Watershed Model Work Plan

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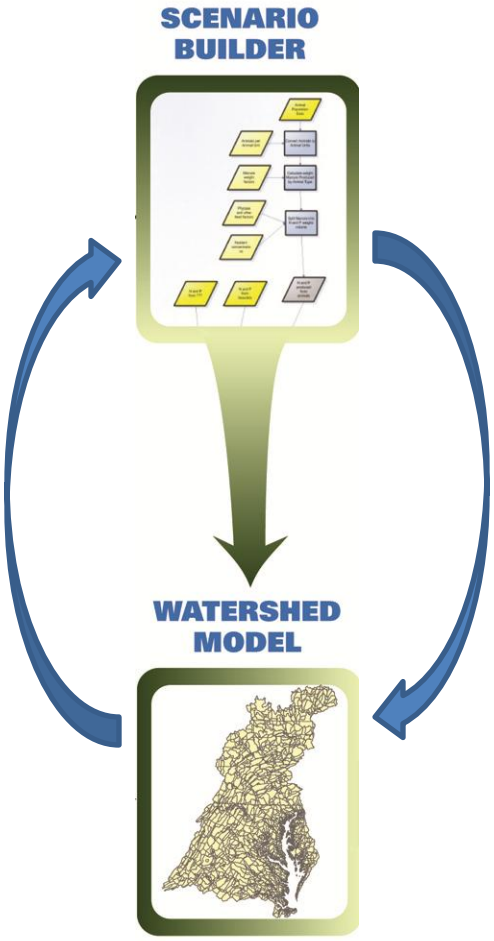
Modeling Quarterly Review

12/11/2013

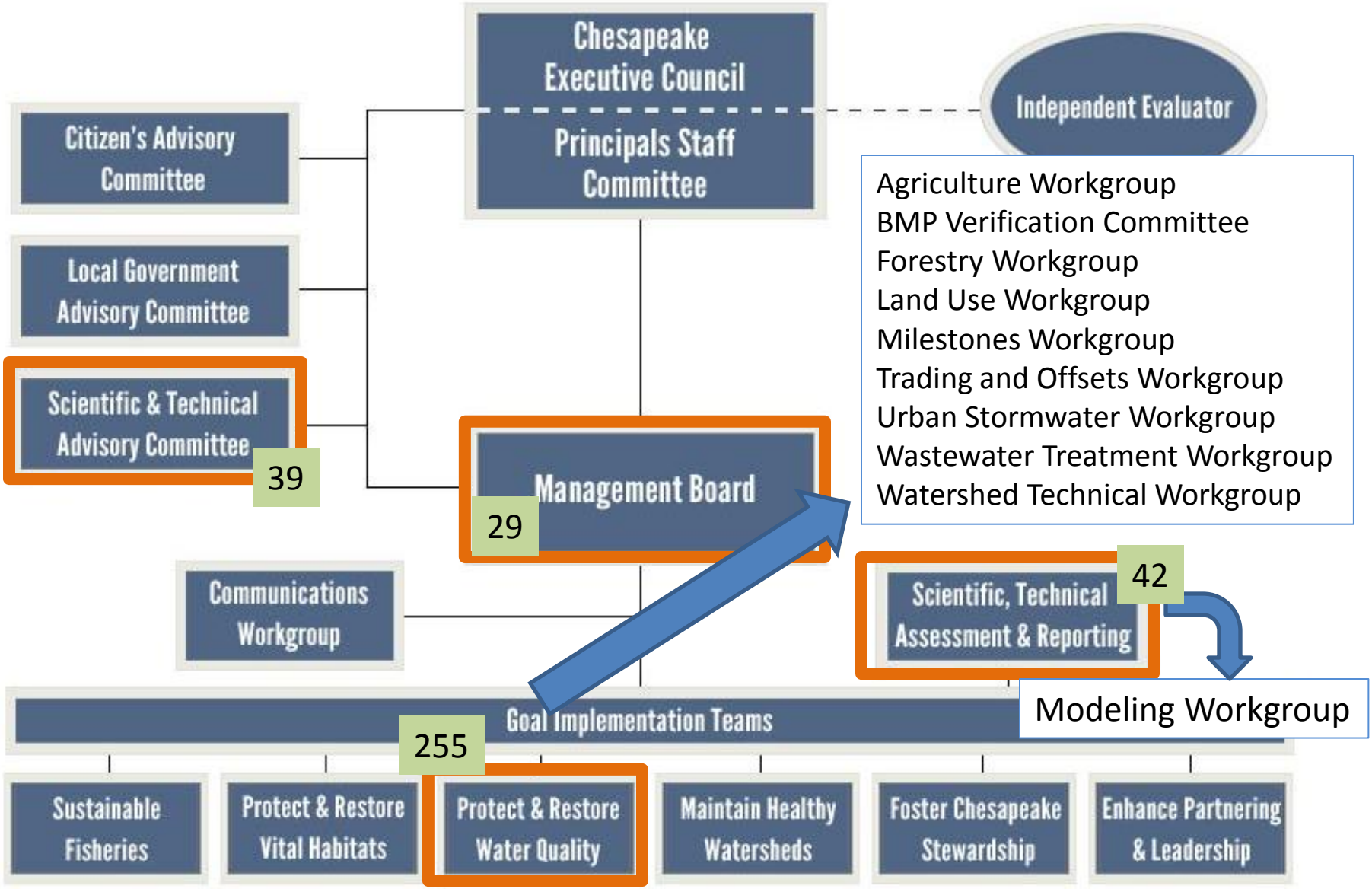
Phase 5 Projects

- Automation
- Extension to 2011
- Climate Change
  - Five Projects with PSU, USGS, UMCES, EPA, RAND, ICPRB
  - Three Proposals with VIMS, VaTech, Princeton, JHU
- Partnership Support

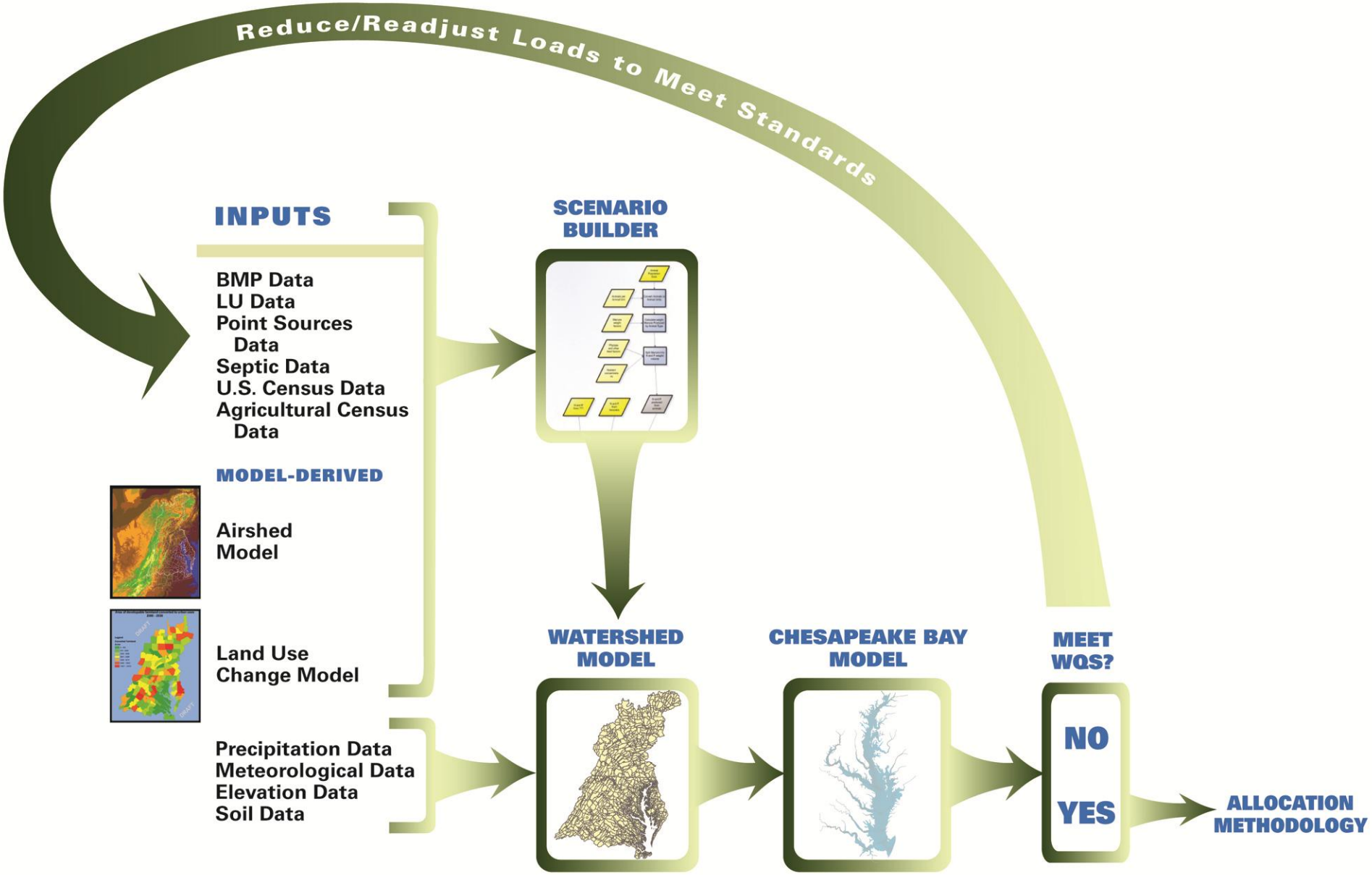


Model related Membership as of 7/2013 – 365 individuals

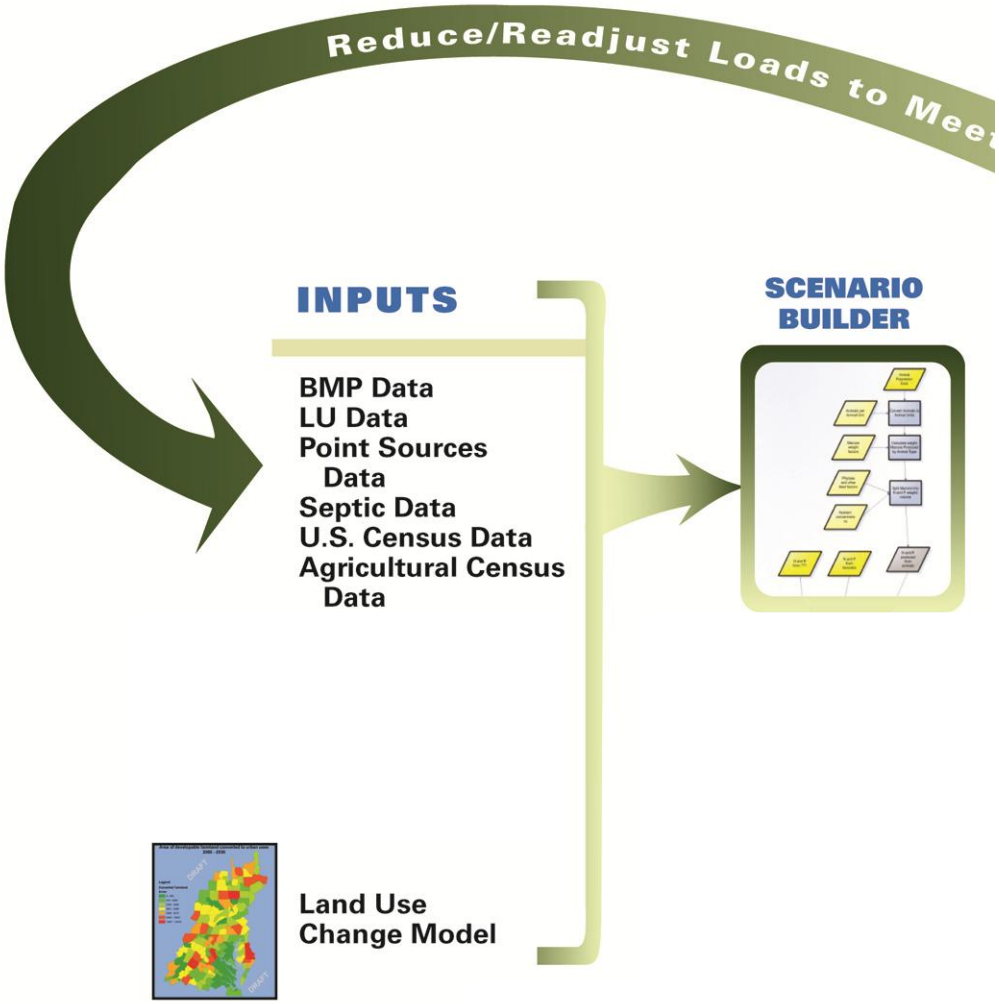
Chesapeake Bay Program Partnership



Chesapeake Bay Partnership Models



Chesapeake Bay Partnership Models



Priorities

Who Decides? (imho)

- WQGIT – Ultimate responsibility for the following
  - Panels – BMP effectiveness, input data sources and calculations
  - Land Use Workgroup – primary responsibility to determine land uses and methods to map them. Can make recommendations on loading rates.
  - Ag, Forestry, Urban Workgroups – Make recommendations on land use types, loading rates, BMPs, or any other aspect of modeling.
- Modeling Workgroup – primary responsibility to determine calibration methods and multiple model averaging methods

Ag Modeling Subcommittee

- ModWG : WSM :: AMS : SB
- Reports to the Ag WG
- Primarily Scientists
  - USDA lead
  - EPA, USGS, SERC
  - University Rep from each state
- Working on Priorities set by the BBBM Workshop
- Currently running scenarios through SB and the WSM determining sensitivity to different upgrades

Some Likely Ag Modeling Subcommittee Priorities

- Soil Phosphorus
- Nutrient Balance Issues
  - Animal Counts => Manure applications
  - Fertilizer Applications
  - Uptake Rates
- Land use loading rates (AFO, Nursery)

Draft Modeling Schedule for MPA

Dec 20, 2016 - All models are final. The partnership decision-making process begins to discuss how these new models will be used in the WIP3 process

September 2016 – Final comments on the draft Phase 6 model

Dec 20, 2015 - Phase 6 draft model is complete. Evaluation followed by fine tuning during this year

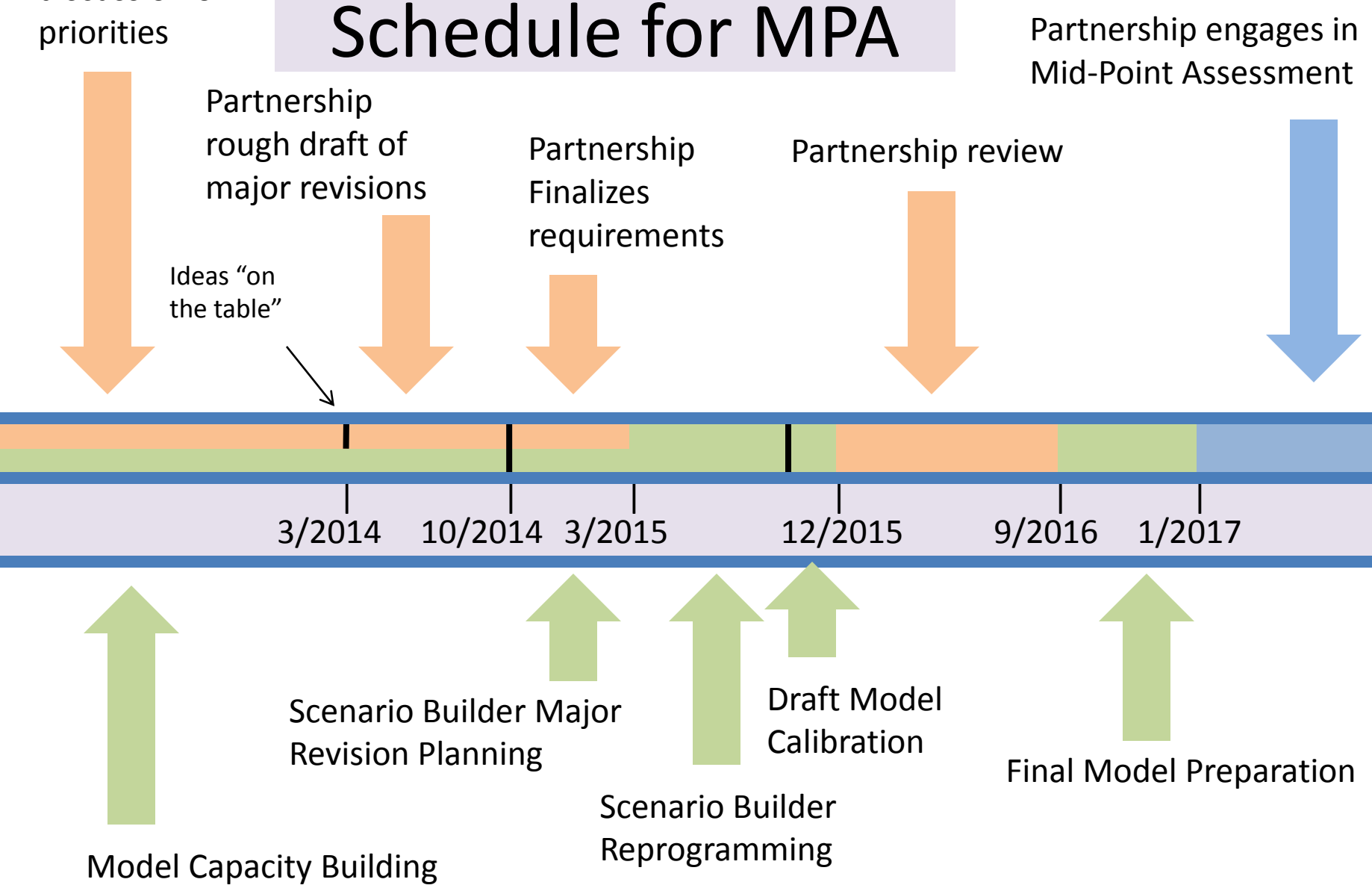
Oct 20, 2015 – All inputs are final and delivered to the WSM by the scenario builder team for the final calibration run

March 20, 2015 – All major partnership decisions are made on changes to scenario builder processing and data. Scenario builder final modifications begin.

Oct 20, 2014 – Rough Draft of major changes to nutrient processing in Scenario Builder will need to be complete. (Examples: land use types and manure application rules)

March 20, 2014 – Ideas must be on the table

Draft Modeling Schedule for MPA



MPA WSM-Related Priorities

- Revise Modeling Structure (phase 6)
- Revise Calibration
  - Particularly regional factors

Phase 6 Development

- Develop sensitivities to input
- Develop export targets
- Incorporate sensitivities in model code
- Calibration Methodology
- Investigate Modeling Issues
- Incorporate Panel Recommendations
- Code Updates

Phase 6 Sensitivities and Targets

- Gather Information
  - AGCHEM - CBPO
  - Sparrow - CBPO
  - CEAP - BARC
  - Forest Disturbance model – Gutierrez-Magness, et al
  - APLE – Coale and Mulkey
  - Other Coefficient Models - TetraTech
  - Literature - TetraTech
- Synthesize and Discuss with Workgroup
- Next Step – Incorporate Sensitivity into PQUAL

Calibration

- Starting from a good place – possible enhancements include:
- Gather additional flow and concentration data and load estimates
- More focus on PQUAL seasonal pattern
- Enhanced river calibration
- Regional Factor Methods

Incorporate Panel Recommendations

- Stormwater performance standards
- Stormwater retrofits
- Nutrient management
- Conservation Tillage
- Cover Crops
- Poultry Litter
- Stream Restoration
- On-Site Wastewater Treatment systems
- Urban Fertilizer Management
- Riparian Buffers
- Urban Tree planting
- Erosion and sediment control
- Illicit discharge
- Septic
- manure treatment technology
- impervious disconnect
- animal waste storage systems
- liquid manure injection/incorporation
- forest management
- urban filter strips and upgraded stream buffers
- urban shoreline erosion control
- floating wetlands
- street sweeping
- algal turf scrubbers
- cropland irrigation management
- MS4 minimum management measures

Other Modeling Issues (as time allows)

- Reservoirs
  - Susquehanna
  - Ponds
- Lag Times
- Small Scale Effects
- Uncertainty Analysis
- Code Updates (speed and clarity)
- …

Phase 6 Development

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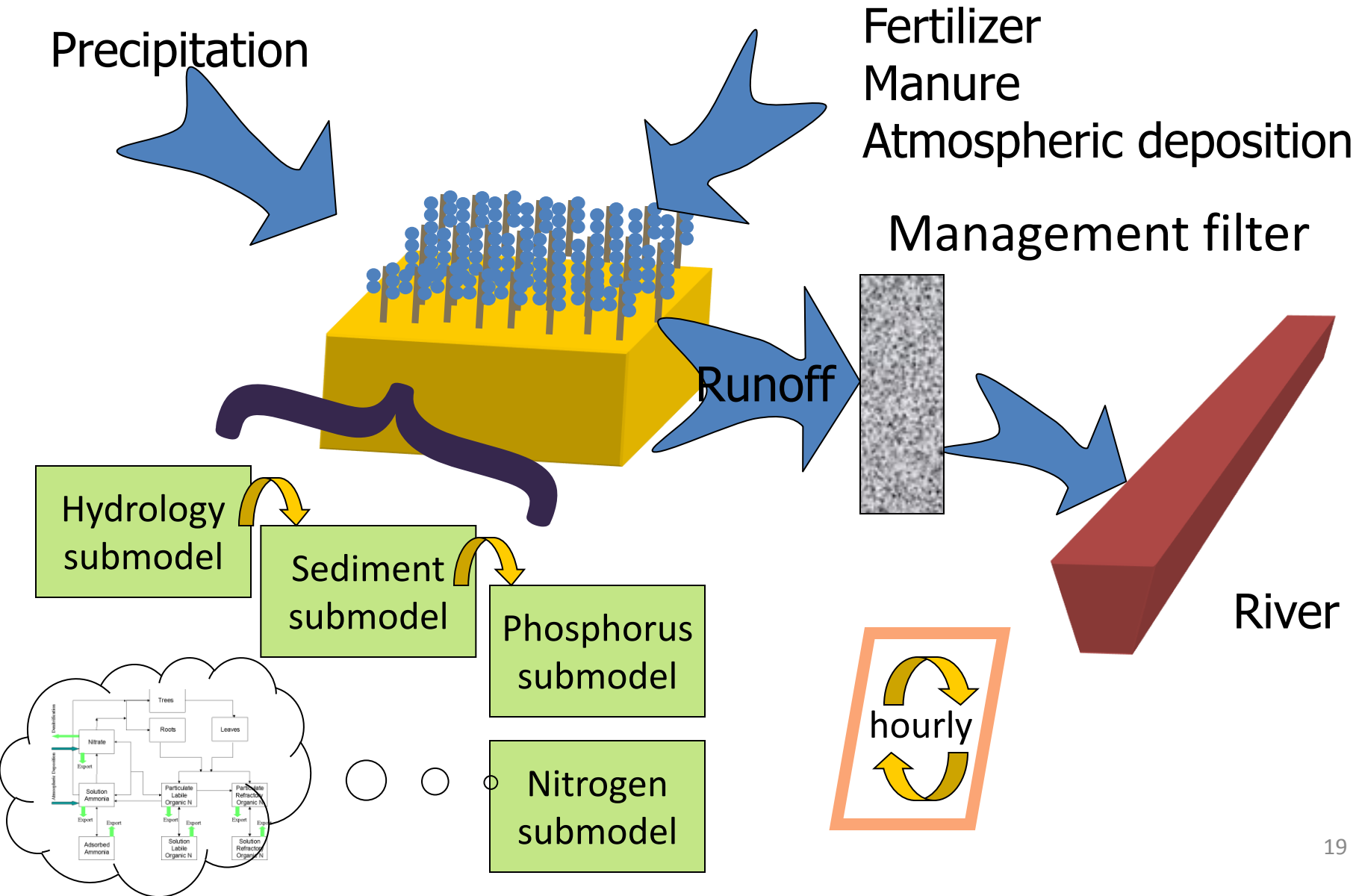
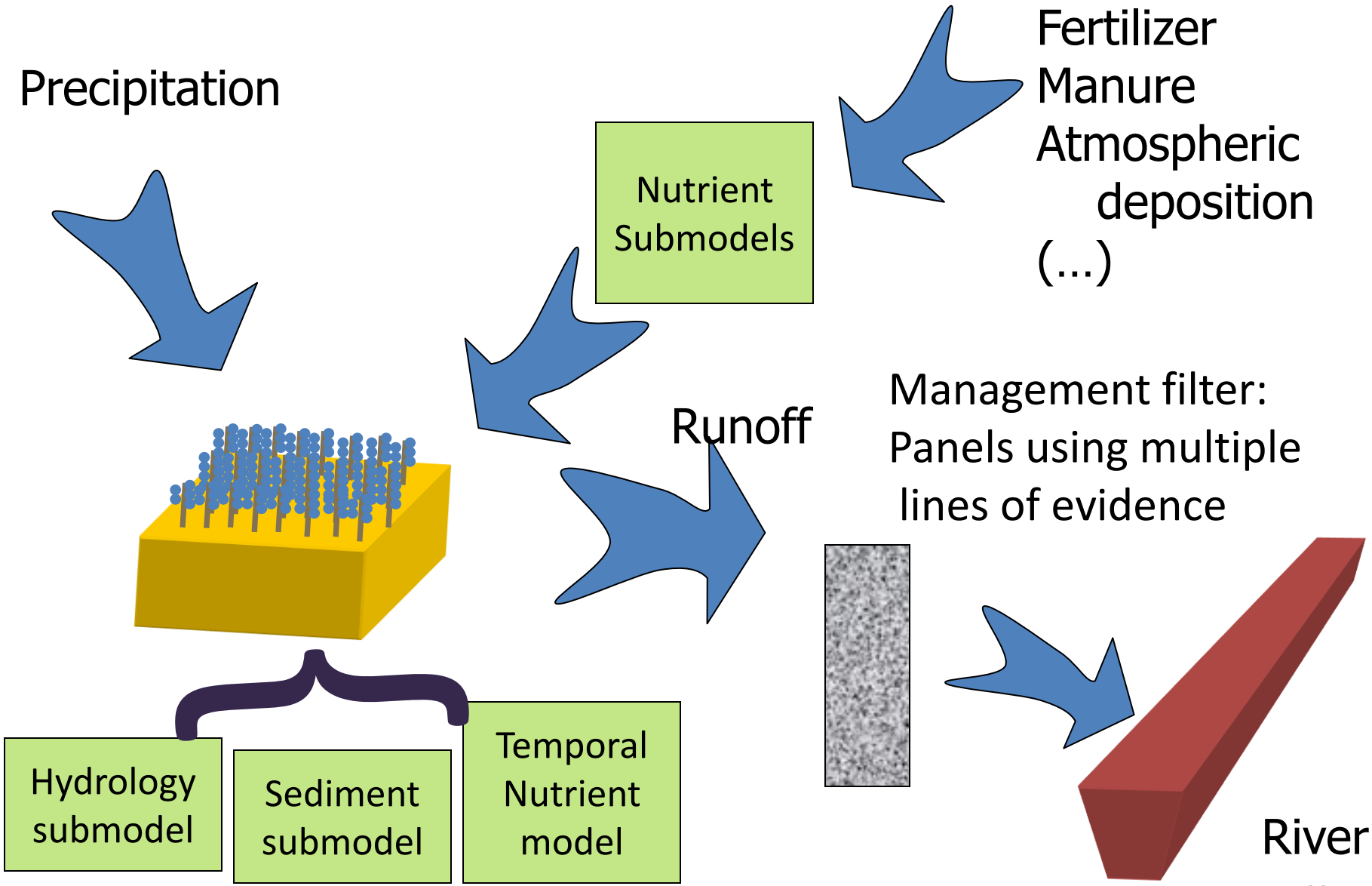
Phase 5


Precipitation
Fertilizer
Manure
Atmospheric deposition
Management filter
Runoff
River
Hydrology submodel
Sediment submodel
Phosphorus submodel
Nitrogen submodel
hourly
Trees
Roots
Leaves
Nitrate
Solution Ammonia
Particulate Labile Organic N
Particulate Refractory Organic N
Adsorbed Ammonia
Solution Labile Organic N
Solution Refractory Organic N
Export
Denitrification
Atmospheric Deposition

Phase 6


Precipitation
Fertilizer
Manure
Atmospheric deposition
(…)
Nutrient Submodels
Runoff
Management filter:
Panels using multiple lines of evidence
Hydrology submodel
Sediment submodel
Temporal Nutrient model
River