The Question

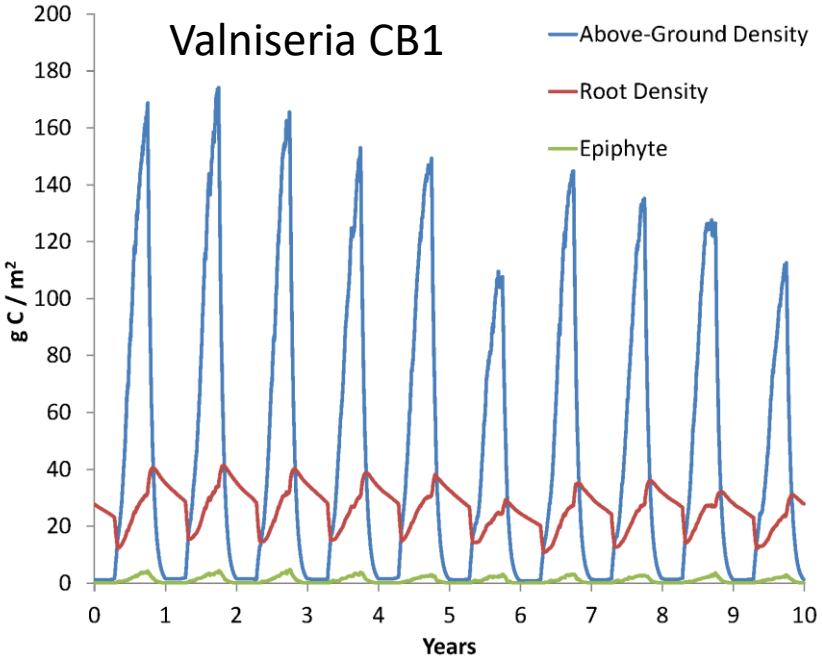
- We want to know how SAV influences sediment-water nutrient cycling. How much nutrient is removed from water column by SAV?
- We quantify these fluxes within the model code.
- We need to export the desired information from the code and put it into useful form.

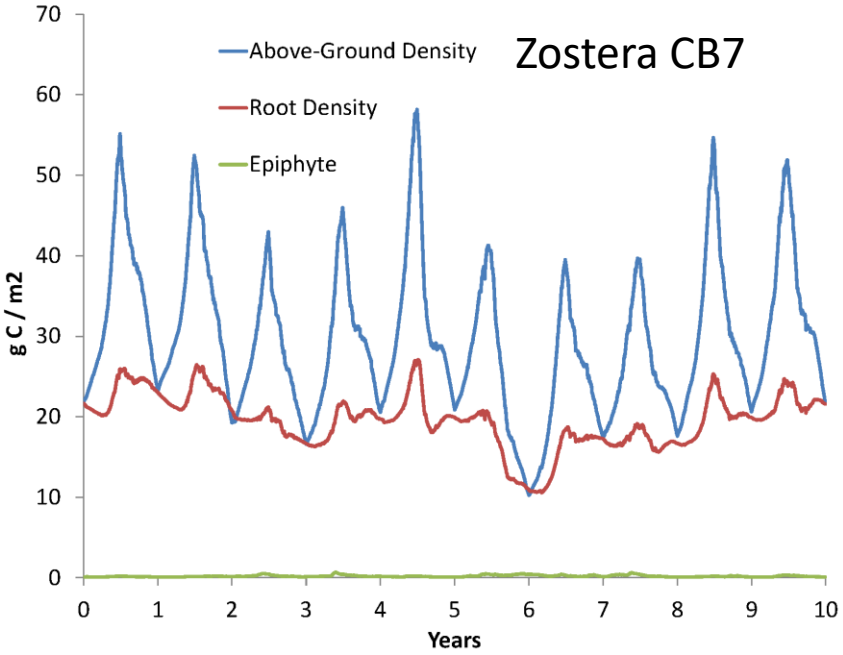
Long-Term Goals

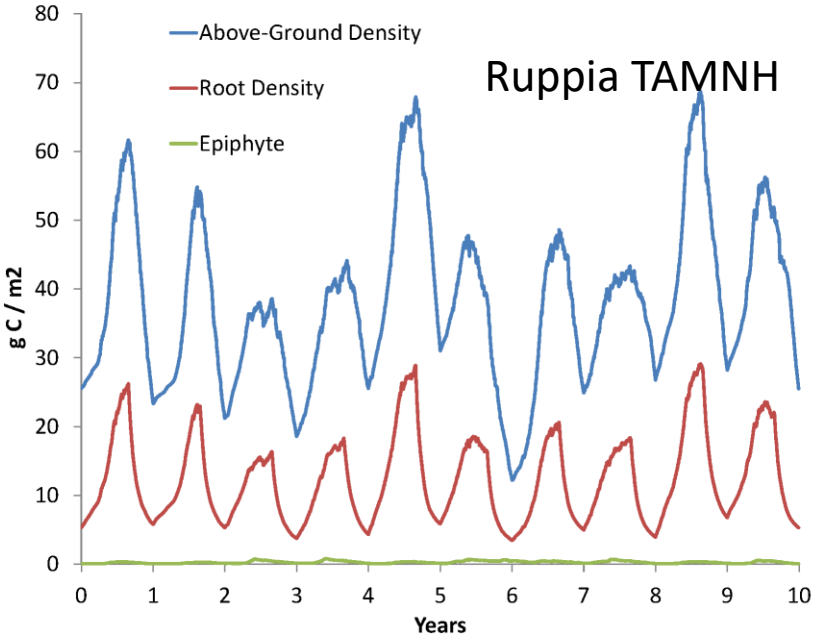
- Perform detailed mass-balance analysis of sediment-water fluxes etc.
- Compare SAV nutrient fluxes to local and system-wide external loads. Calibration and WIP3
- Run calibration with and without SAV. Examine water quality as indicated by stoplight plots etc.
- Run WIP3 with and without SAV. Examine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

Status

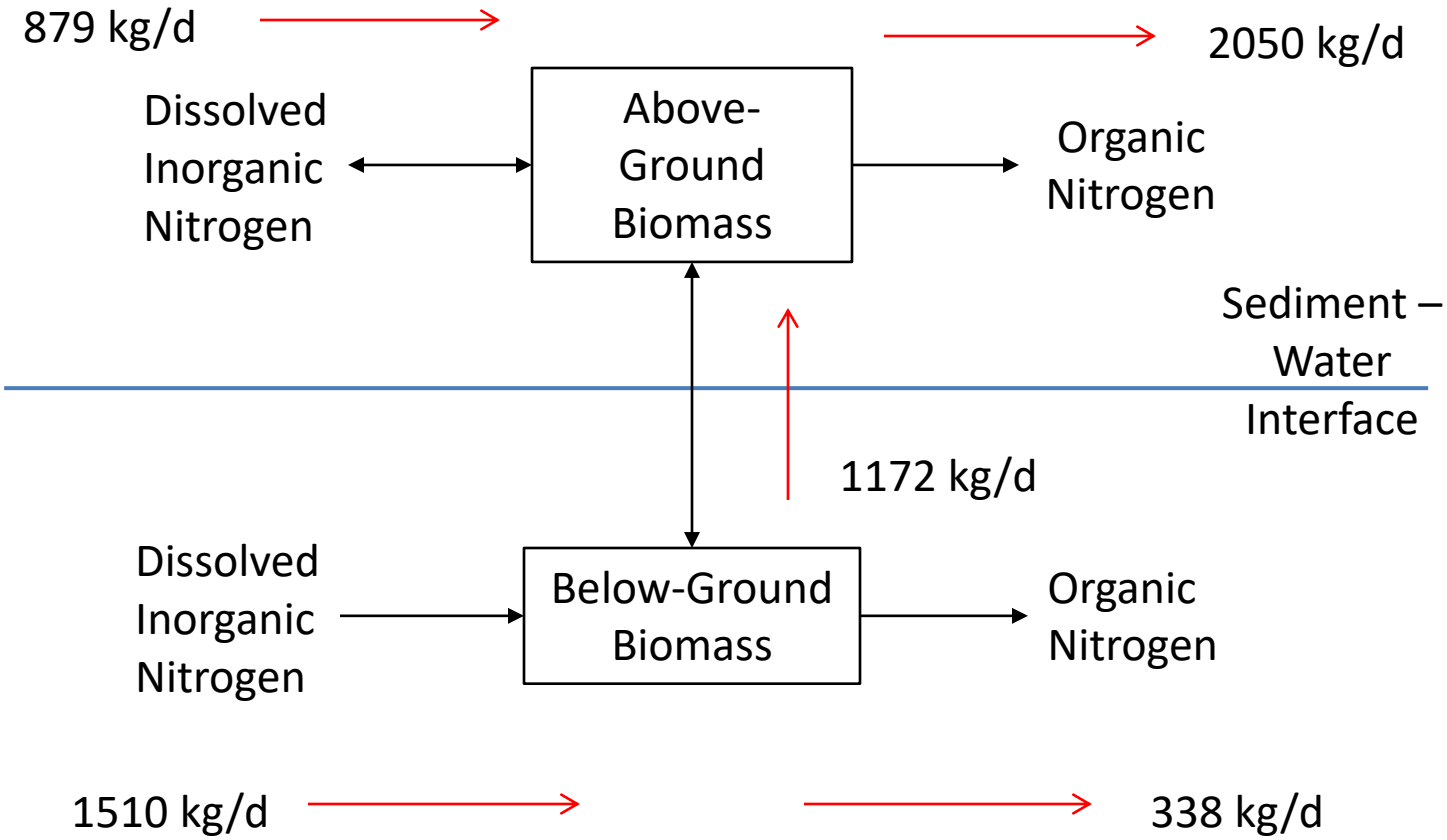
- We have made calibration runs with and without SAV to examine SAV effects on sediment-water N and P fluxes.
- Initial results presented to Modeling and Research Subcommittee January 2021.


Valniseria CB1
Above-Ground Density
Root Density
Epiphyte
g C / m²
Years


Zostera CB7
Above-Ground Density
Root Density
Epiphyte
g C / m2
Years

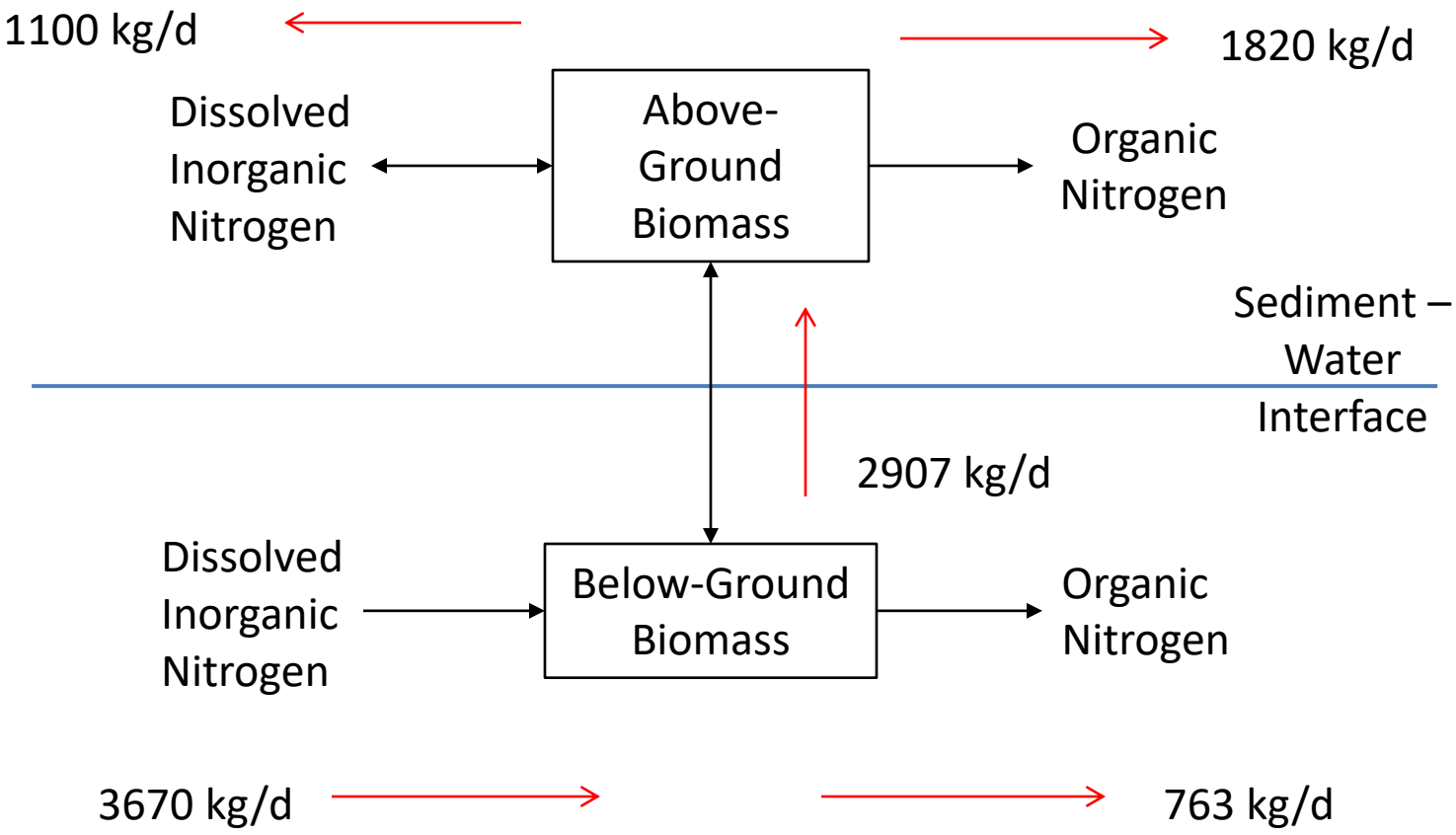

Ruppia TAMNH
Above-Ground Density
Root Density
Epiphyte
g C / m2
Years

The Nitrogen Cycle



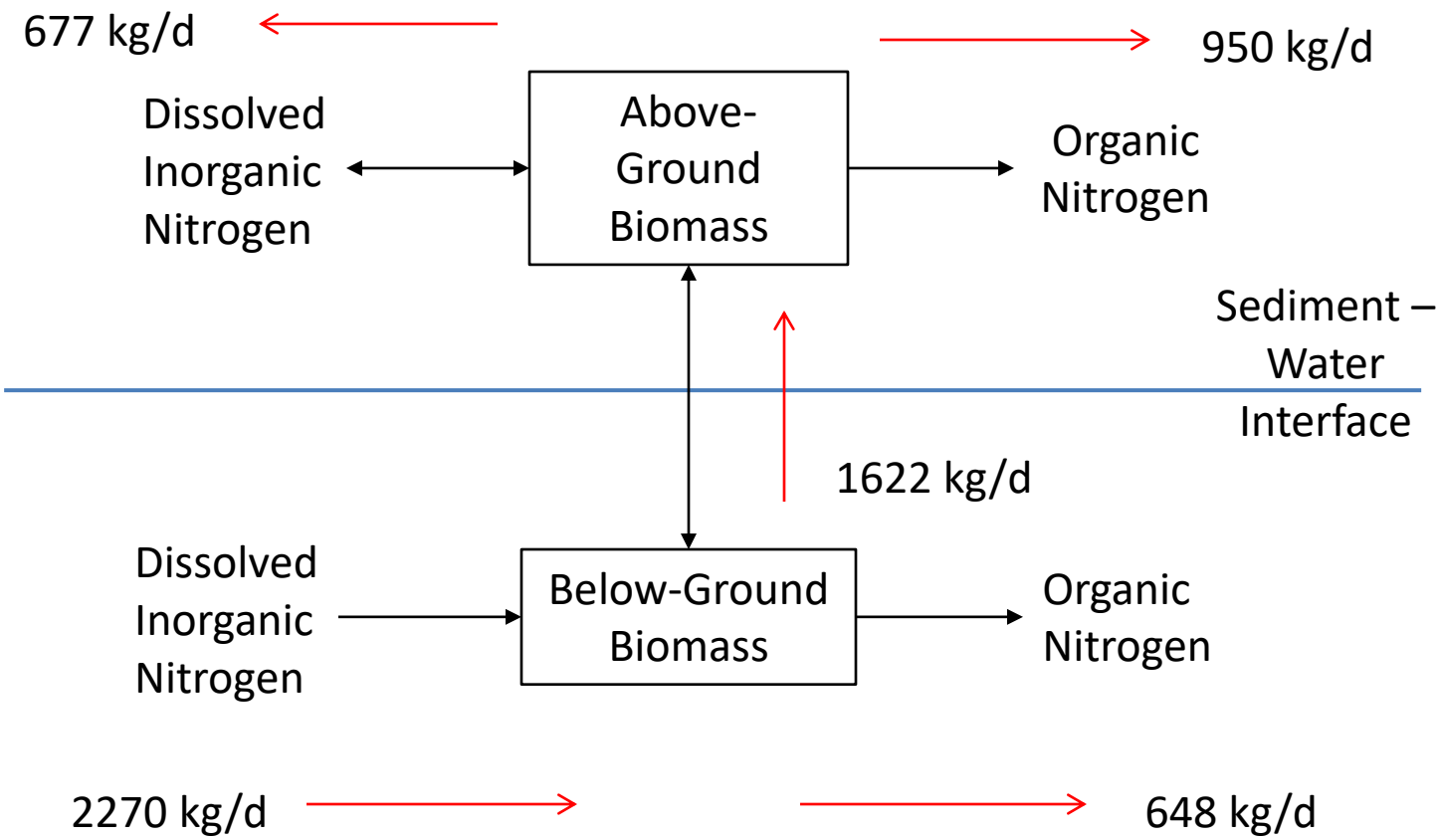
We quantify and can report out the indicated fluxes (CB1TF, vallisneria).

The Nitrogen Cycle



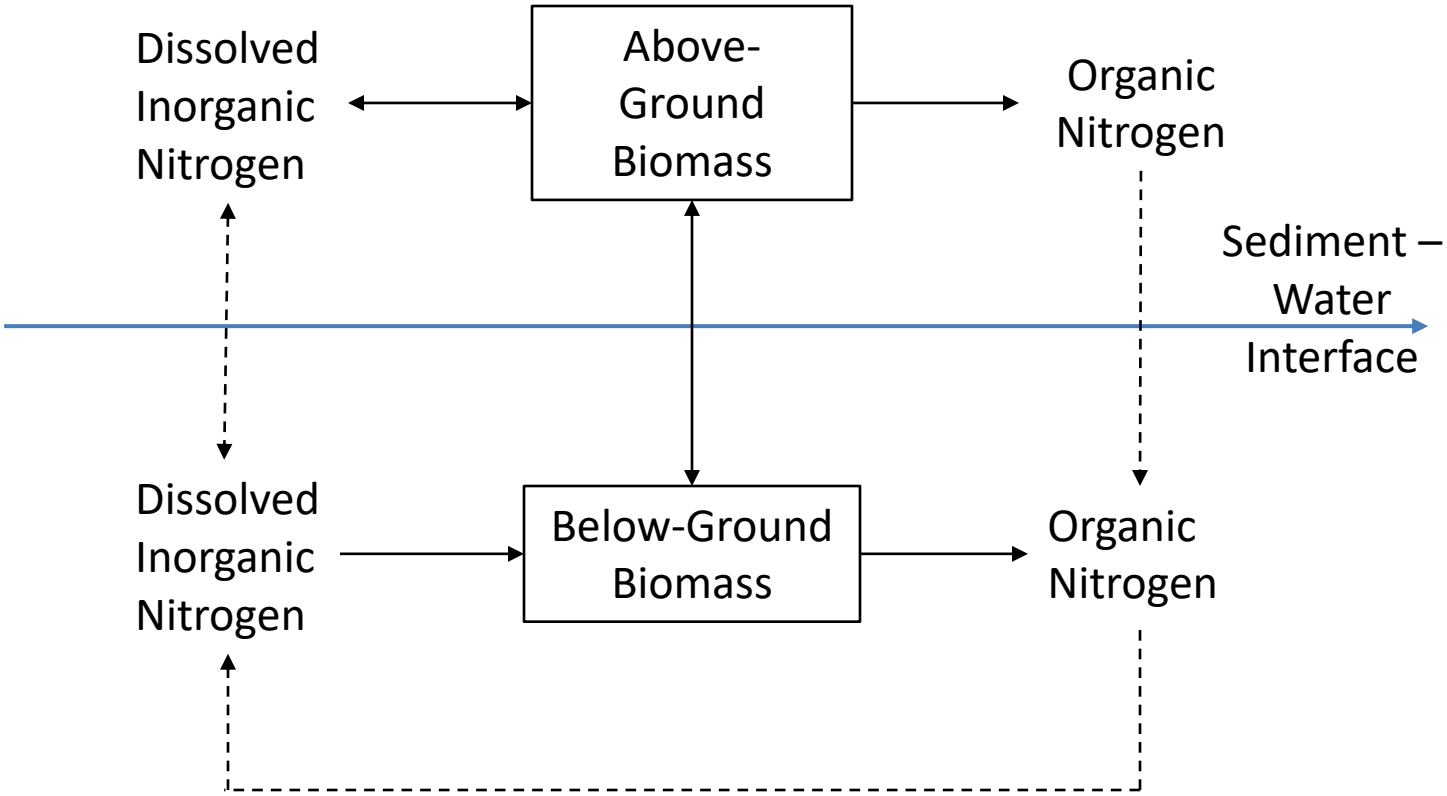
We quantify and can report out the indicated fluxes (TANMH, ruppia).

The Nitrogen Cycle



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

Complications



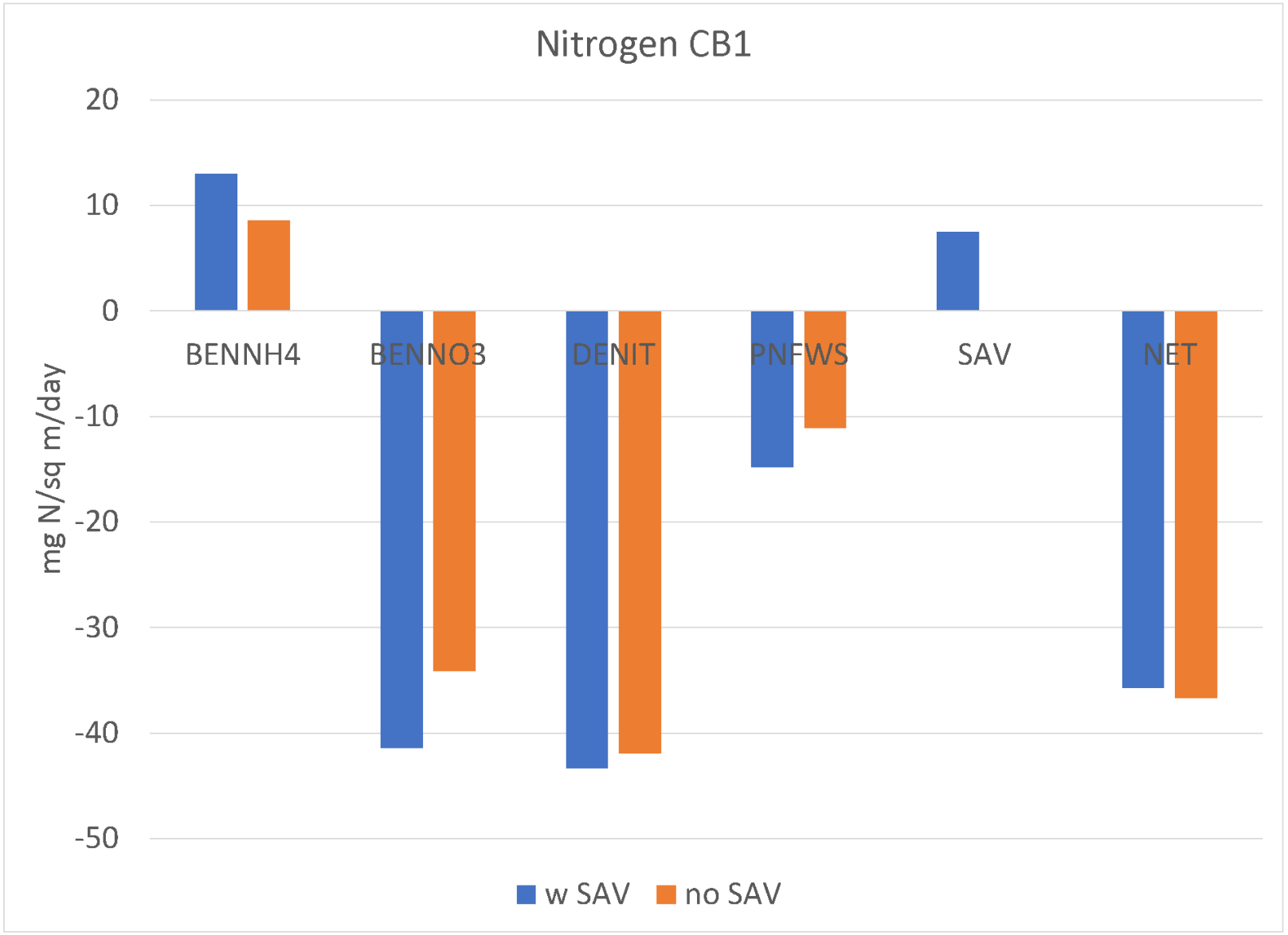
We quantify and can report out the additional fluxes but it is difficult to isolate the influence of SAV.

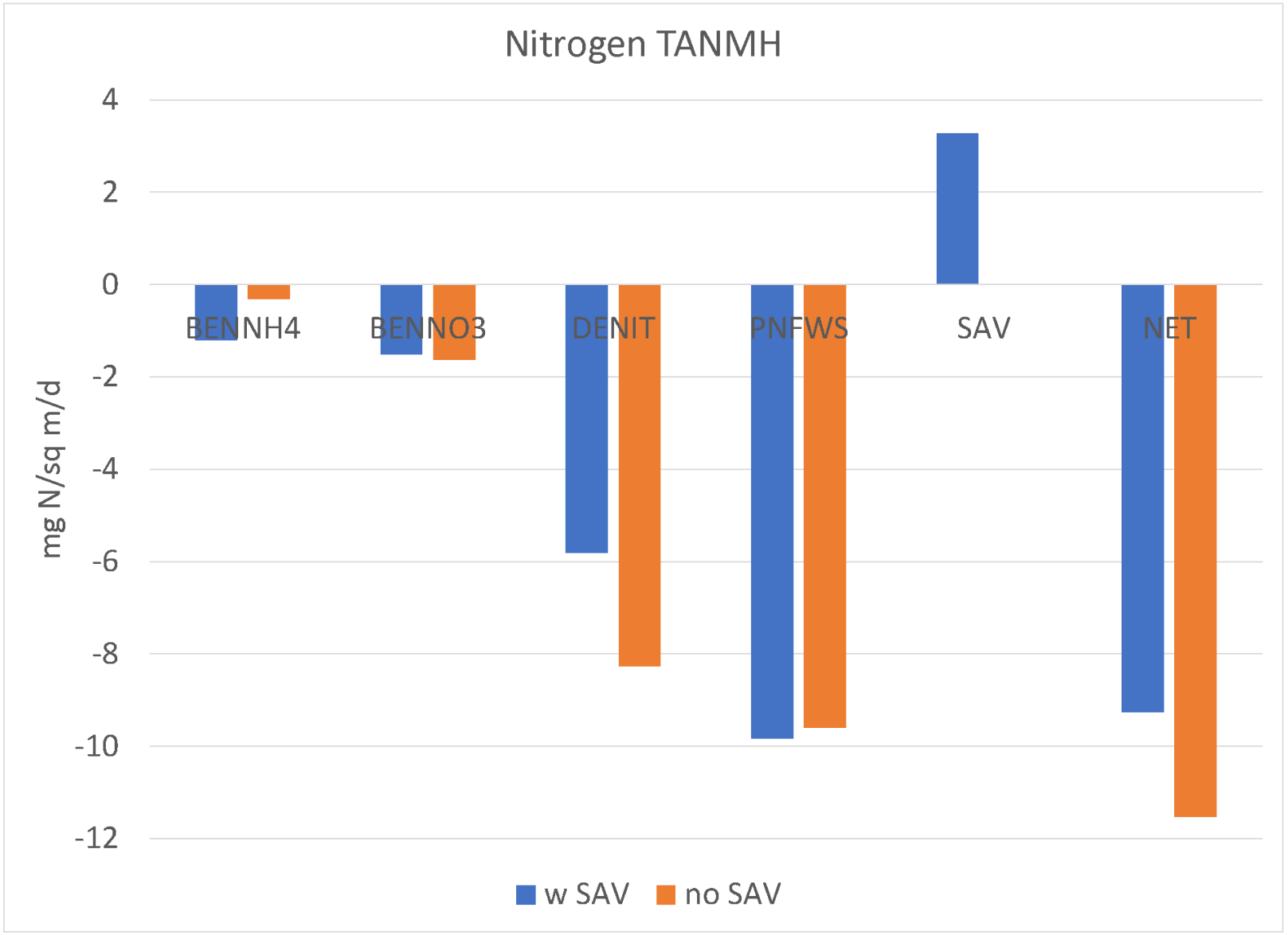
Nitrogen Key

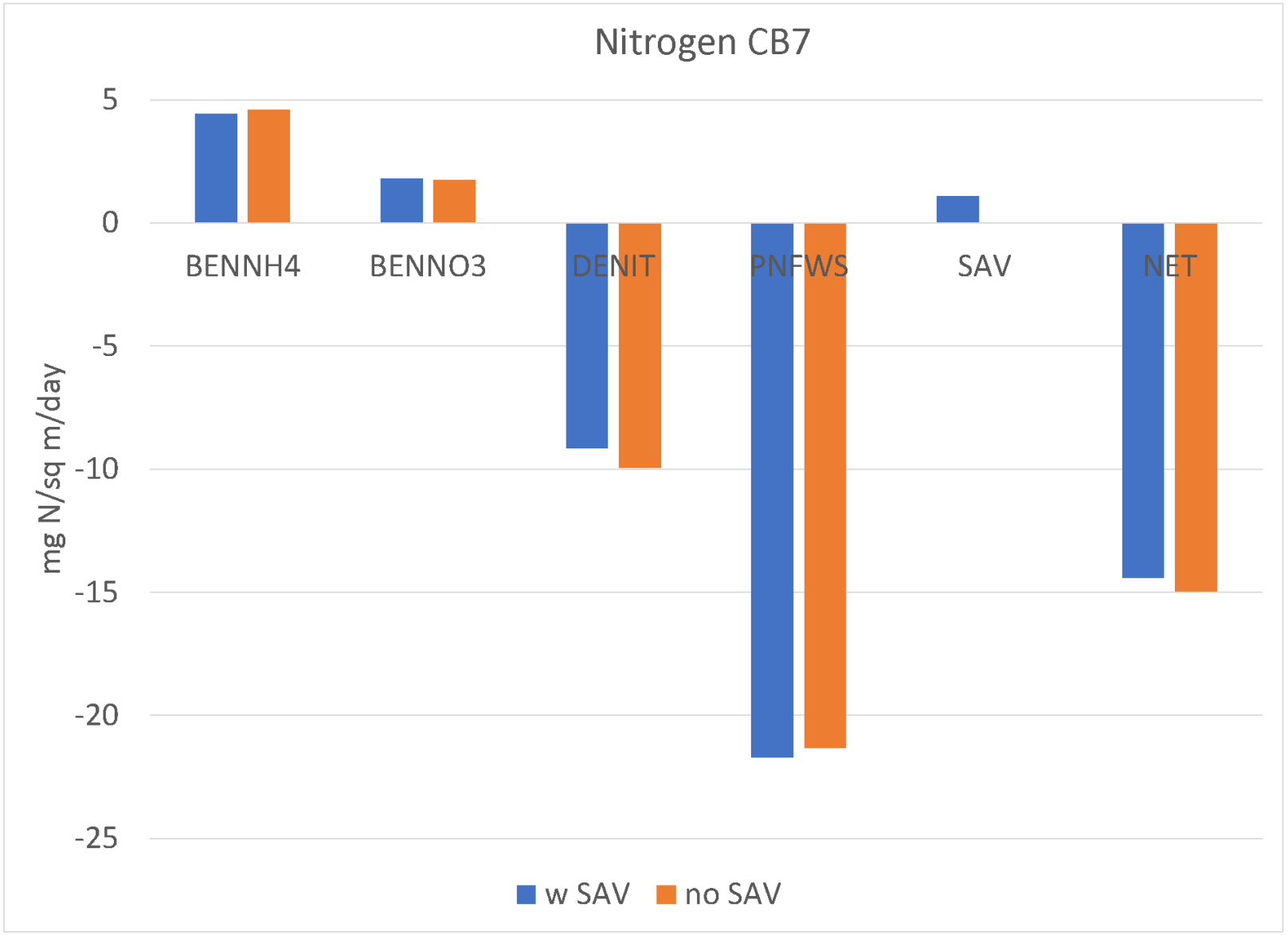
- All fluxes are positive from sediment to water. Negative from water to sediment.
- BENNH4 – Sediment-water NH4 flux
- BENNO3 – Sediment-water NO3 flux
- DENIT – Denitrification
- PNFWS – Particulate nitrogen flux from water to sediment
- SAV – Sediment-water nitrogen flux (DIN + Organic) through SAV
- Net – Net nitrogen flux from water to sediment (BENNH4 + BENNO3 + PNFWS + SAV

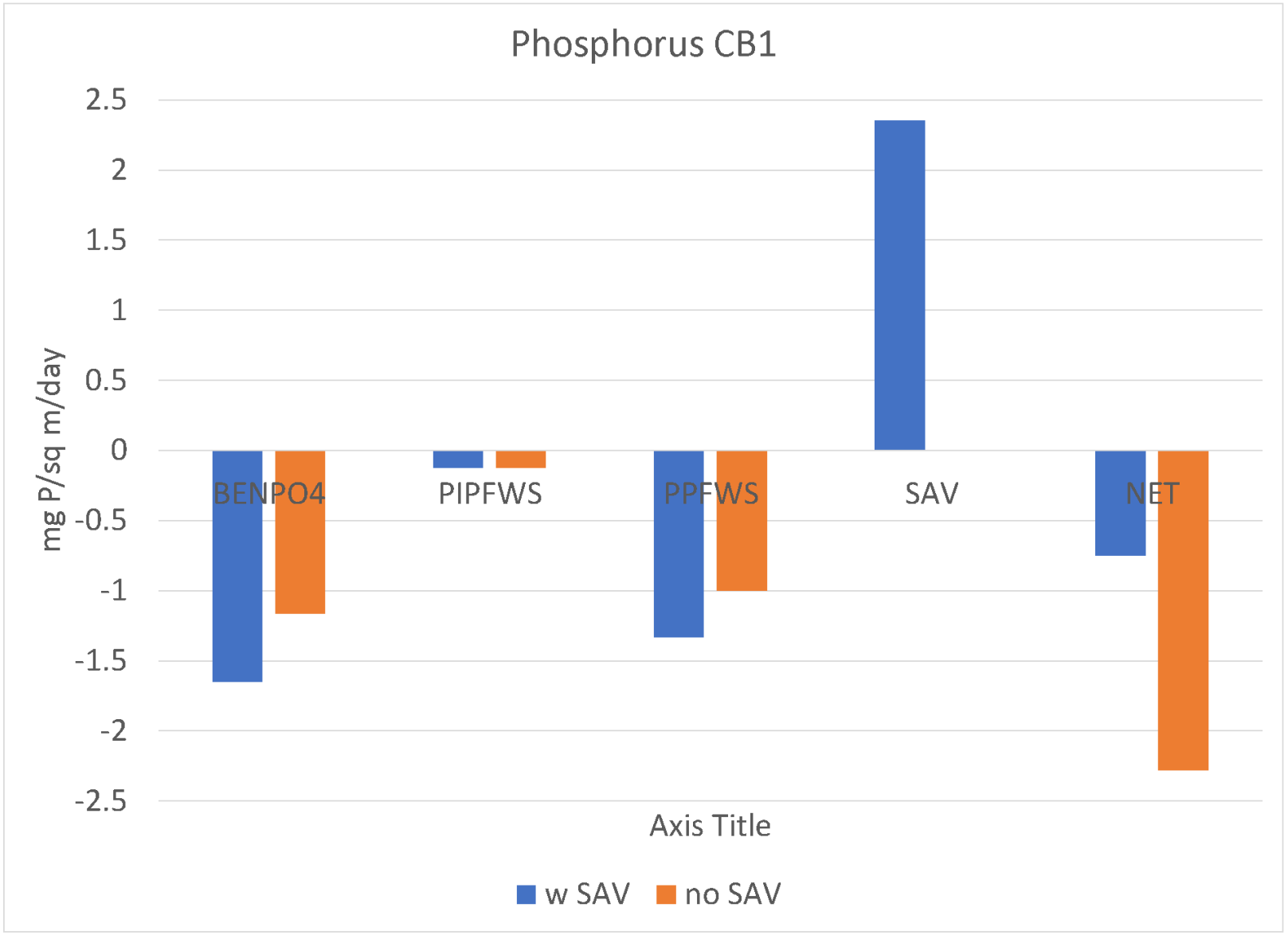
Phosphorus Key

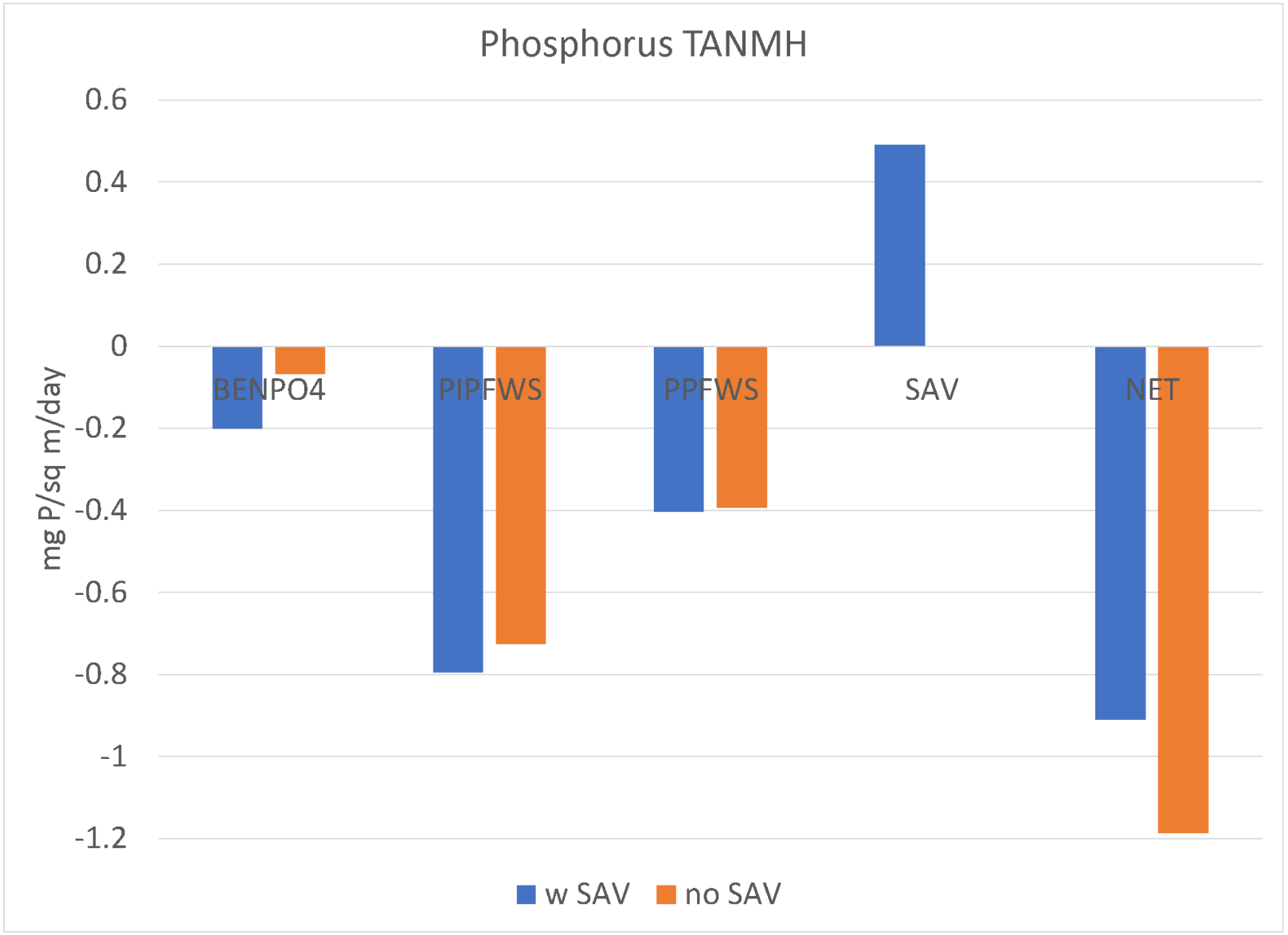
- All fluxes are positive from sediment to water. Negative from water to sediment.
- BENPO4 – Sediment-water PO4 flux
- PIPFWS – Particulate inorganic phosphorus flux from water to sediment
- PPFWS – Particulate organic phosphorus flux from water to sediment
- SAV – Sediment-water phosphorus flux (DIP + Organic) through SAV
- Net – Net phosphorus flux from water to sediment (BENPO4 + PIPFWS + PPFWS + SAV

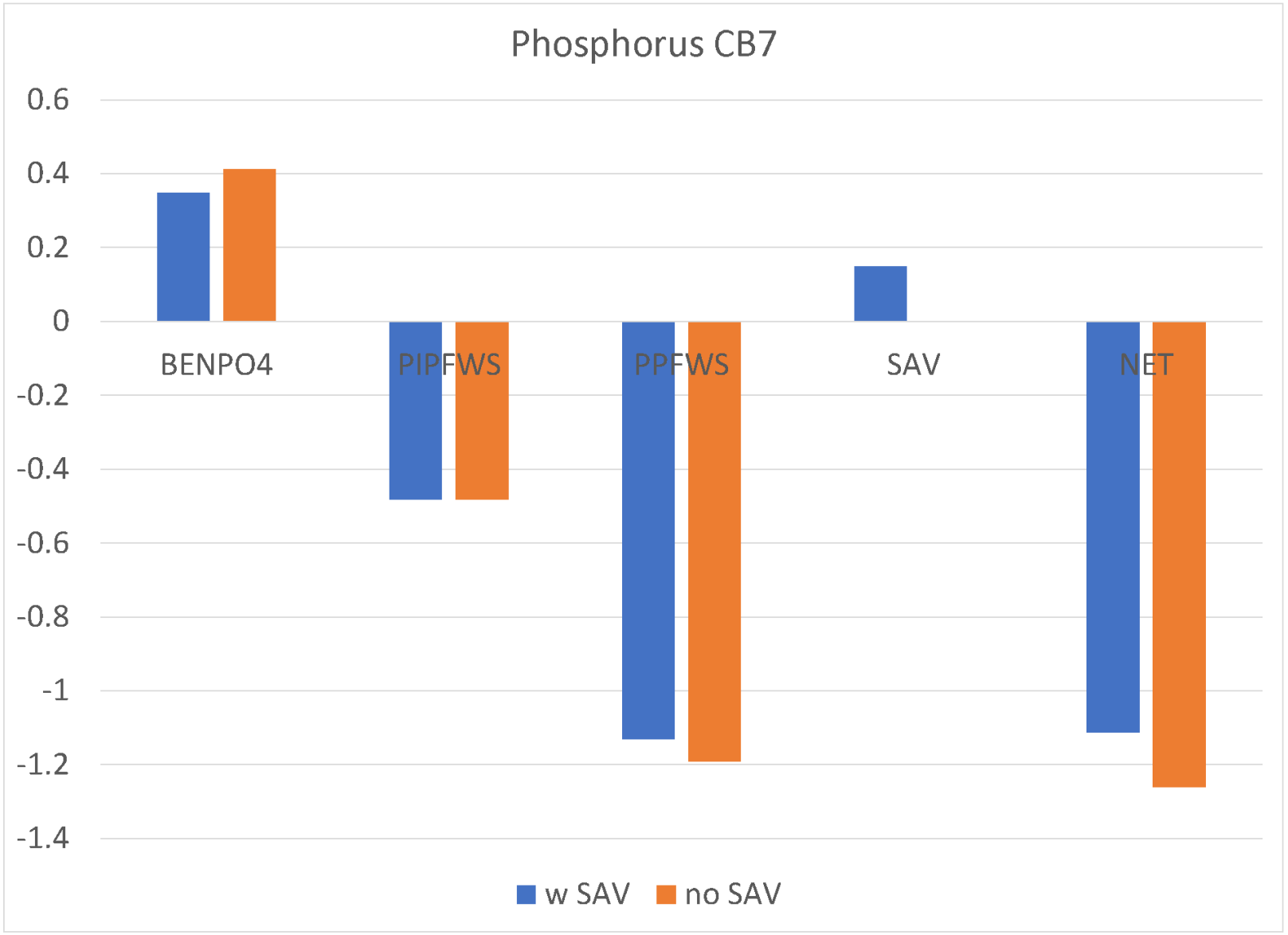

Nitrogen CB1
20
10
0
-10
-20
-30
-40
-50
mg N/sq m/day
BENNH4
BENNO3
DENIT
PNFWS
SAV
NET
w SAV
no SAV


Nitrogen TANMH
4
2
0
-2
-4
-6
-8
-10
-12
mg N/sq m/d
BENNH4
BENNO3
DENIT
PNFWS
SAV
NET
w SAV
no SAV


Nitrogen CB7
5
0
-5
-10
-15
-20
-25
mg N/sq m/day
BENNH4
BENNO3
DENIT
PNFWS
SAV
NET
w SAV
no SAV


Phosphorus CB1
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
mg P/sq m/day
BENPO4
PIPFWS
PPFWS
SAV
NET
Axis Title
w SAV
no SAV


Phosphorus TANMH
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
-1.2
mg P/sq m/day
BENPO4
PIPFWS
PPFWS
SAV
NET
w SAV
no SAV


Phosphorus CB7
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
-1.2
-1.4
BENPO4
PIPFWS
PPFWS
SAV
NET
w SAV
no SAV

Conclusions

- We are looking at segments which are vegetated but not entirely vegetated.
- The magnitude of net effects of SAV is variable.
- Presence of SAV appears to diminish retention of nutrients in sediments.
- SAV has no determinist effect on denitrification.

Next Steps?

- Try to isolate SAV impact by examining individual vegetated cells.
- Perform analyses on a seasonal basis.
- Extend this analysis to other segments and Bay-wide.
- Examine magnitude of SAV effects compared to loads and/or other factors.
- Extend this analysis to the WIP3 run. What is effect of SAV on WIP3 conditions?
- Document results.
- And ??????