Soil Indicator Dashboards

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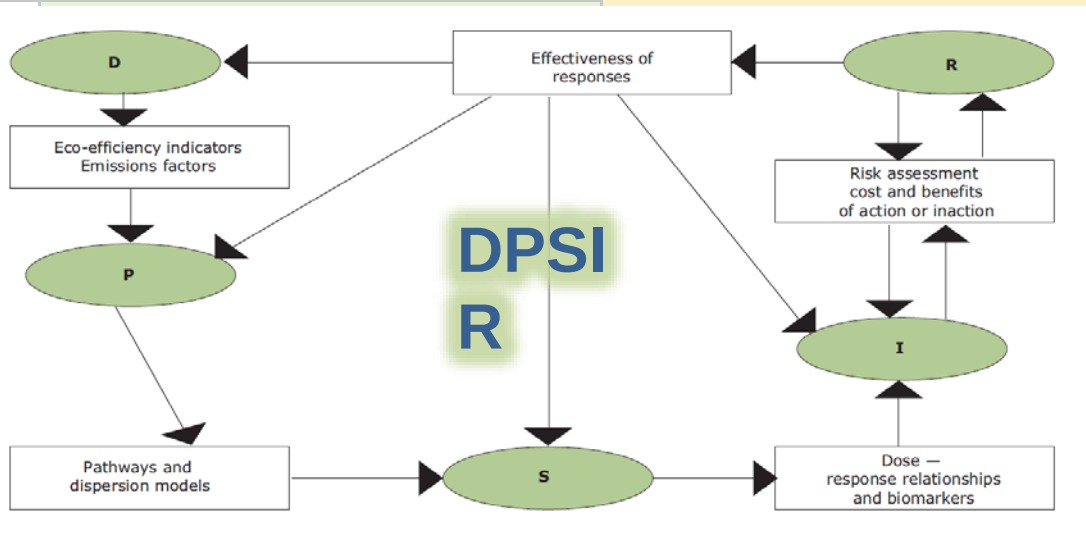
European Environment Agency

State and Outlook of the Environment Report

SOER 2020 – examples

- **137 EEA thematic indicators**
  - Reporting template with specifications and results
  - Soils: lack of policy, largely lack of reporting (except: LULUCF, NEC), indicators are incomplete

Air Pollution	Past trends (10-15 years)	Outlooks 2030
Emissions of air pollutants	nds show a mixed picture	Developments show a mixed picture
Concentrations of air pollutants	Improving trends dominate	
Air pollution impacts on human health and wellbeing		
Air pollution impacts on ecosystems		
Chemical Pollution		
Emissions of chemicals		
Impacts of chemical pollution on ecosystems		
Chemical pollution and risk to human health and well-beir		
Industrial Pollution		
Pollutant emissions from industry		picture
Clean industrial technologies and processes		
Freshwater		
Pollution pressures on water and links to human health	Developments show a mixed picture	Developments show a mixed picture
Land and Soil		
Soil condition	Deteriorating trends dominate	Deteriorating developments dominate



Soil dashboards: synthesis on status and trend

Indicators Assessments

Status of the World's Soil Resources (FAO and ITPS, 2015, **2025, ff**)

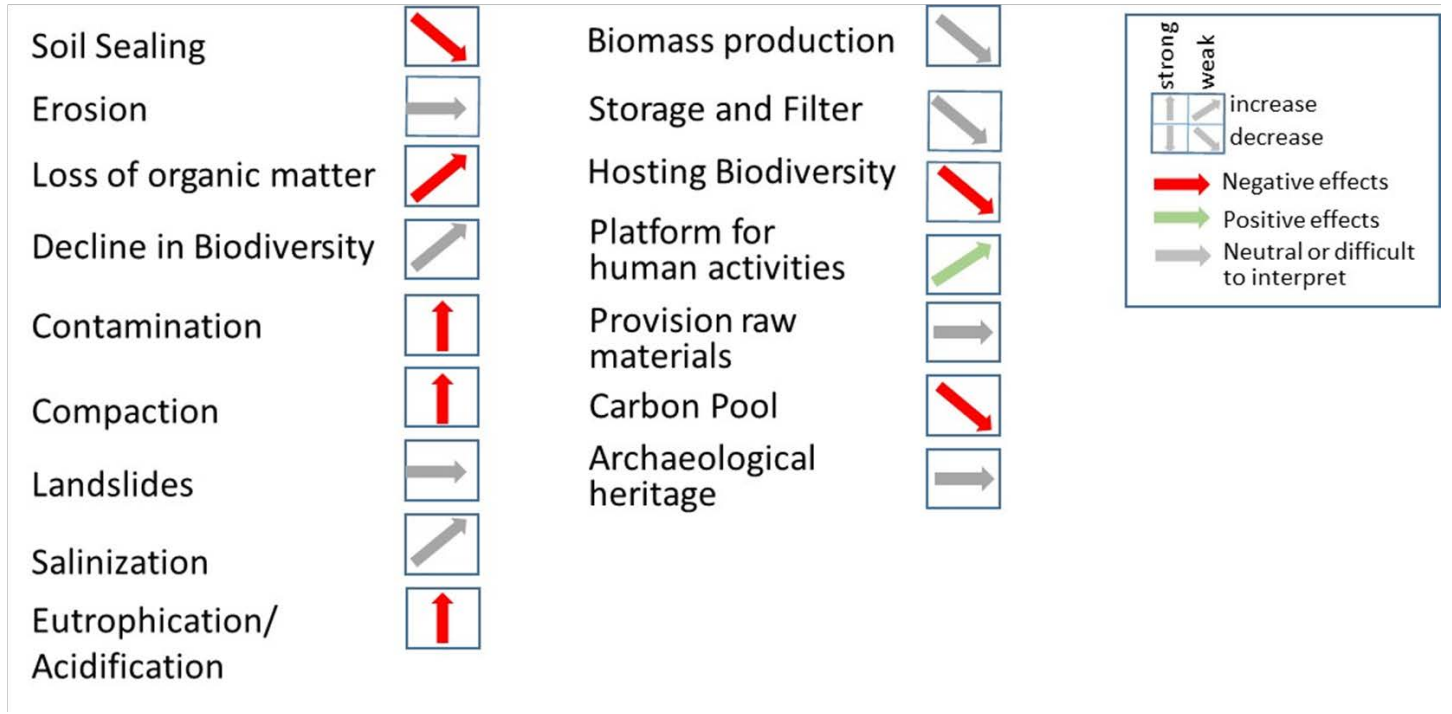
SOER 2020, **2025, 2030, ff**

(EEA 2019, conceptual)

European Soil Condition Assessments (ca. 10 cycles, 2020 ongoing)

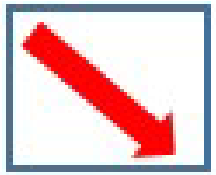
Global Summary of Threats to Soil Functions

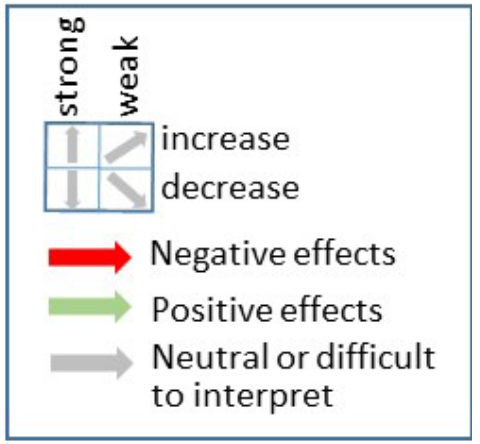
Region	Soil erosion	Organic carbon change	Nutrient imbalance	Salinization	Soil sealing	Loss of biodiversity	Soil pollution	Acidification	Compaction	Water-logging	Comments
Europe and Eurasia	Fair	Poor	Poor	Poor	Poor	Fair	Poor	Poor	Fair	Fair	In densely populated Western Europe, soil ealing is one of the most threatening phenomena. Salinization is a widespread threat in Central Asia and in some areas in Spain, Hungary, Turkey, and Russia.



EXAMPLE to showcase from an existing dashboard

Soil Sealing





European Environment Agency

DASHBOARD (TABLEAU)

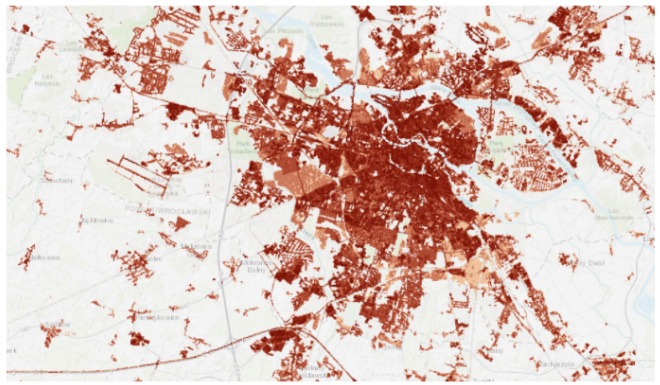
Imperviousness in Europe

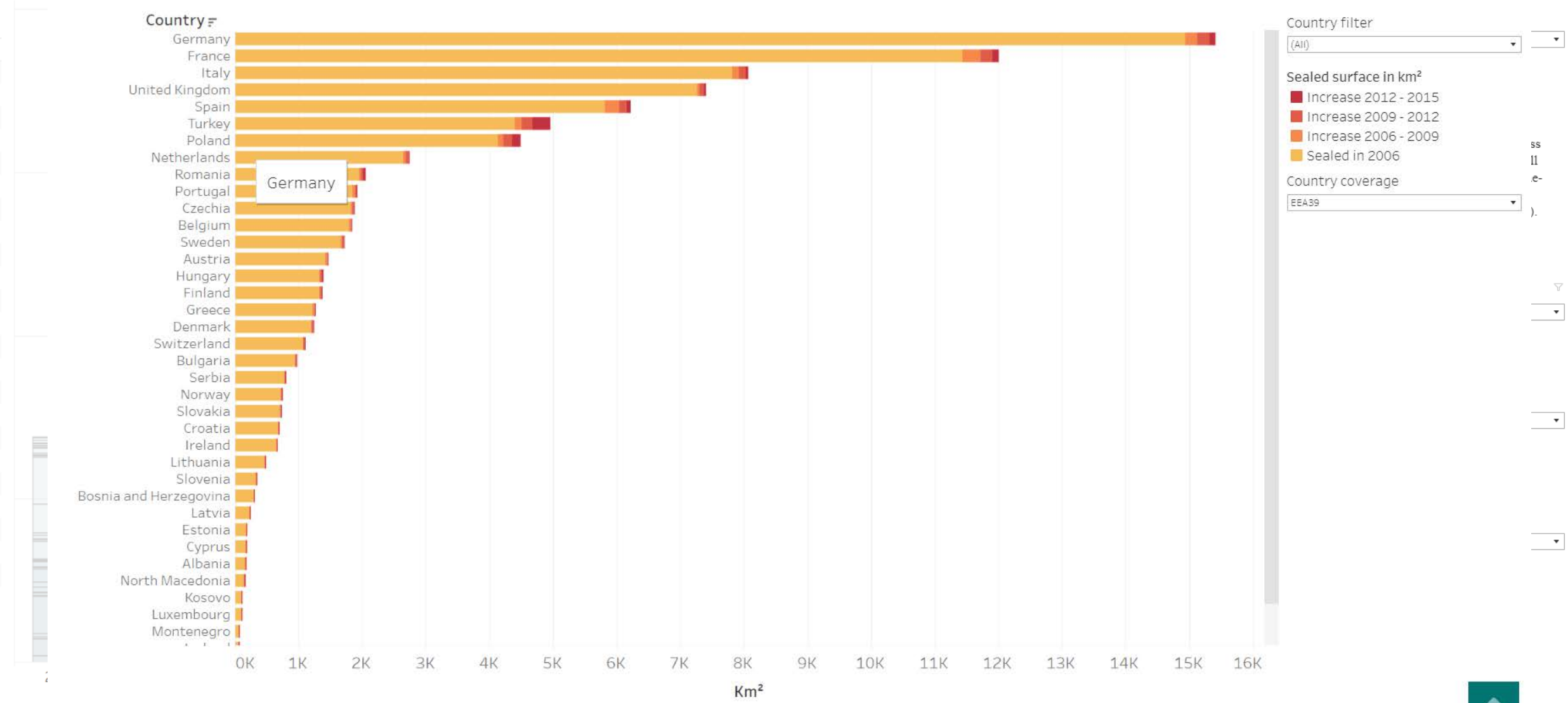
This interactive data viewer provides accounts of land surface sealing status and change in Europe (EEA39 and EU28) for every 3 years between 2006 and 2015, measured by the high resolution Copernicus imperviousness datasets. The viewer facilitates the assessment of soil sealing over a specific period, which can be analyzed within user defined spatial units such as administrative

The indicator | Europe in numbers | Sealed surface change per country years | Sealed surface per NUTS3 | Sealed surface increment | Sealing increase compared 2006 | Annual change rate 2006-2015 | Relative sealed surface by country(%) | Sealed surface in Corine Land Cover classes

Imperviousness: accounting for the sealed land surface

The imperviousness indicator viewer illustrates land surface sealing status and change in Europe (EEA39 and EU28) as measured by the high resolution Copernicus imperviousness datasets (https://www.eea.europa.eu/data-and-maps/data/copernicus-land-monitoring-service-imperviousness-2 and https://land.copernicus.eu/pan-european/high-resolution-layers/imperviousness). The datasets are produced for the years 2006, 2009, 2012, 2015. The change layers address the changes between the layers 2006-2009, 2009-2012, and 2012-2015. The imperviousness change value for a 100m raster cell is based on 100m imperviousness change products. In the viewer, values are indicated in km^2 per the status year, while the surface of change is expressed in km^2 and in percentage. The default reference unit is countries, but the indicator can be aggregated based in various different spatial units (e.g. biogeographical regions or MAES ecosystems). The aggregation of imperviousness values to reference units is performed using the LEAC CUBE method.

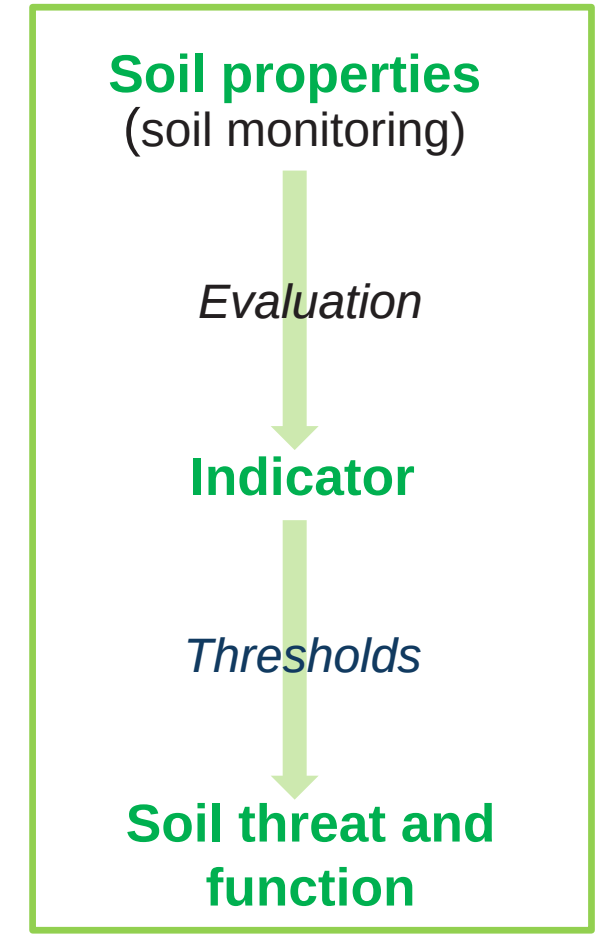



Country
Germany
France
Italy
United Kingdom
Spain
Turkey
Poland
Netherlands
Romania
Portugal
Czechia
Belgium
Sweden
Austria
Hungary
Finland
Greece
Denmark
Switzerland
Bulgaria
Serbia
Norway
Slovakia
Croatia
Ireland
Lithuania
Slovenia
Bosnia and Herzegovina
Latvia
Estonia
Cyprus
Albania
North Macedonia
Kosovo
Luxembourg
Montenegro
Germany
0K 1K 2K 3K 4K 5K 6K 7K 8K 9K 10K 11K 12K 13K 14K 15K 16K
Km²
Country filter
(All)
Sealed surface in km²
Increase 2012 - 2015
Increase 2009 - 2012
Increase 2006 - 2009
Sealed in 2006
Country coverage
EEA39

Towards an indicator set for soil monitoring in Europe

Functional soil quality indicators – Definitions and thresholds
EEA, ETC/ULS, NRC Soil **(draft Dec 2020, EIONET review Jan 2021)**

Soil carbon loss	a) Minimum/optimal SOC levels b) SOC sequestration potential
Soil nutrient balance (soil fertility)	Critical N limits Critical P limits
Acidification	a) Critical pH levels for agricultural (crop) land b) Critical levels of dissolved free aluminium, and base cation/aluminium ratio in forest soils
Soil Contamination	Critical levels for Pb, Cd, Cu, Zn
Loss of Biodiversity	Operating ranges (OR) for specific soil animals and microorganisms (temperature, pH, C/N)
Soil loss by water erosion	Critical erosion rates
Soil Compaction	Evaluation matrix for current pore volume or BD needed
Soil sealing	Sealing index (impervious soil coverage) below target reduction



Key messages

- **Previous and current soil assessments lack complete, representative and reliable soil and soil-related information**
- **Targets** are needed for protecting soil and the functions it provides
- **Policy context** exists, but was not sufficient in the past: climate and air policies, environmental policies including agriculture
- **Country involvement** in information development is crucial (technically, INSPIRE allows…)
- A **soil indicator set** is needed (specifications, policy context, use cases)
- **EUSO-Dashboards** could then present geographic soil data and information, quasi as a **Soil barometer**), to inform a broad audience, and to support decision making