Height correction

There are some birds for which the height profile looks like this

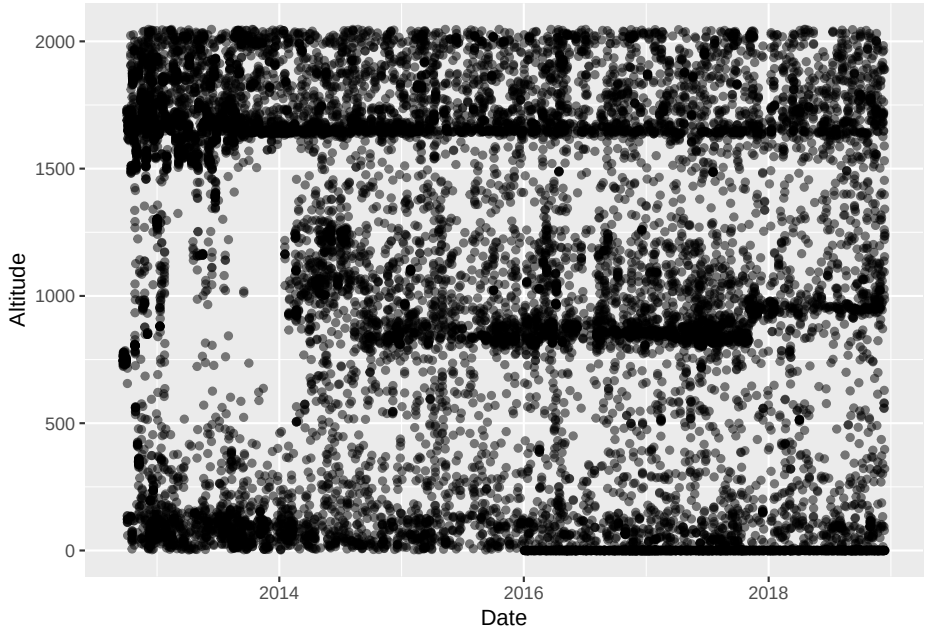

Figure 1: Raw altitude

I understand that this is the elevation of the bird above sea level. I have subtracted the ground height based on a digital elevation model (Shuttle Radar Topography Mission). This gives us the raw flight height above ground (figure 2).

I see in a comment in the raw data that these tags wrap the altitude to zero when it goes above 2042 meters (please correct me if I am wrong). Asssuming that this is correct, we can take care of two of the levels of heights shown in figure 2 (one around zero and one around -2000) by adding 2042 meters to any height reading exceedingly negative. By looking at the plots, I have considered -300 meters to be reasonable (but again please correct me if I am wrong). I tried -1000 first but seemed to exclude some flights that might have reached high heights after wrapping (thus getting close to zero from the negative side).

This seems to fix the period before 2016 (figure 3), but afterwards there is a new level around -1000 that I am not sure how to deal with. First, I thought of subtracting 2042 again, because maybe bird was flying so high that the tag wrapped twice, but this doesn't seem to work (figure 4).

In figure 5 we can see a detail 300 height measurements in the period after 2016 before applying any correction, in case it helps.

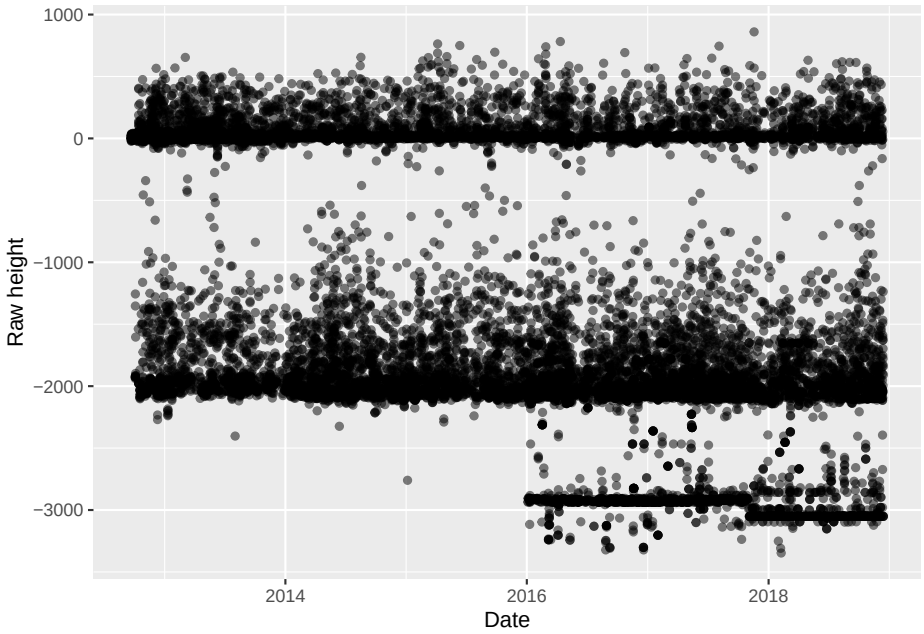

Figure 2: Raw height

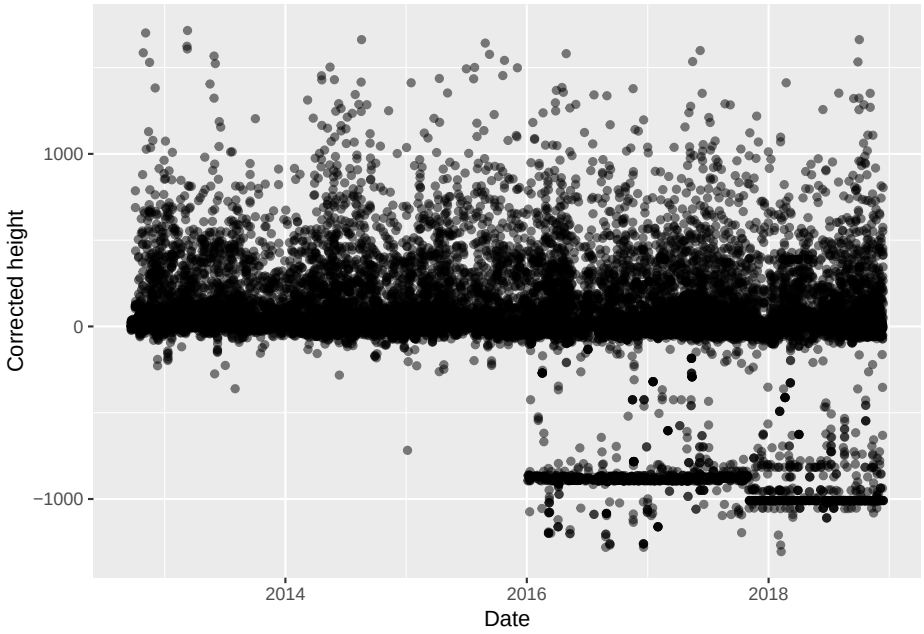

Figure 3: Corrected height

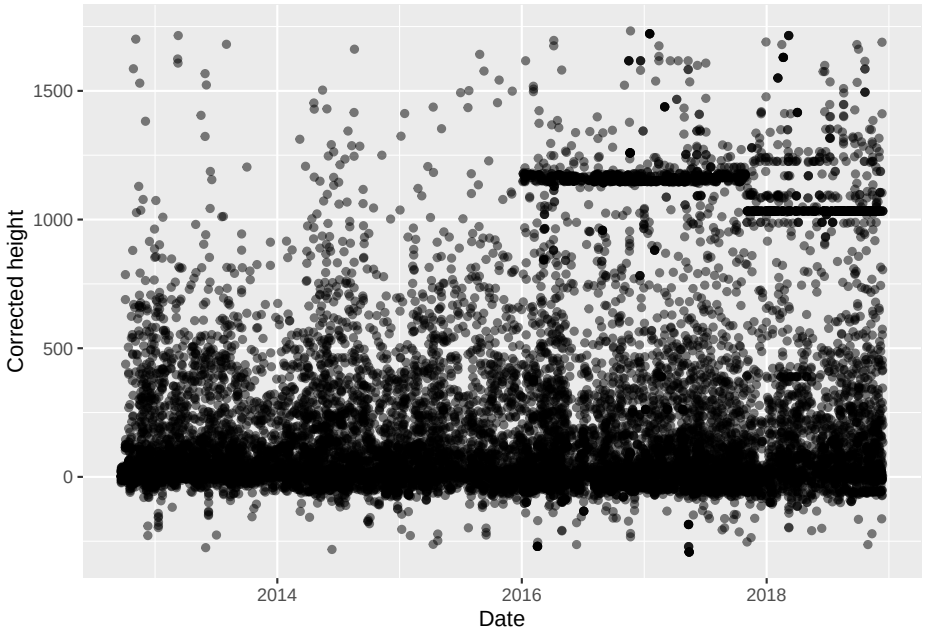

Figure 4: Twice corrected height

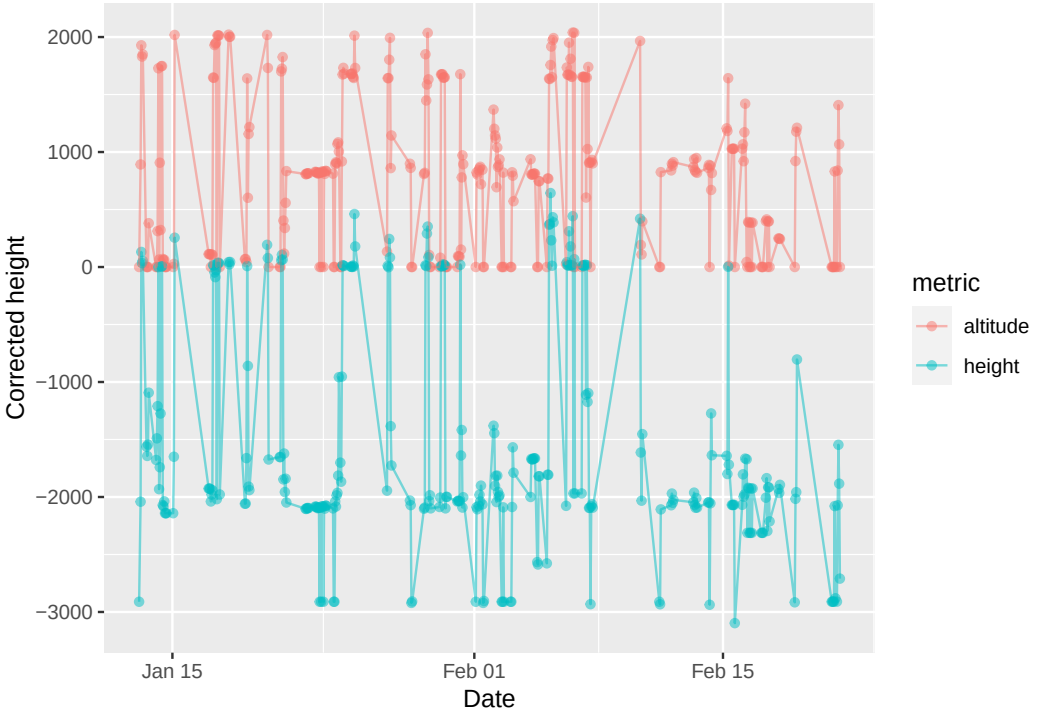

Figure 5: Height (a.g.l.) vs. altitude (a.s.l.)