

# Phase 7 Plans

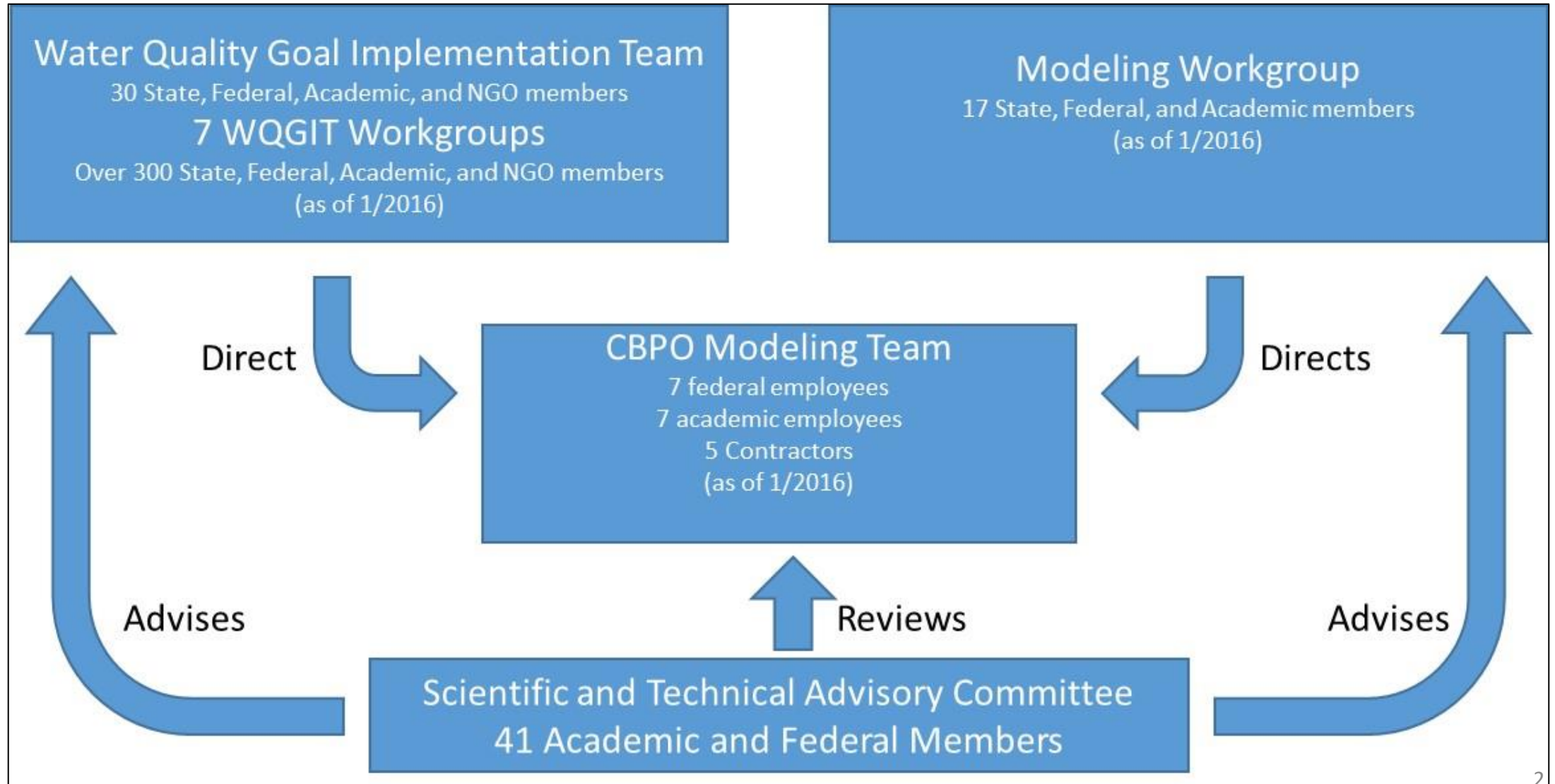
Gary Shenk – CBPO

WQGIT

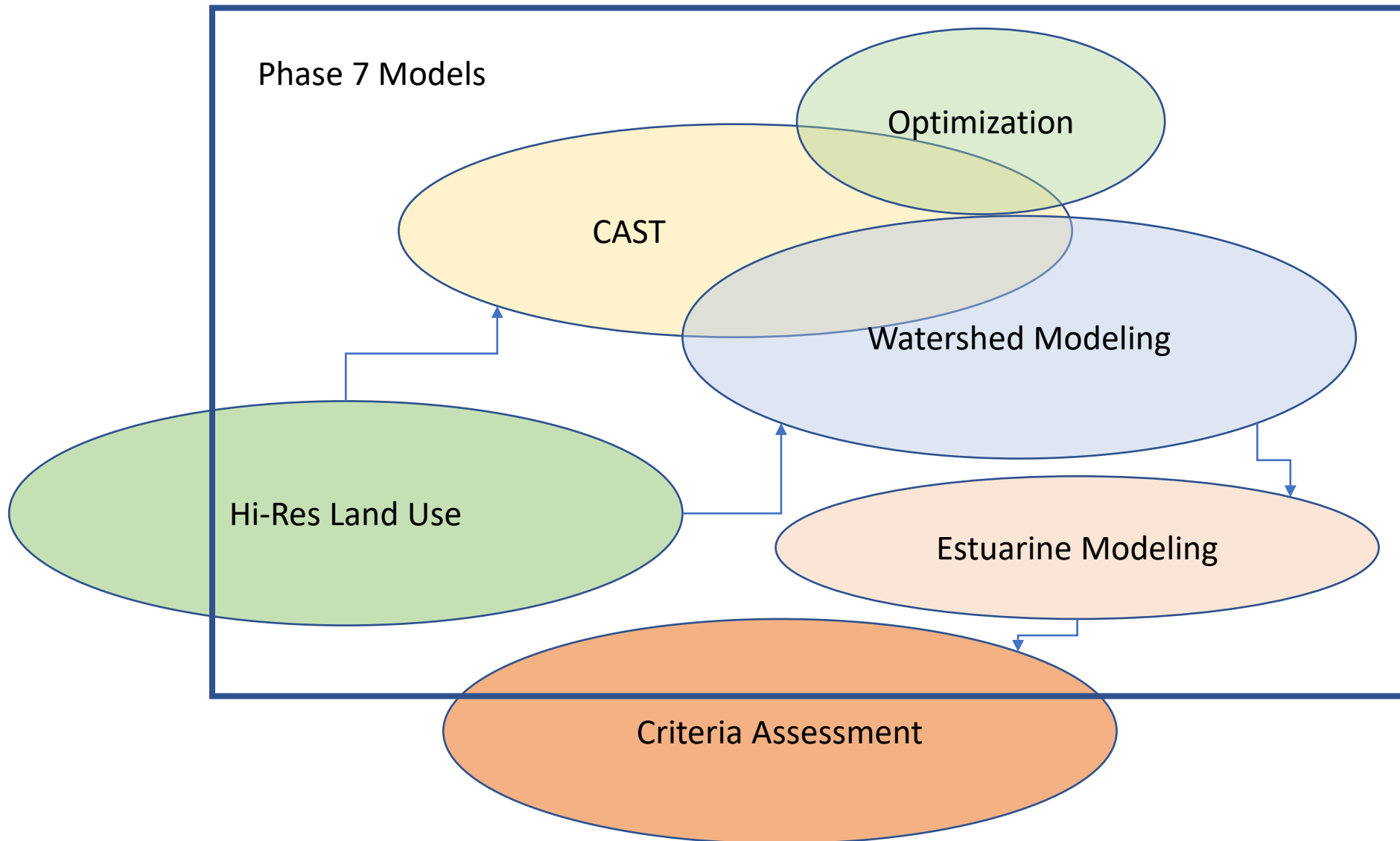
2/28/2022

# Governance

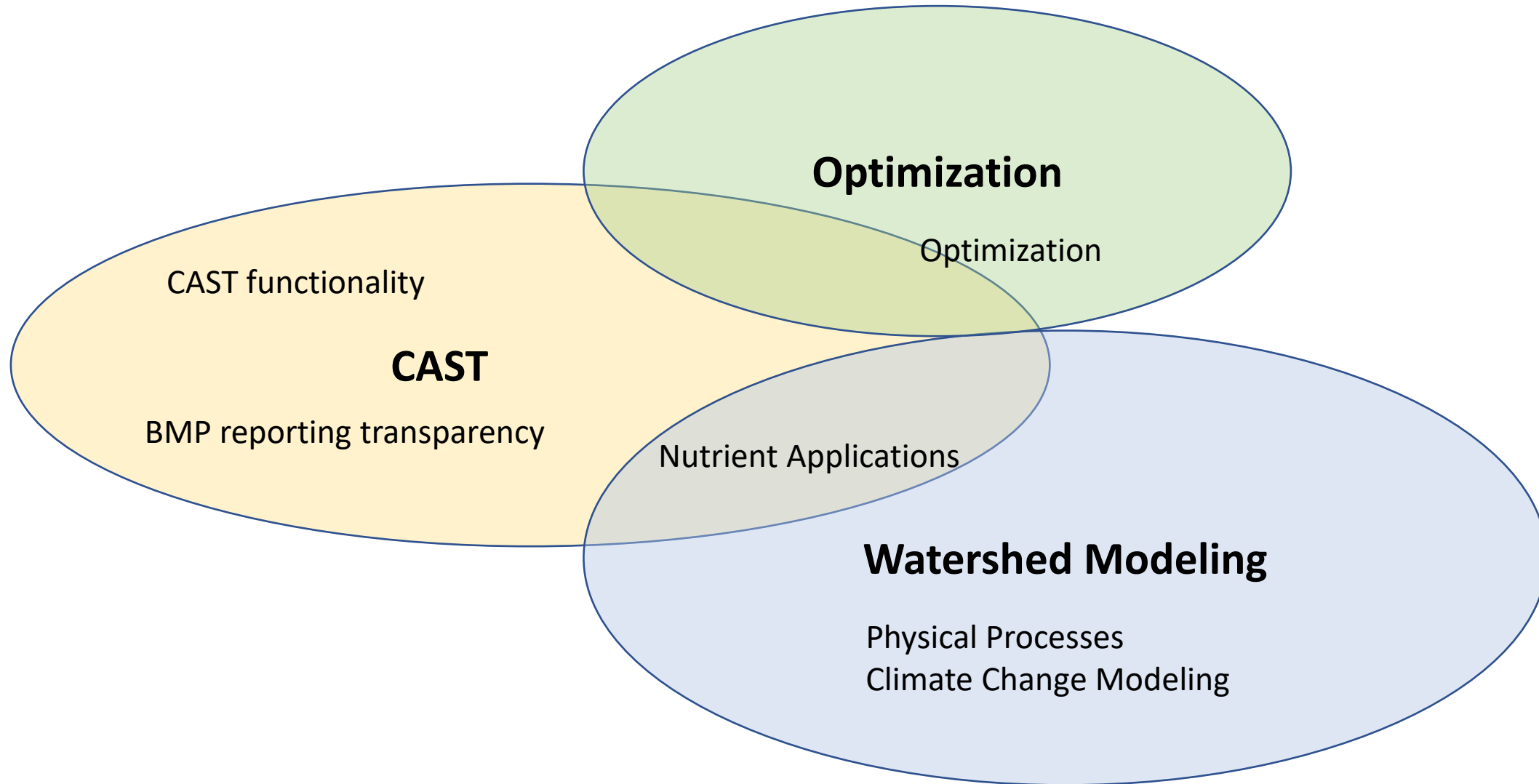
<https://cast-content.chesapeakebay.net/documents/P6ModelDocumentation%2F1%20Overview%202018%2005%2022.pdf>  
[https://www.chesapeakebay.net/who/group/modeling\\_team](https://www.chesapeakebay.net/who/group/modeling_team)  
<https://www.chesapeakebay.net/what/programs/modeling>



# Phase 7 Development Tracks



# Phase 7 Development Tracks



# Phase 7 Development Tracks and Lead

- Land Use – Peter Claggett
- CAST – Olivia Devereux
- Optimization – Lewis Linker
- Watershed Modeling – Gary Shenk
- Main Bay and Tributary Models – Lewis Linker
- Criteria Assessment – Peter Tango

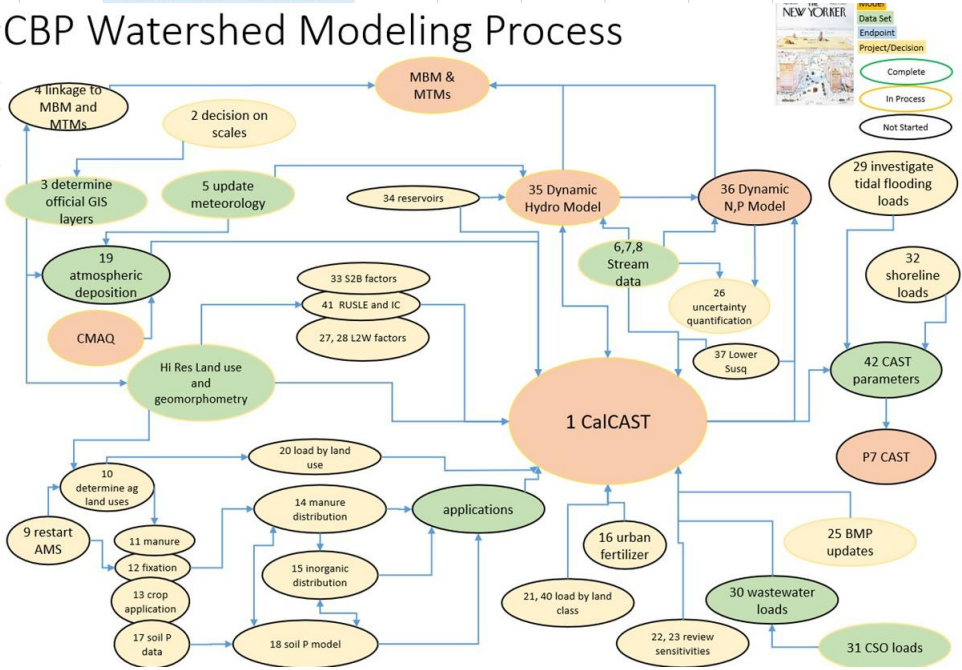
# Each Track Will Provide Schedule Documents

Format will vary by Track

|                         | 2022  | 2022 | 2022 | 2022 | 2023  | 2023                                      | 2023 | 2023 | 2024                    | 2024         | 2024      | 2024 | 2025 | 2025 | 2025         | 2025 |
|-------------------------|---|------|------|------|-------|---|------|------|-------------------------|--------------|-----------|------|------|------|--------------|------|
|                         | 1   | 2    | 3    | 4    | 1     | 2   | 3    | 4    | 1                       | 2            | 3         | 4    | 1    | 2    | 3            | 4    |
| Phase 7 Activity        | Work plan   |      |      |      | Build | 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 |      |      |      |       |   |      |      |                         |              |           |      |      |      |              |      |
| Variable Scale Modeling |   |      |      |      |       | 29 Investigate tidal flooding loads       |      |      |                         |              |           |      |      |      |              |      |
|                         |   |      |      |      |       |   |      |      | 30 Update to Wastewater |              |           |      |      |      |              |      |
|                         |   |      |      |      |       | 31 Update to CSOs                         |      |      |                         |              |           |      |      |      |              |      |

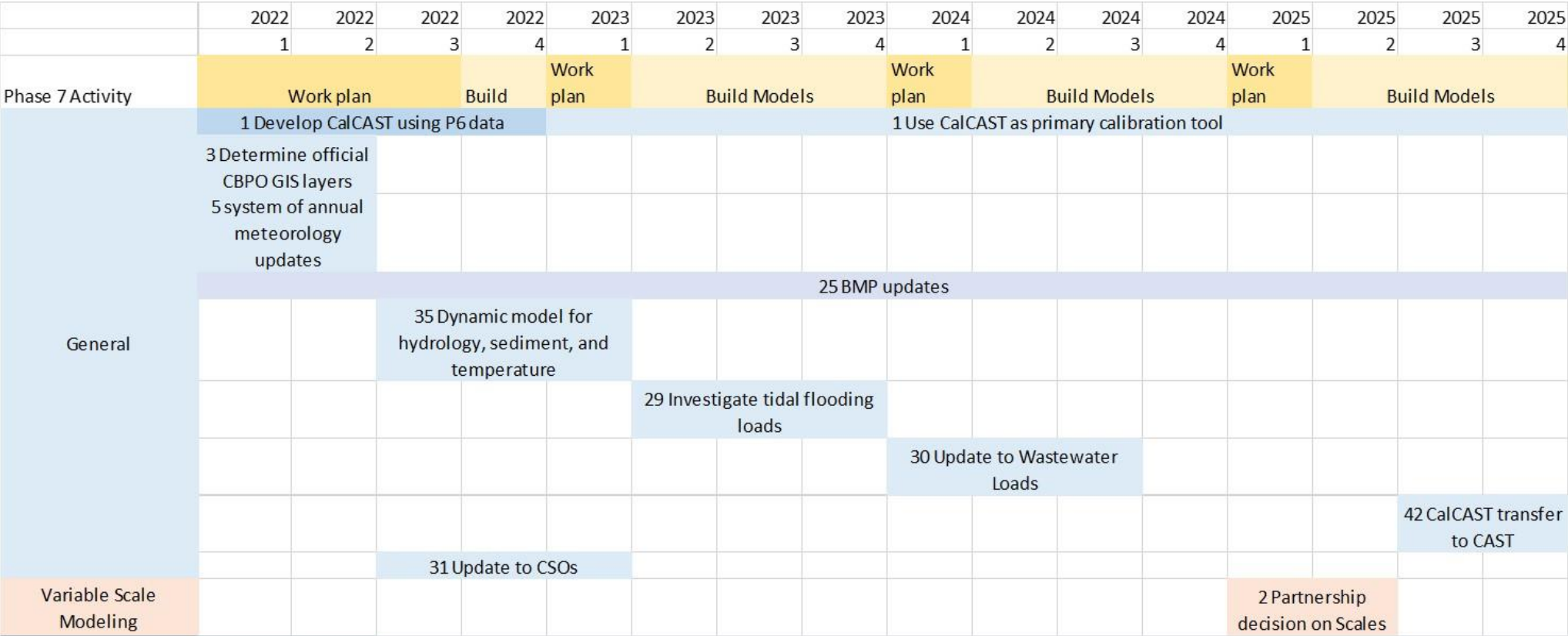
| Item | Category                      | What: short description  | Why: who asked for it or why is it necessary  | Who in CBP is when the work   | development time |   |
|------|-------------------------------|--|---|-------------------------------|------------------|---|
| 1    | General                       | 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 incorporation of all other development priorities | Bertani; Bhatt; Shenk         | MWG              | First priority. The rest of development depends on CalCAST. Need decisions on scale. 2022   |
| 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   |
| 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  |
| 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. Identify 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? |

## CBP Watershed Modeling Process



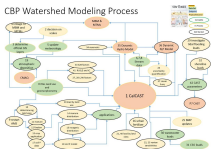
# Each Track Will Provide Schedule Documents

Gantt Chart



| Task ID | Task Name  | Start Date | End Date   | Duration | Priority | Assignee   | Status      | Comments |
|---------|--|------------|------------|----------|----------|------------|-------------|----------|
| 1       | Develop CalCAST using P6 data                          | 2022-01-01 | 2022-04-01 | 90 days  | High     | John Doe   | Completed   |          |
| 2       | Use CalCAST as primary calibration tool                | 2022-04-01 | 2022-12-31 | 273 days | High     | John Doe   | In Progress |          |
| 3       | Determine official CBPO GIS layers                     | 2022-01-01 | 2022-03-01 | 60 days  | Medium   | Jane Smith | Completed   |          |
| 4       | System of annual meteorology updates                   | 2022-01-01 | 2022-03-01 | 60 days  | Medium   | Jane Smith | Completed   |          |
| 5       | Dynamic model for hydrology, sediment, and temperature | 2022-03-01 | 2022-06-01 | 90 days  | High     | John Doe   | In Progress |          |
| 6       | Investigate tidal flooding loads                       | 2022-06-01 | 2022-08-01 | 60 days  | Medium   | John Doe   | In Progress |          |
| 7       | Update to Wastewater Loads                             | 2022-08-01 | 2022-10-01 | 60 days  | Medium   | John Doe   | In Progress |          |
| 8       | Update to CSOs   | 2022-03-01 | 2022-05-01 | 60 days  | Medium   | John Doe   | Completed   |          |
| 9       | Partnership decision on Scales                         | 2022-10-01 | 2022-12-31 | 90 days  | High     | John Doe   | In Progress |          |
| 10      | CalCAST transfer to CAST                               | 2022-12-31 | 2023-01-01 | 1 day    | High     | John Doe   | Completed   |          |

Format will vary by Track





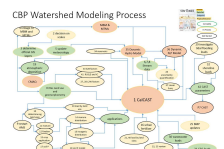
# Each Track Will Provide Schedule Documents

## Task List

|      |                               | <b>What:</b> short description   | <b>Why:</b> who asked for it or why is it necessary   | <b>Who</b> in CBPO or elsewhere will do the work | <b>Where</b> in the CBP organizational chart do the decisions lie | <b>When</b> does this need to be done, including general dependencies and development time | <b>How:</b> A very short description with a link to the longer documentation  |
|------|-------------------------------|--|---|--|---|--|---|
| Item | Category                      |  |   |  |   |  |   |
| 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 incorporation 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 techniques 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.     | Identify 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?                            |



*Format will vary by Track*

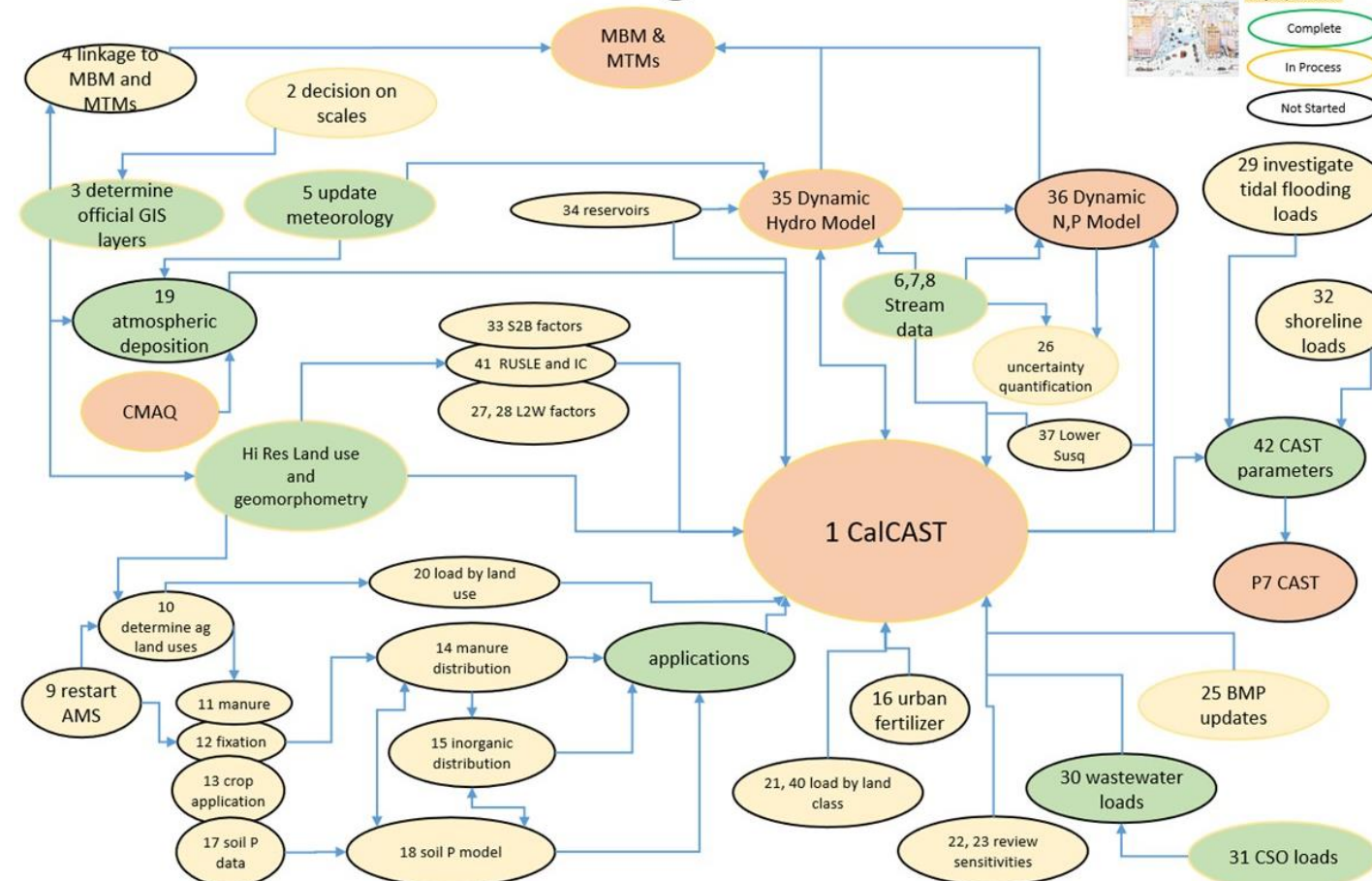




# Each Track Will Provide Schedule Documents

### Flow Chart

# CBP Watershed Modeling Process



*Format will vary by Track*

# Web page under development

- All six projects
- Linked under each WG/GIT home page
- Linked for all agenda items

Phase 7 Model Development web x +

File | C:/Users/gshenk/OneDrive%20-%20Chesapeake%20Bay%20Program/Documents/temp/Phase%207%20Model%20Development%20web%20page%20... | ☆ | 6 |

Apps | CBPO Scheduler | Sign in to Concur... | Citi Commercial Car... | Chesapeake Bay Ge... | https://gis.chesape... | Priority Agricultural... | Priority Agricultural... | Reading list

## Phase 7 Model Development

Subhead: 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 and assess progress towards water quality goals and outcomes of 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

Phase 7 Models

Optimization

CAST

Watershed Modeling

Hi-Res Land Use

Estuarine Modeling

Criteria Assessment

How are the projects interrelated?

[CAST](#) is a publicly available model of the Chesapeake Bay watershed used to estimate changes in long-term nutrient and sediment loads due to changes in point sources, land use, and land management. *Watershed modeling* provides the science behind the calculations in CAST while *optimization* allows users to find a least cost management option in CAST for a given nutrient and sediment reduction. The production of new *high resolution land use* data will inform and improve the phase 7 watershed modeling products while also providing important data for other CBP goals and outcomes. *Estuarine Modeling* translates changes in nutrients and sediment to water quality outcomes in the tidal waters of the Bay. *Criteria Assessment* is the process of determining whether the predicted water quality outcomes meet state water quality standards.

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](#)

# Additional Topics from the WQGIT ++

- WQGIT processes – Jeremy Hanson
  - Ongoing discussion of WQGIT processes
  - Not the focus of today's presentation
- Planning Target calculations – Gary Shenk
  - Next decisions in 2027
  - Focus in 2025-2026
  - Can discuss any time
- Co-benefits
  - CBP partnership still figuring this out
  - Require participation from CBP GITs and WGs

# Summary and next steps

- Comprehensive Phase 7 plan with six components being developed
  - Can be modified going forward
- Web page with CBP process and model planning documentation
- April WQGIT meeting – Updates for all six components