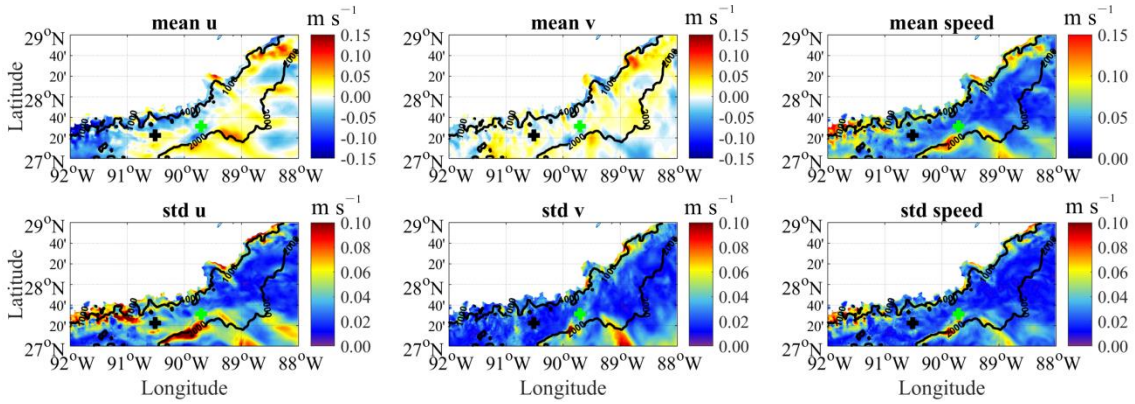

Figure S1. **Lateral velocity near the traps in April.**

Lateral velocity plots (mean and standard deviation for u, v and speed calculated as $(u^2+v^2)^{1/2}$) at about 120 m above the bottom during the sampling period in April (April 15th to 30th) nearby the trap sites. Grid points with depth smaller than 800 m are removed. Trap locations are shown by black (GC600) and green (AT357) plus signs; black contours indicate 1000 m and 2000 m isobaths.

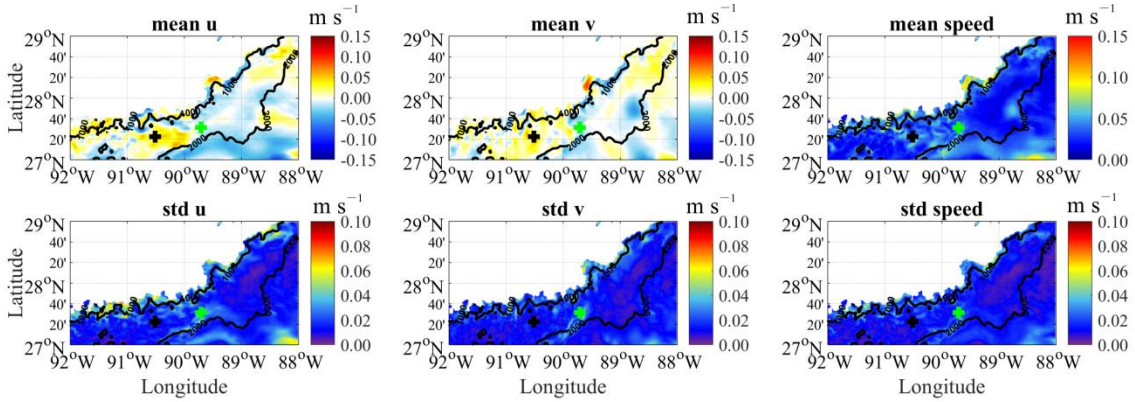

Figure S2 Lateral velocity near the traps in October.

Lateral velocity plots (mean and standard deviation for u, v and speed calculated as $(u^2+v^2)^{1/2}$) at about 120 m above the bottom during the sampling period in October (Sep 27th to Oct 12th) nearby the trap sites. Grid points with depth smaller than 800 m are removed. Trap locations are shown by black (GC600) and green (AT357) plus signs; black contours indicate 1000 m and 2000 m isobaths.

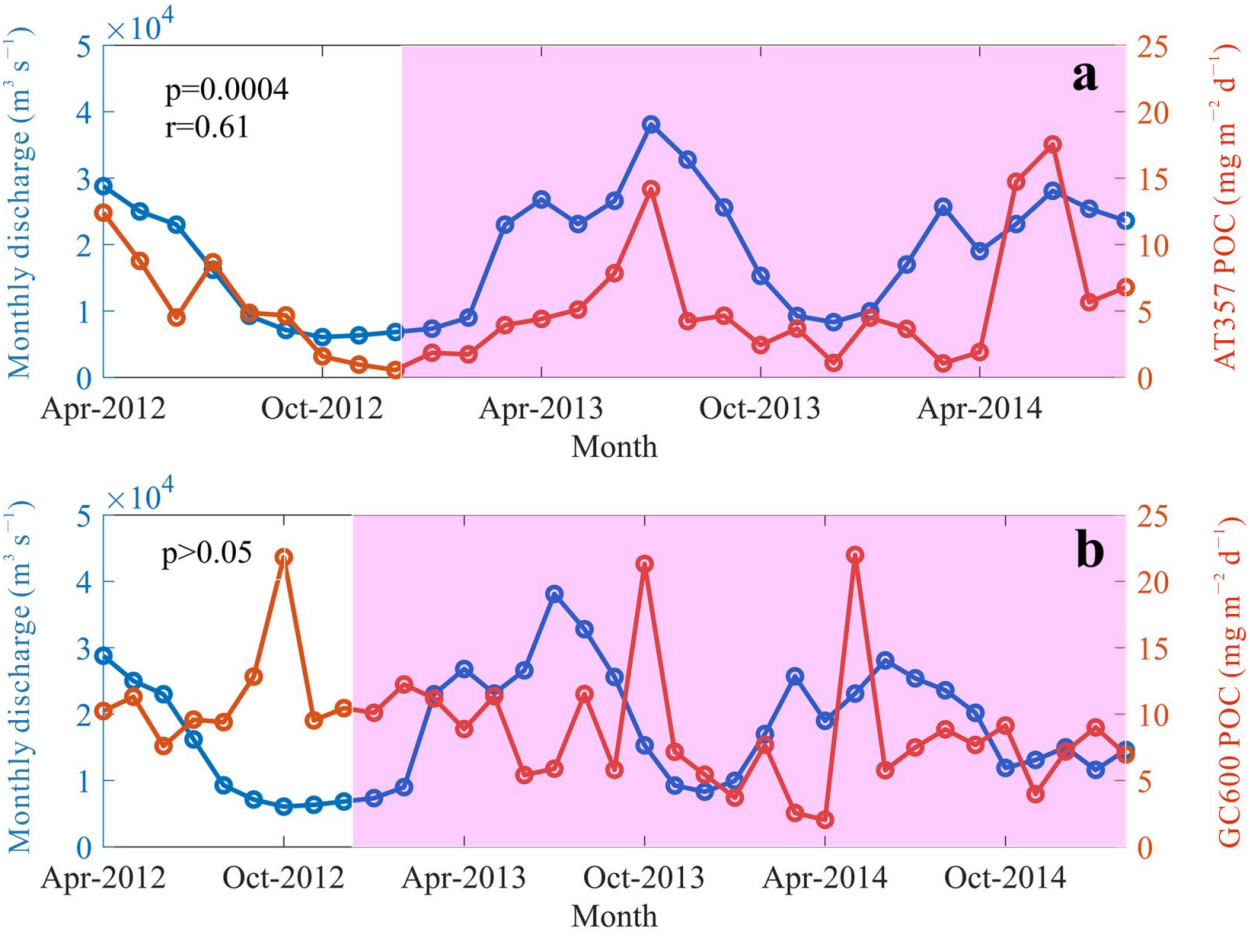

Figure S3. Lagged correlations between monthly river discharge (blue) and POC fluxes measured by the traps (red).

The river discharge time-series are lagged by two months because this lag maximizes correlations at AT357. a) AT357 (R=0.61) and b) GC600 where correlation remains not statistically significant independently of lag. Shaded area represents period outside that of interest (i.e., after December 2012); p-value is also indicated.

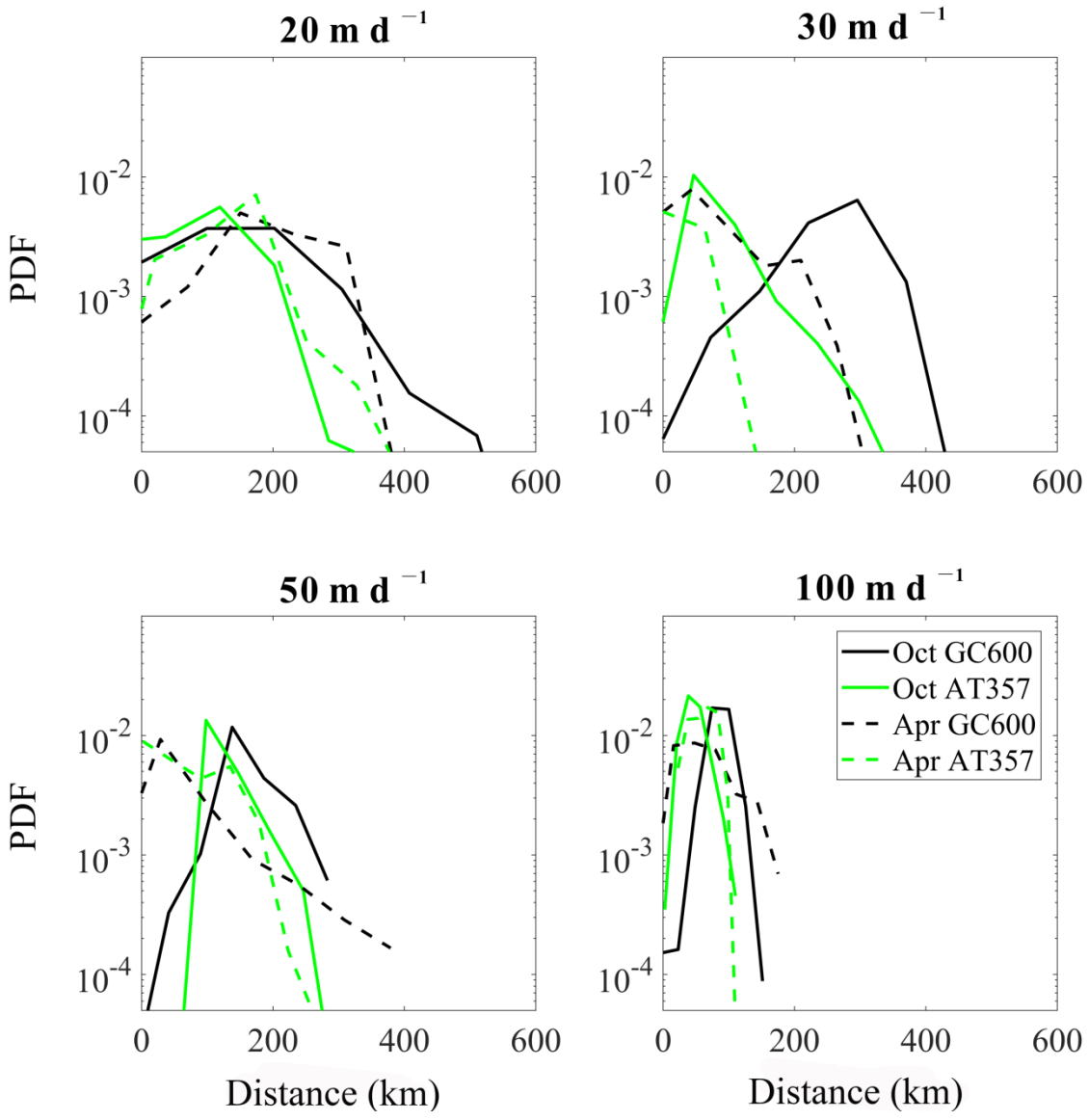

Figure S4. Probability density functions (PDFs) of the lateral distance and catchment area sizes

PDFs of the lateral distance between points of origin of particles and trap sites (GC600, black; AT357, green) in spring (dash line) and fall (solid line) 2012 for the four sinking speeds considered averaged, in each case, over all ensemble members. The maximum lateral distance determines the maximum size of the catchment area, and the peak of the distribution indicates the average (most likely) radius of catchment area.