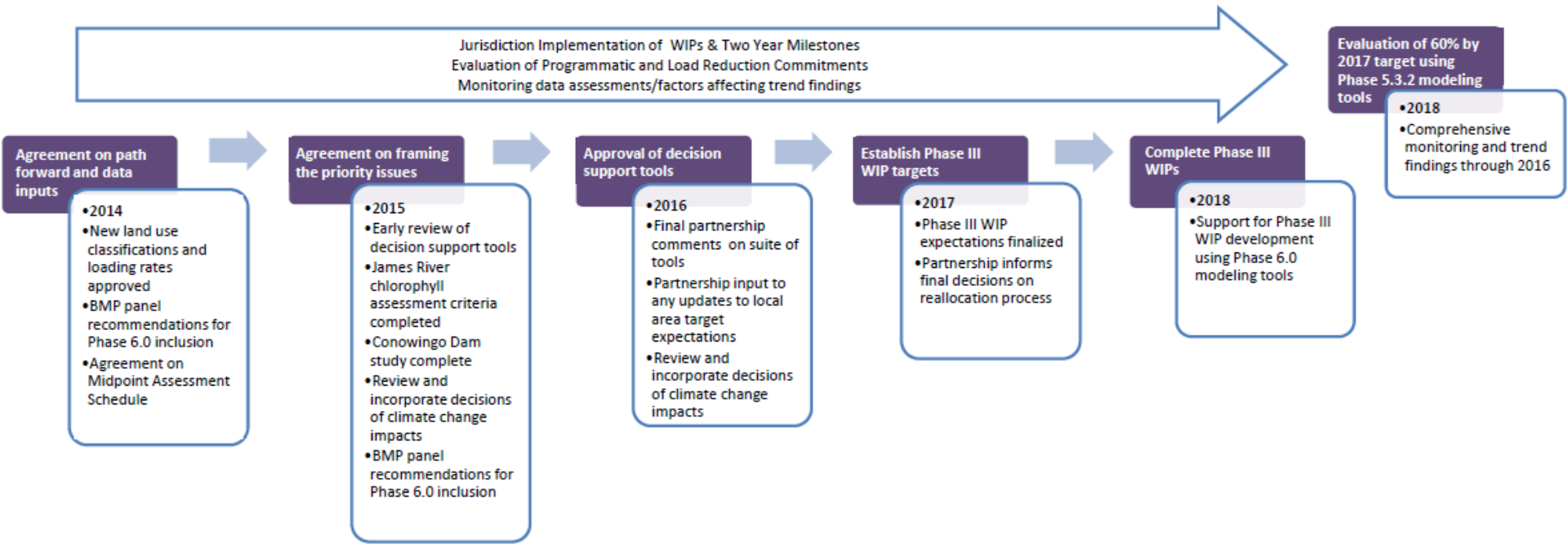
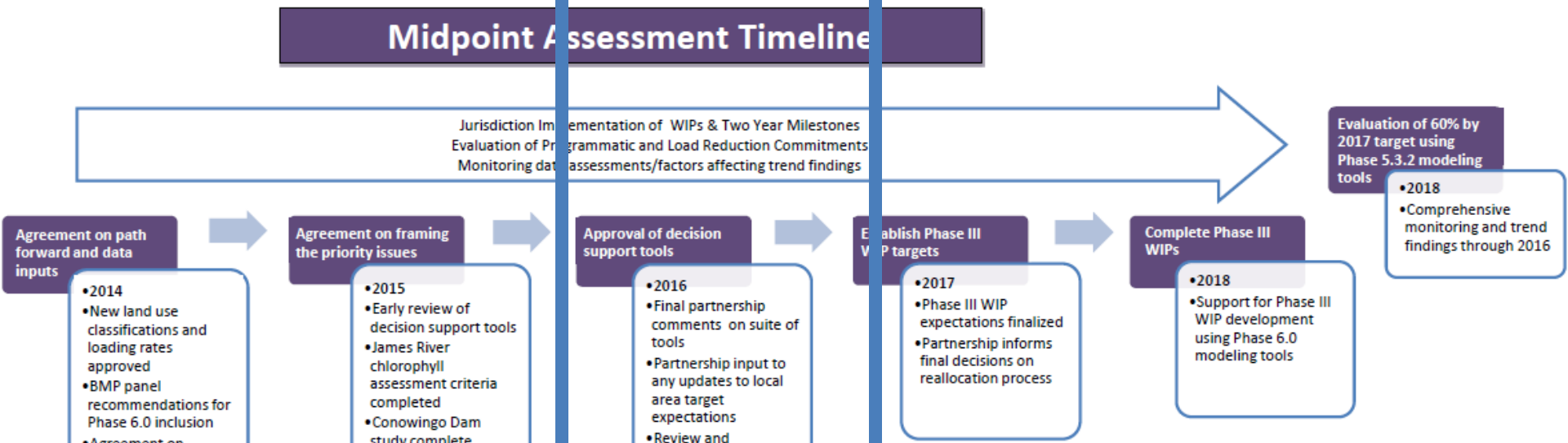
Scenario Builder and Watershed Model Progress toward the MPA

Gary Shenk Modeling Workgroup 9/30/14

Midpoint Assessment Timeline

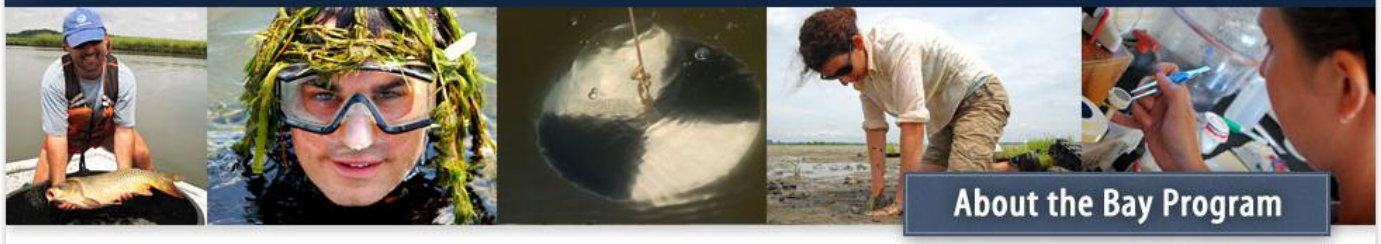




CREATE
The Models

REVIEW
The Models

USE
The Models



Who We Are
How We Work
How We're Organized
- Chesapeake Executive Council
- Principals' Staff Committee
- Management Board
- Citizens Advisory Committee
- Local Government Advisory Committee
- Scientific and Technical Advisory Committee
- Communications Workgroup
- Scientific and Technical Analysis and Reporting

Scenario Builder and Watershed Model Plan for the MPA

In preparation for the 2017 Mid-Point Assessment, the CBP Partnership has expressed priorities for the Phase 6 watershed model development which are detailed in documents under the 'Projects and Resources' tab on the Water Quality GIT page. Initial priorities were set in the October 2012 water quality GIT meeting. These priorities have been updated and refined by recommendations from subsequent workshops and CBP meetings. The MPA master schedule lists these priorities in a table format. Additional documents on the web page are specific work plans to accomplish these tasks.

Out of necessity, phase 6 development is occurring along multiple parallel paths. These must eventually meet in a draft phase 6 watershed model and scenario builder that will be ready for full partnership review beginning January 1 2016. These parallel paths encompass all of the CBP priorities.

This document summarizes the priorities and identifies lead researchers for each effort. The descriptions here are brief with links to more detailed workplans.

Efforts

Below are the efforts related to the Scenario Builder and Watershed Model Plan for the Mid-Point Assessment

- **BMP effectiveness**
- **BMP Implementation Accounting**
- **Fertilizer and Manure Applications**
- **Land Use Types and Acreage**
- **Land Use Loading Rates**

MPA Web Site

- Web site to keep the Partnership up-to-date on model development
- Continual updates
- Your name is on the page
  - You own the content.

File Edit View History Bookmarks Tools Help

Modeling Workgroup - Ch...

www.chesapeakebay.net/groups/group/modeling_team

Google

- Penn State Integrated Hydrologic Modeling System (PIHM)
- Watershed Implementation Plan Tools
- Input decks and outputs for the states' draft Phase I Watershed Implementation Plans, Hybrid Backstop TMDL, and Full Backstop TMDL

Members | Meetings | Workgroups & Task Groups | Projects & Resources | Publications

FINAL Water Quality Model Calibration Run January, 2002

Benthic SONE Plot (77.32 KB)

SAV SONE Plot (7.29 MB)

Benthic & Sediment Time Series (5.43 MB)

Benthic Algae Presentation (168.26 KB)

Longitudinal Plot (7.55 MB)

Peer Review Guidance

Midpoint Assessment

New **web page** summarizes the priorities and identifies lead researchers for each effort. The descriptions are brief with links to more detailed workplans.

Review of the Shallow Water SAV and Clarity Simulation

Questions Posed to the Reviewers (26 KB)

Reviewers of the Shallow Water SAV and Clarity Simulation (32.5 KB)

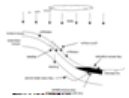
Review of the Shallow Water SAV and Clarity Simulation (241.3 KB)

Chesapeake Bay Water Quality and Sediment Transport Model

Sediment Transport Model Review Team Comments - March 2005 (45.38 KB)

Sediment Transport Model Review Team Comments - July 2005 (53.22 KB)

Scale in the Chesapeake Bay Program Watershed Model

Landscape	Phase 5		Phase 6		Sparrow	Other Data Sources
	Nutrients	Sediment	Nutrients	Sediment		
Field   		**AG and Forest:** Used RUSLE2 to estimate EOF sediment targets **Urban**: Used Langland and Cronin To estimate pervious vs impervious loading	*Can we estimate EOF loads directly based on available information?*	*Should we update the sediment EOF estimates?*	Sources (fertilizer, manure, atdep, urban area) multiplied by global coefficients	Literature Reviews from TetraTech Sources in Phase 5 documentation Sensitivity documentation CEAP APLE
Hillslope – Watershed   	Field-level, hillslope, and small stream processes are all combined in the Edge-of-Stream nutrient estimates No EOF is simulated EOS estimates are a combination of regional factors and field-scale process simulation calibrated to average export rates Informed by inputs and calibration	Hillslope and small stream processes are combined in a sediment delivery ratio that is based on the average distance between each major land use type and a major river, adjusted for the coastal plain.	*Can we estimate watershed delivery based on landscape parameters?*		Land to Water factors such as soil parameters and slopes	ICPRB/USGS Sparrow Land Data team Connected Impervious Land Data team Urban Tree Canopy
Small Stream    			*Can we estimate small stream effects?*		Explicitly simulated to NHD+ level	ICPRB/USGS Sparrow Land Data team Urban Stream Corridor Land Data team Riparian Forest Land Data team Riverine Wetlands Center for Watershed Protection CBP Grant
Large River   	Directly Simulated in HSPF for river averaging at least 100 cfs Calibrated to WQ data		Directly Simulate in HSPF for river averaging at least 100 cfs Calibrate to WQ data		Explicitly simulated	Calibrate to sparrow DFS or loads?

Phase 5

Nutrients

Field-level, hillslope, and small stream processes are all combined in the Edge-of-Stream nutrient estimates

EOS estimates are a combination of regional factors and field-scale process simulation calibrated to average export rates

Sediment

Edge of field is explicitly simulated

Sediment delivery ratio based on the average distance between each major land use type and a major river.

Directly Simulated in HSPF for river averaging at least 100 cfs

Calibrated to WQ data

Phase 6

Nutrients

Can we estimate EOF loads directly based on available information?

Sediment

Should we update the sediment EOF estimates?

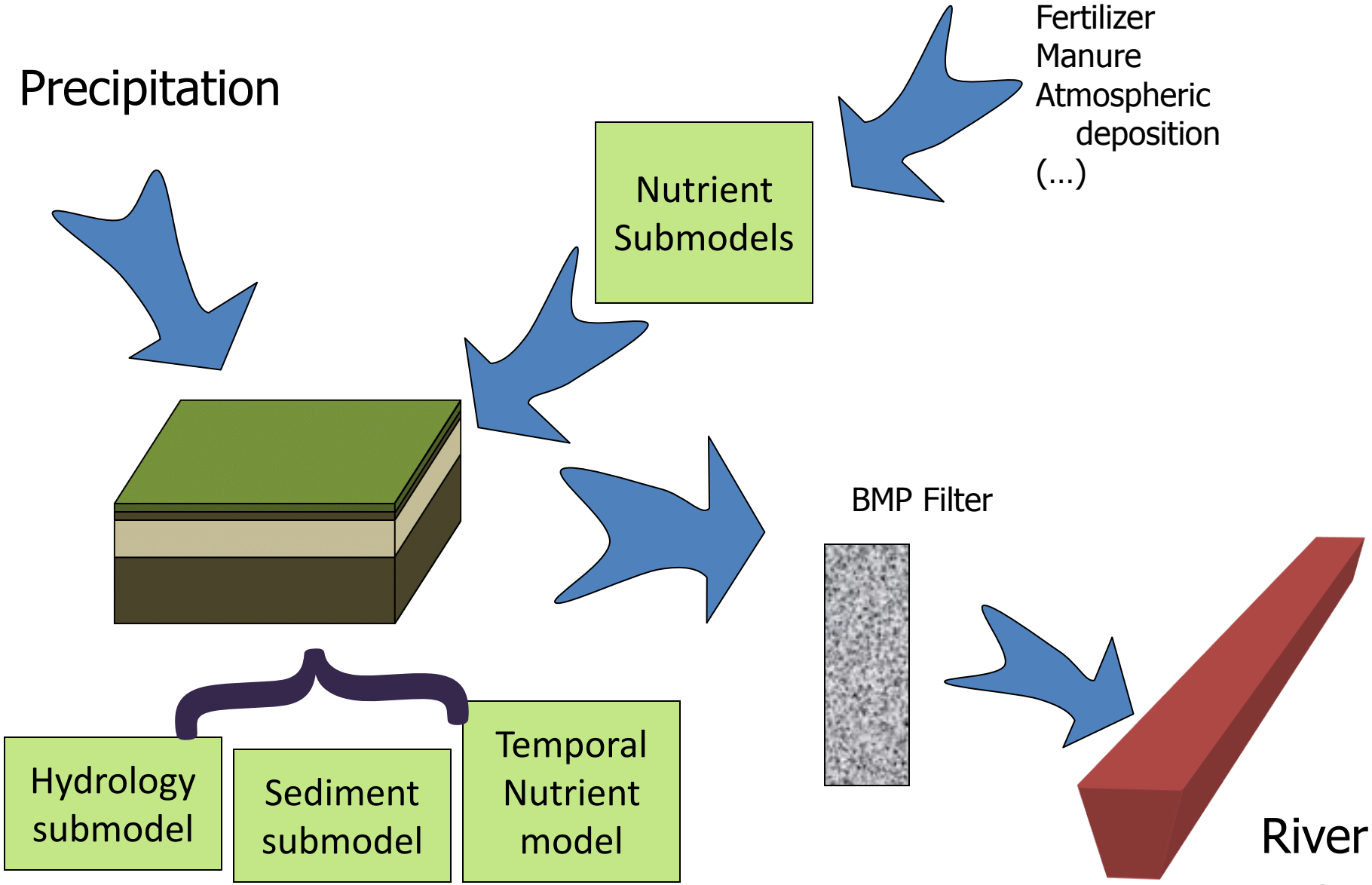
Can we estimate watershed delivery based on landscape parameters?

Can we estimate small stream effects?

Directly Simulated in HSPF for river averaging at least 100 cfs

Calibrated to WQ data

Phase 6


Precipitation
Fertilizer
Manure
Atmospheric
deposition
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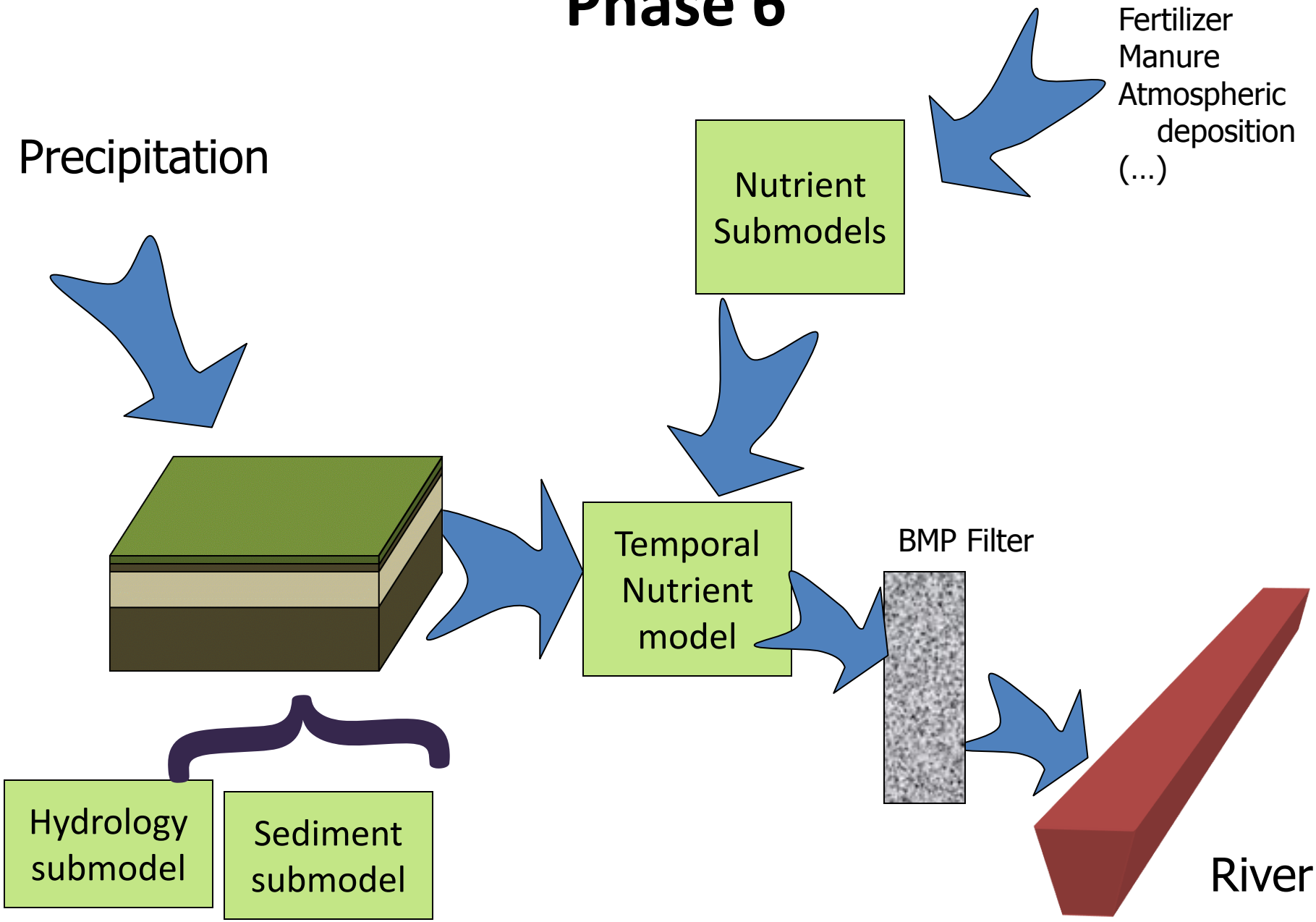
Nutrient
Submodels
BMP Filter
Hydrology
submodel
Sediment
submodel
Temporal
Nutrient
model
River

Phase 6


Fertilizer
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Precipitation
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Temporal Nutrient model
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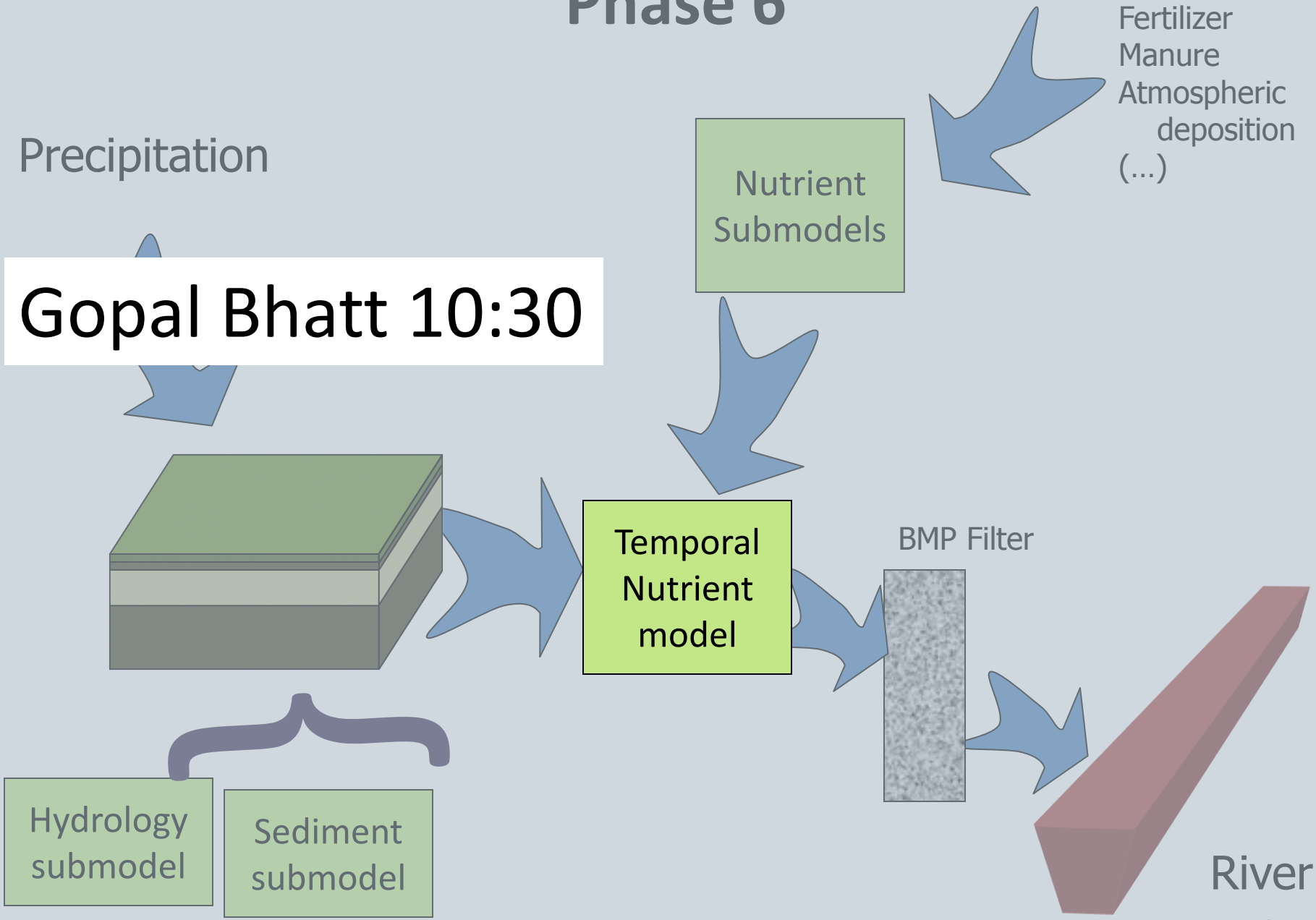
River

Phase 6


Fertilizer
Manure
Atmospheric deposition
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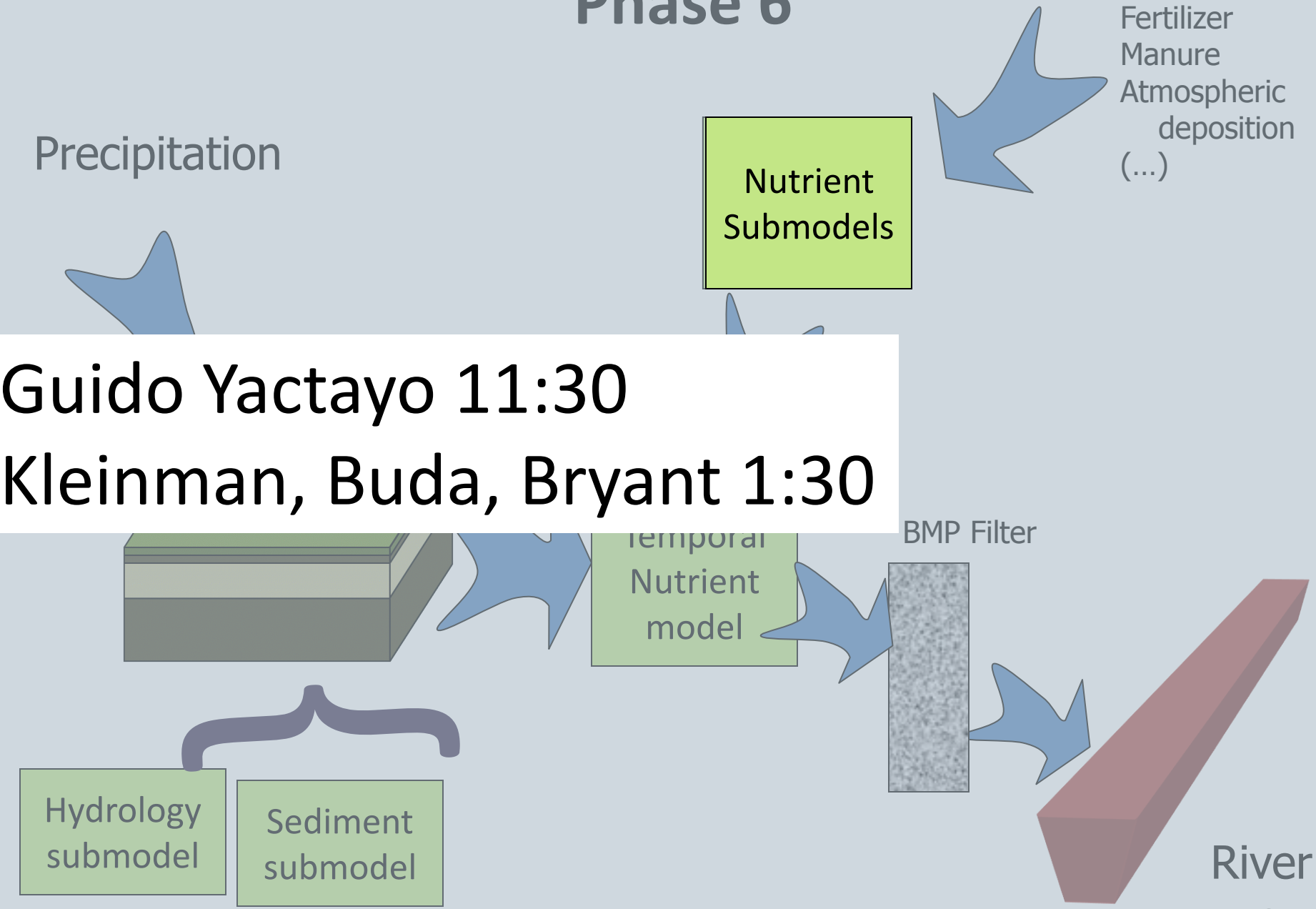
Nutrient Submodels
Precipitation
Gopal Bhatt 10:30
Temporal Nutrient model
BMP Filter
Hydrology submodel
Sediment submodel
River

Phase 6


Fertilizer
Manure
Atmospheric deposition
(…)
Precipitation
Nutrient Submodels
Guido Yactayo 11:30
Kleinman, Buda, Bryant 1:30
BMP Filter
Nutrient model
Hydrology submodel
Sediment submodel
River

Phase 6

Field

Hillslope – Watershed

Small Stream

Large River

Nutrients

Can we estimate EOF loads directly based on available information?

Sediment

Should we update the sediment EOF estimates?

Can we estimate watershed delivery based on landscape parameters?

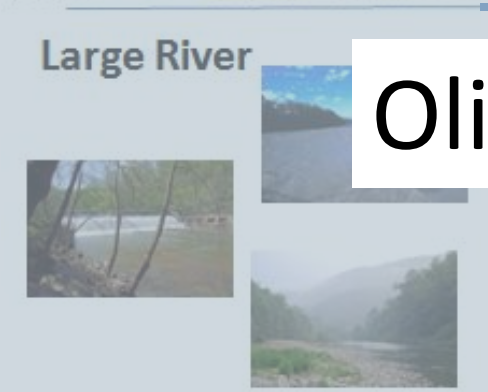
Can we estimate small stream effects?

Peter Claggett 11:40

SPF for river averaging at least 100 cfs

Calibrated to WQ data

Phase 6



Nutrients

Can we estimate EOF loads directly based on available information?

Sediment

Should we update the sediment EOF estimates?

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Olivia Devereux 2:00

SPF for river averaging at least 100 cfs

Calibrated to WQ data

Phase 6

Field

Hillslope – Watershed

Small Stream

Large River

~~Nutrients~~ ~~Sediment~~

Ross Mandel 2:20

Can w… based …

…date the sediment EOF estimates?

Can we estimate watershed delivery based on landscape parameters?

Can we estimate small stream effects?

Directly Simulated in HSPF for river averaging at least 100 cfs

Calibrated to WQ data

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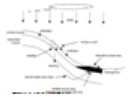
Hillslope – Watershed   	Field-level, hillslope, and small stream processes are all combined in the Edge-of-Stream nutrient estimates No EOF is simulated EOS estimates are a combination of regional factors and field-scale process simulation calibrated to average export rates Informed by inputs and calibration	Hillslope and small stream processes are combined in a sediment delivery ratio that is based on the average distance between each major land use type and a major river, adjusted for the coastal plain.	*Can we estimate watershed delivery based on landscape parameters?*		Land to Water factors such as soil parameters and slopes	ICPRB/USGS Sparrow Land Data team Connected Impervious Land Data team Urban Tree Canopy
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