

DAY 1 Discussion Questions

WQGIT Phase 7 Meeting

October 25, 2021

What is working well for you in the Phase 6 suite of modeling tools (e.g. CAST/ Watershed Model, Estuarine Model, Airshed Model)?

CAST

CAST and the Airshed Model

Running scenarios works well in the existing CAST

CAST

CAST and the Airshed model

Watershed Model

The ability to update the model to incorporate new data.

CAST Scenarios

Using CAST to evaluate different options/scenarios



What is working well for you in the Phase 6 suite of modeling tools (e.g. CAST/ Watershed Model, Estuarine Model, Airshed Model)?

It is helpful to be able to customize geographies down to local HUCs.

CAST as a public facing interface

WSM and the submodels dealing with ag and urban loads, respectively.

Watershed Model and CAST

CAST is useful for developing targets for implementation and evaluating load reductions and progress. A lot of good info in CAST really.

Accessing land use and BMPs data from CAST

CAST application; running scenarios.

CAST, understanding large- scale sector progress.

Using CAST to track BMP implementation (and associated WQ improvements) across the watershed



What is working well for you in the Phase 6 suite of modeling tools (e.g. CAST/Watershed Model, Estuarine Model, Airshed Model)?

CAST Scenarios

Visualization and access of inputs, such as animal numbers, etc.

Documentation available helps with transparency

CAST Scenarios

CAST and ability to test suites of preferable BMPs for effect

Data handling and reporting (CAST Outputs)

Watershed model hydrology

CAST

Visualization tools



What is working well for you in the Phase 6 suite of modeling tools (e.g. CAST/Watershed Model, Estuarine Model, Airshed Model)?

CAST. Helpful for WIP planning. The improvements for Phase 6 were significant relative to Phase 5 (nutrient spread, replacing the unlimited pool of fertilizer with one based on an estimate of sales, etc.). It's a solid base to work from for Phase 7

Good comprehensive load estimates from watershed and airshed. CAST is relatively easy to use.

Being able to use CAST for large-scale progress tracking (looking at state goals)

CAST BMP reports that can be broken down by county

CAST is really useful for getting the loading rates for land uses. I also use the graphs showing the trends over time. CAST is the only publicly available source of the air model data used by CBPO.

Visualization Features

Differentiation of federal agency lands



What would you like to see changed in the Phase 6 suite of modeling tools?

Characterization and articulation of uncertainty

Ag input refinements with new data sources.

Determining the benefit of specific efforts and weighing them against others is not simple.

Legume assumptions

Evaluating Co-benefits (flooding, Carbon, air quality, etc) with NPS would be helpful- I believe this was contemplated as part of a STAC Workshop.

Ag and urban load rebalancing.

Differentiate federal agency lands

Working from the Phase 6 base, perhaps an effort to re-evaluate application curves, N fixation, soil P, land use/crop types, land use loading rates, fertilizer accounting, etc.

Address benefits to other outcomes, such as stream health, toxic contaminants



What would you like to see changed in the Phase 6 suite of modeling tools?

Model documentation that allows users to easily track how Phase 6 (or the new Phase) functions

Urban load refinements, incorporation of local monitoring data

Ag input refinements

The connection between air sources and management efforts is very unclear, particularly on the ammonia side.

Simplification of agricultural model. It is too complex and leads to weird results.

Ability to see percent of load reduction from each BMP type when building a scenario e.g. forest buffers account for x% of load reductions in scenario

Improved and simplified processes to capture and credit existing BMPs, especially those related to BMPs for nonpoint pollution control.

Water quality monitoring and assessment usage of data that is not currently being used

Better urban fertilizer data

What would you like to see changed in the Phase 6 suite of modeling tools?

Tracking Bay Agreement outcomes, in addition to WQ progress

Add ability to model incremental progress, attainment in individual segments and uses

Add the land use model to CAST.

Improve transparency of NEIEN to CAS5 data reporting

Ability to run different climate change scenarios.

A better way to track annual BMP implementation progress without the issues that currently arise due to BMP expiration

Manure/ Fert applications, Ag Data Inputs, application/model assumptions

Better land use change estimates

Publicly accessible tracking of BMP losses through verification and back-out and cut-off



What would you like to see changed in the Phase 6 suite of modeling tools?

Means of encouraging reporting and crediting of agricultural BMPs.

Nutrient speciation

Ability to simulate BMP effectiveness spatially

Better P dynamics in urban watersheds

SAV nutrient sinks simulation

Improvement in urban phosphorus sensitivities to Nutrient Inputs
Improvement to Stream bed and bank loads

More data for calibration in the WS model. Improvements in shallow water modeling (Estuarine model) and being able to better assess WQS for all Designated uses.

Efforts, which have important influences on bay tributaries, but limited effect upon the most sensitive segment are not 'rewarded' in CAST.

Differentiate State lands.



What would you like to see changed in the Phase 6 suite of modeling tools?

Link annual reporting to CAST so we can see the date of implementation

Data that captures what forests and wetlands are lost

Add all of the 30 outcomes to CAST

An simulation option made available for finer scale assessment in the watershed and in the tidal Bay so that all watershed streams and the tidal tributaries and embayments can be simulated.

Easier Stream Restoration crediting

Improve Representation and Simulation of Land Use Change 1985-2035

Improved agricultural data, looking to additional data sources beyond ag census

Transparency in land use change model

comparing year to year scenarios is very challenging because inputs (or understanding of inputs change) For instance, ag census data causes years that follow each other to appear significantly different, for reasons unrelated to progress.



What would you like to see changed in the Phase 6 suite of modeling tools?

Better wetland data tracking

Improvements to abandoned and historic mined lands

Some assessment of uncertainty could be beneficial.

Better means of communication to stakeholders about the modeling processes and results.

modeling monitoring comparisons available

More flexibility to take advantage of higher resolution data.
Improved documentation on the website

Faster updating of progress scenarios

Groundwater loads quantified as a source

Living resources interactions



What would you like to see changed in the Phase 6 suite of modeling tools?

Capture nutrient load from solar farm conversions

Accomodate PCBs and other pollutants

The tidal water monitor was not discussed today but has been in the previous two meetings. The attainment of standards, which is based on monitoring, needs to be used i for more strategic decision making.

Artificial increases in ag loads in multi-cropping systems should be evaluated

Better definition of wetlands, of their hydrologic and biogeochemical cyclings trends (including forms of N, P, and C)

Further assessment of uncredited BMPs

More local scale impacts

What are the key takeaways from the previous 3 presentations on modeling and monitoring?

We have made a lot of progress but there is still a lot of work to do

A land use map would help partners to visualize where BMPs could be targeted.

Have the prior 8 model updates improved the partnership's ability to plan/target implementation?

It is an evolving process and the program is assessing how best to utilize existing monitoring data

There is still the influence of policy decisionmaking in determining states' response to modeling

Opportunities exist for improvement. We have a long, acclaimed history of leading edge model development.

Modeling is an iterative and nuanced process

Need to incorporate more local tidal water monitoring data rather than extrapolate all loading assumptions from nontidal areas

We are making steady progress, one step and at a time.



What are the key takeaways from the previous 3 presentations on modeling and monitoring?

There is progress to be made to match model inputs/outputs to what we are seeing in on-the-ground implementation and monitoring.

Monitoring may affirm the accuracy of modeling results and decisionmaking, but not a given that monitoring may drive decisionmaking.

We need to provide better context on utility of the model to policy makers using the model to make decisions...

The modeling tools have made significant progress over time, however there are still gaps that should be addressed in order for the model to be more informative toward planning and assessing performance

Still unsure of the planning targets. It seems a foregone conclusion that there will be a p7 watershed model. With a new watershed model, planning targets will change, correct?

The focus in deep channel as a promise ignores shallows and we need a policy shift at the highest levels if we want to show progress where we have most interaction. With local waters

We need lead time to communicate changes in load targets to leadership.

It may be unreasonable to think the models can drive implementation in the future.

Still unclear how monitoring influences delivery factors and how those will be updated



What are the key takeaways from the previous 3 presentations on modeling and monitoring?

CAST and Bay modeling cover a lot- but ultimately the goals of the tools are to help make better decisions for bay outcomes, and hold partners accountable for past efforts.

Still lack of data from tidal/ coastal plain, need to incorporate monitoring efforts

Additional monitoring efforts should be made.

Need to verify lag time assumptions in model with monitoring data

We need to invest more in monitoring and tweak the model. To serve more needs

What we were doing 30 years ago, is a lot different than what we are doing now... We should probably expect continued levels of change moving into the future.

Doing the same things we have tried 8 times over and expecting a different outcome

Future modeling should not simply tweak what we are doing and already know. Instead, test our underlying assumptions (deep channel goal) and how the changing world/watershed is going to impact our efforts and what we may need to do to adapt efforts.

We need a way to merge our tools so mapping and CAST are mutually supportive and add co benefits sooner rather than later



Have these presentations changed any response and feedback provided from the earlier Round Table? (If yes, please specify)

We need to step back and reconsider the big picture questions we want the models to help answer

Tidal monitoring data and progress toward attainment needs to be used more in the decision making for water-quality.

Yes, nuances reshuffled priorities

Not really; the presentations were helpful, but I think there are a number of ideas for a wide range of topics. I'm not sure we've really touched many of those newer ideas.

It is still unclear as to where we should start with prioritization of the work that should be done for Phase 7

No. Primary concern remains identifying priorities for future modeling efforts and where our efforts and energies should be targeted.

Progress on nutrient load reduction is disappointing -- at first glance. Would there be benefit to estimating through modeling, and, showing what the current situation would be if no or few BMP actions had been taken?

No

Maybe, gave me more info, need to think it through.



Have these presentations changed any response and feedback provided from the earlier Round Table? (If yes, please specify)

No.

Gave content to consider prioritizing

No, not really. I think there needs to be more time dedicated to asking for ideas, what the current problems are that could be addressed, etc.. that was a very short part of the meeting.



DAY 2 Discussion Questions

WQGIT Phase 7 Meeting

October 26, 2021

What does the WQGIT want to see done differently with new suite of modeling tools to advance implementation efforts & achieve water quality goals?

Relative confidence of inputs distinct by source sector with outputs

More explicit modeling of the incentive programs in place (particularly for ag) and how they have influenced implementation.

non point source responses

centralized location for all web-available modeling tools

Greater understanding, incorporation and public outreach of fiscal and financial impacts of model effects on land management and conservation practices.

MBM - improve Shallow water simulation for CC, improving problem tribs and incremental attainment. MTM should wait.

more transparent about uncertainty

dynamics in shallow water

Evaluate what's working and what's not



What does the WQGIT want to see done differently with new suite of modeling tools to advance implementation efforts & achieve water quality goals?

We need to address the PSC and EC direction on 2035 climate change assessment.

Focused attention on subject areas on where implementation has been limited

Addressing uncertainty

more time for WTWG and source sector WG review

Greater opportunities to evaluate tradeoffs

Focus on shallow waters modeling in part because they introduce significant uncertainty that modeling could help flesh out a little bit more. Focus on shallow waters also readily engages stakeholders, including mobilization of resources .

simplify nutrient application calculation

Wait on MTMs, don't focus too much on being spatially explicit, scales are too different

Evaluate land use change over time and review land use policy bmps based on the evaluation



What does the WQGIT want to see done differently with new suite of modeling tools to advance implementation efforts & achieve water quality goals?

focus on progress that can be made in shallow waters

Refine agricultural inputs for WSM and CAST

Focus on bmps with co-benefits to achieve multiple benefits

Transparency of input data sources and robustness, consistency, and similar metadata

tools that prevent Technical assistance staff from focusing on verifying rather than implementing.

More details on how urban loads and nutrient sensitivity will be revised

more transparency (in terms of simplicity), user understanding of how simulation is being done

Refine Nutrient assumptions in WSM and CAST

targeting with implementation



What does the WQGIT want to see done differently with new suite of modeling tools to advance implementation efforts & achieve water quality goals?

Recognition of spatial limitations based on uncertainties

consider info provided to us from STAC - more effective implementation, rethink criteria...

whatever we do. communication of the strengths, weaknesses, applicability of tools need to be better communicated to the public

regardless of changes made to modeling to reflect physical process simulation improvements, concern that modeling is being used for purposes beyond the TMDL

Find additional data sources to support agricultural simulation.

Compare phase 6 or 7 with other models such SPARROW, specifically future climate impacts on water quality

we need models that would allow the assessment of different water uses (for example cold water and small embayments) and to show progress at the scales where progress has been made

CAST Transparency - Ability to see all of the reported BMPs, verification, backout and cutoff in one report

Include groundwater loads as a separate load source



What does the WQGIT want to see done differently with new suite of modeling tools to advance implementation efforts & achieve water quality goals?

Build on Bay Data Dashboard, Tributary Reports, Land Use data and Chesapeake Conservancy BMP Opportunities work to aggregate those products into a BMP targeting tool

moving into 2025 with a stable model to support regulatory stability

unless we can spatially capture landowner willingness, let's not spent significant staff and financial resources on targeting

Investing in tracking tools (Satellite imagery, Fertilizer data, etc) that avoid the need for onsite verification and will last for decades to come.

Progress scenarios should make clear what changes due to management (BMPs, Investments, Etc) and what changes due to growing pressures (growth, animals, Climate)

Recognition that uncertainties cannot be eliminated completely. That the best way to handle uncertainty is to be transparent about it.

We need an evaluation of what commitments we fell short of and why.

incorporate co-benefits of each practice that can be selected by the user

Relative confidence of estimated loads as an output metric, even qualitative like high or low.



What does the WQGIT want to see done differently with new suite of modeling tools to advance implementation efforts & achieve water quality goals?

Improved cost estimates

Co-benefits, Co-benefits, Co-benefits, Co-benefits,

Build BMP targeting tool outside (but linked in) CAST. Use Bay Data Dashboard, Tributary Reports, Land Use and CC BMP Opportunities work as a starting point

Models being able to demonstrate incremental progress in terms of WQ Attainment, can help support decision making.



What functionality can the tools provide to support decision making?

Ability to assess attainment.

provide scenarios and options

inform, but not determine, on-the-ground implementation

If accurate, it will help state and local stakeholders and decisionmakers implement cost efficient and environmentally effective practices.

Refined scales or targeting is of little use to most localities; reality is that stormwater BMPs are sited by MS4 localities based on availability of sites and costs and by developers based on economics and regulatory requirements.

Demonstrate progress toward targets

Ability to see impacts on WQ while planning for implementation.

Tools should be used for state wip implementation, tracking and assessment, not overly refined at small spatial scales

Qualitative estimates of confidence based on BMP mixes and land uses inherent to geographies and scenarios



What functionality can the tools provide to support decision making?

Estimated lag times based on BMP mix

Evaluate progress of the partnership's efforts, year over year, and identifying where we did not achieve the goals we set.

Provide the framework for a discussion on how to implement management practices for a better, healthier watershed and tidal Bay

Improve transparency and enhance communication with stakeholders.

Upfront communication about what spatial scales is model output most accurate and therefore usable

Identify specific 'value' of management efforts, and predict what level of incentive is necessary to increase implementation.

It will also help identify for state and local stakeholders and decisionmakers needed technical resources and direct financial resources to meet those needs.

provide feedback that helps elucidate progress or lack of progress

Provide a menu of options/BMPs to consider.



What functionality can the tools provide to support decision making?

Land use change patterns

Provide information regarding which aggregate set of BMPs are associated improvements in load reductions where.

identify where state leadership can make the most influential policy decisions.

Improved cost estimates with NRCS tie in

What was mentioned earlier (I think by James) related to ag land values/production costs/commodity prices is interesting. Don't know that could be realistically be accommodated. cost of taking land out of production is critical to decision-making.

credit for air emission reduction

Evaluate the incentive structures (what are we underpaying for, what are we overpaying for) of various programs that are directed towards achieving bay goals.

More explicit consideration of air sources, and how management factors influence these; providing more specific information as to how various management efforts might influence these loads.

Ability to track progress at a BMP level through portion of load changes in a year that came from specific practice types



What functionality can the tools provide to support decision making?

Scales for each input and output should be available

Being able to re-define/model local land use could direct to watershed optimal land use distribution and integration with surrounding watersheds

dynamics of shallow water

Identify where investments are needed, and where historic investments have been ineffective.

Evaluate land use change on a per capita basis

Greater connection of modeling to shallow waters and living resources

Refine landuse change model beyond current urban growth model

Tie land use change model in with tools, it's not transparent as is

Evaluating if we need to look at uncertainty using different approaches



What functionality can the tools provide to support decision making?

Updated LU mapping and ensuring BMP efficiencies are fully evaluated that have been introduced in CBPO workgroups

of the ag lands in the watershed, identifying and targeting areas that are ripe for BMPs to produce a disproportionate load reduction.



What modeling priorities would the WQGIT like to see that's not reflected in the current Phase 7 Workplan?

Enhanced groundwater functionality

Update average hydrology to a more modern period

Including confidence and uncertainty metrics among the various parameters

Update critical conditions period and 10 yr hydrology period.

Improved nutrient speciation towards a mass balance

Specific consideration of how to manage air sources within the modeling framework (and make it clear to managers/cast users of the air implications of inputs or BMPs)

Take another look at average source sector loads using more recent SPARROW and other loading information. Average loads should reflect more current conditions

Not sure of the accuracy of this statement - continued evaluation and application of ag BMP practices and methods being considered by the Ag Workgroup and Ad Hoc Workgroup.

Co-benefits - Include Carbon Sequestration (CO₂e) and Soil Carbon change resulting from a CAST Scenario. (Start from NRCS COMET model)



What modeling priorities would the WQGIT like to see that's not reflected in the current Phase 7 Workplan?

More understanding of land use change model, inputs and assumptions

Explicit consideration of incentive programs, and how those programs look according to CAST.

Update accounting for air credits, how to take credits from Air actions beyond what is required by the CAA.

Identifying new approaches to verification, that avoid utilizing critical technical assistance staff time.

Models should be able to help us focus our efforts moving forward in the areas where there are the greatest needs in achieving targets, especially focusing the agricultural sector. Gear towards improving understanding of implementation actions.

consideration of how practices and decisions are applied as offsets/trades to account for growth

Optimal Land Use distribution for watersheds based on land cover and surrounding watersheds and existing use

Integrate GIS layers, EJ screen, data dashboard and Chrissie Bibi and healthy watersheds assessment into one place (CAST)

Cost share programs around the watershed are built around the idea that they get credit in the bay model; yet I don't think there has ever truly been alignment between these systems- and more explicit connections could be greatly beneficial.

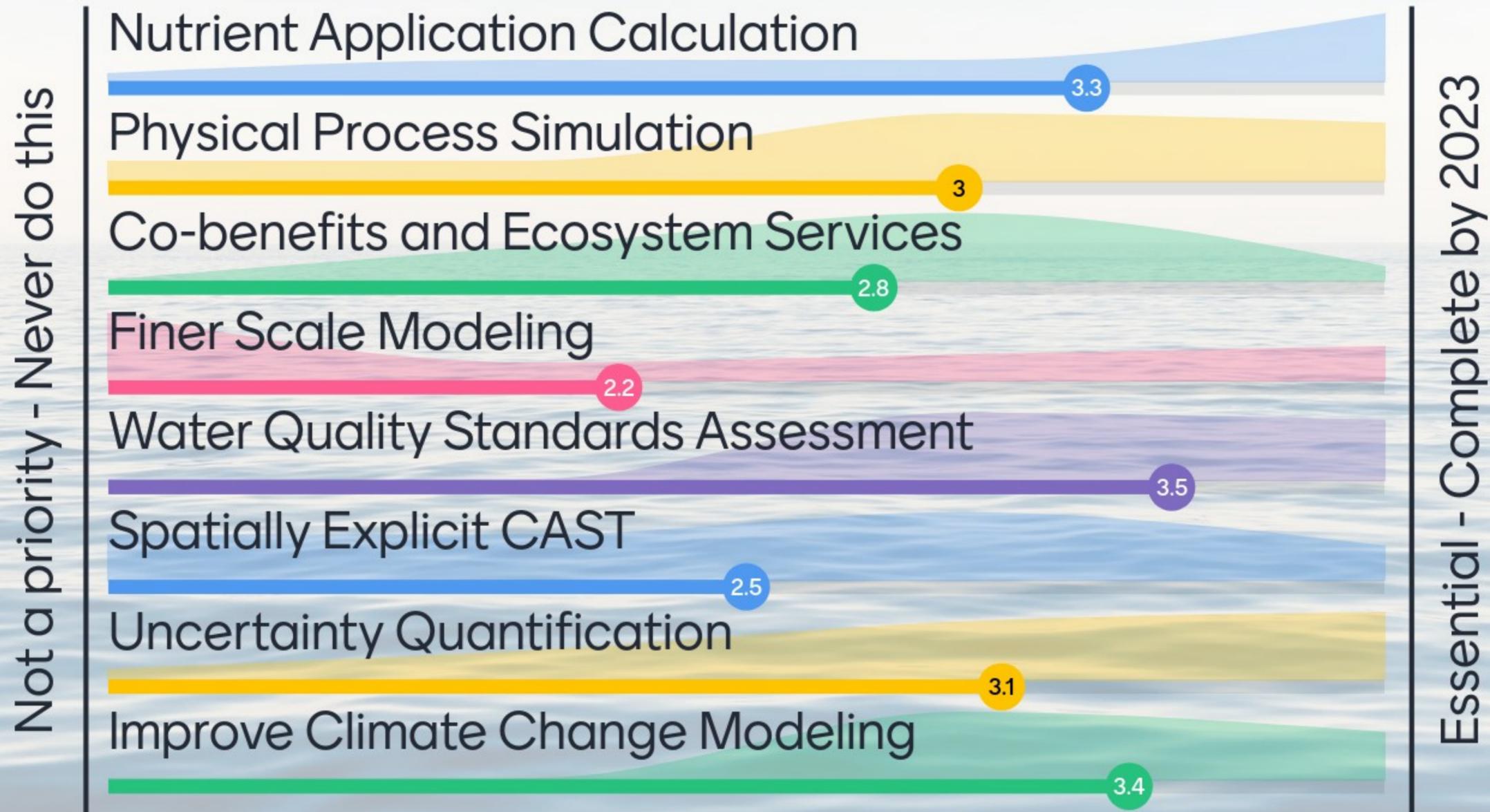


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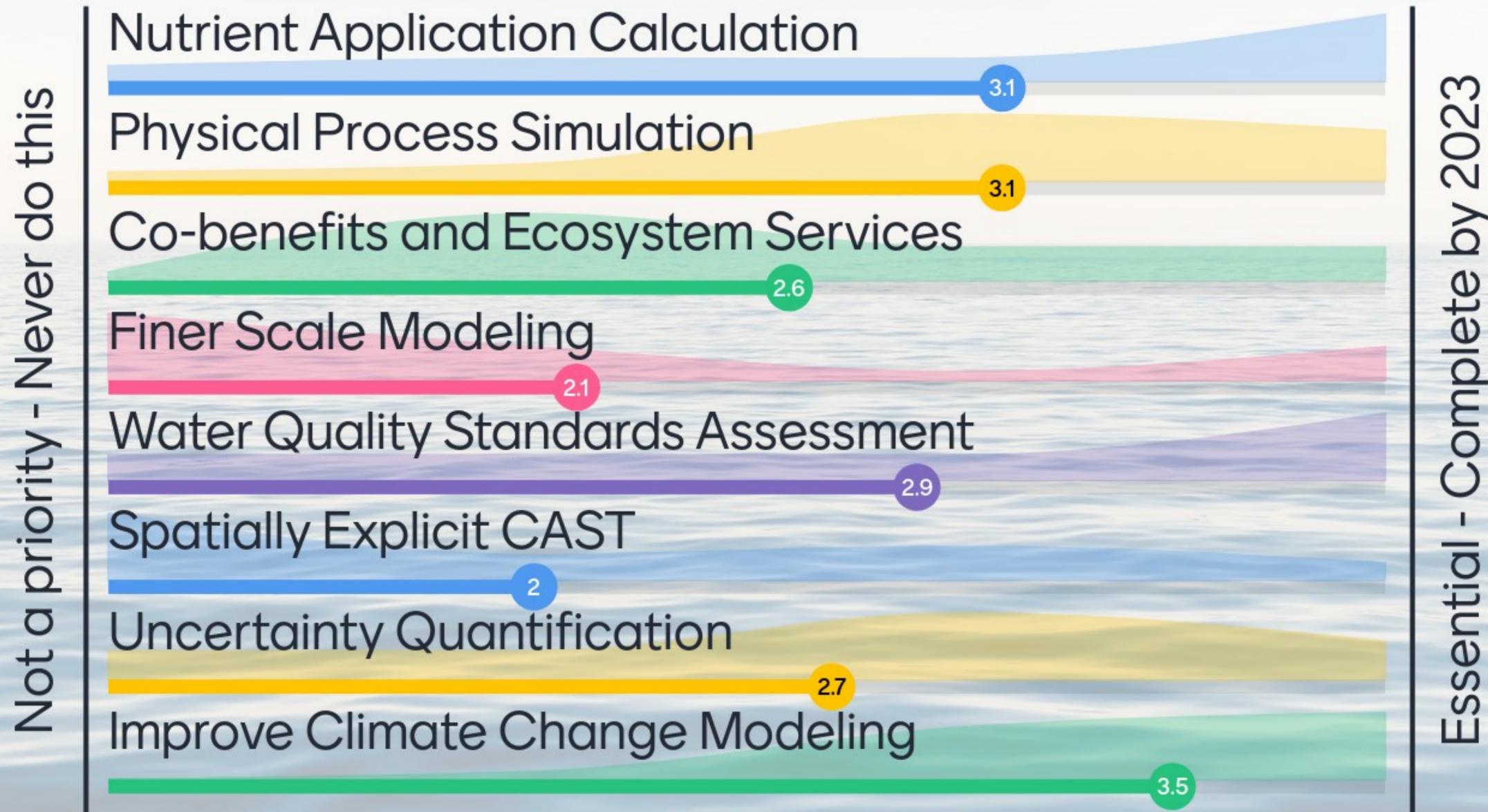
Use of local water quality monitoring data



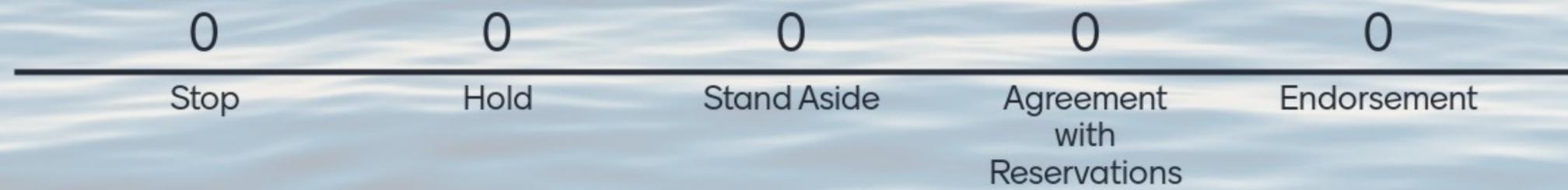
VOTING MEMBERS ONLY: Prioritize each area of focus (never do this; put on the backburner; work towards for a future model; or complete by '23)



INTERESTED PARTIES ONLY: Prioritize each area of focus (never do this; put on the backburner; work towards for a future model; or complete by '23)



VOTING MEMBERS ONLY: Consensus on Overall Phase 7 Model Development Timeline and Review Process



VOTING MEMBERS ONLY: Consensus on Initial List of Phase 7 Model Updates

