Phase 7 Plans

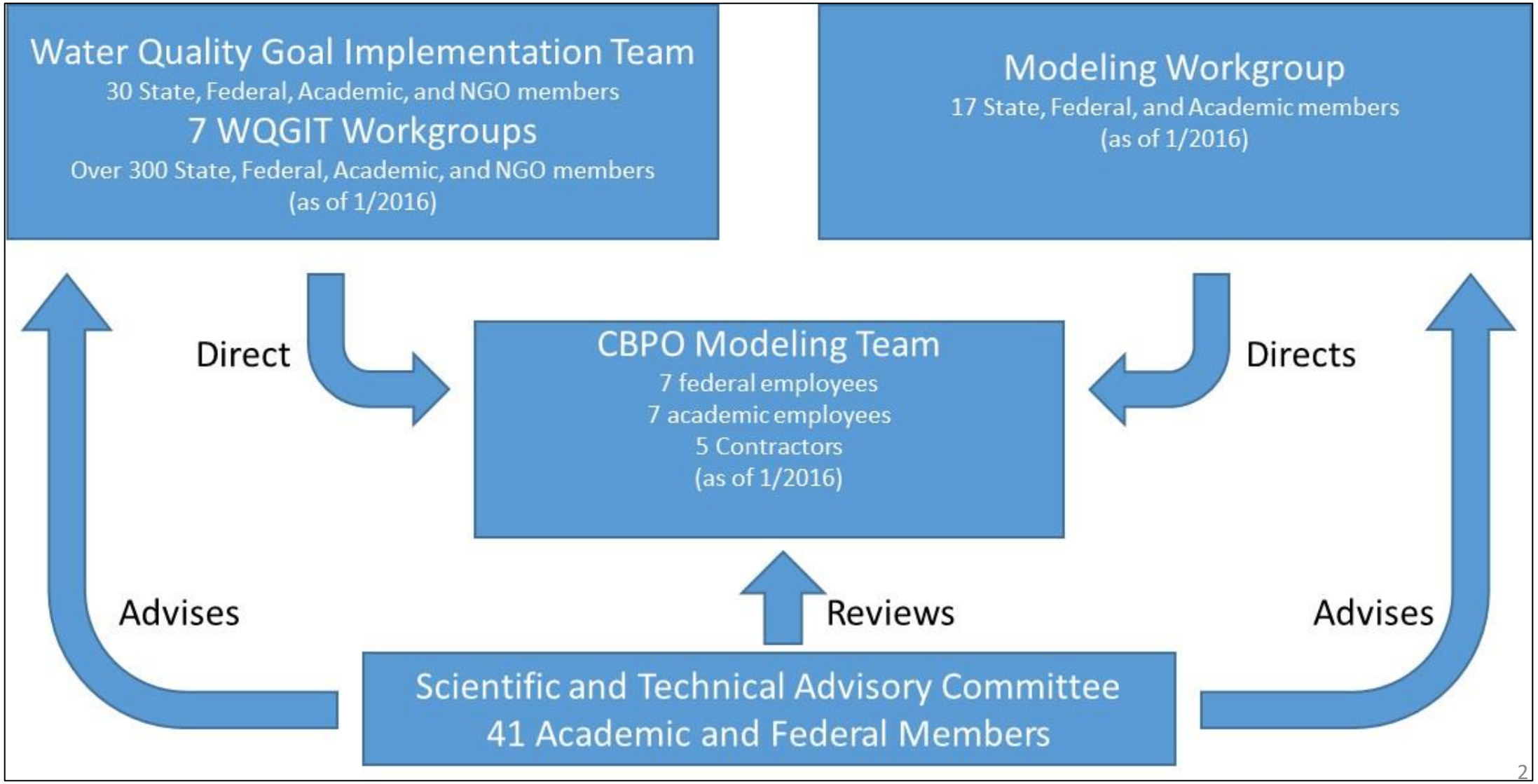
Gary Shenk – CBPO

WQGIT

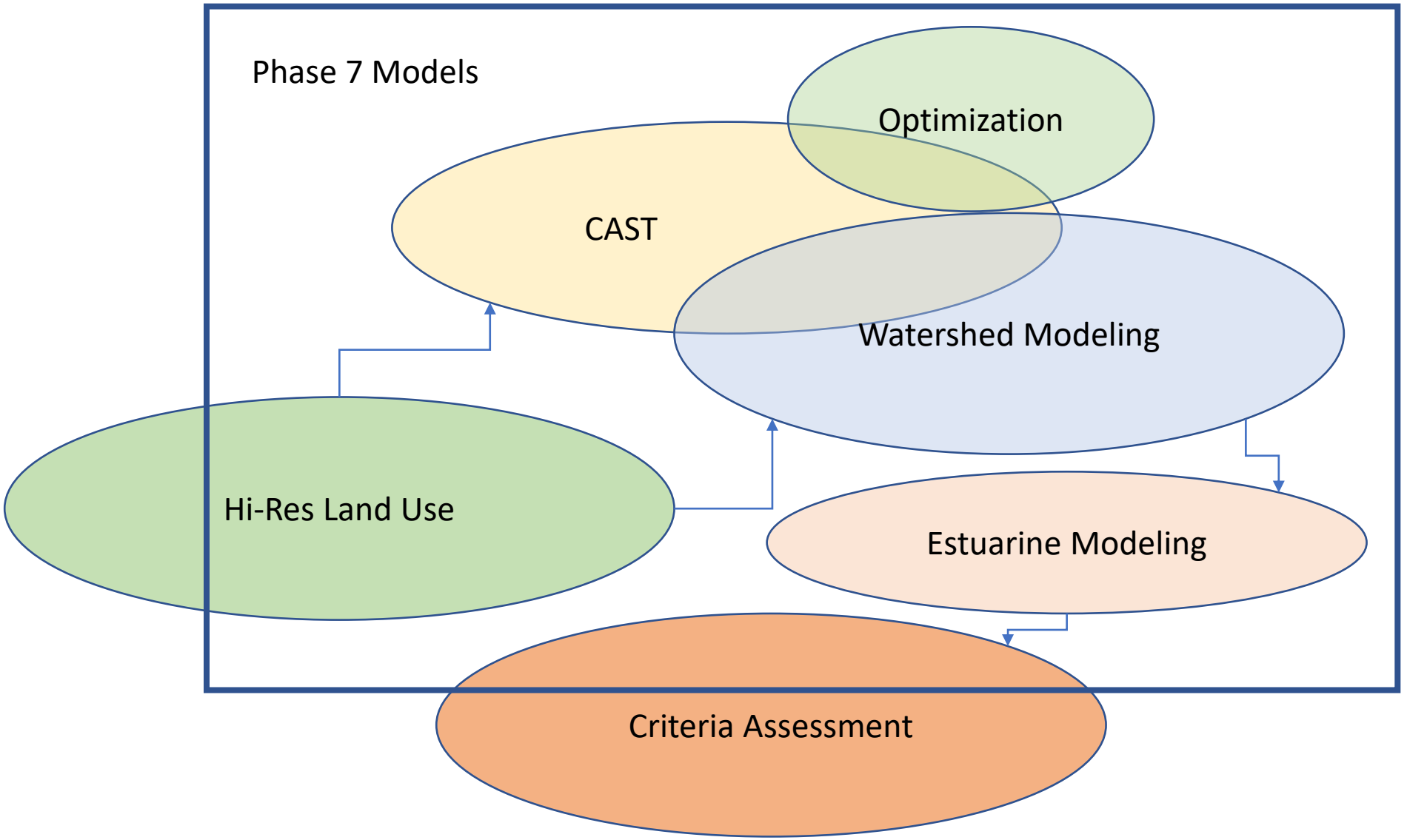
04/25/2022

Governance

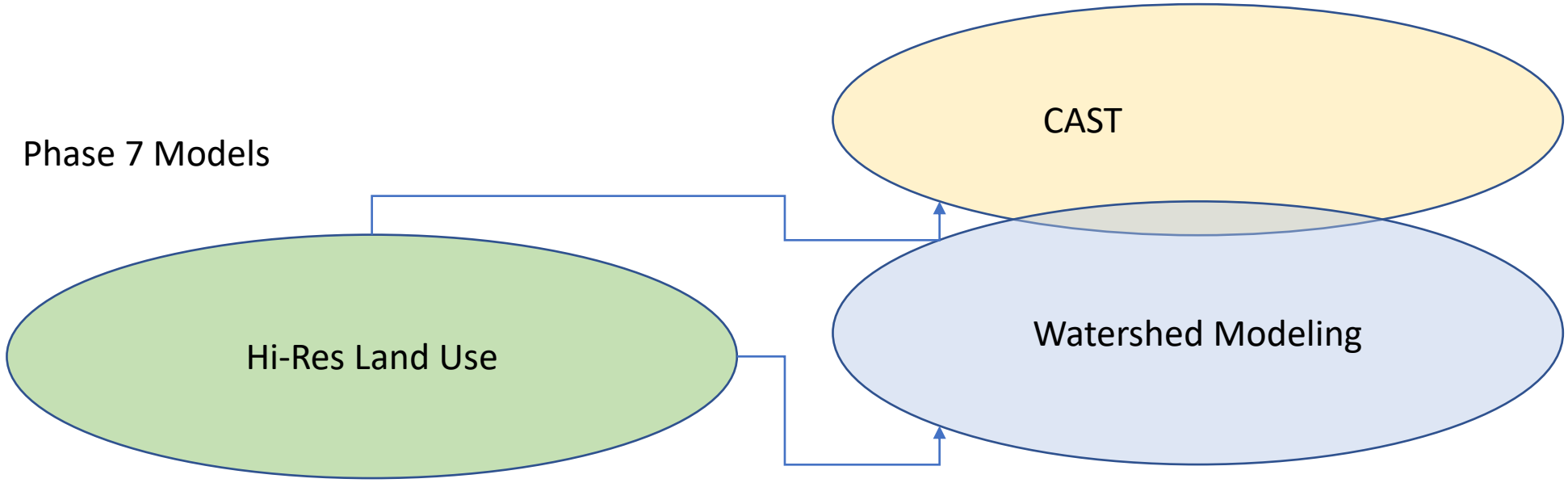
https://cast-content.chesapeakebay.net/documents/P6ModelDocumentation%2F1%20Overview%202018%2005%2022.pdf
https://www.chesapeakebay.net/who/group/modeling_team
https://www.chesapeakebay.net/what/programs/modeling



Phase 7 Development Tracks

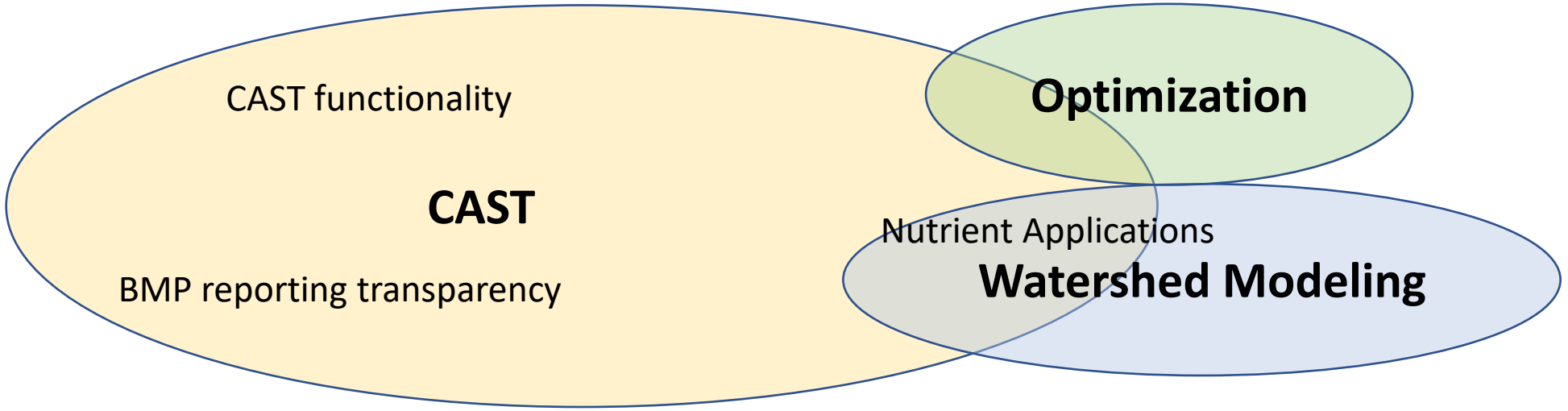


Phase 7 Development Tracks - High Res Land Use



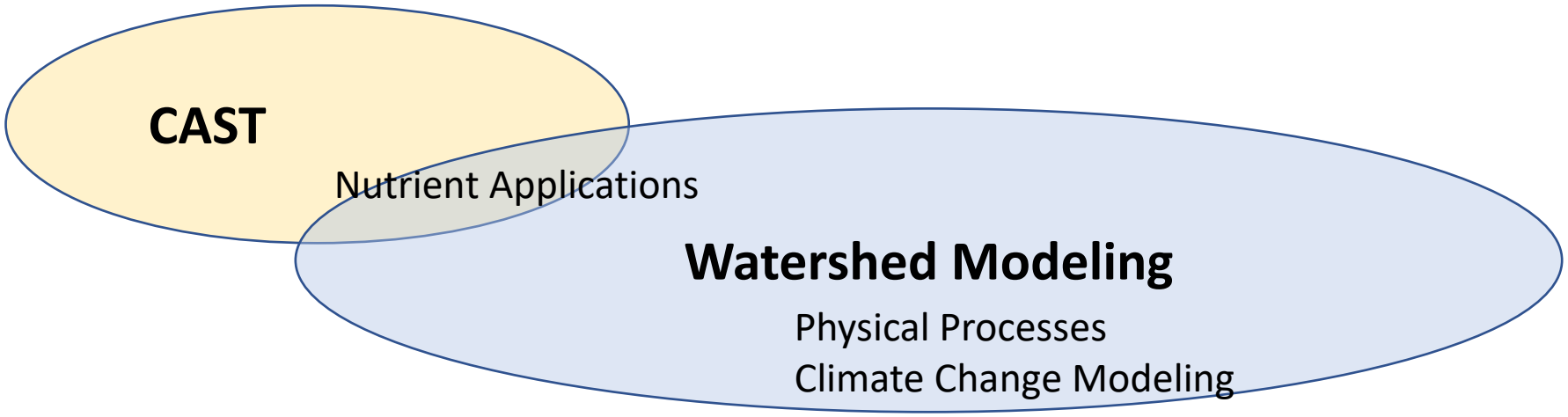
- High resolution land use products are being developed at the meter scale for delivery in 2024.
- Analysis includes fine-scale landscape and riverine features that may help predict loading rates
- *Lead – Peter Claggett*

Phase 7 Development Tracks – CAST



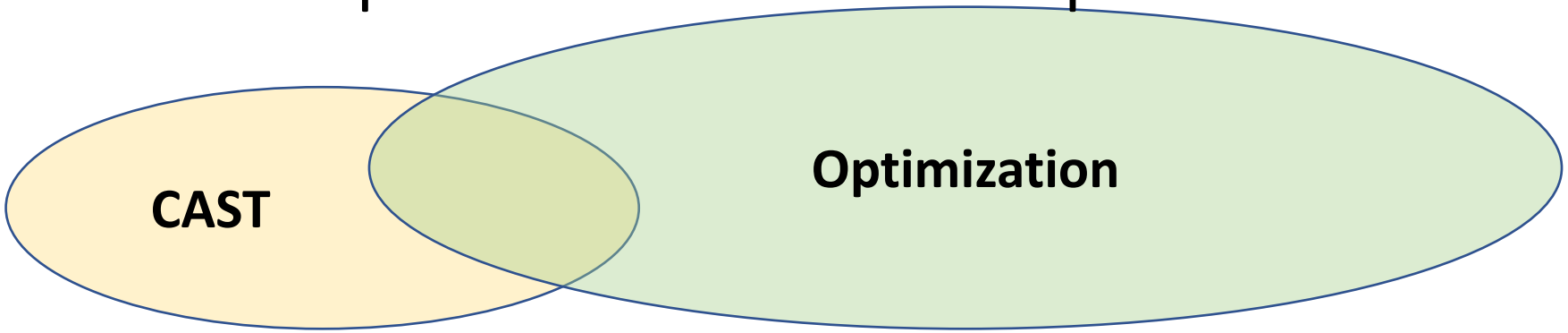
- Improve transparency and usability
- Redesign the process for submitting management practice data.
- A spatial interface to CAST will be designed to give output for a user-defined spatial extent.
- Nutrient applications will be shared with the watershed modeling track
- *Lead – Olivia Devereux*

Phase 7 Development Tracks – Watershed Modeling



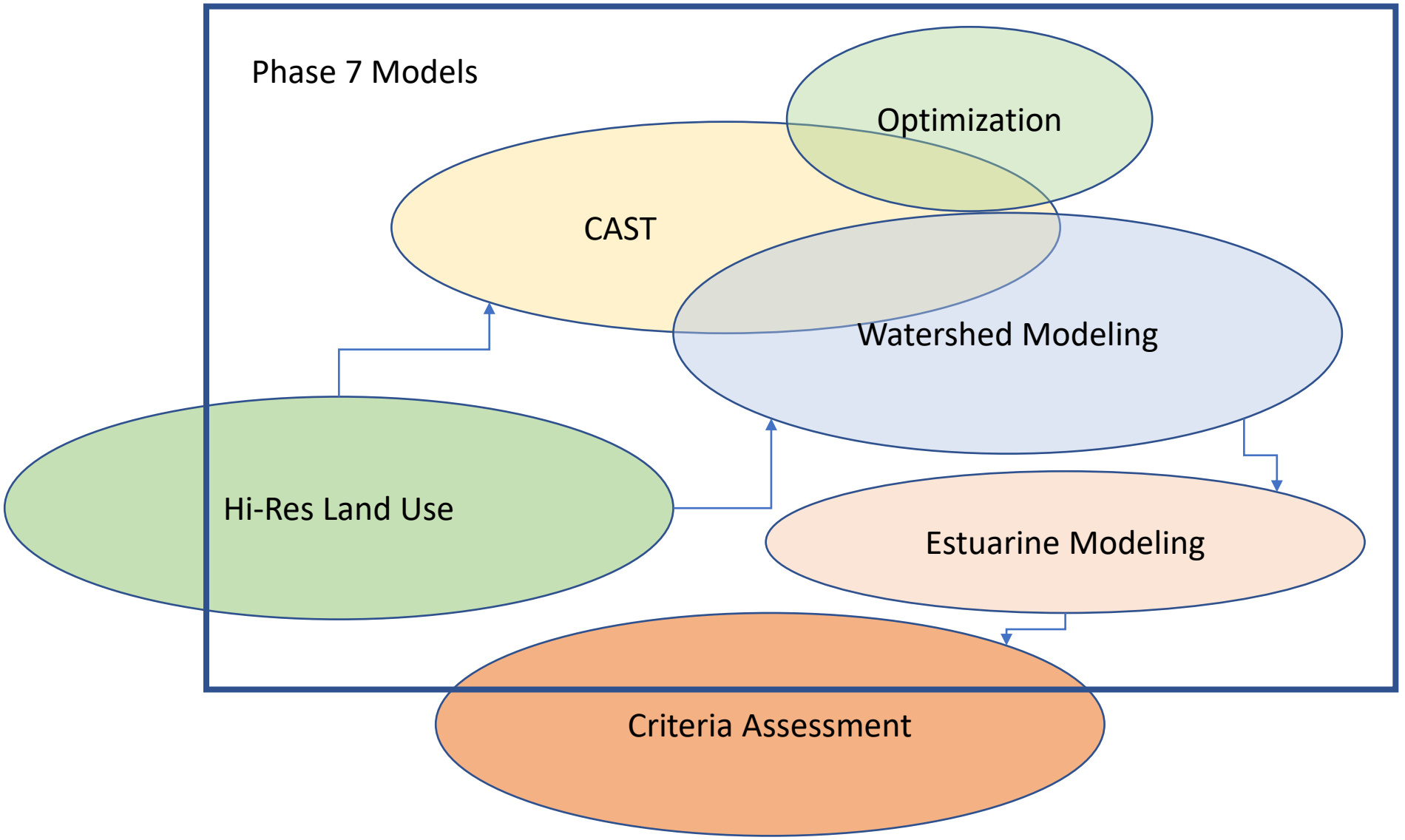
- Better representation of physical processes
- Improve climate change effect modeling
- Variable scale modeling
- Nutrient application calculations shared with CAST track
- *Lead – Gary Shenk*

Phase 7 Development Tracks - Optimization



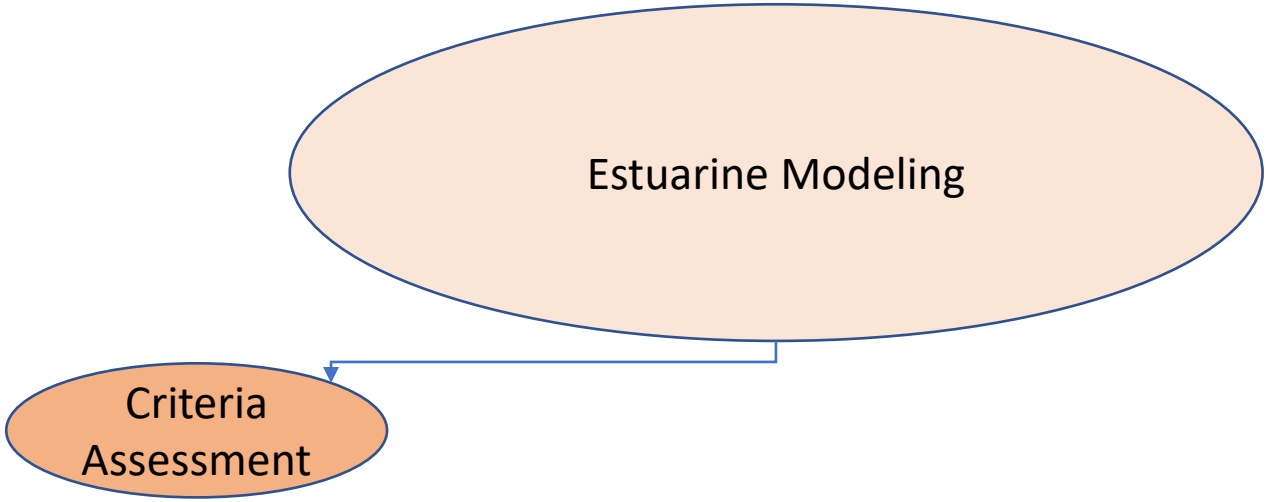
- CAST scenarios can be generated representing the least cost to achieve a desired level of nutrient and sediment reduction.
- *Lead – Lew Linker*

Phase 7 Development Tracks



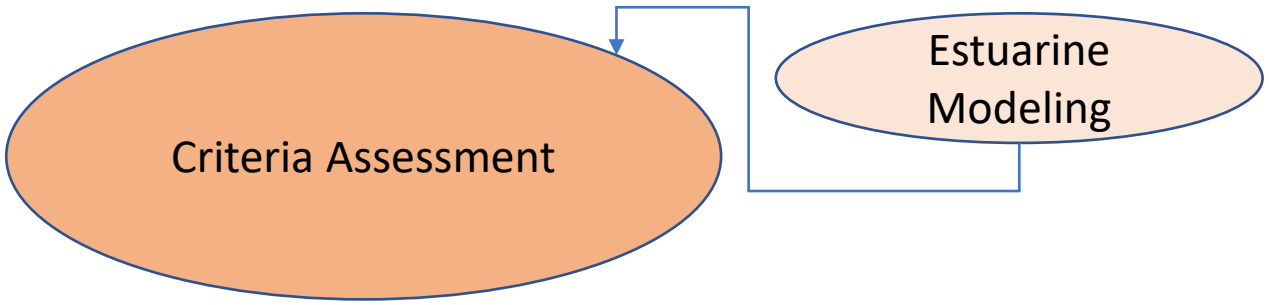
Phase 7 Development Tracks – Estuarine Modeling

- Main Bay Model being developed for entire tidal Chesapeake
- Multiple Tributary Models developed as testbeds to improve Main Bay Model
- *Lead – Lew Linker*



Phase 7 Development Tracks – Criteria Assessment

- New types of dissolved oxygen observations
- New Interpolator methods and software
- Evaluation of all criteria
- Consideration of climate change in criteria
- *Lead – Peter Tango*

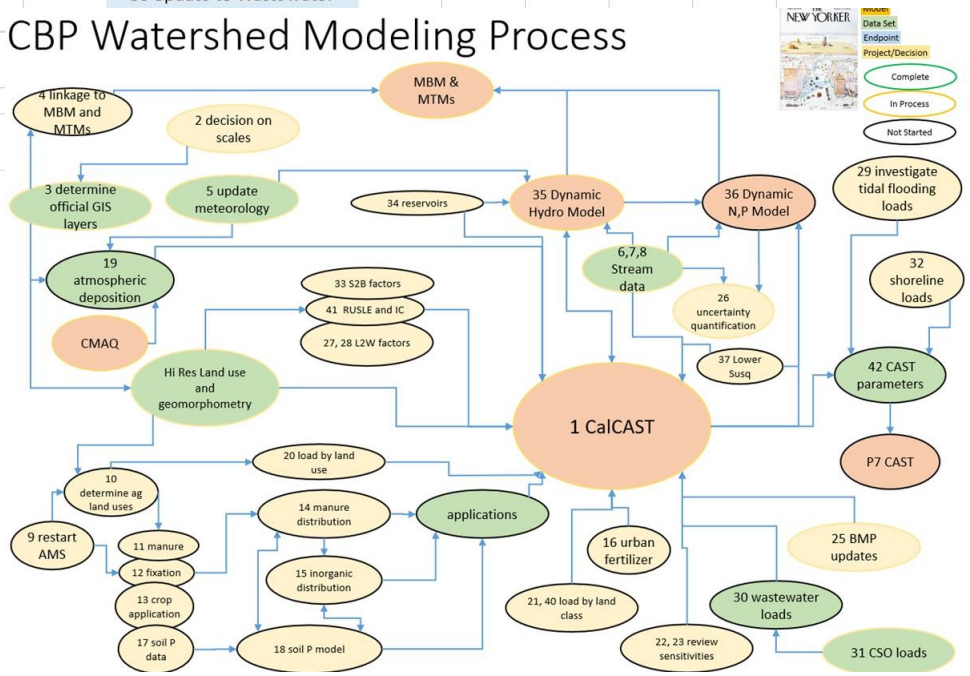


Each Track Has Provided Schedule Documents

Format will vary by Track

	2022 1	2022 2	2022 3	2022 4	2023 1	2023 2	2023 3	2023 4	2024 1	2024 2	2024 3	2024 4	2025 1	2025 2	2025 3	2025 4
Phase 7 Activity	Work plan			Build	Work plan	Build Models			Work plan	Build Models			Work plan	Build Models		
General	1 Develop CalCAST using P6 data								1 Use CalCAST as primary calibration tool							
	3 Determine official CBPO GIS layers															
	5 system of annual meteorology updates															
	25 BMP updates															
			35 Dynamic model for hydrology, sediment, and temperature													
						29 Investigate tidal flooding loads										
									30 Update to Wastewater							
			31 Update to CSOs													
Variable Scale Modeling																

Item	Category	What: short description	Why: who asked for it or why is it necessary	Who in C elsewhen the work		development time	
1	General	Develop CalCAST. CalCAST will be a tool for comparing estimated load to monitored loads given a set of inputs and parameters. It will be used in the calibration	CalCAST allows the CBP to test various data sets and strategies to see which match monitoring data best. Primary suggestion of STAC Phase 6 STAC review and Future of Modeling workshop. Allows efficient incoporation of all other development priorities	Bertani; Bhatt; Shenk	MWG	First priority. The rest of development depends on CalCAST. Need decisions on scale. 2022	A model of loads at a point is developed in Section 12 of the documentation. It will be implemented for speed of calculation with the potential to wrap parameter estimation techiques around it
2	variable scale modeling	Discuss scale and reach decision	Development of various Phase 7 tasks will benefit from knowledge of the output scale	Shenk	WQGIT, MWG	2022-2025	Presentation to WQGIT and MWG on various aspects, discussed in section 2
3	General	determine official versions of GIS layers: NHD, county, shoreline, Lrseg	Counties have updated boundaries. NHD necessary to use many important data sets, shoreline determines watershed/estuarine parameters. Lrseg may change for NHD boundaries	McDonald, Fitch, Ahmed, Bhatt	MWG	early 2022	CBPO discussions, with results to be written into section 2
4	Main bay and tributary models	physical and chemical linkage with estuarine model	Needed to run estuarine models	Bhatt	MWG	late 2022. Need to determine form of dynamic model first for the variable description.	Indentify set of terminal segments. Identify estuarine cell for each terminal segment. Compare old ICM variables with new ICM variables. Do new WSM variables match up?



Web page

- Overview

Phase 7 Model Development | Ch

chesapeakebay.net/what/programs/modeling/phase_7_model_development

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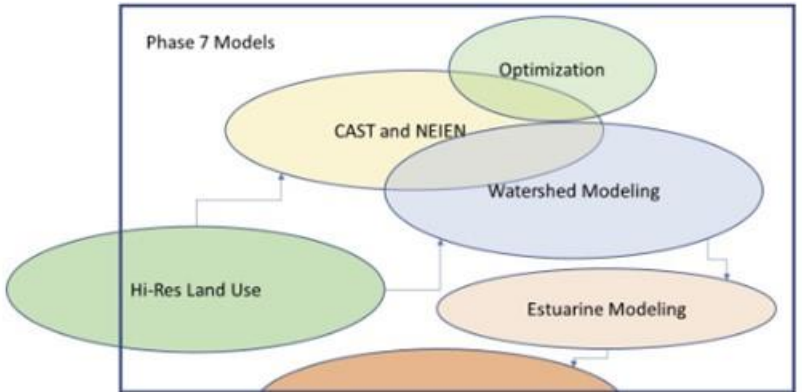
WHAT WE DO > PROGRAMS & PROJECTS > PHASE 7 MODEL DEVELOPMENT

Phase 7 Model Development

The Chesapeake Bay Program is updating its modeling and analysis tools used in the Chesapeake Bay TMDL.

Currently in development, 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. The model, which will be ready for use by 2027, consists of six interrelated projects:

1. High Resolution Land Use
2. Chesapeake Assessment Scenario Tool (CAST)
3. Optimization
4. Watershed Modeling
5. Estuarine Modeling
6. Criteria Assessment



Modeling

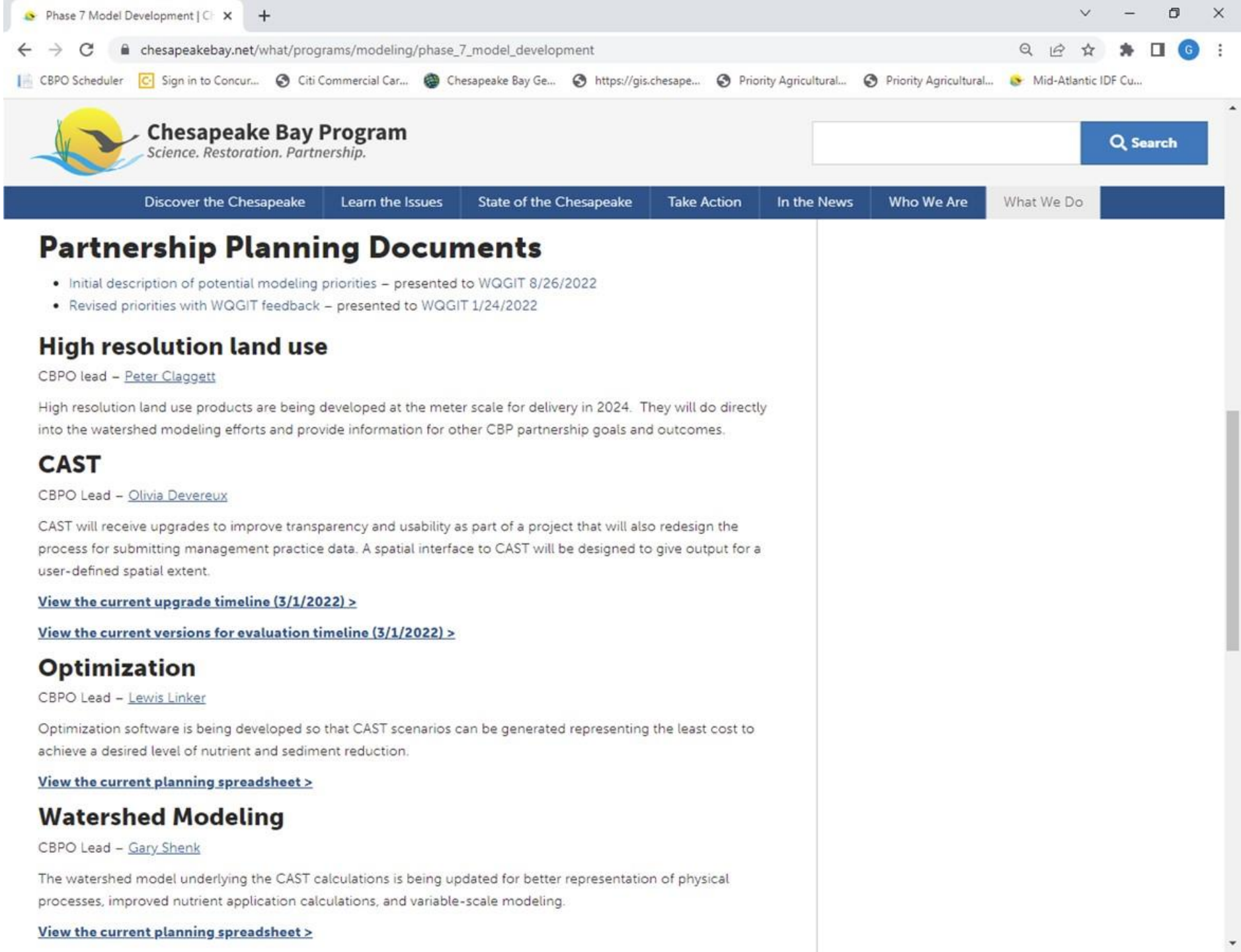
Phase 7 Model Development

Programs & Projects

- Modeling
- Monitoring
- Quality Assurance
- Resource Lands Assessment
- Chesapeake Bay TMDL
- Watershed Implementation Plans
- BMP Verification

Web page

- All six projects



Phase 7 Model Development | C

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Partnership Planning Documents

- Initial description of potential modeling priorities – presented to WQGIT 8/26/2022
- Revised priorities with WQGIT feedback – presented to WQGIT 1/24/2022

High resolution land use

CBPO lead – Peter Claggett

High resolution land use products are being developed at the meter scale for delivery in 2024. They will do directly into the watershed modeling efforts and provide information for other CBP partnership goals and outcomes.

CAST

CBPO Lead – Olivia Devereux

CAST will receive upgrades to improve transparency and usability as part of a project that will also redesign the process for submitting management practice data. A spatial interface to CAST will be designed to give output for a user-defined spatial extent.

View the current upgrade timeline (3/1/2022) >

View the current versions for evaluation timeline (3/1/2022) >

Optimization

CBPO Lead – Lewis Linker

Optimization software is being developed so that CAST scenarios can be generated representing the least cost to achieve a desired level of nutrient and sediment reduction.

View the current planning spreadsheet >

Watershed Modeling

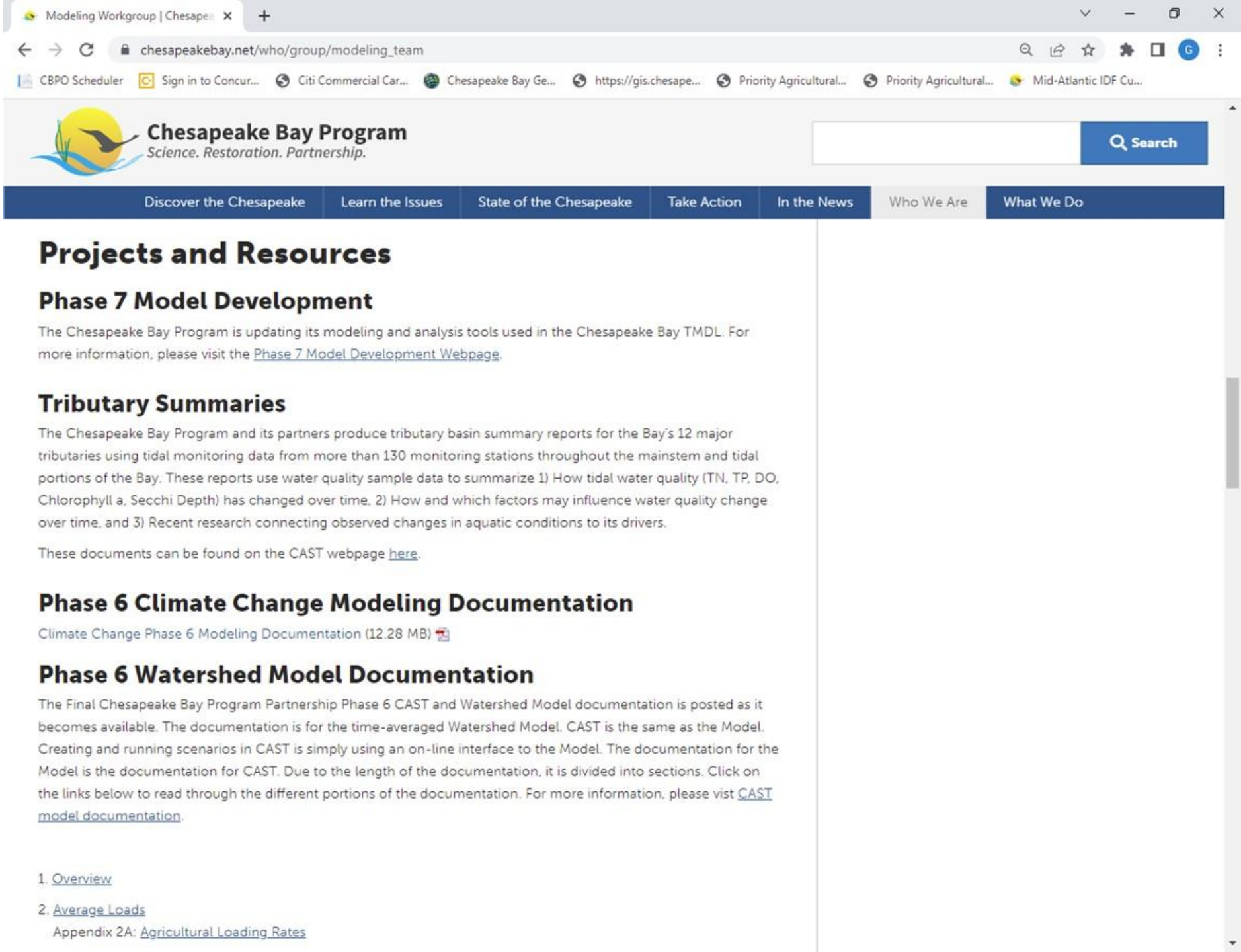
CBPO Lead – Gary Shenk

The watershed model underlying the CAST calculations is being updated for better representation of physical processes, improved nutrient application calculations, and variable-scale modeling.

View the current planning spreadsheet >

Web page

- Linked from
  - Modeling Workgroup
  - WQGIT
  - Many WQGIT WGs



Phase 7 Development Tracks