Chesapeake Bay Program
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Detailed Phase 7 Timeline Update

WQGIT

September 2024

Phase 7 Model Update Summary

Currently in development is Phase 7 of the CAST model.

The Phase 7 Modeling Tools will be used by the partnership to inform decisions related to nutrient and sediment reduction goals outlined in the Chesapeake Bay Watershed Agreement. Integral to this updated suite of tools is the ability to project climate change effect through 2035.

All of these tasks are dependent upon the entire partnership's review to assist with the completion of these Phase 7 projects.

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https://www.chesapeakebay.net/what/programs/modeling/phase-7-model-development

Detailed Phase 7 Timeline

As requested by GIT members, this version of the Phase 7 timeline now includes the subtask-level of detail.

When there is a decision associated with one of the subtasks, we have included the approving body of the formal review, the best POC, and the likely month when the decision is being made listed in the timeline.

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Phase 7 Projects and Leads

1. High Resolution Land Use – Peter Claggett
2. Chesapeake Assessment Scenario Tool (CAST) – Olivia Devereux
3. Optimization – Lew Linker
4. Agricultural Inputs – Tom Butler
5. Atmospheric Deposition Modeling – Lew Linker
6. Watershed Modeling – Gary Shenk
7. Estuarine Modeling – Lew Linker
8. Criteria Assessment – Peter Tango

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High Resolution Land Use

Phase 7 Finalization Project	Project Point of Contact	Project Tasks	Subtask Point of Contact and Approval Body	Subtasks and Associated Deadlines Raised by the Partnership
High-Res Land Use	Peter Claggett	Translating LULC	FWG/LUWG; Peter Claggett	Redefine mixed open load rates and/or composition
			USWG; Peter Claggett	Reconcile mapped and backcast construction with reported construction
			USWG; Fred Irani	Update P7 summary units: CSS's and MS4's
			FFWG; Fred Irani	Update P7 summary units: federal lands
			FFWG; Fred Irani	Report agriculture on federal lands
			FWG; Sarah McDonald	Reconcile mapped and backcast timber harvest with reported timber harvests
			AMT/AgWG; Jackie Pickford	Reconcile cropland area and change over time from Census of Agriculture and mapped cropland
		Evaluating LULC	MWG; Labeeb Ahmed	Attribution of 100K streams with LiDAR-derived channel geomorphic characteristics: sinuosity, width, and depth
			MWG; Fred Irani	Develop non-stormwater pond density metric for evaluation in CalCAST
			MWG/USWG; Michelle Katoski	Develop set of impervious connectivity metrics for evaluation in CalCAST
			MWG/USWG; Michelle Katoski	Develop road density, septic density, and channel density metrics for evaluation in CalCAST
		Mapping LULC	LUWG; Peter Claggett	Rollup 56 LULC classes to the P7 classification
			LUWG; Sarah McDonald	Finalize high-resolution LULC: 2013/14, 2017/18, 2021/22
		MBM	MWG; Labeeb Ahmed	Attribute P7 Main-Bay-Model with height and slope of upland/marsh interface (USGS)
		Modeling LULC	LUWG;Michelle Katoski	Forecast P7 land uses from 2021 to 2100
			LUWG; Sarah McDonald	Backcast high-res LULC to 1985
		Segmentation	MWG; Bailey Bosley	Align and develop crosswalk between NHD catchments and HUC12's
			MWG; Andy Fitch	Finalize P7 segmentation: 2020 County Boundaries + orographic regions + NHD catchments (or HUC12's) + Shoreline
		Septic Modeling	Land Data Team; Labeeb Ahmed	Implement the SmartSewer expansion for all jurisdictions
			WWTWG/USWG; Jackie Pickford	Remap septic systems using parcel data
			WWTWG/USWG; Jackie Pickford	Update sewer service areas and sewer model

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High Resolution Land Use

		Q3	Q4	Q1	Q2	Q3	Q4
Subtask Point of Contact and Approval Body	**Subtasks and Associated Deadlines Raised by the Partnership**	**2024**		**2025**			
FWG/LUWG; Peter Claggett	Redefine mixed open load rates and/or composition			Jan			
USWG; Peter Claggett	Reconcile mapped and backcast construction with reported construction					Sept	
USWG; Fred Irani	Update P7 summary units: CSS's and MS4's					Aug	
FFWG; Fred Irani	Update P7 summary units: federal lands					Aug	
FFWG; Fred Irani	Report agriculture on federal lands		Dec				
FWG; Sarah McDonald	Reconcile mapped and backcast timber harvest with reported timber harvests		Nov				
AMT/AgWG; Jackie Pickford	Reconcile cropland area and change over time from Census of Agriculture and mapped cropland				Apr		
MWG; Labeeb Ahmed	Attribution of 100K streams with LiDAR-derived channel geomorphic characteristics: sinuosity, width, and depth			Jan			
MWG; Fred Irani	Develop non-stormwater pond density metric for evaluation in CalCAST			Jan			
MWG/USWG; Michelle Katoski	Develop set of impervious connectivity metrics for evaluation in CalCAST			Jan			
MWG/USWG; Michelle Katoski	Develop road density, septic density, and channel density metrics for evaluation in CalCAST			Jan			
LUWG; Peter Claggett	Rollup 56 LULC classes to the P7 classification			Jan			
LUWG; Sarah McDonald	Finalize high-resolution LULC: 2013/14, 2017/18, 2021/22		Dec				
MWG; Labeeb Ahmed	Attribute P7 Main-Bay-Model with height and slope of upland/marsh interface (USGS)		Dec				
LUWG;Michelle Katoski	Forecast P7 land uses from 2021 to 2100				Apr		
LUWG; Sarah McDonald	Backcast high-res LULC to 1985					Sept	
MWG; Bailey Bosley	Align and develop crosswalk between NHD catchments and HUC12's		Dec				
MWG; Andy Fitch	Finalize P7 segmentation: 2020 County Boundaries + orographic regions + NHD catchments (or HUC12's) + Shoreline		Dec				
Land Data Team; Labeeb Ahmed	Implement the SmartSewer expansion for all jurisdictions		Dec				
WWTWG/USWG; Jackie Pickford	Remap septic systems using parcel data		Dec				
WWTWG/USWG; Jackie Pickford	Update sewer service areas and sewer model		Dec				

CAST

Phase 7 Finalization Project	Project Point of Contact	Project Tasks	Subtask Point of Contact and Approval Body	Subtasks and Associated Deadlines Raised by the Partnership
CAST	Olivia Devereux	Spatially Explicit Maps and Planning		Data Center and Contractor develop mapping display within CAST
				Evaluation of additional spatial functionality needs
				Development of additional functionality
		BMP Reporting and Transparency		Reengineer the BMP reporting process
			USWG/WTWG; Auston	Urban Nutrient Management EP Revistation Results
			FWG/WTWG; Auston	Agroforestry EPEG Results
			FFWG/WTWG; Auston	Federal Harvested Acres and Construction Acres
		CAST-General		Documentation of CAST on website
		Ecosystem Services and Co Benefits		Ecohealth Relationship Browser

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CAST

Subtask Point of Contact and Approval Body	Subtasks and Associated Deadlines Raised by the Partnership	2024		2025				2026				2027				2028			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
	Data Center and Contractor develop mapping display within CAST																		
	Evaluation of additional spatial functionality needs																		
	Development of additional functionality																		
	Reengineer the BMP reporting process																		
USWG/WTWG; Auston	Urban Nutrient Management EP Revistation Results					Sept													
FWG/WTWG; Auston	Agroforestry EPEG Results					Sept													
FFWG/WTWG; Auston	Federal Harvested Acres and Construction Acres			Mar															
	Documentation of CAST on website																		
	Ecohealth Relationship Browser																		

Optimization

Phase 7 Finalization Project	Project Point of Contact	Project Tasks	Subtask Point of Contact and Approval Body	Subtasks and Associated Deadlines Raised by the Partnership
Optimization	Lew Linker	Development of an efficient single objective hybrid optimization procedure.		Done 2022, subtasks not included
		Development of efficient multi-objective (MO) optimization procedures		Done 2023, subtasks not included
		Scalability Studies and Improvements using Learning Engine and Parallel Computing		Comparative study to choose a few best performing methods
			MWG Quarterly; Lewis Linker	Scalability to State and Watershed level Scenarios
			MWG Quarterly; Lewis Linker	"Innovization" approach for improving scalability
			MWG Quarterly; Lewis Linker	Distributed computing approach for improving scalability
		User-friendly and routine applications with enhanced optimization procedures	MWG Quarterly; Lewis Linker	User-friendly optimization through a dashboard
			MWG Quarterly; Lewis Linker	Surrogate-assisted optimization procedures
			MWG Quarterly; Lewis Linker	Robust optimization method for handling uncertainties in variables and parameters
			MWG Quarterly; Lewis Linker	Sustainable watershed management practices

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Optimization

		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Subtask Point of Contact and Approval Body	**Subtasks and Associated Deadlines Raised by the Partnership**	**2024**		**2025**				**2026**			
	Done 2022, subtasks not included										
	Done 2023, subtasks not included										
	Comparative study to choose a few best performing methods										
MWG Quarterly; Lewis Linker	Scalability to State and Watershed level Scenarios		Dec								
MWG Quarterly; Lewis Linker	"Innovization" approach for improving scalability			March							
MWG Quarterly; Lewis Linker	Distributed computing approach for improving scalability			March							
MWG Quarterly; Lewis Linker	User-friendly optimization through a dashboard				June						
MWG Quarterly; Lewis Linker	Surrogate-assisted optimization procedures					Sept					
MWG Quarterly; Lewis Linker	Robust optimization method for handling uncertainties in variables and parameters						Dec				
MWG Quarterly; Lewis Linker	Sustainable watershed management practices							March			

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Ag Inputs

Project Point of Contact	Project Tasks	Subtask Point of Contact and Approval Body	Subtasks and Associated Deadlines Raised by the Partnership
Tom Butler	Manure application	AMT; Tom Butler	Grain with Manure Acres
		AMT; Tom Butler	Manure Application Curves
	Crop Yields	AMT; Tom Butler	Statistical Framework (economics, weather, growth regions, etc)
	Industry data	AMT; Tom Butler	All animal calculations and source data should be reviewed (animal populations, manure regeneration values)
	Mortality	AMT; Tom Butler	Manure Nutrient Categorization
	Fertilizer data	AMT; Tom Butler	Examination of Sources
		AMT; Tom Butler	Utilization of Statistical Framework to Utilize Multiple Lines of Evidence
	Application algorithm	AMT; Tom Butler	Application Strategy

Ag Inputs

		Q3	Q4	Q1	Q2	Q3	Q4
Subtask Point of Contact and Approval Body	**Subtasks and Associated Deadlines Raised by the Partnership**	**2024**		**2025**			
AMT; Tom Butler	Grain with Manure Acres		Oct				
AMT; Tom Butler	Manure Application Curves		Oct				
AMT; Tom Butler	Statistical Framework (economics, weather, growth regions, etc)		Oct				
AMT; Tom Butler	All animal calculations and source data should be reviewed (animal populations, manure regeneration values)						Nov
AMT; Tom Butler	Manure Nutrient Categorization		Nov				
AMT; Tom Butler	Examination of Sources						Nov
AMT; Tom Butler	Utilization of Statistical Framework to Utilize Multiple Lines of Evidence						Nov
AMT; Tom Butler	Application Strategy						Nov

Atmospheric Deposition Modeling

Phase 7 Finalization Project	Project Point of Contact	Project Tasks	Subtask Point of Contact and Approval Body	Subtasks and Associated Deadlines Raised by the Partnership
Atmospheric Deposition Modeling	Lew Linker	1985-present CMAQ Deposition timeseries	MWG Quarterly; Lewis Linker	Blend Phase 6 and 7 Nitrogen Deposition Approaches
		Decarbonization of Economy Scenarios	MWG Quarterly; Lewis Linker	Complete GCAM Support Scenarios
		Completion of Phase 7 Library of CMAQ Airshed Model (2035 IRA, 2016 Base , 2035 IRA and State Targets, 2035 Net zero Carbon, 2050 IRA, 2050 IRA and state Targets, and 2050 Net Zero Carbon Scenarios)	MWG Quarterly; Lewis Linker	Review of Final Scenarios

Atmospheric Deposition Modeling

Subtask Point of Contact and Approval Body	Subtasks and Associated Deadlines Raised by the Partnership	2024	
		Q3	Q4
MWG Quarterly; Lewis Linker	Blend Phase 6 and 7 Nitrogen Deposition Approaches		Dec
MWG Quarterly; Lewis Linker	Complete GCAM Support Scenarios		Oct
MWG Quarterly; Lewis Linker	Review of Final Scenarios		Dec

Watershed Modeling

Phase 7 Finalization Project	Project Point of Contact	Project Tasks	Subtask Point of Contact and Approval Body	Subtasks and Associated Deadlines Raised by the Partnership
Watershed Modeling	Gary Shenk	General	MWG Quarterly; Gary Shenk	Determine Delivery and Loading Paramaters for CAST using CalCAST
			WWTWG Quarterly	Marine Boat Discharge Review
			WWTWG Quarterly	Update to CSOs
			WWTWG Quarterly	Exfiltration from Sanitary Sewers
			WWTWG Quarterly	Drinking Water Discharges
			WQGIT Monthly	Partnership Decision on Scale of CAST
		Physical Process Simulation	MWG Quarterly; Gary Shenk	Review Land Class Relative Loading
			WQGIT SECTORS	Review within Class Loading Rates (each sector is specific timeline, reachout to sector coordinator for more info)
			MWG Quarterly; Gary Shenk	Review of sensitivies including Climate
			MWG Quarterly; Gary Shenk	Invesitigate land to water
			MWG Quarterly; Lewis Linker/Richard Tian	Tidal Shoreline Loads
			MWG Quarterly; Gary Shenk	Reservoir Consideration
			MWG Quarterly; Lewis Linker	Lower Susquehannna Simulation (Conowingo Model Simulation)
			MWG Quarterly; Gary Shenk	Stream to Bay Factors in CalCAST
		Uncertainty Quantification		Quantification Through CalCAST
				TMDL Indicator and METRIC
		Improve Climate Change Modeling	MWG Quarterly; Gary Shenk	Produce 2035 Meteorology Data Sets
			MWG Quarterly; Gary Shenk	Determine Method of Application Climate Data
		Main Bay and Tributary Models Connection		Ensure connection to Phase 7 Watershed Model to MTM is established

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Watershed Modeling

		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Subtask Point of Contact and Approval Body	**Subtasks and Associated Deadlines Raised by the Partnership**	**2024**		**2025**				**2026**			
MWG Quarterly; Gary Shenk	Determine Delivery and Loading Paramaters for CAST using CalCAST						Oct				
WWTWG Quarterly	Marine Boat Discharge Review		Oct								
WWTWG Quarterly	Update to CSOs				June	July					
WWTWG Quarterly	Exfiltration from Sanitary Sewers				June	July					
WWTWG Quarterly	Drinking Water Discharges				June	July					
WQGIT Monthly	Partnership Decision on Scale of CAST		Dec								
MWG Quarterly; Gary Shenk	Review Land Class Relative Loading						Oct				
WQGIT SECTORS	Review within Class Loading Rates (each sector is specific timeline, reach out to sector coordinator for more info)				June	July					
MWG Quarterly; Gary Shenk	Review of sensitivities including Climate					July					
MWG Quarterly; Gary Shenk	Invesitgate land to water						Oct				
MWG Quarterly; Lewis Linker/Richard Tian	Tidal Shoreline Loads						Oct				
MWG Quarterly; Gary Shenk	Reservoir Consideration					July					
MWG Quarterly; Lewis Linker	Lower Susquehannna Simulation (Conowingo Model Simulation)						Oct				
MWG Quarterly; Gary Shenk	Stream to Bay Factors in CalCAST					Oct					
	Quantification Through CalCAST										
	TMDL Indicator and METRIC										
MWG Quarterly; Gary Shenk	Produce 2035 Meteorology Data Sets										
MWG Quarterly; Gary Shenk	Determine Method of Application Climate Data										Nov
	Ensure connection to Phase 7 Watershed Model to MTM is established										

Estuarine Modeling

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Phase 7 Finalization Project	Project Point of Contact	Project Tasks	Subtask Point of Contact and Approval Body	Subtasks and Associated Deadlines Raised by the Partnership
Estuarine Modeling	Lew Linker	Interim MBM and MTM Development (2023 – 2024)	MWG Quarterly; Lewis Linker	Initiate MTM activities
			MWG Quarterly; Lewis Linker	Kick-off joint meetings of MBM and MTM Teams with MWG
			MWG Quarterly; Lewis Linker	Conduct full initial calibration and verification of hydrodynamic and WQ model output
			MWG Quarterly; Lewis Linker	Address important knowledge gaps in ICM
			MWG Quarterly; Lewis Linker	Begin completion of work to improve shallow water dynamics in MBM
			MWG Quarterly; Lewis Linker	Begin completion of work to improve shallow water dynamics in MTMs
			MWG Quarterly; Lewis Linker	Completion of work on basic living resource linkages of refined chlorophyll, wetland, and SAV simulation and potential linkage to higher trophic levels
			MWG Quarterly; Lewis Linker	Completion of work using MBM and MTMs to better resolve CBP problem segments.
			MWG Quarterly; Lewis Linker	Work examining CC influence on SAV, shallow water, & phenology of CC watershed loads and tidal Bay processing
			MWG Quarterly; Lewis Linker	Improve nutrient speciation simulation by better tracking the watershed to tidal Bay and the tidal water to sediment exchanges of the different nutrient species
		Final MBM and MTM Development (2025)	MWG Quarterly; Lewis Linker	Provide a fully operational MBM that meets the needs of CBP
			MWG Quarterly; Lewis Linker	Finish documentation on the software package in a report that will include detailed documentation on model structure, major code changes, validation and calibration procedure and usage
			MWG Quarterly; Lewis Linker	Demonstrate feasibility and utility of using a state of the science UG model to better estimate Chesapeake WQ standards in shallow open waters under 2035 and future climate change conditions
			MWG Quarterly; Lewis Linker	Transfer the software package to CBPO for operational testing, and work with CBPO personnel to test the model package under operational settings and resolve any issues that may arise
			MWG Quarterly; Lewis Linker	All MBM and MTMs fully operational
			MWG Quarterly; Lewis Linker	Conduct full review of al MBM and MTMs with CBP technical and management groups and with STAC
			MWG Quarterly; Lewis Linker	Review all recent studies related to Bay WQ processes and work with CBP and Mod-WG to identify key missing processes and update the code to address knowledge gaps as they are filled
			MWG Quarterly; Lewis Linker	Provide estuarine models, analysis tools, and initial scoping scenarios, final code version and other materials to CBPO for testing
			MWG Quarterly; Lewis Linker	Finalize work to improve shallow water dynamics in MBM
			MWG Quarterly; Lewis Linker	Finalize work to improve shallow water dynamics in MTMs
			MWG Quarterly; Lewis Linker	Finalize work on basic living resource linkages of refined chlorophyll, wetland, and SAV simulation and potential linkage to higher trophic levels
			MWG Quarterly; Lewis Linker	Finalize work using MBM and MTMs to better resolve CBP problem segments
			MWG Quarterly; Lewis Linker	Finalize work examining CC influence on SAV, shallow water, and phenology of CC watershed loads and tidal Bay processing
		MBM and MTM Review (2026) and Application (2027)	MWG Quarterly; Lewis Linker	Provide final estuarine models, analysis tools, model documentation and other materials to CBPO
			MWG Quarterly; Lewis Linker	Improve the CBP management decisions through the successful application of developing quantitative assessments of climate change in the Chesapeake main-Bay and in ultra-local tidal waters, as directed by CBP managers with detailed estimates for how to respond to 2035 climate change challenge
			MWG Quarterly; Lewis Linker	Provide initial (2026) and final (2027) scoping scenarios, analyses, and other materials to support Chesapeake protection and restoration efforts and address the needs and requirements of CBP decision makers and managers for responding to climate change in the Chesapeake
			MWG Quarterly; Lewis Linker	Develop user-friendly interfaces with model software and technical transfer training so that a variety of stakeholders can have full access and know how to use to pre- and post-processing, visualization, and scenario tools
			MWG Quarterly; Lewis Linker	Develop and apply 2035 CC and all other management MBM and MTM scenarios as determined by CBP decision makers
			MWG Quarterly; Lewis Linker	Document the findings and recommendations in the final report
			MWG Quarterly; Lewis Linker	Provide final TMDL scenario simulation results to address the needs and requirements of CBP decision makers and managers for responding to climate change in the Chesapeake, tributaries, and in ultra-local areas as requested.
		Continuous Activities		Support the Modeling Workgroup, WQGIT, and other technical and management/policy CBP groups as needed
				Host a dedicated web site for the new MBM
				Submit annual reports with detailed documentation on model structure, major code changes, validation, and calibration procedure and usage
				Disseminate research findings & experiences via 1-2 journal papers/year
				Coordination/collaboration meetings among MBM and MTM Teams

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Estuarine Modeling

Subtask Point of Contact and Approval Body	Subtasks and Associated Deadlines Raised by the Partnership	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
		2024		2025				2026				2027			
MWG Quarterly; Lewis Linker	Initiate MTM activities														
MWG Quarterly; Lewis Linker	Kick-off joint meetings of MBM and MTM Teams with MWG														
MWG Quarterly; Lewis Linker	Conduct full initial calibration and verification of hydrodynamic and WQ model output		Dec												
MWG Quarterly; Lewis Linker	Address important knowledge gaps in ICM		Dec												
MWG Quarterly; Lewis Linker	Begin completion of work to improve shallow water dynamics in MBM		Dec												
MWG Quarterly; Lewis Linker	Begin completion of work to improve shallow water dynamics in MTMs		Dec												
MWG Quarterly; Lewis Linker	Completion of work on basic living resource linkages of refined chlorophyll, wetland, and SAV simulation and potential linkage to higher trophic levels		Dec												
MWG Quarterly; Lewis Linker	Completion of work using MBM and MTMs to better resolve CBP problem segments.						Dec								
MWG Quarterly; Lewis Linker	Work examining CC influence on SAV, shallow water, & phenology of CC watershed loads and tidal Bay processing						Dec								
MWG Quarterly; Lewis Linker	Improve nutrient speciation simulation by better tracking the watershed to tidal Bay and the tidal water to sediment exchanges of the different nutrient species		Dec												
MWG Quarterly; Lewis Linker	Provide a fully operational MBM that meets the needs of CBP					Sept									
MWG Quarterly; Lewis Linker	Finish documentation on the software package in a report that will include detailed documentation on model structure, major code changes, validation and calibration procedure and usage						Dec								
MWG Quarterly; Lewis Linker	Demonstrate feasibility and utility of using a state of the science UG model to better estimate Chesapeake WQ standards in shallow open waters under 2035 and future climate change conditions						Dec								
MWG Quarterly; Lewis Linker	Transfer the software package to CBPO for operational testing, and work with CBPO personnel to test the model package under operational settings and resolve any issues that may arise						Dec								
MWG Quarterly; Lewis Linker	All MBM and MTMs fully operational						Dec								
MWG Quarterly; Lewis Linker	Conduct full review of al MBM and MTMs with CBP technical and management groups and with STAC										Dec				
MWG Quarterly; Lewis Linker	Review all recent studies related to Bay WQ processes and work with CBP and Mod-WG to identify key missing processes and update the code to address knowledge gaps as they are filled						Dec								
MWG Quarterly; Lewis Linker	Provide estuarine models, analysis tools, and initial scoping scenarios, final code version and other materials to CBPO for testing						Dec								
MWG Quarterly; Lewis Linker	Finalize work to improve shallow water dynamics in MBM						Dec								
MWG Quarterly; Lewis Linker	Finalize work to improve shallow water dynamics in MTMs						Dec								
MWG Quarterly; Lewis Linker	Finalize work on basic living resource linkages of refined chlorophyll, wetland, and SAV simulation and potential linkage to higher trophic levels						Dec								
MWG Quarterly; Lewis Linker	Finalize work using MBM and MTMs to better resolve CBP problem segments						Dec								
MWG Quarterly; Lewis Linker	Finalize work examining CC influence on SAV, shallow water, and phenology of CC watershed loads and tidal Bay processing						Dec								
MWG Quarterly; Lewis Linker	Provide final estuarine models, analysis tools, model documentation and other materials to CBPO							Mar							
MWG Quarterly; Lewis Linker	Improve the CBP management decisions through the successful application of developing quantitative assessments of climate change in the Chesapeake main-Bay and in ultra-local tidal waters, as directed by CBP managers with detailed estimates for how to respond to 2035 climate change challenge														Dec
MWG Quarterly; Lewis Linker	Provide initial (2026) and final (2027) scoping scenarios, analyses, and other materials to support Chesapeake protection and restoration efforts and address the needs and requirements of CBP decision makers and managers for responding to climate change in the Chesapeake														Dec
MWG Quarterly; Lewis Linker	Develop user-friendly interfaces with model software and technical transfer training so that a variety of stakeholders can have full access and know how to use to pre- and post-processing, visualization, and scenario tools										Dec				
MWG Quarterly; Lewis Linker	Develop and apply 2035 CC and all other management MBM and MTM scenarios as determined by CBP decision makers														Dec
MWG Quarterly; Lewis Linker	Document the findings and recommendations in the final report										Dec				
MWG Quarterly; Lewis Linker	Provide final TMDL scenario simulation results to address the needs and requirements of CBP decision makers and managers for responding to climate change in the Chesapeake, tributaries, and in ultra-local areas as requested.														Dec
	Support the Modeling Workgroup, WQGIT, and other technical and management/policy CBP groups as needed														
	Host a dedicated web site for the new MBM														
	Submit annual reports with detailed documentation on model structure, major code changes, validation, and calibration procedure and usage														
	Disseminate research findings & experiences via 1-2 journal papers/year														
	Coordination/collaboration meetings among MBM and MTM Teams														

Criteria Assessment

This project timeline is available in the Phase 7 spreadsheet, parallel to the other projects. Ultimately, there will be a linkage to the Estuarine Model output for scenario evaluation.

Key components of the project include:

- The estuarine water quality criteria assessment procedures will be updated to allow for assessment of all criteria, including short-duration criteria (coordinated through the Criteria Assessment Protocols workgroup).
- A new interpolator tool for use with the monitoring data is being developed. Timeline for these subtasks is available in the Master Phase 7 spreadsheet (coordinated in the Bay Oxygen Research Group).
- New high frequency data is being collected in deep waters (coordinated through the Hypoxia Collaborative Team).

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Other Phase 7 Timeline Key Dates

- **December 2024:** PSC introduction of high-level Phase 7 timeline
- **September 2025:** UNM Expert Panel Report Expected
- **December 2025:** Ag Inputs to model finalized largely; RAND Climate Change Efficiency Report Expected
- **2026:** Partnership and STAC Independent Review
- **January 2027:** Release of CBP Phase 7 Suite of Models
- **2027:** Exercise Phase 7 for Future Planning
- **January 2028:** Release of Finalized Phase 7 Suite of Models (Further details to come)

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Thank you!

Any questions?
You can contact me at smith.auston@epa.gov

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