



Criteria Assessment Protocol Action Team (CAP AT) Meeting

July 13th, 2026
1:30 PM – 3:30 PM

[Visit the meeting webpage for meeting materials and additional information.](#)

Purpose: This was the July monthly meeting for the Criteria Assessment Protocol Action Team. In this meeting, Matt Stover (MDE) presented on the CAP AT Workplan. Then, Tish Robertson (VA DEQ) dove into the behind-the-scenes work of CAP AT Leadership by sharing their proposed decision rules.

Minutes

I. Welcome, Introductions & Announcements

*Leads: **Peter Tango** (Co-Chair, U.S. Geological Survey, USGS), **Tish Robertson** (Co-Chair, Virginia Department of Environmental Quality, VA DEQ), **Matt Stover** (Co-Chair, Maryland Department of the Environment, MDE), **Kaylyn Gootman** (Co-Coordinator, Environmental Protection Agency, EPA), and **Leah Ettema** (Co-Coordinator, EPA)*

Upcoming Conferences, Meetings, Workshops and Webinars

- [Clean Water Goal Team July Monthly Meeting](#) – July 27, 2026, 1pm-4pm. Virtual.
- [Restore America's Estuaries' 2026 Coastal & Estuarine Summit](#) – September 22-25, 2026. San Francisco, California.
- [Chesapeake Watershed Forum](#) – November 13-15, 2026. Shepherdstown, West Virginia. *Session proposals are currently open and due May 27. More information can be found [here](#).*

Announcements

- Call for nominations for Chairs of the Monitoring Workgroup and Data, Analysis and Reporting Workgroup **due Wednesday, July 15th**. Details were shared with the CAP mailing list on June 25th. Please reach out to Allison Welch (awelch@chesapeakebay.net) for further information.

In-Meeting Announcements:

Comment: *Peter Tango:* There are structure and governance updates that align with the revised Watershed Agreement. The Monitoring Workgroup is a consolidation of some of the Scientific, Technical Assessment Reporting (STAR) workgroups. Data Analysis and Reporting Workgroup is also a consolidation of STAR workgroups, including the Integrated Trends and Analysis Team.

II. [Criteria Assessment Protocol Action Team Workplan](#)

*Lead: **Matt Stover** (MDE)*

This presentation was given at the [Clean Water Goal Team June Meeting](#). Matt began by explaining the target within the Water Quality Standards, Attainment and Monitoring Outcome

that charges the CAP AT. This is to develop partnership approved approaches for assessing all designated uses by 2028. Matt explained that they plan on using the States' Multiple-Lines-of-Evidence (SMLE) Approach to meet the 2028 deadline and strive to use the 4-d interpolator for this as well. Currently, they are not assessing all of the criteria and need to address this gap. Their priorities include developing decision rules that can be used with the 4-d interpolator and the SMLE approach.

Next, Matt explained how the 4-d interpolator will work by using existing monitoring data to predict dissolved oxygen (DO) across time and space. The interpolator will provide the estimates, but it won't work through the decision rules and assessment methods. The CAP AT must develop these to use the interpolator results for criteria assessment.

Matt compared the 4-d interpolator and SMLE approach decision rules that will need to be completed. For the rest of 2026, they will focus on the decision rules needed for the interpolator. Matt shares the guiding principles of criteria assessment methods that guide their work and decision making.

Matt shared the timeline for the process. Their goal is to be able to show results and explain methods by the winter.

Discussion Notes:

Comment: *Peter Tango:* One thing we should make sure we capture on the timeline is to develop documentation for the decision rules.

- **Response:** *Tish Robertson:* We'll probably want to plan for some documentation in early 2027.
- **Comment from chat:** *Peter Tango:* Sorry Matt - I see it on the timeline. I didn't see the same thing on the Gant Chart. That was what I was speaking to. Thanks.

Q: *Clifton Bell:* Since you have to build the widget, test it, and compare the 4-d interpolator decision rules to other decision rules, how can you make these decisions in fall 2026? Is this just moving ahead with testing?

- **A:** *Matt Stover:* I think a lot of the rules we are coming up with aren't very controversial. We already use these in other assessment methodologies. I think the testing will be looking for fatal flaws. Some of it will be defining different time periods. We gave a lot of thought for those decisions, like the 7-day period. Strange scenarios could play out when we have real data. We've tried to think about those as best we can. Most of these ideas aren't super novel.
- **A:** *Tish Robertson:* I don't think we'll find any fatal flaws when we test the decision rules. It's more about understanding differences between what we've been doing with the 3-d interpolator and what we could see with the 4-d interpolator. That would be the benefit of testing the decision rules. It's not to see if anything is wrong but to understand what we can expect.
- **Response:** *Kaylyn Gootman:* CAP has been at this for a long time. We're on the cusp of getting to these decision rules. If we are talking about a widget for implementing these decision rules using the 4-d interpolator will come later. Building a widget will not slow down CAP's decision rules.
- **Response:** *Peter Tango:* I agree with Tish and Matt. The upcoming presentation is complementary to what has already been done. It's refining and filling in gaps that have been estimated in the past with the best available information.
- **Response:** *Clifton Bell:* It sounds like you're pretty confident that the testing won't change the decision rules. Maybe that discussion is better held after we get a chance to hear about the decision rules. There are aspects of the 4-d interpolator that we don't yet understand.

Q: Clifton Bell: The decision in the fall to implement the decision rules isn't the final official state decision, correct? That will be subject to a public review as part of our assessment protocols.

- **A: Tish Robertson:** You are correct.

Q: Dave Montali: I am here to try to see the linkages between our current assessment methodologies and the 4-d interpolator. There will be a lot of nuances. We're going to have partnership approved methodology and rules. Then Virginia and Maryland will have their state rules. The goal is to try to make everything consistent, but if they are not, what drives the integrated report? Is it the state rules?

- **A: Matt Stover:** Part of the reason we are doing the state derived method is because we'd like something more immediate. It may be something we hold onto long-term or a stop gap measure. The states potentially anticipate the 4-d interpolator taking longer than we hope before it's ready to be used with the integrated reports. We also wanted something that was easier to explain, easier for the public to understand, and to ground truth the 4-d interpolator assessment results. You've worked with West Virginia for a long time and you're familiar with the assessment methodologies for the integrated report. A lot of them are pretty simple. In a lot of cases, we ask ourselves whether our assessment methodology results make sense. You can make best professional judgement calls based on that. The 4-d interpolator will be a lot more complex than any assessment method we've ever used. We want to have another way to evaluate it and make sure it makes sense. We're also worried about the number of records and whether that can be done on a standard laptop. The standardization of interpolator cells should help. We want to make sure we have a back-up plan. We could keep them both going for a while and see what happens. It's kind of a weight of evidence approach. We haven't considered the possibility of them not agreeing.
- **Response: Dave Montali:** We've used our model output for third day average on deep and open water and the instantaneous minimum (IM) on the deep channel. At x million pounds per year, we've got x level of attainment. I have a big question mark on how this is going to change. If we have our 1995 results and can characterize the attainment at that time and what level of reduction would be needed to reach attainment. How does the 4-d interpolator change that? Even without us changing the base period. We have a certain assessment of attainment in 1995 and then a method to judge whether our best management practices (BMPs) and reductions will result in attainment. I am curious about how 4-d will change the attainment assessment back in the base.
- **Response: Kaylyn Gootman:** These are great questions. You're thinking about the hydrologic base period and how we run model output through our 3-d interpolator to understand load reductions and planning targets. If we stick with those same year sets, we'll be able to use those same monitoring locations from the older years. Updating to newer years, opens up a land of possibility for places where we've collected data in addition to historical long-term monitoring stations and adding in new information from places where we have a host of water quality information and more DO. We know more about the Bay. That additional DO may lead us to find something different than we had calculated before, but we're updating things everywhere for Phase 7. We'll know when we do it and make that comparison. It is an exciting opportunity to advance the method and be able to use more information, especially the high frequency datasets.
- **Response: Dave Montali:** I remember Rebecca saying that the 4-d interpolator won't be much different than the 3-d interpolator back when we didn't have the high frequency data. If we are talking 1993/95, then the 4-d interpolator won't change the base assessment too much. Am I correct?
- **Response: Rebecca Murphy:** We have been talking with the Modeling Team and intend to use the 4-d interpolator with the model output in the same workflow that is currently used with

the 3-d interpolator. If we are interpolating 1995, it would be the same data points that are currently being interpolated. There might be slight differences in the results, but we will be able to understand why. We will still be able to do the 30-day mean and instantaneous minimum computations with the different interpolator. We'd also be able to look at the other time period's criteria. We don't know how that would change results.

Q: *Rebecca Murphy:* If we were using the SMLE method and not the interpolator, would we be able to assess the 1990s period that is important for the model scenarios? They are probably designed with the idea of having high frequency data.

- **A:** *Tish Robertson:* Yes. We are coming up with an assessment framework that works on our routine monitoring data. We have that data in the 1993-95 period.
- **Response:** *Kaylyn Gootman:* I guess it all comes down to what the rulesets are from CAP. How do you interpret those outputs that define whether you know something is in attainment for that designated use?

Comment: *Peter Tango:* The type of assessments that we are now capable of include hourly profiles of water quality information. Would you be recommending that hourly output of our model at our stations would be used to mimic the expectation of having the capacities we do now? This would be different than what was done with two sample long-term monitoring. Thinking of how the modeling group is anticipating meshing with the capacities we have now. Putting this out there as something to think about as those discussions happen.

III. Proposed Decision Rules for the 4D Interpolator-Based DO Criteria Assessments

Lead: Tish Robertson (VA DEQ)

This presentation gave an overview the decision rules that staff members at MDE and VA DEQ have been working on. These are general decision rules that could be applied to any high frequency datasets and those that pertain to the 4-d interpolator. These decision rules are the priority for CAP in 2026. Tish covered the guiding principles of criteria assessment methods that Matt went over in his presentation and explained how this guides the decision rules being made by the CAP AT.

Tish broke the decision rules into three categories: 1) Rules for how to temporally aggregate the output of the 4D interpolator, 2) Rules for determining which interpolator cells are assessed against a criterion in cases where the pycnocline depth is important and, 3) Rules for how to determine criteria attainment.

1) Rules for how to temporally aggregate the output of the 4D interpolator

The first proposed decision rule is the hourly average for instantaneous minimum criteria. These don't have an explicit duration, which would have the assumption that there is no averaging period. It is just an instant in time you are evaluating. We know that the 4-d interpolator won't get more precise than one hour. MDE and DEQ staff have settled on an hourly average for the instantaneous minimum criteria because that is the smallest value that will be assessable. Tish pointed to a study on hypoxia that provides rationale for this decision. This will be a big change compared to the current protocol used with the 3-d interpolator.

The second proposed decision rule would be rolling, non-overlapping periods for 30-day and 7-day mean calculations. Tish showed how the rolling periods differ from the current calendar period method. This is for the summer monitoring period. MDE/DEQ decided they liked the rolling calendar option because they have more periods with the full seven days.

The third proposed decision rule is dates and date-hours for 1-day mean and instantaneous minimums. They decided the calendar works for the short duration criteria. They would use dates for the 1-day periods and date-hours for the hourly estimates assessed against the IM.

The fourth proposed decision rule requires a minimum 50% temporal coverage for assessing 30-day and 7-day means. Tish showed some examples of how this would work. Each table pertained to interpolator cells. Tish's first example showed how this would work for the open water 7-day mean. One of the assessment periods in this example would not be included in the assessment for the criterion because it only has 3 days and needs at least 50%, which would be 4 days. The second example is for the migratory fish spawning and nursery use 7-day mean. For this assessment criteria, a low mean salinity is required. In this example, those periods need at least 4 days with a low mean salinity. If there aren't at least 4 of these days, the criteria is not computed.

2) Rules for determining which interpolator cells are assessed against a criterion in cases where the pycnocline depth is important

Next, Tish moved into the rules for determining which interpolator cells are to be assessed against a criterion in cases where the pycnocline depth is important. The pycnocline doesn't apply to all segments of the Bay but is extremely important for the two designated uses that rely on the pycnocline, the deep water and deep channel use.

Tish spent some time describing the criteria protocol for those that rely on the pycnocline. For these designated uses, the interpolator cell must be within that designated use (above/below pycnocline) at least 50% of the time. Only the data within that designated use should be used in assessment.

Tish showed a visual of how the pycnocline would be considered over a 7-day mean period. Based on where the pycnocline is each day, they would calculate the percentage of time that each cell was in the open water use. They would use the 50% rule and compute a 7-day mean for cells that are in the open water use at least 50% of the time. This is also used for the 30-day mean at that scale. For instantaneous minimum, this method wouldn't be used. This method would be a departure from what they are currently doing.

3) Rules for how to determine criteria attainment

Next, Tish went into the rules for how to determine criteria attainment. Tish mentioned that this would be diving deep into cumulative frequency diagrams (CFDs) but she is happy to talk with anyone if they'd like to further understand water quality standards. Reach out to her at tish.robertson@deq.virginia.gov.

First, Tish shared that each assessment value should be rounded to the tenth. In this, they would compute the 7-day mean for each period. The water quality criterion of 4.0 has two significant figures, so the mean must be rounded to two significant figures, however it is currently calculated to the thousandth place. This is a policy at VA DEQ that Tish recommends the group use. This rounding should be done right before the assessment. While calculating means, there shouldn't be any rounding yet. The instantaneous minimum criteria assessment should only be done with rounded values.

The next proposed decision rule is that a segment CFD must have a minimum of four assessment points. Tish provided an illustration for this. In scenario 1, they are looking at results for a segment. They count the exceedances in an interpolator cell and calculate the proportion of the volume that isn't meeting the assessment criterion. In this example, there were only two periods where spatial exceedance rate was able to be calculated. The CFD is built based on those two points. The two points at the end of the curve are to make the curve look good and don't count as

assessment points. In scenario 2, there are two more periods that can be assessed. This CFD is built with four assessment points. They are proposing that scenario 1 wouldn't be used for the attainment decision but they would use scenario 2. This is because there are enough points to do a good job with the approximate distribution of the space time exceedance frequency, which is what the CFD allows them to do.

The third proposed decision rule is that assessment CFDs should be selected from the 90th percentile of realization CFDs. For the 3-d interpolator CFD procedure, they produce a single assessment CFD for each segment criterion combination. This is compared to a reference curve. The 4-d interpolator would allow them to do multiple realizations/simulations and have many CFDs to show the uncertainties, variability, and distribution. They needed to understand how to make an attainment determination from multiple CFDs. They considered multiple options. The first would be to take the average CFD from the realizations. However, this would mean that a segment could attain a criterion with 50% of the CFDs indicating it didn't attain. That is a high false negative rate. The 90th percentile CFD would give more comfort. There would be a slight error rate, but it would be protective. This is what they decided on.

The next proposed decision rule is subtracting the area under the reference curve from the area under the segment-criterion CFD and rounding to the hundredth's place. If the difference is more than 0.00%, the segment should be judged as failing the criterion. Tish showed the reference CFD that is currently used to delineate the allowable space-time exceedance frequency. She showed three examples that currently indicate nonattainment because the assessment curve should not cross the reference curve at any point, no matter how small the excursion is. This rule means a segment can outperform the reference curve most of the time but have one period where it goes over the line. They are proposing that they will continue to use the reference curve and generate it in the same way but would test compliance by subtracting the area under the reference curve from the area under the assessment curve. If the difference is greater than 0, then the segment would fail the criterion. If it was less than or equal to 0, it would meet the criterion. This would move away from testing the shape of the space-time exceedance frequency and instead look at the magnitude. Tish showed two examples. One where there isn't attainment and one where there is, despite the assessment curve passing the reference curve during a period. Tish provides rationale for this decision which includes lack of peer-reviewed science, alignment with existing protocols and participation with the 10% allowable exceedance frequency.

The last proposed decision rule is that a bioreference CFD should be approved by staff of the tidal Bay jurisdictions. This should be a partnership decision where water quality assessment staff review the work.

Tish included some reference materials that guided the decision making on slide 35.

During Presentation Discussion Notes:

After the first decision rule category:

Q: *Dave Montali:* Did you consider a true rolling seven-day? Instead of doing 1-7, you'd do 1-7, 2-8, 3-9, and so on.

- **A:** *Tish Robertson:* Yes, I did. The issue is we come up on computation constraints. We have lots of interpolator cells that we'd be doing these calculations for. That's something we'd be concerned about if we were doing a moving window approach. That's a valid point.
- **Response:** *Jon Harcum:* I don't think the computational part of calculating the running average is that big of a deal. If it's only a computational issue, when we try this out, we may find that it's not an issue. I don't think it should be driving your decision.

- **Response:** *Tish Robertson:* I don't have any qualms about it. I've done a moving average on high frequency data and that's been something I've had to deal with. Maybe your laptop has more RAM than mine.
- **Response:** *Jon Harcum:* I don't think my laptop does. You may need to do your computations in R instead of Excel.
- **Response:** *Tish Robertson:* I do all of my computations in R. That's something I'd be concerned about. Other than that, I wouldn't have any worries.
- **Response:** *Rebecca Murphy:* Maybe we'd be able to do a couple of tests and show computational time based on the ways you code for different averages, it might be ok.

Q: *Rebecca Murphy:* Is open water 7-day a year round criteria?

- **A:** *Tish Robertson:* Yes, but we break it out between summer and non-summer. The summer 30-day means are not assessed in the same CFD as the non-summer months. You build separate CFDs for those time periods.
- **Response:** *Rebecca Murphy:* Excellent. That answered my next question because I know that's how that's done now for the 30-day mean. I was wondering if that is something the team wanted to keep.
- **Response:** *Tish Robertson:* Yes. I believe that is in our water quality standards that we have to do it that way.
- **Response:** *Rebecca Murphy:* I imagine you are proposing to do the 30-day means as 30 days rather than the calendar months.
- **Response:** *Tish Robertson:* Correct. These would be true 30-day periods, rather than approximately 30 days in the method we were using.
- **Response:** *Rebecca Murphy:* It would be 30 days for the non-summer and 30 days for the summer, but then there would be a few days in each case at the end that wouldn't be included.
- **Response:** *Tish Robertson:* Correct. Even if we went with Jon's idea there would still be some truncation.

Q: *Clifton Bell:* In example one, the last period doesn't extend into October. Is that because it's the end of the assessment period?

- **A:** *Tish Robertson:* Yes. This is the summer open water 7-day mean. The summer period stops September 30th.

After the second decision rule category:

Q: *Dave Montali:* I'm worried about the others on the bottom line, where three out of seven days aren't expected to meet the criteria. Did you consider excluding any cell that contains a blue box in the 7-day period?

- **A:** *Tish Robertson:* No, we thought 50% was a good cut off. There will be some classification error because the hourly DO estimates won't be temporally matched with the pycnocline boundary estimates. Those are on a daily timestep. It is possible to classify an hourly DO estimate as open water when technically it was deep water and vice versa. This would be a way to maximize the assessment dataset for any particular criteria without being overly inclusive. That was our goal with the 50% rule. I would be interested to hear another threshold to consider.
- **Response:** *Rebecca Murphy:* For the 57% cells, the 7-day average for open water would only be for the days that the cells fell in the open water. It wouldn't include results from the other 43% of the time. I remember that you presented this last summer, and we thought it was feasible to implement and made sense. Things can be changed too.
- **Response:** *Tish Robertson:* That's correct.

- **Response from chat:** *Peter Tango:* I think right now we are saying that the pycnocline is either set for 2 weeks (within a cruise period) or a month of the same. Now we are getting to daily assignments - much more in line with how the bay works, I think. And I meant my message to reference how the 3D interpolator has worked with the long-term biweekly to monthly data.
- **Q:** *Dave Montali:* Any blue box would not be included in the open water average. Is that what you were saying?
- **A:** *Tish Robertson:* Yes.
- **Q:** *Dave Montali:* That's fine then. The two that are pink don't ever get assessed for the open water use, correct?
- **A:** *Tish Robertson:* Not for this particular period.

Q: *Clifton Bell:* If you're already excluding the cells based on day, why do you need another decision rule to exclude the cell entirely? Aren't you already taking care of your concern whether it is above or below the pycnocline based on individual day? You clarified that you are making a daily decision on whether to include cells based on the position of the pycnocline. Why do you need to entirely exclude a cell when you've already excluded that data?

- **Response:** *Tish Robertson:* I don't think it's fair to say we're excluding the cell. For the pink cells, the hourly estimates for the days that were above the pycnocline are being used in the open water IM assessment. We're not throwing them out of the designated use completely. For this period, the 7-day mean, we're not using the DO estimates. It's like a continuation of the 50% rule from the previous slide. We don't have enough days when it was in the open water use to feel comfortable computing a 7-day mean at those two cells. We need to have at least 50% coverage of that period in that designated use to go forward with the 7-day mean computation.
- **Response from chat:** *Peter Tango:* Criterion dependent evaluations are connected to what I think you are asking Clifton.
- **Response from chat:** *Rebecca Murphy:* We average cells individually to get a 7-day mean DO by cell. So, this decision is which cells to include in the 7-day mean specifically.
- **Response:** *Clifton Bell:* That makes sense. I understand that you don't have enough data to calculate that average.
- **Response:** *Tish Robertson:* Yes, I probably should have said that before. Your question helped me realize how I should communicate that.

Comment: *Richard Tian:* I wonder whether we computed the average of the pycnocline over the seven days and then used the average pycnocline to do the criteria assessment. I think that's what we're doing currently for the 7-day mean.

- **Response:** *Tish Robertson:* I like having the daily timestep to the pycnocline because we know it's variable. If we were to average it over a longer time period, then we'd have a higher classification error rate.

After Presentation Discussion Notes:

Q: *Elgin Perry:* I think all of these well thought out and documented decision rules bode well for the timeline Matt shared earlier in the call. I can easily imagine translating all of this into computer code. I have a question about the minimum number of samples for the CFD. If you had four points and they were all zeros, meaning there is no exceedance, you would have four points on the y-axis and the lowest would be at 0.2. If you drew a line from that to the 1.0 point on the far right, I think it would be above the reference curve. It would be interesting to have a dataset that has no exceedance but results in a reference curve that has the possibility of exceedance.

- **A: Tish Robertson:** I think you are right and I know exactly what you are saying. I have played with different combinations of exceedances. That's helped inform my recommendations to the group. There are some crazy scenarios where we are failing. That's why we want to retain the reference curve. If we retain the reference, then we will be on safe footing. If we have a reference curve that is drawn on the same number of points, then we can't fail the scenario you just described.
- **Response: Elgin Perry:** So, you create your reference curves with the same number of points as in the assessment data.
- **Response: Tish Robertson:** Yes. That means the allowable exceedance rate is not fixed. It will always be a function of how many assessment points you have.
- **Response: Elgin Perry:** I was concerned with the theoretical continuous reference curve.
- **Response: Tish Robertson:** In the reference to the 2007 document, it does say to use a continuous reference curve. Later there is a publication that instructs not to use the continuous distribution, but the segmented reference curve based on the same number of reference points as the CFD.

Comment: Clifton Bell: About 20 years ago, there were comments about using the area under the curve because we didn't think there was much science behind the shape of the curve. I support that one. I have some alarm bells about the 90th percentile realizations. This seems to impart a bias. Elgin gave a presentation on how you might consider uncertainty in the output. You could give the benefit of the doubt to the regulatory community or to the environment. I thought DEQ's position was that based on the existing methods, they don't bias it either way and go straight down the middle.

- **Response: Tish Robertson:** We want to minimize type 2 errors. We don't want it to be biased, but we want it to be protective. What's the best way to do that? I'm open to suggestions. Taking the average CFD might be fraught but I'm open to hearing the argument for that.
- **Response: Clifton Bell:** The benefit of those realizations is to get the best estimate of the expected value. If we're trying to be consistent with existing policies and methods, that would have a 90% bias. If we are considering anything like this, it needs testing. In areas where you have high variance, the 90th percentile may be really high. It may preclude attainment given the amount of uncertainty. Of the ten rules you presented today, I think all of them looked great except for that one.

Comment: Peter Tango: I am excited about the advances and recommendations here. When thinking about what you are saying, Clifton, there was the 2003 documentation with recommendations on curves. This covers how much variability there was in the different proposals for some of those reference curves. The 2003 document has some recommendations that weren't picked up. That's a beautiful way to incorporate the variability. We've had challenges expressing how the organisms perceive the environment. Kudos to the team for working on that and fleshing it out. It plays into the conversation that Elgin has brought to us about how we address the variation around the curve. I think it is backed up by information we had about the variability of those curves. This is a good application stepping forward.

Qs from chat: Jon Harcum:

- 1) Do you mean Excel-like rounding or Programming-like rounding?
 - **Response: Tish Robertson:** We do the rounding in R. We call it the round to even rule. It's not Excel rounding.
- 2) In slide 23, is there a minimum number of cells that contribute to the migratory fish spawning nursery use since perhaps only a portion of the segment might?

- **Comment:** *Jon Harcum:* Let's suppose we're looking at the graphic on the right of slide 23. If we have the specific salinity, where only a portion of the segment is contributing to that 0.04 spatial exceedance, how little of the segment needs to be part of that?
- **Response:** *Tish Robertson:* We didn't come up with the decision rule for spatial coverage, and I don't know if we need to or how we would do that. It wouldn't be 50% like we have in time. That might be something that we need to work out. The migratory fish spawning nursery use is weird because it doesn't encapsulate the fullness of all the segments. The salinity in a mesohaline segment is going to be really high. You're only going to have one or two interpolator cells in a segment that met that condition.
- **Response:** *Jon Harcum:* The deep channel can be a fairly small body of water.
- **Response:** *Tish Robertson:* The open water use can too, if you just think about it as the surface cells that are included above the pycnocline. It might be a small sliver of the overall volume of the segment. We don't have any rules for that currently. We will build a CFD on any spatial exceedance rate. Maybe we should just keep doing it that way.

3) When you say, "select the 90th percentile CFD," do you mean select the realization whose CFD area is at the 90th percentile, or construct a CFD from the pointwise 90th percentile y-values across all realization CFDs?

- **Response:** *Tish Robertson:* I was thinking about it in terms of area. I suppose you could also do it for each assessment point. You would calculate the 90th percentile spatial exceedance rate and then build a CFD based on that. Based on the decision rule we've come up with for comparing areas, it makes sense to do it on the area of the simulation CFDs.
- **Response:** *Jon Harcum:* So, calculate the areas for all simulations and then the 90th percentile of the area would be used.
- **Response:** *Tish Robertson:* Yes, that's what I'm saying.

Comment: *Dave Montali:* A while ago in the Modeling Workgroup, I heard that if you have multiple models, then your best prediction of the true condition is the average of those models. I don't know if that helps with the decision to make on the percentile you want to use.

Q from chat: *Peter Tango:* Food for thought on the minimum of 4 points for the CFD. There is a "50%" theme for inclusion in other steps. Would 50% required criteria periods be too high of a bar (a feeling you are throwing away good information if you had 49% or less but more than 3 points)?

- **Q:** *Peter Tango:* You mentioned the minimum of four data points. Other steps include a minimum of 50%. I was curious if you had a reason for four points as opposed to the 50% rule.
- **Response:** *Tish Robertson:* Initially, I threw out 10 points, but the group believed that was too many. It's more of a gut feeling. We don't have a technical reason for going with four. I like four because it looks like a better approximation than two points. If we were to do an assessment for the 10% reference on the examples on slide 23, scenario 2 would meet the criteria but scenario 1 would fail, even though the spatial exceedance rates are really low. I like having an extra few data points to make sure you're not condemning a segment from a small snapshot in time.
- **Response:** *Peter Tango:* Thanks. I was looking for your opinion. We have lots of good information so I don't want to toss something out if it's good information but I understand that you are being protective of the results.
- **Response:** *Tish Robertson:* I can only imagine that this kind of decision for the 4-d interpolator would only apply to the migratory fish spawning and nursery criteria. Even

with the deep channel and deep water uses, the designated segments will almost always be stratified over the summer so we would have more than just two assessment points. For this criterion, I could see it being complicated because we have mesohaline segments that are designated for it and they won't always meet that salinity condition. There was a reason why I picked this criterion to focus on.

Q: *Clifton Bell:* Can we talk about when decisions will be made for these decision rules? Is the group going to have time to think about this and reconvene? The timeline slide had a fall 2026 decision.

- **A:** *Kaylyn Gootman:* We do have a tight timeline, but there is space to have ad hoc meetings as needed. If you let us know, the Leadership Team can explore options for increased engagement.
- **A:** *Tish Robertson:* We want to see a presentation from the Bay Oxygen Research Group. It doesn't have to be all of the criteria, but it would be nice to get preliminary results sometime in the Fall. We could convene a CAP meeting for that presentation. Maybe we lighten up on the timeline. I was thinking we could aim for November to take another pulse check from CAP to see how comfortable everyone is. We might have revisions to share with the group based on the feedback we received.
- **Response:** *Kaylyn Gootman:* I like those suggestions. I am happy to hear what others think. That will give us a few more CAP meetings and we can always organize an offshoot meeting to do a deep dive into a particular subject.
- **Response:** *Jon Harcum:* In terms of getting results in a timely fashion, it would be nice if some segments could be suggested to target result efforts. Fishing Bay had relatively high DO except for one station. That's probably not an interesting example when looking at CFDs and these decision rules. It might be more interesting to pick a borderline segment.
- **Response:** *Matt Stover:* Sounds good, Jon. We feel the same as Tish. It isn't over until we propose it for the integrated report and put it out for public review. Until we see results, there isn't a decision to be made on a lot of this stuff.
- **Response:** *Elgin Perry:* If there are contentious rules that you'd like to see with different options, it would be good to pass that onto us so we could prepare examples.
- **Response:** *Tish Robertson:* I think it would be worth doing the percentile selection in multiple ways.
- **Response:** *Matt Stover:* I was about to say the same thing.
- **Response:** *Peter Tango:* Me three.

Comment: *Kaylyn Gootman:* If you've had time to digest today's presentations and you have questions, please reach out to our team (gootman.kaylyn@epa.gov).

IV. Adjourn

Next Meeting: August 10, 2026

Attendees:

- | | |
|------------------------------------|------------------------------|
| • Allison Welch, CRC | • Joe Morina, VA DEQ |
| • Amanda Shaver, VA DEQ | • Jon Harcum, TetraTech |
| • Carl Friedrichs, VIMS | • Joseph Wood, CBF |
| • Cindy Johnson, VA DEQ | • Juan Vicenty-Gonzalez, EPA |
| • Clifton Bell, Brown and Caldwell | • Kaylyn Gootman, EPA |
| • Dave Montali, TetraTech | • KC Filippino, HRPDC |
| • Elgin Perry | • Kelly Gable, EPA |
| • Gabriel Duran, CRC | • Mark Brickner, PA DEP |

- Mark Trice, MD DNR
- Matt Stover, MDE
- Melinda Culter, MDE
- Michael LaSala, Land Studies
- Normand Goulet, NVRC
- Peter Tango, USGS

- Rebecca Murphy, UMCES
- Scott Heidel, PA DEP
- Sophia Grossweiler, MDE
- Suzanne Trevena, EPA
- Tish Robertson, VA DEQ