

Trap bulk flux data overview

Status:

- Total C, PIC, POC, mass, biogenic silica, and ^{234}Th fluxes are final.
- Will momentarily (by end of week) be posting mean flux data for each platform to EXPORTS shared drive, with SeaBASS submission to follow.
- Total N fluxes are preliminary
- Need input on best format of split data
- Still working on optical flux proxies

Trap Team PIs:

Meg Estapa, UMaine
Ken Buesseler, WHOI
Colleen Durkin, MBARI
Melissa Omand, URI

Students, postdocs, technicians who have done the sample analysis

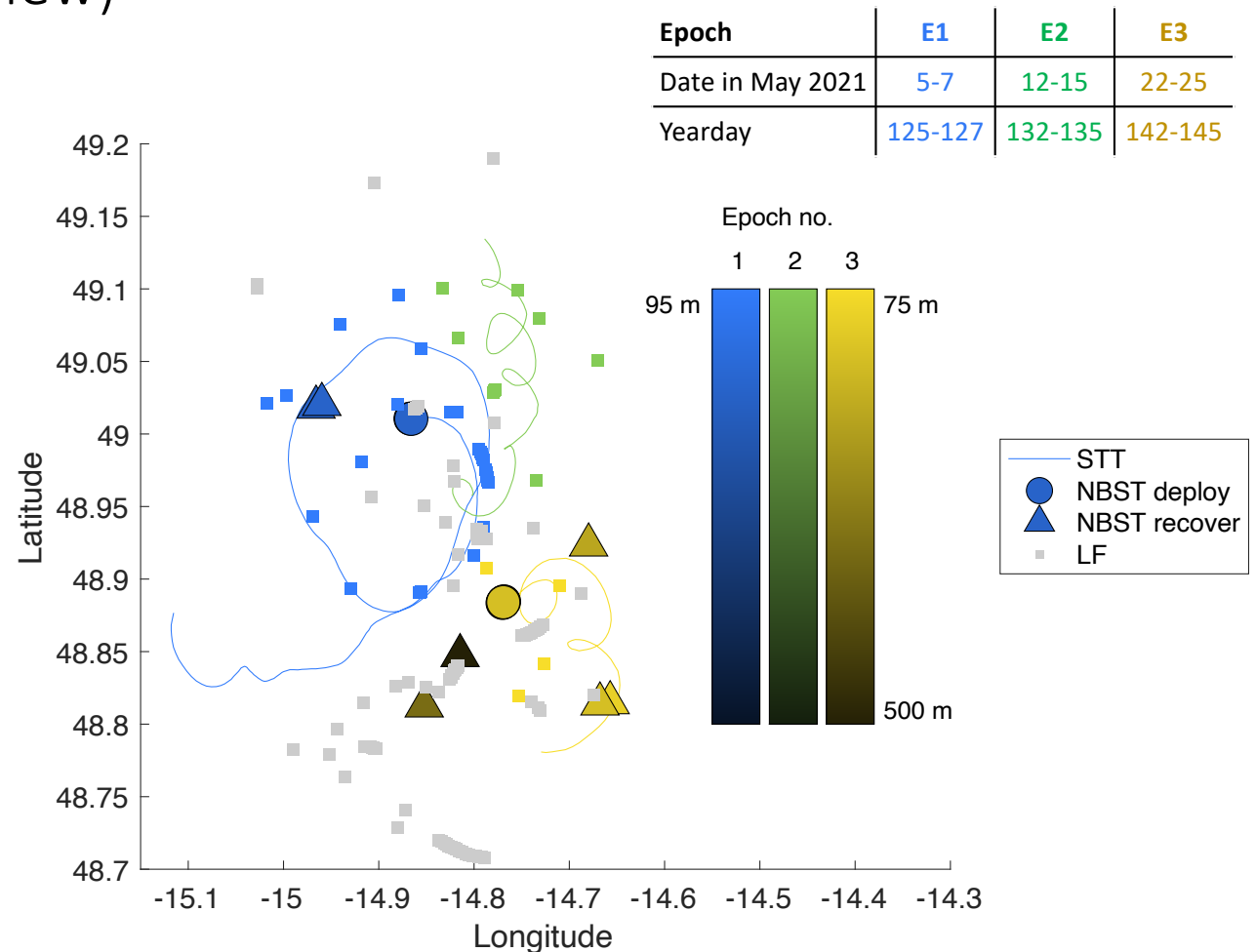
Sam Clevenger, WHOI (Th)
Jessica Drysdale, WHOI (PIC)
Pat Kelly, URI (TC/TN)
Sean O'Neill, UMaine (mass, bSi)
Steve Pike, WHOI (Th)
Muntsa Roca-Martí, WHOI/Dal (TC/TN, PIC)

Platform positions (overview)

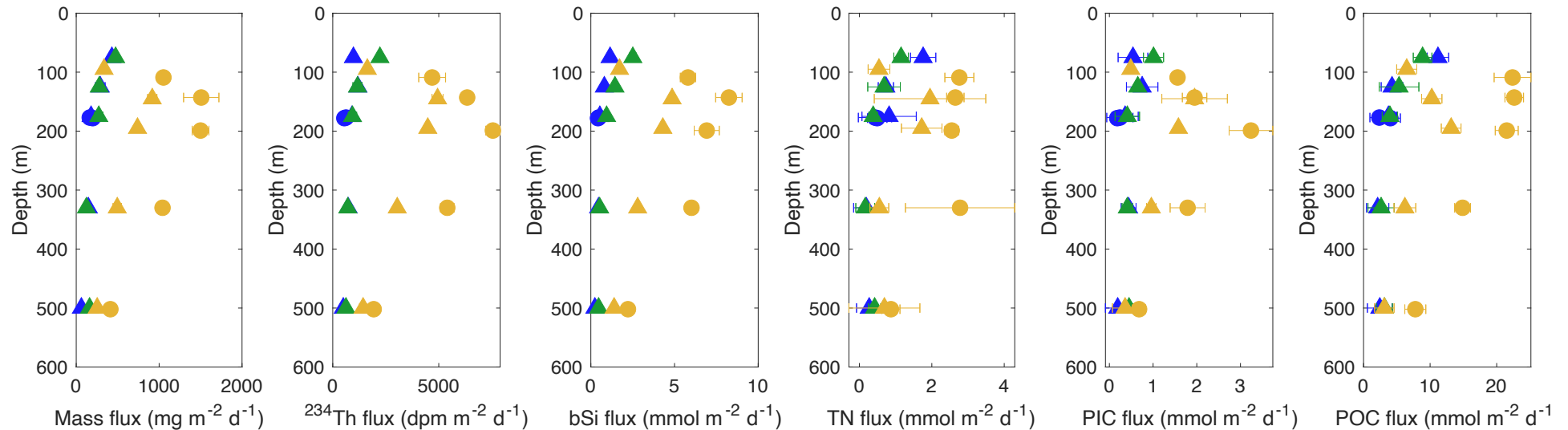
Platforms measuring sinking particle flux:

- **Epoch 1:** 2 NBSTs at the same depth, 5-depth STT.
- **Epoch 2:** No NBSTs, 5-depth STT
- **Epoch 3:** 5 NBSTs and 5-depth STT.

STT trajectories and modeling suggest strong tidal and inertial periodicity to NBST paths. Unlikely that we will have a source funnel model anytime soon.

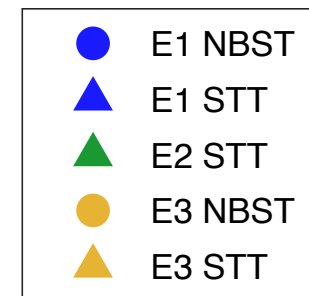


Bulk flux magnitude and some caveats

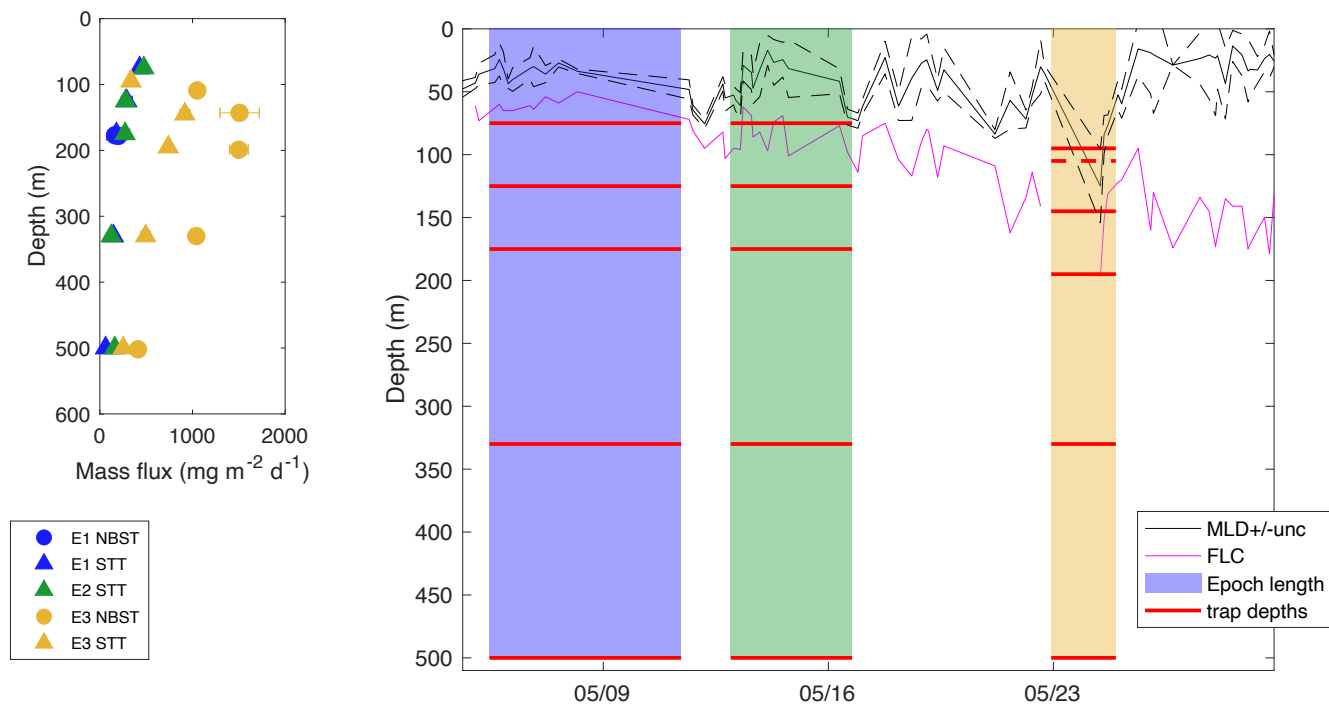


- Ongoing QC: high TN variability in some samples may be analytical?
- Occasional burnwire failures meant trap lids did not close prior to recovery. The affected samples ($n = 4$) are flagged in the data file and time spent open at the surface (for NBSTs) is noted.

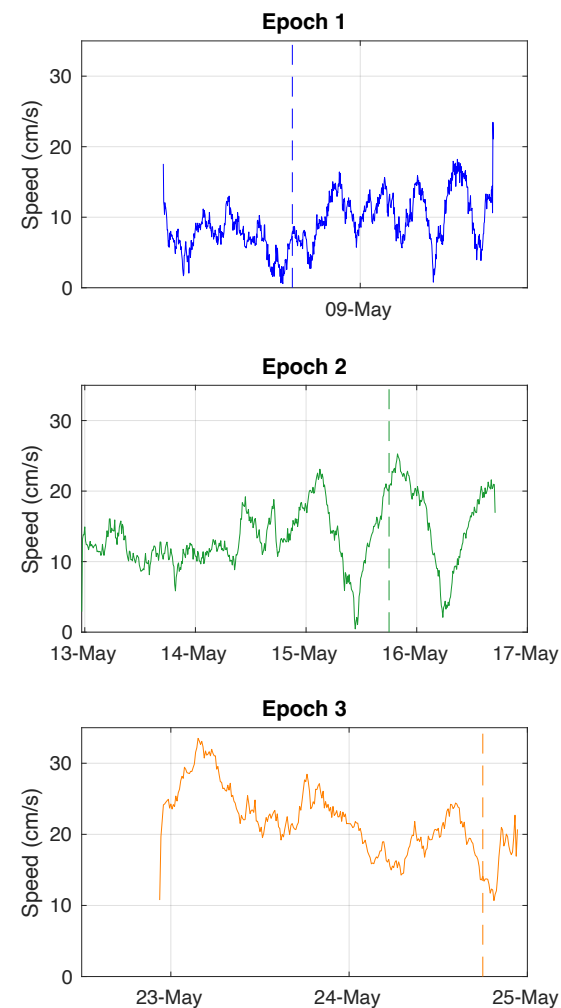
| Epoch | E1 | E2 | E3 |
|------------------|---------|---------|---------|
| Date in May 2021 | 5-7 | 12-15 | 22-25 |
| Yearday | 125-127 | 132-135 | 142-145 |



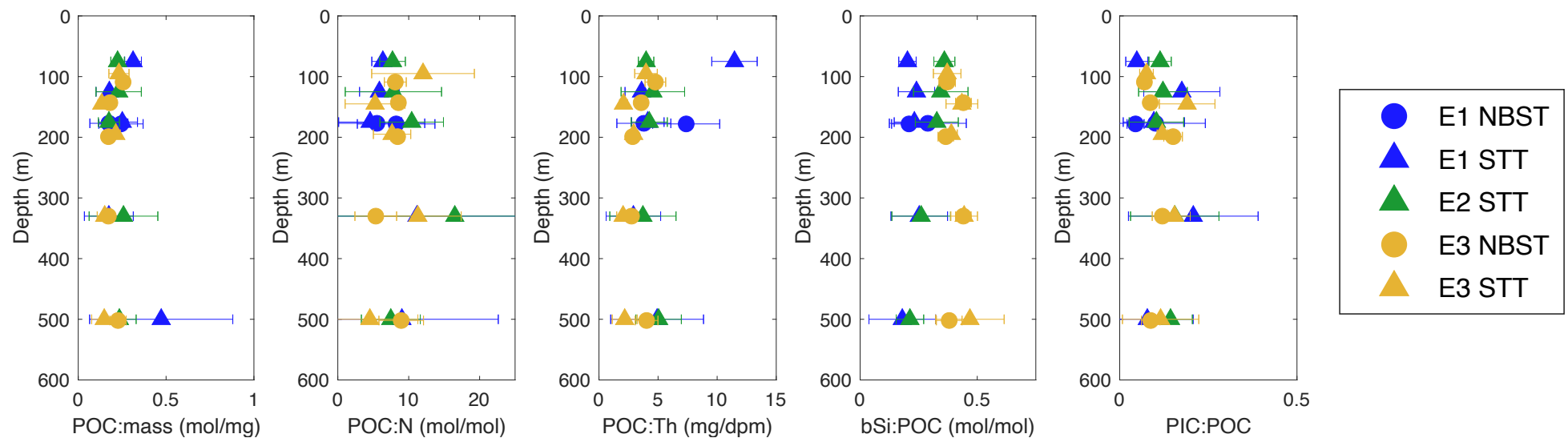
Why are NBST fluxes in E3 larger than STT fluxes?



1. STT at 95 m may have been in the mixed layer (NBST was at 105 m)
2. Stronger relative current speeds in Epoch 3 may have led to undercollection by STT
3. There may have been strong spatial variability in flux
4. Need to compare to ^{234}Th flux from water column! Early hints are that NBST flux magnitude is probably the better estimate in Epoch 3.



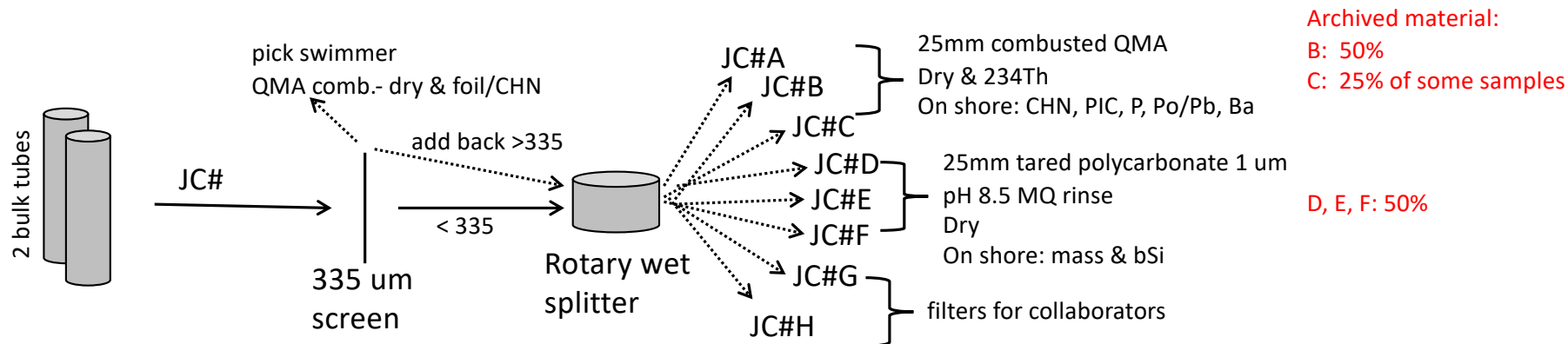
How and when did bulk flux and composition of material collected in traps change during EXPORTS N. Atlantic?



- No bulk composition evidence for large “swimmer” contamination like in N. Pacific
- Compositional shift towards higher bSi in Epoch 3
- Not a lot of evidence for differences in *composition* of material collected in STT vs. NBST in E3

| Epoch | E1 | E2 | E3 |
|------------------|---------|---------|---------|
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Splitting Plan



Process blanks: Collected and processed as above, but tubes were not deployed. Tube-normalized, mean cruise blank for each analyte was subtracted prior to flux computation.

Splitting pattern exception: Epoch 3, NBST-307, 143 m (JC 50, 51)

- Tube A (JC 50) = lid open, Tube B (JC 51) = lid closed, so processed individually.
- JC 50/Tube A swimmer screen was not added back prior to splitting, so whole amount was picked and filtered separately onto QMA filters only.
- Tube A and Tube B are comparable (however $50/A < 51/B$)
- JC 50 splits are < 335 um only, while JC 51 splits include the whole sample.

Split data format: Report per-filter amounts rather than fluxes?