We have carefully considered these reviews and believe that we have been able to respond satisfactorily to each point raised by the referees. We are grateful to Kirk Cochran and Michiel Rutgers van der Loeff for their useful comments on our manuscript.

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This is a useful global compilation of POC fluxes derived from Th-234 deficits. The compilation is quite complete, but there may be a bit of an "apples and oranges" comparison in that different integration depths for the Th-234 deficit and different size fractions for the POC/Th-234 ratio are used in different studies. The authors should add these details to the tabulations (e.g. Table 2) so that readers can see how comparable are the approaches to the different published estimates of Th-derived POC flux.
We agree with the referee and we added C/Th size fractions, model used and Th flux integration depths in Table 2 in the revised version of the manuscript. If one wants to use this database, it will then be possible to sort out the data by size fractions of C:Th and/or integration depth and/or model (SS, NSS), thereby it avoids apples and oranges comparison.

An additional complication is that POC/Th-234 ratios on different particle size fractions may be the best estimate for deriving POC fluxes in different locations. In other words, "one size fits all" may not be valid for deriving POC fluxes from Th-234 deficits in all oceanic regions. A final uncertainty is the assumption of steady state. A number of the studies cited tried to estimate the NSS flux from Th-234 profiles taken over an interval of time. The POC fluxes estimated from these might be given in conjunction with the SS flux values, again for comparison. Given all these uncertainties and differences in application of the method from investigator to investigator and region to region, it is noteworthy that the patterns of POC export are sensible and in broad agreement with prior independent work. A major (and critical) unresolved issue is whether the magnitudes are in agreement with other estimates.
Although it is not the aim of this study to compare differences between ^{234}Th-derived and sediment trap POC fluxes, we have inserted a couple of sentences on studies that have compared the ^{234}Th method to direct measurements of POC fluxes in section 3.2.

Nevertheless, this is a valuable contribution to the database on oceanic POC export. Minor point- More data on Arctic (Cape Bathurst Polynya) POC fluxes are available in Amiel and Cochran (2008, JGR, 113, C03S06, doi:10.1029/2007JC004260)
In Cochran (2008), the 234Th fluxes were converted to marine and terrestrial POC fluxes using the POC/Th ratio on filterable particles >70 µm and d13C measurements to determine the fraction of marine and terrestrial POC. However, no total POC flux (as compiled in the present manuscript) is reported in this paper.

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This paper does exactly what the title tells: it presents published POC export data based on the 234Th technique. It is very good to have all these data collected and in this way obtain an impression of the geographical distribution of POC export rates measured with this technique and also of areas where data are lacking. The paper follows the Longhurst biogeochemical provinces, which is a good approach. However, the discussion on the global distribution of fluxes is rather superficial. The paper mentions "global patterns....with highest daily POC export rate occurring in the high latitude North Atlantic, the Arctic and the Southern Ocean", giving the impression that POC ex-port is just a matter of latitude. It then discusses two exceptions (one of them a study with just one station) with high export at low latitude. But it fails to mention that the Boreal Polar province is now represented by 72 stations, including high-export shelf seas and extremely low export areas in the central Arctic Ocean. This contrast within one province should at least be mentioned. It is one more example showing that it is not possible to explain export or export ratio (see comment page 170 line 7 and Fig. 1 in Henson et al., 2011) from latitude or temperature alone.
We agree with the referee. We added a couple of sentences discussing the specificities of the Arctic ocean and tempered our statement about "high latitude = high export" in section 3.2 of the revised manuscript.

I wonder why the authors did not include in this dataset the 234Th export rates and the POC/234Th values used. That would make the dataset much more useful. The 234Th export data are more robust than the POC export data because of the large uncertainty in the POC/234Th ratio (an uncertainty clearly mentioned in the paper). If future studies would find new ways to estimate distributions of POC/234Th ratios in sinking particles, they would have to repeat the data mining performed by the present authors.
We added 234Th flux to our database and updated the text and added a new figure (Figure 3). Also, we will add the 234Th fluxes to the database in the PANGEA data repository.

Technical issues: 166 last line. P is once expressed per m2, the second time incorrectly per m3. 167 line 5 "a non steady state (NSS) model can be applied. The NSS model can be useful: : :.". I think it is the other way round: if we only have one profile, we must give arguments that it is valid to use a steady state assumption (see Savoye et al., 2006). 168, line 20. The figure is not cumulative. References: The Longhurst 1991 reference appears not to be the appropriate reference for the definition of the provinces. Buesseler 1998a and b are identical. The Rodriguez and Baena (2008) study deals with the Antarctic, not with the Arctic as listed in Table 1.
All the technical issues have been corrected in the revised version of the manuscript.