

FABDEM Changelog

We are grateful for the feedback we have received since the release of FABDEM V1-0, and the recommendations on how we can improve the dataset. Consequently, we have made a few updates, which are documented below. We value your feedback, so please feel free to contact us at laurence.hawker@bristol.ac.uk or fabdem@fathom.global.

FABDEM V1-2 (Release January 2023)

- The underlying Copernicus DEM has been updated to Copernicus 2021_1. Details on the updates to the Copernicus DEM can be found [here](#).
- Copernicus DEM has variable grid spacing in high latitudes (50°N/S). This results in grids not being aligned across the interface where different resolutions are used. For FABDEM, Copernicus DEM was first resampled to a 1 arcsecond grid, however for V1.0, the alignment of high latitude tiles was not matched to the low latitude tiles. The pre-processing of the Copernicus DEM was updated for FABDEM V1.2 to align all tiles consistently.
- Some tiles in high latitudes had artifacts due to pixel resampling (see Figure 1 for an example). Fixed alignment solved this issue
- Format changed to Cloud Optimized Geotiff, with updated compression options (DEFLATE with PREDICTOR=2). This reduces file size by ~40%
- AREA_OR_POINT label changed to Point. Previously incorrectly labelled as Area.

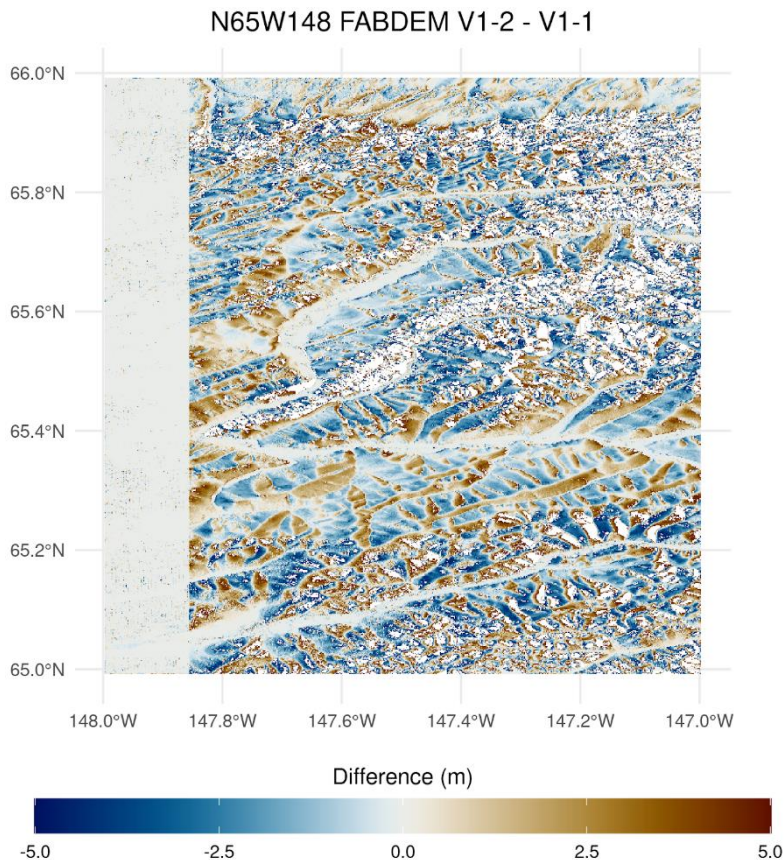


Figure 1: Difference between FABDEM V1-2 and FABDEM V1-1

FABDEM V1-1 (Not Publicly Released)

Discontinuities were noticed at edge of tiles covering large homogenous forests (e.g. Amazon and Congo). This has been linked to a post-processing step in FABDEM v1-0:

- A 5 pixel buffer was added to the corrected DEM for each tile, before post-processing. This buffer was raw Copernicus DEM, without forests removed
- The inconsistency between the corrected DEM and buffer resulted in incorrect depression filling during the post-processing step for densely forested areas (Figure 2)
- This happened in large forests as these are areas where corrections are applied over wide areas

Figure 3 shows an example of the uncorrected buffer used in FABDEM V1-0. As a result, valleys were filled in the depression filling post-processing stage based on the elevation of the uncorrected buffer, which was typically ~20m higher in these areas of dense, homogeneous forests.

This inconsistency is fixed in FABDEM V1-1. The fix involves extending the buffer and using the corrected surface instead. This avoids using the uncorrected elevations which falsely filled in the values. The result of the fix can be seen in Figure 4.

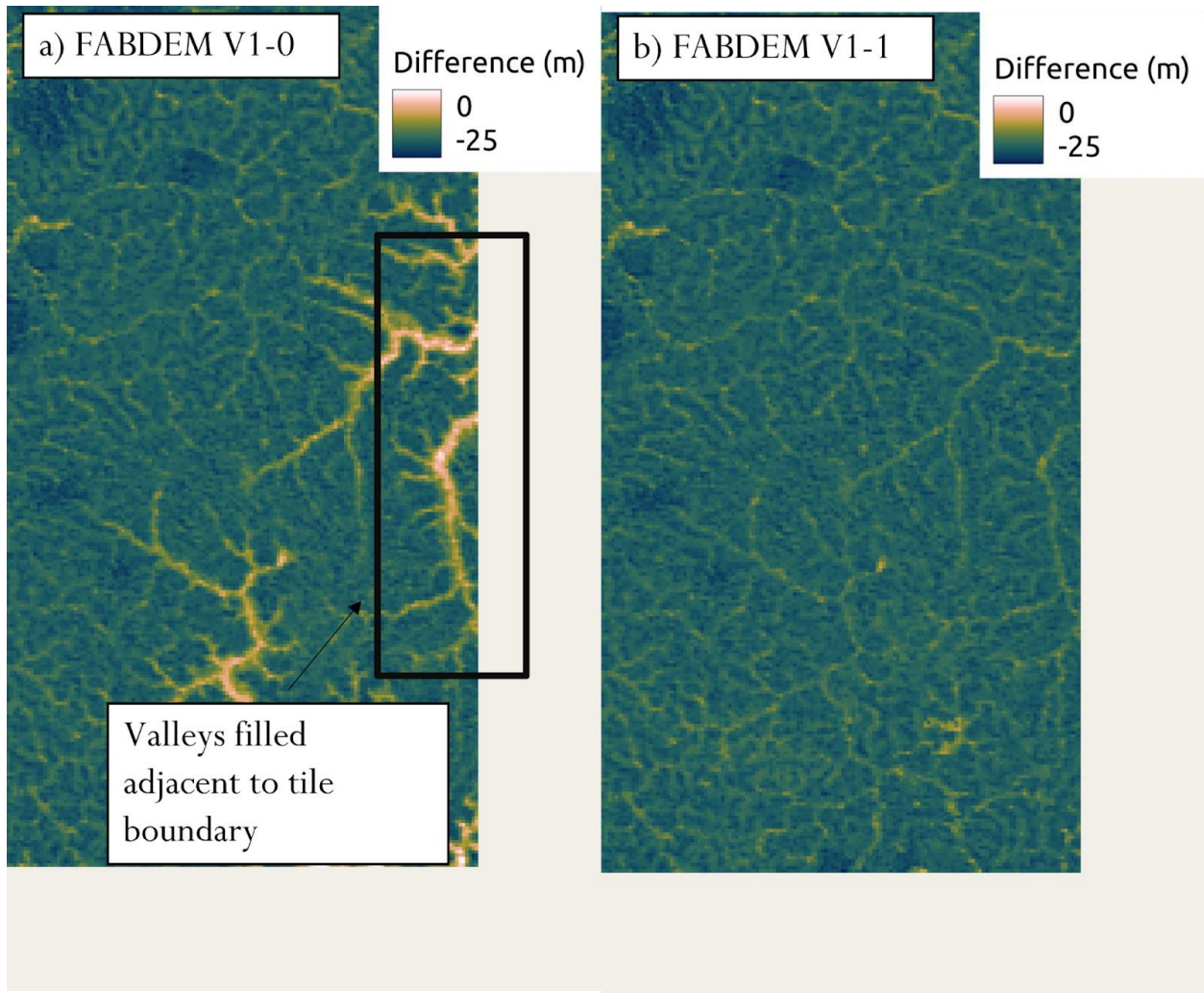


Figure 2: FABDEM V1-0 with valleys incorrectly filled (a), compared to FABDEM v1-1 (b). Difference to Copernicus DEM.

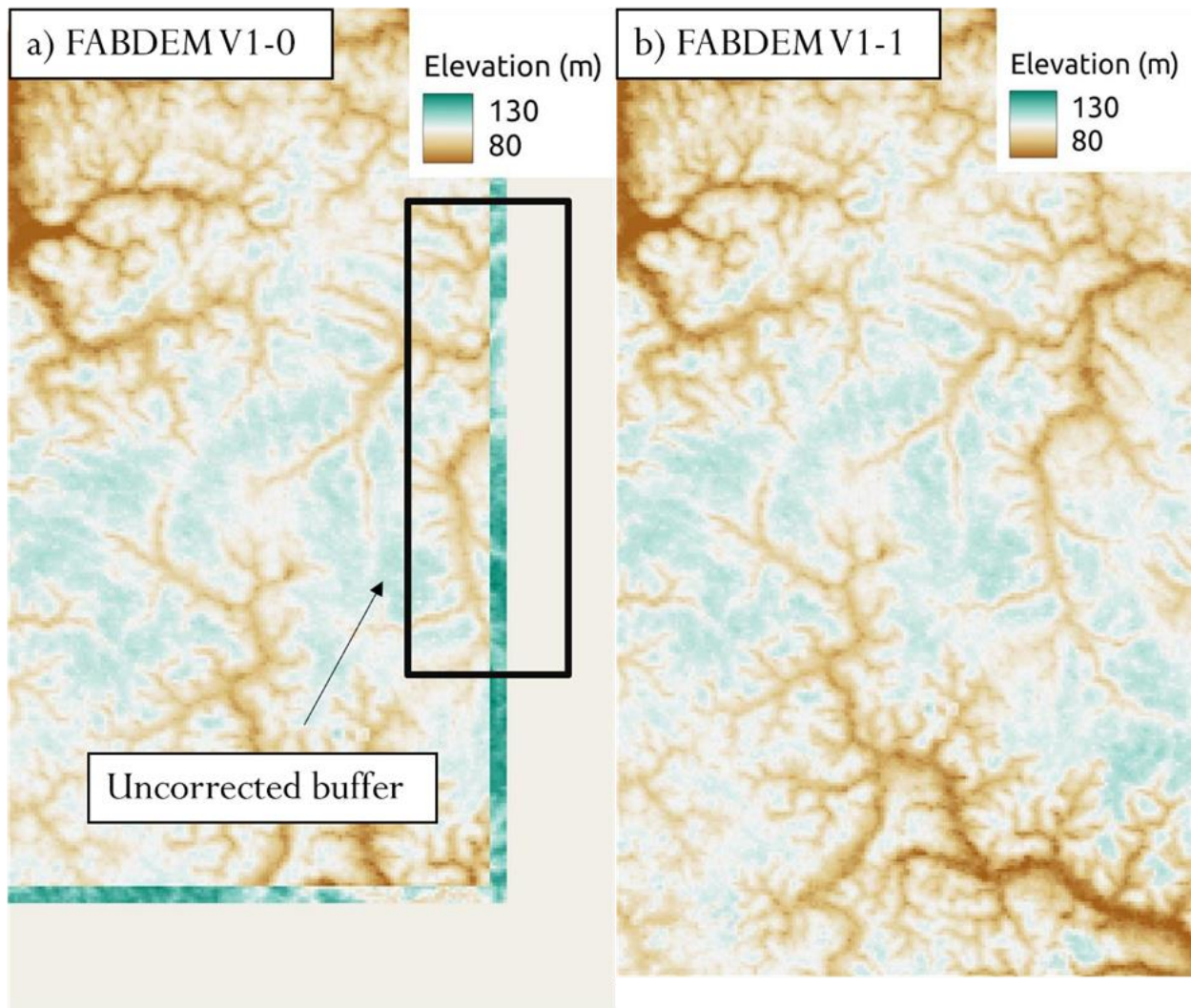


Figure 3: FABDEM V1-0 with uncorrected buffer from Copernicus GLO-30 DEM (a), compared to FABDEM V1-1 with a consistent, expanded buffer

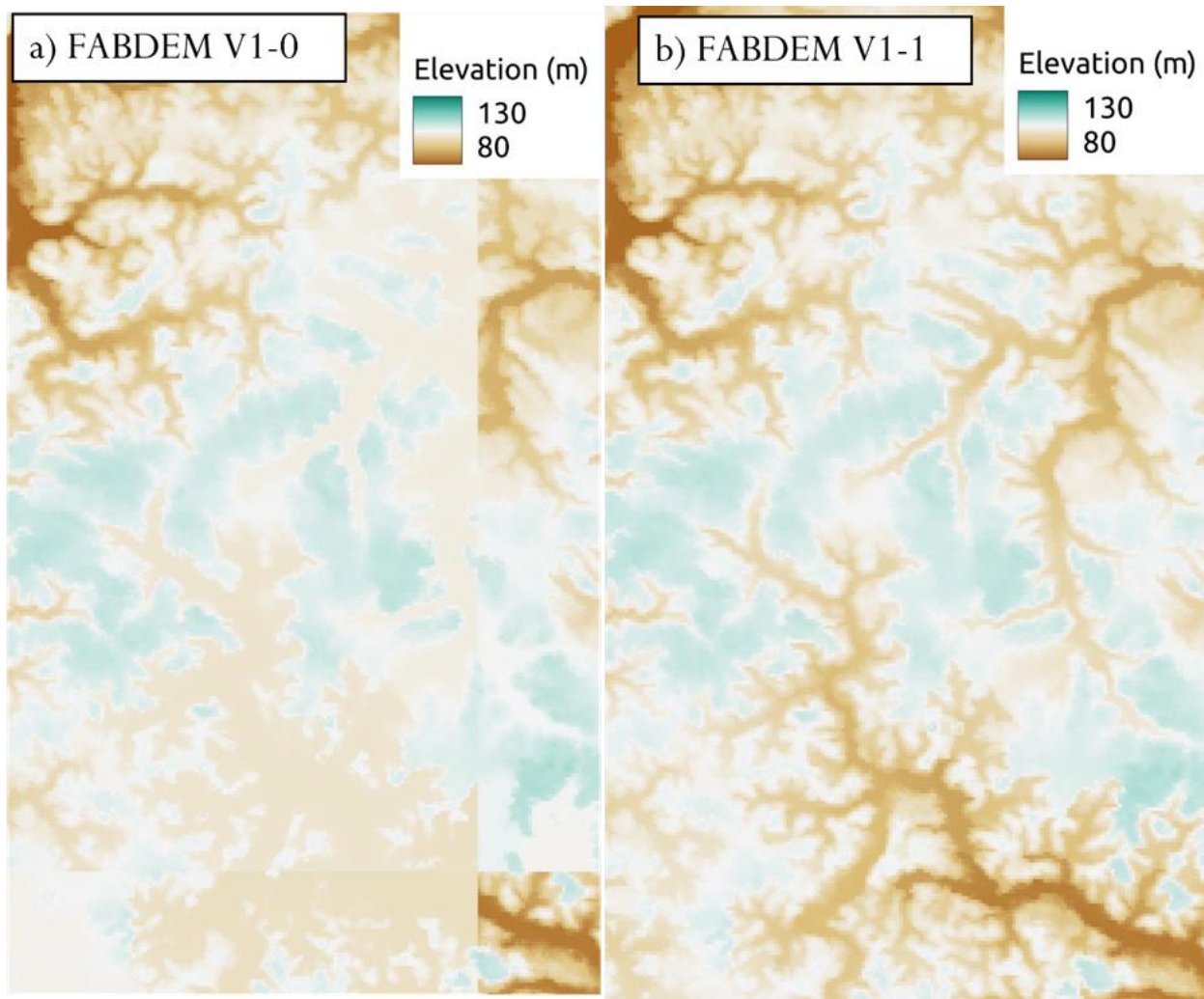


Figure 4: FABDEM v1-0 (a) compared to FABDEM v1-1 (b). Note the lack of discontinuities at tile boundaries.