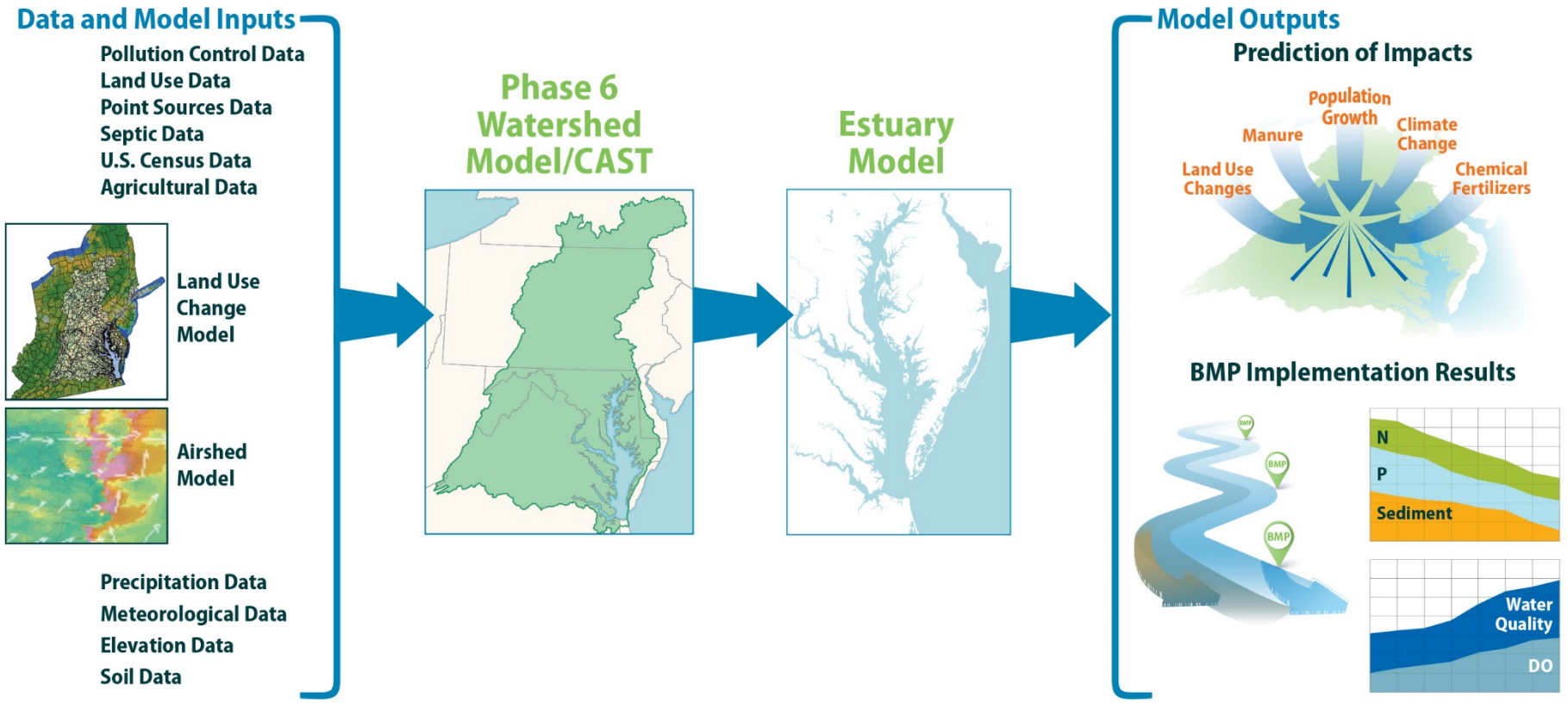
The Phase 6 Chesapeake Bay Program Watershed Model

Gary Shenk – USGS - Chesapeake Bay Program

11/8/18



What management practices to we need to implement to achieve appropriate dissolved oxygen?

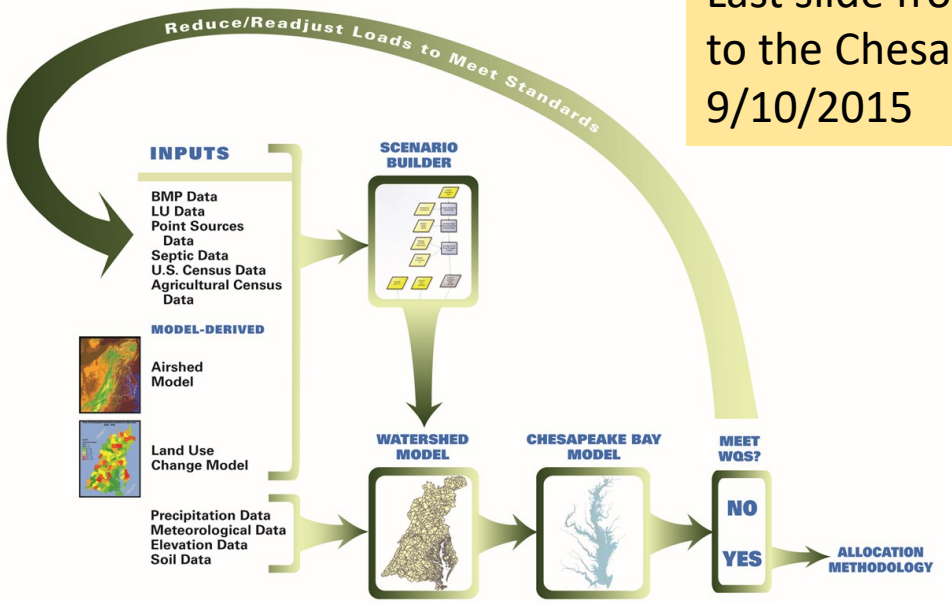
Effects

Allocations

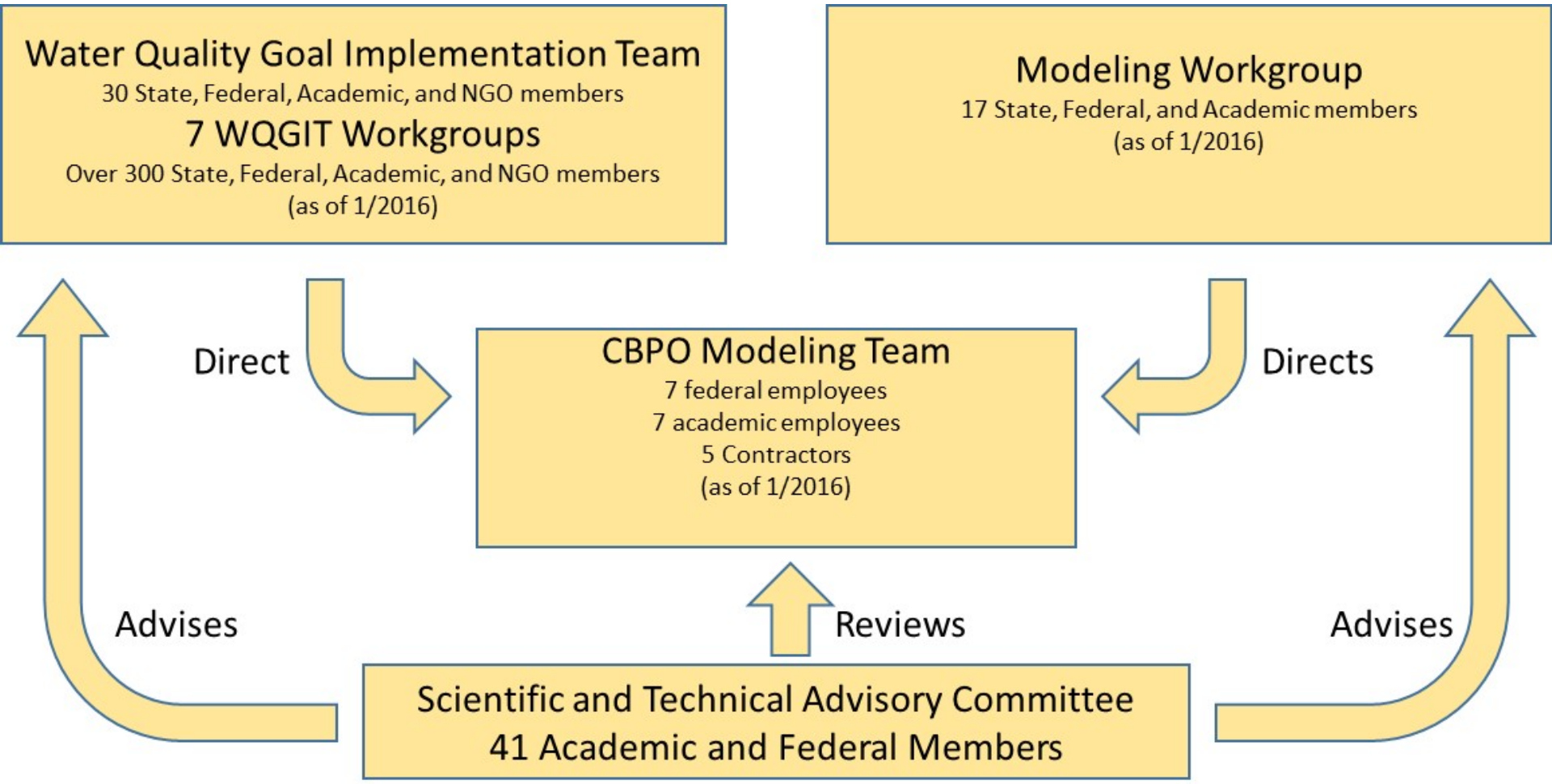
Goal – Stakeholder understanding

- Understandable model
- Inclusive process
- Better and more local input data
- More monitoring data

Last slide from previous presentation to the Chesapeake Bay Commission 9/10/2015



Participatory Modeling







Phase 6 Model Structure

Average Load + Δ Inputs * Sensitivity

*

Land Use Acres

*

BMPs

*

Land to Water

*

Stream Delivery

*

River Delivery

Direct Loads

Phase 6

Keep It Simple

Include Everything

Average Load + ΔInputs * Sensitivity

*

Land Use Acres

*

BMPs

*

Land to Water

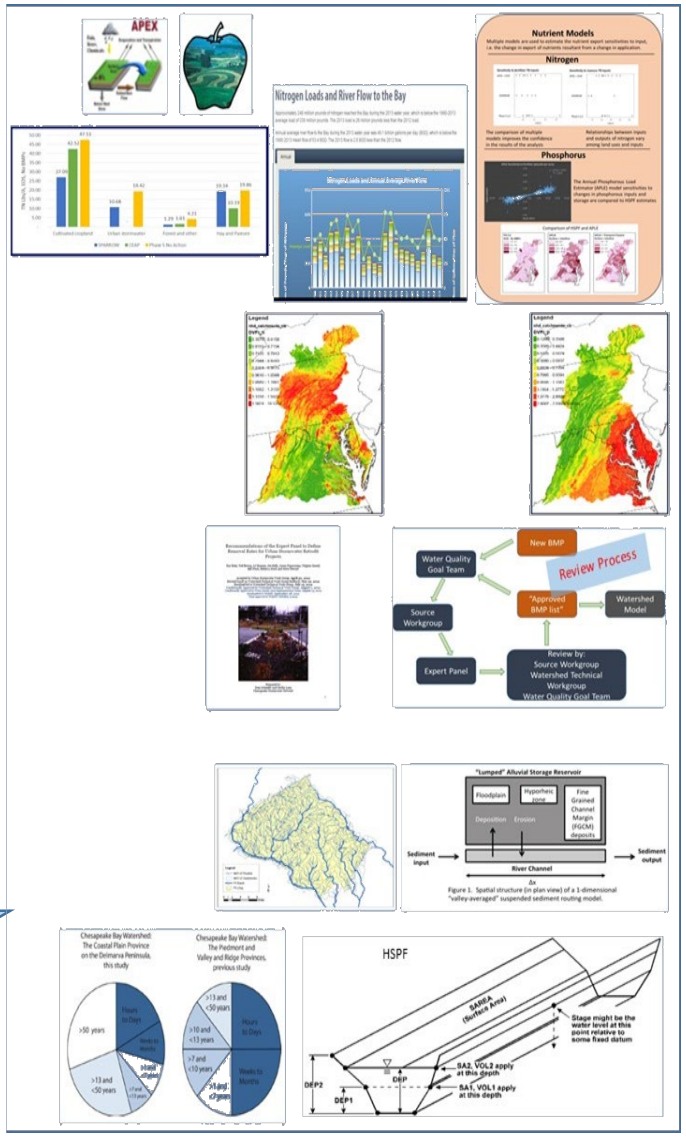
*

Stream Delivery

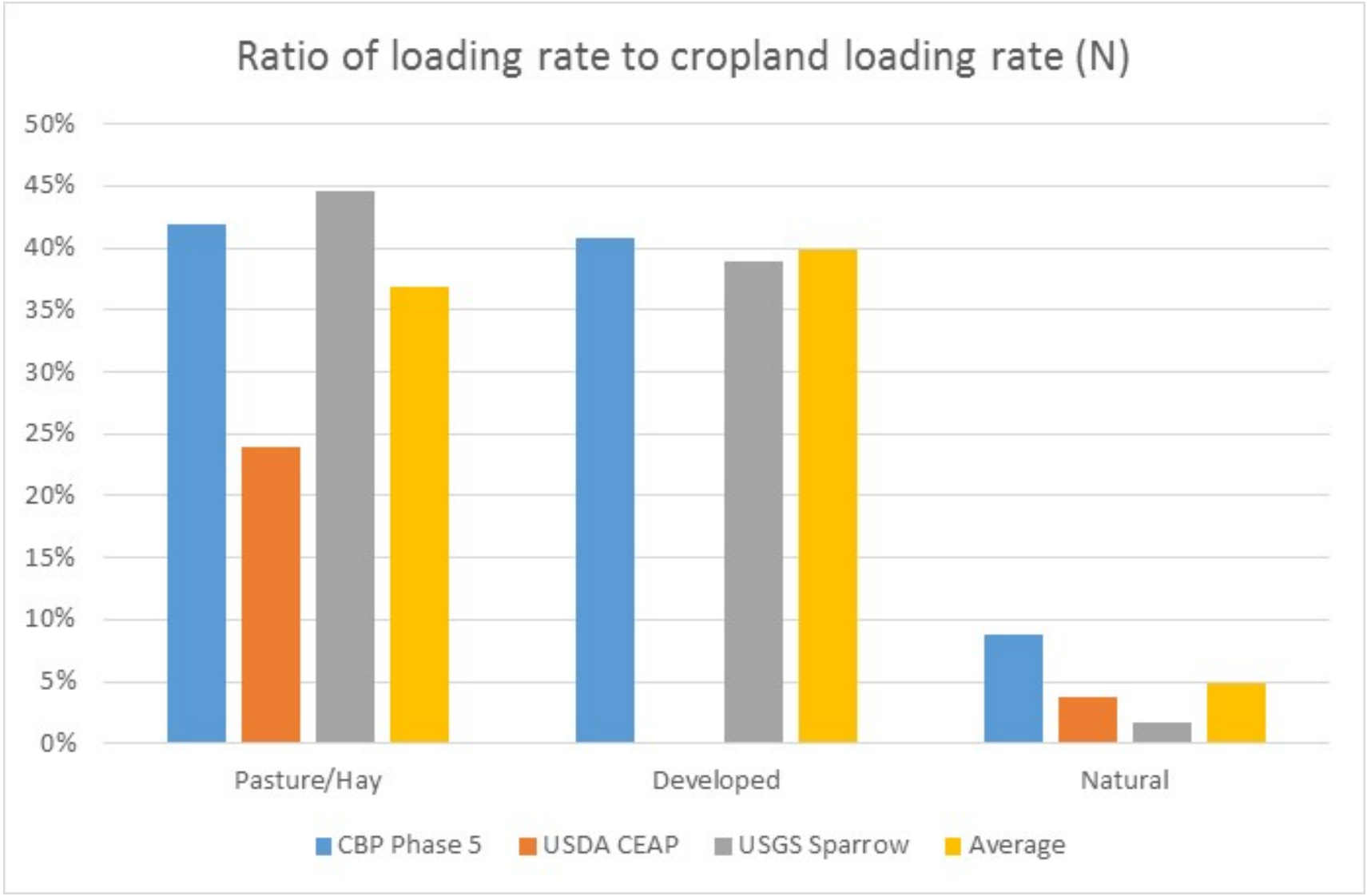
*

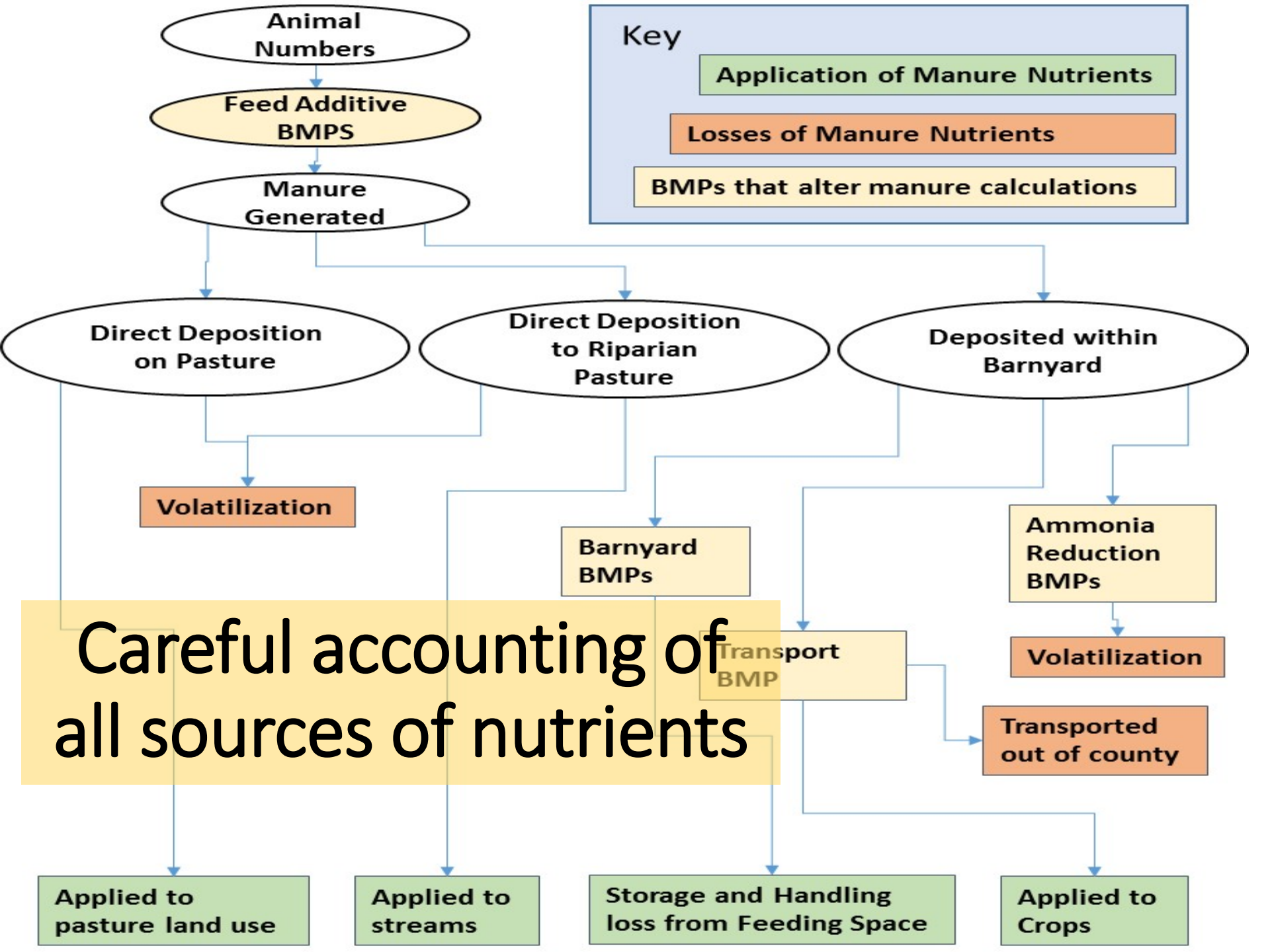
River Delivery

Direct Loads



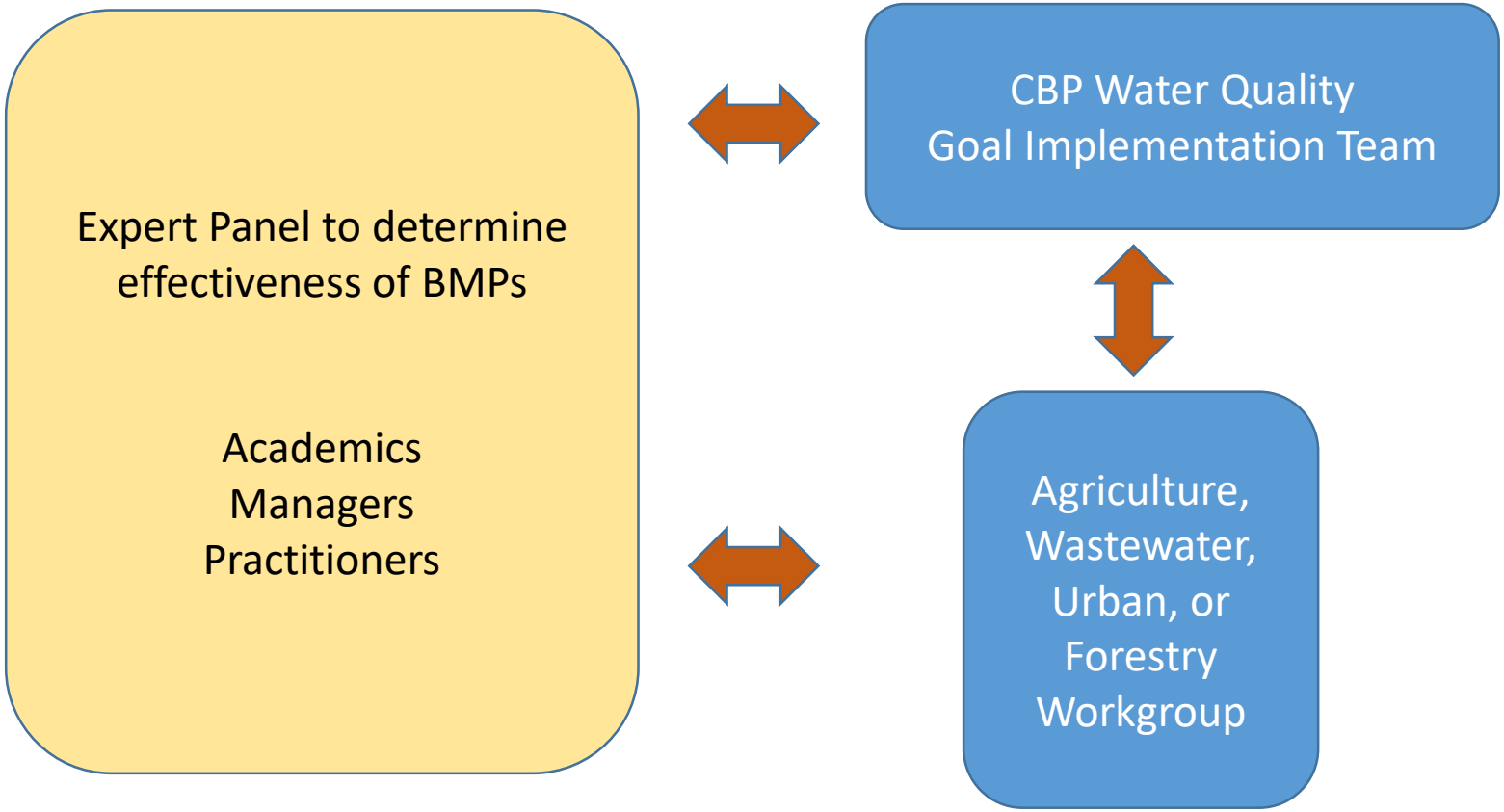
Gathering Knowledge from Multiple Sources



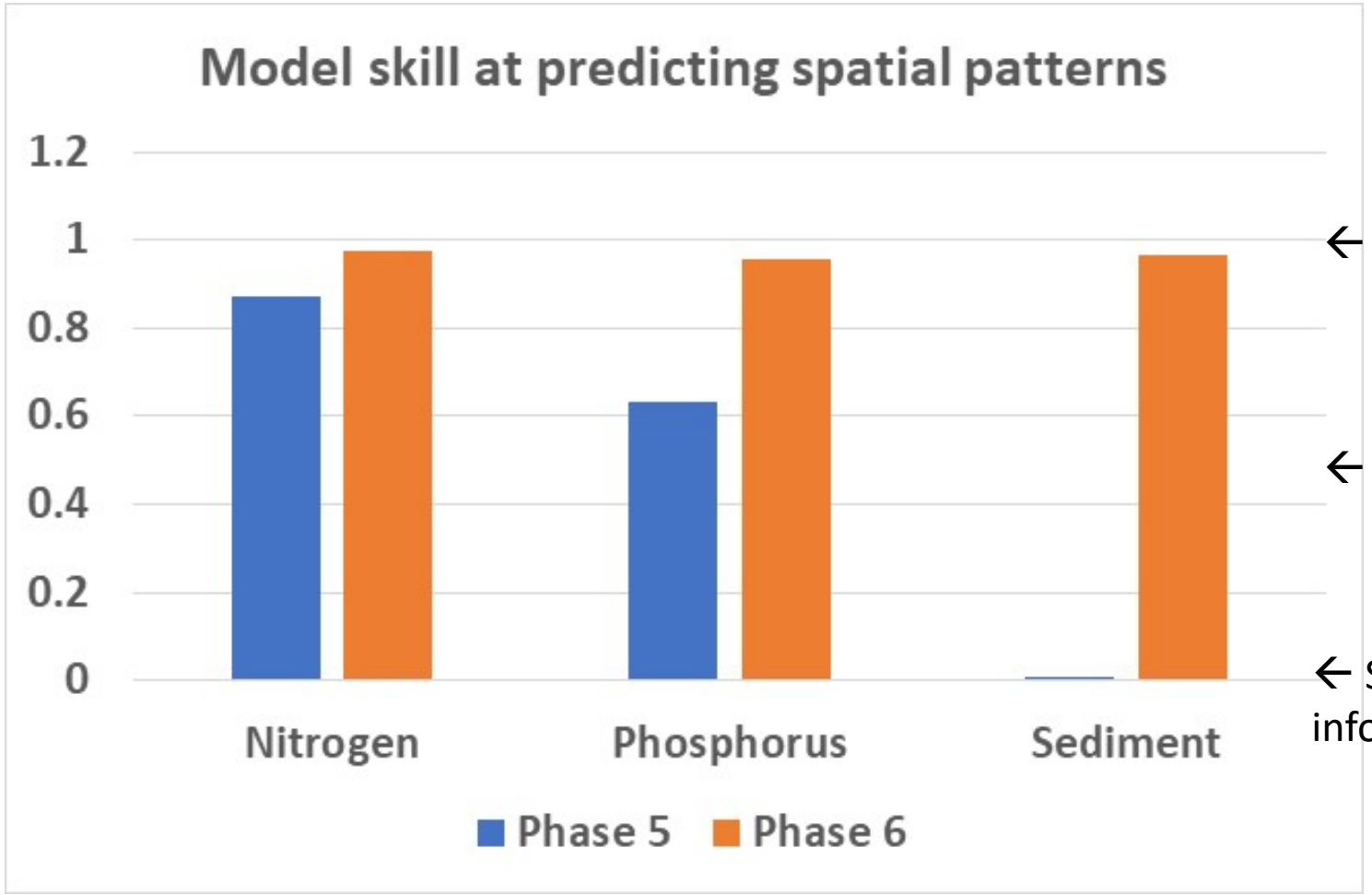

Animal Numbers
Feed Additive BMPS
Manure Generated
Key
Application of Manure Nutrients
Losses of Manure Nutrients
BMPs that alter manure calculations
Direct Deposition on Pasture
Direct Deposition to Riparian Pasture
Deposited within Barnyard
Volatilization
Barnyard BMPs
Ammonia Reduction BMPs
Transport BMP
Volatilization
Transported out of county
Careful accounting of all sources of nutrients
Applied to pasture land use
Applied to streams
Storage and Handling loss from Feeding Space
Applied to Crops

Chesapeake Bay Program
A Watershed Partnership

Collaborative Stakeholder Processes



How did it work?



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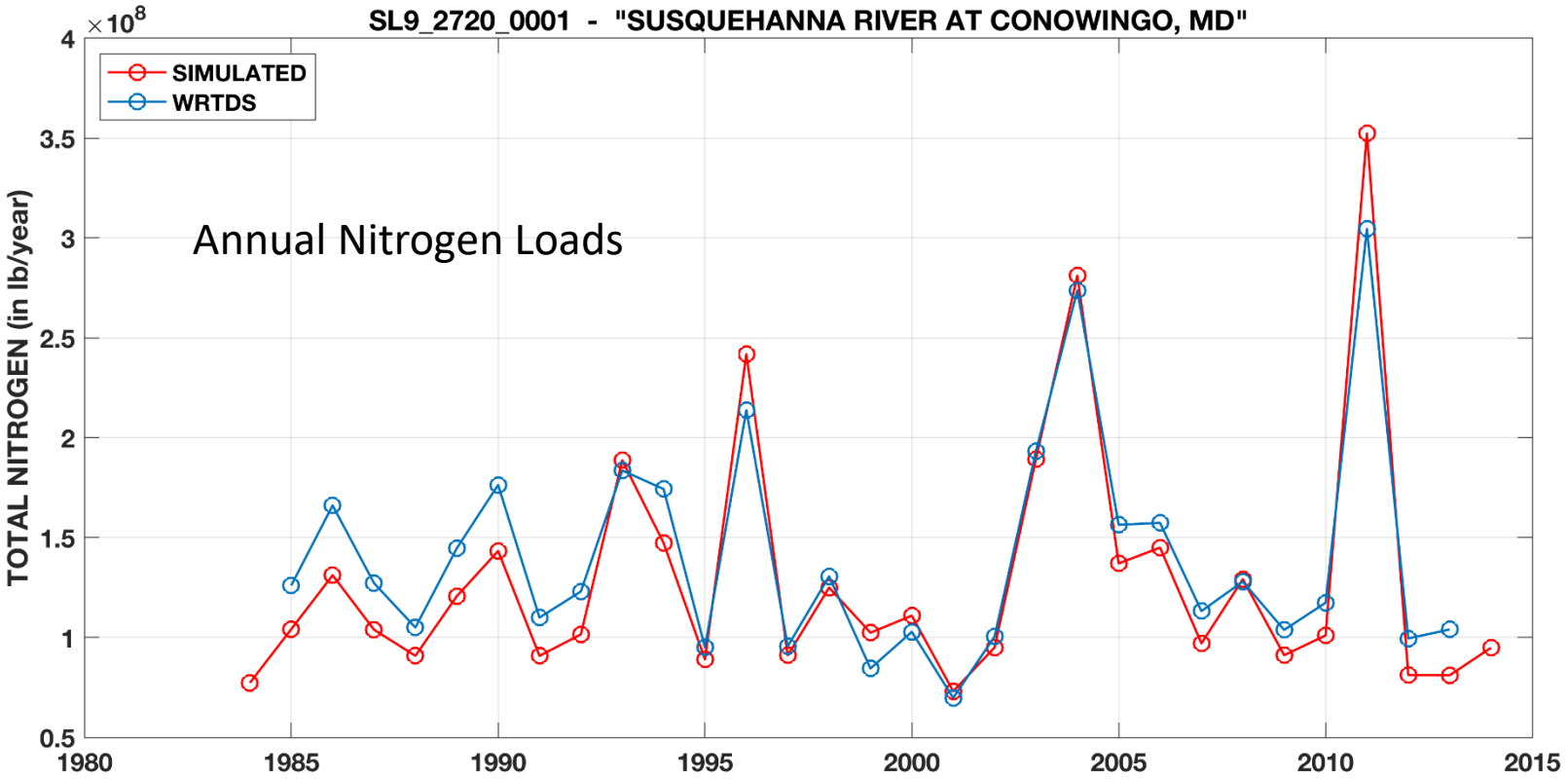

Skill of annual nitrogen load	= 0.861
Skill of annual phosphorus loads	= 0.935

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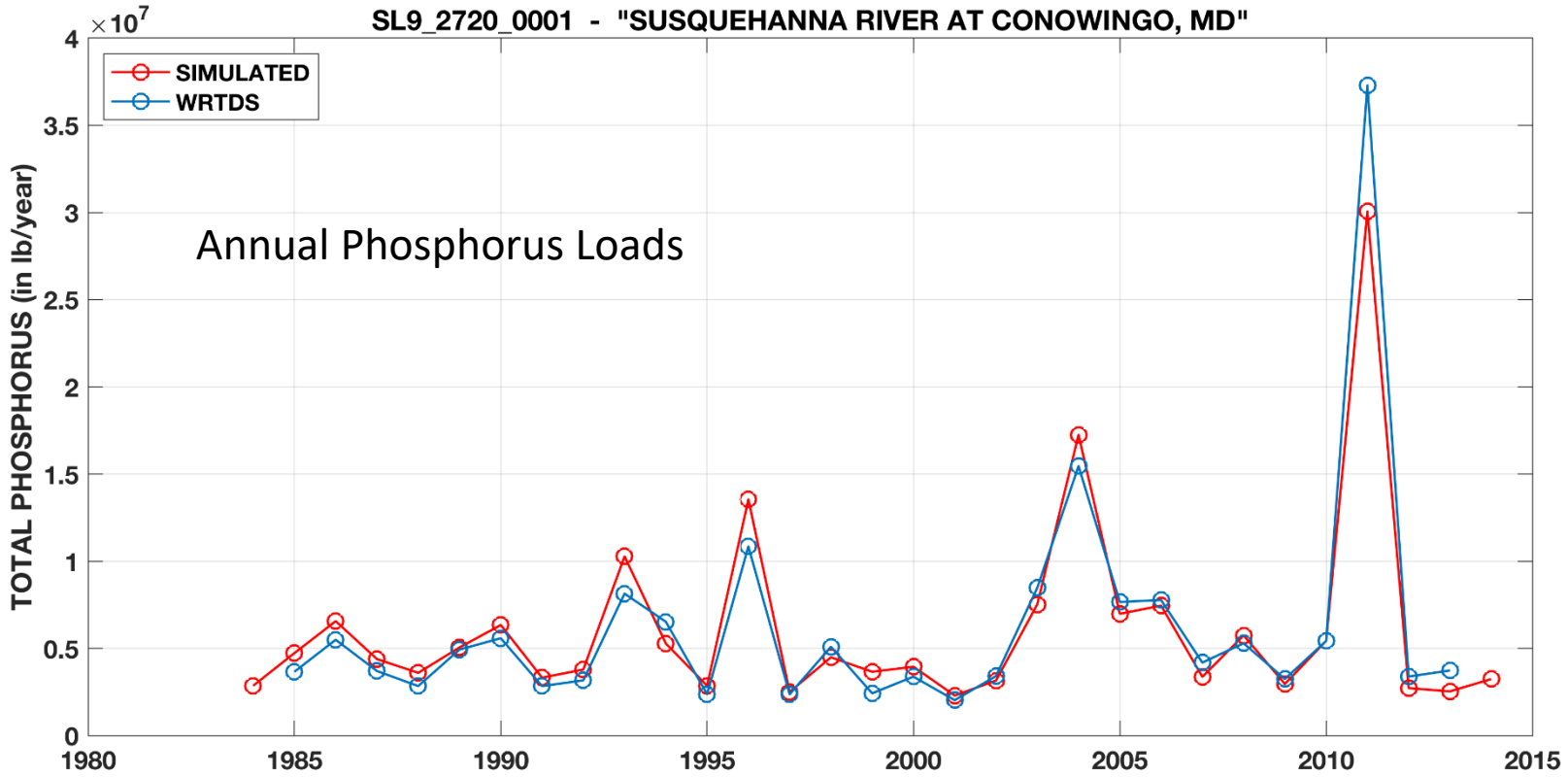

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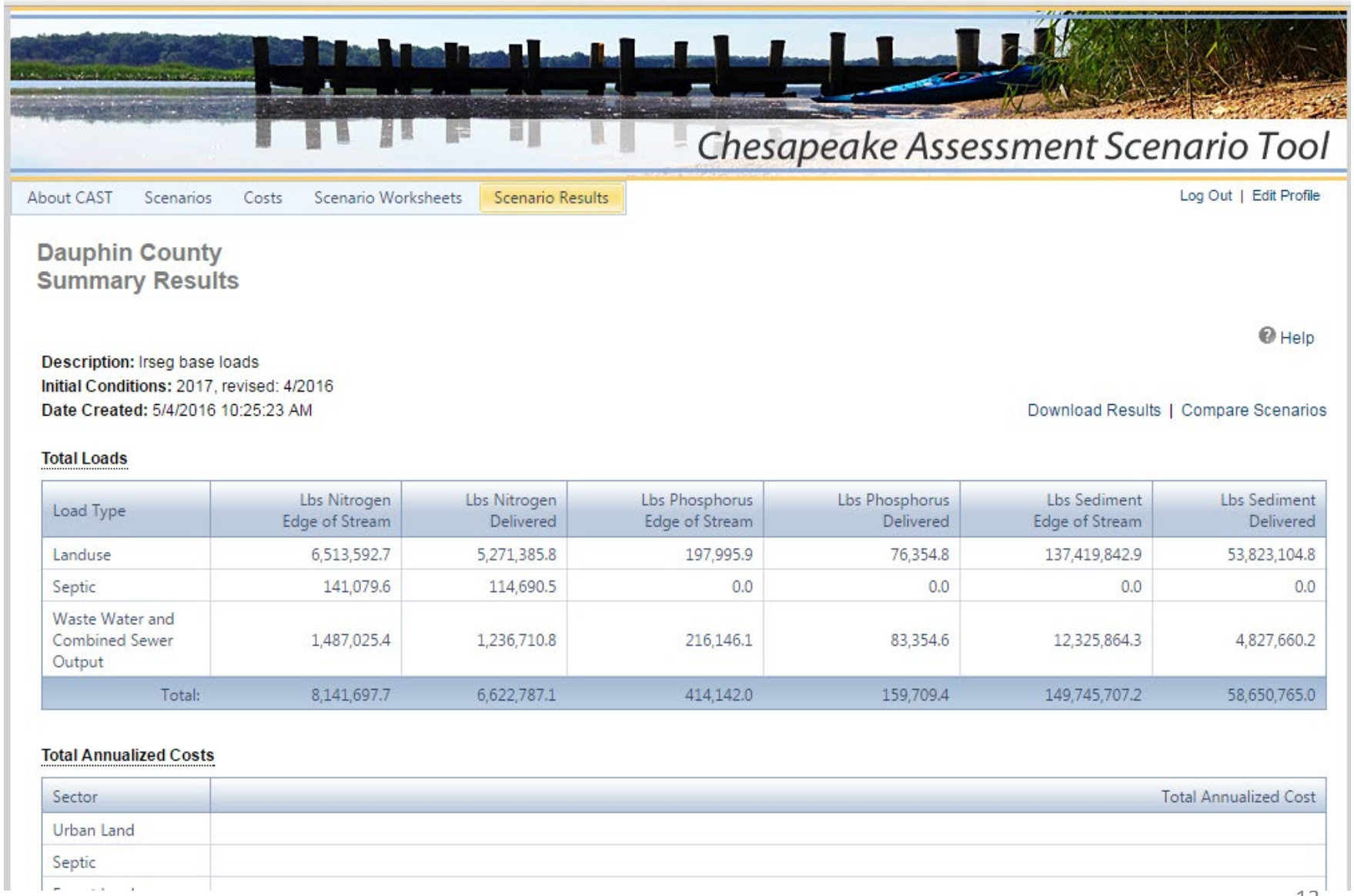
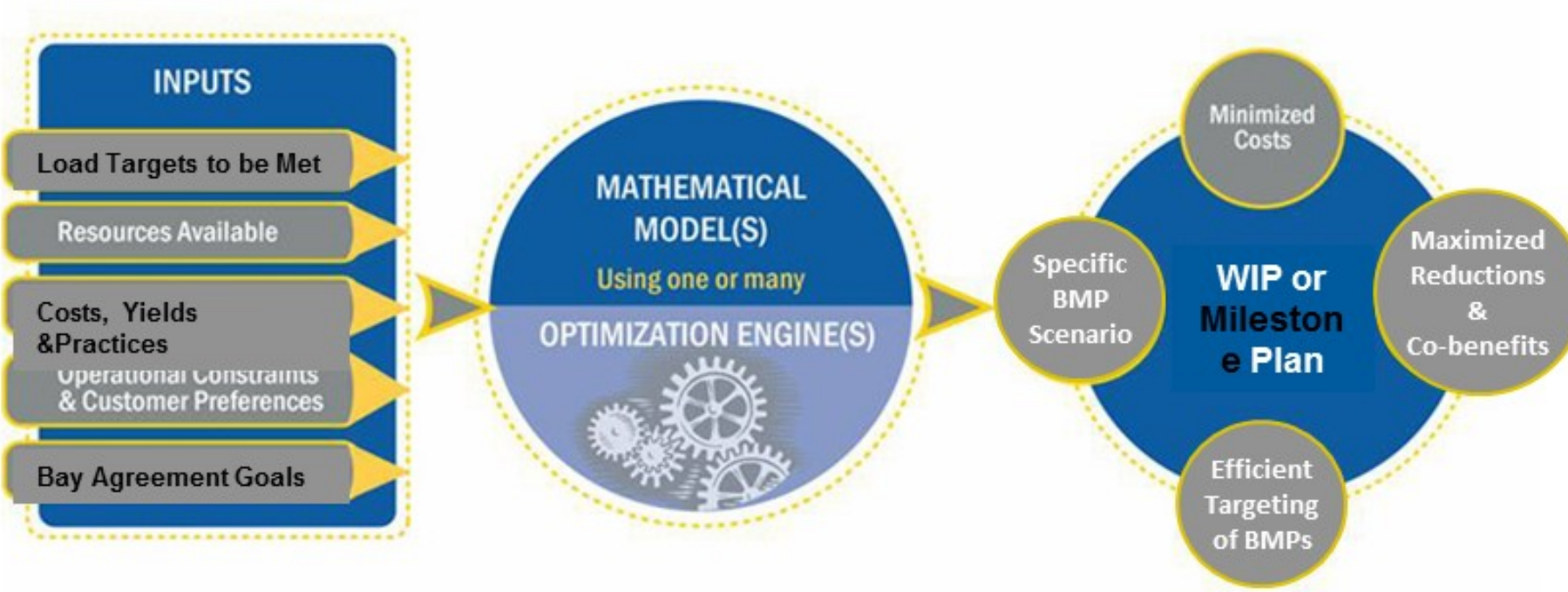
On Line Version -- CAST



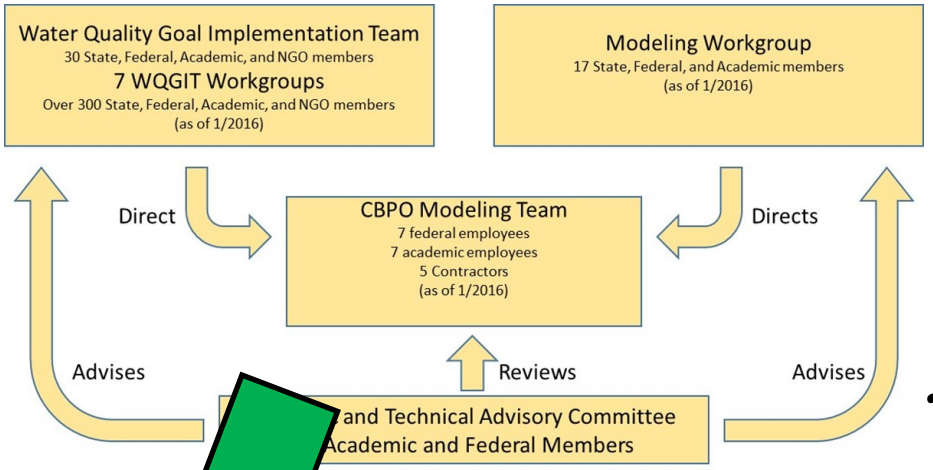
OPTIMIZATION Calculation Engine

Users input objectives, tool outputs BMPs in the plan that maximize effectiveness at minimum cost.



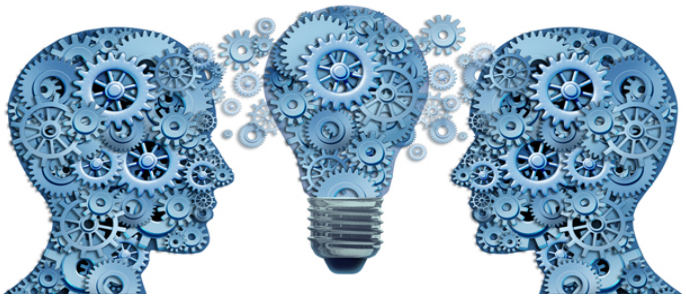
* Still in vaporware stage

Extensive partnership involvement…

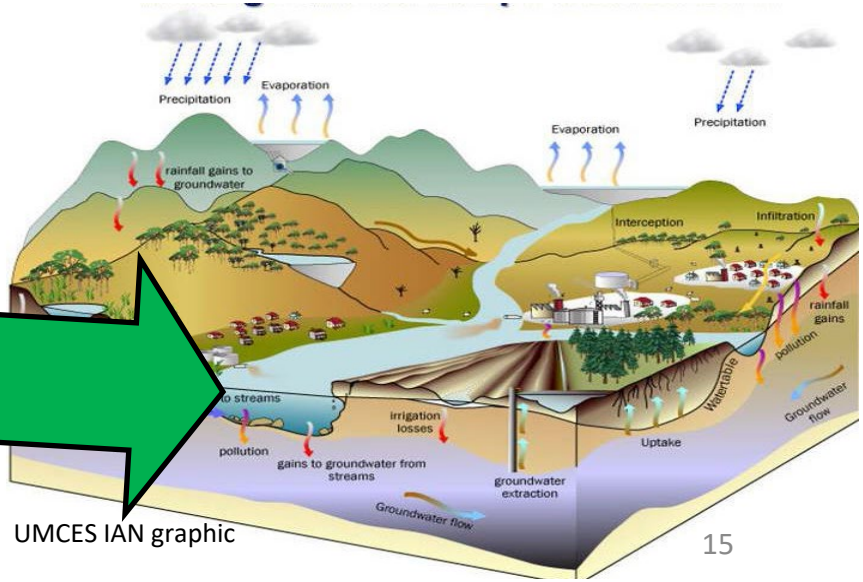


…Which Leads to a robust model of the watershed

…Leads to collaborative thinking…



http://www.theatlantic.com/health/archive/2011/12/is-the-expansion-of-knowledge-endangering-genius/249735/



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