be 30% off in one direction or the other.
    - Karl Berger: So it would all go into mixed open?
    - Peter Claggett: Yes – the excess area that we've mapped as potential ag.
    - Gary Shenk: In one version, the difference between the ag census and this true-up method, the ag in most areas shrunk in a fairly normally distributed way between 0-30%. That didn't change at all from this suggested change, but the growing counties (of which there were fewer) saw increases as much as 30-40%.
- Bill Keeling: I see that you didn't use our cropland and pasture accuracies – of which VA's were very high. So why should VA be penalized by using a surveyed set of data that's statistically manipulated (ag census) versus a remotely-sensed measured set of data?
    - Peter Claggett: We did that for consistency of method. Your accuracies are very high, and we wouldn't want to apply them to the ag census. In order to incorporate what you're saying, we'd have to say that in 2013, if we've mapped X amount of cropland and X amount of pasture in Augusta County, they're 95% accurate and we would adjust the census of ag either up or down to meet your mapped number. And then going back through time, we're not sure what the mapped accuracies are anymore.
    - Bill Keeling: I wouldn't consider the exclusion of our data acceptable just because you need consistency with other states who didn't have that data.
    - Peter Claggett: We'll consider that request and get back to you on it.
    - Karl Berger: So it's more a question of how to project the land use backwards – what method could you use in VA to get the true-up accurate backwards through time? It would have to be a slightly different method than what's used in other states.
    - Gary Shenk: It's do-able – instead of putting census in for VA, we'd do the true-up with their uncertainties, and then we'd have a factor for what to put the census into those acres. If we do that though, it will take a while and it's not something that the Bay Program Office can agree to do because the Partnership set the schedule. And if this is new information that the CBP would accept to

delay the calibration, it's something the entire Partnership would have to agree to do.

- Peter Claggett: We're using VA's data – we've tailored our analysis to them, run the counties separately, and MD has their statistical method for estimating turf to all but 5 counties, and for the other 5 counties they're using our data. So yes – we've been making exceptions, and we've had error rates for VA for some time, but for consistency we've never settled on using their error rates for crop and pasture.
- Karl Berger asked if there were any other concerns.
- Shannon McKenrick: MD has error rates for most of our land uses, and previously we had said that our state-wide error rate would be OK. We would like to provide our own error rates for the counties where we will use our own land use. I don't know if that will be significant in the long run, or if it would be difficult for the CBP. Could you provide more information on how the VA accuracies were developed?
    - Peter Claggett: VA DEQ hired Sanborn in order to do the QA/QC, but we're using Conservancy-provided accuracies for land uses.
    - Shannon McKenrick: We'd like to see those accuracies and error rates if possible.
    - Peter Claggett: We'll email out the Conservancy report and the table with the error rates in it to the group.
- Karl Berger: So until this is finalized, it will delay the release of the tabular data and the review of model inputs.
    - Gary Shenk: As far as I can see, Bill's saying that VA cannot approve this. We have a Bay-program approved set of numbers for this table, and what is currently running in the hydrologic calibration is the land use with this table in it. If this group is not approving this table, we need to stop that and go back to the other land use - it'd be losing about a day or so. So I'm asking VA if we could move forward with the table presented on the screen, realizing that this issue is coming up and that you haven't approved the overall land use. Could we agree that this table is better than the last version, leaving open the possibility of altering that later on? IE – we would want to use the proposed table, understanding that VA has an issue they would want to put in front of the Partnership.
- Jill Whitcomb: What is the overall effect of correcting the over-reporting of the ag census – would that then decrease the available agricultural land for nutrient application?
    - Peter Claggett: Compared to past versions of the models – yes, we will have less agricultural land in Lancaster.
    - Jill Whitcomb: From the ag perspective, I support making things more accurate with this mapping, as opposed to extrapolating data from surveys.
- Karl Berger: So we could move forward with the proposal that's been presented today, with certain caveats – the potential for MD to use their own error rates, and VA raising this issue through the Partnership.
- Bill Keeling: If NY and PA are OK with the numbers in this table, I'm not opposed with using them. But I just can't agree with these numbers as presented for VA.

- Peter Claggett: So we could tee this issue up for the WQGIT – this would be a decision to accept new information.
- Karl Berger: So VA is not prepared to accept this proposal, but you are OK with other states using this table, and presumably you will raise to the WQGIT the request to use your information, and perhaps by that time the CBP Modeling Team will have worked out a method that's acceptable to you. So other representatives at the table – do you have any problems with moving forward with the proposed values?
    - Bill Keeling: What Peter suggested would be acceptable to VA, but I would have to make sure the managers are OK with it. So if Peter's proposing to use VA numbers for 2013, and the ag census for 1984, with an interpolation in between than we could potentially be OK with that.
- Gary Shenk requested that VA also include a proposal for animal agriculture in their proposal.

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DECISION: The LUWG agreed to proceed with the proposed error rate methodology as presented, with the understanding that Virginia representatives will work with the CBP to develop an alternative methodology reconciling VA's 3rd party accuracies for crop and pasture land uses.

Maryland Dept. of Planning Land Use Forecasting Model – S. Martins, MDP
Stephanie Martins presented on MDP's land use forecasting model.

Discussion:

- Mark Symborski: So if the preservation continues at historical rates, you didn't explicitly consider trends?
    - Stephanie Martins: In a way it is considered because it's informed by small-area projections, but the idea that a lot more acreage in rural areas is slated to be preserved over time would be considered in that analysis.
- Paul Patnode: A lot of this is based on historic yields. One problem we run into with Prince George's county is that historic yields are fine, but the easy parcels to develop are already developed. So we consider our numbers to be high because of that – did you consider that?
    - Stephanie Martins: We can do that, and what we would do is work directly with the local jurisdictions to adjust our yields based on those considerations.
- Lee Epstein: Have you given any thought to a less-basic version for commercial development?
    - Stephanie Martins: Yes, but unfortunately we won't be able to use it in time for this analysis, but we would love to work on that moving forward.

- Peter Claggett: With forest and farmland conversion, is each parcel tagged as either forest or agricultural?
    - Stephanie Martins: Yes – and we've talked about figuring out how much of larger resource parcels are either ag or forest based on the new land use data, and adjusting the numbers to accommodate the percent of the parcel that's ag or forest.
    - Peter Claggett: I think if you did that and added a map of what could be developed, that would be good too.
- Karl Berger: So there are two potential sues for this work in the LUWG – one is to compare results against the Phase 6 land use forecasts, and the other is to potentially use MD's forecasting results for 2025, provided it's similar enough to our model.
    - Peter Claggett: Right – and I would like this to be a decision that the group makes – whether or not it would be OK for MD to use their results if they prove appropriate and there is some degree of vetting by this group.
- Norm Goulet: Do we have all the inputs for the rest of the other states? I know VA is not going to have that level of input state-wide.
    - Peter Claggett: I'm not proposing we use MDP's model anywhere outside of MD – we have the model we've developed for use in the Bay states, and it doesn't rely on the same type of information they have. We have all of the data for our model, for every state.
- Lee Epstein: Have you back-cast this to see how it works?
    - Stephanie Martins: Not yet – the closest thing to that is this table, where we look at recent trends and how they compare to projected future trends.
- Karl Berger: I'm not hearing any major concerns, but I don't think we're at the point where we would approve using MD's model for their 2025 forecasts. But perhaps we should get that on the agenda for a future meeting. If anyone has any serious concerns between now and the next meeting, it would be good to submit those in writing.
- Norm Goulet: I would also suggest that you put this together via email and distribute it to the entire workgroup, allowing them an opportunity to comment.

ACTION: Peter Claggett and Lindsey Gordon will distribute information on Maryland Department of Planning's land use forecasting model to the LUWG. Workgroup members will be asked to review and provide comments on using the MDP model for Maryland's Phase 6 2025 forecasted land use. The LUWG will be asked to approve the use of this model during their June meeting.

2025 Land Use Growth Projections and Review Process – P. Claggett, USGS
Peter Claggett presented preliminary results for the historical trends land use growth scenario in Maryland, data that will be available for review, and reviewed expectations.

Discussion:

- Norm Goulet asked if the forecasts differentiated fallow land, because that land is typically developed first in the real world. Lee Epstein agreed that this information would be very useful to inform the forecasts.
    - Peter Claggett agreed that this would be useful.
    - Norm Goulet: Fallow land near an urban area would be more likely to develop faster than fallow land not near an urban area.
    - Peter Claggett: We account for that to some degree, but we would need those statistics.
- Discussion on gathering data on infill and lot size for counties outside of MD. Norm Goulet offered to work with Peter to help gather that information.
- Norm Goulet recommended not releasing information on the change in total N, P, and sediment, citing concern over those values influencing the review of the scenarios and assumptions.
    - Mary Gattis: In the Phase III WIPs, jurisdictions need to create local area planning goals, so that information may be very helpful for them in thinking how to address those goals. If you want to, we could consider if it makes sense to release that information for the jurisdictions.
- Peter Claggett asked the group what other metrics would help them to evaluate the scenarios.
    - Karl Berger suggested new impervious per job, and agricultural fragmentation.
    - Lee Epstein suggested trying to capture the value of low-cost BMPs on well-managed farms that could potentially deter urban development, that would necessitate more expensive BMPs.
    - Peter Claggett: BMPs affect our loading rates, and you could have some index of running the Watershed Model without BMPs and with BMPs for 2025 and looking at the change in agriculture between that. The logic could be that if you lost 10% of your farmland in a county, then you lost 10% of the BMPs that are reported on farmland for that county.
- Erik Fisher: How are you looking at changes in wastewater loads as a result of this?
    - Claggett: We have mapped sewer service areas, so to the extent that we make assumptions about infill, it will be on sewer by definition. And if there's undeveloped areas that are sewered, we would assume areas off sewer would be on septic.
- Erik Fisher: I'm wondering if one of the metrics should be the proportion of development on septic versus public utilities.
- Question on how re-development is considered, with the comment that re-development on urban land that improves water quality would be an ideal future scenario for urban areas.
- Mary Gattis replied that it would be good to include state permit data – with regard to percent urban redevelopment versus percent greenfield development.
- Darold Burdick: For Fairfax County, you don't get any additional credit for new development, but there was the potential to get credit for re-development.

    - Peter Claggett: In the way we interpret these results, if development gets credited with some sort of offset in the current urban load, it will also change the calculations of change in N, P, and sediment. So some counties where we have high certainty and they're already highly developed could see loads go down.
    - Karl Berger: Almost all state regulations require that re-development sites have stricter requirements on water quality.
- Peter Claggett: Is re-development currently reported as a BMP?
    - Norm Goulet: Yes.
    - Mary Gattis: How is that handled with runoff reduction versus BMPs? Isn't that the way they're starting to count the credits at the state level – using a runoff reduction method versus individual BMPs since they can't apply multiple BMPs to the same area.
    - Norm Goulet: Typically, when you get a redevelopment, you get a retrofit that picks up the additional load.
- Darold Burdick: I think we should have one of our alternative scenarios be re-development, at least in urban areas.

Alternative Future Land Use Growth Projection Scenarios and Timeline – P. Claggett, USGS
Peter Claggett lead a discussion with the workgroup to develop alternative future land use growth projection scenarios and timeline for production.

Discussion:

- Mary Gattis noted that the proposed June 7th forum would involve local governments in addition to LGAC and LUWG members.
    - Karl Berger: Something to consider is that we won't be asking the local governments to submit any local data during this proposed forum; rather, we would want to discuss the alternative future scenarios.
    - Mary Gattis: It's certainly going to take some work between now and June to figure out what the questions are that need to be addressed during this meeting.
    - Peter Claggett: And if we could bring in outside speakers, we may be able to dive into the policy implications and how this information is used.
- Darold Burdick: This collection period – is this even possible to complete in 2 months?
    - Peter Claggett: We've already collected a fair amount of data through the 3-year collection effort we had to support the land use, and that includes zoning information. Now, we're going to send out to the workgroup what data we do have, and where we're lacking zoning data. The request we send out will be very specific.
    - Norm Goulet suggested reaching out to MWCOG and HRPDC to locate data.
    - Mary Gattis offered to look into hiring contract staff to collect local data, and asked LUWG to consider inviting local expertise in land use planning.
- Lee Epstein: So by the fall, future scenarios will be chosen, but what about the entire policy discussion?
    - Peter Claggett: We don't have this laid out yet, but the entire policy discussion needs a timeline. This includes how these scenarios will be used. But as a

technical advisory workgroup, I don't know if the LUWG needs to be involved in that.
    - Lee Epstein: Even with regard to what gets credited? I thought it would be appropriate for this group to generate ideas as to what types of things should or shouldn't be credited – a new conservation easement? Zoning and planning?
    - Peter Claggett: I did talk about it in the broad sense, and I think the workgroup should decide what role they want to play in this.
    - Karl Berger: Doesn't most of this fall out from what the scenario says?
    - Peter Claggett: There's a lot of stuff associated with land use change that our land use models don't account for, and we make assumptions about what we think we're going to see. So all of these issues are technical, but don't fall exclusively within the land use workgroup's domain.
    - Lee Epstein: My understanding was that this tool would possible be able to provide credit for local or state "policy" change that happens. Or, what can already be simulated – taking out a portion of land from what could be a potential future development. I thought both were to be considered.
    - Mary Gattis: These are some of the questions I think we should bring up at this forum.
    - Lee Epstein: Another thing to consider is whether some portion of the credit needs to be related to an implementation or an addition – not just a prevention; ie – BMPs or something to that affect. So I think it would be good for us to weigh in on what makes sense.
    - Erik Fisher: And to make sure the scenarios reflect what is capable of being credited. If we're going to credit zoning, we want to make sure that the scenarios reflect zoning.
- Mary Gattis: I'll be developing a problem statement with questions we want to address, and I hope to have that to you in the next couple of weeks for input.
- Peter Claggett asked the group if they were comfortable with using scenarios for "Sustainable Chesapeake" and "Infill and Redevelopment", or if there were alternative scenarios that should be developed.
    - Norm Goulet replied that a good benchmark would be a metro-area buildout.
    - Karl Berger asked how many scenarios were realistic to complete. Peter replied that it would be feasible to do 5.
    - Darold Burdick: It seems like some of these scenarios lend themselves to a certain type of environment – it wouldn't make sense to do redevelopment in rural America, right?
    - Mary Gattis: Because it's expensive to sprawl, and there are places choosing to focus on redeveloping their urban centers.
    - Peter Claggett: I do think that's an interesting concept, and that we could potentially blend some scenarios into a new one, that has geographic consideration for what is feasible.

ACTION: LUWG members should submit proposals for alternative future scenarios to Peter Claggett (pclagget@chesapeakebay.net) in advance of the June 7th forum with LGAC.

Workgroup members should also provide any input on the metrics and data sources informing these scenarios to Peter Claggett.

- Karl Berger: I think we need a more refined list than this one of the scenarios that we're proposing during the meeting in June.
- Erik Fisher: This is where it gets confusing to keep this discussion separate from discussing what gets credited. If people are seriously looking at crediting zoning, then we need to have a scenario that looks at that.
- Mark Symborski: I'm concerned that these practices are additive, and what would be really useful for local governments as they're trying to credit land conservation would be a Bay Model-lite, like CAST, that includes the different policy scenarios. You won't be able to take these and add them together or tease them apart.
    - Lee Epstein: Or have that simplified tool at least reflect what the ultimate decision is on what's creditable.
    - Norm Goulet: All of that is possible within our current tool framework. The problem is attributing a nutrient reduction to it.
    - Karl Berger expressed concern about meeting deadlines.
    - Peter Claggett: We have a deadline for the PSC to make a decision on setting Phase III WIPs on a future land use in October. That decision doesn't necessarily have to account for all the scenarios, but it has to account for enough confidence for the process moving forward and the models and methods being used, that they recommend moving forward with this.
    - Erik Fisher: Mark's comment highlights a huge question – how will this scenario be used? Are each individual local jurisdiction's changes going to eventually be modeled, or will they be assigned to one of these scenarios and given a pre-determined credit? These scenarios can be informative, but if we're going to use them in the WIP for an accounting purpose, it seems like the CAST proposal might be a better way to go.
    - Peter Claggett: Doing this Bay-wide gives people a visualization and quantification of the effects writ-large of land use policies. I think they can provide an impetus to do those things at a local level, because you can see it played out over time and space. That doesn't mean that this model has to be the accounting mechanism, but it could help people include conservation and land use planning in their plan.
    - Erik Fisher: I still think it would be worthwhile considering revisions to this list if this information will be used in accounting.
    - Norm Goulet: None of these scenarios are used for crediting purposes.
    - Lisa Schaefer: One concern we had is what kind of data is going into these scenarios that would support this – particular to PA and zoning data, I'd be very curious to see what the CBP has and still needs for our jurisdictions.
- Peter Claggett: I think we need to have a timeline for this crediting conversation, likely in parallel with the development of these scenarios, because it does influence our selection of scenarios and our level of work.

    - Mary Gattis: It seems to me that if you don't have zoning data for particular areas, you should just note that. But perhaps for those areas, we could look to other pieces of information as a proxy?
    - Peter Claggett: Yes – we have proxies for zoning now, and we also have a lot of local information despite zoning.
- Karl Berger recommended developing a briefing document to help guide the discussion on crediting conservation.
- Peter Claggett suggested triaging the decision making process and decisions that need to be made: whether a 2025 depiction of land use is more realistic than keeping land use constant, and whether manipulations of that land use could be credited.
    - Karl Berger: So perhaps we could select just a subset of scenarios for the PSC to base their decision on? And then the discussion on crediting would occur in parallel?
    - Peter Claggett: Yes, and the timeline for crediting alternative scenarios could extend past the PSC timeline. We could think about quantifying that credit, and how best to credit those things.

Fatal Flaw Strategic Review Guide and Timeline for 2025 Land Use Growth Projections – L. Gordon, CRC

Lindsey Gordon briefed the workgroup on the proposed fatal flaw strategic review guide, which outlines the LUWG review of model documentation and land use data.

Next meeting: Wednesday, May 3 10:00 – 12:00 PM Conference call

Participants:

Name	**Affiliation**
Karl Berger	MWCOG LUWG Chair
Peter Claggett	USGS LUWG Coordinator
Lindsey Gordon	CRC
Lee Epstein	CBF
Erik Fisher	CBF
Jennifer Herzog	Land Trust Alliance
David Saavedra	Chesapeake Conservancy
Cassandra Pallai	Chesapeake Conservancy
Jake Czawlytko	USGS
Labeeb Ahmed	USGS
Greg Noe	USGS
Gary Shenk	USGS
Fred Irani	USGS
Renee Thompson	USGS
Pat Gleason	EPA
Norm Goulet	NVRC

Lori Brown	DNREC
Robert Hirsch	Baltimore County MD
Steve Stewart	Baltimore County MD
Mark Symborski	Montgomery County MD
Paul Patnode	Prince George's County MD
Alisha Mulkey	MDA
Stephanie Martins	MDP
Shannon McKenrick	MDE
Angel Valdez	MDE
Darold Burdick	Fairfax County VA
Dipmani Kumar	Fairfax County VA
Bill Keeling	VA DEQ
Chris Yearick	NYS
Travis Stoe	PA DEP
Mark Hockley	PA DEP
Jill Whitcomb	PA DEP
Marah Vecenie	PA DCNR
Matt Baker	UMBC
Sebastian Donner	WV DEP
Megan Grose	WV DEP
Dave Montali	WV DEP/Tetra Tech
Katherine Wares	CRC
Todd Brajkovich	
David Newburn	UMD
Mary Gattis	LGAC