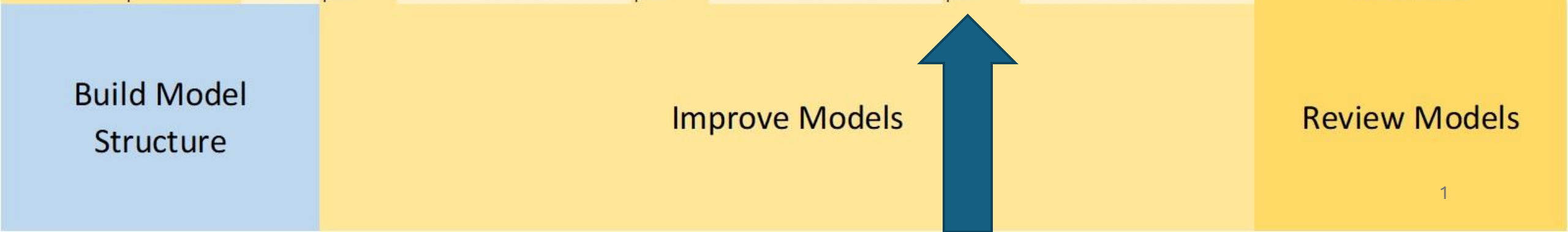
CBP Watershed Model Plan for 2025

1 Scale
2 Connection Plans
3 Timing

CBPO Staff

1/7/2025

2022	2022	2022	2022	2023	2023	2023	2023	2024	2024	2024	2024	2025	2025	2025	2025	2026	2026	2026	2026
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Work plan			Build	Work plan	Build Models			Work plan	Build Models			Work plan	Build Models			Review Models			



Remember the Four I's
Core Values of the Modeling Workgroup

Integration - Integration of the most ***recent science*** and knowledge in air, watershed, and coastal waters to support ecosystem modeling for restoration decision-making.

Innovation - Embracing creativity and encouraging ***improvement*** in the development and support of transparent and robust modeling tools.

Independence – Making modeling decisions on the basis of the ***best available evidence*** and using the most appropriate methods to produce, run, and interpret models, independent of policy considerations.

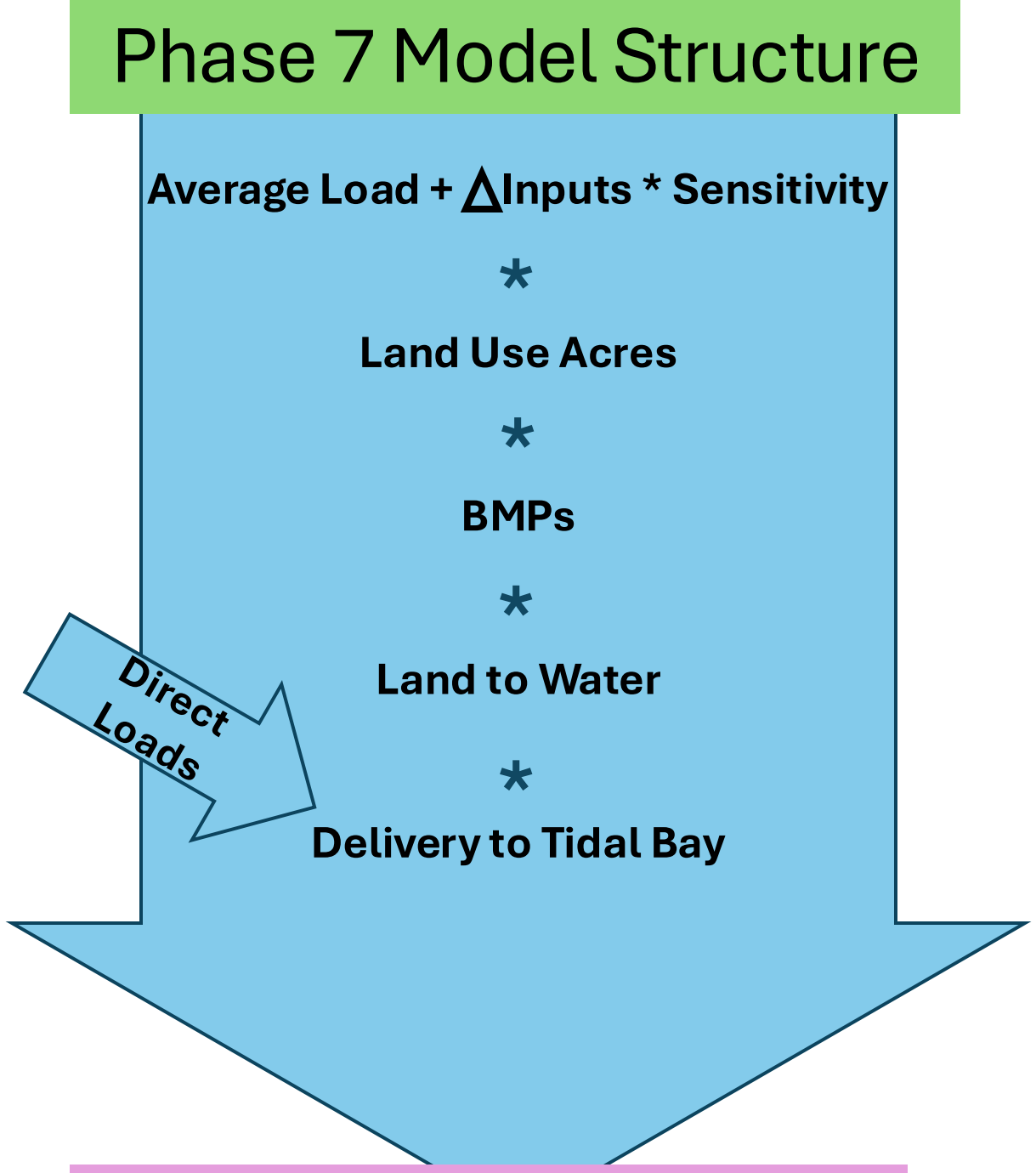
Inclusiveness - Commitment to an open and transparent process and the engagement of relevant partners that results in strengthening the CBP ***partnership***'s decision-making tools.

Cast/CalCast/DM

Phase 7
CAST

"The watershed model"

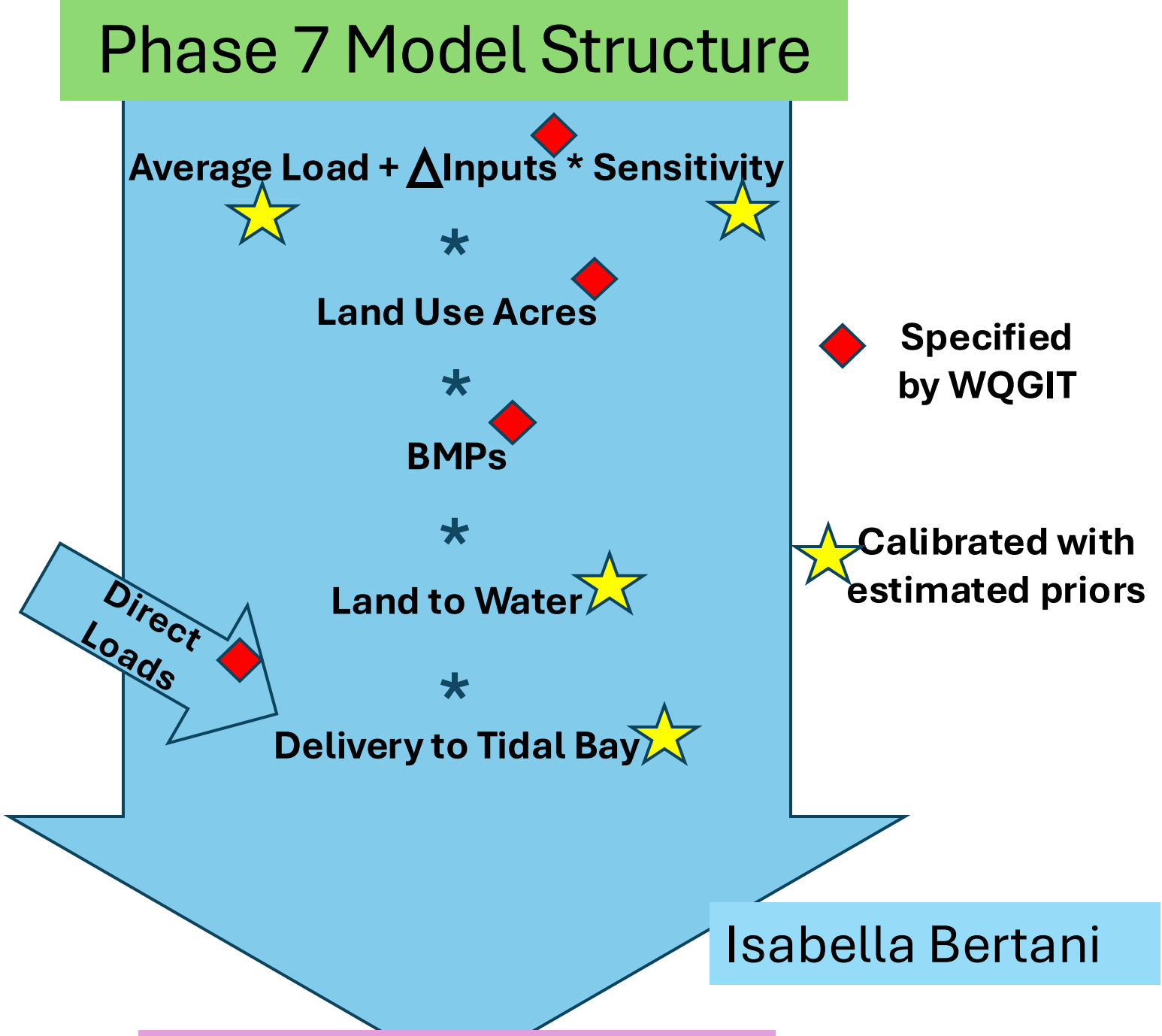
1000s of scenarios once finalized



Phase 7
CalCAST

Tool for finding parameters that best match observations

Will only be used for research after P7 finalized



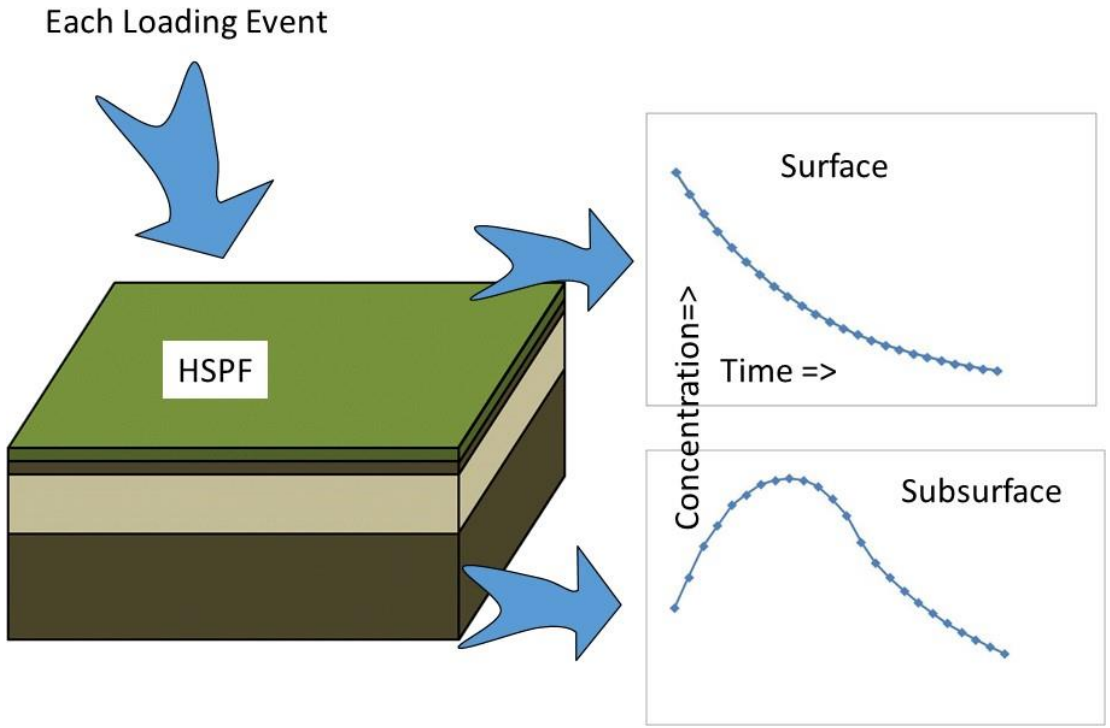
Isabella Bertani

Phase 7

Dynamic Model

Tool for

- loading estuarine models
- Comparing against observations
- Other potential collaborative projects



Gopal Bhatt

CalCast informs CAST; CAST constrains the DM

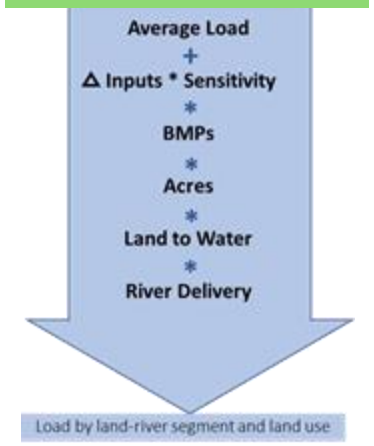
Phase 7 CAST Structure

Average Load
+
ΔInputs * Sensitivity
*
BMPs
*
Acres
*
Land to Water
*
River Delivery

Load by land-river segment and land use

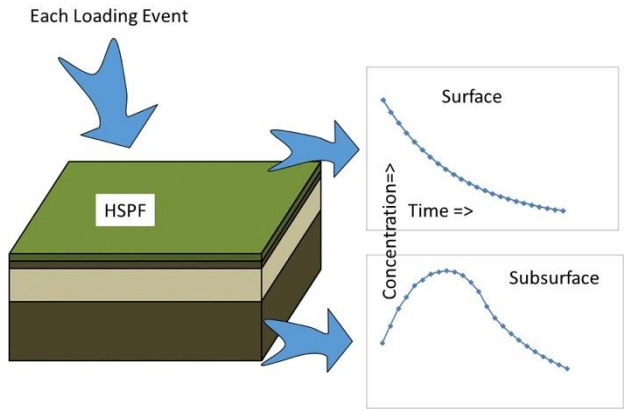
Inform

CalCAST



Constrain

Dynamic Model

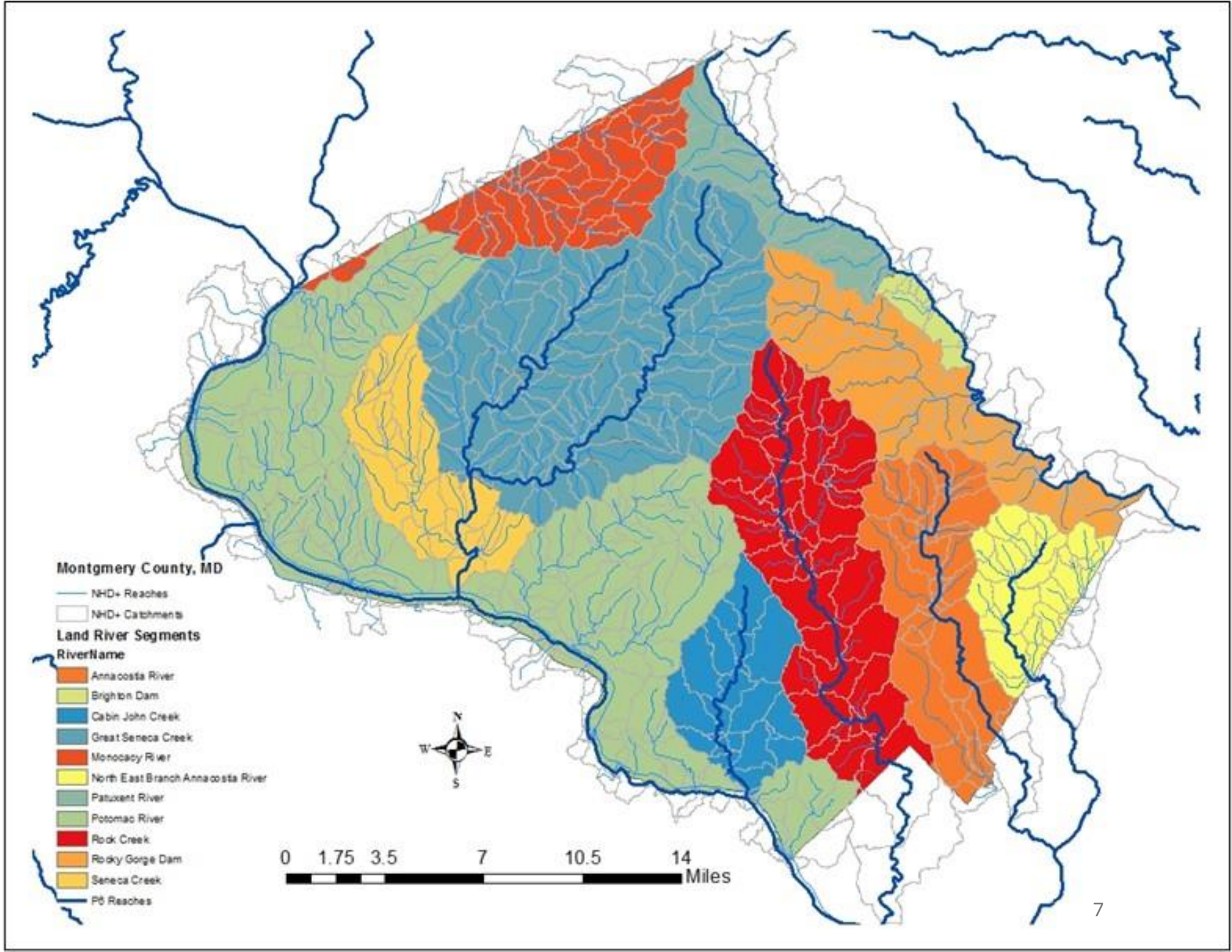


CAST model documentation; section 1
https://cast.chesapeakebay.net/Documentation/ModelDocumentation

Scale

Definitions

- Land segment
- Land-river segment
- NHD catchment



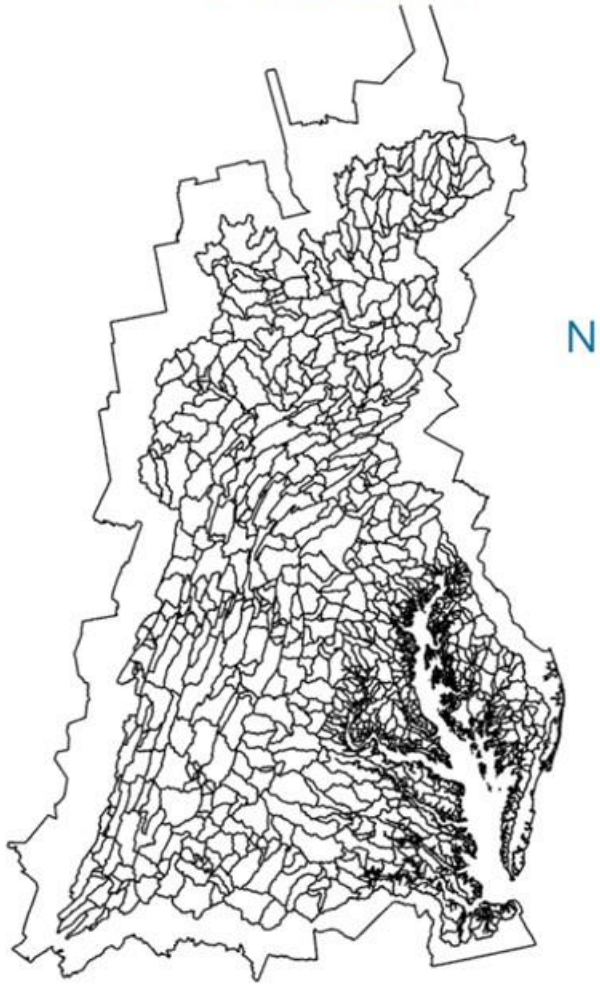
Watershed Models Scales

- **CalCAST** is being developed at the **NHD100k** scale to incorporate more monitoring data and to support finer scale modeling
- The **Dynamic Model** will run at the **NHD100k** scale because it is required by the estuarine model
- **Phase 7 CAST will be built at the scale that the WQGIT decided on 12/9/24**

- **HUC12-based river segments**

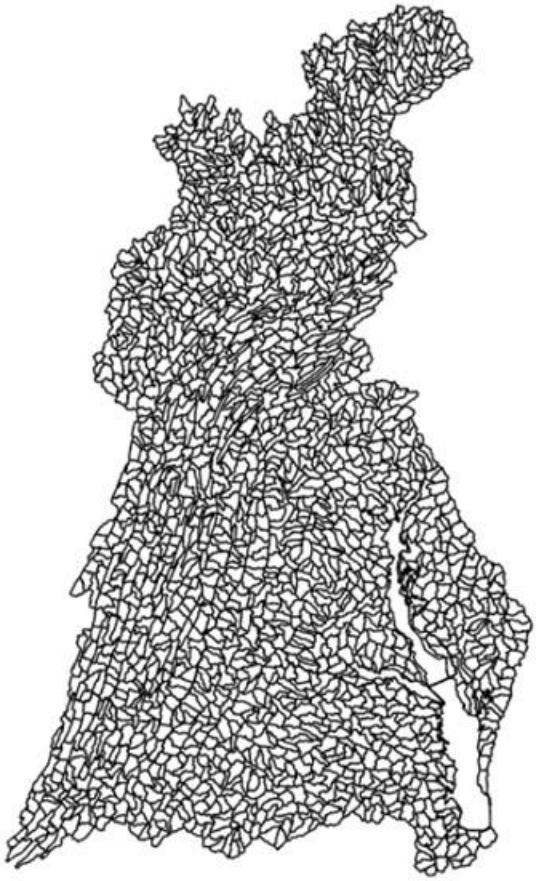
River Segments

Phase 6



N = 979

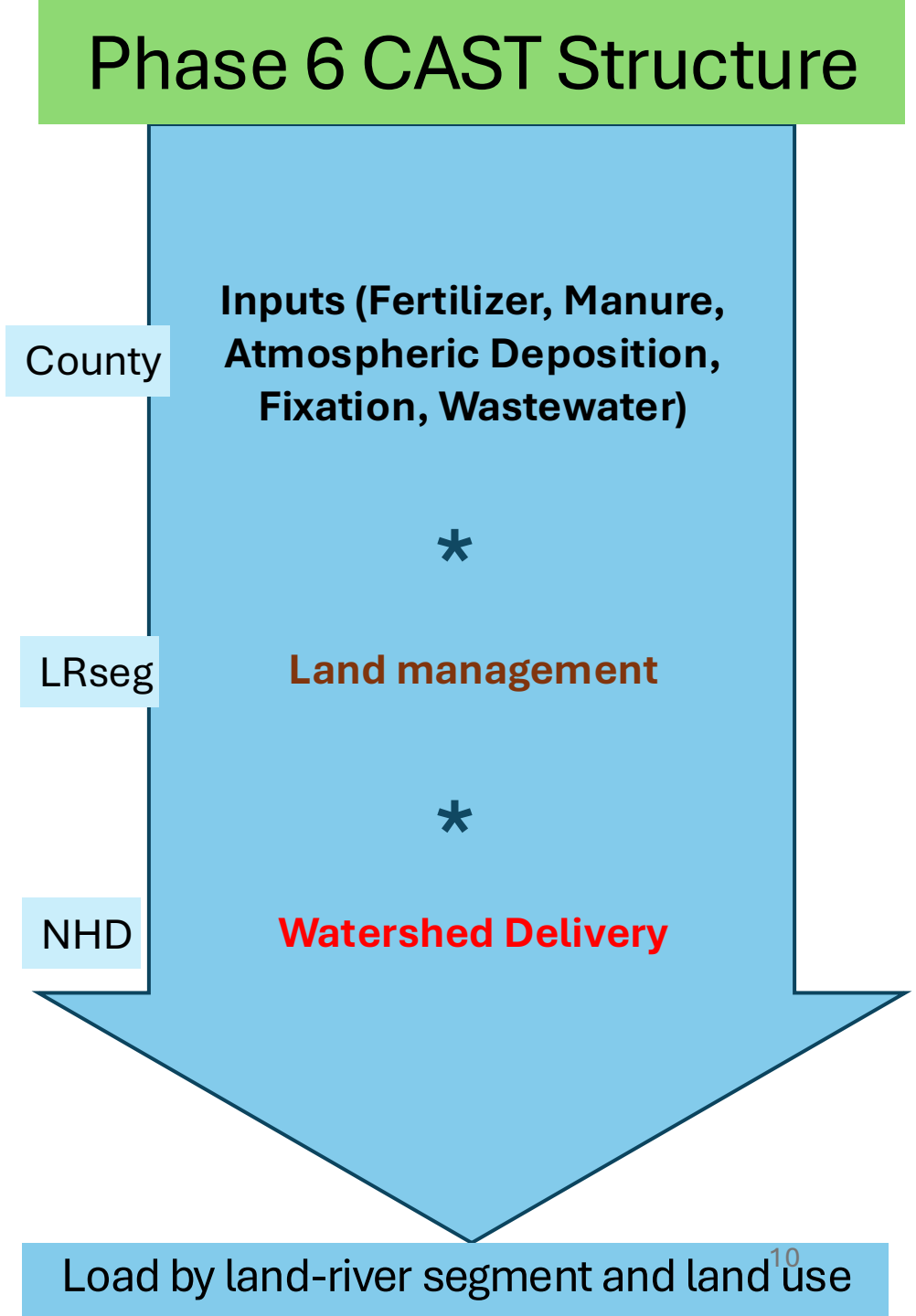
Phase 7



N = 1978

This is a similar arrangement to Phase 6

- In general,
  - Inputs are estimated at the county level
  - Land management is estimated at the LRseg level
  - Watershed delivery is estimated at the NHD level
- Information is upscaled or downscaled and calculations are made at the land-river segment scale



Multiple Scales in Phase 6

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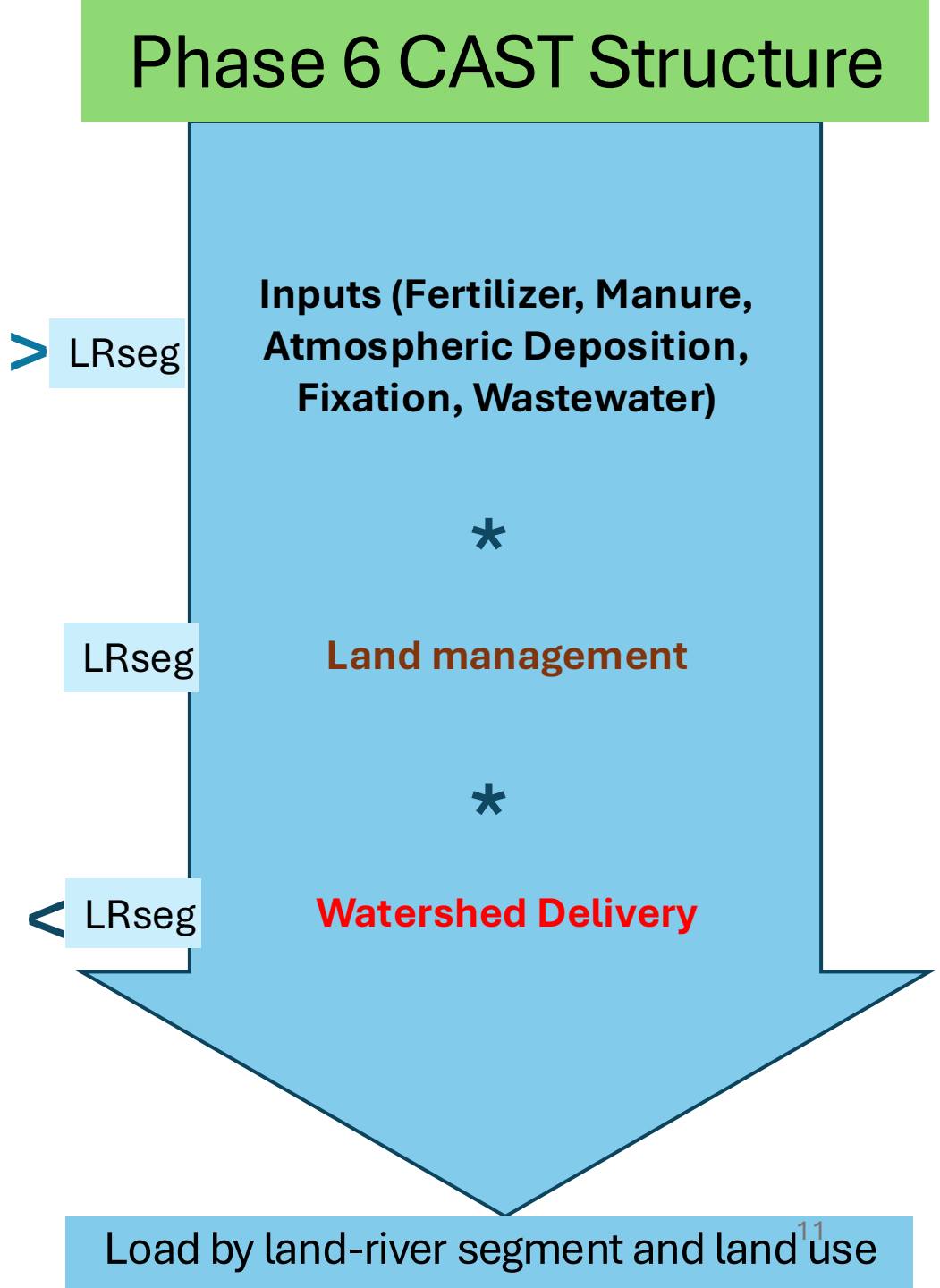
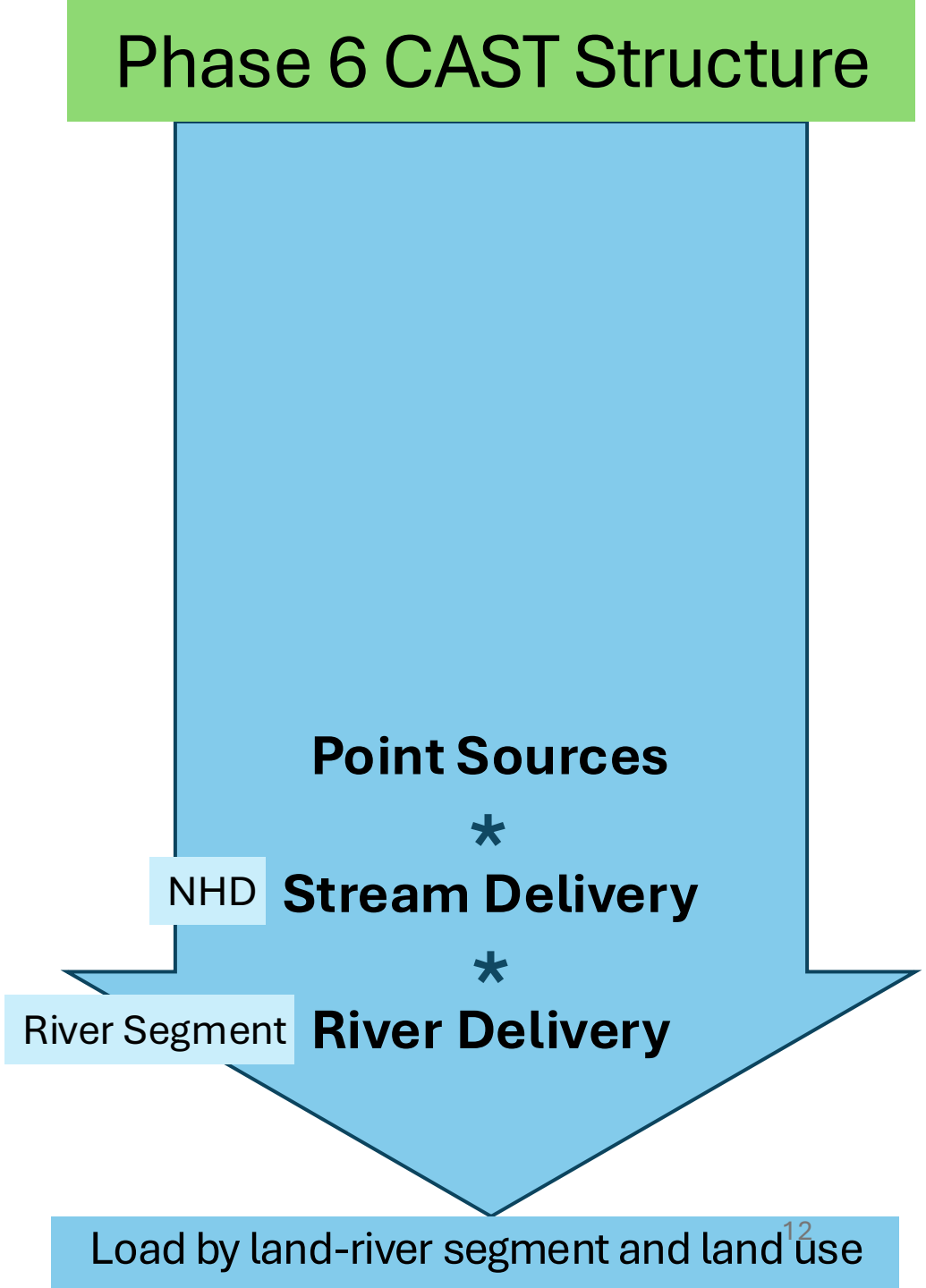
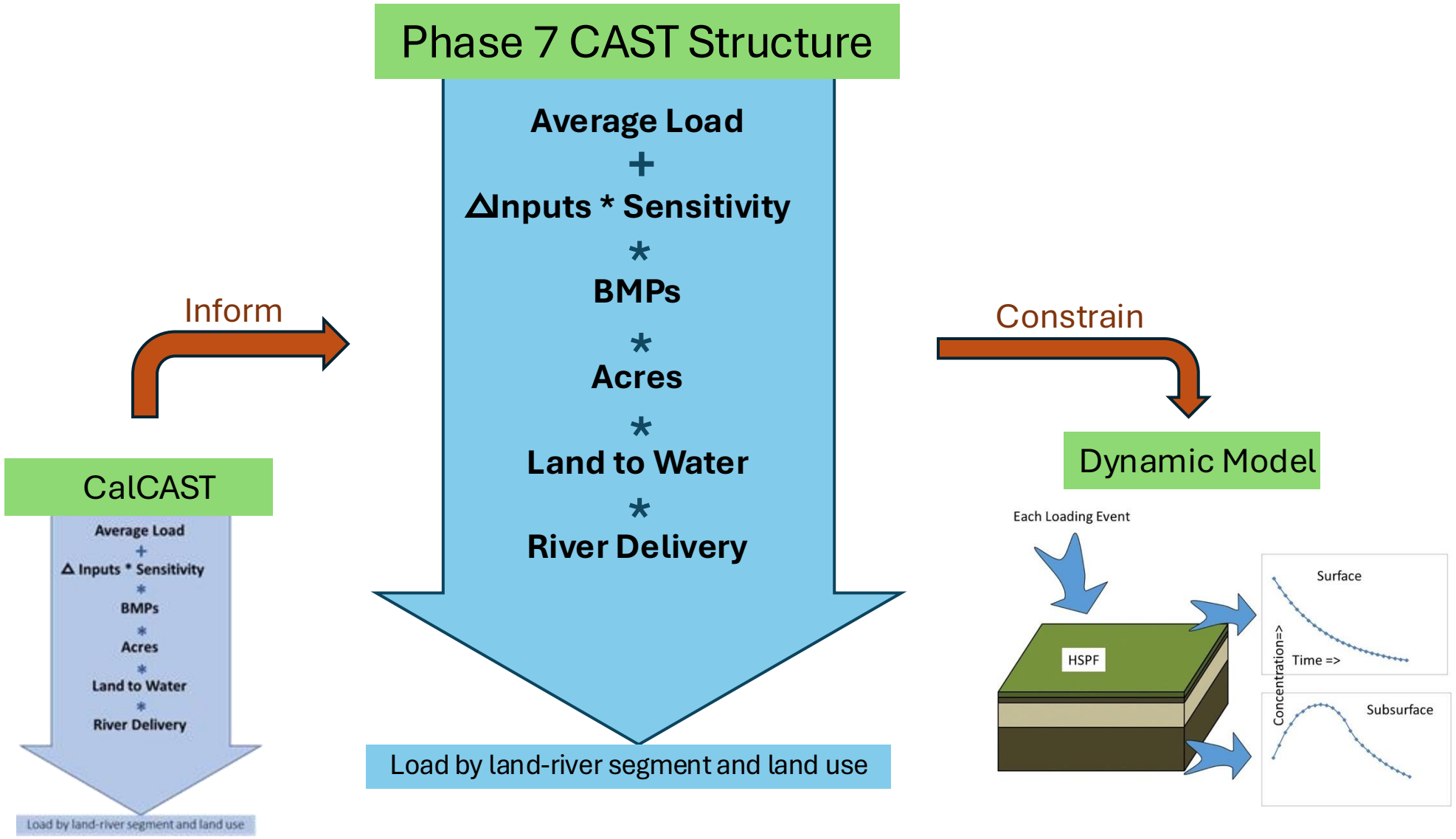


Multiple Scales in Phase 6

- Point Sources are kept a the NHD scale



2025 is the year of getting specific!



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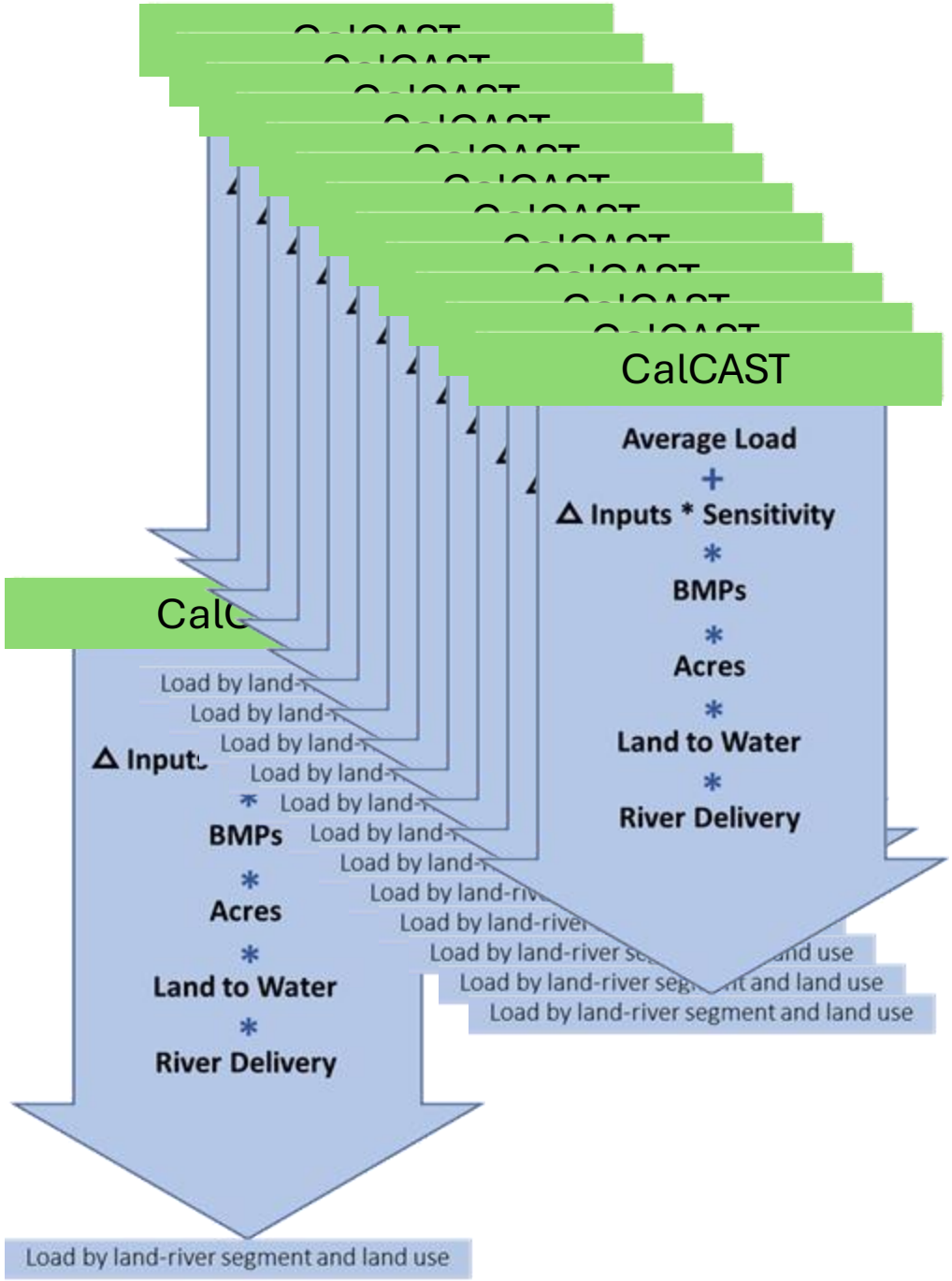
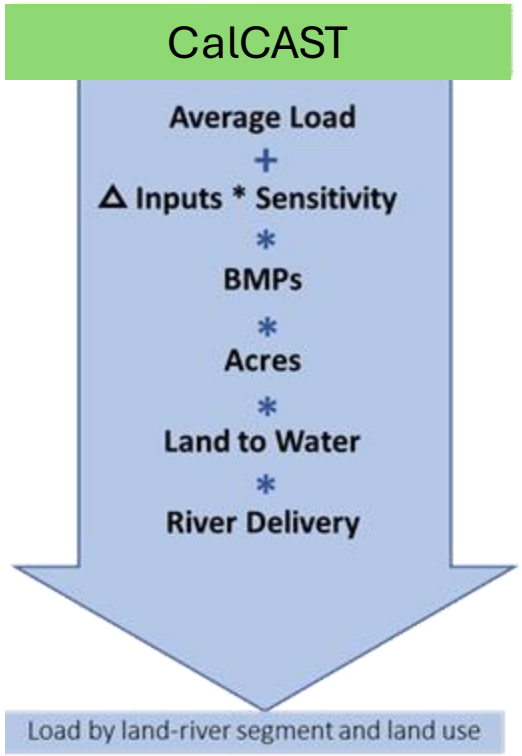


Constituent	Average Annual	Annual Flow-Normalized	Annual True Condition
Flow	X		X
Baseflow	X		X
Nitrogen	X	X	X
Phosphorus	X	X	X
Sediment	X	X	X

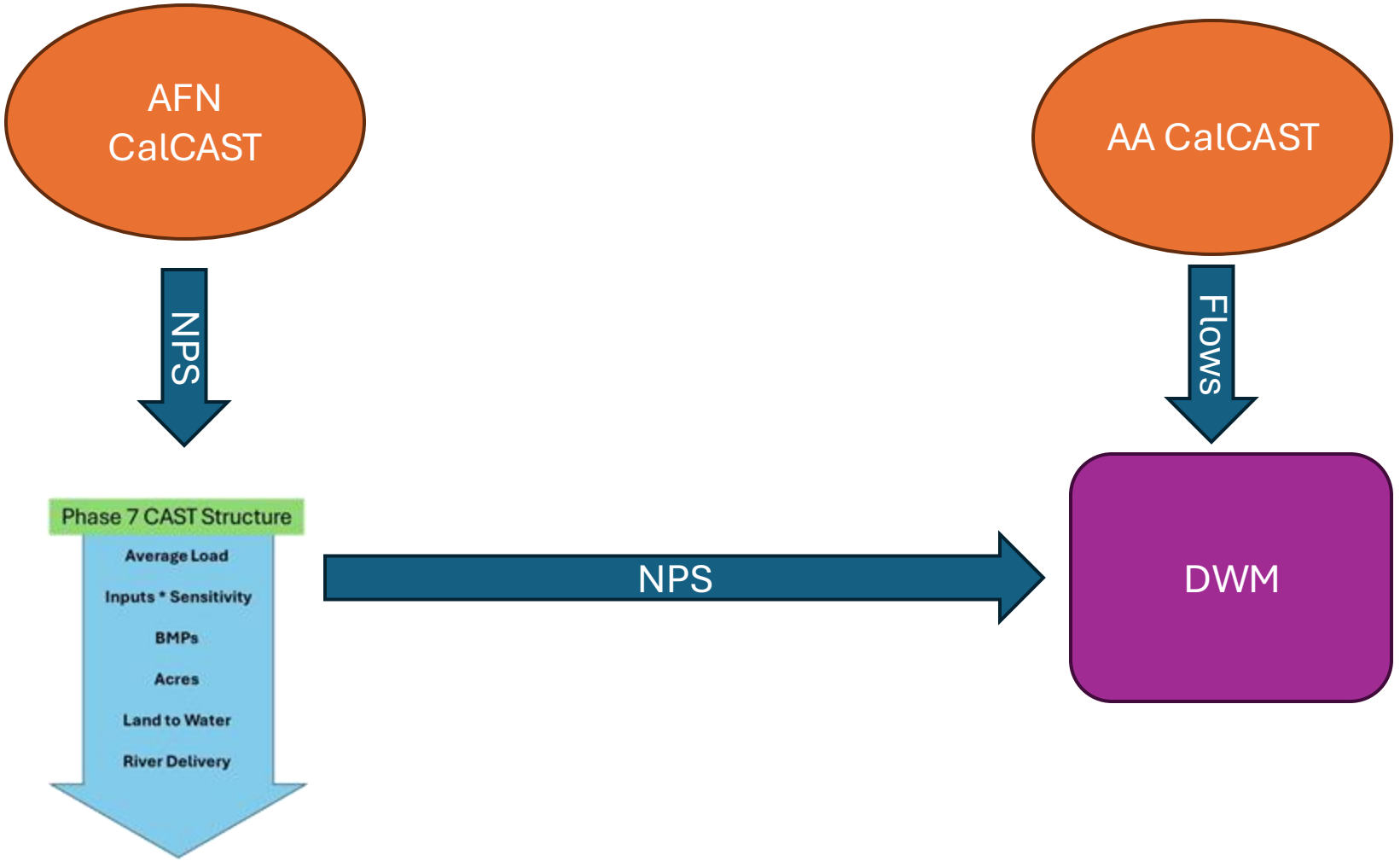
Specific plan #1; use AFN and AA CalCAST

Constituent	Average Annual	Annual Flow-Normalized	Annual True Condition
Flow	In Use		
Baseflow	In Use		
Nitrogen	Plan B	Plan A	
Phosphorus	Plan B	Plan A	
Sediment	Plan B	Plan A	

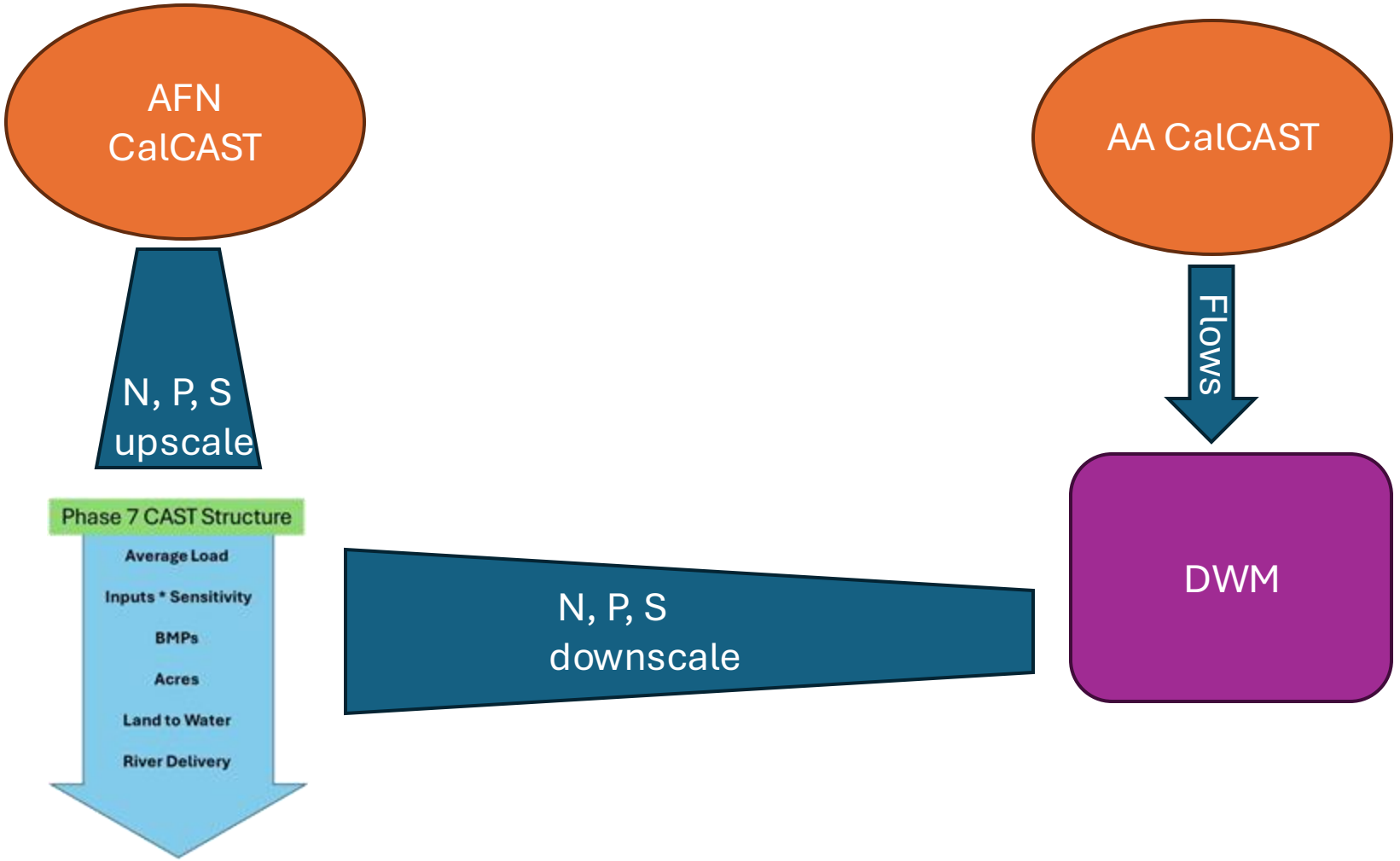


- Annual Flow-Normalized parameters best predict flow-normalized trends
  - Ultimate management purpose
- Average annual is a fallback option similar to phase 6 but *using CBP inputs*.

Specific plan #1; use AFN and AA CalCAST

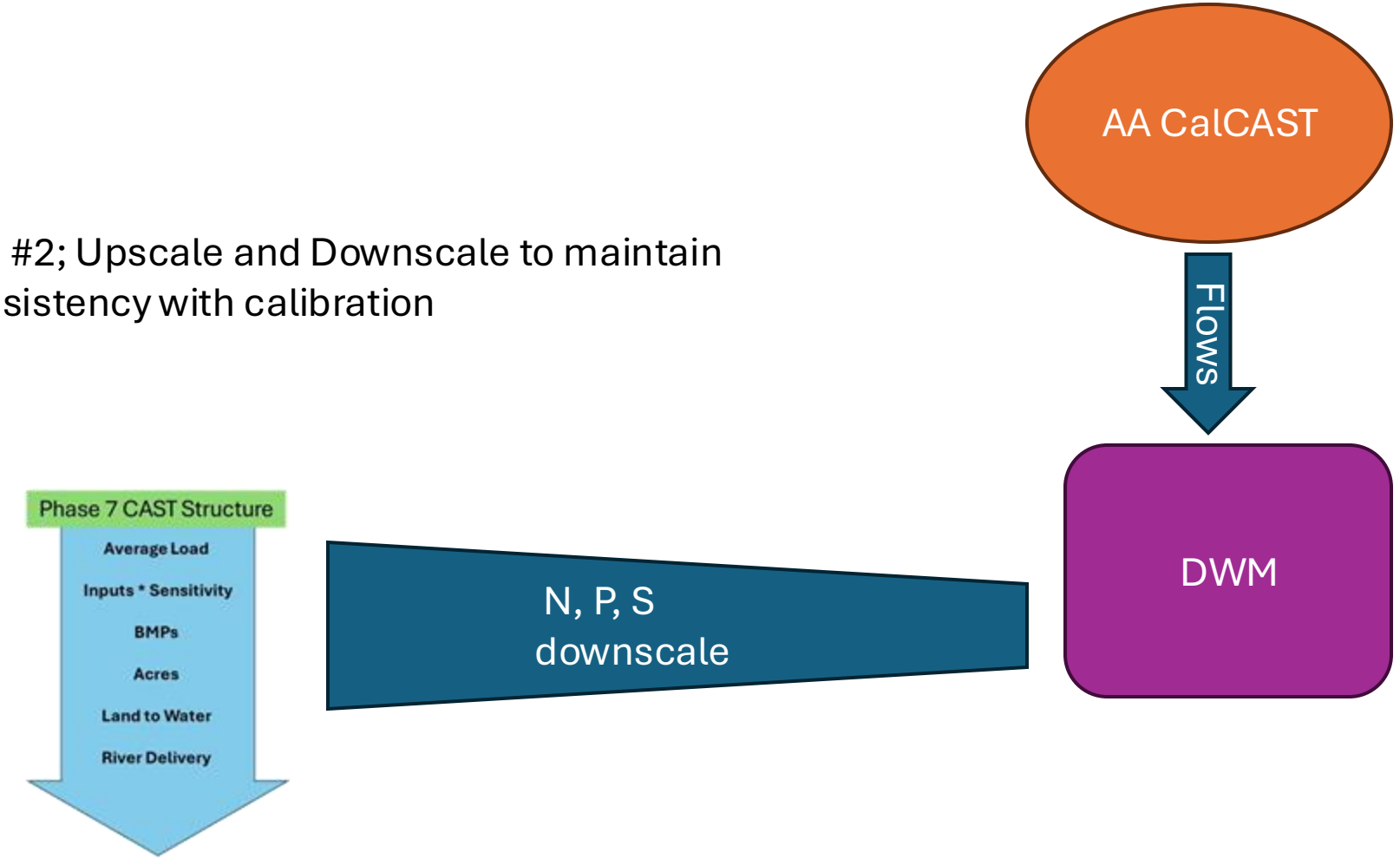


Specific Plan #2; Pass through CAST with upscaling and downscaling



Scenarios won’t have CalCAST for N, P, S

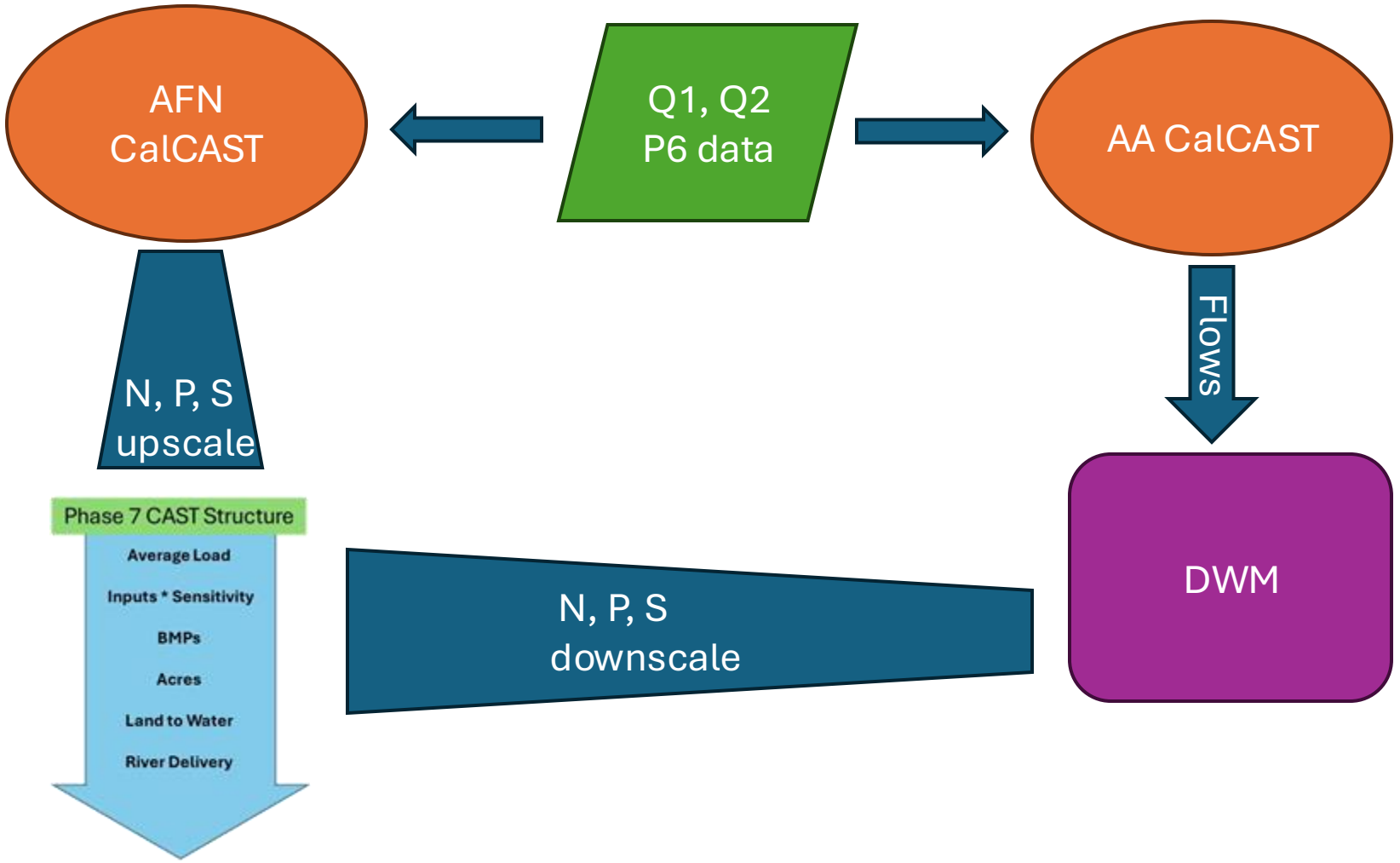
Specific plan #2; Upscale and Downscale to maintain scenario consistency with calibration



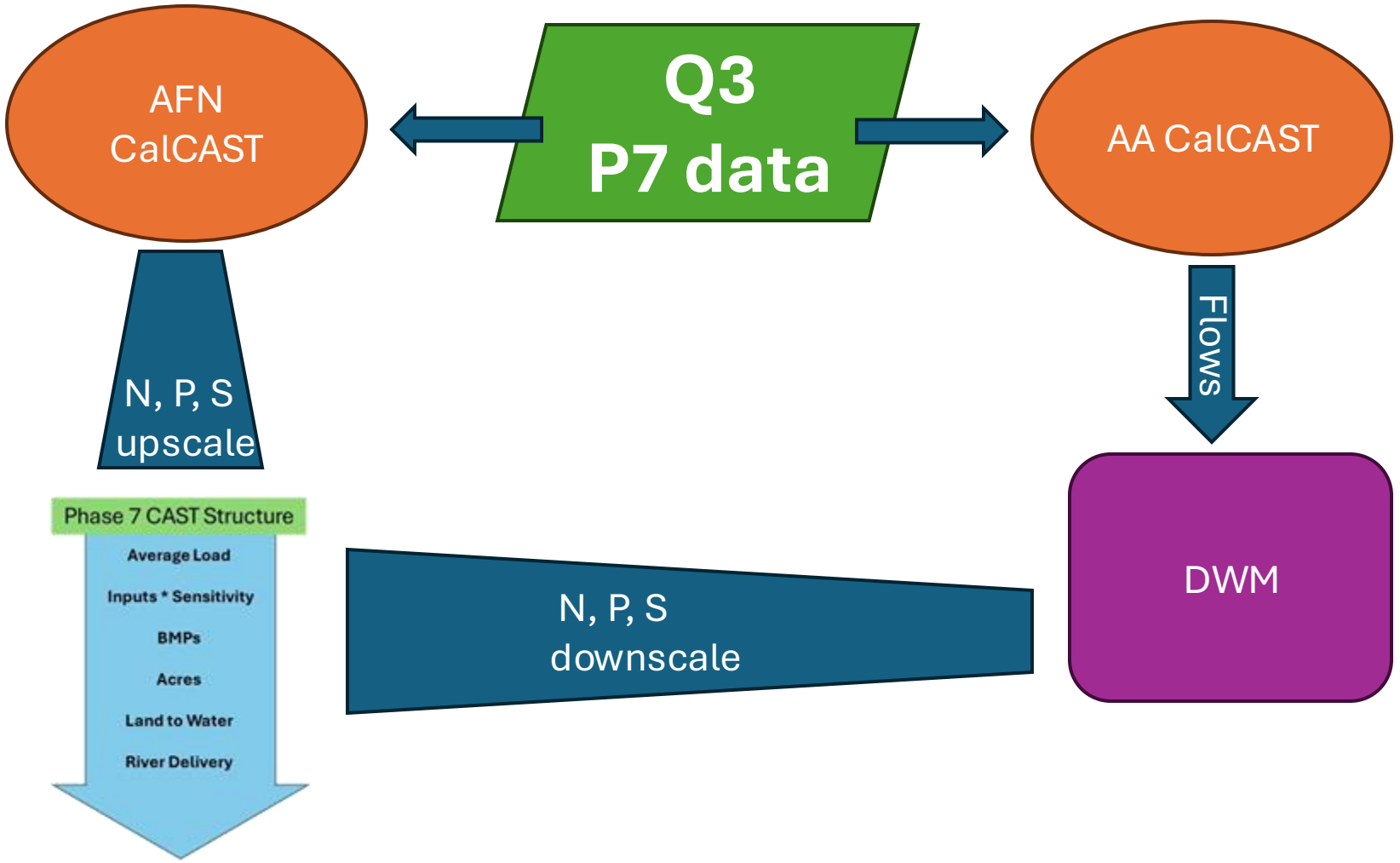
Specific plan #3 – use DWM and USGS load information to set final river delivery

- CalCAST determines the best global parameters
  - However, some river input stations not good enough for estuarine model.
- Modifications to the delivery factors to better match WRTDS loads
- Similar to:
  - Phase 6
  - SPARROW model

Specific plan #4 – Automate the system



Specific plan #4 – Automate the system



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