

Refresher

- 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

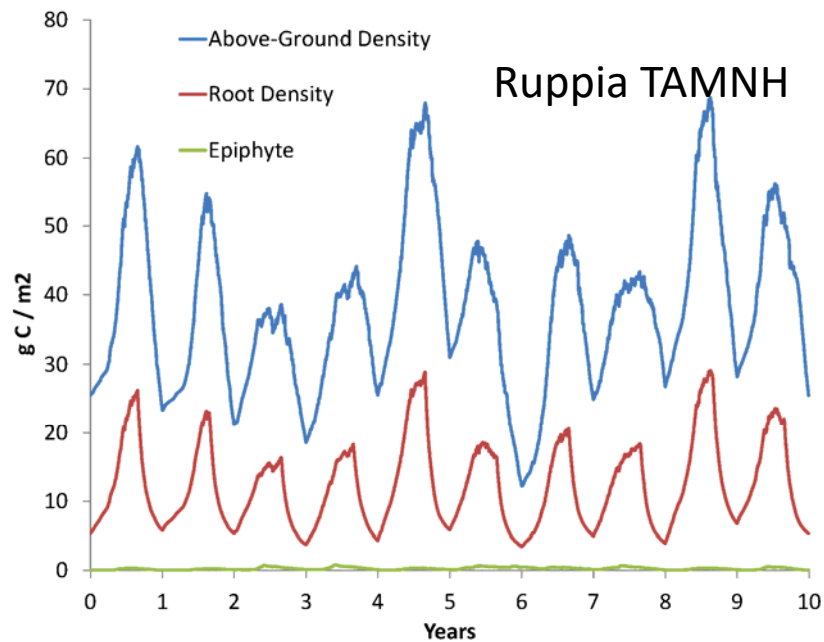
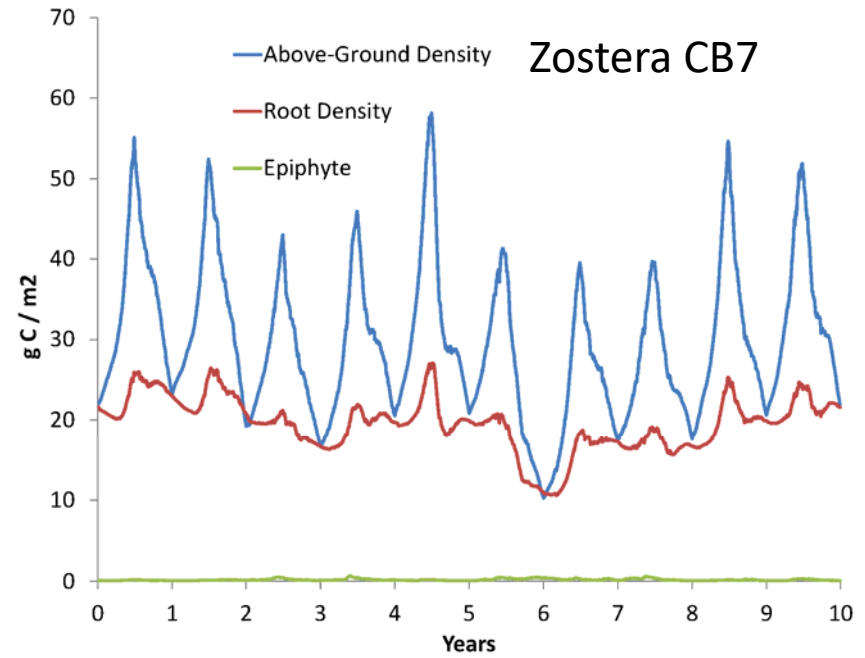
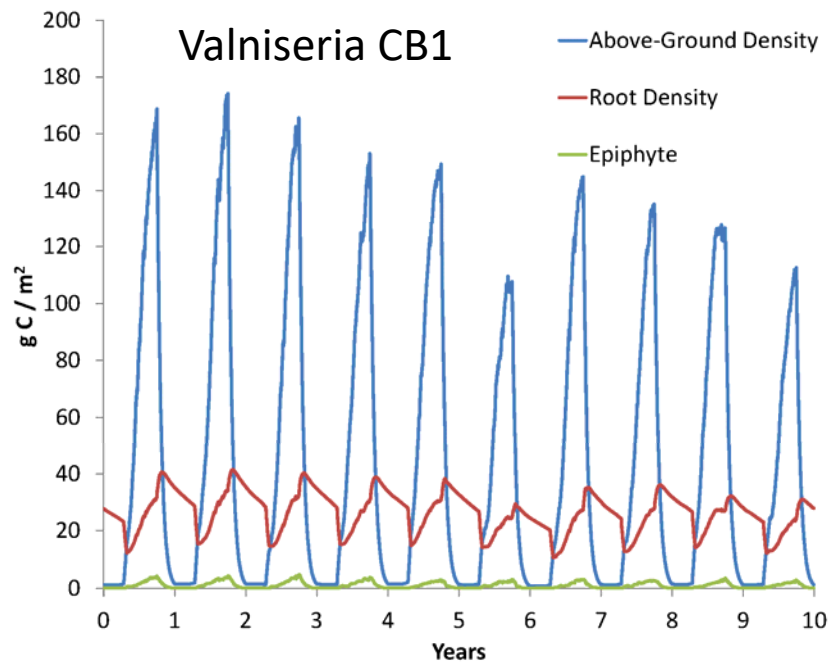
- We have made calibration runs with and without SAV to examine SAV effects on sediment-water N and P fluxes.
- We have examined results on a segment-wide basis for CB1, TANMH, CB7
- Initial results presented to MARS January 2021 and SAV Work Group February 2021.
- Today, we're going to take a more detailed look at results in individual cells.

Previous Conclusions

- The magnitude of SAV effects is variable, influenced by species and location.
- Presence of SAV appears to diminish retention of nutrients in sediments.
- SAV has no deterministic effect on denitrification.

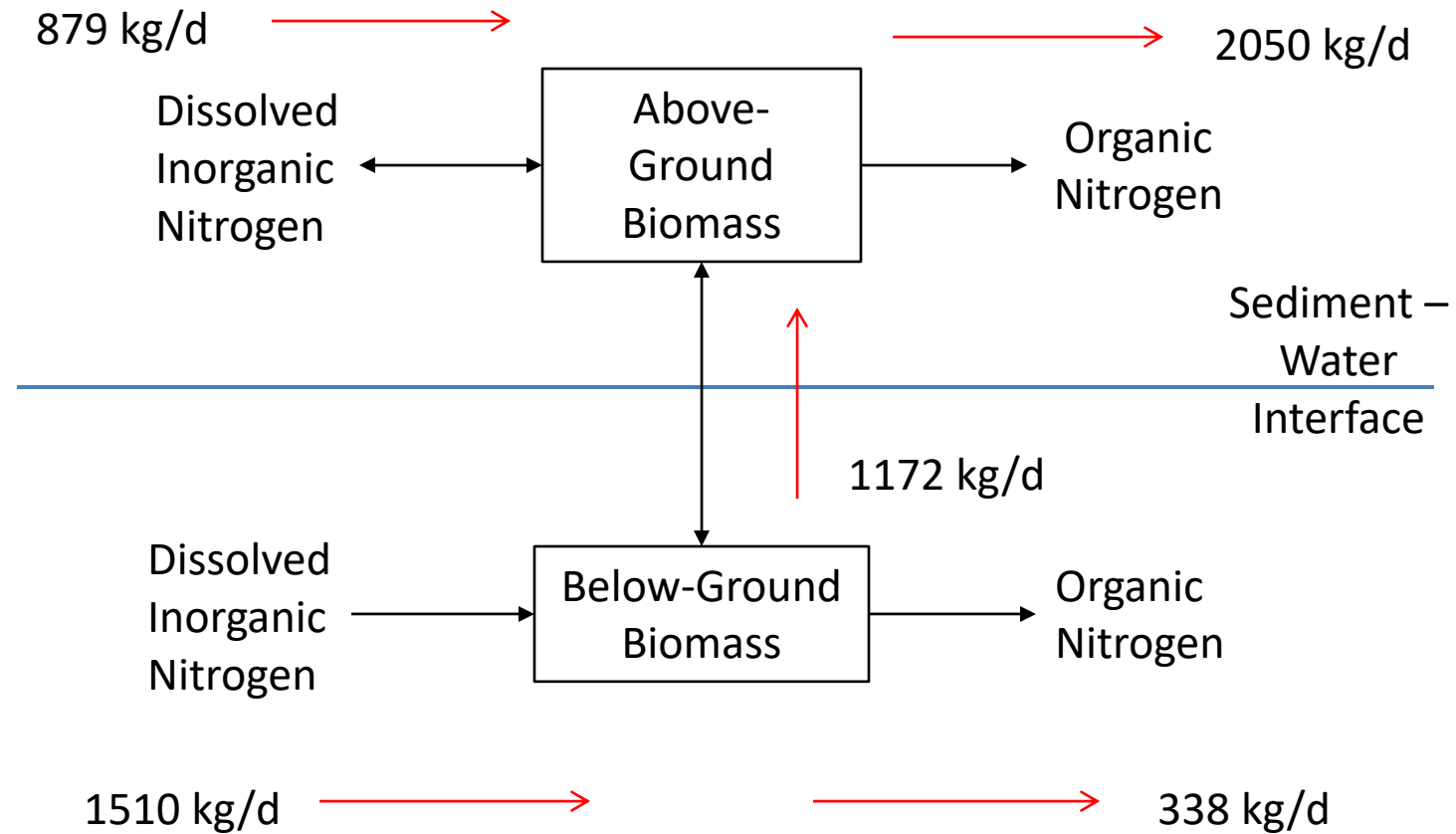
Results from SAV Work Group

- Our finding that SAV transfers nutrients from bed sediments to the water column is reasonable. In this regard, SAV resembles terrestrial vegetation.
- We need to take a more detailed look at seasonality of net transfers.



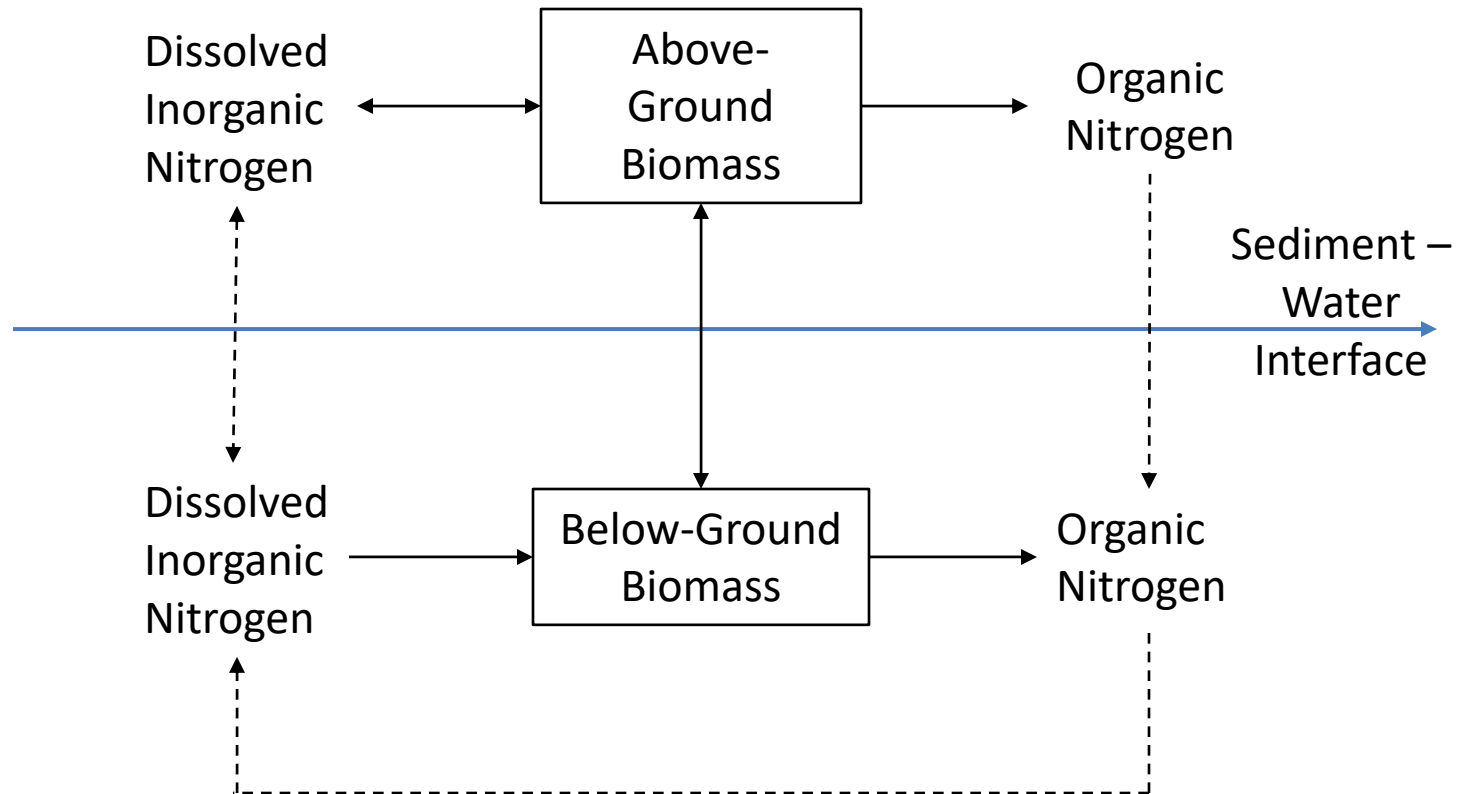
Our SAV model includes three species and epiphytes. The species differ in their spatial distribution and in the seasonal and inter-annual distribution of biomass.

The Nitrogen Cycle



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

Complications



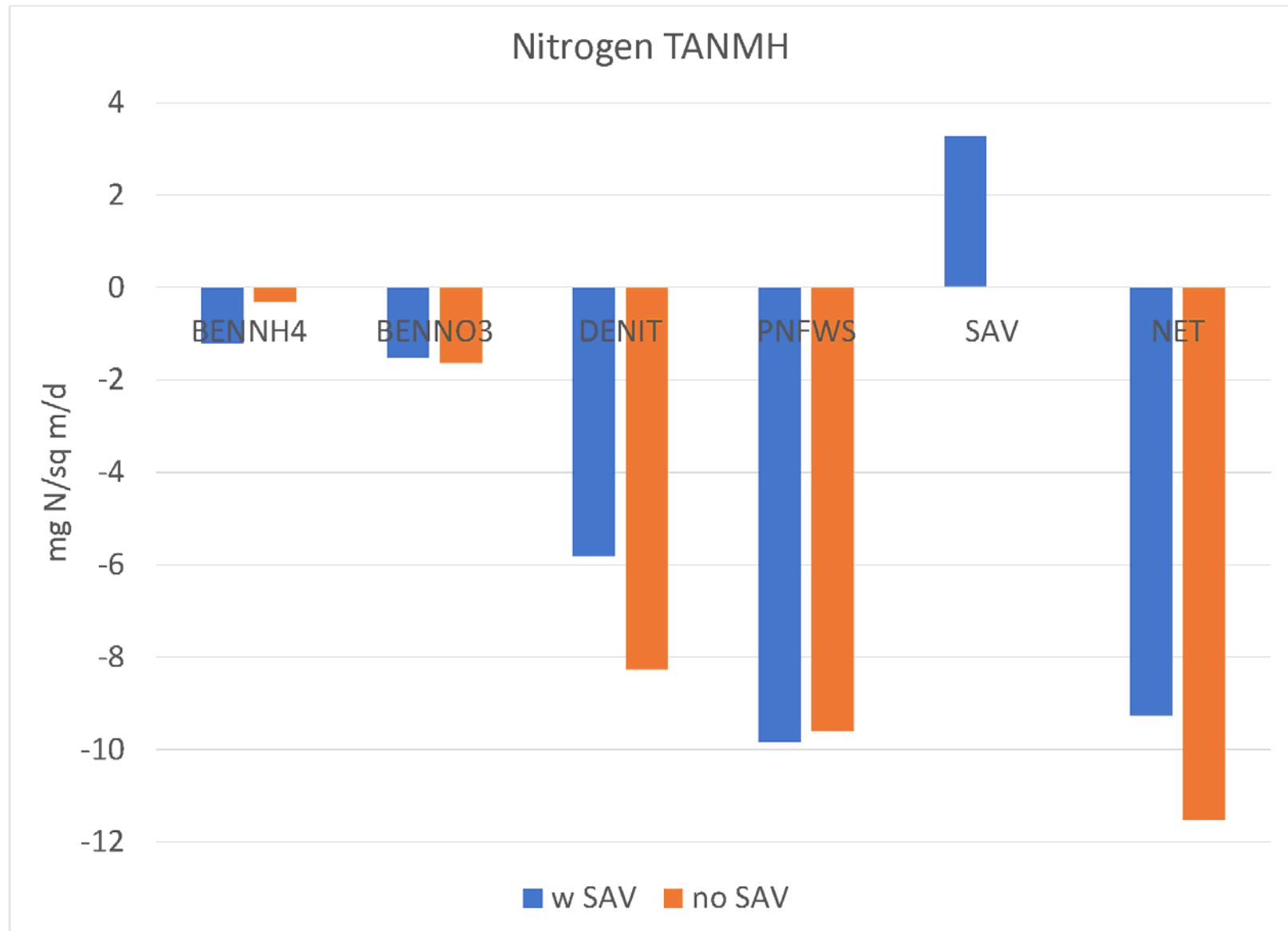
We quantify and can report out the additional fluxes but it is difficult to isolate the influence of SAV.

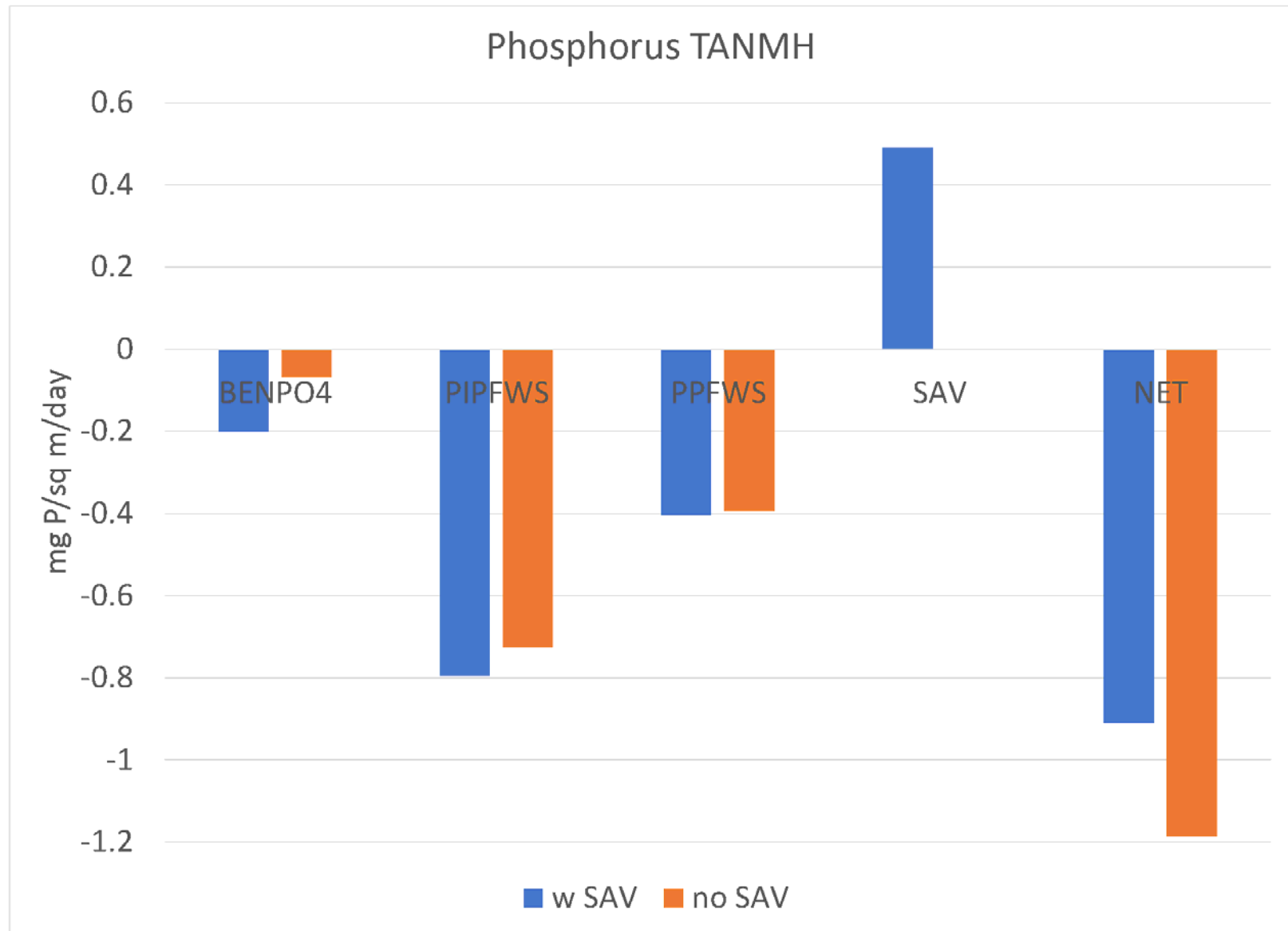
Nitrogen Key

- 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)





Next Steps

- Segments contain both vegetated and non-vegetated cells so the influence of SAV is “diluted” by our segment-wide analysis.
- Seasonality is important. The influence of SAV on nutrient fluxes during spring and summer should be isolated.
- We’re going to look at time series in individual cells, with and without SAV.

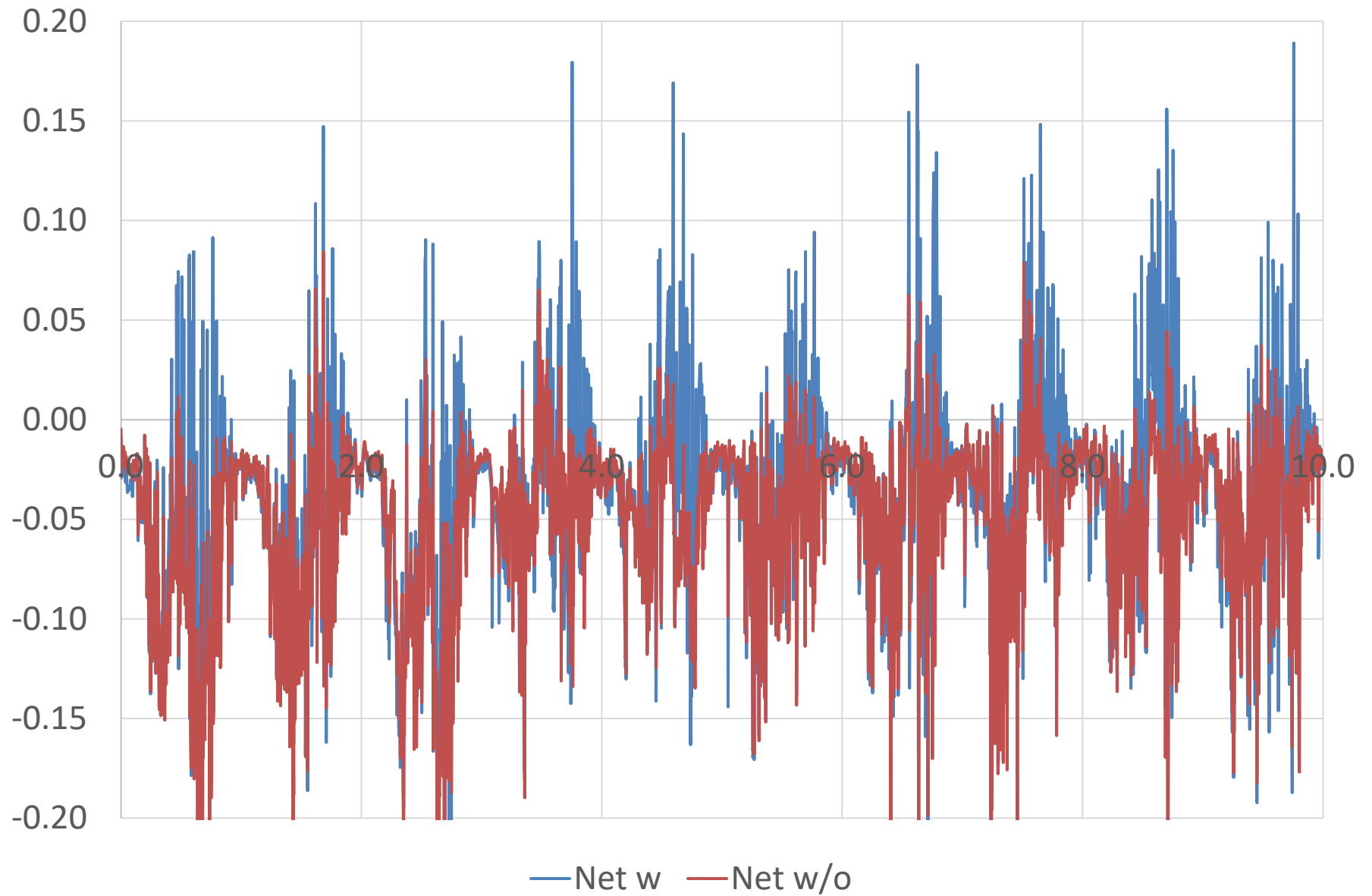


CB1 - Vallisneria

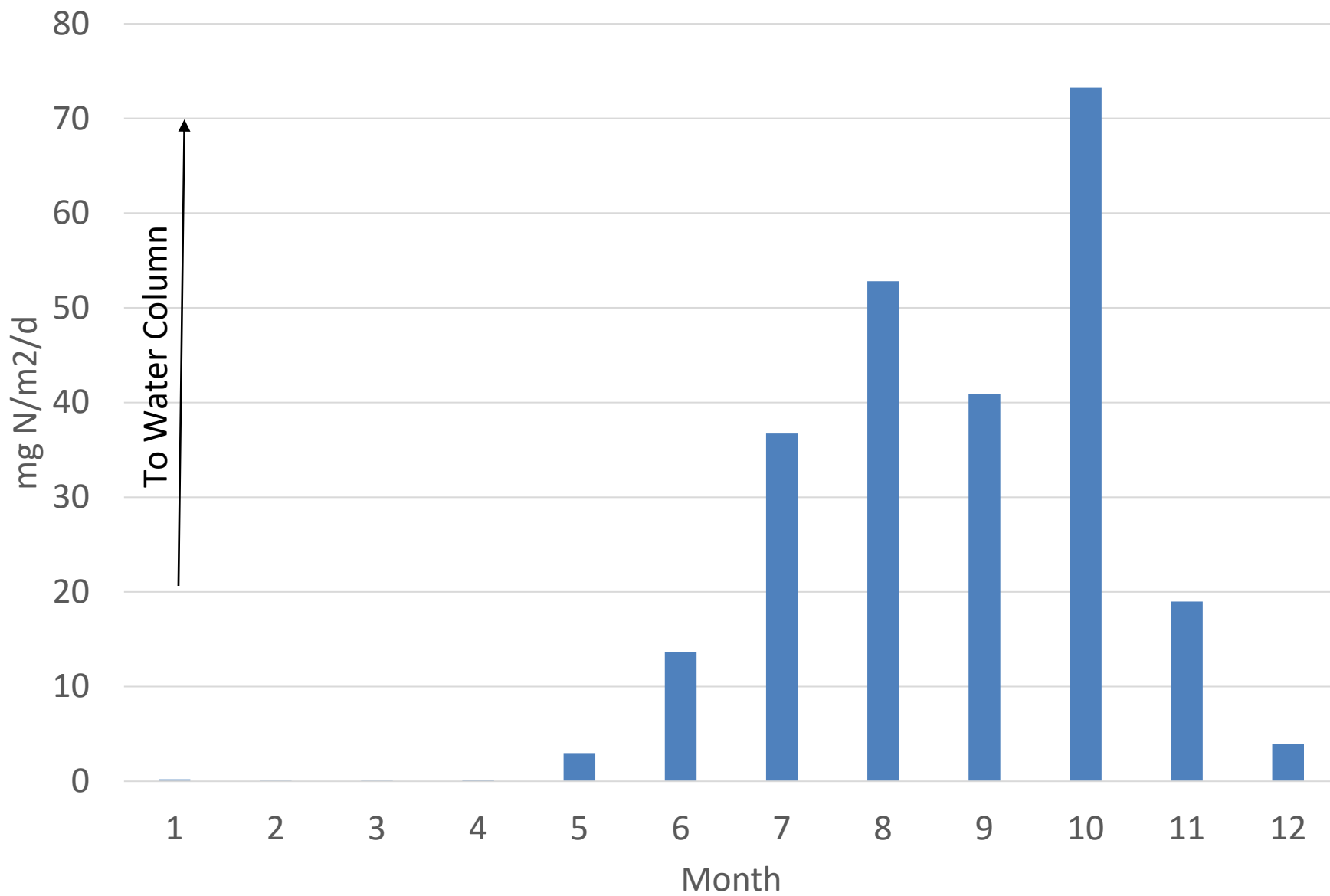
TANMH - Ruppia

CB7 - Zostera

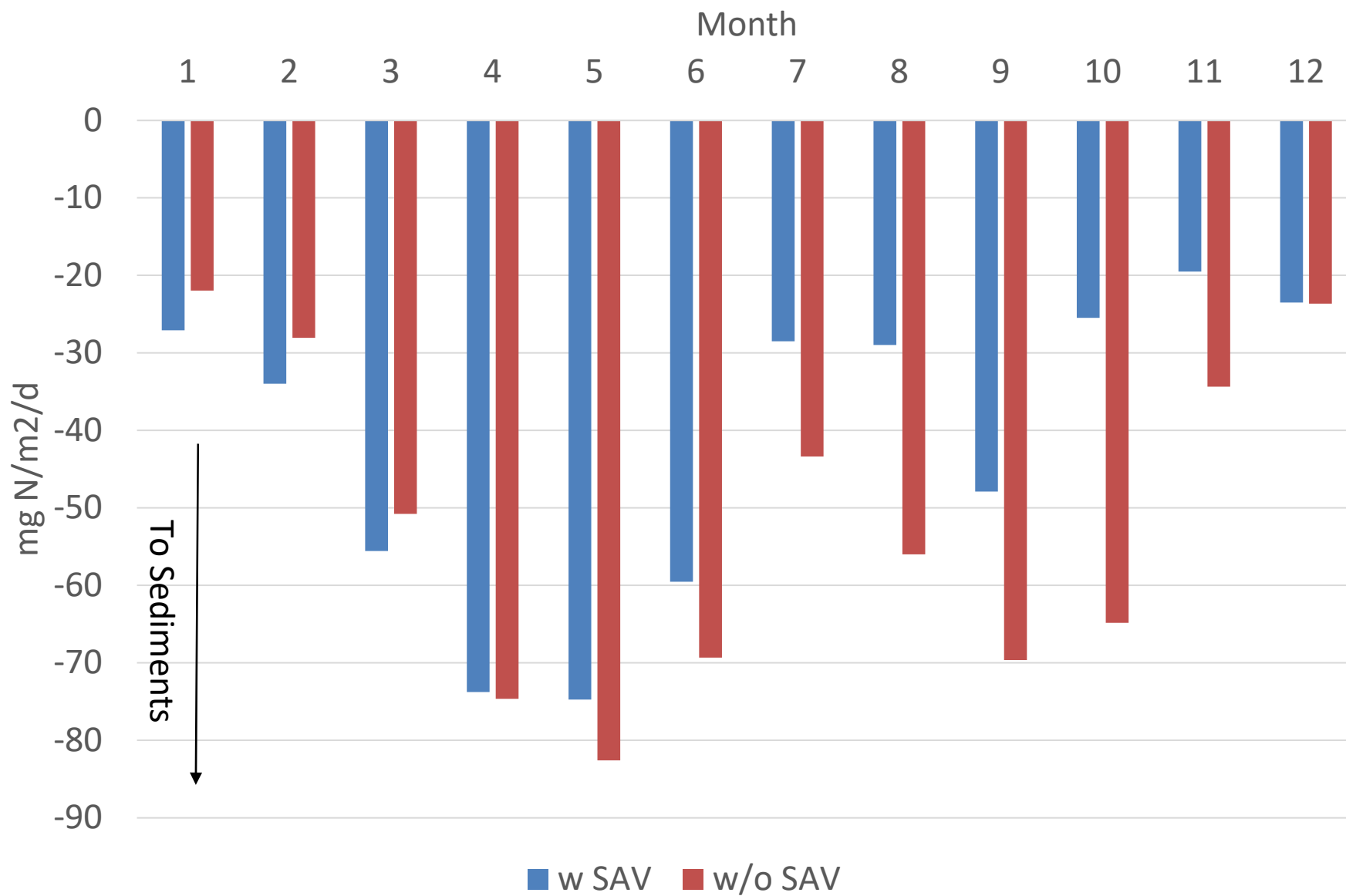
Net Sediment-Water N Flux in CB1



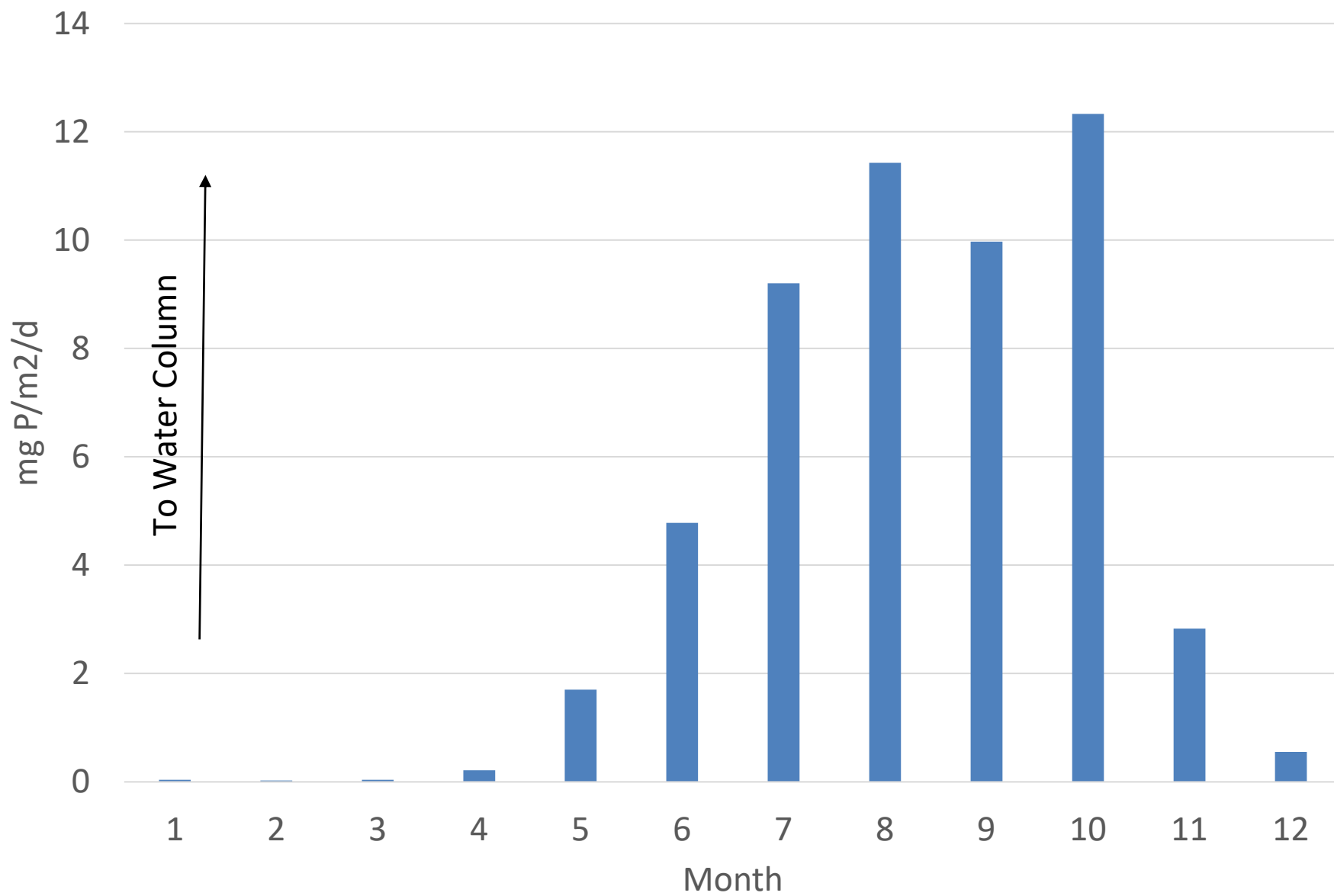
SAV-Water N Flux CB1



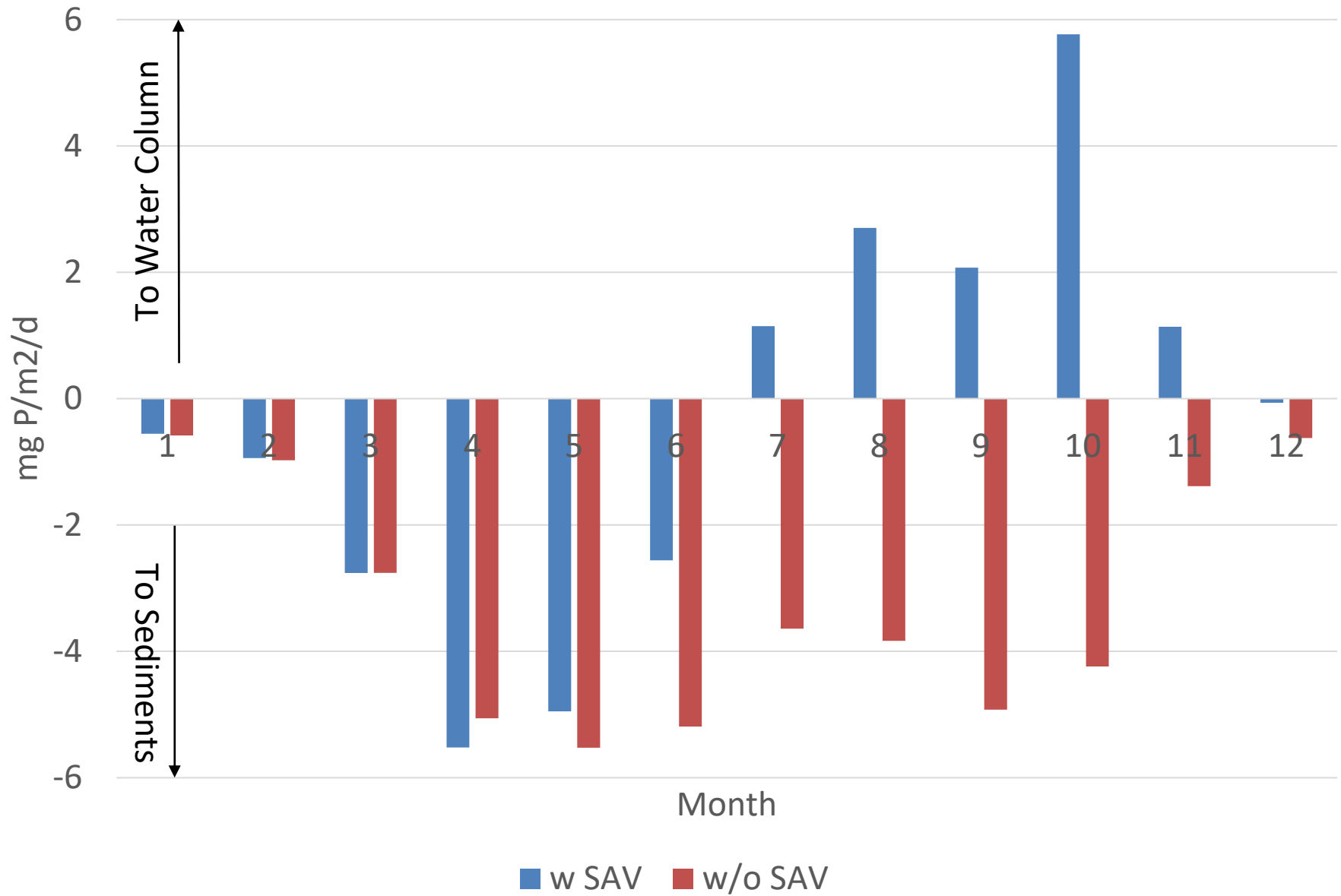
Net Sediment-Water Nitrogen Flux CB1



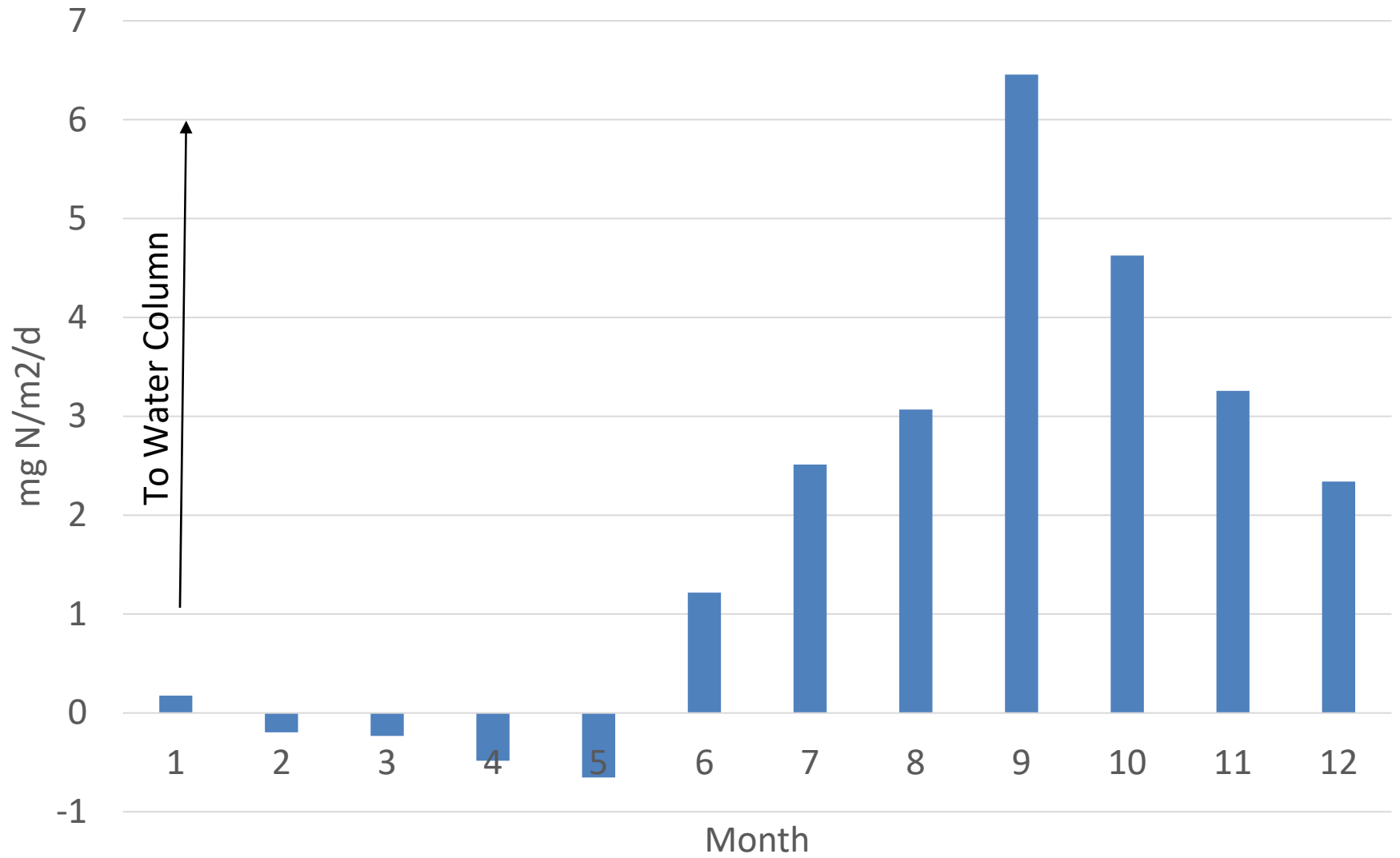
SAV-Water P Flux CB1



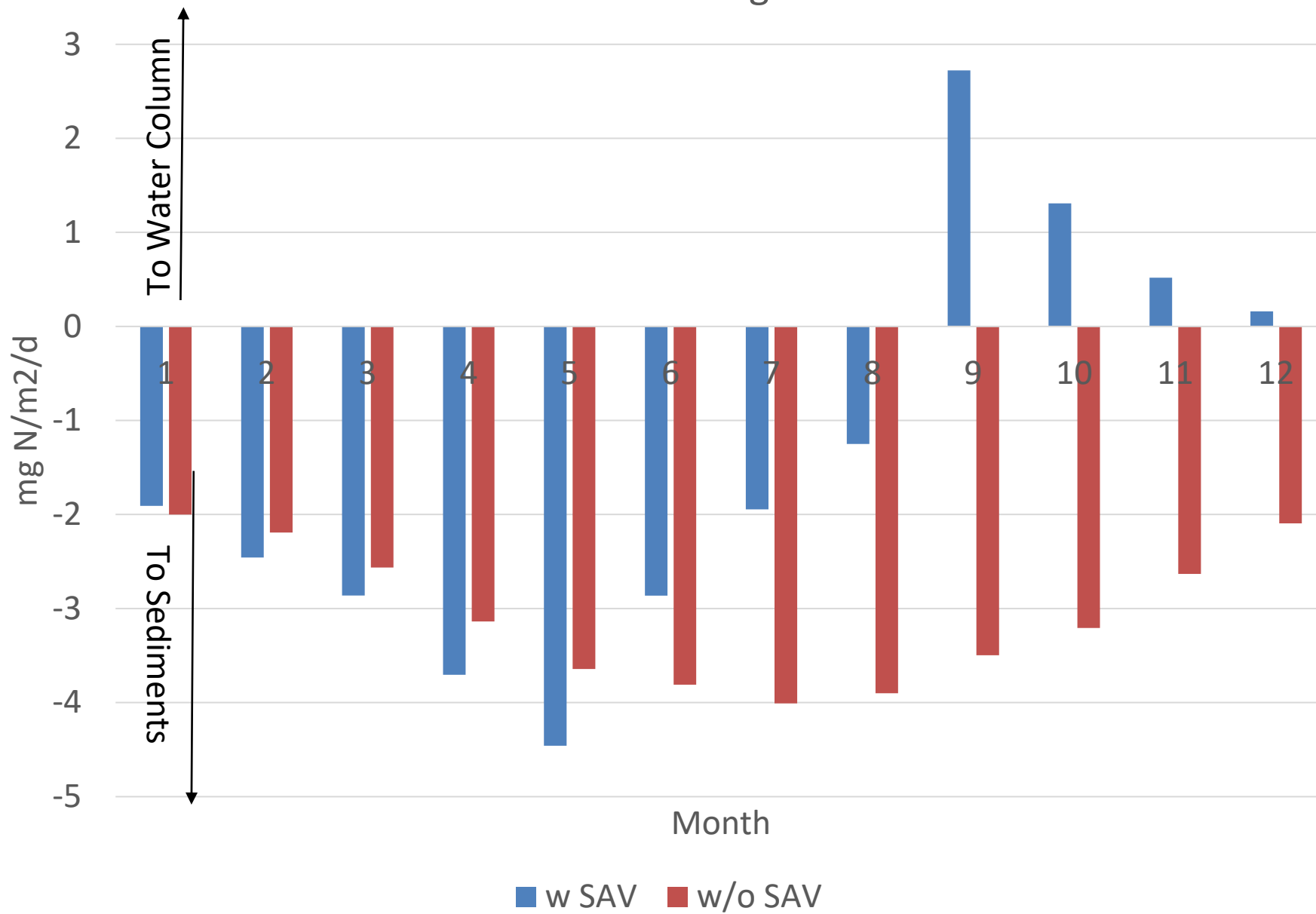
Net Sediment-Water P Flux CB1



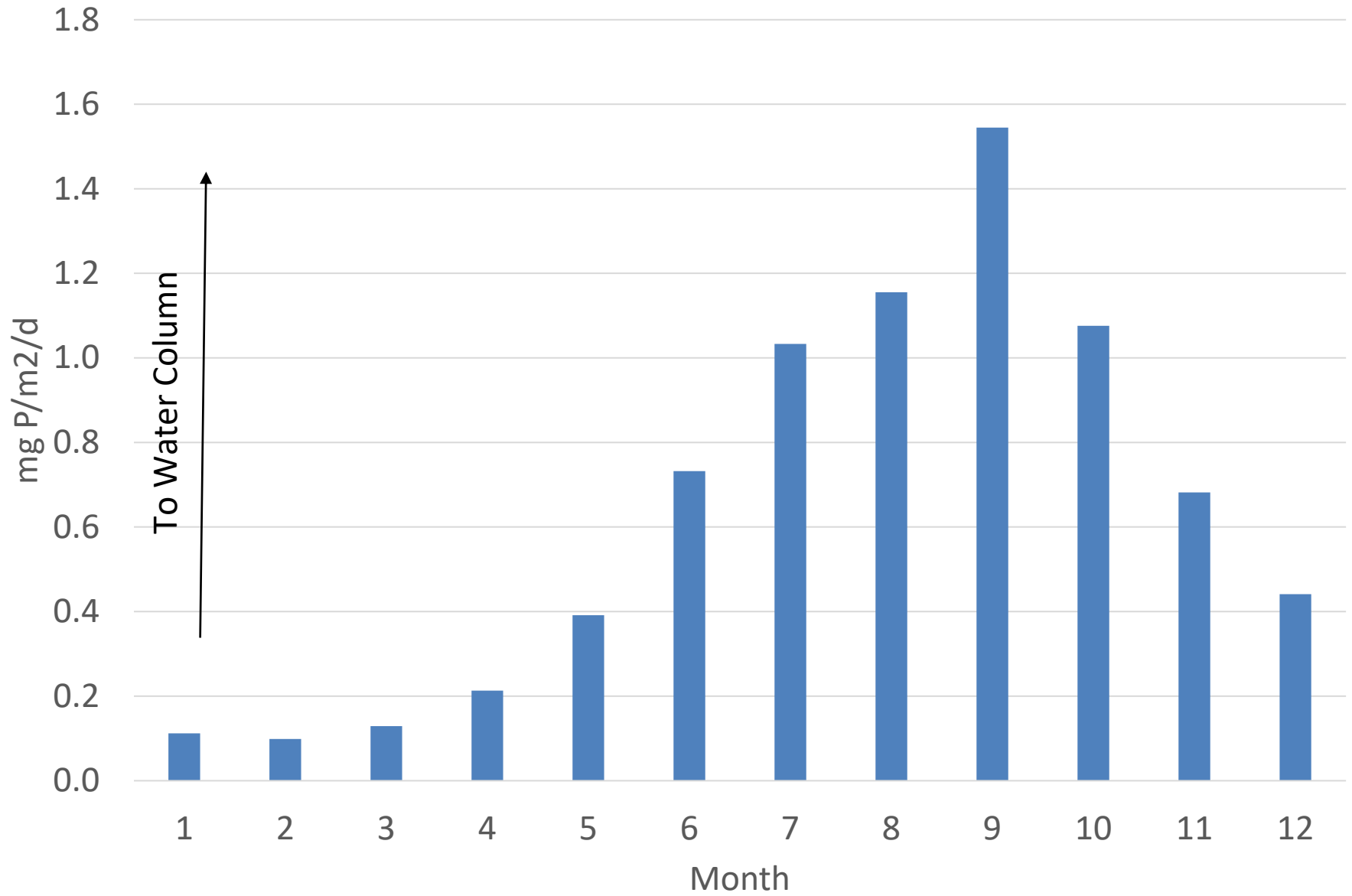
SAV-Water N Flux TANMH



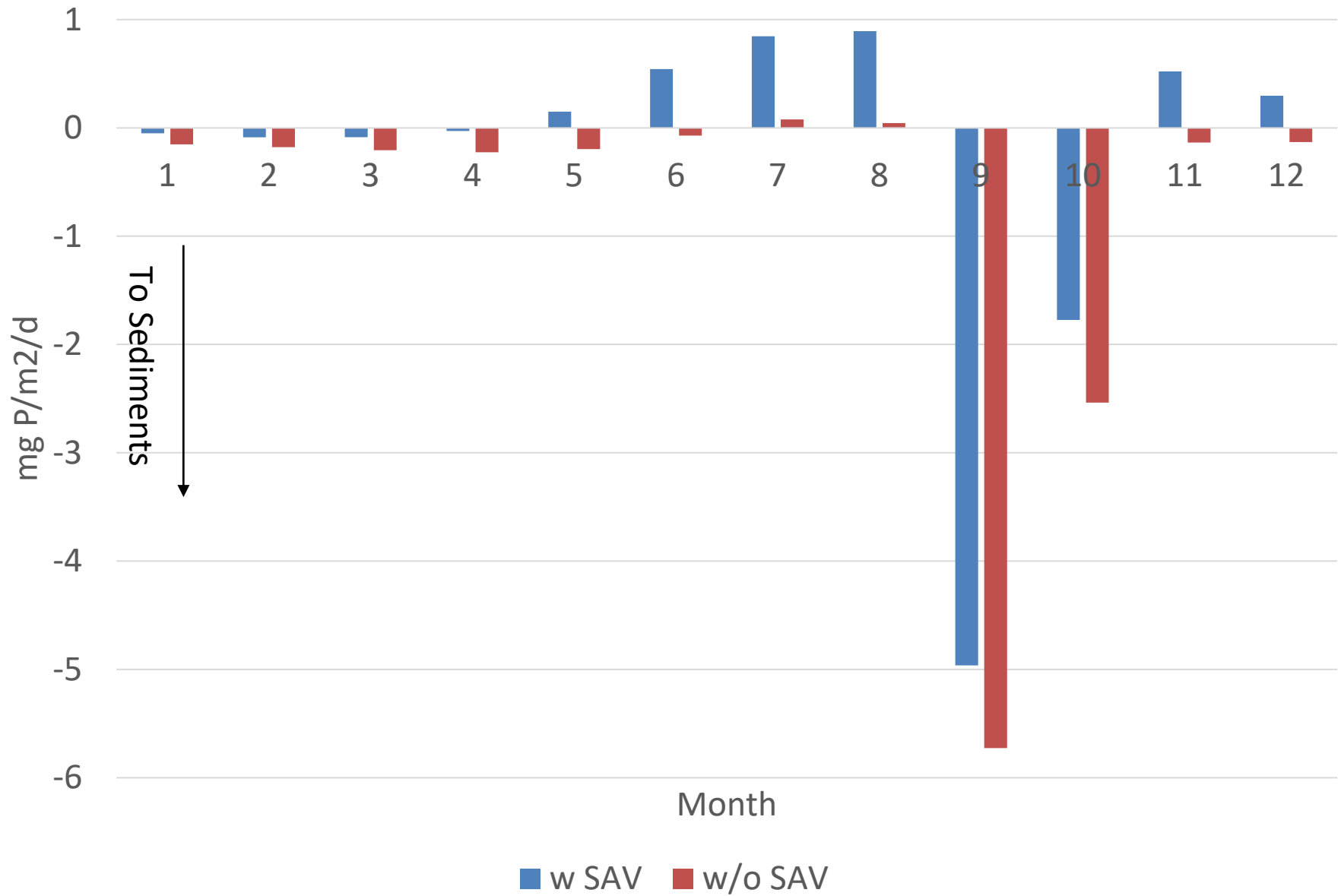
Net Sediment-Water Nitrogen Flux TANMH



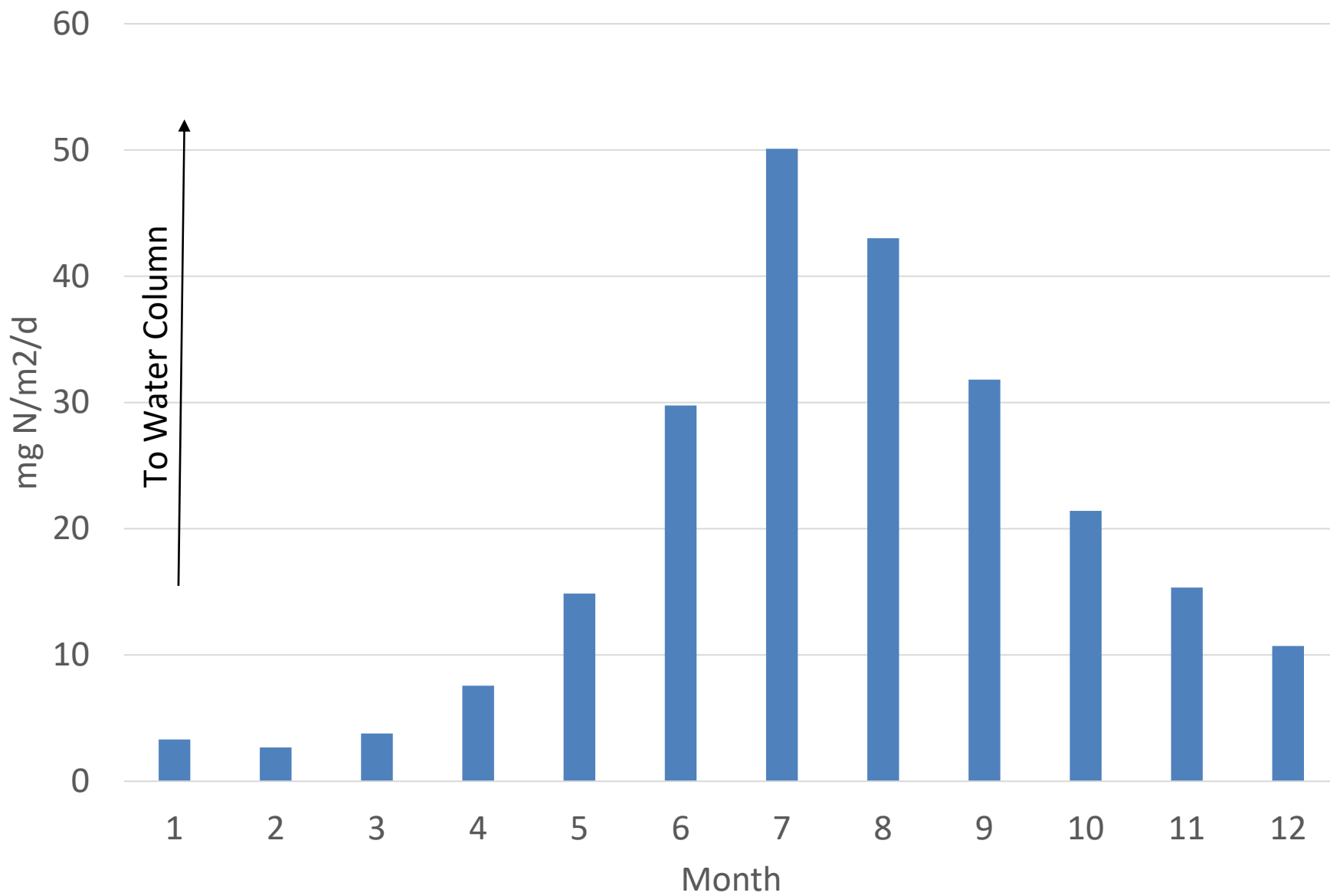
SAV-Water P Flux TANMH



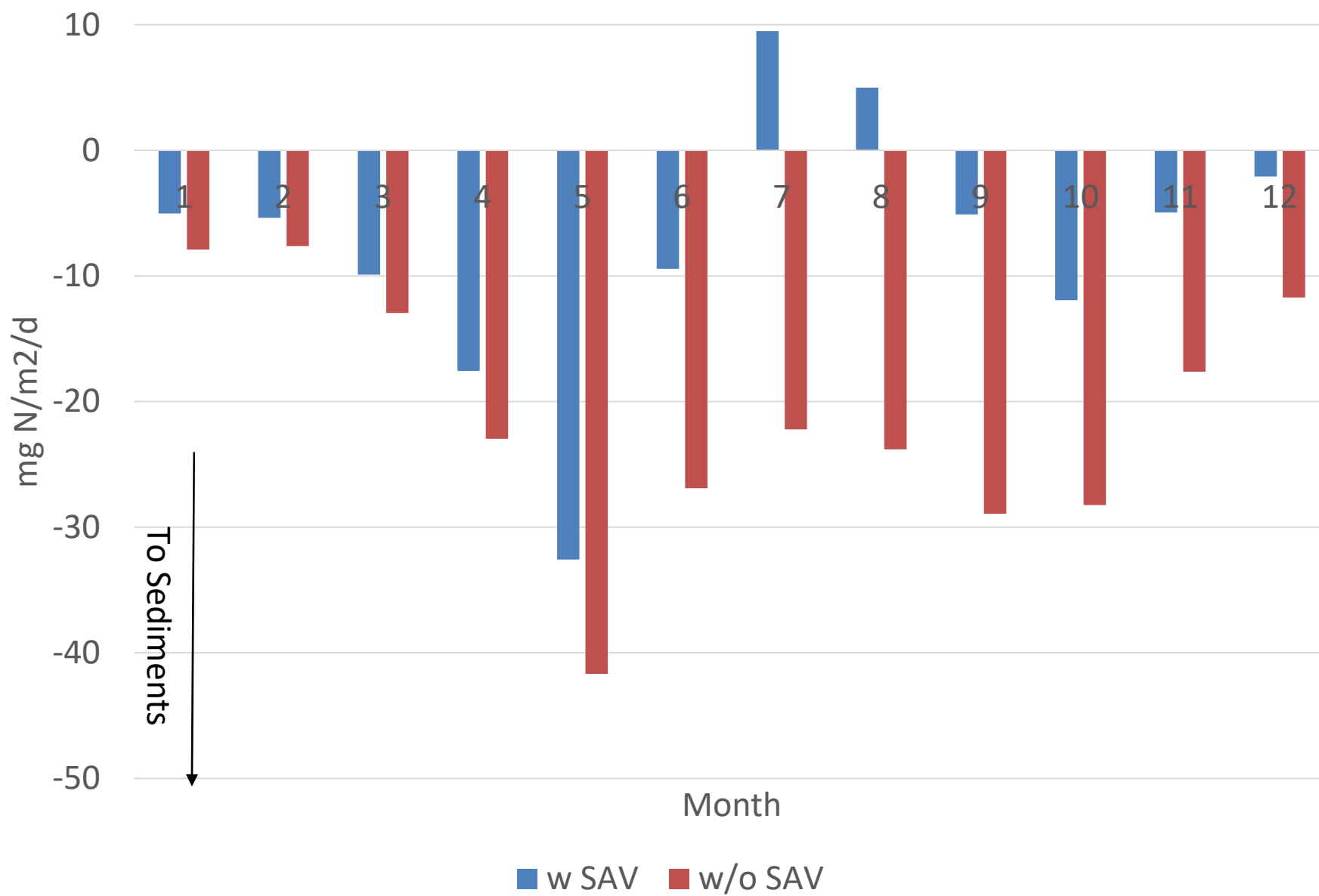
Net Sediment-Water P Flux TANMH



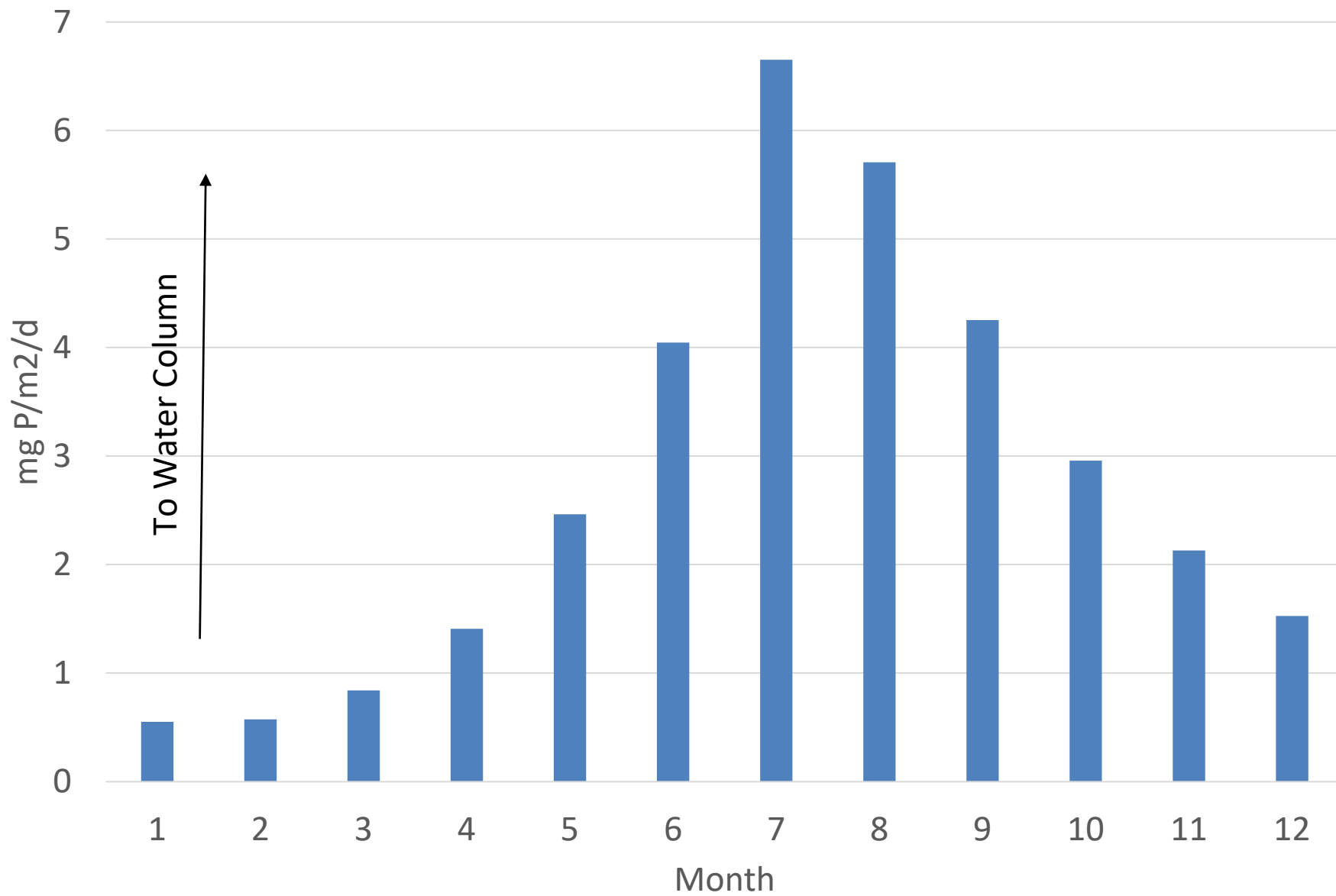
SAV-Water N Flux CB7



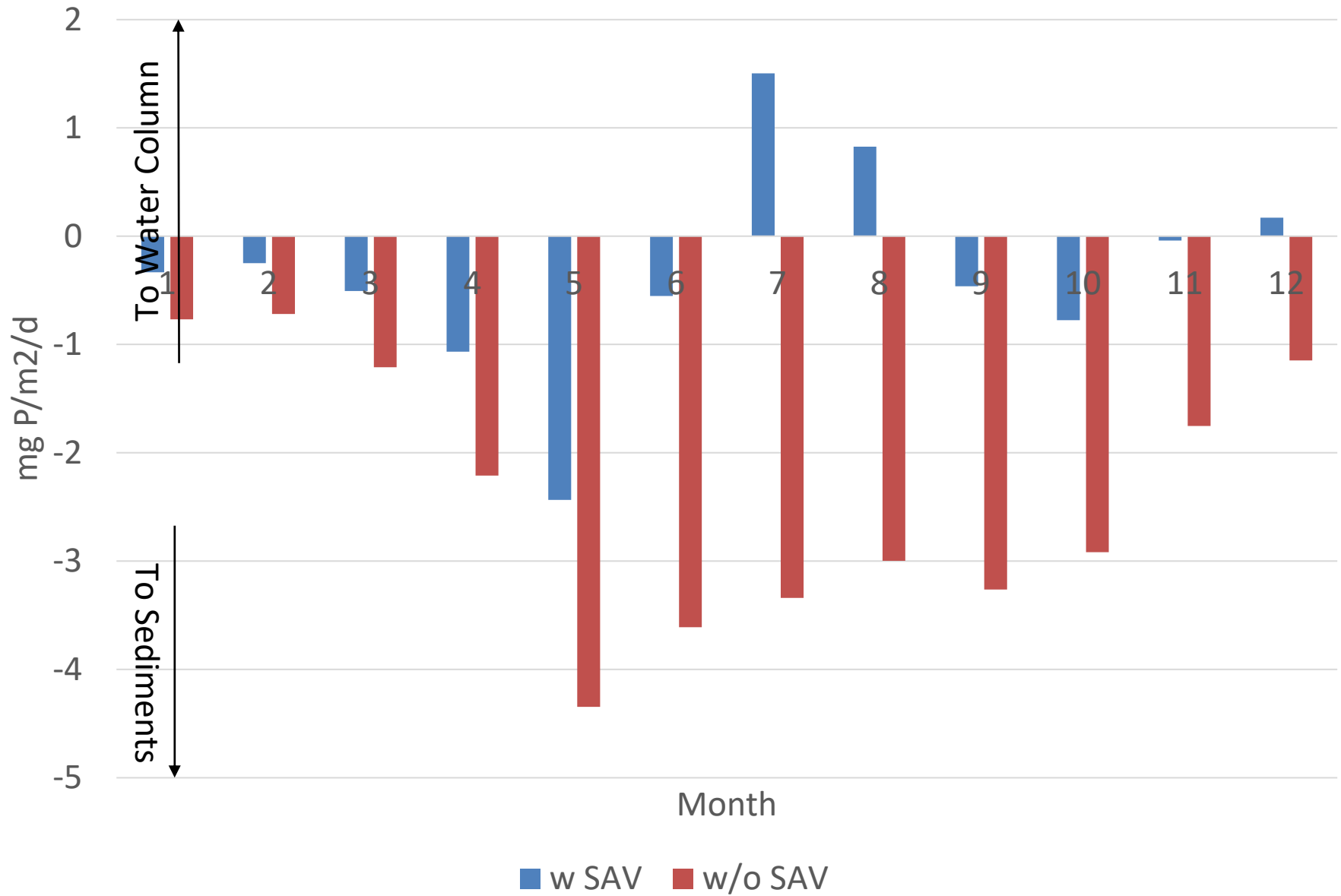
Net Sediment-Water Nitrogen Flux CB7



SAV-Water P Flux CB7



Net Sediment-Water P Flux CB7



Conclusions/Next Steps

- Our previous finding that SAV diminishes net sediment nutrient retention remains valid. In some instances, SAV reverses net sediment retention to net sediment release.
- Impact on water quality isn't revealed by examination of fluxes alone.
- Our next step is to examine key water quality parameters (e.g. DO, chlorophyll) with and without SAV.