

## Slovenian National Geokinematic Model: GKM\_SVN2026\_TM

***GKM\_SVN2026\_TM*** is the Slovenian national geokinematic model from 2026 in the projected coordinate reference system D17/TM

*Release: 2026*

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*Owner: Surveying and Mapping Authority of the Republic of Slovenia*

*Creator: University of Ljubljana, Faculty of Civil and Geodetic Engineering*

*Authors: B. Stopar et al.*

The Slovenian national geokinematic model, version GKM\_SVN2026\_TM, is a regular square grid in the projected coordinate system, which is based on the Transverse Mercator (TM) projection as applied in the Slovenian national projected coordinate reference system ETRS89-SVN (EPSG 3794) with the parameters:

- latitude of natural origin = 0°
- longitude of natural origin = 15°
- scale factor at natural origin = 0.9999
- false easting = 500000 m
- false northing = -5000000 m

The geodetic datum is ETRS89-D17 (ETRF2000@2016.75). The grid points are given with the projected coordinates and ellipsoidal heights (e, n, h). The corresponding velocities are given in the local geodetic system for each grid point (E, N, U).

The grid covering the country territory and its surroundings consists of:

- 1170 (39 × 30) grid points or
- 1102 (38 × 29) grid cells.

The grid cell dimensions are:

- 10 kilometers in easting and
- 10 kilometers in northing.

The grid area covers 380 km × 290 km. The grid points are listed from west to east and from south to north – in rows from west toward east, where these rows follow from south toward north, i.e.:

- starting in the south-west corner of the grid area SW (310000, -40000) ≡ point № 0001 and
- ending in the north-east corner of the grid area NE (690000, 250000) ≡ point № 1170.

In each line of the corresponding text file, there is a record for one grid point providing seven space-delimited attributes:

- four-character consecutive number (0001 to 1170),
- easting (e) coordinate in meters,
- northing (n) coordinate in meters,
- ellipsoidal height (h) in meters (400 m – an average height of the terrain),
- east velocity component (vE) in meters per year,
- north velocity component (vN) in meters per year, and
- up velocity component (vU) in meters per year.

The national geokinematic model is based on the analysis of daily coordinate time series from 44 GNSS CORS stations in Slovenia and its surroundings (including GNSS stations of the neighboring CORS networks involved in cross-border data exchange). The estimated standard deviations of horizontal velocity components are below 0.5 mm/yr. The velocities of grid points are determined using least-squares collocation method. The velocities vary considerably over the grid area. Due to the lack of data near the edges of the grid area (extrapolation), the model should only be used within national borders.

This national geokinematic model is a product of the Green Slovenian Location Framework (GreenSLO4D), a strategic project under the 2021–2026 Recovery and Resilience Plan. Results are also based on the previous basic research project called Geokinematic Model of the Territory of Slovenia (SLOKIN). The model is created at the University of Ljubljana, Faculty of Civil and Geodetic Engineering.

## References

- Stopar, B., Ritlop, K., Pavlovčič Prešeren, P., Hamza, V., Mencin, A., Filač, M., Sterle, O., Kregar, K., Koler, B., Marjetič, A., Štebe, G., Jeraj, S., Savšek, S., Ambrožič, T., Triglav Čekada, M., Novak, N., Fabiani, N. (2026a). **Razvoj štirirazsežnega državnega koordinatnega sistema**. Final report. Faculty of Civil and Geodetic Engineering of the University of Ljubljana and Geodetic Institute of Slovenia, Ljubljana, 278 p. [in Slovene].
- Stopar, B., Ritlop, K., Pavlovčič Prešeren, P., Vrabec, M., Sterle, O. (2026b). **Vzpostavitev geokinematskega modela Slovenije**. Raziskave s področja geodezije in geofizike 2025 (SZGG, Ljubljana, February 5, 2026). Proceedings, vol. 31, pp. 125–137 [in Slovene],  
[https://fgg-web.fgg.uni-lj.si/SUGG/referati/2026/SZGG\\_2026\\_Stopar\\_et\\_al.pdf](https://fgg-web.fgg.uni-lj.si/SUGG/referati/2026/SZGG_2026_Stopar_et_al.pdf)
- Stopar, B., Sterle, O., Ritlop, K., Pavlovčič Prešeren, P., Koler, B., Triglav Čekada, M., Radovan, D., Fabiani, N., Jamšek Rupnik, P., Atanackov, J., Bavec, M., Vrabec, M. (2021). **Projekt SLOKIN – geokinematski model ozemlja Slovenije**. Raziskave s področja geodezije in geofizike 2020 (SZGG, Ljubljana, January 28, 2021). Proceedings, vol. 26, pp. 87–104 [in Slovene],  
[https://fgg-web.fgg.uni-lj.si/SUGG/referati/2021/SZGG\\_2021\\_Stopar\\_in\\_dr.pdf](https://fgg-web.fgg.uni-lj.si/SUGG/referati/2021/SZGG_2021_Stopar_in_dr.pdf)