



Marginal lands for Growing Industrial Crops

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DEC	Websites, patent fillings, videos, etc.	<input type="checkbox"/>
OTHER		<input checked="" type="checkbox"/>

Dissemination Level

PU	Public	<input checked="" type="checkbox"/>
CO	Confidential, only for members of the consortium (including the Commission Services)	<input type="checkbox"/>



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1 Publishable executive summary

To access the version 2 MAP-DB containing the Marginal land Agri-environmental zonation (MAEZ) goto link:

<http://iasa-spatial.maps.arcgis.com/apps/webappviewer/index.html?id=3c69a9a930a44814956f4e3bdd18a104>

Access to this version was launched at the MAGIC project meeting in Madrid 9-10 July.

2 Introduction

This document explains access and contents of the second version of the database of the Marginal land map (MAP-DB, version 2) which was made available to project partners and also external users in Month 12 of the MAGIC project. In Annex 1 the presentation is included given on 9th of July to launch access to the new version of the database.

In Annex 2 a description of the MAEZ MAP-DB version 2 is presented in the form of a poster presented at the EUBCE in May 2018.

3 Access to MAP-DB version 2 in ESRI

To access the ESRI viewing tool for MAEZ open underneath link:

<http://iiasa-spatial.maps.arcgis.com/apps/webappviewer/index.html?id=3c69a9a930a44814956f4e3bdd18a104>

If the link does not work copy it and paste it in the webbrowser address bar.

When you open the ESRI tool you will see Figure 1:



Figure 1: View after opening the link and explanation of icons (In the clouds the functions of the icons are explained)

Further details on the elaboration and results of the Marginal land mapping can be obtained from D2.6 and also from D4.1 where the use of the Marginal land mapping data is described for selection of test sites and crop types.

Annex 1 Presentation of version 2 of MAP-DB Madrid



Marginal Land Mapping Application

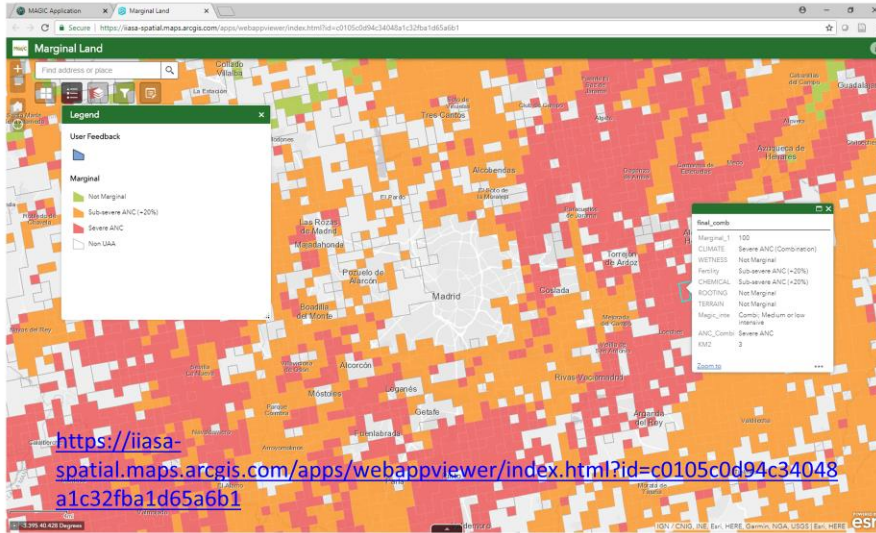
IAN MCCALLUM, IIASA
BERIEN ELBERSEN, WR
MICHIEL EUPEN, WR



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Marginal Land App ver 1.0



<https://iiasa-spatial.maps.arcgis.com/apps/webappviewer/index.html?id=c0105c0d94c34048a1c32fba1d65a6b1>

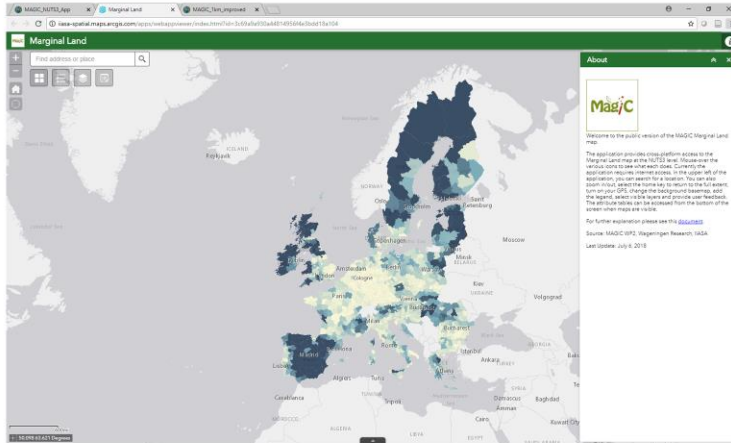
Madrid, 2018

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Marginal Land NUTS3



<http://iasa-spatial.maps.arcgis.com/apps/webappviewer/index.html?id=3c69a9a930a44814956f4e3bdd18a104>

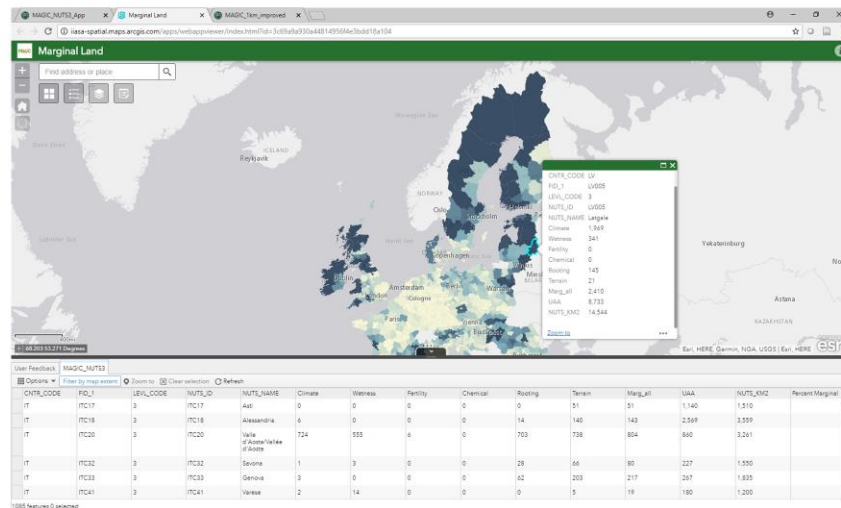
Madrid, 2018

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Marginal Land NUTS3



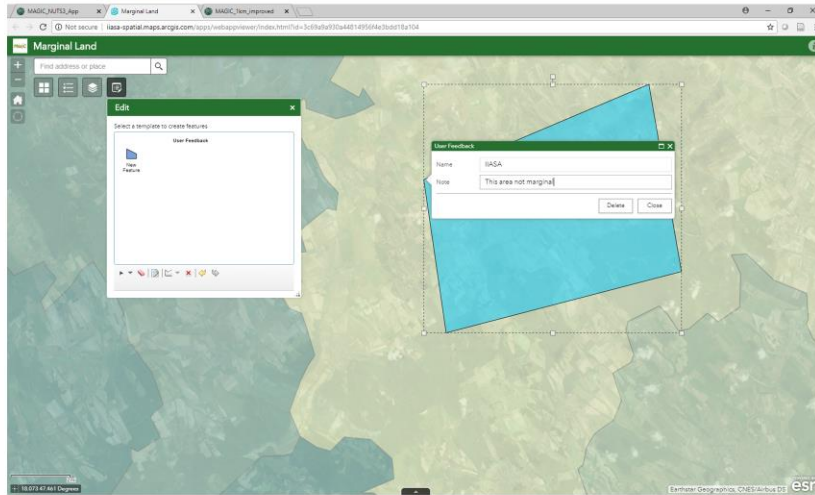
Madrid, 2018

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Marginal Land NUTS3



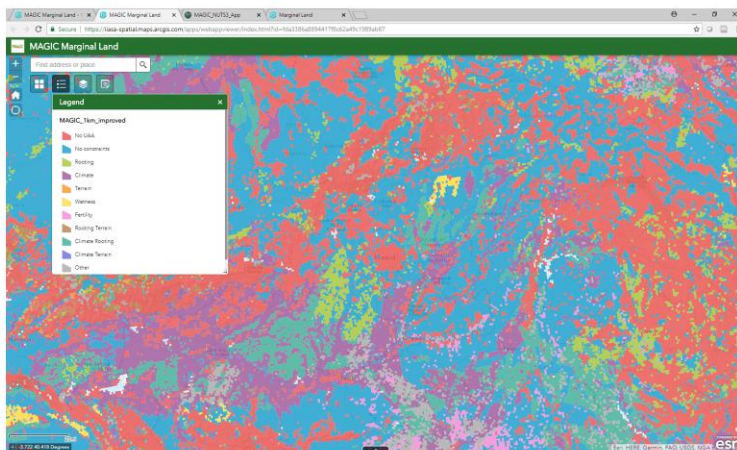
Madrid, 2018

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Marginal Land 1km2



<https://iiasa-spatial.maps.arcgis.com/apps/webappviewer/index.html?id=fda3386a8894417f8c62a49c1989ab87>

Madrid, 2018

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**Annex 2 EUBCE May 2018 poster presentation of MAEZ MAP-DB
version 2**

Mapping Marginal land potentially available for industrial crops in Europe

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Background

In recent decades, the concept of marginal land has gained increasing interest under growing land use pressure owing to the increased demand for biomass for non-food purposes in bio-based industries.

Objective

In MAGIC a first EU wide map is created to assess options for sustainable use of marginal lands to grow industrial crops. The approach builds on the JRC work to identify Areas of Natural Constraints (ANCs) (Van Oorschoven et al., 2014 and Terres et al., 2014) and other land evaluation systems for agronomic suitability. The results describe the location and amount of marginal land area across Europe and what the main characteristics are in terms of biophysical and socio-economic limitations. This classification serves as a basis for developing sustainable best-practice options for industrial cropping in Europe on marginal lands.

Method

- Biophysical factors have been identified for the classification of severe limitations; 18 single factors, grouped into 6 clustered factors:
 1. **Adverse climate** (low temperature and/or dryness)
 2. **Excessive wetness** (limited soil drainage or excess soil moisture)
 3. **Low soil fertility** (acidity, alkalinity or low soil organic matter)
 4. **Adverse chemical conditions** (Salinity or contaminations)
 5. **Poor rooting conditions** (low rootable soil volume or unfavourable soil texture)
 6. **Adverse terrain conditions** (steep slopes, inundation risks)
- The land units were identified with biophysical factors within the 20% margin of the threshold value of severity. This allows to map pair-wise limitations. When two factors are within this 20% margin the land units were classified from sub-severe to severe.
- A correction was made by excluding areas where natural constraints were neutralized via measures such as fertilisation, irrigation, drainage and creation of terraces. Different spatial data sources were used to identify the marginal lands where land improvements were made and intensive agricultural production now occurs.

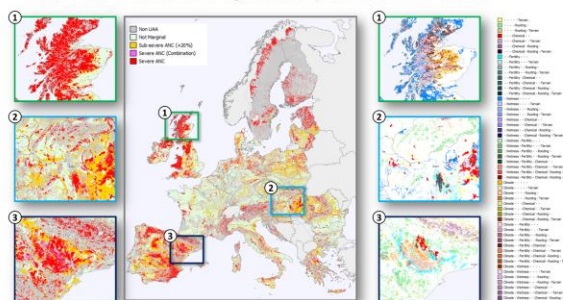


Figure 1. First Map of marginal lands in EU-28. Selected windows: Dominant severe limitations: 1) Scotland; excessive wetness, climate, limitations in rooting. 2) Hungary: multiple limiting factors salinity, fertility, excessive wetness and rooting limitations. 3) Ebro Valley: large concentration of multiple overlapping limitations (all six factors).

In total 29% of the agricultural area is marginal in EU-28. The most common are rooting limitations, with 12% of the agricultural area after correction for improvement. This is followed by adverse climate and excessive soil moisture occurring in respectively 11% and 8% of the agricultural land. The largest share of marginal lands is defined by one of the six clustered limitations, while in a much smaller share multiple limitations occur.

Table 1. Land area share (% of agricultural area)* of total and 6 clusters of biophysical constraints making up marginal lands for EU-28 (total) and per Environmental zone

	1. Adverse climate	2. Excessive soil moisture	3. Adverse chemical comp.	4. Low soil fertility	5. Adverse rooting cond.	6. Adverse terrain	Marginal	Not marginal
Alpine	40%	21%	0%	2%	45%	47%	61%	39%
Atlantic	4%	14%	1%	1%	12%	5%	26%	74%
Continental	1%	5%	2%	1%	5%	2%	14%	86%
Mediterranean	13%	1%	1%	6%	18%	9%	34%	66%
North	62%	14%	0%	3%	13%	3%	71%	29%
Grand Total	11%	8%	1%	2%	12%	6%	29%	71%

*area share of the total marginal area in Europe that can be regarded 'agricultural' as it has been in continuous or discontinuous agricultural use (according to Corine Land Cover (CLC) between 1990 and 2012)

Evaluation of results

The marginal land map for Europe was evaluated in expert meetings. Google Earth (GE) and Google Street View (GSV) were used for verification of the maps. It was noted that in cases where multiple limitations occur, the marginal land predictions are most reliable. The correction for management is effective, although it does not eliminate all intensively managed areas from the marginal land areas.

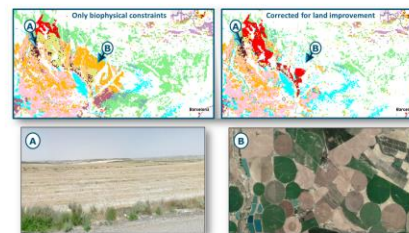


Figure 2. Validation of the correction for land improvements with the help of Google Street View in the Ebro Valley (Spain). Area "A" remains marginal with salinity, fertility, and rooting limitations, while the dryness in area "B" is neutralized by large scale center-pivot irrigation.

Conclusions

- Based on the outcomes of the expert verifications we conclude that the results are promising and useable at a resolution of 1 km².
- Future improvements will be made by using field information and high resolution spatial information. This will improve the reliability of the map at higher resolution (< 1km²) and will provide a better understanding of current uses and options for industrial cropping.
- See the MAGIC website for a link to a map viewer, which enables dynamic exploration of the resulting map.



<http://magic-h2020.eu>

This poster is presenting the work performed in Work Package 2 of the project, MAGIC Marginal lands for Growing Industrial Crops: Turning a burden into an opportunity.

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