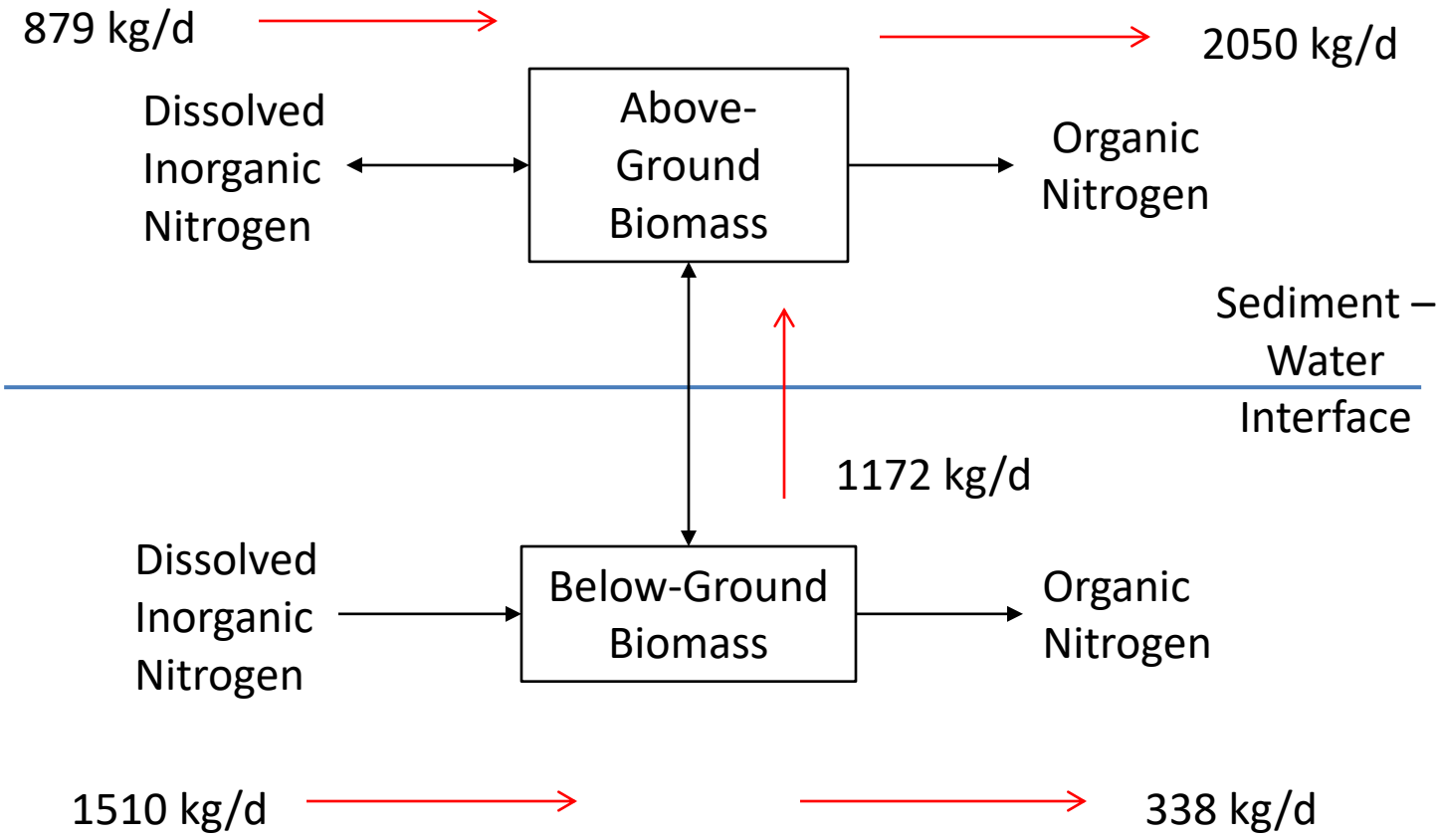
The Question

- We want to know how SAV influences sediment-water nutrient cycling. How much nutrient is removed from water column by SAV?
- We quantify these fluxes within the model code.
- We need to export the desired information from the code and put it into useful form.

Status

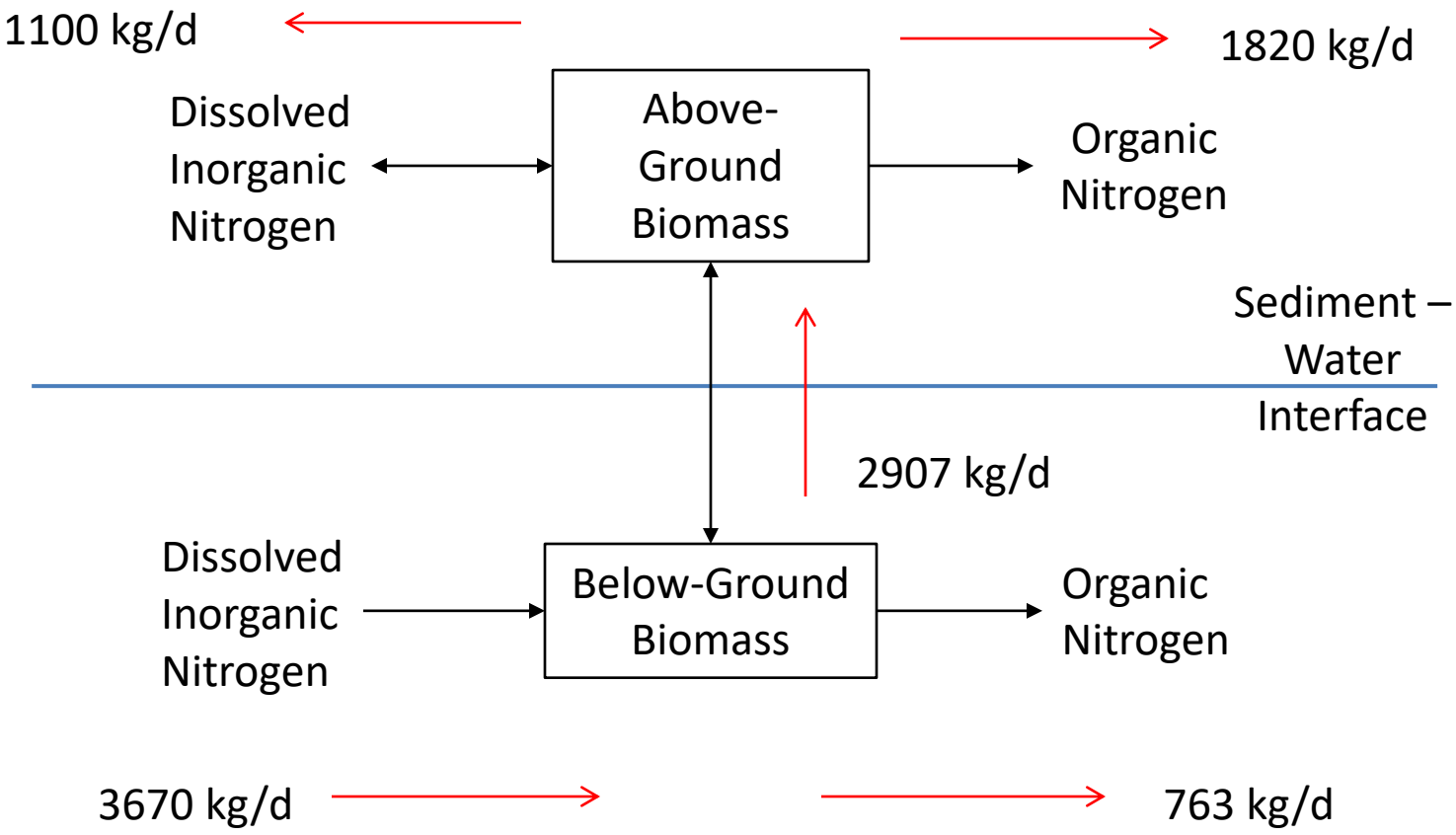
- We have the code to save and output SAV fluxes installed and QC'd at the Bay Program.
- We have a post-processor to organize the material into useful form.

The Nitrogen Cycle



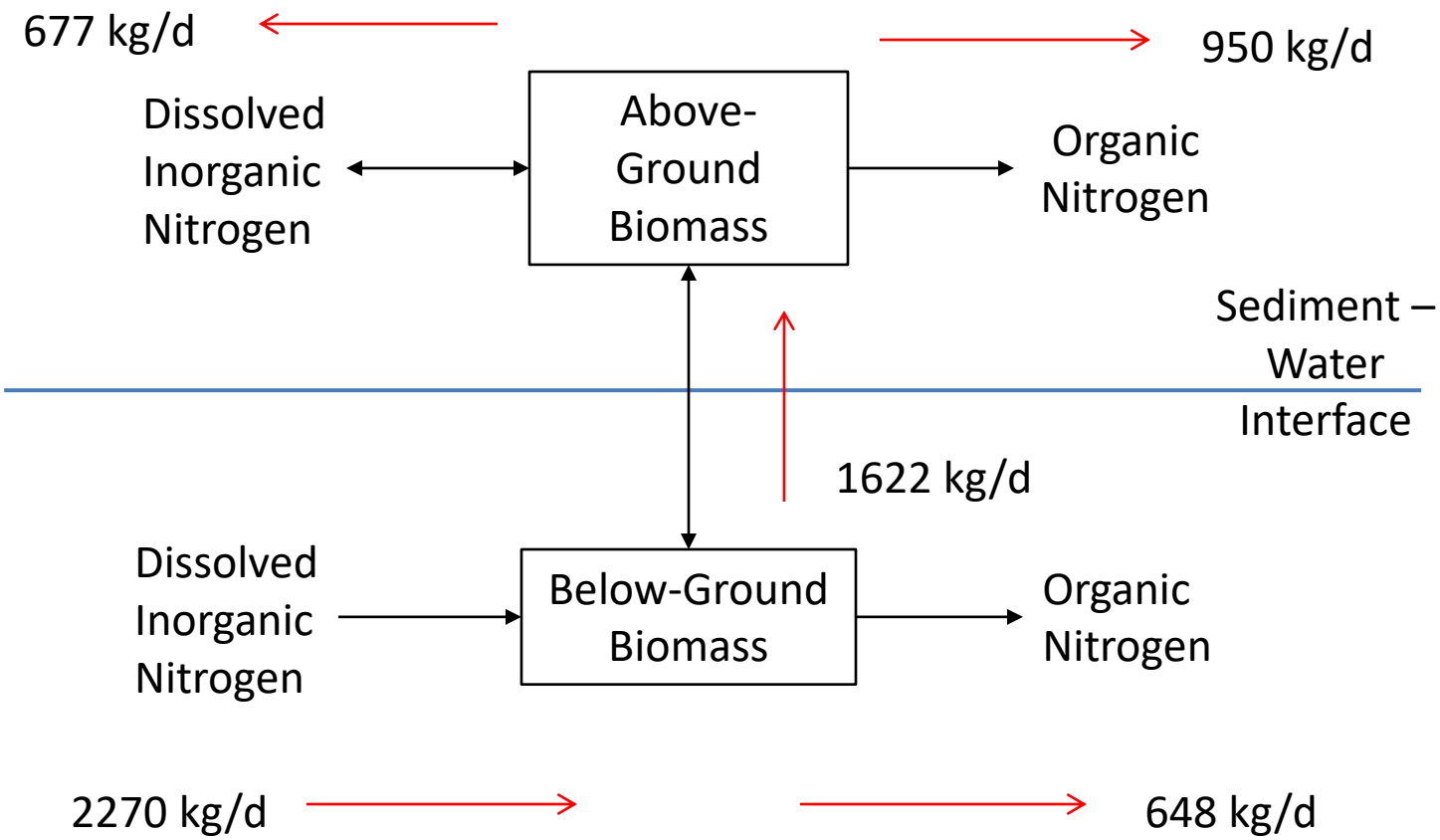
We quantify and can report out the indicated fluxes (CB1TF, vallisneria).

The Nitrogen Cycle



We quantify and can report out the indicated fluxes (TANMH, ruppia).

The Nitrogen Cycle

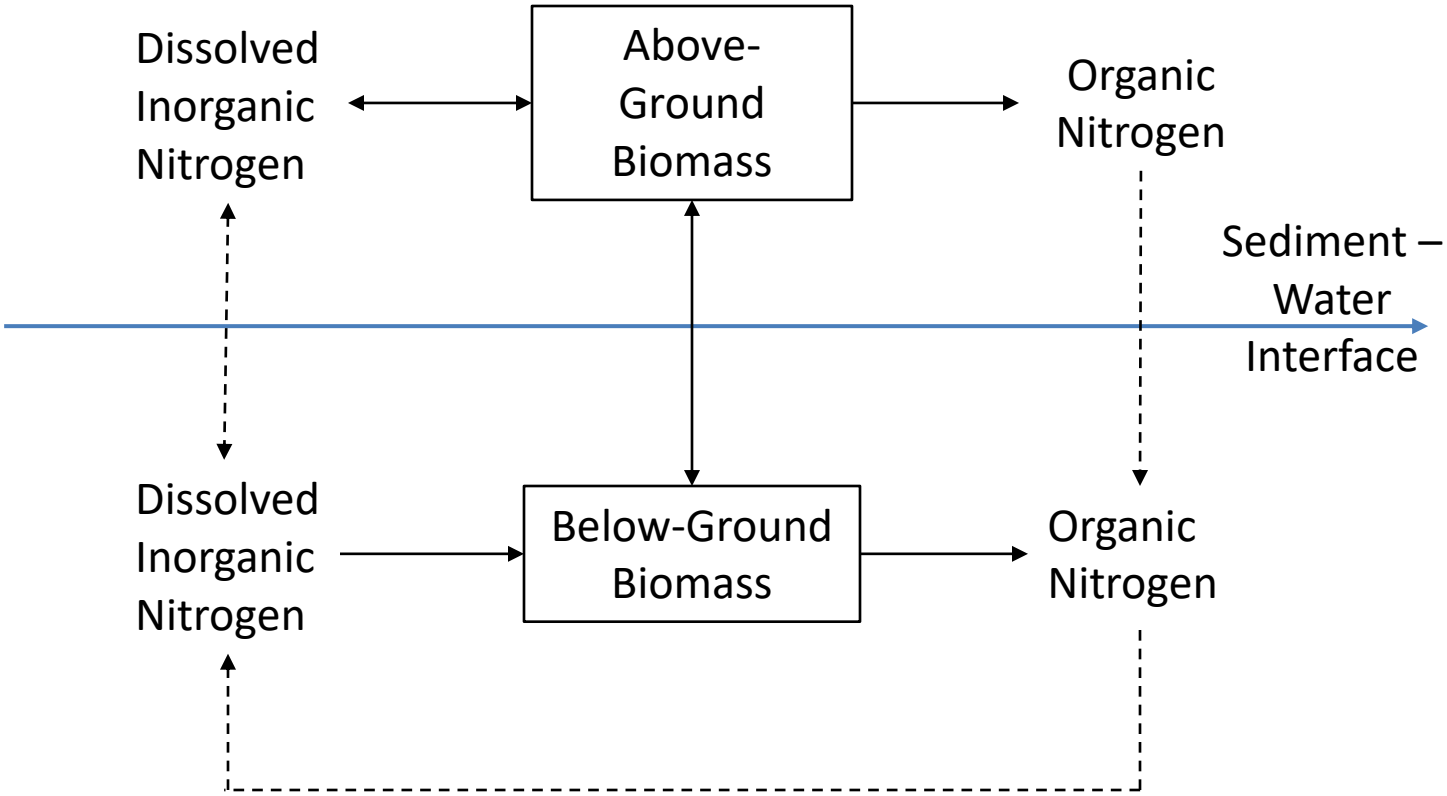


We quantify and can report out the indicated fluxes (CB7PH, zostera).

Initial Conclusions

- SAV tends to transfer nitrogen from benthic sediments to the overlying water column.
- Nitrogen is removed from the sediments as DIN.
- Nitrogen is released to the water in organic form and, in some cases, as DIN.

Complications



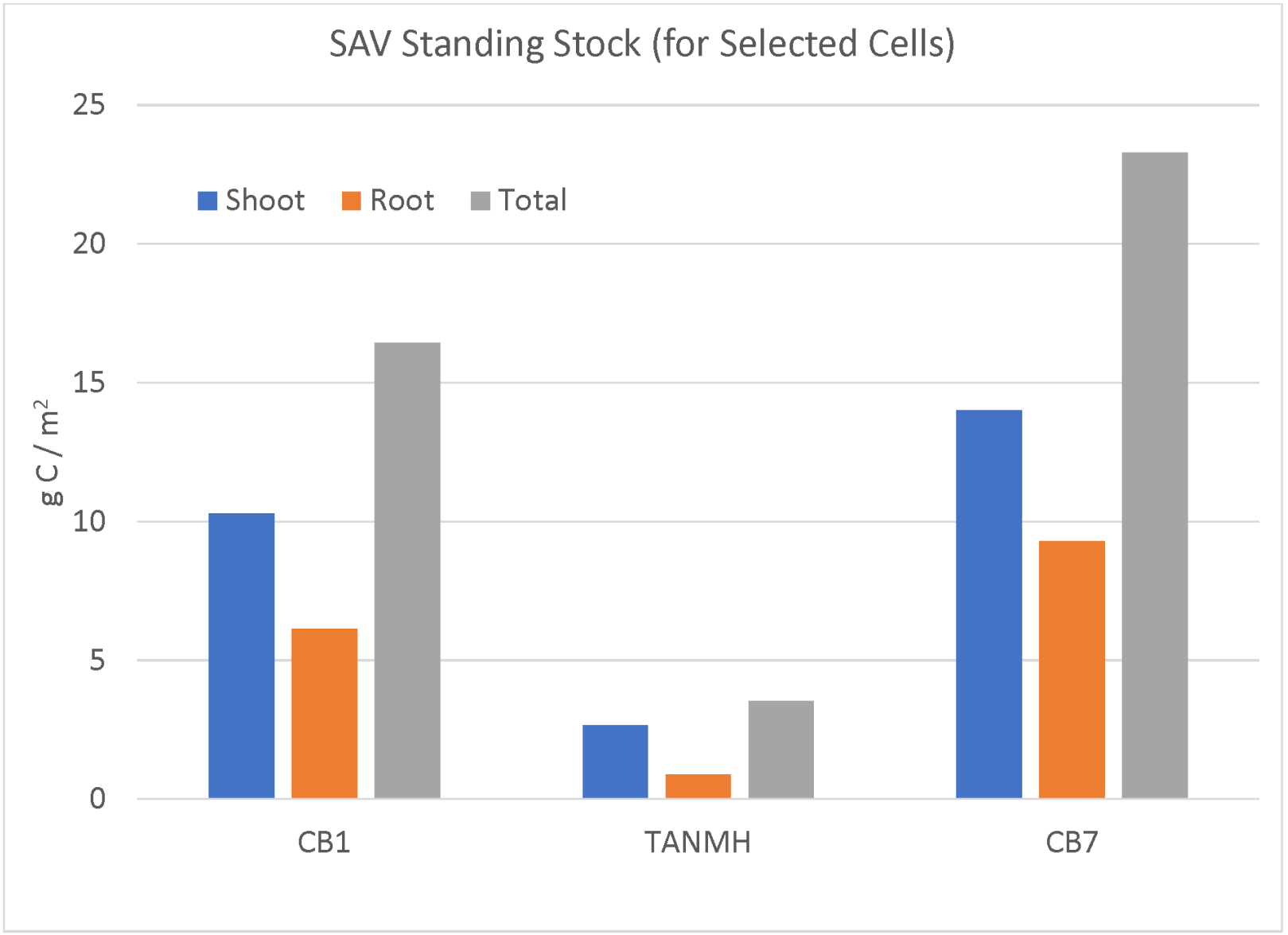
We quantify and can report out the additional fluxes but it is difficult to isolate the influence of SAV.

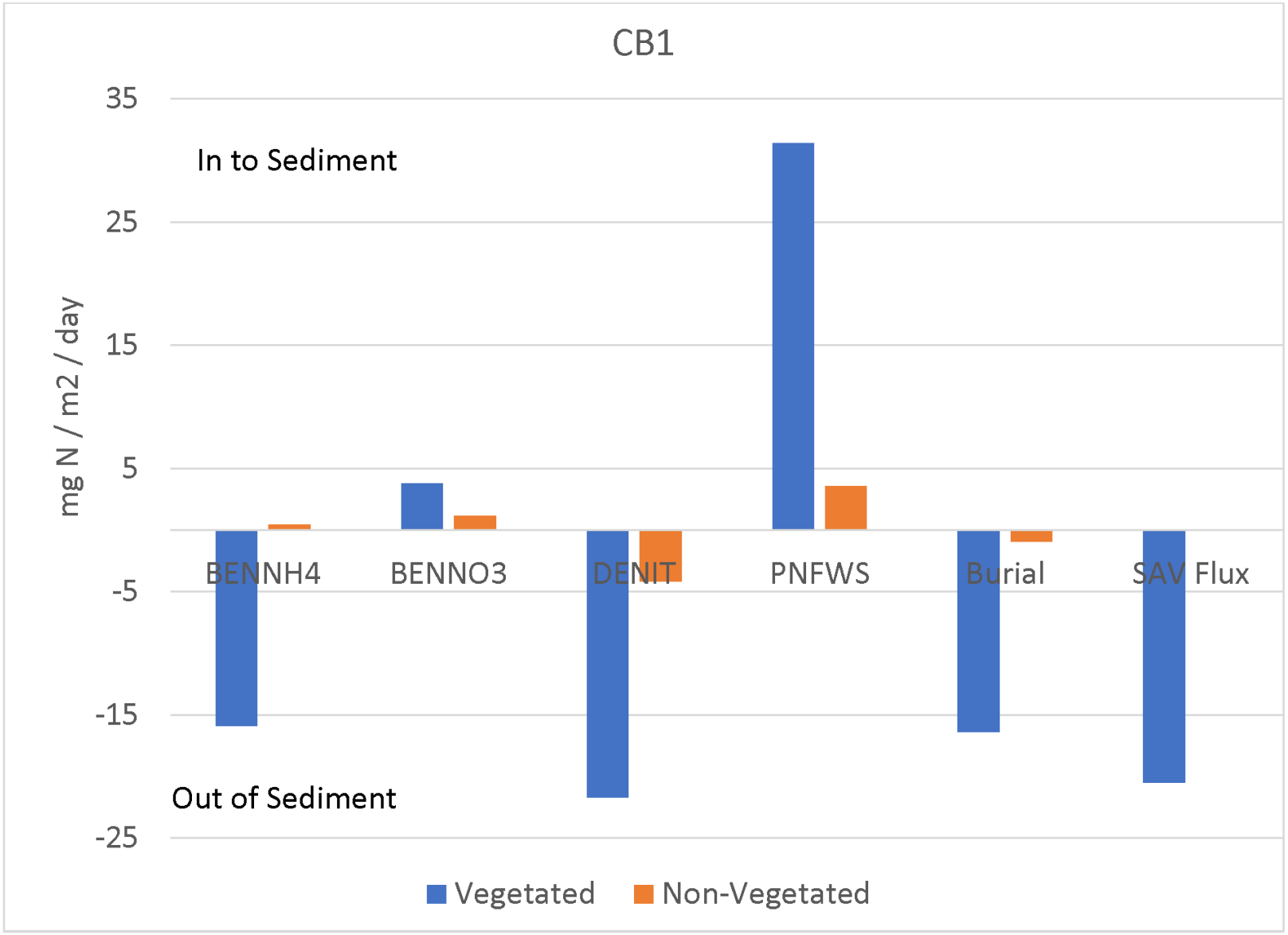
Long-Term Goals

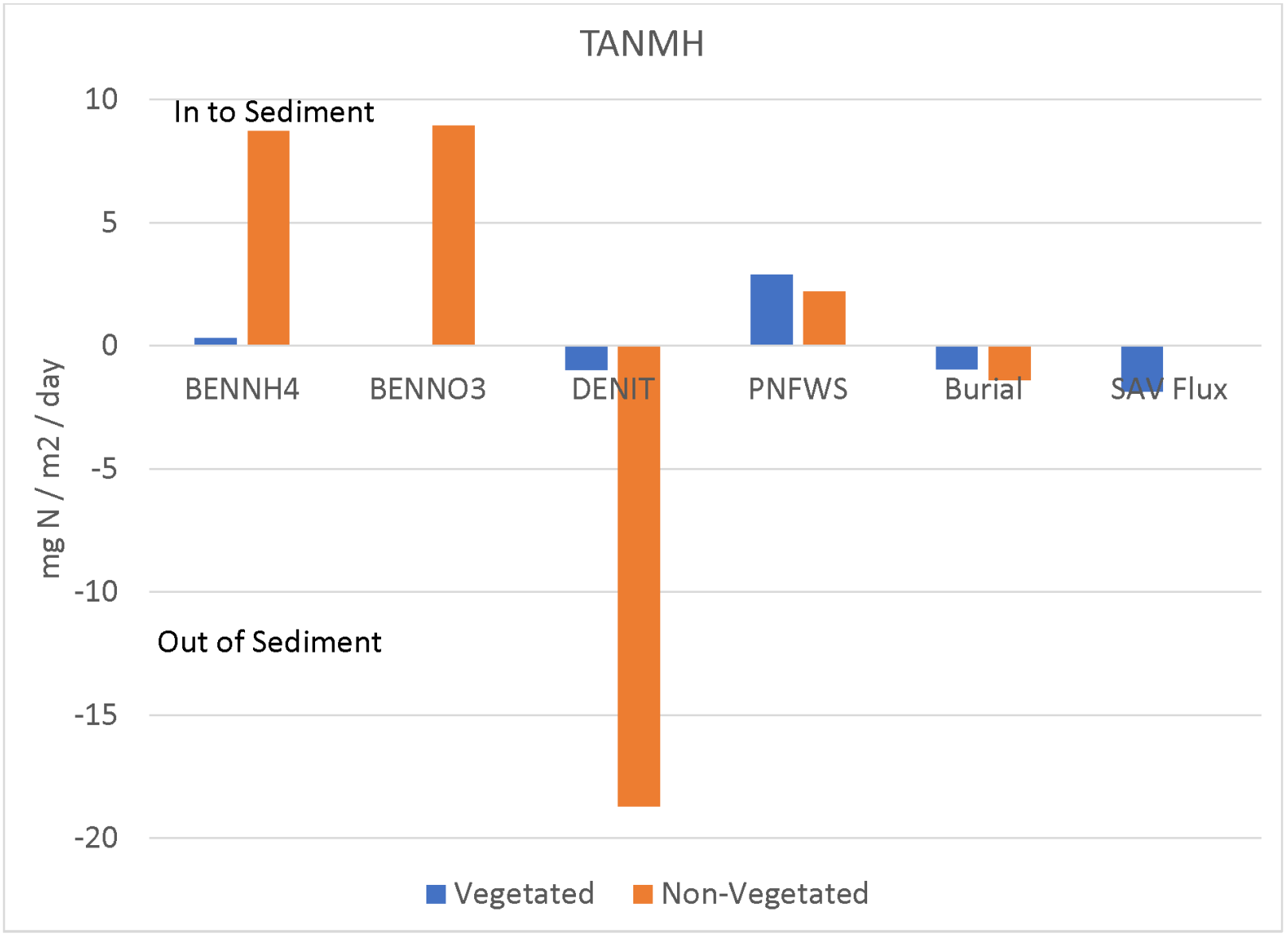
- Perform detailed mass-balance analysis of sediment-water fluxes etc.
- Compare SAV nutrient fluxes to local and system-wide external loads. Calibration and WIP3
- Run calibration with and without SAV. Examine water quality as indicated by stoplight plots etc.
- Run WIP3 with and without SAV. Examine water quality as indicated by stoplight plots etc.

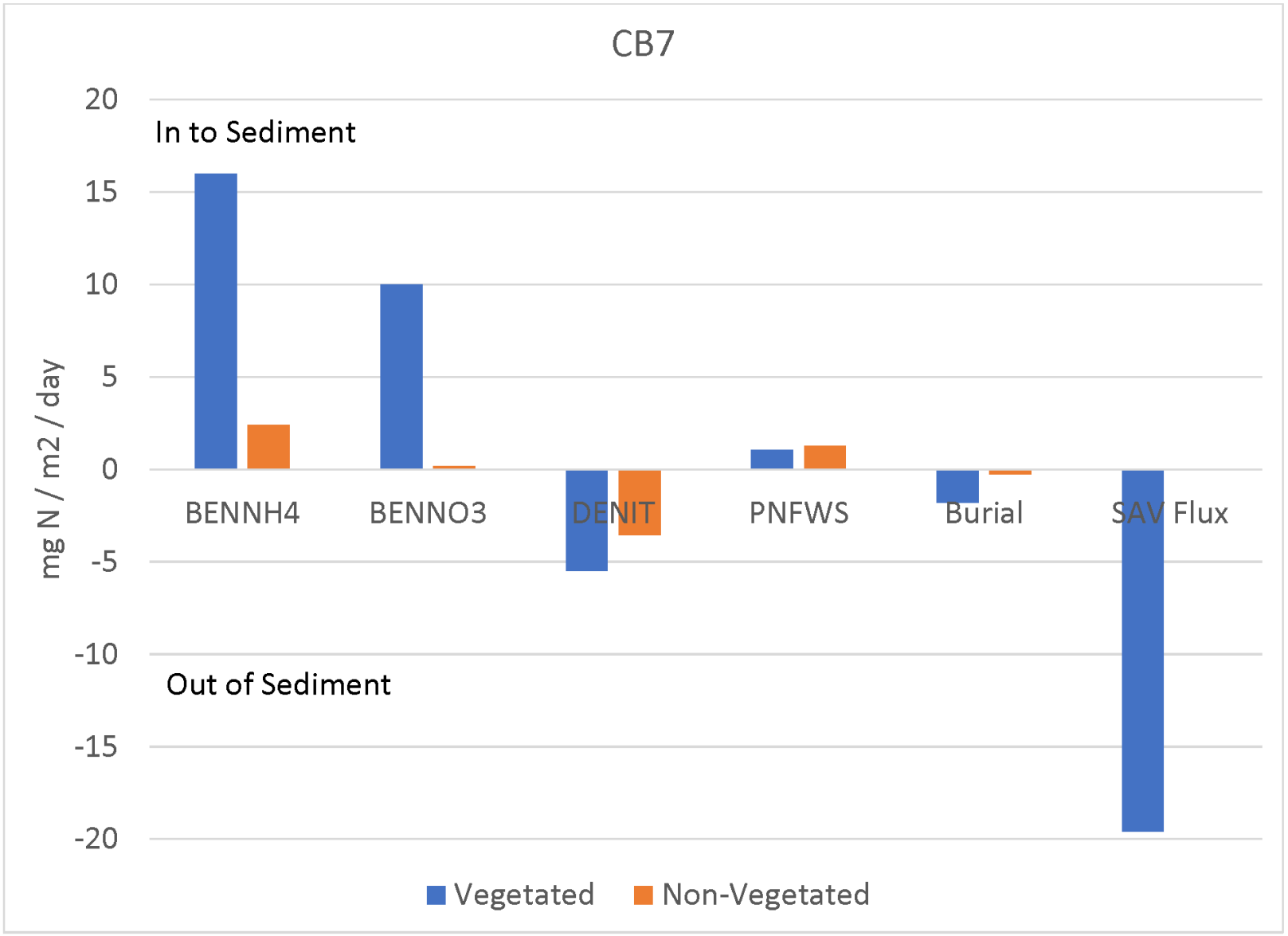
Next Steps?

- In the long run, we need to make model runs with and without SAV to isolate and quantify SAV impacts.
- In the short run, we're going to compare vegetated cells with nearby non-vegetated cells in the same model run.
- Perform careful mass balances on individual cells. Continue with quality assurance process.
- Compare vegetated and non-vegetated cells. Form initial ideas about SAV effects on sediment-water transfers.


SAV Standing Stock (for Selected Cells)
25
20
15
10
5
0
g C / m2
Shoot
Root
Total
CB1
TANMH
CB7


CB1
35
25
15
5
-5
-15
-25
mg N / m2 / day
In to Sediment
Out of Sediment
BENNH4
BENNO3
DENIT
PNFWS
Burial
SAV Flux
Vegetated
Non-Vegetated


TANMH
10
5
0
-5
-10
-15
-20
In to Sediment
Out of Sediment
mg N / m2 / day
BENNH4
BENNO3
DENIT
PNFWS
Burial
SAV Flux
Vegetated
Non-Vegetated


CB7
20
In to Sediment
15
10
5
0
-5
-10
Out of Sediment
-15
-20
mg N / m2 / day
BENNH4
BENNO3
DENIT
PNFWS
Burial
SAV Flux
Vegetated
Non-Vegetated

Summary

- Initial inspection indicates no consistent effect of SAV on sediment-water nitrogen fluxes.
- This may be true or it may be an artifact of our methodology. “Nearby” cells may still be affected by differences in depth, dissolved oxygen or other factors.
- We need to examine larger areas under true “with and without” conditions.

Next Steps

- Continue careful mass-balance checks on model code and processors.
- Introduce phosphorus and carbon to analysis.
- Complete a “No SAV” model run. Perform “with and without SAV” analysis on model calibration run.