

Available knowledge for European ecosystems assessment:

Overview and data specifications



Prepared by:
Dania Abdul Malak

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Project Manager:
Markus Erhard

European Environment Agency



UNIVERSIDAD
DE MÁLAGA

University of Malaga - ETC SIA
Edificio CAITI, Módulo B, 2ª planta A
C/ Dr. Ortiz Ramos, s/n Ampliacion
Campus Teatinos
29071 MALAGA,
Spain

Tel.: +34 951952998

Contact: etc-sia@uma.es



MINISTERIO DE AGRICULTURA, ALIMENTACIÓN Y MEDIO AMBIENTE



	Ecosystem condition	Major drivers of ecosystem change				
Ecosystem type	Condition (state)	Habitat change	Climate change	Overexploitation (unsustainable management)	Invasive species	Pollution and Nutrient Enrichment
Biodiversity level	<ul style="list-style-type: none"> - HD and BD reporting obligations - IUCN European species assessments - Birdlife International species assessments - Species and habitats accounts of European conservation importance - EEA's on-going fast track implementation methodology of biodiversity and species accounts (ecosystem accounting methodology) - Thematic High Resolution Layers 	<ul style="list-style-type: none"> - HD and BD reporting obligations - IUCN European species assessments - Birdlife International species assessments - Species and habitats accounts of European conservation importance - Landscape fragmentation - Loss of accessibility for migratory fish due to dams in major European river basins 	<ul style="list-style-type: none"> - ESPON climate - EFFIS 	<ul style="list-style-type: none"> - HNV forest - AEI4 Indicator on Area under organic farming - AEI23 indicator on HNV farmland - Carbon accounts on timber extraction and grazing livestock - CSI032 Indicator on Status of marine fish stocks - FAO fishstats 	<ul style="list-style-type: none"> - SEBI10 Indicator on Invasive alien species in Europe - EASIN network - Trends and pathways of Marine Alien Species (upcoming datasets: EEA) 	<ul style="list-style-type: none"> - Air quality Directive - Nitrates Directive - SEBI9 Indicator on Critical load exceedance for nitrogen - Exceedance of pesticides in soils - Heavy Metals input-output balance - Critical levels of ozone damage assessment
Woodland and forest	<ul style="list-style-type: none"> - HD and BD reporting obligations - CLC - JRC Forest Type Map 2006 - HNV forest area, Naturalness - Pan-European map on growing stock - EFI dataset, EFISCEN database - UNECE/FAO/Forest: Europe statistics - CORILIS radius 0, NDVI - Pan-European map of forest biomass increment (FISE). 	<ul style="list-style-type: none"> - HD and BD reporting obligations - CLC - JRC Forest Type Map 2006 - HANTS NDVI - JRC Forest Pattern, Fragmentation and Connectivity - SEBI13 Indicator on fragmentation of natural and semi-natural areas - IUCN European species assessments - Birdlife International species assessments 	<ul style="list-style-type: none"> - CLC - Natura 2000 database - World Fire Atlas - JRC Eurosoil - OEROK 2011, - JNCC 2010 - HANTS NDVI - ESPON climate - EFFIS - Maps on impacts of CC on tree species distribution (FISE/EFDAC). 	<ul style="list-style-type: none"> - HNV forest - Nutrient accounts - SEBI17 Indicator on forest (growing stock, increment and felling) - NFI datasets 2005 - Carbon accounts on timber extraction and grazing livestock - Timber provision (JRC, based on AFOLU and EFISCEN) - Pan-European map on growing stock - Forest productivity (forest biomass) - JRC Forest Pattern, Fragmentation and Connectivity - Forest mapping - Private forest ownership map - EFFIS 	<ul style="list-style-type: none"> - SEBI10 Indicator on Invasive alien species in Europe - EASIN network 	<ul style="list-style-type: none"> - Air quality Directive - Nitrates Directive - SEBI9 Indicator on Critical load exceedance for nitrogen - Critical levels of ozone damage assessment - Nutrient accounts – Methodology development for N and P accounts per ecosystem type - HAIR2010 - Heavy Metals input-output balance - E-PRTR
Grassland	<ul style="list-style-type: none"> - HD and BD reporting obligations - CLC - HR layer on grassland - LEAC tools - FAO livestock map - JRC nitrogen map - Eurostat Livestock statistics - Grazed biomass 	<ul style="list-style-type: none"> - HD and BD reporting obligations - CLC - HR layer on grassland - HANTS NDVI - Landscape fragmentation - Carbon accounts - HNV farmlands - AEI4 Indicator on Area under organic farming - IUCN European species assessments - Birdlife International species assessments 	<ul style="list-style-type: none"> - CLC - ESPON climate - World Fire Atlas - HANTS NDVI - EFFIS 	<ul style="list-style-type: none"> - HNV farmlands - AEI4 Indicator on Area under organic farming - Nutrient accounts – Methodology development for N and P accounts per ecosystem type - Carbon accounts on grazing livestock - European Topsoil Organic Carbon content (OCTOP) 	<ul style="list-style-type: none"> - SEBI10 Indicator on Invasive alien species in Europe - EASIN network 	<ul style="list-style-type: none"> - Air quality Directive - Nitrates Directive - SEBI9 Indicator on Critical load exceedance for nitrogen - Critical levels of ozone damage assessment - Nutrient accounts – Methodology development for N and P accounts per ecosystem type - Heavy Metals input-output balance
Heathland and shrub	<ul style="list-style-type: none"> - HD and BD reporting obligations - CLC - LEAC tools - Biogeographical regions layer 	<ul style="list-style-type: none"> - HD and BD reporting obligations - CLC - HANTS NDVI - EFFIS - Landscape fragmentation - IUCN European species assessments - Birdlife International species assessments 	<ul style="list-style-type: none"> - CLC - ESPON climate - World Fire Atlas - HANTS NDVI - EFFIS 	<ul style="list-style-type: none"> - HANTS NDVI 	<ul style="list-style-type: none"> - SEBI10 Indicator on Invasive alien species in Europe - EASIN network 	<ul style="list-style-type: none"> - SEBI9 Indicator on Critical load exceedance for nitrogen - Nutrient accounts – Methodology development for N and P accounts per ecosystem type
Agro-ecosystems (cropland)	<ul style="list-style-type: none"> - Biomass harvested - Eurostat Statistics: crop account and land use change - CAPRI LU maps - Carbon accounts – crop production in arable land 	<ul style="list-style-type: none"> - CLC - HANTS NDVI - AEI4 Indicator on Area under organic farming - AEI23 indicator on HNV farmland - CSI14, Land take indicator 	<ul style="list-style-type: none"> - ESPON climate - EFFIS 	<ul style="list-style-type: none"> - Nutrient accounts - Carbon accounts on grazing livestock and arable land - AEI4 Indicator on Area under organic farming - AEI23 indicator on HNV farmland 	<ul style="list-style-type: none"> - SEBI10 Indicator on Invasive alien species in Europe - EASIN network 	<ul style="list-style-type: none"> - Air quality Directive - Nitrates Directive - SEBI9 Indicator on Critical load exceedance for nitrogen - Critical levels of ozone damage assessment

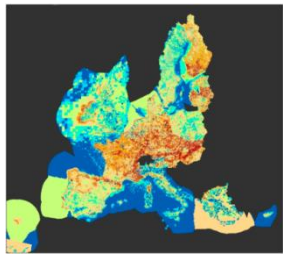
Rivers and lakes	<ul style="list-style-type: none"> - <u>WFD</u> - <u>ECRINS</u> - <u>River basin Districts (RBDs)</u> - <u>CLC</u> - <u>JRC MARS</u> - <u>ETR Evapotranspiration</u> - <u>EEA ORNL's Landscan</u> - <u>FEC</u> - <u>WISE</u> - <u>Waterbase</u> * 	<ul style="list-style-type: none"> - <u>CLC</u> - <u>ECRINS</u> - <u>Waterbase</u> - <u>Loss of accessibility for migratory fish due to dams in major European river basins-</u> - <u>IUCN European species assessments</u> - <u>Birdlife International species assessments</u> 	<ul style="list-style-type: none"> - <u>ESPON climate</u> 	<ul style="list-style-type: none"> - <u>ECRINS</u> - <u>Loss of accessibility for migratory fish due to dams in major European river basins</u> - <u>Waterbase</u> 	<ul style="list-style-type: none"> - <u>MAS (upcoming 2 indicators per MSFD area by EEA (expected 2014))</u> - <u>SEBI10 Indicator on Invasive alien species in Europe</u> - <u>EASIN network</u> 	<ul style="list-style-type: none"> - <u>Air quality Directive</u> - <u>Nitrates Directive</u> - <u>Urban Waste Water Treatment Directive (UWWTD)</u> - <u>WFD: Mean annual nitrates in rivers reported by MS</u> - <u>SEBI9 Indicator on Critical load exceedance for nitrogen</u>
Wetlands	<ul style="list-style-type: none"> - <u>HD and BD reporting obligations</u> - <u>WFD</u> - <u>CLC</u> - <u>LEAC tools</u> - <u>HRL wetland</u> - <u>Satellite imagery</u> - <u>Ramsar layer on wetlands</u> 	<ul style="list-style-type: none"> - <u>HD and BD reporting obligations</u> - <u>CLC</u> - <u>LEAC tools</u> - <u>HRL wetland</u> - <u>IUCN European species assessments</u> - <u>Birdlife International species assessments</u> - <u>Loss of accessibility for migratory fish due to dams in major European river basins</u> - <u>Wetlands inventories and land use/land cover layers</u> * 	<ul style="list-style-type: none"> - <u>ESPON climate</u> 	<ul style="list-style-type: none"> - <u>Multi-temporal satellite imagery</u> - <u>Wetland indicators developed by ETC-SIA (section 3.6.2.1. of the EA Methodology report)</u> - <u>Wetlands inventories and land use/land cover layers</u> 	<ul style="list-style-type: none"> - <u>SEBI10 Indicator on Invasive alien species in Europe</u> - <u>EASIN network</u> 	<ul style="list-style-type: none"> - <u>Air quality Directive</u> - <u>Nitrates Directive</u> - <u>WFD: Mean annual nitrates in rivers reported by MS</u> - <u>SEBI9 Indicator on Critical load exceedance for nitrogen</u>
Marine	<ul style="list-style-type: none"> - <u>HD and BD reporting obligations</u> - <u>MSFD (upcoming datasets)</u> - <u>CLC</u> - <u>Art. 17 Species distribution</u> - <u>Art. 12 Birds conservation status</u> - <u>Ecosystem map (ETC/SIA 2013)</u> - <u>Natura 2000 database</u> - <u>EU Sea map</u> - <u>Waterbase</u> 	<ul style="list-style-type: none"> - <u>HD and BD reporting obligations</u> - <u>MSFD (upcoming datasets)</u> - <u>IUCN European species assessments</u> - <u>Birdlife International species assessments</u> - <u>Loss of accessibility for migratory fish due to dams in major European river basins</u> 	<ul style="list-style-type: none"> - <u>ESPON climate</u> - <u>EMIS portal and data</u> 	<ul style="list-style-type: none"> - <u>Common Fisheries Policy (CFP)</u> - <u>MSFD (upcoming datasets)</u> - <u>CSI032 Indicator on Status of marine fish stocks</u> - <u>CSI034 Indicator on Fishing fleet capacity</u> - <u>FAO fishstats</u> - <u>CSI 033 Indicator on Aquaculture production</u> - <u>Biomass surveys and analysis of commercial catch per unit effort (CPUE)</u> 	<ul style="list-style-type: none"> - <u>SEBI10 Indicator on Invasive alien species in Europe</u> - <u>Trends and pathways of Marine Alien Species (upcoming datasets: EEA)</u> 	<ul style="list-style-type: none"> - <u>Air quality Directive</u> - <u>Nitrates Directive</u> - <u>CSI021 Indicator on Nutrients in transitional, coastal and marine waters</u> - <u>CSI023 Indicator on Chlorophyll in transitional, coastal and marine waters</u> - <u>MAR001 Indicator on Hazardous substances in marine organisms</u> - <u>Regional Sea Conventions monitoring networks</u>

Data availability			
Low	Moderate	High	Very High

* Only the most relevant knowledge available is listed in this table. Please refer to the "Towards a Pan-European ecosystem assessment report (ETC-SIA 2013) for more details

MAES table 4. Synthesis Table providing an overview on the relevance and gaps present in the available knowledge for European ecosystems assessment.

Biodiversity**Appendix 1. Species and habitats accounts of European conservation importance**

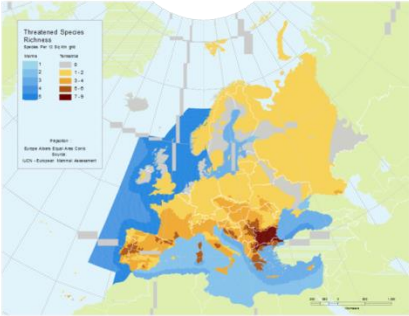
Name of the data set:	
Species and habitats of European conservation importance	
Description of the information content:	
<p>The aim of developing the accounts is to track and register the species and habitats numbers per unit area, and their conservation status and changes in either number or status in time. The paper describes how three spatially explicit accounts have been made using the distributional data within the Article 17 records in conjunction with European CORINE land cover data. These are: the total number of species or habitats of conservation importance present in a given area; the species' prevailing trends of change for population size or habitats' trend of change in area coverage; and prevailing future prospects for species. The species and habitat accounts presented here are designed to complement other ecosystem accounting elements, such as land accounts, biomass/primary production and water accounts, which together represent a composite ecosystem capital accounting framework.</p> <p>Main sources of data: CORINE land cover (CLC) 2006 Art. 17 Conservation Status data and Species distribution - EEA / ETC-DB Art. 12 Birds conservation status Ecosystem types from Biodiversity Baseline - EEA / DG. Env – BISE Biogeographic regions - EEA / ETC-DB NLEP – Net Landscape Ecological Potential - EEA DLT - Dominant Land Cover Types – EEA Natura 2000 – The European Network of protected areas</p>	
Source:	
CEM, EEA	
Link:	
CEM working paper no. 11	
Policy relevance / legal framework:	
Habitat Directive	
CONSENT spatial data system:	
Biodiversity	
Relevant database information on ecosystems assessment:	
<p>The species and habitat accounts are designed to complement other ecosystem accounting elements, such as land accounts, biomass/primary production and water accounts, which together represent a composite ecosystem capital accounting framework.</p>	
Spatial coverage:	
EU-27	
Temporal coverage:	
2001-2006	
Resolution:	
1 km	
Format:	
Raster	
Data availability:	
Public access.	
Shortcomings / limitations / gaps:	
<p>The main constraint identified is the varying quality and completeness of the data reported by the MS under Article 17 in terms of the assessed species conservation elements and the spatial precision of the species distribution and ranges. Validation of the accounts and indicators has not been undertaken so far.</p> <p>Attribution problem of biodiversity information for ecosystems. Knowledge gaps exist in individual elements of biodiversity. Little is known, for example, about many aquatic systems (e.g. floodplains and deltas), genetic diversity outside the agricultural sector, soil biodiversity and for many species groups (e.g. invertebrates). Generally, data for marine species and habitats are much scarcer than for terrestrial ecosystems and across some important ecosystem types (e.g. marine and coastal).</p>	

Before attempting to relate these European level estimates to local and site sources of species numbers and their conservation status, the unknown and missing assessments should be addressed.
The distribution ranges used here need further improvement and harmonization.
Improvement of the accounting method by the incorporation of additional sources of wide-area inputs, such as the IUCN species assessments.

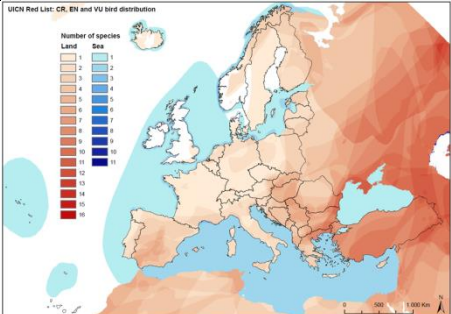
Status of the underlying methodology:

Intermediate – needs further validation

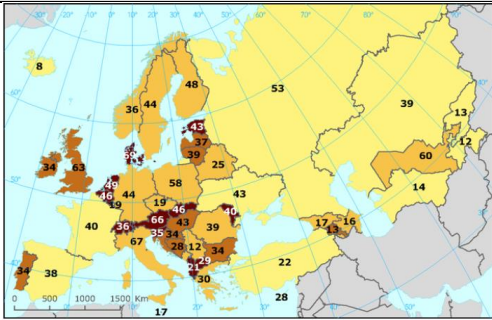
Appendix 2. IUCN European assessments

Name of the data set:	
IUCN European assessments	
Description of the information content:	
IUCN Red List European assessments GIS layers (species and presence).	
<p>The European Red List is a review of the conservation status of c. 6,000 European species (mammals, reptiles, amphibians, freshwater fishes, butterflies, dragonflies, and selected groups of beetles, molluscs, and vascular plants) according to IUCN regional Red Listing guidelines. It identifies those species that are threatened with extinction at the European level – so that appropriate conservation action can be taken to improve their status.</p> <p>Status assessments have already been completed for mammals, reptiles, amphibians, butterflies, dragonflies, freshwater fishes and selected saproxylic beetles, molluscs and vascular plants. Assessments of pollinators, medicinal plants, birds and marine fishes are currently being carried out.</p>	
Source:	
http://ec.europa.eu/environment/nature/conservation/species/redlist/	
Link:	
IUCN	
Policy relevance / legal framework:	
No legal binding framework	
CONSENT spatial data system:	
Biodiversity	
Relevant database information on ecosystems assessment:	
Species threat status and trends	
Spatial coverage:	
EU-27	
Temporal coverage:	
Different assessments were done in different periods ranging from 2005 - 2012	
Resolution:	
Format:	
Vector	
Data availability:	
No public access. European assessment GIS layers can be requested to UICN.	
Shortcomings / limitations / gaps:	
<p>Data gaps</p> <p>Spatial distribution and threat categories are based on expert knowledge</p>	
Status of the underlying methodology:	
Mature.	

Appendix 3. Global birds' assessment


Name of the data set:	
Global birds assessment	
Description of the information content:	
Distribution and threat category data (presence, origin, seasonality) compiled by BirdLife International and NatureServe for all the world's birds. Presence describes the level of certainty we have as to the species existence in an area, Origin describes whether that species occurs in an area naturally and Seasonality describes the the period in the species life cycle in which it occurs in an area.	
Source:	
BirdLife International	
Link:	
http://www.birdlife.org/datazone/home http://www.birdlife.org/datazone/info/spcdownload	
Policy relevance / legal framework:	
No legal binding framework	
CONSENT spatial data system:	
Biodiversity	
Relevant database information on ecosystems assessment:	
Birds threat status and trends	
Spatial coverage:	
Global	
Temporal coverage:	
2012	
Resolution:	
Format:	
Vector	
Data availability:	
European assessment must be requested to BirdLife International	
Shortcomings / limitations / gaps:	
Data gaps / Spatial distribution and threat categories are based on expert knowledge	
Status of the underlying methodology:	
Mature.	

Appendix 4. Invasive alien species in Europe (SEBI 010)


Name of the data set:	
Invasive alien species in Europe (SEBI 010)	
Description of the information content:	
<p>Invasive alien species assessment in Europe.</p> <p>The indicator 'Invasive alien species in Europe' comprises two elements: 'Cumulative number of alien species in Europe since 1900', which shows trends in species that can potentially become invasive alien species, and 'Worst invasive alien species threatening biodiversity in Europe', a list of invasive species with demonstrated negative impacts.</p> <p><i>1. 'Cumulative number of alien species in Europe since 1900'</i></p> <p>The cumulative number of alien species established in Europe from 1900 onwards is estimated in 10-year intervals. Pre-1900 introductions are also estimated. Information is broken down by major ecosystems (terrestrial, freshwater and marine) and selected 'taxonomic' groups: vertebrates, invertebrates, primary producers (vascular plants, bryophytes and algae) and fungi.</p> <p><i>2. 'Worst invasive alien species threatening biodiversity in Europe'</i></p> <p>The list of worst invasive alien species threatening biodiversity in Europe distinguishes a number of the most harmful invasive alien species in Europe, across ecosystems and major taxonomic groups, with respect to their impacts upon European biodiversity and changing abundance or range. The list of worst invasive alien species threatening biodiversity in Europe covers the pan-European area. Two criteria were used to select species for the list:</p> <ul style="list-style-type: none"> - The species is recognized by experts (1) to have a serious adverse impact on biological diversity of Europe. - The species, in addition to its adverse impact on biodiversity, may have negative consequences for human activities, health and/or economic interests. <p>The indicator on the cumulative number of alien species established in Europe includes data from all European countries with marine/estuarine waters (and non European countries bordering European seas). For terrestrial and freshwater ecosystems, however, data are currently available for 11 European countries. Nevertheless the indicator may be considered fairly representative for the European area. Data coverage on the cumulative numbers of alien species established in Europe will be expanded to cover more countries in the future.</p> <p>SEBI 2010 Expert Group on invasive alien species based the assessment on national data sets (Belgium, Denmark, Germany, Malta and the United Kingdom) available online; review papers (Netherlands and Turkey); NEMO database for the Baltic; Black Sea database; HCMR data base for the Mediterranean; project reports (ALIENS, DAISIE); and the contributions of experts from France, Spain and Russia made during a dedicated workshop.</p>	
Source:	
EEA – ETC-BD	
Link:	
http://www.eea.europa.eu/data-and-maps/indicators/invasive-alien-species-in-europe/invasive-alien-species-in-europe	
Policy relevance / legal framework:	
CONSENT spatial data system:	
Biodiversity	
Relevant database information on ecosystems assessment:	
Status and evolution of invasive species: threat of ecosystems biodiversity	
Spatial coverage:	
Pan Europe	
Temporal coverage:	
<1900-2008	
Resolution:	
NUTSO	
Format:	
Tiff maps, tabular, graphs	
Data availability:	
Maps, tables and graphs are available online through EEA web site.	
Shortcomings / limitations / gaps:	

Gaps in input datasets making its use inadequate
Status of the underlying methodology:
Mature.

LULC and agro-forestry**Appendix 5. CORINE Land Cover (CLC)**

Name of the data set:	
CORINE Land Cover (CLC)	
Description of the information content:	
CLC provides information related to land use/land cover in the EU. CLC products are based on the photointerpretation of satellite images by the national teams of the participating countries - the EEA member or cooperating countries. The resulting national land cover inventories are further integrated into a seamless land cover map of Europe.	
Source:	
EEA	
Link:	
http://www.eea.europa.eu/data-and-maps	
Policy relevance / legal framework:	
European Land use policies/ European biodiversity policies	
CONSENT spatial data system:	
LULC and Agri-forest	
Relevant database information on ecosystems assessment:	
CLC data helps providing support for protecting ecosystems, halting the loss of biological diversity, tracking the impacts of climate change, assessing developments in agriculture and implementing the EU Water Framework Directive.	
Spatial coverage:	
Variable: EU-27 or EU32	
Temporal coverage:	
1990, 2000, 2006, 2012 (upcoming)	
Resolution:	
100 and 250 m	
Format:	
Raster and vector	
Data availability:	
Different CLC versions are available on the EEA web site.	
Shortcomings / limitations / gaps:	
Spatial coverage is variable: coverage in 1990 is low compared to 2000 and 2006. No data for Island, UK, Norway, Sweden, Finland, Switzerland and Balkans region in 1990. No data for Greece and Switzerland in 2006.	
Status of the underlying methodology:	
Mature.	

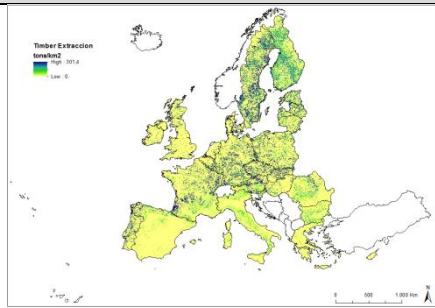
Appendix 6. European Forest Type Map

Name of the data set:	
European Forest Type Map	
Description of the information content:	
<p>The Forest Type Map 2006 map is a 25m spatial resolution raster Forest / Non Forest Map. It includes the classes: Broadleaved Forest, Coniferous Forest, Non-forest, Water, Clouds/snow and no data. The forest class of the Forest Type 2006 map should be considered as a forest cover class rather than a forest use class. The areas classified as forest are therefore the ones occupied by forest and woodlands with a vegetation pattern composed of native or exotic coniferous and/or broad-leaved trees, at the moment of the satellite images acquisition.</p> <p>Data based on satellite imagery of IRS-P6 LISS-III, SPOT4 (HRVIR) and SPOT5 HRG) sensors and MODIS 250 Composites (MOD13Q). CORINE Land Cover 2006 was used as ancillary data. The map was produced exploiting an automatic classification technique based on a Neural Network clustering algorithm.</p>	
Source:	
JRC	
Link:	
http://forest.jrc.ec.europa.eu/activities/forest-mapping/forest-type-map-2006/	
Policy relevance / legal framework:	
EU biodiversity strategy 2020/ INSPIRE/ EU Habitat Directive/ Forest Europe process	
CONSENT spatial data system:	
Biodiversity/ Land use and agri-forest	
Relevant database information on ecosystems assessment:	
Visual signs of forest conservation status. No forest management information can be extracted.	
Spatial coverage:	
Pan Europe	
Temporal coverage:	
2006	
Resolution:	
25 m	
Format:	
Raster	
Data availability:	
The Forest Type Map 2006 map can be viewed and queried at the European Forest Data Center web	
Shortcomings / limitations / gaps:	
Furthermore, due to the similarity of spectral signatures, the following land use classes are difficult to separate and may in certain cases also be classified as forest, as a function of tree density and background reflectance: Wooded parks, Parts of olive groves, Fruit tree plantations, Agro-forestry areas, Transitional woodlands.	
Status of the underlying methodology:	
Mature.	

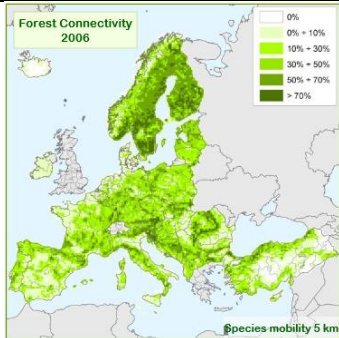
Appendix 7. HNV forest area

Name of the data set :	
High Nature Value Forest Area	
Description of the information content:	
<p>Identifying HNV forests is important in the light of the current EU policies on biodiversity, and the reform of the CAP with all its coming or more elaborated measures on forest(ry). One of the action points in the EU Biodiversity Action plan (2006) is the identification of High Nature Value (HNV) forests.</p> <p>The actual definition of HNV forests includes a very simple approach for naturalness definition (“natural and semi-natural forests”), relating to the degree to which forests are characterized by natural processes and / or the absence of human influence.</p> <p>Input variables: 1 - naturalness of tree species composition, 2 - growing stock volume, 3 – hemeroby, 4 – accessibility, 5 - connectivity</p> <p>At present, ETC-SIA is improving the methodology of Chirici et al. 2012, by addressing the assemblages of vegetation rather than species and by simplifying the indicator addressing only naturalness instead of the 5 inputs variables stated previously</p>	
Source:	
<p>EEA & European Forest Institute Gherardo Chirici, Jeannette Eggers, Annemarie Bastrup-Birk, Michael den Herder, Marcus Lindner, Fabio Lombardi, Marco Marchetti: European Forest Assessments: Further development of the High Nature Value (HNV) forest area indicator.- Nov. 2012</p>	
Link:	
http://forum.eionet.europa.eu/nrc-agriculture-and-forest-interest-group/library/forests/hnv-forest-area-2013/hnv-forest-area-report	
Policy relevance:	
Biodiversity 2020, EU Biodiversity Action Plan,	
Relevant information on land (use) management:	
HNV likelihood map for beech forests	
Spatial coverage:	
EEA 39	
Temporal coverage:	
Unknown	
Resolution:	
1 x 1 km	
Format	
Raster	
Data availability:	
EEA	
Shortcomings / limitations / gaps:	
<p>The use of species distribution maps introduces some uncertainties in the calculation of the indicator. In 2013, ETC-SIA is testing the use of species assemblages instead of species distribution data to overcome this gap.</p>	
Status of the underlying methodology	
Under development	

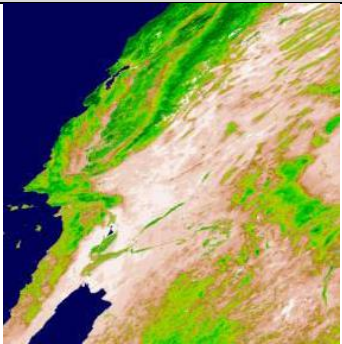
Appendix 8. Timber extraction

Name of the data set:	
Timber extraction	
Description of the information content:	
Annual statistics of timber extraction per 1 km ² pixel. Based on EFISCEN database, EFI (European Forest Dataset), National Forest Inventories and FAO statistics, CORILIS and NDVI data.	
Source:	
ETC-SIA	
Link:	
No direct link to data	
Policy relevance / legal framework:	
Forest management	
CONSENT spatial data system:	
LULC and Agri-forest	
Relevant database information on ecosystems assessment:	
Information of forest management (extractions) and conservation status	
Spatial coverage:	
EU-27	
Temporal coverage:	
2000-2010	
Resolution:	
1 km Grid	
Format:	
Raster	
Data availability:	
Data can be requested to ETC-SIA	
Shortcomings / limitations / gaps:	
No data for Norway, Island, Switzerland and Balkans region	
Status of the underlying methodology:	
Mature.	

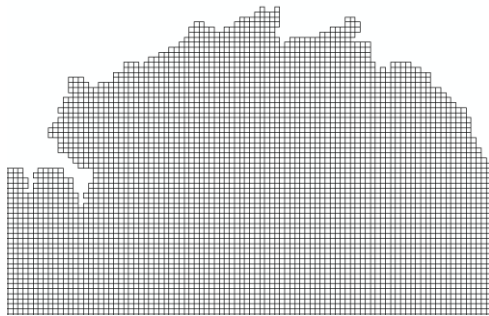
Appendix 9. Forest Fragmentation

Name of the data set:	
Forest Landscape in Europe: Pattern, Fragmentation and Connectivity	
Description of the information content:	
<p>The JRC develops research on integrated modelling to assess and report forest landscape pattern and associated fragmentation/connectivity processes in Europe. A standardized and easily reproducible set of indices has been developed on the basis of three conceptual models based on the information from CLC and the Pan-European forest map of JRC.</p> <ul style="list-style-type: none"> - Forest Spatial Pattern refers to the spatial arrangement of forest across the landscape. - Forest Fragmentation is a change in pattern with a loss of forest area and of connectivity (isolation). - Forest Connectivity refers to the degree to which the landscape facilitates or impedes species movement across forest habitat. 	
Source:	
JRC	
Link:	
Data viewer: http://forest.jrc.ec.europa.eu/efdac/applications/viewer/ Executive report: http://publications.jrc.ec.europa.eu/repository/bitstream/111111111/27726/1/lb-na-25717-en-n.pdf	
Policy relevance / legal framework:	
EU biodiversity strategy 2020/ INSPIRE/ EU Habitat Directive/ Forest Europe process	
CONSENT spatial data system:	
Biodiversity/ Land use and agri-forest	
Relevant database information on ecosystems assessment:	
Visible signs of forest conservation status No forest management information can be extracted.	
Spatial coverage:	
Pan Europe	
Temporal coverage:	
1990 – 2000 – 2006	
Resolution:	
25 km Grid	
Format:	
Vector	
Data availability:	
The European-wide forest pattern, fragmentation and connectivity data derived from the indicator set can be viewed and queried at the European Forest Data Center web site/EFDAC map viewer	
Shortcomings / limitations / gaps:	
No data for Greece, Switzerland and UK Low resolution: representativity is limited to 25 km grid (regions > 600 km ²)	
Status of the underlying methodology:	
Mature.	

Appendix 10. HANTS NDVI

Name of the data set :	
Hants NDVI	
Description of the information content:	
<p>Vegetation phenology (day numbers: Start of Season, End of Season, Peak of Season, Low/minimum of Season; NDVI values: minimum, maximum and mean).</p> <p>The Harmonic Analysis of NDVI Time Series (HANTS) algorithm is used to process and analyse the time series of satellite images for each individual year. HANTS is a least squared curve fitting procedure, based on harmonic components (cosine-functions), and considers only the most significant frequencies expected to be present in the time profiles. Values with a large negative deviation from the current estimated curve are excluded from the procedure in an iterative way. This process is repeated until the maximum error is acceptable or the number of remaining values becomes too small. Annual time series of NDVI remote sensing imagery from the MODIS satellite describe the vegetation dynamics (or plant phenology). HANTS applies a Fourier analysis to these time series and derives a set of annual Fourier components. For each year an amplitude and phase value are derived for four frequencies (mean NDVI, annual cycle, 6-months cycle, 4 months cycle). The Fourier components characterise the vegetation dynamics in a quantitative way and can be used as input for a wide range of applications, like land use mapping, change detection or phenology.</p>	
Source:	
MOD13Q1 product (NASA) and HANTS time series algorithm	
Link:	
<p>MOD13Q1 product: http://glovis.usgs.gov/</p> <p>HANTS algorithm: http://gdsc.nlr.nl/gdsc/en/tools/hants</p>	
Policy relevance / legal framework	
No legal binding framework	
CONSENT spatial data system	
Biodiversity / LULC and Agri-forest	
Relevant database information on land (use) management:	
<p>Environment:</p> <ul style="list-style-type: none"> • Phenology mapping (start/peak/end of season). • Biomass production (mean/max/min NDVI per year). • Land use change: Annual CORINE(-light) update. • Hot-spot detection. • Agriculture: Detection and mapping of different crops (cereals, early crops, late crops, irrigated). 	
Spatial coverage:	
EEA39	
Temporal coverage:	
2001-2012, 16-day period	
Resolution:	
250 m	
Format	
Raster	
Data availability:	
Public access. MODIS products are available through different NASA data holdings (GloVis, Warehouse Inventory, etc). HANTS can be downloaded from the GDSC website.	
Shortcomings / limitations / gaps:	
Presence of residual atmospheric effects (clouds, smoke, etc).	
Status of the underlying methodology	
Mature.	


Reference Layers
Appendix 11. LEAC tools

Name of the data set:	
LEAC tools	
Description of the information content:	
Administrative land accounting units are used to allocate land cover changes and to relate socio-economic processes to land cover dynamics. The GISCO database (Eurostat) provides a medium-scale layer for regional administrative boundaries (NUTS) covering the entire EU territory. The hierarchy of administrative land accounting units allows the analysis of the data at various scales, from NUTS 3 (province level) to NUTS 0 (country level). A mixed level, combining NUTS 3 and NUTS 2 was defined in order to homogenize the size of the units.	
Source:	
EEA	
Link:	
http://www.eea.europa.eu/themes/landuse/interactive/land-and-ecosystem-accounting-leac	
Policy relevance / legal framework:	
INSPIRE	
CONSENT spatial data system:	
Reference layers	
Relevant database information on ecosystems assessment:	
Ancillary data	
Spatial coverage:	
EU27 + AL, BA, HR	
Temporal coverage:	
2006	
Resolution:	
1 km	
Format:	
Vector	
Data availability:	
Public access: http://www.eea.europa.eu/data-and-maps/data/reference-grid-for-land-cover-accounts-leac	
Shortcomings / limitations / gaps:	
Status of the underlying methodology:	
Mature.	

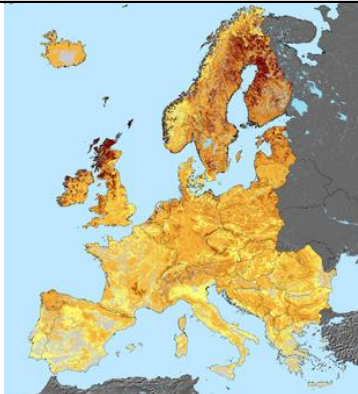
Climate Change
Appendix 12. Combined environmental sensitivity to climate change

Name of the data set:	
Combined environmental sensitivity to climate change - ESPON climate	
Description of the information content:	
<p>Combined sensitivity to climate change of areas protected by NATURA 2000, forests sensitive to fire, soils sensitive to water erosion and soil organic carbon content. Regional sensitivities calculated on the basis of most recent statistical data. Environmental sensitivity dimension focuses on natural entities that are highly sensitive (like protected natural areas or especially fire prone forests) and relatively stable entities like soils, that have only limited capacities to adapt and at the same constitute the basis for animal and plant ecosystems.</p> <p>The indicator shows that especially mountain and river delta regions have protected natural areas and/or possess sensitive soils and forests. Moreover, the north of Scandinavia is identified as particularly sensitive due to the size of protected areas. Indicator derived from own calculations based on JRC EuroSoil, NATURA 2000 database 2010, OEROK 2011, JNCC 2010, World Fire Atlas 2010 and CORINE Land Cover 2000/2006.</p>	
Source:	
ESPON	
Link:	
http://www.espon.eu/main/Menu_Projects/Menu_AppliedResearch/climate.html	
Policy relevance / legal framework:	
CONSENT spatial data system:	
Air and Climate	
Relevant database information on ecosystems assessment:	
No forest management information can be extracted.	
Spatial coverage:	
EU-27	
Temporal coverage:	
2010	
Resolution:	
NUTS 3	
Format:	
Vector	
Data availability:	
No public access. Data must be requested from the ESPON Database portal.	
Shortcomings / limitations / gaps:	
No data for Island, Switzerland and Balkans region. Data limitations in Norway	
Status of the underlying methodology:	
Mature.	

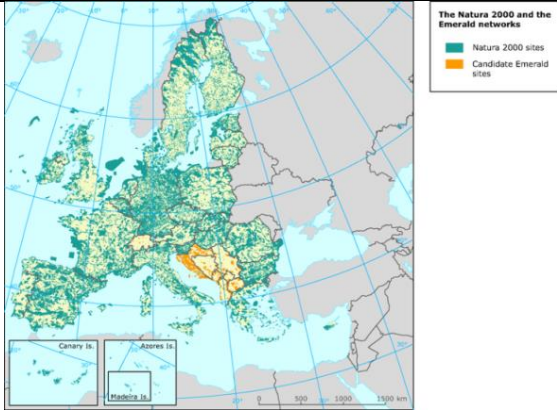
Soils**Appendix 13. European Soil Database ESDB v2.0**

Name of the data set :	
European Soil Database ESDB v2.0	
Description of the information content:	
<p>It is a simplified representation of the diversity and spatial variability of the soil coverage. The database contains a list of Soil Typological Units (STU). Besides the soil names they represent, these units are described by variables (attributes) specifying the nature and properties of the soils: for example the texture, the water regime, the stoniness, etc. The European Soil Database (ESDB) contains four discrete datasets:</p> <ul style="list-style-type: none"> - the Soil Geographical Database of Eurasia at scale 1:1,000,000 (SGDBE) - the Pedotransfer Rules Database (PTRDB) - the Soil Profile Analytical Database of Europa (SPADBE) - the Database of Hydraulic Properties of European Soils (HYPRES) 	
Source:	
"European Soil Database (v 2.0), European Soil Bureau Network and the European Commission, EUR 19945 EN, March 2004"	
Link:	
http://eusoils.jrc.ec.europa.eu/ESDB_Archive/ESDBv2/index.htm http://eusoils.jrc.ec.europa.eu/library/Data/ Datarequest/ESDB_RasterLibrary.html	
Policy relevance:	
Soil Thematic Strategy, CAP	
Relevant information on land (use) management:	
Dominant limitation to agricultural use, water capacity, depth, erodibility, structure, etc.	
Spatial coverage:	
EU-25	
Temporal coverage:	
All data and information corresponds to the stage of development of the European Soil Database on 31/12/2003	
Resolution:	
1 x 1km	
Format	
Raster	
Data availability:	
Publicly available after registration	
Shortcomings / limitations / gaps:	
Status of the underlying methodology	
Mature	

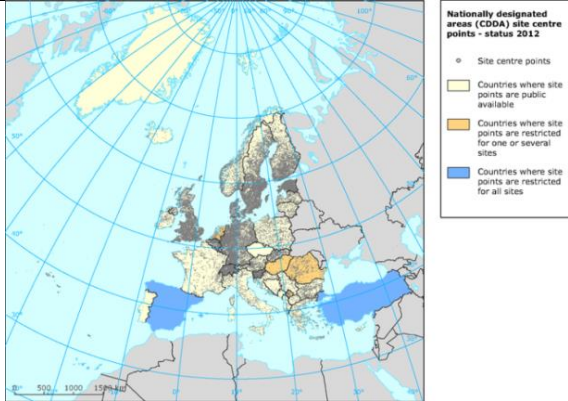
Appendix 14. European Topsoil Organic Carbon content (OCTOP)

Name of the data set :	
European Topsoil Organic Carbon content (OCTOP)	
Description of the information content:	
<p>Map of Soil Organic Carbon content (%) in the surface horizon of soils in Europe. Data result from calculations taking into account soil, climate, landcover and topography.</p> <p>Soil organic carbon, the major component of soil organic matter, is extremely important in all soil processes. Organic material in the soil is essentially derived from residual plant and animal material, synthesized by microbes and decomposed under the influence of temperature, moisture and ambient soil conditions.</p> <p>The annual rate of loss of organic matter can vary greatly, depending on cultivation practices, the type of plant/crop cover, drainage status of the soil and weather conditions. There are two groups of factors that influence inherent organic matter content: natural factors (climate, soil parent material, land cover and/or vegetation and topography), and human-induced factors (land use, management and degradation).</p>	
Source:	
<p>JRC Jones, R.J.A, R. Hiederer, E. Rusco, P.J. Loveland and L. Montanarella (2005). Estimating organic carbon in the soils of Europe for policy support. European Journal of Soil Science, October 2005, 56, p.655-671.</p>	
Link:	
http://eusoils.jrc.ec.europa.eu/esdb_archive/octop/octop_data.html	
Policy relevance:	
Soil Thematic Strategy, CAP	
Relevant information on land (use) management:	
Organic matter	
Spatial coverage:	
37 countries	
Temporal coverage:	
2004	
Resolution:	
1 x 1km	
Format	
Raster	
Data availability:	
Publicly available after registration	
Shortcomings / limitations / gaps:	
Status of the underlying methodology	
Mature	

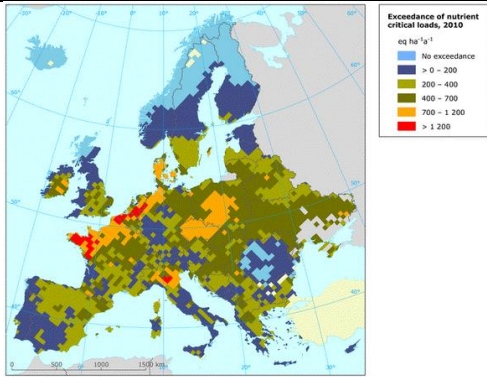
Conservation areas
Appendix 15. Natura 2000 data

Name of the data set :	
Natura 2000 data	
Description of the information content:	
<p>Natura 2000 is the key instrument to protect biodiversity in the European Union. It is an ecological network of protected areas, set up to ensure the survival of Europe's most valuable species and habitats.</p> <p>Natura 2000 is an ecological network composed of sites designated under the Birds Directive (Special Protection Areas, SPAs) and the Habitats Directive (Sites of Community Importance, SCIs, and Special Areas of Conservation, SACs).</p>	
Source:	
MS reporting, EEA	
Link:	
http://www.eea.europa.eu/data-and-maps/data/natura-2	
Policy relevance:	
EU Biodiversity Strategy, HD, BD	
Relevant information on land (use) management:	
Designated conservation areas, green infrastructure	
Spatial coverage:	
EU-27	
Temporal coverage:	
2011	
Resolution:	
1 : 100 000	
Format	
Vector (shapefile) and descriptive database	
Data availability:	
Public (although some sensitive information has been filtered). Specific terms and conditions apply to data within the United Kingdom.	
Shortcomings / limitations / gaps:	
Status of the underlying methodology	
Mature	

Appendix 16. Nationally designated areas (CDDA)

Name of the data set :	
Nationally designated areas (CDDA)	
Description of the information content:	
The Common Database on Designated Areas (CDDA) is more commonly known as Nationally designated areas. The inventory began in 1995 under the CORINE programme of the European Commission. It is a result of an annual data flow through Eionet countries. The EEA publishes the data set and makes it available to the World Database of Protected Areas (WDPA). The CDDA data can also be queried online in the European Nature Information System (EUNIS).	
Source:	
EEA	
Link:	
http://www.eea.europa.eu/data-and-maps/data/nationally-designated-areas-national-cdda-7#tab-european-data	
Policy relevance:	
EU Biodiversity Strategy, HD, BD	
Relevant information on land (use) management:	
Designated conservation areas, GI	
Spatial coverage:	
EEA EU-32	
Temporal coverage:	
2012	
Resolution:	
Unknown	
Format	
Vector (shapefile) and descriptive database	
Data availability:	
Public. However EEA does not have permission to distribute some or all sites reported by Austria, Estonia, Finland, Hungary, Ireland, Kosovo, Malta, the Netherlands, Romania, Slovenia, Spain and Turkey.	
Shortcomings / limitations / gaps:	
Status of the underlying methodology	
Mature	

Pollution**Appendix 17. Nutrient enrichment**

Name of the data set:	
Exceedance of critical loads for eutrophication due to the deposition of nutrient nitrogen	
Description of the information content:	
The results were computed using the 2008 Critical Loads database hosted by the Coordination Centre for Effects (CCE). The deposition estimates were based on own calculations using modelling methodologies according to different emissions scenarios: current legislation (CLE) in 2000, 2010, 2020 and maximum feasible reductions (MFR) in 2020. Exceedance units: eq ha ⁻¹ a ⁻¹	
Source:	
EEA - Coordination Centre for Effects (CCE)	
Link:	
http://www.eea.europa.eu/data-and-maps/figures/exceedance-of-critical-loads-for-eutrophication-due-to-the-deposition-of-nutrient-nitrogen-in-2010	
Policy relevance / legal framework:	
Directive on Air Quality - Convention on Long-range Transboundary Air Pollution (LRTAP Convention) at the UNECE	
CONSENT spatial data system:	
Pollution	
Relevant database information on ecosystems assessment:	
No forest management information can be extracted.	
Spatial coverage:	
Pan Europe	
Temporal coverage:	
This indicator can be computed at different years as the data are updated regularly	
Resolution:	
50 km Grid (can be computed at different resolutions)	
Format:	
Map - Tiff image	
Data availability:	
Map available as Tiff image	
Shortcomings / limitations / gaps:	
No data for Turkey and Malta - Low resolution: representativity is limited to 50 km grid (regions > 2500 km ²)	
Status of the underlying methodology:	
Mature.	

Appendix 18. Nutrient accounts - N and P accounts per ecosystem type

Name of the data set:	
Nutrient accounts – Methodology development for N and P accounts per ecosystem type	
Description of the information content:	
<p>Pan-European nutrient accounts presents a yearly picture of the nutrient balances per ecosystem: crop type, forest and grassland; based on data related to different inputs sources and outputs:</p> <p>Crops:</p> <ul style="list-style-type: none"> - <i>Inputs</i>: inorganic fertilizer, amount of nitrogen and phosphorus originating from manure, atmospheric deposition, biological fixation (only nitrogen), - <i>Outputs</i>: crop uptake, grazed biomass <p>Forest:</p> <ul style="list-style-type: none"> - <i>Inputs</i>: atmospheric deposition, biological fixation (only nitrogen) - <i>Output</i>: forest fires, timber extraction <p><u>Nutrient accounts are based on:</u></p> <ul style="list-style-type: none"> - Data developed in the framework of the carbon account (crops, grazed biomass, etc), including area and yield, at with 1 km resolution, available for 2000-2010 and for EU27. - Country specific nitrogen and phosphorus excretion coefficients per animal category are available from OECD data. - National mineral fertiliser application (Eurostat/FIA). - The annual EMEP MSC-W model results of air concentrations and depositions are available as gridded data from the EMEP webpage. The EMEP data are already at a 50 km grid resolution and need to be disaggregated to the 1 km grid. - For forest ecosystems, results from the paper Deposition and emissions of reactive nitrogen over European forests (Simpson et al. 2006) may be used. - CORINE Land Cover (forest types), HRL forest. - Annual forest stocks and timber extraction from the carbon accounts. 	
Source:	
ETC-SIA	
Link:	
No direct link to data	
Policy relevance / legal framework:	
Nitrogen Directive	
CONSENT spatial data system:	
LULC and Agri-forest	
Relevant database information on ecosystems assessment:	
Pressure on agriculture, grassland, and forest ecosystems	
Spatial coverage:	
EU-27	
Temporal coverage:	
2000-2010	
Resolution:	
1 km Grid	
Format:	
Raster	
Data availability:	
Data can be requested to ETC-SIA	
Shortcomings / limitations / gaps:	
<p>Uncertainties arise mainly from the use of country or crop specific conversion factors, coefficients or application rates that do not reflect regional differences. N fixation for instance may vary highly within a single country between northern and southern latitudes. The same holds true for some national statistics (i.e. on mineral fertilizer) which present data gaps that need to be filled.</p> <p>Data on atmospheric deposition are model based and hence the attached uncertainties must be taken into considerations. Nevertheless, scientific evidences (e.g. Simpson et al. 2006) suggest that the EMEP data are valid in reproducing deposition.</p> <p>Uncertainties still are present as well regarding the input maps of the carbon accounts. Despite the fact that the results and intermediate results of the accounting task have been reviewed in depth for the purpose of the ecosystem accounts, they have not been applied to other domains so far. The comparison of the nutrient accounts with external data on different</p>	

components of these accounts will highlight as well the quality of the input data. Most work on nutrient balances has been done for agricultural land (arable land and grassland). Forest ecosystems have not been treated in such a detail. Nevertheless, atmospheric deposition of N and P on forests are of importance and a significant input into forest ecosystems. Outputs (mainly timber extraction) are available via carbon account data sets.

Status of the underlying methodology:

Mature.

Appendix 19. Harmonized environmental indicators for pesticide risk

Name of the data set :

HAIR2010 - Harmonized Environmental Indicators for Pesticide Risk

Description of the information content:

HAIR2010 calculates a set of environmental and human risk indicators related to the agricultural use of pesticides in member states of the European Union. The model comprises of a set of modules with relatively simple algorithms suitable for processing a large number of combinations (compounds, crops and locations). The methodology is derived from more sophisticated guidance and tools used in registration procedures.

The use of pesticides may lead to contamination and exposure of the environment directly adjacent to the area of the treated crop. The registration considers the risk of a particular use by comparing the duration and level of exposure with the appropriate environmental concentration of concern (e.g. a toxic concentration or a quality standard). For example, the long-term exposure of the soil ecosystem by a pesticide is calculated as the fraction present in the topsoil resulting from a sequence of years with annual applications at a fixed rate and time interval. Dissipation and relevant fluxes are explicitly taken into account but these terms are not necessarily reported since the concept does not consider the solution of a mass balance.

Groups of risk indicators for different protection goals are included; for the aquatic ecosystem, for groundwater, for terrestrial habitats, and for workers and bystanders.

The input data are stored in three databases:

The HAIR database contains crop, soil and climate maps and all other input data needed for calculating the risk indicators

The Compound database contains the physico-chemical properties, fate properties and toxicity data of the active ingredients of pesticides

The Usage database contains regional (NUTS1) average applications described by the area treated, application rate, application date, number of treatments, time interval, method of application, product formulation type, and optional mitigation factors

Source:

HAIR2010 Software package

Link:

Available at <http://www.hair.pesticidemodels.eu/>

Policy relevance:

Sustainable Use Directive (EU 128/2009)

Pesticide Statistics Regulation (EU 1185/2009)

Relevant information on land (use) management:

Link between the environmental risks related to pesticide usage and land use (crops), soil including land slope - and climate conditions

Spatial coverage:

EU-27 excluding Malta, Cyprus

Temporal coverage:

Flexible temporal coverage; determined by the years present in the Usage db. (see below, 3.)
Crop maps are static. Precipitation and temperature maps contain long-term average values from an original 50K grid.

Resolution:

Input: Pesticide usage at NUTS1 regions.

Format

Output: At 10K resolution, CSV format.

Data availability:

The HAIR db with maps (Crops, climate and soil), crop- and other parameters is provided with the software package.

A Compound db with fate properties and toxicity for the compounds mentioned in the Usage db needs to be provided by the user. Example databases may be available at Alterra, Team ERA.

A Usage db with regional average pesticide applications needs to be provided by the user.

According to our knowledge, a European database with pesticide use data is not available.

Shortcomings / limitations / gaps:

Data availability is a bottle neck

Crop-, soil- and climate maps; crop (calendar) data, and specific input data required for calculating pesticide risk indicators are available in the HAIR db which is part of the software version.

To some extent, fate- and tox data of compounds with a registration in the Netherlands and/or in other member states are available at the Environmental Risk Assessment Team, Alterra, Wageningen UR. Depending on the pesticides of concern, data gaps may need to be filled. The HAIR2010 programme includes a procedure for the replacement of compound properties missing in the Compound db.

The availability of pesticide usage data at European scale needs to be assessed. According to EU Regulation 1185/2009, EUROSTAT databases will be filled with a combination of annual sales (volume) data and usage data from surveys conducted once per 3-5 years. Such data may not be available yet. The 1st implementation round starts with the year 2011.

Status of the underlying methodology

The risk indicators in HAIR2010 are not validated. Their methodology is derived from more sophisticated guidance and tools used in registration procedures. Some of these sources do have a higher validation status.

The risk indicators in HAIR2010 are suitable for deriving trends over time; for ranking/comparing compounds and applications, and for mapping. These presentations can be used to evaluate the impact on the environment of changes in pesticide use. The risk indicators are not intended for predicting the actual risk resulting from one specific use, nor for calculating the absolute level of risk at a particular field or moment in time.

Appendix 20. Heavy Metals

Name of the data set :

Heavy Metals – balance approach to assess long term impact on ecosystem functioning

Description of the information content:

EU-27 wide input-output balance approach for arable land and grassland, resulting in dynamic mass balance model to predict annual changes in metal pools in soil.

Inputs considered:

Atmospheric deposition

Manure

Inorganic fertiliser

Compost

Sludge

Outputs considered

Leaching

Crop uptake (crop specific) for arable, grassland and nature

Model output:

NUTS2 averaged levels of metals in soil, crop and leachate. At present no distinction between land use within NUTS2 units

Changes in soil, crop and leachate concentration with time in relation to soil management

Atmospheric dep.: Maps calculated with the MSCE-HM model are overlaid with NUTS2 regions from the MITERRA model by (area-weighted) averaging the grid cells for each NUTS2 unit

Inorganic fertiliser: The N, P and K input from fertilizers and N, P and K content are available per type of fertilizer from FAOSTAT data. Metal contents in fertilizers are based on literature review.

Manure: Prior to distribution at NUTS2 level, input by manure is first calculated by multiplying heads of cattle, N excretion and fraction of gaseous losses. All the data are originally derived from the RAINS model, at country level. Manure loading rates are calculated by the MITERRA model at NUTS2 level accounting for different crop types. Levels of N added via manure are converted to metal loading rates using EU averaged metal-N ratios for different types of manure

Sludge/compost: Information over used sludge as soil amendment is collected and provided by EU commissioned reports on disposal and recycling of sewage sludge (EC, 2001a). The information is at country level and based on EU forecasts of recycled sludge application. Heavy metal concentrations in sludge are derived from the literature (Amlinger, 2004).

Leaching: leaching losses are calculated based on predicted concentrations at NCU level using regression functions correcting for soil type and multiplication with the average annual net water surplus at NUTS2 level.

Crop uptake: Crop yield information is originally available at country level. All crops are distributed at NUTS level with the MITERRA model. For each NUTS2 unit, a reference yield and reference BCF area-and-crop weighted averages have been calculated. Average yields per each NUTS unit include crops from both arable and pasture land.

Soil data used to generate metal base map are based on FOREGS database. Land use is available at NUTS2 level with subdivision for arable, grassland and nature (surface area and soil properties)

Source:

Alterra

Link:

Data not directly accessible via internet

Policy relevance:

Sludge Directive, Nitrogen Directive, EU2003/2003

Relevant information on land (use) management:

Link between farm management (manure/fertilizer) applications and impact on soil quality and ecosystem health


Spatial coverage:

EU-27 (with small coverage gaps and limited data)

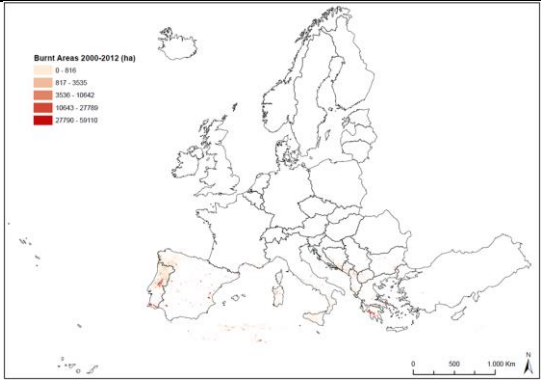


quality in specific areas)	
Temporal coverage:	
Not relevant, changes in soil metal content are model based	
Resolution:	
Calculations at NUTS2 level partially (leaching) at NCU level	
Format	
NUTS2 units	
Data availability:	
Soil data (FOREGS) freely available, input/output model calculations available from Alterra	
Shortcomings / limitations / gaps:	
<p><i>Soil data</i> At present a limited database (FOREGS) has been used to construct the base maps at NUTS 2 level. Additional information (GEMAS database) is available but its use is restricted. Spatial coverage is limited in the FOREGS database (approx. 840 datapoints), GEMAS database has > 4000 datapoints. Within NUTS2 unit information is available on land use (including surface area and properties) but results are expressed at NUTS2 level</p> <p><i>Data based fluxes</i> Input (notably sludge, compost, inorganic fertilizer) at NUTS2 level is based on national production/consumption levels and distributed equally (dependent on crop N requirement) at NUTS2 level. Actual inputs are more variable, especially for sludge and compost. This variability is not visible at NUTS2 level</p> <p><i>Model calculated fluxes</i> Calculation of crop uptake limited by linear BCF model which is not available/validated for all crops. Quality of BCF depends on crop type and metal. Limited data for other metals (e.g. Cr, Ni) Metal leaching based on NCU level calculations and upscaling to NUTS2 level. Leaching fluxes strongly relate to soil properties (notably pH and organic matter/clay) and variability at NUTS2 level is therefore low (compared to smaller spatial units) Downscaling to 1 km² level is technically feasible but results are not always reliable/representative since most input information is not available at this scale level and would simply mean further downscaling of regional and national data. NOTE: In principle the method applied for nutrient balances can be linked to that for metals when considering inputs of manure, fertiliser etc. since both approaches are using the same inputs for specific sources of metals of nutrients.</p>	
Status of the underlying methodology	
The mass balance model is functional but not yet linked to ecosystem assessment. To do this, the model results need to be linked to specific indicators of ecosystem functioning related to metals which can either be critical levels in soil (total metal content, e.g. PNEC-soil) or soil solution (PNEC-solution)	


Appendix 21. European Pollutant Release and Transfer Register (E-PRTR)

Name of the data set :	
European Pollutant Release and Transfer Register (E-PRTR)	
Description of the information content:	
<p>The European Pollutant Release and Transfer Register (E-PRTR) is the new Europe-wide register that provides easily accessible key environmental data from industrial facilities in European Union Member States and in Iceland, Liechtenstein, Norway, Serbia and Switzerland. It replaces and improves upon the previous European Pollutant Emission Register (EPER). The new register contains data reported annually by some 28,000 industrial facilities covering 65 economic activities across Europe.</p> <p>For each facility, information is provided concerning the amounts of pollutant releases to air, water and land as well as off-site transfers of waste and of pollutants in waste water from a list of 91 key pollutants including heavy metals, pesticides, greenhouse gases and dioxins for years 2007 to 2010. Some information on releases from diffuse sources is also available and will be gradually enhanced.</p>	
Source:	
Countries' reports	
Link:	
http://prtr.ec.europa.eu/Home.aspx http://www.eea.europa.eu/data-and-maps/data/member-states-reporting-art-7-under-the-european-pollutant-release-and-transfer-register-e-prtr-regulation-7	
Policy relevance:	
UNECE (United Nations Economic Commission for Europe) PRTR Protocol; Regulation (EC) No 166/2006 which implements the UNECE PRTR Protocol; environmental directives such as WFD or Environmental Impact Assessment Directive.	
Relevant information on land (use) management:	
Pollutant releases from industrial facilities in Europe.	
Spatial coverage:	
27 EU Member States as well as Iceland, Liechtenstein, Norway, Serbia and Switzerland.	
Temporal coverage:	
2001, 2004, 2007-2011	
Resolution:	
Unknown	
Format	
Csv, mdb, kml	
Data availability:	
Information and data available from E-PRTR web site, full dataset through EEA web site.	
Shortcomings / limitations / gaps:	
Status of the underlying methodology	
Unknown	

Human impacts**Appendix 22. European forest fires**

Name of the data set :	
European Forest Fire Information System (EFFIS) - European Fire Database	
Description of the information content:	
<p>EFFIS addresses forest fires in Europe in a comprehensively, providing EU level assessments from pre-fire to post-fire phases, thus supporting fire prevention, preparedness, firefighting and post-fire evaluations. It provides updated and reliable information on wildland fires in Europe, in particular about Current situation(meteorological fire danger maps and forecast), Fire history: number and coverage of past fires, and Fire news per country.</p> <p>The European Fire Database contains the forest fire information compiled by EU Member States and other European countries, stored and managed by JRC within the European Forest Fire Information System (EFFIS). Layer contains data about burnt areas in ha and fire dates. European forest fire database</p>	
Source:	
JRC	
Link:	
http://forest.jrc.ec.europa.eu/effis/ no direct link to datasets is established	
Policy relevance:	
Forest Focus regulation (EC) No 2152/2003, Forest management, EU Forestry Strategy	
Relevant information on land (use) management:	
Near real time fire forecast maps, historical fire incidence. Information about forest pressures.	
Spatial coverage:	
37 countries (EU-28 and neighboring countries)	
Temporal coverage:	
Partial data go back to 1980. Data flow from the European Fire Database between 2000-2012	
Resolution:	
250 m in "current situation", NUTS 1-NUTS 3 in "fire history"	
Format	
Web server image, reports	
Data availability:	
Online request needed to access the GIS layers. Public access only allows to retrieve general information	
Shortcomings / limitations / gaps:	
Difficult accessibility; only NUTS level resolution for historical fires. At present the European Fire Database of the contains fire data from 21 countries: Bulgaria, Croatia, Cyprus, Czech, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Poland, Portugal, Romania, Slovakia, Spain, Sweden, Switzerland, Turkey.	
Status of the underlying methodology	
Mature	

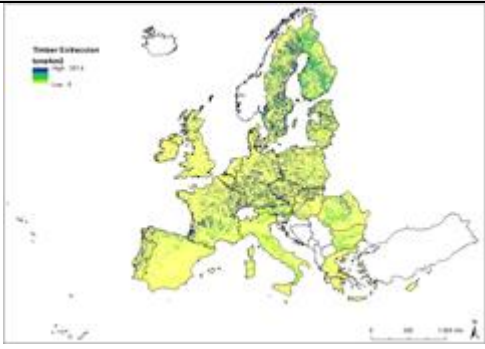
Appendix 23. Grazed biomass

Name of the data set :	
Grazed biomass	
Description of the information content:	
It estimates the dry matter of grass grazed by livestock per year.	
Source:	
ETC SIA	
Link:	
Some technical information in : http://forum.eionet.europa.eu/etc-sia-consortium/library/2012_subvention/261_emerging_issues/331_land_ecosystem/deliverable/rpd_leac_diam_re_i.1.0.pdf/index.html	
Policy relevance:	
CAP, Biodiversity Strategy	
Relevant information on land (use) management:	
Farming intensity, potential soil quality	
Spatial coverage:	
EU-27	
Temporal coverage:	
2000-2010	
Resolution:	
1km*1km	
Format	
Raster	
Data availability:	
Contact Christoph Schröder @ ETC SIA	
Shortcomings / limitations / gaps:	
Status of the underlying methodology	
In progress	

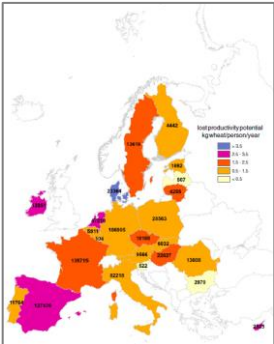
Appendix 24. Landscape fragmentation

Name of the data set :	
Landscape fragmentation	
Description of the information content:	
Roads, motorways, railways, intensive agriculture and urban developments are breaking up Europe's landscapes into ever-smaller pieces, with potentially devastating consequences for flora and fauna across the continent. The report, 'Landscape fragmentation in Europe', demonstrates how areas of land are often unable to support high levels of biodiversity when they are split into smaller and smaller parcels.	
Source:	
EEA	
Link:	
http://www.eea.europa.eu/highlights/increasing-fragmentation-of-landscape-threatens	
Policy relevance:	
Biodiversity, spatial planning	
Relevant information on land (use) management:	
Fragmentation of the landscape by urban areas and transport infrastructure. Indication of human impact on the landscape	
Spatial coverage:	
EEA 32	
Temporal coverage:	
2006 / 2009	
Resolution:	
1 x 1 km	
Format	
Raster (*.tif)	
Data availability:	
EEA	
Shortcomings / limitations / gaps:	
Transport network limited to coarse scale EU-level data (EuroRegionalMap)	
Status of the underlying methodology	
Mature	


Appendix 25. Crop production in arable land

Name of the data set:	
Carbon accounts – crop production in arable land	
Description of the information content:	
Annual crop production in tons per 1 km ² pixel based on CAPRI Land Cover maps, CORILIS C0 and agriculture statistics from Eurostat at NUTS2/3 level. It is assumed that no carbon stock is left above ground after harvest. The crops used for the calculation of the biomass are: cereals, citrus, oilseeds, roots, fruits (corilis), olives (corilis), rice (corilis), vineyard (corilis), and industrial crops	
Source:	
ETC-SIA	
Link:	
No direct link to data	
Policy relevance / legal framework:	
CAP	
CONSENT spatial data system:	
LULC and Agri-forest	
Relevant database information on ecosystems assessment:	
Agricultural productivity per year	
Spatial coverage:	
EU-27	
Temporal coverage:	
2000-2010	
Resolution:	
1 km Grid	
Format:	
Raster	
Data availability:	
Data can be requested to ETC-SIA	
Shortcomings / limitations / gaps:	
No data for Norway, Island, Switzerland and Balkans region Further testing is needed to verify the usability of these datasets as indicators	
Status of the underlying methodology:	
Mature.	

Appendix 26. Losses of cropland productivity in the EU

Name of the data set:	
Annual per capita and total national losses of cropland productivity potential in EU countries expressed in wheat yield equivalents (2000 – 2006).	
Description of the information content:	
<p>Spatial analyses of cropland productivity levels and land use data from 2000 and 2006 were performed to assess the loss of cropland resources for biomass production of the European Union due to land take. Productivity loss in administrative regions was calculated, based on the analysis of 24 member states, on the basis of the extent and quality of agricultural land resources converted to artificial surfaces.</p> <p>The data used for this study are: CORINE LC data 2000 – 2006 SoilProd model: spatially explicit results SPOT VEGETATION1 decadal data</p> <p>The annual per capita and total national losses of cropland productivity potential in EU countries expressed in wheat yield equivalents (2000–2006). Per capita losses are expressed in kg per person; national sums are in tons per country.</p>	
Source:	
JRC	
Link:	
No direct link to data	
Policy relevance / legal framework:	
CAP	
CONSENT spatial data system:	
LULC and Agri-forest	
Relevant database information on ecosystems assessment:	
Loss of agriculture / soil quality (related to management)	
Spatial coverage:	
EU-27	
Temporal coverage:	
2000 – 2006	
Resolution:	
NUTS0	
Format:	
Vector	
Data availability:	
No public access.	
Shortcomings / limitations / gaps:	
No data for Island, UK, Norway, Switzerland, Greece and Balkans region	
Status of the underlying methodology:	
Mature.	

Appendix 27. Loss of accessibility for migratory fish due to dams in major European river basins

Name of the data set :	
Loss of accessibility for migratory fish due to dams in major European river basins	
Description of the information content:	
Loss of accessibility for migratory fish in the last 150 years. Map shows the degree of fragmentation in major European river basins due to dams at least 10 m high not allowing the normal fish passage. Based on EEA's Waterbase databases on the status, quantity and quality of Europe's rivers, lakes, groundwater and transitional bodies, coastal and marine waters; and also on European catchments and Rivers network system (Ecrins)	
Source:	
EEA	
Link:	
http://www.eea.europa.eu/data-and-maps/figures/loss-of-accessibility-for-migratory	
Policy relevance / legal framework:	
Water Framework Directive	
CONSENT spatial data system:	
Biodiversity	
Relevant database information on ecosystems assessment:	
Status of fragmentation of continental waters: biodiversity threat	
Spatial coverage:	
Pan Europe	
Temporal coverage:	
1860, 1910, 1960 and 2010	
Resolution:	
1 km Grid	
Format	
Map - Tiff image	
Data availability:	
Map available as Tiff image	
Shortcomings / limitations / gaps:	
Status of the underlying methodology	
Mature.	

Appendix 28.a). Overfishing – status of fish stock in the European Seas

Name of the data set:	
Overfishing – CSI 032: Status of marine fish stocks	
Description of the information content:	
<p>Overfishing indicator shows the status of fish stocks in the International Council for the Exploration of the Sea (ICES) and General Fisheries Commission for the Mediterranean (GFCM) fishing regions of Europe. The charts in the map show the proportion of assessed stocks that are overfished (red) and stocks within safe biological limits (blue). The numbers in the circles indicate the number of stocks assessed within the given region. The size of the circles is proportional to the magnitude of the regional catch.</p> <p>Data sets are based on time series that can give a good account of the state of a stock. Stocks outside safe biological limits per area are identified in the yearly ICES and GFCM reports.</p>	
Source:	
EEA	
Link:	
http://www.eea.europa.eu/data-and-maps/indicators/fisheries-european-commercial-fish-stocks/fisheries-european-commercial-fish-stocks	
Policy relevance / legal framework:	
EU Common Fisheries Policy	
CONSENT spatial data system:	
Biodiversity	
Relevant database information on ecosystems assessment:	
Status and trends of fishing stocks. Biodiversity relevance: shows a real risk of biodiversity loss.	
Spatial coverage:	
Pan Europe	
Temporal coverage:	
2008	
Resolution:	
European seas	
Format:	
Tiff maps, tabular, graphs	
Data availability:	
Maps, tables and graphs are available online through EEA web site.	
Shortcomings / limitations / gaps:	
<p>It is important to note that the indicator may not reflect the complete ecological impact of stock status. For example, even if relatively few stocks in the Baltic are outside biological limits the demise of cod stocks has a very significant impact on the ecosystem (probably relatively much more so than some other stocks).</p>	

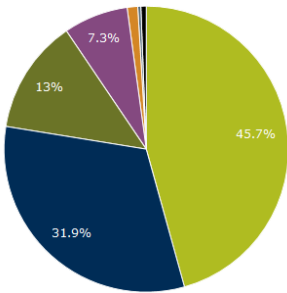
Appendix 28.b). Fishing fleet capacity (CSI 034)

Name of the data set :	
Fishing fleet capacity (CSI 034)	
Description of the information content:	
<p>The indicator is a measure of the size and capacity of the fishing fleet, including the average size of vessels, which in turn are assumed to approximate to the pressure on marine fish resources and the environment.</p> <p>The size of the European fishing fleet is presented as numbers of vessels, the capacity as the total engine power, given in kW and the gross tonnage (GT) given in tonnes. Average size is a derived measurement given in GT/vessel.</p> <p>Data for all the countries come from Eurostat and Directorate-General for Maritime Affairs and Fisheries (DG MARE). Eurostat compiles its fleet statistics from a Statistical Register of Fishing Vessels that is updated annually from an administrative file maintained by DG MARE, in application of Commission Regulation (EC) No 26/2004. The data in the Statistical Register relate to the situation on 31 December of the reference year. The Statistical Register records the length, tonnage, power and year of construction of all registered fishing vessels.</p> <p>Moreover, under a gentlemen's agreement, once annually the national authorities of Norway and Iceland send Eurostat records for their fishing vessels to be included in the Statistical Register. Data on fleet statistics for new EU members (Bulgaria and Romania) are missing as they commenced their data submissions to the DG MARE's as from 1 January 2007.</p> <p>Regarding tonnage, under the EU legislation the Member States are required to record the vessel tonnage using the Gross Tonnage (GT) under the London Convention (1986) as opposed to the previously used Gross Registered Tonnage (GRT) under the Oslo Convention (1946) (Council Regulation (EEC) No. 2930/86).</p> <p>Percentage changes in capacity (power, tonnage, and numbers) have been calculated using the last and first years for which data exist. The average size of a vessel is a derived measurement based on the tonnage and number of vessels.</p> <p>The changes in these parameters were evaluated over the period 1998-2008 for EU15 and EFTA countries, 2004 -2008 for EU7 and 2007- 2008 for Bulgaria and Romania, due to data availability and to allow for comparisons to be made.</p>	
Source:	
Fishing fleet, number of vessels (Eurostat) Fishing fleet, total tonnage (Eurostat) Fishing fleet, total energy power (Eurostat)	
Link:	
http://www.eea.europa.eu/data-and-maps/indicators/ds_resolveuid/e4a8799063f57ff6f3ae364bdd0b3291	
Policy relevance / legal framework	
<p>EU fishing policies aim to achieve sustainable fishing on the long term within a sound ecosystem through appropriate management of fisheries, while offering stable economic and social conditions for all those involved in the fishing activity. Sustainable exploitation of the fish stocks is ensured through the EU Common Fishery Policy, formally created in 1983 (Council Regulation (EEC) No. 170/83), which aimed to address the biological, economic and social dimension of fishing. Since then, adjustments to the fishing fleet have been made, in order to achieve a sustainable balance between its capacity and size, and available resources.</p>	
CONSENT spatial data system	
marine	
Relevant database information on land (use) management:	
Spatial coverage:	
Austria Belgium Bulgaria Cyprus Denmark Estonia Finland France Germany Greece Iceland Ireland Italy Latvia Liechtenstein Lithuania Luxembourg Malta Netherlands Norway Poland Portugal Romania Slovenia Spain Sweden Switzerland United Kingdom	
Temporal coverage:	
1998-2008	
Resolution:	
Format	
Data availability:	
Public access.	
Shortcomings / limitations / gaps:	
<p>The change in recording tonnage from Gross Registered Tonnage (GRT) to Gross Tonnage (GT) has taken place over a number of years throughout the 1990s and at varying rates in different countries. Given that the GT of a vessel is generally significantly greater than the GRT, great care has to be taken in comparing the tonnages of the various fleets at different times. Recording of tonnage by GT was largely complete by the end of 2002. Data sets are fragmented both temporally and spatially. Moreover, data available in a consistent manner is lacking for EU7 before 2004 and for Bulgaria and Romania before 2007.</p>	

Restructuring the fleet and reducing its capacity do not necessarily lead to reduction in fishing pressure as advances in technology and design allow new vessels to exert more fishing pressure than older vessels of equivalent tonnage and power. Therefore capacity, as currently measured, is not showing the effective fishing pressure that is being exerted by European fishing fleets. Other vessel characteristics, such as fishing gear, level of activity and technological developments must also be accounted for if fishing pressure and its impact on marine ecosystems is to be properly assessed.

Status of the underlying methodology

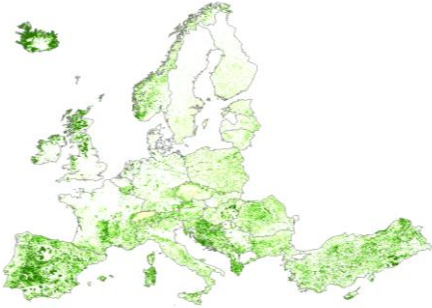
Appendix 29. Land take

Name of the data set :																	
CSI 014 – Land take																	
Description of the information content:																	
Part of EEA Core Set of Indicators (CSI) - How much and in what proportions is agricultural, forest and other semi-natural and natural land being taken for urban and other artificial land development?																	
Source:																	
EEA																	
Link:																	
http://www.eea.europa.eu/data-and-maps/indicators/land-take-2/assessment-2																	
Policy relevance:																	
Biodiversity Strategy 2020,																	
Relevant information on land (use) management:																	
Spatial distribution and intensity of land take for urban and other artificial land (lcf2 Urban residential sprawl + lcf3 Sprawl of economic sites and infrastructures) Lcf2 and lcf3 refer to the EEA land cover flows (land accounting)																	
Spatial coverage:																	
EEA 39, except Greece	<p>Europe 38 – Relative contribution of land-cover categories to uptake by urban and other artificial land development (2000-2006)</p>  <table border="1"> <thead> <tr> <th>Land-cover category</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Arable land and permanent crops (ha)</td> <td>45.7%</td> </tr> <tr> <td>Pastures and mosaic farmland (ha)</td> <td>31.9%</td> </tr> <tr> <td>Forests and transitional woodland shrub (ha)</td> <td>13%</td> </tr> <tr> <td>Natural grassland, heathland and sclerophyllous vegetation (ha)</td> <td>7.3%</td> </tr> <tr> <td>Open space with little or no vegetation (ha)</td> <td>< 1%</td> </tr> <tr> <td>Wetlands (ha)</td> <td>< 1%</td> </tr> <tr> <td>Water bodies (ha)</td> <td>< 1%</td> </tr> </tbody> </table>	Land-cover category	Percentage	Arable land and permanent crops (ha)	45.7%	Pastures and mosaic farmland (ha)	31.9%	Forests and transitional woodland shrub (ha)	13%	Natural grassland, heathland and sclerophyllous vegetation (ha)	7.3%	Open space with little or no vegetation (ha)	< 1%	Wetlands (ha)	< 1%	Water bodies (ha)	< 1%
Land-cover category		Percentage															
Arable land and permanent crops (ha)		45.7%															
Pastures and mosaic farmland (ha)		31.9%															
Forests and transitional woodland shrub (ha)		13%															
Natural grassland, heathland and sclerophyllous vegetation (ha)		7.3%															
Open space with little or no vegetation (ha)	< 1%																
Wetlands (ha)	< 1%																
Water bodies (ha)	< 1%																
Temporal coverage:																	
2006																	
Resolution:																	
1 x 1 km																	
Format																	
GIS																	
Data availability:																	
http://www.eea.europa.eu/data-and-maps/data/CORINE-land-cover																	
Shortcomings / limitations / gaps:																	
5 ha minimum mapping unit for changes																	
Status of the underlying methodology																	
Mature																	

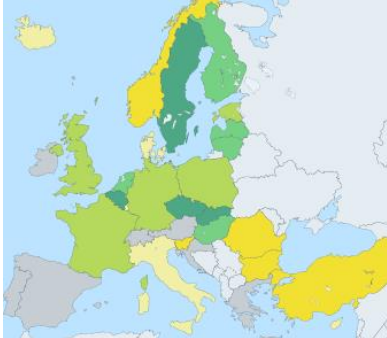
Appendix 30. IRENA 7 Area under organic farming

Name of the data set :	
IRENA 7 Area under organic farming	
Description of the information content:	
<p>Share of agricultural land under organic farming.</p> <p>Organic farming is a way of agricultural production which uses organic production methods and places the highest emphasis on environmental and wildlife protection and, with regard to livestock production, on animal welfare considerations. In the context of European Union (EU) statistics, farming is considered to be organic if it complies with Regulation 834/2007 of 28 June 2007 on organic production and labelling of organic products.</p> <p>Annual data collection. Data are provided by the Member States and Norway on the basis of a harmonised questionnaire.</p>	
Source:	
Eurostat (statistics), EEA (map)	
Link:	
http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Organic_farming_statistics http://epp.eurostat.ec.europa.eu/portal/page/portal/agriculture/data/database http://www.eea.europa.eu/data-and-maps/figures/regional-map-showing-the-share-of-organic-farming-area-in-total-uaa-in-2000	
Policy relevance:	
Agricultural policy, environmental friendly production methods	
Relevant information on land (use) management:	
<p>Certified organic crop area</p> <p>Certified organic crop production and yields from fully converted areas</p> <p>Certified organic livestock</p> <p>Number of certified registered organic operators</p> <p>Number of certified registered operators processing and importing products from organic farming</p> <p>Certified production of organic animal products</p>	
Spatial coverage:	
EU27 + Norway	<p>Organic farming area / utilised agricultural area (UAA) in 2000</p> <p>%</p> <ul style="list-style-type: none"> 0 - 1 1 - 2 2 - 5 5 - 10 > 10 <p>Non EU-15</p> <p>NUTS region (*)</p> <p><small>(*) NUTS 2: AT, BE, DE, DK, EL, ES, FR, GR, IE, IT, LU, NL, PT, SI, SK, UK, SE NUTS 3: DK, FI, FR, IE, IT & SE</small></p> <p><small>NUTS = Nomenclature of territorial units for statistics © Eurogeographics Association for the administrative boundaries.</small></p>
Temporal coverage:	
2000 (map), 2009 (ESTAT statistics) Mandatory delivery from 2008	
Resolution:	
NUTS2	
Format	
Tables	
Data availability:	
The tables can be downloaded from ESTAT and the map from EEA	
Shortcomings / limitations / gaps:	
Resolution (NUTS level 2)	
Status of the underlying methodology	
Data collection based on Regulation 834/2007	

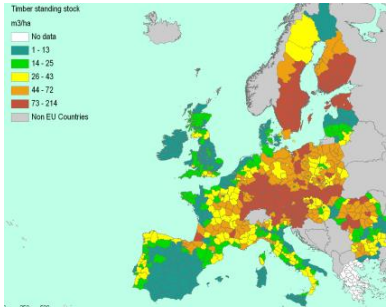
Appendix 31. HNV farmland

Name of the data set :	
HNV Farmland	
Description of the information content:	
High Nature Value (HNV) Farmlands are a concept for the preservation of a high degree of biodiversity in agriculturally used regions, aiming at safeguarding of certain types of farming which are major benefactors of biodiversity. Traditional or extensive farmed landscapes can be real biodiversity hotspots, supporting either a high species and habitat diversity or the presence of species of European conservation concern, or both.	
Source:	
EEA	
Link:	
http://agrienv.jrc.it/publications/pdfs/HNV_Final_Report.pdf	
Policy relevance:	
Common Agricultural Policy, Rural Development Policy (No. 1974/2006/EC), Biodiversity 2020 target	
Relevant information on land (use) management:	
Potential of presence of high nature value farmlands with a particular grid cell (1 – 100%). A 75% probability of a 1x1 km grid cell indicates that 75% of the cell area are covered by HNV farmland.	
Spatial coverage:	
EEA39	
Temporal coverage:	
2006	
Resolution:	
100x100m & 1x1km	
Format	
Raster (*.tif) & EEA-GRID (1x1km)	
Data availability:	
It can be downloaded from CIRCA	
Shortcomings / limitations / gaps:	
Information on land use management in the process of identifying potential HNV areas not available / considered.	
Status of the underlying methodology	
Version 3 – methodological refinement on-going	

Appendix 32. Timber harvest / timber extraction

Name of the data set :	
Timber harvest / timber extraction	
Description of the information content:	
<p>Forestry statistics 2009 (Eurostat pocketbooks) Forest assessment of growing stock, increment and fellings: Forest utilisation rate in 2005 (annual increment in growing stock as a percentage of annual felling) for countries in the Ministerial Conference on the Protection of Forests in Europe (MCPFE). Balance between felling and increment on forest available for wood supply Indicator is based on the MCPFE Report on Sustainable Forest Management in Europe</p>	
Source:	
Eurostat	
Link:	
http://epp.eurostat.ec.europa.eu/portal/page/portal/forestry/data/main_tables http://epp.eurostat.ec.europa.eu/portal/page/portal/forestry/data/database	
Policyrelevance:	
Sustainable forest management	
Relevant information on land (use) management:	
Annual fellings as a share of net annual increment (%) (code tsdnr520) Non-sustainable forest management (SEBI 017)	
Spatial coverage:	
EU-27, EFTA and candidate countries	
Temporal coverage:	
2005, 2007, 2008	
Resolution:	
NUTS 0 (country level)	
Format	
Statistical tables	
Data availability:	
Eurostat online	
Shortcomings / limitations / gaps:	
National data only	
Status of the underlying methodology	
Mature	

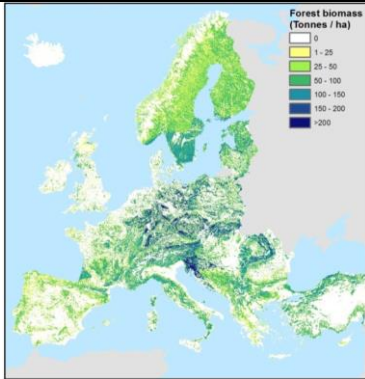
Appendix 33. Timber provision

Name of the data set :	
Timber provision	
Description of the information content:	
Timber provision refers to the products made from trees harvested from natural forests and plantations.	
Source:	
A European assessment of provision of ecosystem services (JRC, 2011) AFOLU EFISCEN forest inventory database	
Link:	
http://publications.jrc.ec.europa.eu/repository/handle/111111111/16103 (JRC report) http://www.efi.int/portal/virtual_library/databases (EFISCEN)	
Policy relevance:	
Forest management, intensity of land use	
Relevant information on land (use) management:	
Timber standing stock Timber increment	
Spatial coverage:	
EU-27	
Temporal coverage:	
Resolution:	
NUTS X (mix of level NUTS 2 & 3)	
Format	
Tables, maps	
Data availability:	
Unknown	
Shortcomings / limitations / gaps:	
EFISCEN forest inventory data are not harmonised across different countries. No information to distinguish between managed and unmanaged forests. Only managed forests contribute to timber production.	
Status of the underlying methodology	
Under development	

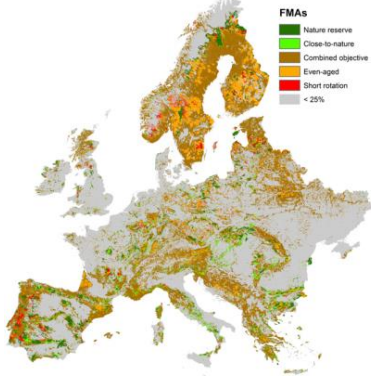
Appendix 34. Non-sustainable forest management (SEBI 017)

Name of the data set:	
Non-sustainable forest management (SEBI 017)	
Description of the information content:	
<p>Forest assessment of growing stock, increment and felling:</p> <ul style="list-style-type: none"> - Forest utilization rate in 2005 (annual increment in growing stock as a percentage of annual felling) for countries in the Ministerial Conference on the Protection of Forests in Europe (MCPFE). - Balance between felling and increment on forest available for wood supply <p>Indicator is based on the MCPFE Report on Sustainable Forest Management in Europe.</p>	
Source:	
EEA	
Link:	
http://www.eea.europa.eu/data-and-maps/indicators/forest-growing-stock-increment-and-fellings/forest-growing-stock-increment-and	
Policy relevance / legal framework:	
Forest Europe process (UNECE/FAO)	
CONSENT spatial data system:	
Biodiversity	
Relevant database information on ecosystems assessment:	
Growing stock is an important and well-accepted proxy for biodiversity. Sustainable development of growing stock in forests and other wooded land, through comparison of felling and net annual increment is possible due to the reliability and long-term availability of data and for all Pan-European countries.	
Spatial coverage:	
Pan-European	<p>Utilization rate (annual fellings expressed as a percentage of the annual increment) in 2005</p> <ul style="list-style-type: none"> < 20 20-40 40-60 60-80 > 80 Not reported
Temporal coverage:	
1990-2005	
Resolution:	
NUTS0	
Format:	
Tiff maps, tabular, graphs	
Data availability:	
Maps, tables and graphs are available online through EEA web site.	
Shortcomings / limitations / gaps:	
Status of the underlying methodology:	
Mature.	


Appendix 35. Living forest biomass and carbon stock

Name of the data set :	
Living forest biomass and carbon stock	
Description of the information content:	
<p>The first report and maps available present a summary of early results of the FOREST Action (JRC) activities on forest biomass and carbon stock in Europe. They present 4 European-wide maps of forest biomass and carbon stock at IPCC Tier 1 level: above ground and total (above and below ground) living forest biomass and above ground and total carbon stock in living forest biomass. Maps of forest biomass and carbon stock are relevant for quantifying terrestrial carbon storage and carbon sinks as well as for estimating potential emissions from land cover changes (afforestation, deforestation, reforestation), forest fragmentation and biotic (pests) and abiotic (e.g. forest fires, windstorms) disturbances.</p>	
Source:	
Barredo J.I., San Miguel J., Caudullo G., Busetto L., 2012. A European map of living forest biomass and carbon stock – Executive report. EUR 25730 EN – Joint Research Centre – Institute for Environment and Sustainability. Luxembourg: Publications Office of the European Union.	
Link:	
http://publications.jrc.ec.europa.eu/repository/handle/111111111/27248	
Policy relevance:	
Forest management, intensity of land use	
Relevant information on land (use) management:	
Above-ground biomass and carbon stocks for forests	
Spatial coverage:	
EEA 39	
Temporal coverage:	
2006, 2010	
Resolution:	
1 x 1 km	
Format	
Raster grid	
Data availability:	
Contact Jose I. Barredo @ JRC. These data will be part of the MAES Pilot 3 – Forest.	
Shortcomings / limitations / gaps:	
Still not publicly available	
Status of the underlying methodology	
Under development	

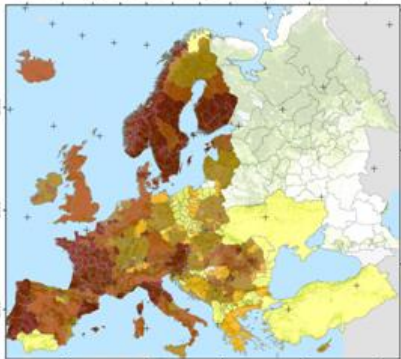
Appendix 36. Map of potential forest management approaches of European Forests

Name of the data set :	
Map of potential forest management approaches of European Forests	
Description of the information content:	
Conceptual framework to stratify forest management across European forests using the tree species map and other abiotic constraints. The approach is to classify management throughout Europe into broad groups with similar objectives and strategies. Output is the most suitable forest management approach per square kilometer.	
Source:	
Hengeveld, G. M., G.-J. Nabuurs, M. Didion, I. Van den Wyngaert, A. P. P. M. Clerkx, and M.-J. Schelhaas. 2012. A forest management map of European forests. <i>Ecology and Society</i> 17(4): 53. http://dx.doi.org/10.5751/ES-05149-170453	
Link:	
http://www.ecologyandsociety.org/vol17/iss4/art53/ES-2012-5149.pdf http://opendap.cgi-systems.nl/thredds/catalog/projecten/EuropeanForest/FMAmap/catalog.html	
Policyrelevance:	
Forest management	
Relevant information on land (use) management:	
Potential forest management approaches (FMA) = gradient of intensity of intervention with the natural processes in a forest	
Spatial coverage:	
EEA 39+	
Temporal coverage:	
Resolution:	
1 x 1 km	
Format	
Raster	
Data availability:	
Through the online resources of the original paper, the second link provided above.	
Shortcomings / limitations / gaps:	
Use of rough proxies for missing information, no information on forest ownership, lack of productivity-related factors	
Status of the underlying methodology	
Under development	

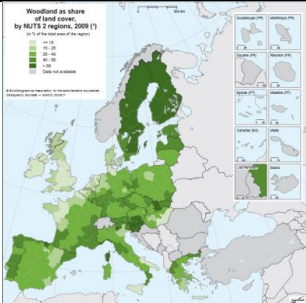
Appendix 37. Forest species map

Name of the data set :	
Forest species map	
Description of the information content:	
Set of 1x1 km tree species maps showing the distribution of 20 tree species over Europe (Brus et al. 2011). It provides 20 raster datasets for different tree species (raster name = species name) and one combined raster dataset 'Dominant Species' showing the dominant tree species per pixel.	
Source:	
G. J. Nabuurs, D. J. Brus, G. M. Hengeveld, D. J. J. Walvoort, P. W. Goedhart, A. H. Heidema, K. Gunia : Tree species map for European forests. Brus, D.J., G.M. Hengeveld, D.J.J. Walvoort, P.W. Goedhart, A.H. Heidema, G.J. Nabuurs, K. Gunia, 2011. Statistical mapping of tree species over Europe. European Journal of Forest Research 131 (1): 145–157.	
Link:	
http://www.efi.int/portal/virtual_library/information_services/mapping_services/tree_species_maps_for_european_forests/ http://www.efi.int/projects/tree-species-map/register.php	
Policyrelevance:	
Forestmanagement	
Relevant information on land (use) management:	
Tree species	
Spatial coverage:	
EEA 39+	
Temporal coverage:	
Resolution:	
1 x 1 km	
Format	
Raster	
Data availability:	
Underlying GIS data are available for download from EFI website after short registration	
Shortcomings / limitations / gaps:	
Status of the underlying methodology	
Peer reviewed	

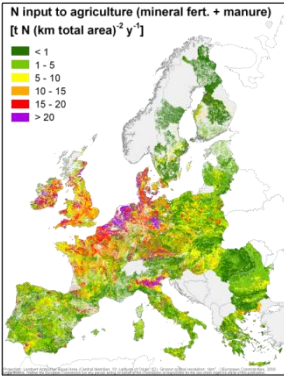
Appendix 38. Forest ownership

Name of the data set :	
Forest ownership	
Description of the information content:	
Spatial distribution of forest ownership and differences in European countries	
Source:	
European Forest Institute Pulla, P., a. Schuck, P.J. Verkerk, B. Lasserre, M. Marchetti & T. Green: Mapping the distribution of forest ownership in Europe.- EFI Technical Report 88, 2013	
Link:	
http://www.efi.int/files/attachments/publications/private_forest_ownership_map_of_europe_april_2013.pdf http://www.efi.int/files/attachments/publications/efi_tr_88_2013.pdf	
Policy relevance:	
Forest management	
Relevant information on land (use) management:	
Quantify the spatial distribution of forest ownership at the sub-national level (regional, counties, departments, districts, etc.) Collection of information of availability of geo-referenced maps on forest ownership	
Spatial coverage:	
47 European countries	
Temporal coverage:	
Various	
Resolution:	
Administrative regions (different levels)	
Format	
Table, map	
Data availability:	
Unknown	
Shortcomings / limitations / gaps:	
Different administrative levels in different countries.	
Status of the underlying methodology	
Mature	

Appendix 39. LUCAS project

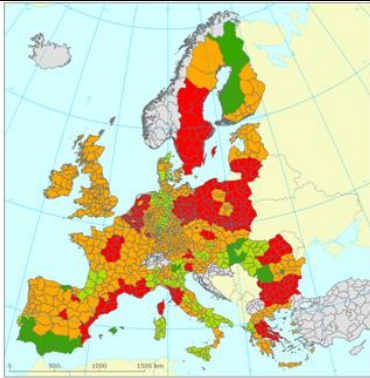
Name of the data set :	
LUCAS	
Description of the information content:	
<p>The LUCAS project was developed as a standard survey methodology (including sampling plans, nomenclature and data collection processes) that allows obtaining harmonised estimates of the land cover and land use at European Union (EU) level. LUCAS has become a multi-purpose platform with land cover and use data as its core activity. Flexible modules dealing with more specific themes, such as soil and biodiversity, can increasingly be integrated into the survey.</p> <p>2001 to 2007 – pilot surveys in 13 – 15 Member States 2009 – survey in 25 Member States (except CY and MT) , 230.000 survey points 2012 – full EU-27 survey</p>	
Source:	
Eurostat (database)	
Link:	
http://epp.eurostat.ec.europa.eu/portal/page/portal/lucas/data/LUCAS_primary_data/2012	
Policy relevance:	
Agricultural policy, agricultural and environmental statistics,	
Relevant database information on land (use) management:	
<p>The LUCAS data are archived in a database. The single parameters are labelled with a field ID.</p> <p>Grass land management: (field ID 29) The surveyor has to record the use of the grassland: Visible signs of grazing b) no sign if grazing</p> <p>Water management: (field ID 32) Type of irrigation b) source of water</p> <p>Forest: (field ID 27) This class includes the production of round wood as well as the extraction and gathering of wild growing non-wood forest products. No forest management information can be extracted.</p> <p>Transect: Information on landscape elements crossed in 500m transect</p>	
EU-27	
Temporal coverage:	
2006 – 2009 – 2012	
Resolution:	
NUTS 2	
Format	
Statistics (tables)	
Data availability:	
Online access to statistical database files	
Shortcomings / limitations / gaps:	
Representativity is limited to NUTS level 2 units, i.e. regions > 10.000 km ²	
Status of the underlying methodology	
Mature	

Appendix 40. CAPRI

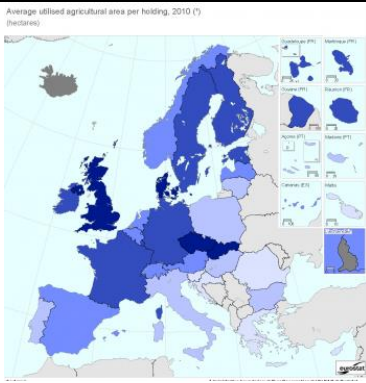
Name of the data set :	
CAPRI Modelling System for the evaluation of exante impacts of the Common Agricultural Policy and trade policies on production, income, markets, trade, and the environment, from global to regional scale. The AFOLU DATABASE provides spatially disaggregated information on crop shares, yields, stocking densities, fertilizer application rates in 150.000 Homogenous Soil Mapping Units (cluster of 1x1 km grid cells) for EU-27.	
Description of the information content:	
CAPRI is the Common Agricultural Policy Regional Impact Modelling System, AFOLU DATA is the information system of the 'GreenHouse Gases in Agriculture, Forestry and Other Land Uses' (GHG AFOLU) project. AFOLU DATA provides: (1) an overview on climate change related policy and bodies, with special attention to the European level and to the AFOLU sector; (2) information on research projects aimed at understanding and quantifying the GHG balance of European terrestrial ecosystems and the associated uncertainty at different scales; (3) a collection of databases and tools for the assessment of GHG fluxes in the AFOLU sector in Europe, using different methods and at different scales.	
Source:	
CAPRI project: University of Bonn AFOLU database: JRC	
Link:	
CAPRI project information: http://www.capri-model.org/dokuwiki/doku.php http://www.capri-model.org/dokuwiki/doku.php?id=capri:concept:spatialdownscaling http://www.capri-model.org/dokuwiki/doku.php?id=capri:concept:HNV Links to data sets in the AFOLU database: http://afoludata.jrc.ec.europa.eu http://afoludata.jrc.ec.europa.eu/index.php/dataset/detail/243 (livestock densities) http://afoludata.jrc.ec.europa.eu/index.php/dataset/detail/218 (nitrogen input) http://afoludata.jrc.ec.europa.eu/index.php/dataset/detail/247 (national N budget) http://afoludata.jrc.ec.europa.eu/index.php/dataset/detail/63 (farm management practices) http://afoludata.jrc.ec.europa.eu/index.php/experiment/datapackages/1 (data package with several data sets)	
Policy relevance:	
Agricultural policy, forestry, Greenhouse Gases, Climate change	
Relevant information on land (use) management:	
Information has been disaggregated to homogeneous soil mapping units (HSMU). Livestock density in LU/ha for ruminants (cattle, sheep and goats) and monogastric animals (pigs and poultry). Information on total HSMU-area, utilized agricultural area, and permanent grassland are included as well (km ²). Nitrogen input is distributed over the spatial units on the basis of regional data for mineral fertilizer consumption and national application rates per country and crop. In simple terms, manure is distributed on the basis of the crops N requirement and N-availability in vicinity of the spatial unit. Mineral fertilizer nitrogen is added according to crops need. Farm, land, and soil nitrogen budgets for agriculture in Europe calculated with CAPRI Farm management practices: mineral fertilizer application (kg N/ha), manure nitrogen application (kg N at tail/ha) and (kg N after considering volatilization losses/ha). Yield (kg/ha). HNV farmland index based on Shannon index of diversity of annual crops and mineral nitrogen fertiliser application	
Spatial coverage:	
EU-27	
Temporal coverage:	
2000	
Resolution:	
1 x 1 km	
Format	
Raster (*.tif)	
Data availability:	
It can be ordered from JRC, registration needed.	
Shortcomings / limitations / gaps:	

Status of the underlying methodology
Disaggregation of CAPRI land use statistics on the basis of environmental characteristics, CLC, LUCAS survey and Farm Structure Survey 2000.

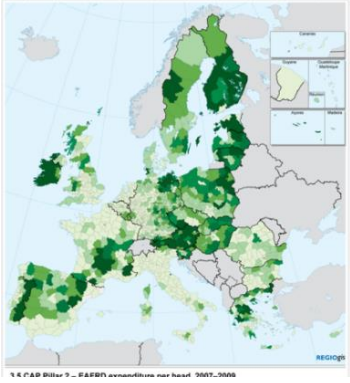
Appendix 41. Disaggregated crop yield statistics

Name of the data set :	
Disaggregated crop yield statistics	
Description of the information content:	
<p>The data set has been produced by the EEA and uses CAPRI land cover (crop) maps to disaggregate agricultural statistics (Eurostat) to the km² grid cell level. Crop datasets are available as 1 km² raster for 28 different crops. CAPRI pixel data are aggregated at NUTS-2level (at which Eurostat provides their yield data) in order to achieve the total area cultivated with certain crop (group). Based on this sum and the percentages, production and yield are downscaled to pixel level, so every pixel indicates the yield in t/km² for every crop group. Using these proportions, disaggregation of regional agriculture statistics into Corilis 0 maps is performed.</p>	
Source:	
EEA	
Link:	
Contact Oscar Gomez @ EEA	
Policy relevance:	
Agricultural policy, land use intensity	
Relevant information on land (use) management:	
Change of yield maps by major crop types	
Spatial coverage:	
EU-27	
Temporal coverage:	
Unknown	
Resolution:	
1 x 1 km	
Format	
Raster	
Data availability:	
EEA	
Shortcomings / limitations / gaps:	
Results should be interpreted at NUTS level 2 or 3	
Status of the underlying methodology	
Mature	

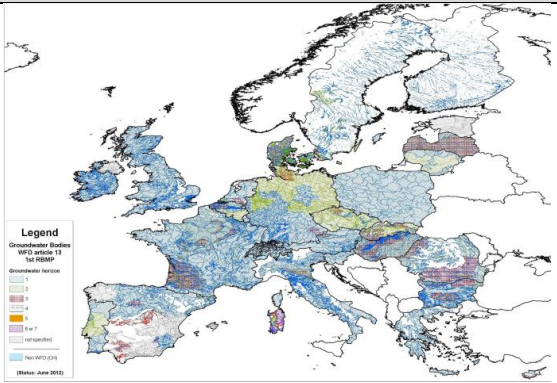
Appendix 42. Farm Structure Survey

Name of the data set :	
Farm Structure Survey	
Description of the information content:	
<p>The survey on the structure of agricultural holdings, also known as the farm structure survey (FSS), helps assess the agricultural situation across the EU, monitoring trends and transitions in the structure of agricultural holdings, while also modelling the impact of external developments or policy proposals.</p> <p>Update cycle every 10 years with intermediate sample surveys.</p>	
Source:	
Eurostat	
Link:	
http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Farm_structure_statistics http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Farm_structure_statistics http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Large_farm_statistics http://epp.eurostat.ec.europa.eu/statistics_explained/images/d/d0/Farm_structure_YB2013.xls	
Policy relevance:	
Agricultural policy, land management, farm labour, rural development, CAP reform	
Relevant information on land (use) management:	
<p>Overview of agricultural holdings (ef_ov) – size structure Land Use (ef_lu) – utilised agricultural area Livestock (ef_ls)</p>	
Spatial coverage:	
EU-27 + CH + NO + HR	 <p>Average utilised agricultural area per holding, 2010 (*) (hectares)</p>
Temporal coverage:	
FSS 2007 Agricultural census 2010	
Resolution:	
NUTS 2	
Format	
Tables	
Data availability:	
Available at Eurostat online	
Shortcomings / limitations / gaps:	
Resolution (NUTS level 2)	
Status of the underlying methodology	
Regulation (EC) 1166/2008	

Appendix 43. CAP pillar 2 spending

Name of the data set :	
CAP pillar 2 spending	
Description of the information content:	
<p>Different reports / statistics on rural development Study on employment, growth and innovation in rural areas (SEGIRA, 2010) Fifth report on economic, social and territorial cohesion (2 maps on CAP expenditure) Rural development in the EU – Statistical and economic information 2012</p>	
Source:	
DG Agriculture, DG Regio	
Link:	
<p>http://ec.europa.eu/agriculture/analysis/external/employment/full-text_en.pdf (SEGIRA) http://capreform.eu/what-common-agricultural-policy/ (DG Regio cohesion report) http://ec.europa.eu/agriculture/statistics/rural-development/2012/ (rural development statistics) http://ec.europa.eu/agriculture/statistics/rural-development/2012/ch34_en.pdf (environment chapter)</p>	
Policy relevance:	
Rural development, CAP	
Relevant information on land (use) management:	
<p>Pillar 2: Rural development - concerns the improvement of the environment and the countryside through support for land management as well as helping to fight climate change. Projects could include preserving water quality, sustainable land management, planting trees to prevent erosion. Study on employment, growth and innovation in rural areas (SEGIRA, 2010) Assessment of employment and growth in rural areas with particular attention paid to women and young people, agriculture and the agri-food industry; the key conditions for stimulating economic growth in rural areas; and providing a classification of major drivers of employment and socio-economic development in rural areas Fifth report on economic, social and territorial cohesion (2 maps on CAP expenditure) CAP pillar 2 spending (expenditure per UAA 2000-2006 & per head, 2007-2009) – maps developed in SEGIRA study Rural development in the EU – Statistical and economic information 2012 Area of UAA for extensive arable crop / extensive grazing (indicator 9) Population of farmland birds (indicator 17 – trend index)</p>	
Spatial coverage:	
EU-27	
Temporal coverage:	
Various (2000, 2006, 2012)	
Resolution:	
NUTS 2	
Format	
Tables, maps	
Data availability:	
Tables available from DG Agriculture	
Shortcomings / limitations / gaps:	
Resolution (NUTS level 2)	
Status of the underlying methodology	
Based on regulation	

Freshwater**Appendix 44. WISE Groundwater**

Name of the data set :	
WISE Groundwater	
Description of the information content:	
A groundwater body is defined in WFD Art. 2 as a distinct volume of groundwater within an aquifer or aquifers, whereas an aquifer is defined as a geological layer with significant groundwater flow. The submission of GWB data to the Commission by the EU Member States was accomplished via the Reportnet platform, as a part of the dataflow for WFD. Art. 13 reporting. GWBs are registered to so-called horizons, which represent distinct vertical layers of groundwater resources.	
Source:	
EEA, ETC/ICM, "GW_reference_layer_status_v3.ETCICM.pdf"	
Link:	
http://www.eea.europa.eu/data-and-maps/data/wise-groundwater#tab-gis-data	
Policy relevance:	
WFD, CAP, UWWT	
Relevant information on land (use) management:	
Location of the main groundwater bodies (to be joint with the attributes of the Waterbase below)	
Spatial coverage:	
EU-27 + Switzerland	
Temporal coverage:	
2009-2011	
Resolution:	
1 : 250 000	
Format	
Vector (shapefile) and some characteristics in an XML schema	
Data availability:	
Public, EEA	
Shortcomings / limitations / gaps:	
Status of the underlying methodology	
Mature	

Appendix 45. Waterbase – Groundwater v.13

Name of the data set :	
Waterbase – Groundwater v.13 (with possible links to other “Waterbases” such as “Water quantity”)	
Description of the information content:	
Waterbase is the generic name given to the EEA's databases on the status and quality of Europe's rivers, lakes, groundwater bodies and transitional, coastal and marine waters, and on the quantity of Europe's water resources. Dataset contains data selected from reporting of member and collaborating countries on chemical quality of groundwater, characteristics of groundwater bodies and sampling sites.	
Source:	
EEA, ETC/ICM	
Link:	
http://www.eea.europa.eu/data-and-maps/data/waterbase-groundwater-9	
Policy relevance:	
WFD, CAP, UWWT	
Relevant information on land (use) management:	
Water availability (e.g. depth, size, water abstraction), water quality class, stress (e.g. saltwater intrusion)	
Spatial coverage:	
39 European countries	
Temporal coverage:	
1960 - 2011	
Resolution:	
Unknown	
Format	
Tables	
Data availability:	
Public, EEA	
Shortcomings / limitations / gaps:	
Status of the underlying methodology	
Mature	

Marine**Appendix 46. Nutrients in transitional, coastal and marine waters (CSI 021)**

Name of the data set :	
Nutrients in transitional, coastal and marine waters (CSI 021)	
Description of the information content:	
<p>The indicator illustrates trends in, and concentrations of, winter nitrate and phosphate (microgram/l), as well as Nitrogen/Phosphorous ratio in the seas of Europe. Consistent time series are used as the basis for assessment of trends over time. The trend analyses are based on time series 1985-2004/2005 from stations having at least 3 years data in the period 1999-2004 and at least five years data in all. For nitrogen the combined concentrations of nitrate and nitrite are used, but gaps may be populated with nitrate alone to complete the time series.</p> <p>Winter concentrations are used because in summer all inorganic nutrients are used for plankton growth. The following steps are undertaken for the calculation. For a detailed description of methodology, reference is made to the EEA core set indicator 'Nutrients in transitional, coastal and marine waters' (http://themes.eea.europa.eu/IMS/IMS/ISpecs/ISpecification20041007132008/full_spec).</p> <ol style="list-style-type: none"> 1. Primary aggregation of sea water TCM data The primary aggregation consists of identifying stations and assigning them to countries and sea regions and creating statistical estimates for each combination of station and year. 2. Geographical classification: sea region, coastal/offshore All geographical positions defined in the data are assigned to sea region by coordinates, and classified as coastal or off-shore (> 20 km from coast) by checking them against the coastal contour. 3. Defining stations <p>TCM data reported directly from countries are assigned to station identifiers that are listed with coordinates. For these data, which are mostly along the coast of the reporting country, stations are kept as defined.</p>	
Source:	
Waterbase - Transitional, coastal and marine waters provided by European Environment Agency (EEA)	
Link:	
http://www.eea.europa.eu/data-and-maps/indicators/ds_resolveuid/d67c0df921fed1f72be10e19688707e2	
Policy relevance / legal framework	
<p>There are a number of EU Directives aimed at reducing the loads and impacts of nutrients, including the Nitrates Directive (91/676/EEC); the Urban Waste Water Treatment Directive (91/271/EEC); the Integrated Pollution Prevention and Control Directive (96/61/EEC); and the Water Framework Directive (2000/60/EC) which requires the achievement of good ecological status or good ecological potential of transitional and coastal waters across the EU by 2015.</p> <p>The EU Thematic Strategy on the Protection and Conservation of the Marine Environment and its associated proposed Marine Strategy Directive are of key relevance with regards to the achievement of good environmental status in marine waters. Additional measures arise from international initiatives and policies including: the UN Global Programme of Action for the Protection of the Marine environment against Land-Based Activities; the Mediterranean Action Plan (MAP) 1975; the Helsinki Convention 1992 (HELCOM); the OSPAR Convention 1998 (Convention for the Protection of the Marine Environment of the North-East Atlantic); and the Black Sea Environmental Programme (BSEP).</p>	
CONSENT spatial data system	
marine	
Relevant database information on land (use) management:	
Undesirable effects caused by Nitrogen (N) and phosphorus (P) (have a direct impact on ecosystem integrity and functioning (e.g. changes in species composition, oxygen depletion, changes in community structure) and the delivery of ecosystem services (death of commercial fish species or shellfish poisoning).	
Spatial coverage:	
Belgium , Denmark , Estonia , Finland , Germany , Greece , Ireland , Italy , Latvia , Lithuania , Netherlands , Norway , Poland , Sweden , United Kingdom	<p>Observed changes in winter oxidised nitrogen (NO₂+NO₃) concentrations, 1985–2010</p> <ul style="list-style-type: none"> ● Decrease ● Increase ● None <p>Baltic Sea North-east Atlantic Sea Celtic Seas Greater North Sea (incl. Kattegat and the English Channel) Bay of Biscay and the Iberian Coast</p>
Temporal coverage:	
1985-2005	
Resolution:	
Format	

Data availability:	
Public access.	
Shortcomings / limitations / gaps:	
<p>Data for this assessment are still scarce considering the large spatial and temporal variations inherent to the European transitional, coastal and marine waters. Long stretches of European coastal waters are not covered in the analysis due to lack of data. Trend analyses are consistent only for the North Sea and the Baltic Sea (data updated yearly within the OSPAR and HELCOM conventions) and Italian coastal waters. The accuracy on regional level is largely influenced by the number of stations for which data are available.</p>	
Status of the underlying methodology	
<p>The indicator is based in a well-established data flow from a wide geographic coverage of countries and regional seas. The indicator is based on an EEA priority data flow and the information is timely as it is updated annually. The data are in Waterbase and are freely available on the EEA website. The EEA is Europe's water data centre and hosts the Water Information System for Europe (WISE) which will incorporate Waterbase. The data flows for Marine Conventions may also be incorporated into WISE in the future.</p>	

Appendix 47. Chlorophyll in transitional, coastal and marine waters (CSI 023)

Name of the data set :	
Chlorophyll in transitional, coastal and marine waters (CSI 023)	
Description of the information content:	
<p>The indicator shows 1) annual mean summer surface concentrations (microgram/l), 2) classification of concentration levels (i.e. low, moderate, high) and 3) trends in mean summer surface concentrations of chlorophyll-a (microgram/l) in the regional seas of Europe.</p> <p>Summer period is: June to September for stations north of latitude 59 degrees in the Baltic Sea (Gulf of Bothnia and Gulf of Finland) May to September for all other stations</p> <p>The used regional and subregional seas of Europe are in line with the geographical regions and sub-regions specified in the Marine Strategy Framework Directive (MSFD). Other European Seas (Icelandic Sea, The Norwegian Sea, the Barents Sea and the White Sea) are not covered in this indicator due to current lack of data.</p> <p>The concentration of chlorophyll-a is expressed as microgram /l in the uppermost 10 m of the water column during summer.</p>	
Source:	
Waterbase - Transitional, coastal and marine waters provided by European Environment Agency (EEA)	
Link:	
http://www.eea.europa.eu/data-and-maps/indicators/ds_resolveuid/c179bb23947d7b36f36b87c6b5dfaa58	
Policy relevance / legal framework	
<p>There are a number of EU Directives aimed at reducing the loads and impacts of nutrients. These include: the Nitrates Directive (91/676/EEC) aimed at reducing nitrate pollution from agricultural land; the Urban Waste Water Treatment Directive (91/271/EEC) aimed at reducing pollution from sewage treatment works and certain industries; the Integrated Pollution Prevention and Control Directive (96/61/EEC) aimed at controlling and preventing pollution of water from industry; and the Water Framework Directive (2000/60/EC) which requires the achievement of good ecological status or good ecological potential of transitional and coastal waters across the EU by 2015 and the Marine Strategy Framework Directive (2008/56/EC) which requires the achievement or maintenance of good environmental status in European sea basins by the year 2020 at the latest, through the adoption of plans of action based on 11 descriptors, one of which is Eutrophication.</p>	
CONSENT spatial data system	
marine	
Relevant database information on land (use) management:	
<p>The water quality in transitional, coastal and marine regions can be adversely affected by land-based and water-based anthropogenic activities, which outputs can reach directly or indirectly this environment. Most pollution comes from land-based activities, through inland waterways, such as the application of agricultural fertilizers and animal farming, or the discharge of poorly or untreated wastewater. Pollution can however also be airborne, from emissions, although this is more relevant for marine off-shore waters.</p> <p>These activities may result in elevated nutrient (mostly nitrogen and phosphorus) concentrations (see also CSI 021 Nutrients in transitional, coastal and marine waters) leading to eutrophication and causing a chain of undesirable effects.</p>	
Spatial coverage:	
<p>Albania, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Malta, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovenia, Spain, Sweden, Turkey, United Kingdom</p>	<p>Observed changes in chlorophyll-a (Chla) concentrations, 1985-2010</p> <ul style="list-style-type: none"> ● Decrease ● Increase ○ None <p>Baltic Sea Baltic Sea</p> <p>North-east Atlantic Sea Celtic Seas</p> <p>Greater North Sea (incl. Kattegat and the English Channel) Bay of Biscay and the Iberian Coast</p> <p>Mediterranean Sea Mediterranean Sea</p> <p>Black Sea Black Sea</p>
Temporal coverage:	
1985-2010	
Resolution:	
Format	
Data availability:	
Public access.	
Shortcomings / limitations / gaps:	
<p>Data for this assessment are still scarce considering the large spatial and temporal variations inherent in European transitional, coastal and marine waters. Long stretches of European coastal waters are not covered by the analysis due to lack of data. Trend analyses are only consistent for the eastern North Sea, the Baltic Sea area and French and Croatian coastal waters in the Mediterranean.</p> <p>For the assessment of chlorophyll-a concentrations, different analytical methods are generally used. Although these different analytical methods generally give comparable results with reasonable to good correlations between methods, simple fluorometric and photometric methods are less accurate and therefore may be a source of uncertainty.</p>	

Low sampling frequencies increase the risk of not detecting phytoplankton blooms, and differences in sampling frequency between stations are an additional source of uncertainty. Due to variations in run-off and hydro-geographic variability of the coastal zone and internal cycling processes, trends in chlorophyll-a concentrations cannot be directly related to measures taken, but must be evaluated in a broader context.

Status of the underlying methodology

Appendix 48. Hazardous substances in marine organisms (MAR 001)

Name of the data set :

Hazardous substances in marine organisms (MAR 001)

Description of the information content:

This indicator is based on the assessment of seven substances: the metals cadmium, lead and mercury, the pesticides DDT and lindane, and other two synthetics - HCB and PCBs. This indicator describes the levels and trends in European seas of concentrations of seven hazardous substances in marine biota, based on the individual assessment of monitoring data for the following substances:

Mercury (Hg) and its compounds

Cadmium (Cd) and its compounds

Lead (Pb) and its compounds

Hexachlorobenzene (HCB)

Polychlorinated biphenyl (PCB), using chlorinated biphenyls CB28, CB52, CB101, CB118, CB138, CB153, and CB180 as representatives

The pesticide DDT (using pp'DDE as a representative of DDT)

The pesticide Lindane- 1,2,3,4,5,6-hexachlorocyclohexane (HCH)

The indicator is based on data for substances measured in organisms from the regional seas as follows:

Baltic Sea – Atlantic herring (*Clupea harengus*)

North-east Atlantic Ocean – blue mussel (*Mytilus edulis*), Atlantic cod (*Gadus morhua*), flounder (*Platichthys flesus*)

Mediterranean Sea – Mediterranean mussel (*Mytilus galloprovincialis*)

Black Sea - Mediterranean mussel (*Mytilus galloprovincialis*)

The classification in the maps is based on concentrations in µg/kg, which are then classified into one of three classes: green (Low concentration), yellow (Moderate concentration) or red (High concentration). In addition a pie chart is presented showing the percent of each class within each of the four regional seas.

Source:

[Waterbase - Transitional, coastal and marine waters](#) provided by **European Environment Agency (EEA)**

Link:

http://www.eea.europa.eu/data-and-maps/indicators/ds_resolveuid/e024063b1d8891cb98d408ad5db64a47

Policy relevance / legal framework

The aim of Water Framework Directive is to achieve zero, near zero or background concentrations (more specifically defined in daughter directive on ecological quality standards, i.e. the EQS-directive 2008/105/EC), depending on the contaminant, through abatement actions on inputs, with the objective of reaching good ecological and chemical status by 2015 of fresh, transitional and coastal waters. However the WFD only applies to the transitional and coastal environment. Goals similar to the Water Framework Directive have also been outlined by OSPAR and HELCOM. No similar regional target has yet been formulated for the Mediterranean Sea or the Black Sea, although discussions are under way.

Within the scope of the Marine Strategy Framework Directive, hazardous substances are the relevant criteria and indicators in marine waters under Descriptor 8 ("Concentrations of contaminants are at levels not giving rise to pollution effects") and 9 ("Contaminants in fish and other seafood for human consumption do not exceed levels established by Community legislation or other relevant standards"). In this regard Member States are required to take into account relevant environmental targets.

CONSENT spatial data system

marine

Relevant database information on land (use) management:

The main sources of hazardous substances are generally from waste/disposal burning of fossil fuels and industrial activities, including mining and production. Human activities have caused a general mobilisation of these hazardous substances in the marine environment.

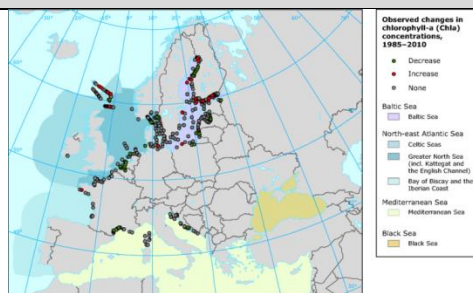
Spatial coverage:

[Albania](#), [Belgium](#), [Bosnia and Herzegovina](#), [Croatia](#), [Cyprus](#), [Denmark](#), [Estonia](#), [Finland](#), [France](#), [Germany](#), [Greece](#), [Ireland](#), [Italy](#), [Latvia](#), [Lithuania](#), [Malta](#), [Montenegro](#), [Netherlands](#), [Norway](#), [Poland](#), [Portugal](#), [Slovenia](#), [Spain](#), [Sweden](#), [Turkey](#), [United Kingdom](#).

Temporal coverage:

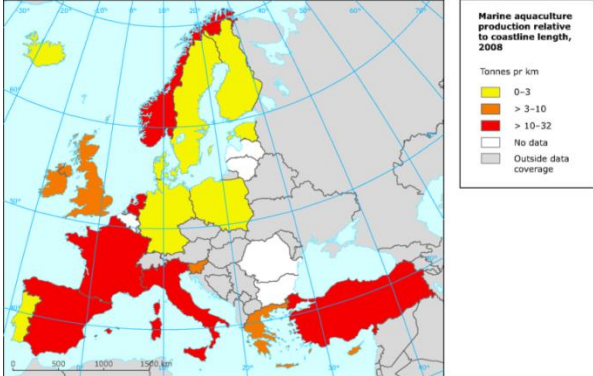
1998-2010

Resolution:



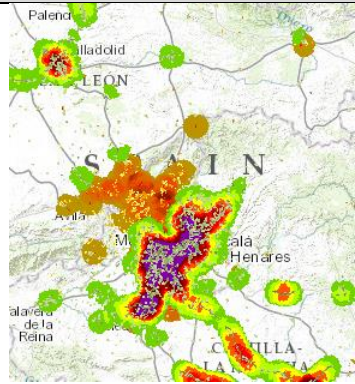
Format	
Data availability:	
Public access.	
Shortcomings / limitations / gaps:	
This assessment is based on data reported to the EEA by EEA member countries, which have significant gaps in terms of availability (geographical and temporal) and consistency, especially for the Mediterranean and Black Seas. These data uncertainties are therefore hindering more adequate assessment of concentrations and trends of hazardous substances in European marine waters.	
Status of the underlying methodology	

Appendix 49. Aquaculture production (CSI 033)

Name of the data set :	
Aquaculture production (CSI 033)	
Description of the information content:	
The indicator tracks aquaculture production and nutrient discharges and thereby provides a measure of the pressures of aquaculture on the marine environment. It is a simple and readily-available indicator but, as a stand-alone indicator, its meaning and relevance are limited because of widely varying production practices and local conditions. It needs to be integrated with other indicators related to production practices (such as total nutrient production or total chemical discharge) to generate a more specific indicator of pressure. Coupled with information on the assimilative capacity of different habitats, such an indicator would allow estimation of impact and ultimately the proportion of the carrying capacity of the surrounding environment used and the limits to expansion.	
Source:	
Fishery data (FAO) provided by FAO Fishery statistics (Eurostat) provided by Eurostat - Statistical Office of the European Union (ESTAT) Coast length provided by World Resources Institute	
Link:	
http://www.eea.europa.eu/data-and-maps/indicators/aquaculture-production-1/ds_resolveuid/8821aa81122428f9f24eb70d5c974dc5	
Policy relevance / legal framework	
Until recently there was no general policy for European aquaculture, although the Environmental Impact Assessment (EIA) Directive (85/337/EEC & amendment 97/11/EEC) requires specific farms to undergo EIAs and the Water Framework Directive requires all farms to meet environmental objectives for good ecological and chemical status of surface waters by 2015. There are few national policies specifically addressing the diffuse and cumulative impacts of aquaculture as a whole on aquatic systems, or the need to limit total production in line with the assimilative capacity of the environment. However, limits on feed inputs in some countries (such as Finland) effectively limit production. The new Reformed Common Fisheries Policy (CFP) aims to improve the management of aquaculture. In September 2002, the Commission presented to the Council and to the European Parliament a communication on "A strategy for the sustainable development of European aquaculture".	
CONSENT spatial data system	
marine	
Relevant database information on land (use) management:	
Spatial coverage:	
Austria Belgium Bulgaria Cyprus Czech Republic Denmark Estonia Finland France Germany Greece Hungary Iceland Ireland Italy Latvia Liechtenstein Lithuania Luxembourg Malta Netherlands Norway Poland Portugal Romania Slovakia Slovenia Spain Sweden Switzerland Turkey United Kingdom	
Temporal coverage:	
1990-2008	
Resolution:	
Format	

Data availability:
Public access.
Shortcomings / limitations / gaps:
<p>The weakness of the indicator relates to the validity of the relationship between production and pressure. Production acts as a useful, coarse indicator of pressure but variations in culture species, production systems and management approaches mean that the relationship between production and pressure is non-uniform.</p> <p>By presenting production relative to coastline length, it is possible to determine a more comparable value of production density. This is potentially a better indicator of pressure than a single production value, but there are difficulties with this indicator. It is inappropriate for landlocked countries; it does not apply to freshwater production; it does not consider the area of coastline that is potentially suitable for production; and the determination of coastline length is problematic and relies upon uniform scale being used for each country's determination.</p>
Status of the underlying methodology

Other features**Appendix 50. Ecotones**

Name of the data set :	
Ecotones	
Description of the information content:	
Ecotones are zone of transition between two adjacent ecological systems and are characterized by a high rate of change compared to these adjacent areas.	
Source:	
EEA	
Link:	
http://www.eyearth.org/Templates/StoryBook2/?appid=38a6e7686d354e05b9e016c8ddd536e4&webmap=a6f1bc85613f44dab4f427d558102abc	
Policy relevance:	
Biodiversity Strategy	
Relevant information on land (use) management:	
An ecotonal area often has a higher density of organisms of one species and a greater number of species than are found in either flanking community. Ecosystem service on pollination (forest-agriculture ecotone)	
Spatial coverage:	
EEA 39	
Temporal coverage:	
2006	
Resolution:	
1 x 1 km	
Format	
Raster (*.tif), vector	
Data availability:	
Shortcomings / limitations / gaps:	
Scale, based on CLC ecotones	
Status of the underlying methodology	
Under development	