

## Soil Ecosystem seRvices and soil threats modEling aNd mApping

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**Start:** November 1<sup>st</sup>, 2021  
**Duration:** 36 months

### Aim:

Assess, analyze and map bundles of soil threats (ST) and soil ecosystem services (SES) across European agricultural landscapes, highlighting how soil threats affect the supply of services bundles through adoption of a set of site-specific reference thresholds.

16 EJP member states (Figure 1)  
25 partners (footnote)  
In 6 workpackages (Figure 2)

### Further information:

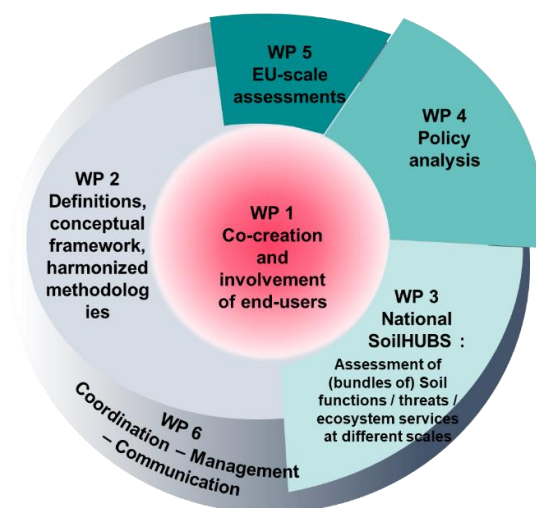
<https://ejpsoil.eu/soil-research/serena>



**Figure 1:** Participating Countries.

**LEAD:** FR: INRA & IT: CNR.

**Partners:** AT: AGES<sup>2</sup>, BAW<sup>3</sup>, BFW<sup>1</sup>; BE: VPO; CZ: CZU; DK: AU; EE: EMU, ARC; ES: CSIC; FR: APT, ACO; HU: ATK; IE: TEAGASC; IT: CREA, ENEA, ERSAF-Lombardia, ISPRA; LV: UL; LT: LAMMC; NL: WR; PL: IUNG; PT: INIAV; SK: NPPC;



**Figure 2:** SERENA Work Packages

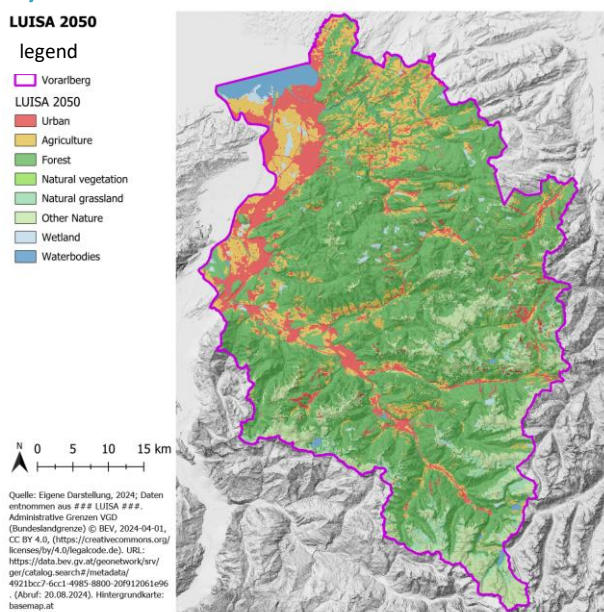
### Activities in and for Austria:

- Survey about perceptions of soil policy terminology (D1.3)
- Survey about definitions and importance of SES and ST (D2.2)
- Modelling of SES and ST under climate change and land management scenarios: soil sealing, primary production, soil erosion, greenhouse gas emissions etc. (D3.4)
- Comparing maps derived by national and EU-scale data bases and modelling procedures (D3.2)

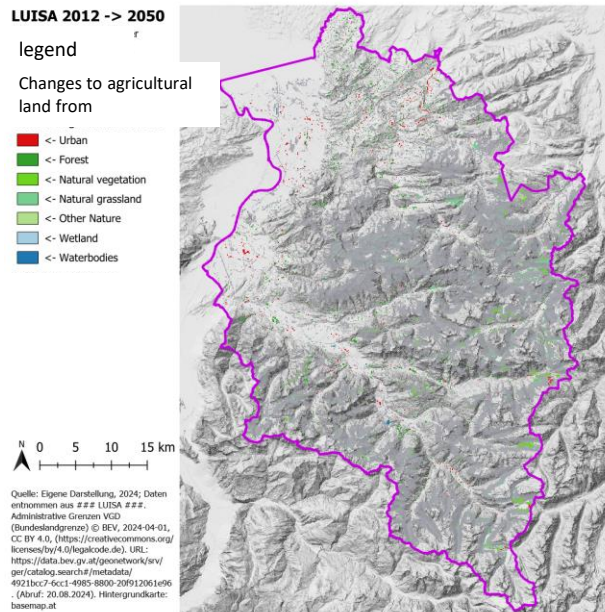
### Publications:

- Foldal, C.B. et al., 2024. Policy measures effectively reduce soil nitrous oxide emissions with minor trade-offs in crop yield. European Journal of Soil Science 75, e13475. <https://doi.org/10.1111/ejss.13475>
- Weninger, T., et al. 2024. Do we speak one language on the way to sustainable soil management in Europe? A terminology check via an EU-wide survey. European Journal of Soil Science 75, e13476. <https://doi.org/10.1111/ejss.13476>
- Saccamacca et al., submitted to STOTEN. Assessing and mapping soil ecosystem services and soil threats changes in agroecosystems through scenario-based approaches – a systematic review.

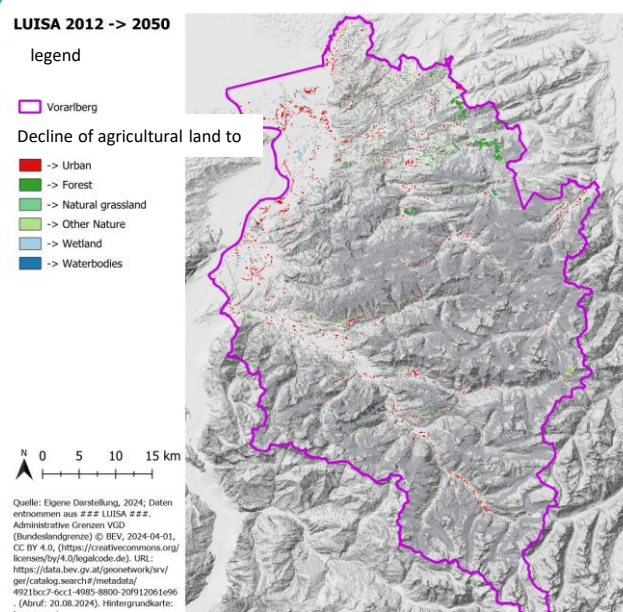
a)



b)



c)



### Mapping of future Land Use, an example from Vorarlberg

Knowing the location and extent of future changes in agricultural land area is relevant for estimating local impacts and adopting policy measures. In D 3.4 we have mapped land use changes for Vorarlberg according to LUISA. The model links demographic, macroeconomic and geospatial data and includes the effect of the CAP (Common Agricultural Policy) at the local scale (past periods). Figure 3a) shows the estimated land use of Vorarlberg in 2050, where the land use categories have been combined for better readability.

Figures 3b and 3c show the changes in agricultural land (cropland and grassland) for the period 2012–2050. The area of cultivated forest and natural grassland (pasture) compensates for the agricultural land lost due to urbanization. Interestingly, the total forest area is expected to increase by 24%, mainly at higher altitudes, due to afforestation of natural grasslands and other natural areas.

**Figure 3** Example of project activities in SERENA focussing on Austria: Land Use in Vorarlberg a) in 2050, projected by LUISA. For the period 2012–2050 b) shows the specific changes to agricultural land (arable and grassland), mainly from natural grassland (Alm) and forest area. c) shows the changes in land use from agricultural land to other land use.