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Interactive comment on "Revisiting carbonate chemistry controls on planktic foraminifera Mg/Ca: implications for sea surface temperature and hydrology shifts over the Paleocene–Eocene Thermal Maximum and Eocene–Oligocene Transition" *by* D. Evans et al.

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Remark: Nice story, would like to see this published
Response: Thank you.

Remark: Wilson Lake (and Bass River) are in New Jersey, not on the US Gulf Coast.
Response: Thank you for spotting this typographic error.

Manuscript text (page 3160 line 25): Finally, Zachos et al. (2006) reconstruct an negative d18Osw shift at the coastal proximal Wilson Lake (US Gulf Coast), which may be related to increased freshwater runoff, given that the PETM is known to be associated with seasonally increased precipitation (Schmitz and Pujalte, 2007).
Remark: In view of the fact that we expect regional effects in hydrological regime, I am not sure how valid it is to compare with Schmitz and Pujalte without mentioning that their records are for the Pyrenees (Spain).
Response: We agree that hydrology patterns over the PETM were spatially variable, although we use this reference to make the broad point that this may well be a factor for coastal-proximal sites. As you point out later in the comment, there is also direct evidence for lower salinity at the New Jersey sites, which we will also cite at this point in the manuscript during revision.

Manuscript text (page 3161 line 5): If this was the only previously unaccounted for source of error, this would result in a reduction of the reconstructed SST shift from 4.5 to 3◦C (Fig. 6).
Remark: For Wilson Lake, how does this compare to Tex86 estimate? I note that this is addressed for Bass River below, maybe mention here that this will be discussed later?
Response: To our knowledge, there are no Mg/Ca data for Bass River or Wilson Lake, and therefore it is difficult to make this comparison. Although the TEX86-derived temperature shifts for these sites are broadly larger than those from Mg/Ca at other sites, this may be a regional climatic signal, and therefore it is not possible to use these data to constrain Mg/Ca-derived shifts at other sites.

Manuscript text (page 3162 line 2): This fully corrected record is characterised by d18Osw within ±0.25 of zero, essentially implying little surface hydrology change at

this site over the PETM.
Remark: What is 'this site'? Are we still talking about 1209?
Response: Yes, we are still referring to 1209. This will be clarified during revision.

Manuscript text (page 3162 line 22): It is possible that the small Mg/Ca shift at DSDP Site 401 is a result of poor foraminifera preservation, however the raw ratios are not abnormal for this time interval, and the high clay content and relatively shallow palaeo-water depth of 1.5–2 km (D'haenens et al., 2012) means that differential preservation across the PETM is potentially unlikely.
Remark: However, it is well possible that the PETM clay layer is in part missing at that site due to core-deformation by rotary drilling (see core photgraph), with only very little true clay material preserved. It is thus possible that proxies have not been measured on coeval material.
Response: This is a good point which should have been considered, and would also explain why there is a much smaller temperature shift here than at any other mid-high latitude site. We will list this as an alternative possibility and more prominently highlight that the kind of relative thermal and hydrological reconstructions we are considering may be inaccurate at this site.

Manuscript text (page 3164 line 5): salinity effects.
Remark: I thought that these were indicated by dinocysts analysis for the New Jersey sites (Sluijs Brinkhuis 2009, Biogeosciences) www.biogeosciences.net/6/1755/2009/ 'Apectodinium spp. became outnumbered by typical low salinity-tolerant dinocysts during phases of the PETM (Figs. 2, 3)'
Response: This is indeed the case. However, because the temperatures for these sites come from TEX86 and not Mg/Ca, there is no need to consider the effect of salinity on the temperature reconstructions. As most other sites are within error of no salinity change, we do not apply this correction for the reasons outlined in the manuscript.

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Interactive comment on Clim. Past Discuss., 11, 3143, 2015.