

Review on the manuscript „The countrywide historical gravity dataset of Lithuanian territory” (ESSD-2025-174), revised submission by Dominykas Šlikas and colleagues

Review 1:

My general impression remains unchanged after this second review: the manuscript is scientifically interesting and contains information and datasets that are (urgently) needed by neighboring countries and other users. Please also refer to the comments available on the ESSD website (<https://essd.copernicus.org/preprints/essd-2025-174/>). It is therefore even more regrettable that, upon reading the revised manuscript, not all comments and suggestions for improvement have been consistently taken up or fully addressed. I would like to point this out in detail and ask the authors to implement these points, rather than merely acknowledging them with a smiley.

Thanks for careful reading of our manuscript 😊

My overall assessment of the revised version is therefore: **Accept with minor revisions.**

Thanks for good assessment 😊

Remaining points of criticism/suggestion:

(1) Framing of the contribution/novelty

I suggested/requested that the authors clearly acknowledge that the main contribution of the paper lies in data preservation and accessibility rather than in the development of new methodology.

One to two sentences should be added early on (in the abstract or at the end of the introduction) to frame the novelty appropriately.

Justification: I do not see any “practical novelties,” nor a clear statement that the applied methods are standard. The manuscript’s novelty lies in the compilation, homogenization, and accessibility of the data.

Reviewer is right. Paper does not propose a new methodology. However, some readers will find few unpublished items like transformation parameters between geodetic coordinate and height systems. By authors heads, it looks like practical novelty.

For justification few sentences are added at the end of Introduction:

“These harmonized data provide unprecedented insights into the gravity field of entire country, supporting diverse applications in geodesy, geophysics, geology, and related scientific fields. High-resolution gravity datasets offer critical information for analyzing Earth's gravitational field, refining geopotential models, and constructing precise geoid models. Furthermore, researchers will benefit from using high-precision gravity network points to evaluate and estimate the accuracy of these developed products.”

(2) Clarity and structure of the manuscript

I suggested shortening the section containing formulas, moving long derivations to the supplement, reducing repetition, and improving the scientific tone. However, the manuscript still contains extensive step-by-step coordinate transformation derivations and worked examples (e.g., Eqs. 3–15 plus example blocks).

Suggestion: Compress this section to a workflow summary and retain only the key formulas, moving the remaining detailed derivations and examples to a (new) supplement.

Reviewer is right. Some parts of a paper are moved to Appendix.

(3) Figures and maps

The authors have adopted most of the suggestions regarding the figures. Unfortunately, some inconsistencies remain. Figures 1, 2, 5, 9, 10, 11, and 12 are shown at the same scale and in the same coordinate system, which greatly improves readability. However, the older map fragments still show different map extents, without this being explicitly stated by the authors. The same map extent is used in the fragments shown in Figs. 3, 6, and 7. The extent shown in Fig. 4 differs in latitude compared to the fragments in Figs. 3, 6, and 7. The Bouguer map in Fig. 8 shows only a single coordinate pair in the upper left corner (Long. = 24°00', Lat. = 55°15'). A second coordinate pair should be provided to better assess the spatial extent of the map.

Suggestion: Harmonize the map extents of Figs. 3, 6, 7, 4, and 8 by using the same map window. This common extent should also be indicated in Fig. 1 as a reference.

Reviewer is right. Figures and maps were corrected as much as historical materials allowed to superpose fragments. Please, pay attention, that in different parts of the territory only some types of maps exist (Fig. 1, 5). Why it is not possible to indicate the reference point in Fig. 1.

(4) Data format

The authors state (Section 3) that the dataset is published in DBF (dBASE) format, which is technically valid but increasingly outdated. The authors agreed: Reviewer is right. Data in CSV format was added to repository.

Sorry, I did not find CSV formatted data in the repository. Already done?

Oh, sorry very much. Version v2 in ZENODO was created, data in CSV format (Comma Separated Values) was added.

(5) SI units

Although I agree with the authors that cgs units are frequently (and still) used in gravity and are generally accepted, I would nevertheless insist that the manuscript explicitly states at least once, preferably in the Introduction (or elsewhere early in the text), **that**

$$1 \text{ mGal} = 10^{-5} \text{ m s}^{-2}.$$

After all, we are physicists and/or geodesists !

We are geodesists 😊 SI system is ruling 😊 Correction is done in the Introduction.

Reviewer 2:

Thanks for careful reading of our manuscript 😊 Thanks a lot for English proofing 😊 All corrections were accepted.

Thanks for good overall assessment 😊

Notes:

Should the definition of δ_m also be included here?

Yes, please take a look into example.

Maybe there needs to be a table number used here?

By authors heads – no. When only Table is in paper, no need to give number to it.
Hopefully Editor will decide on this item.