

An approach to detect suitable marginal lands for bioenergy crops in Europe (SeemLa project)

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Sustainable exploitation of biomass for bioenergy from marginal lands in Europe

Project coordinator



Partner



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SEEMLA partners

1. Agency for Renewable Resources (FNR)
2. Brandenburg University of Technology Cottbus-Senftenberg (b-tu)
3. Institute for Energy and Environmental Research (ifeu)
4. Legambiente Onlus
5. Democritus University of Thrace
6. Decentralised Administration of Macedonia & Thrace
7. Salix Energy Ltd.
8. Institute of Bioenergy Crops and Sugar Beet



Marginal Land and bioenergy production



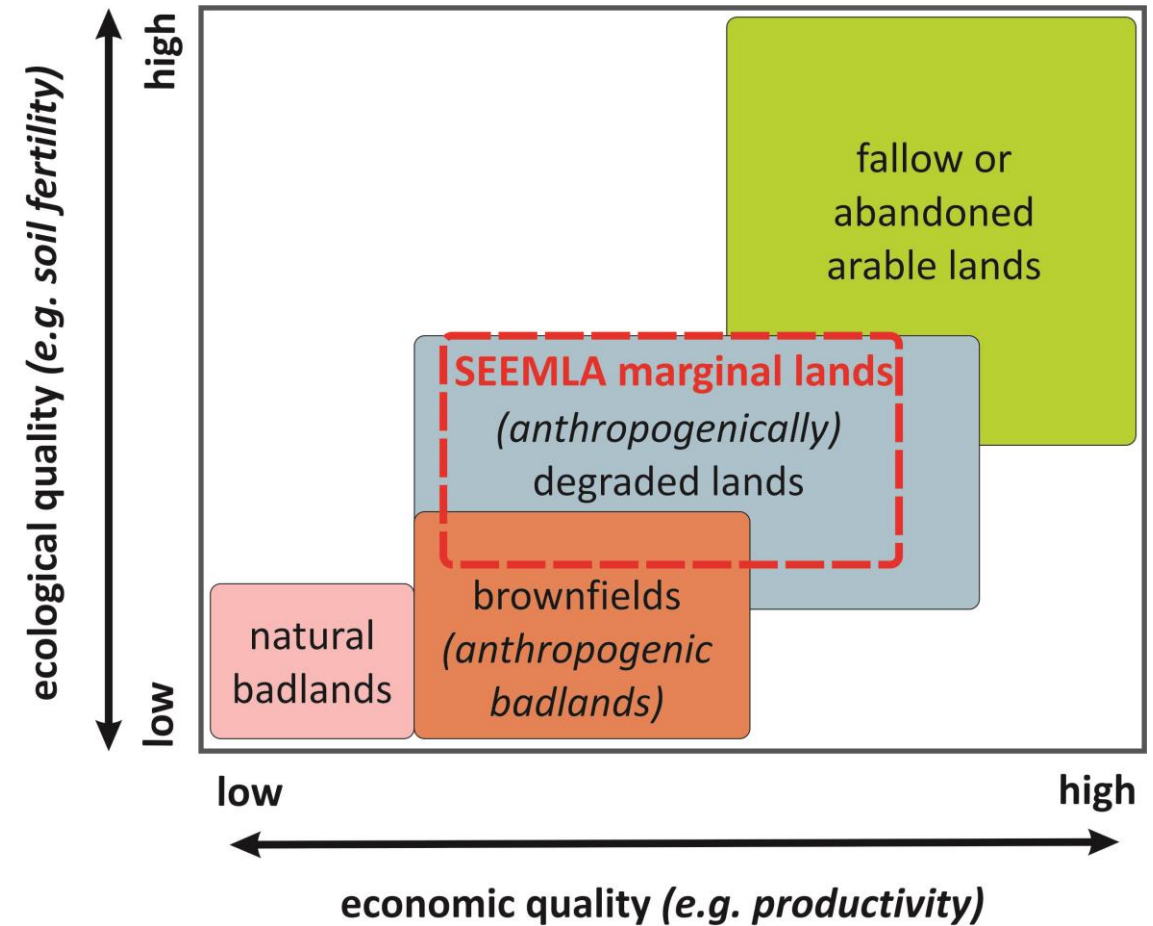
The SEEMLA GIS tool concept

1. MagL Definition

Land with poor site conditions due to low soil fertility and clear economic inefficiencies with regard to agricultural usability.

Excluding:

- sites with potentially high productivity set aside or temporarily abandoned due to certain socio-economic reasons
- badlands with naturally extreme low soil fertility as well as most parts of brownfields or anthropogenic wastelands

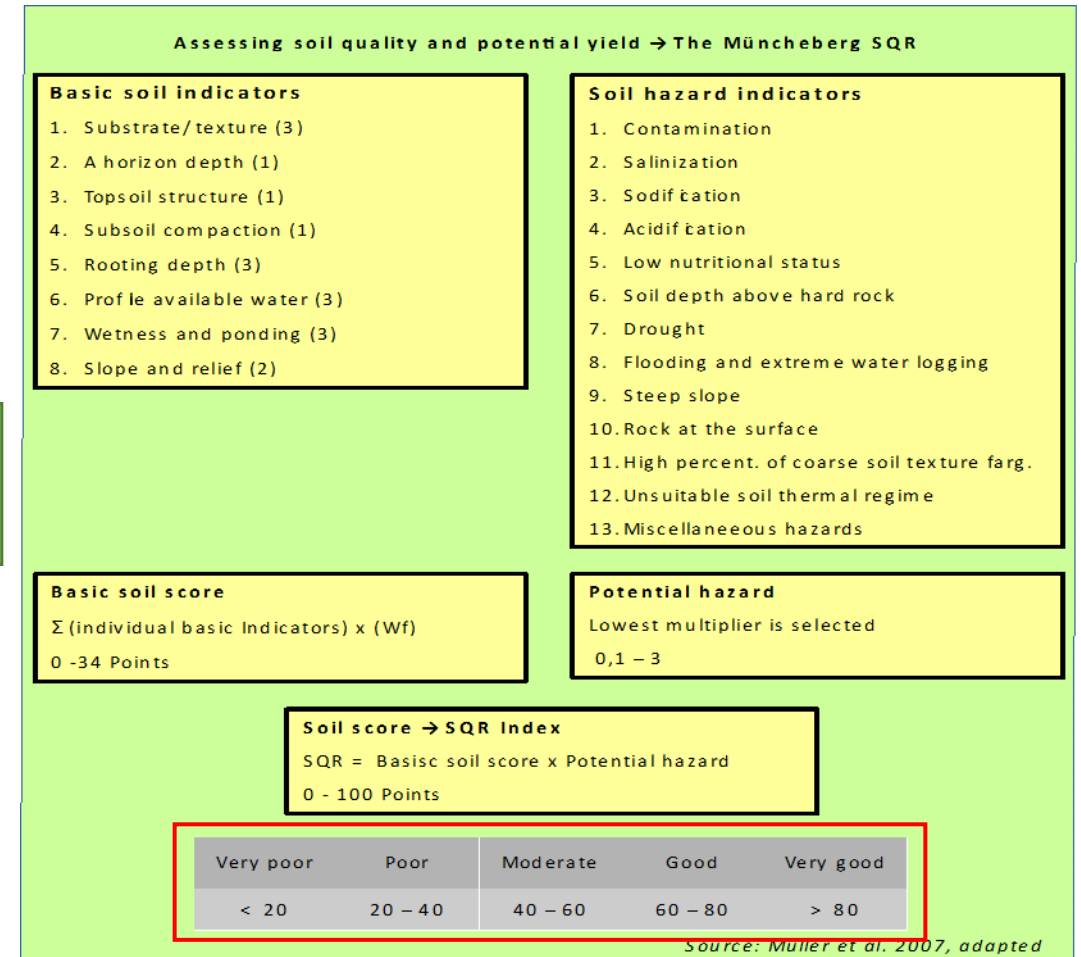


Dauber et al. 2012, adapted by BTU

The SEEMLA GIS tool concept

1. MagL Definition

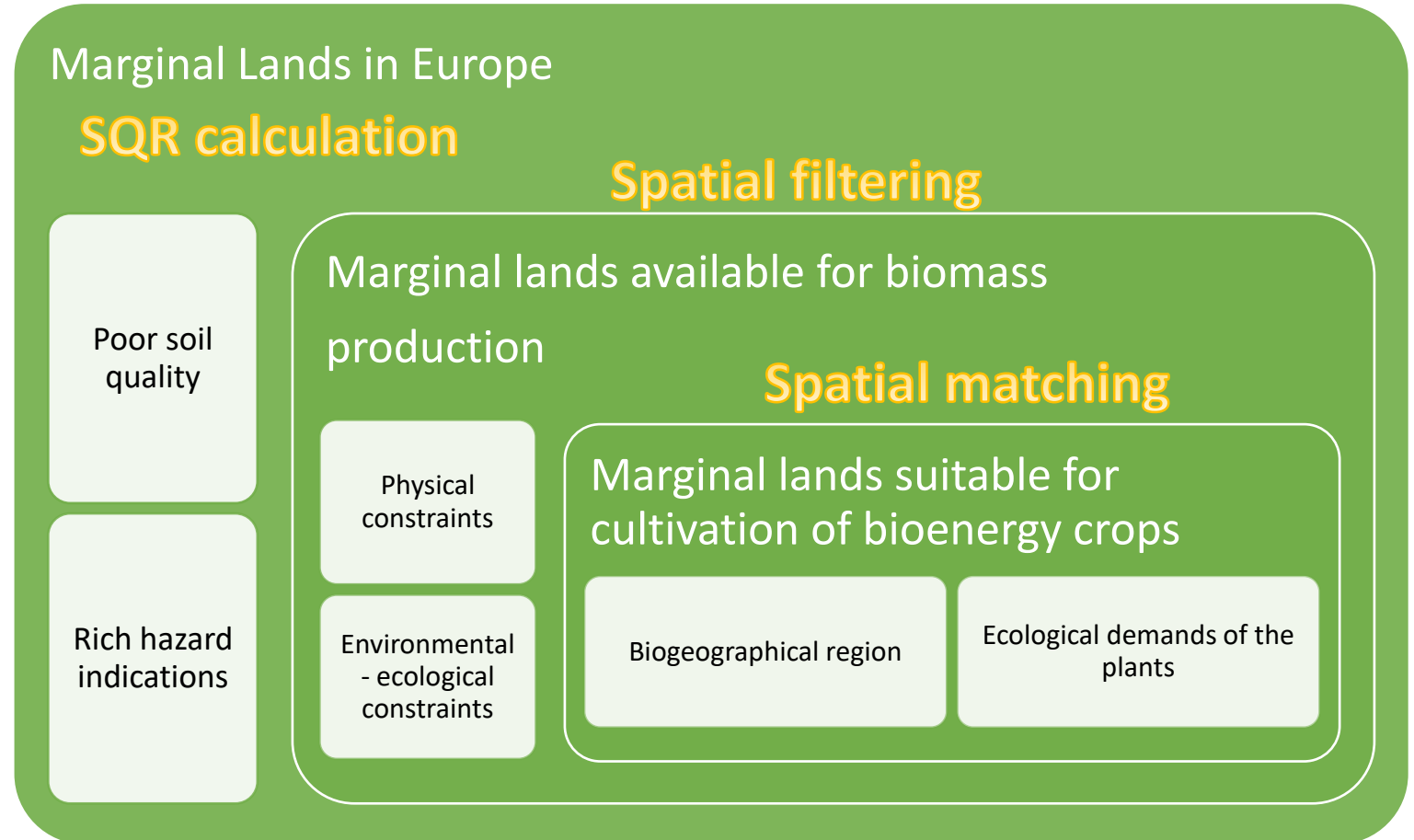
Sites with calculated SQR scores below 40 indicate MagLs within the SEEMLA context.



Muencheberg Soil Quality Rating system (SQR), developed by Mueller et al. (2007), and applied by BTU-CS in pilot fields survey

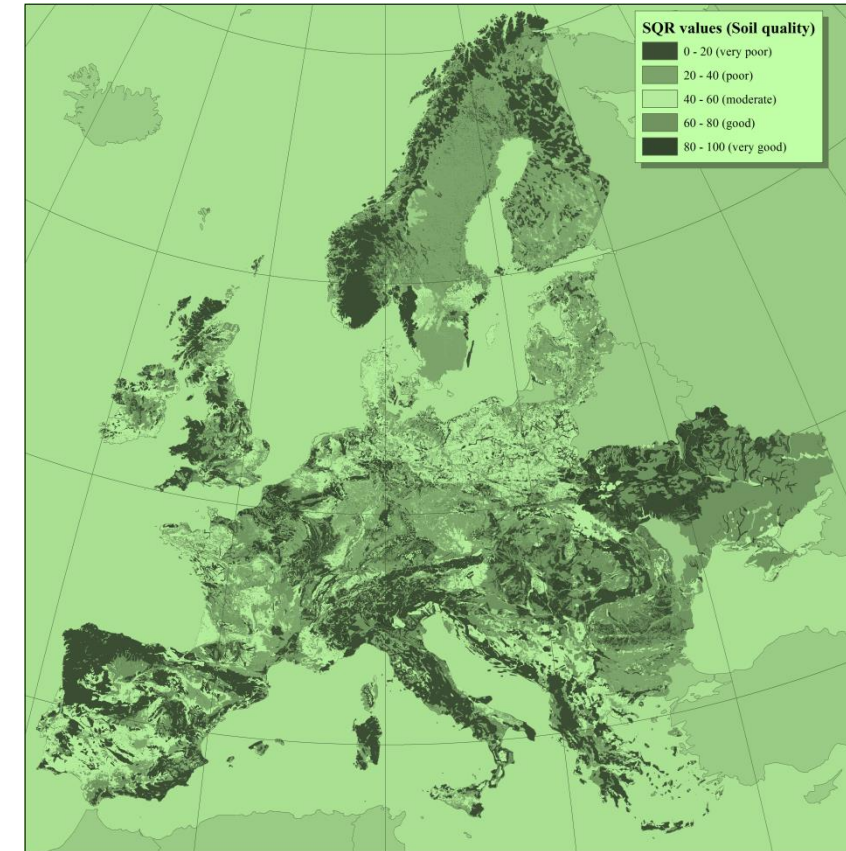
The SEEMLA GIS tool concept

1. MagLs Definition
2. MagLs Identification (regionalization)



The SEEMLA GIS tool concept

1. MagL Definition
2. MagL Identification (regionalization)



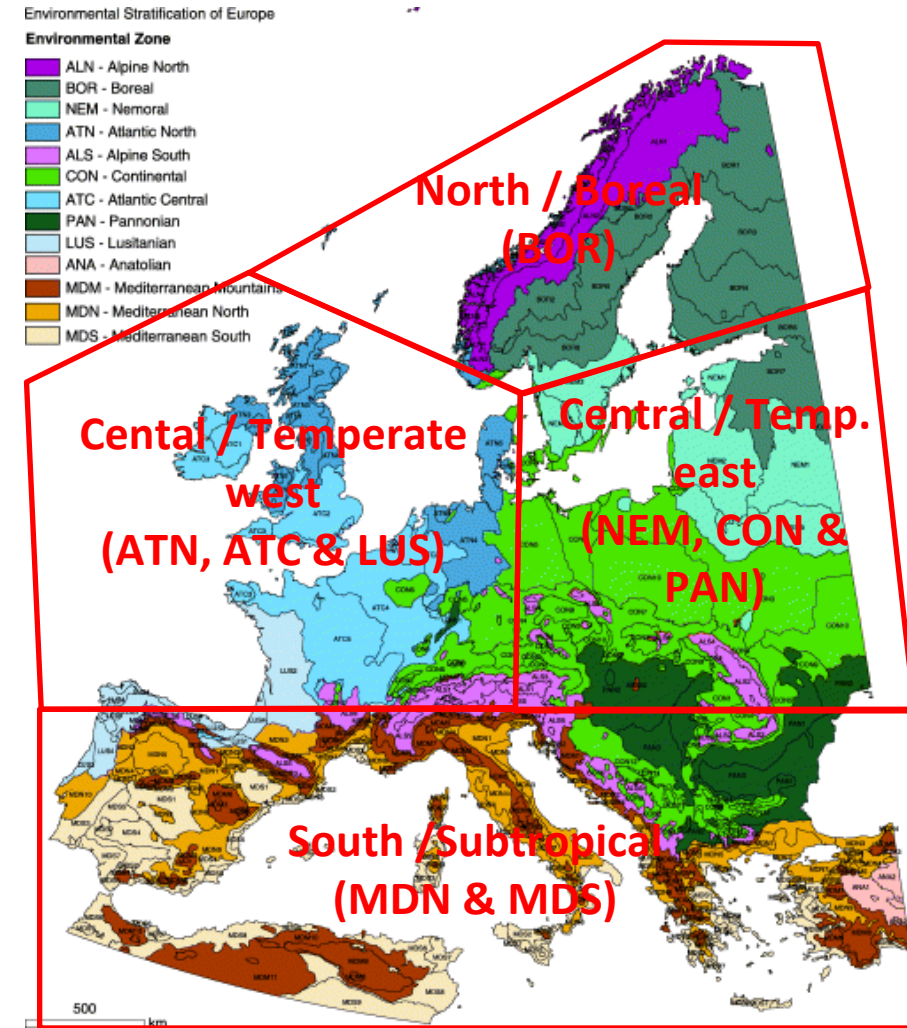
The SEEMLA GIS tool concept

1. MagL Definition
2. **MagL Identification (regionalization)**

| Data sources |
|---|
| FAO Harmonized World Soil Database (HWSD) v 1.2 |
| ESDAC European Soil Database distribution v2.0 |
| WorldClim - Global Climate Data |
| Köppen-Geiger Climate Classification Institute for Veterinary Public Health |
| NASA-Shuttle Radar Topography Mission (SRTM) digital elevation model |
| Protected areas in Europe - European Environment Agency (EEA) |
| World Database on Protected Areas (UNEP & IUCN) |
| High nature value (HNV) farmland - European Environment Agency (EEA) |
| Corine Land Cover v.18.5.1 - EEA Copernicus programme |

The SEEMLA GIS tool concept

1. MagL Definition
2. MagL Identification (regionalization)



The SEEMLA GIS tool concept

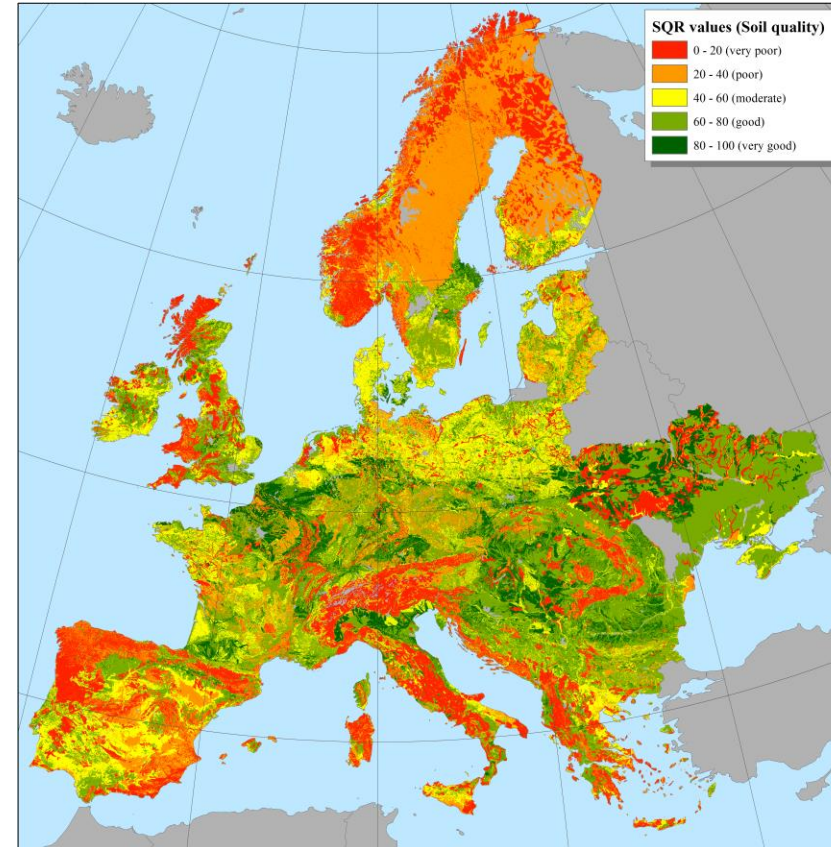
1. MagL Definition

2. MagL Identification (regionalization)

| Common name | Scientific name | Climatic zone |
|----------------|--------------------------------------|--|
| Aleppo pine | <i>Pinus halepensis</i> Miller | Mediterranean |
| Calabrian pine | <i>Pinus brutia</i> Ten. | Mediterranean |
| Black pine | <i>Pinus nigra</i> | Atlantic Continental Mediterranean |
| Poplar | <i>Populus</i> sp. L | Atlantic Continental Mediterranean |
| Basket willow | <i>Salix viminalis</i> L. | Atlantic Continental |
| Miscanthus | <i>Miscanthus</i> × <i>giganteus</i> | Atlantic Continental |
| Giant reed | <i>Arundo donax</i> L. | Mediterranean |
| Switchgrass | <i>Panicum virgatum</i> L. | Atlantic Continental Mediterranean |

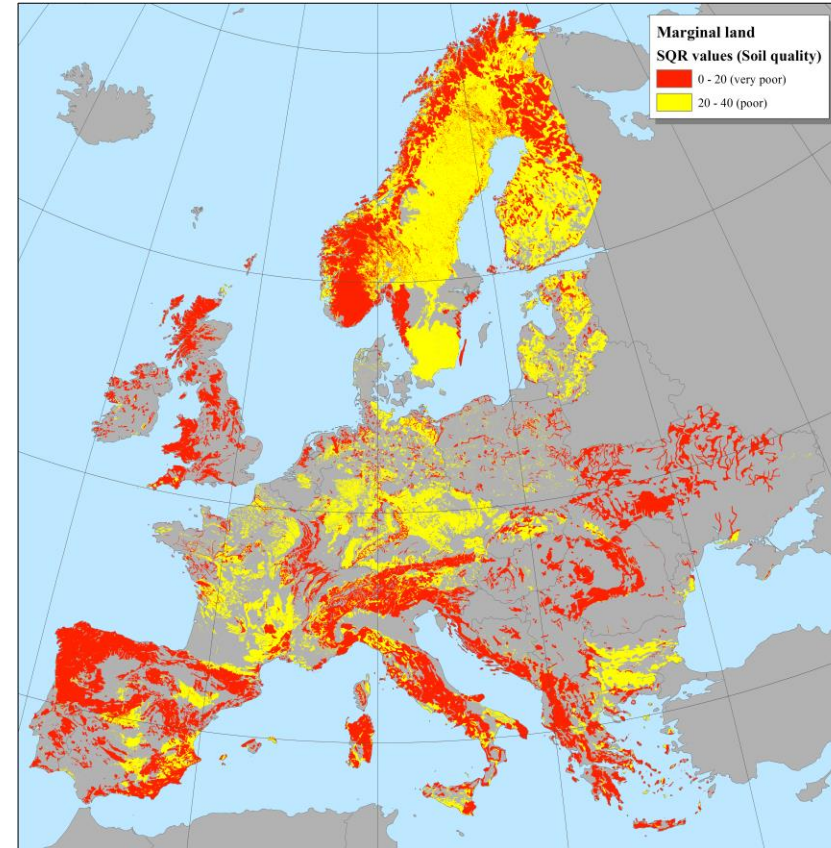
The SEEMLA GIS Tools results

1. **MagLs Definition (calculate SQR)**
2. MagLs Identification (regionalization)



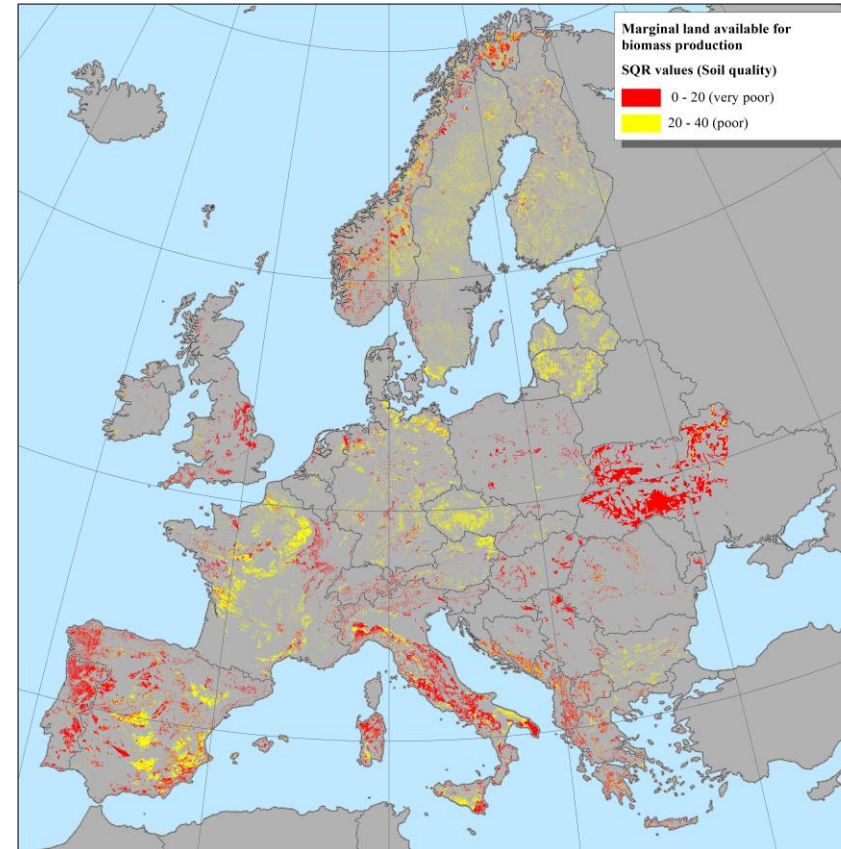
The SEEMLA GIS Tools results

1. MagLs Definition ($SQR \leq 40$)
2. MagLs Identification (regionalization)



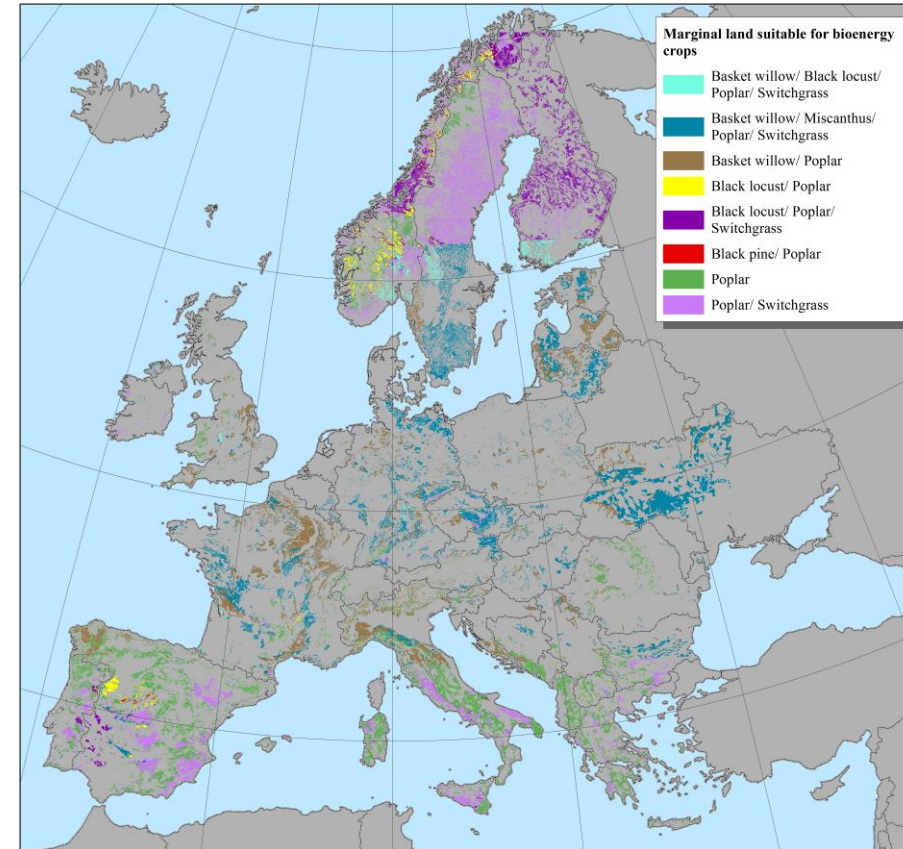
The SEEMLA GIS Tools results

1. MagLs Definition ($SQR \leq 40$)
2. MagLs Identification (regionalization)



The SEEMLA GIS Tools results

1. MagLs Definition ($SQR \leq 40$)
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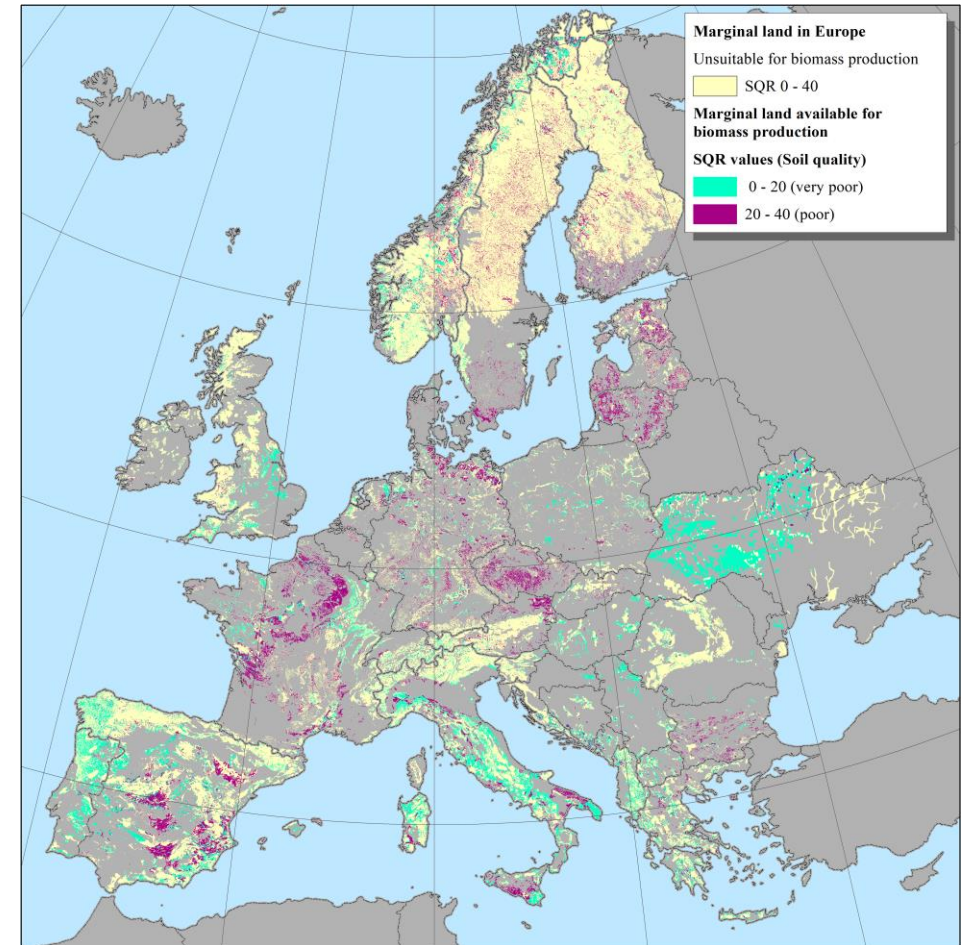


The SEEMLA GIS Tools results

1. MagLs Definition ($SQR \leq 40$)
2. MagLs Identification (regionalization)

Less than 25% of MagL in Europe is considered **suitable for the production of bioenergy resources**, covering an area of 54 Mha, with 40 Mha located within the European Union (EU26).

| SQR values | Marginal Land (Mio ha) | Marginal Land available for biomass (Mio ha) | Marginal Land available for biomass (%) |
|------------|------------------------|--|---|
| ≤ 40 | 224 | 54 | 24.1% |



The SEEMLA website
www.seemla.eu

Thank you for your attention

