Examples of European ecosystem accounts & calculation of carbon balance

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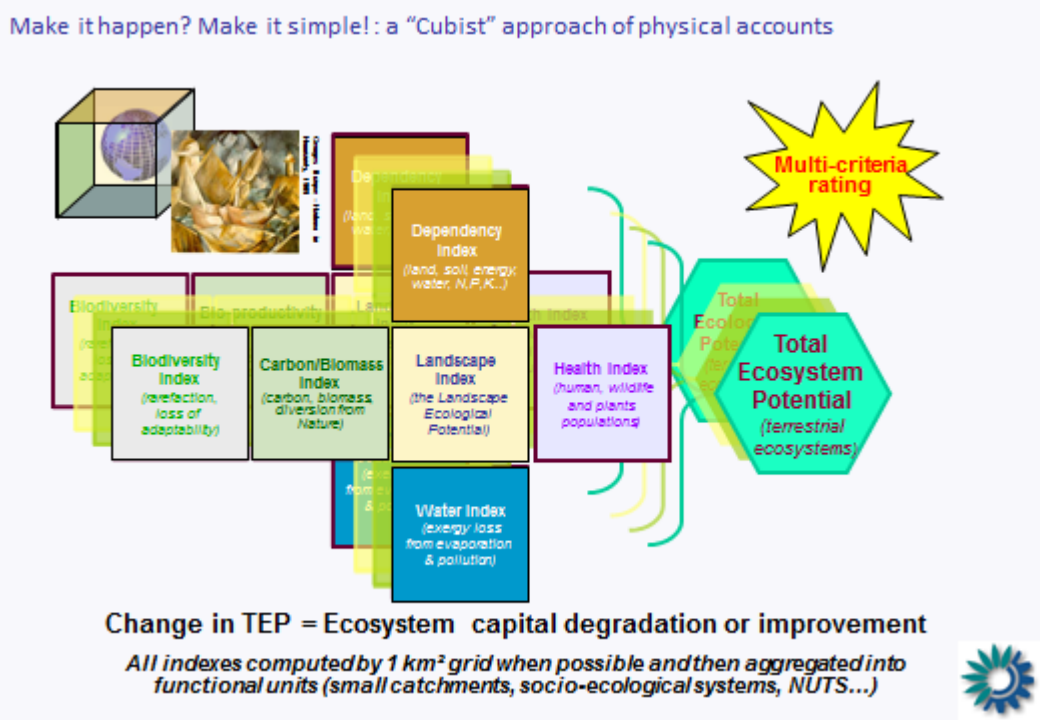
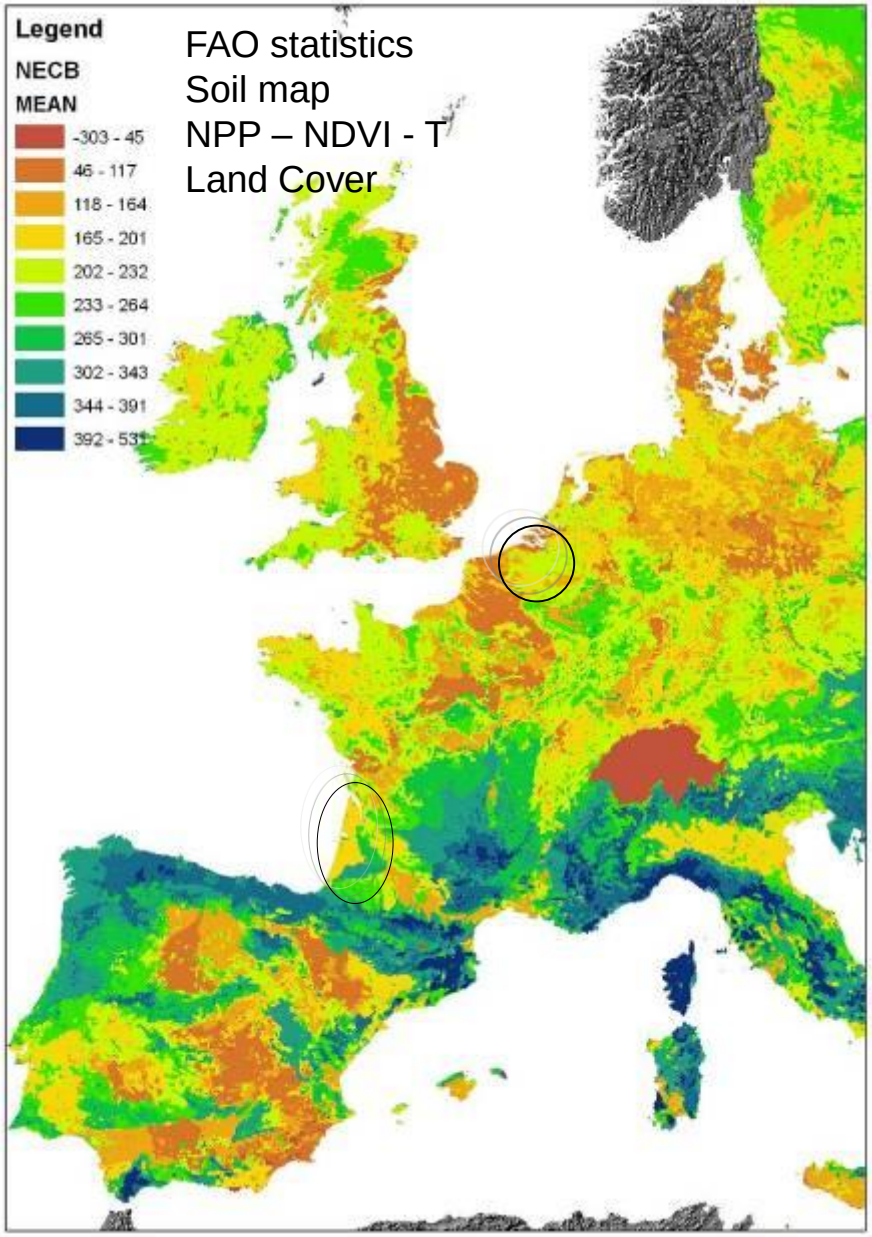
Introduction

Applying the ecosystem cube



1. Ecosystem richness, vitality and resilience = integrity or "health"
2. Main objective of Ecosystem capital accounting - bring together evidence on large scales from statistics (FAO…), remote sensing (medium resolution) and expert valuations (IUCN, Birdlife International, WDPA)
3. And analyse bio-geographical and landscape patterns

Illustrating two facets of ecosystem “cube” for Europe



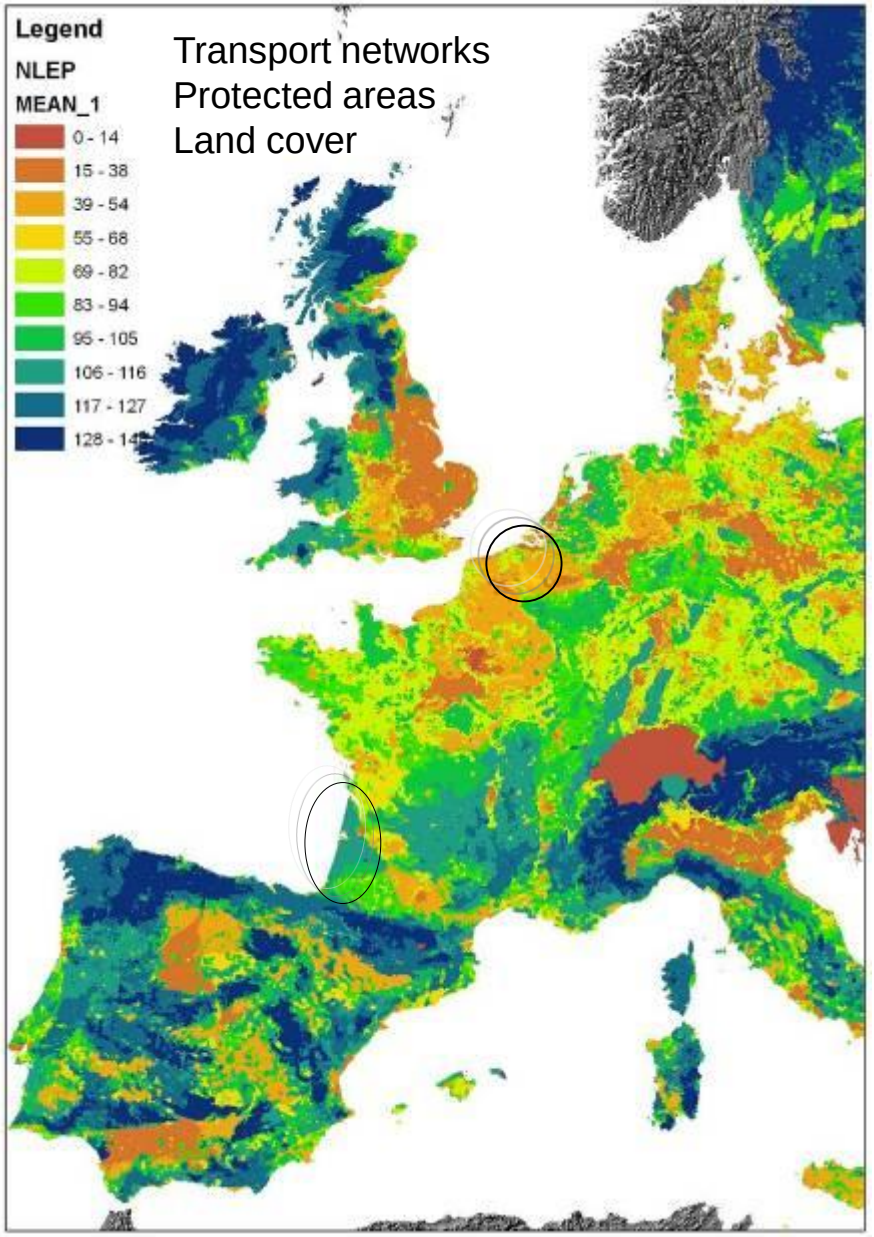
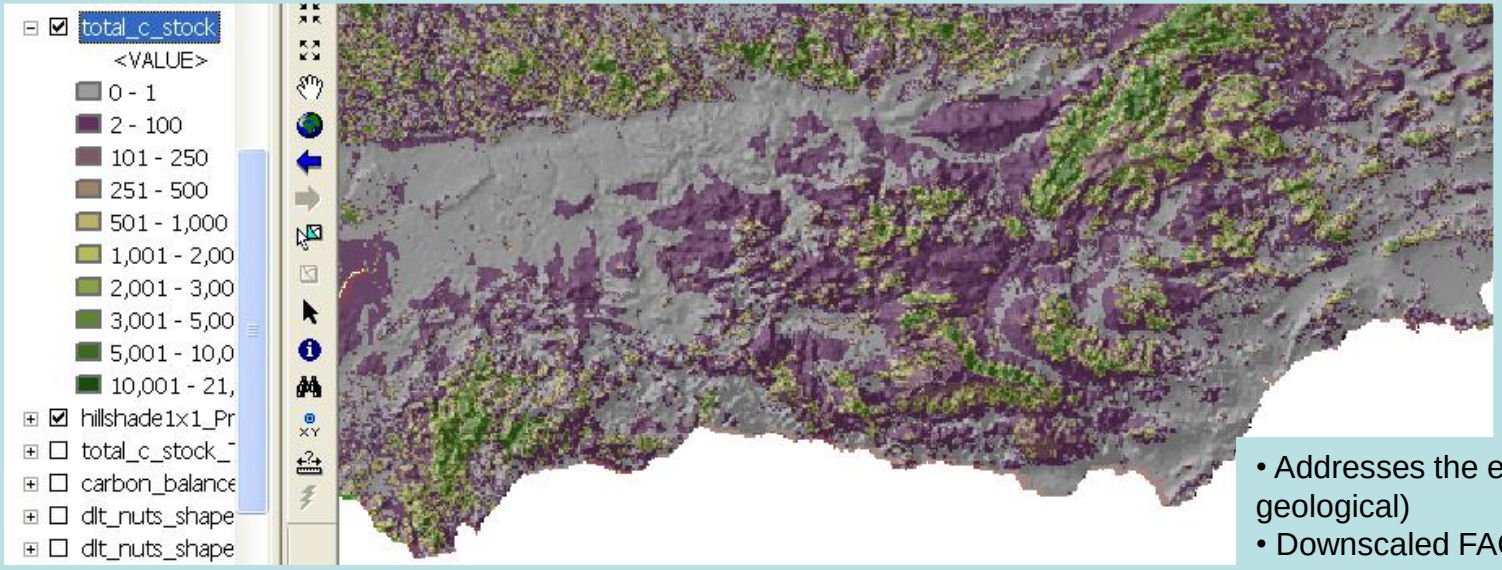


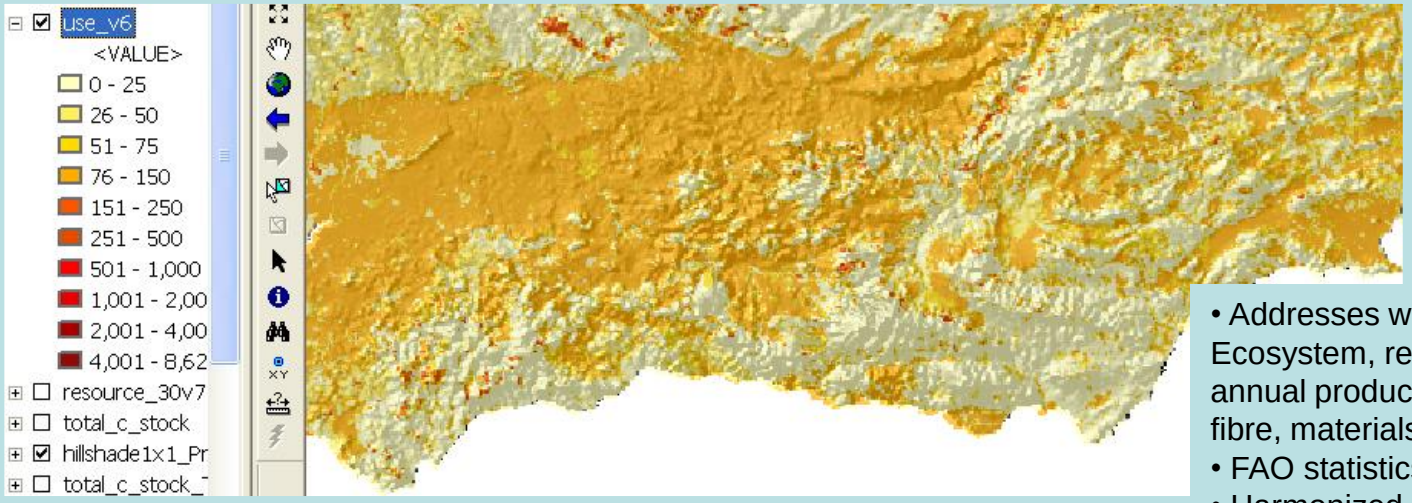
Illustration of Bio-productivity existing stock and new resource production in year 2000



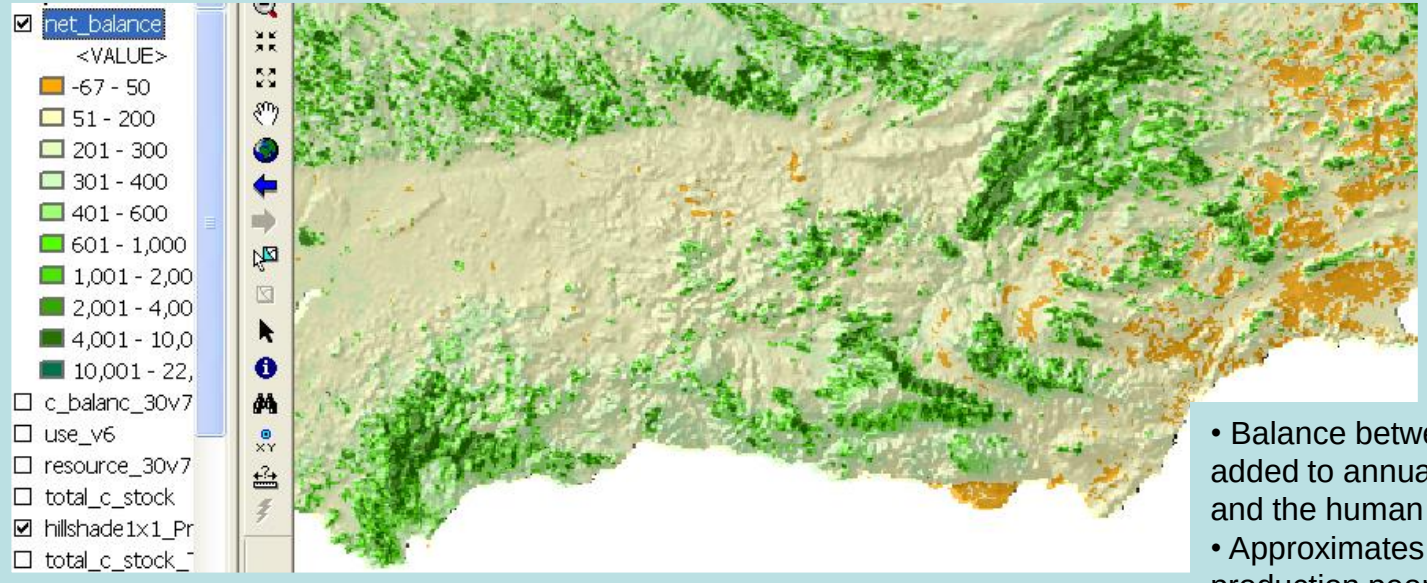
- Addresses the ecosystem processes (not geological)
- Downscaled FAO forest biomass + topsoil
- Harmonized EU map
- Underestimation of real stocks (no herbal and bush biomass included)

- Key ecosystem processes as productivity or vitality (Rapport)
- GEOSUCCESS NPP – C fix model + Night T = adapted to NEP
- Harmonized EU map
- Underestimation (no production under plastic or under forest canopy …)

Illustration of Bio-productivity human use in 2000 and resulting balance



- Addresses what people take from the Ecosystem, renewable resources incl.both annual production and accumulated stock (food, fibre, materials, bio-fuels, NO fossil fuels)
- FAO statistics downscaled on LC and NDVI
- Harmonized EU view, calibration needed for different crops, tree types etc



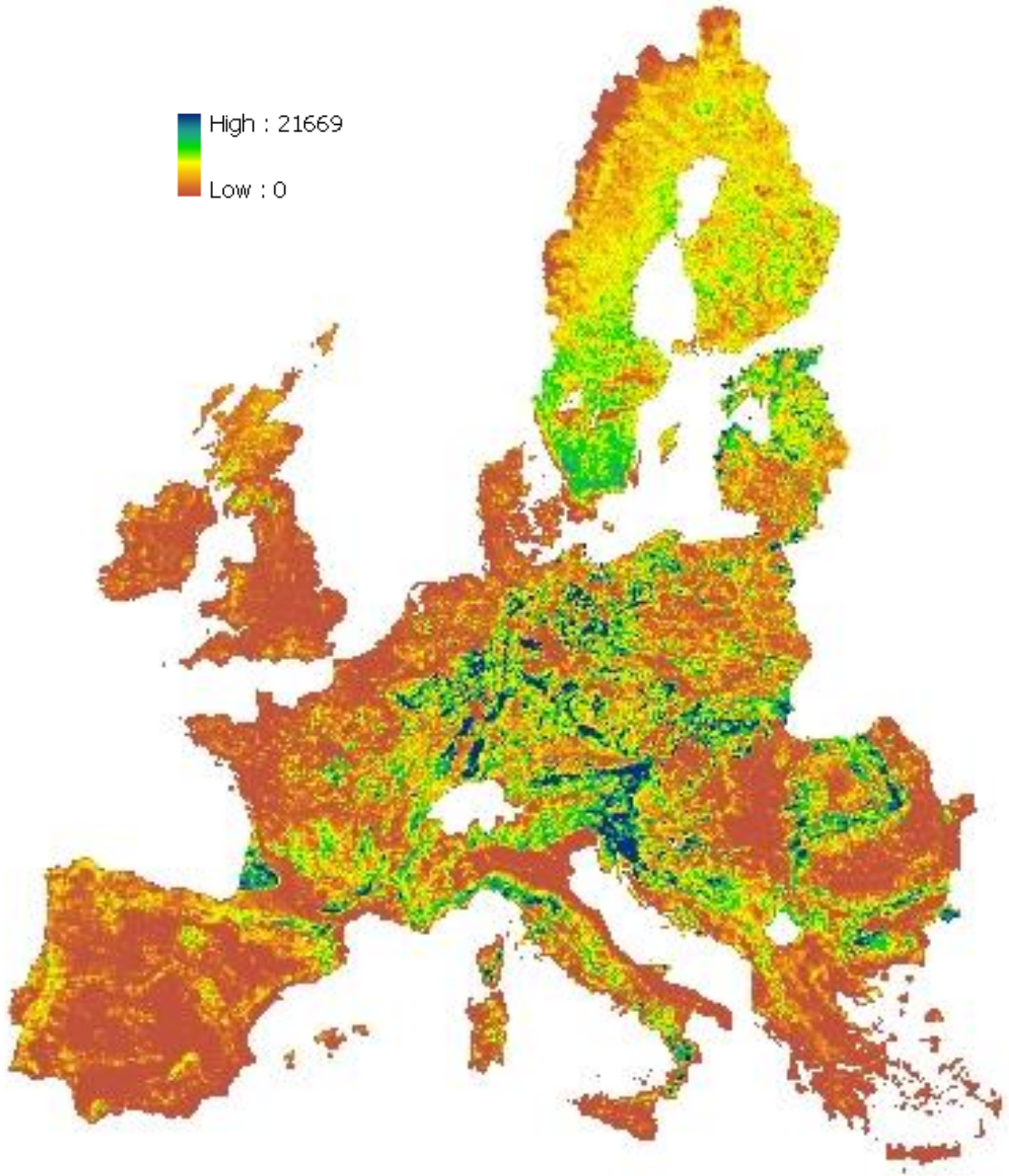
- Balance between the Ecosystem carbon stock added to annual carbon resource production and the human use of both
- Approximates the amount of how much natural production people used and how much they shared with the rest of the ecosystem
- it is not a balance between C-fixing and C-release

CALCULATING and MAPPING NECB

Used inputs:

- FAO's country statistics on: crop harvest, roundwood removals, grazing animals distribution, forest above-ground and bellow-ground biomass all for year 2000
- Remote sensing input (1 km grid): NPP 2000, NDVI 1999 – 2000, Tmin 2000
- Percentage Land cover in 1 km – selected classes croplands, forest lands and grazed lands
- Soil carbon content map

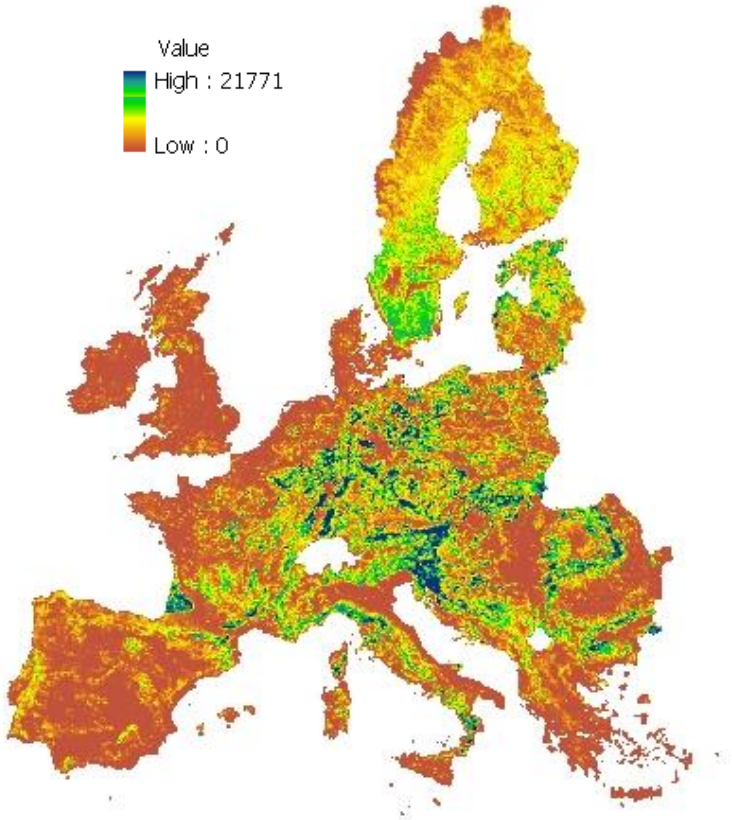
EXISTING CARBON STOCK

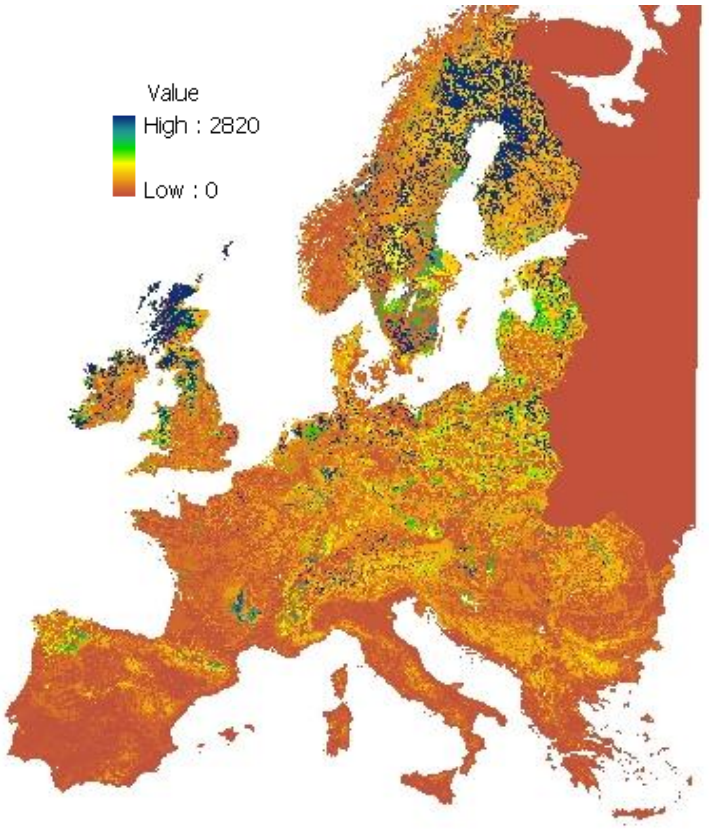


CARBON STOCK IN FOREST + CARBON STOCK IN TOPSOIL

Downscaled FAO data

JRC data

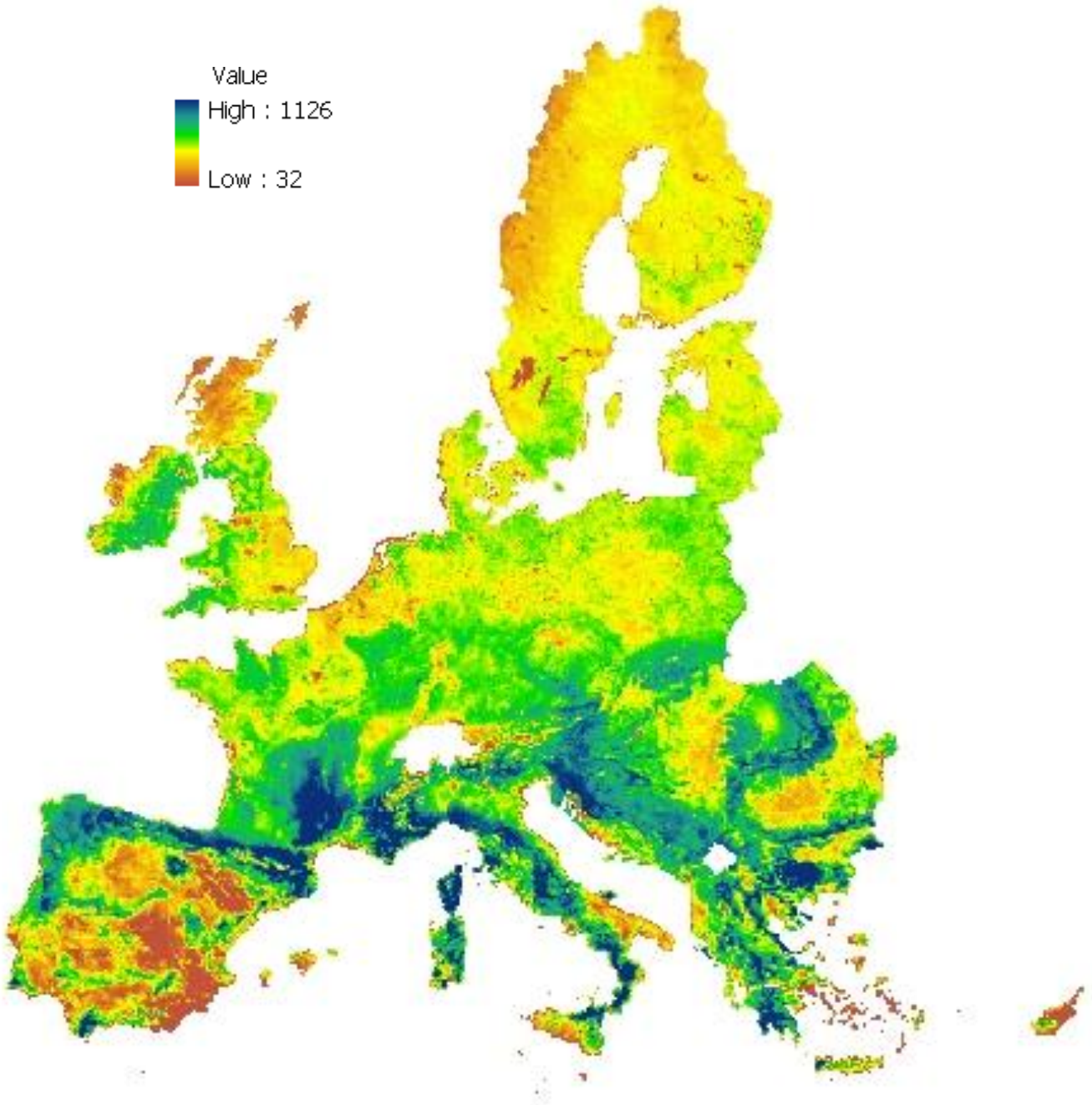




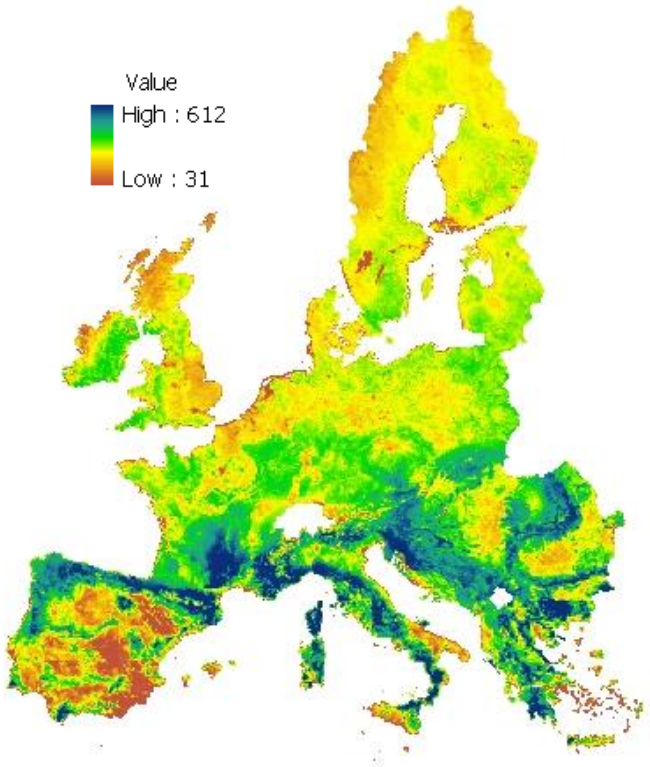
On % standing forest land in 1 km2

…

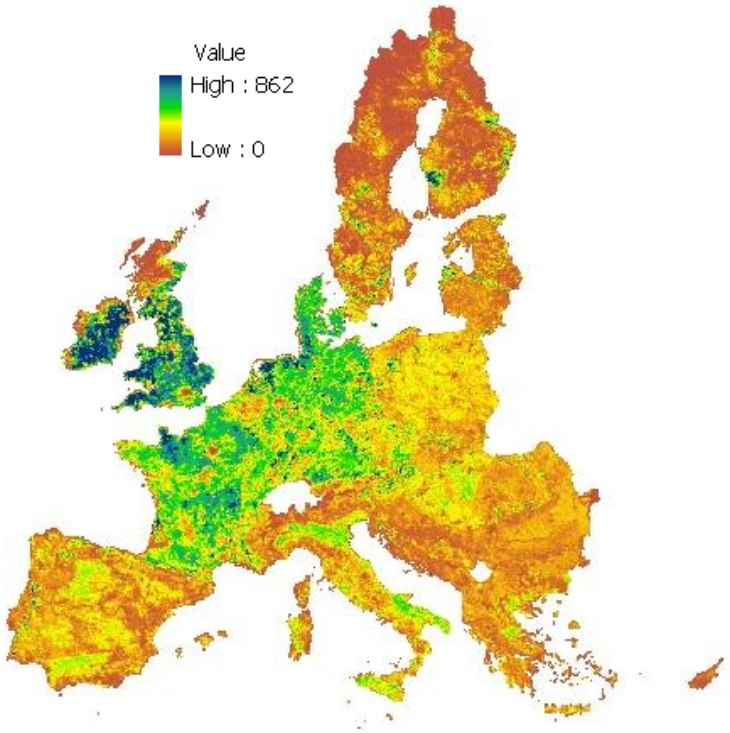
CARBON RESOURCE for year 2000



ADJUSTED NET PRIMARY PRODUCTION + TOTAL RETURNS in year 2000 for year 2000

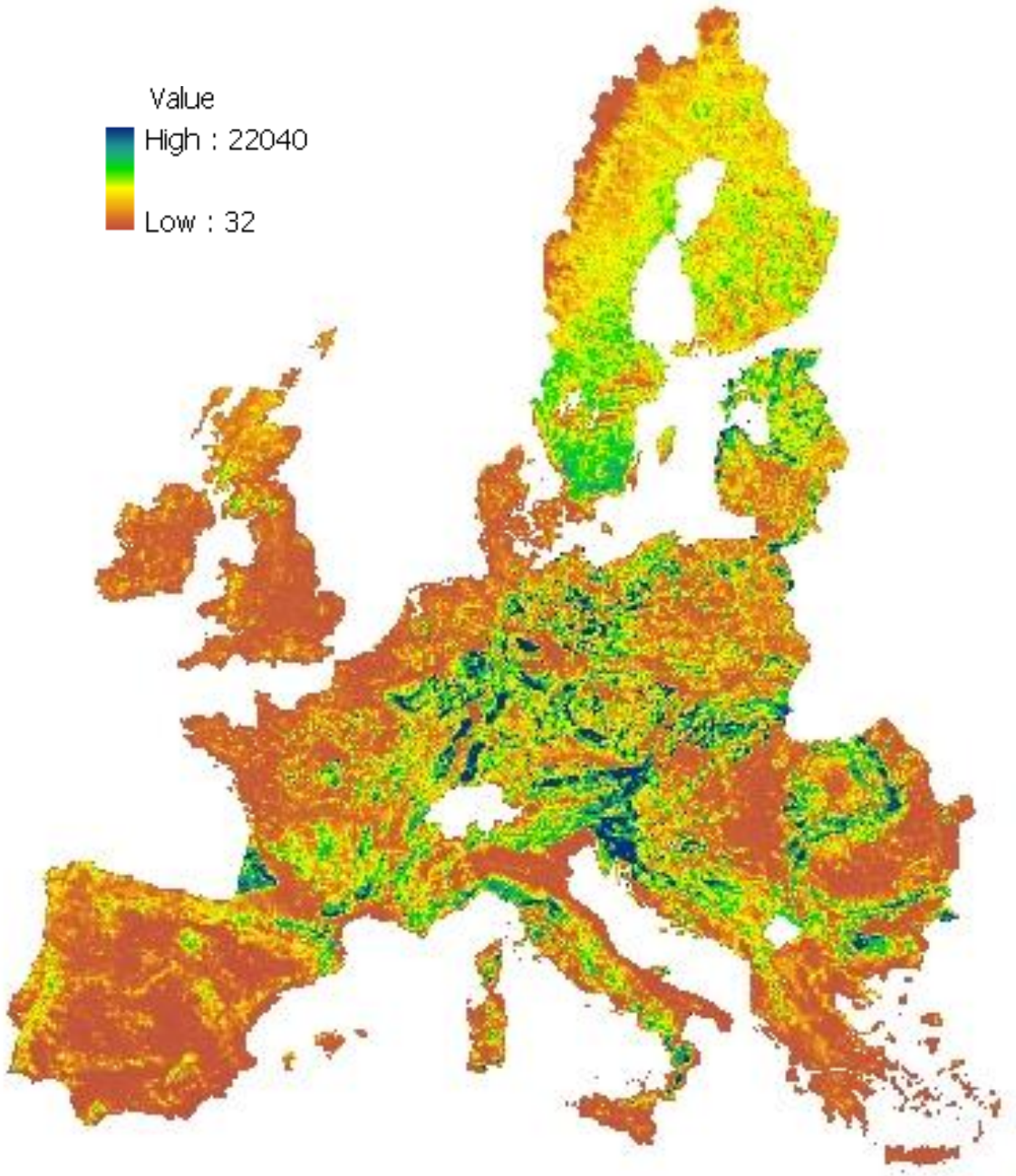


GEOSUCCESS NPP
Night Temperature adjustment

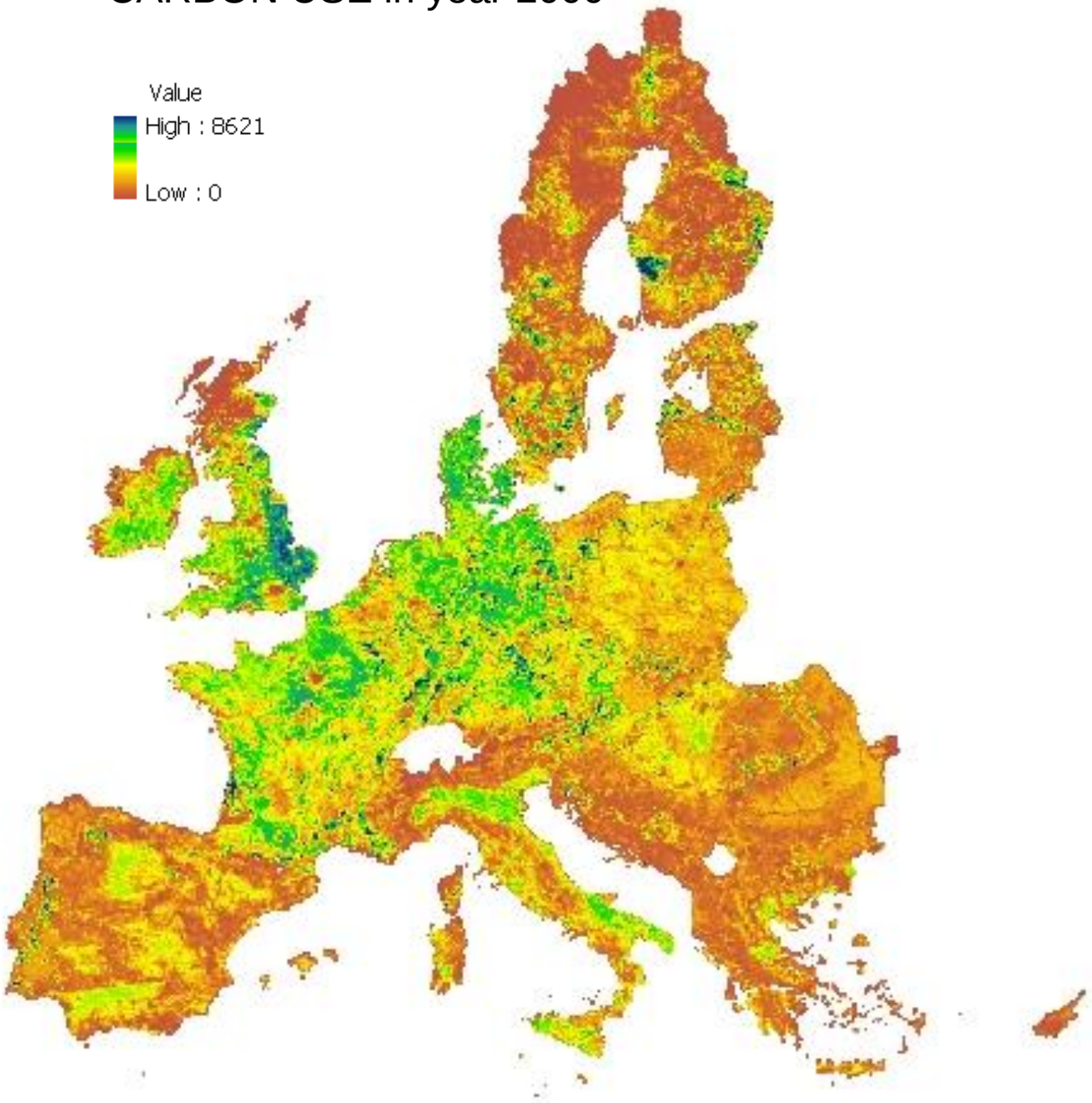


Residuals from crops, timber and manure

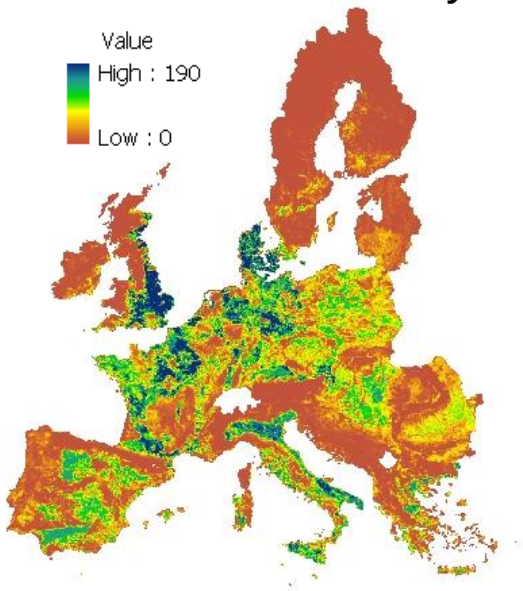
EXISTING STOCK + CARBON RESOURCE for year 2000



CARBON USE in year 2000



DOWNSCALED CROPS year 2000



On % agriculture in 1 km grid

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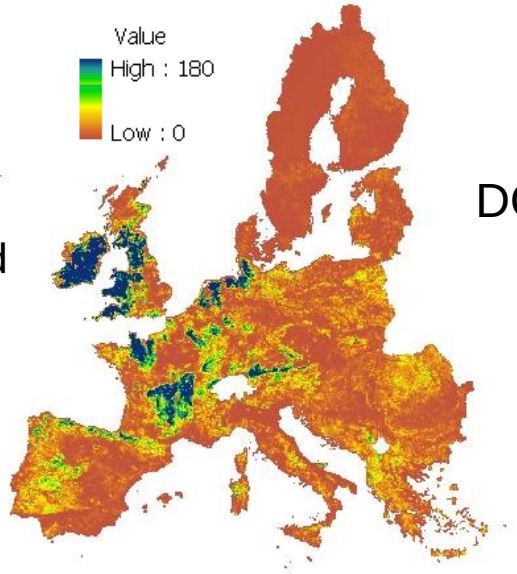
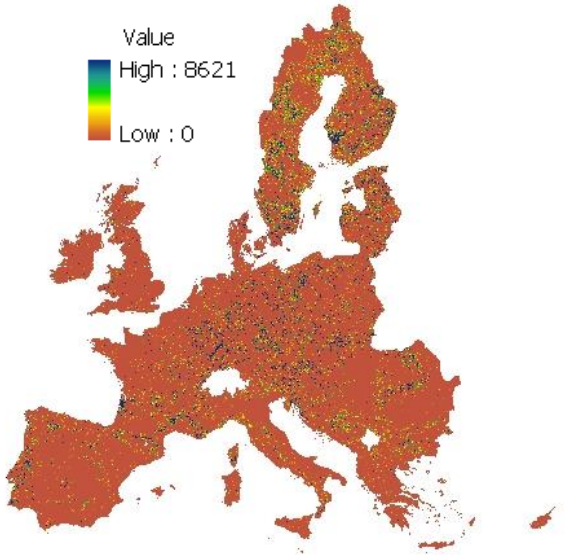
DOWNSCALED GRAZED BIOMASS year 2000



FAO downscaled product calibrated with European % grazed land in 1 km grid

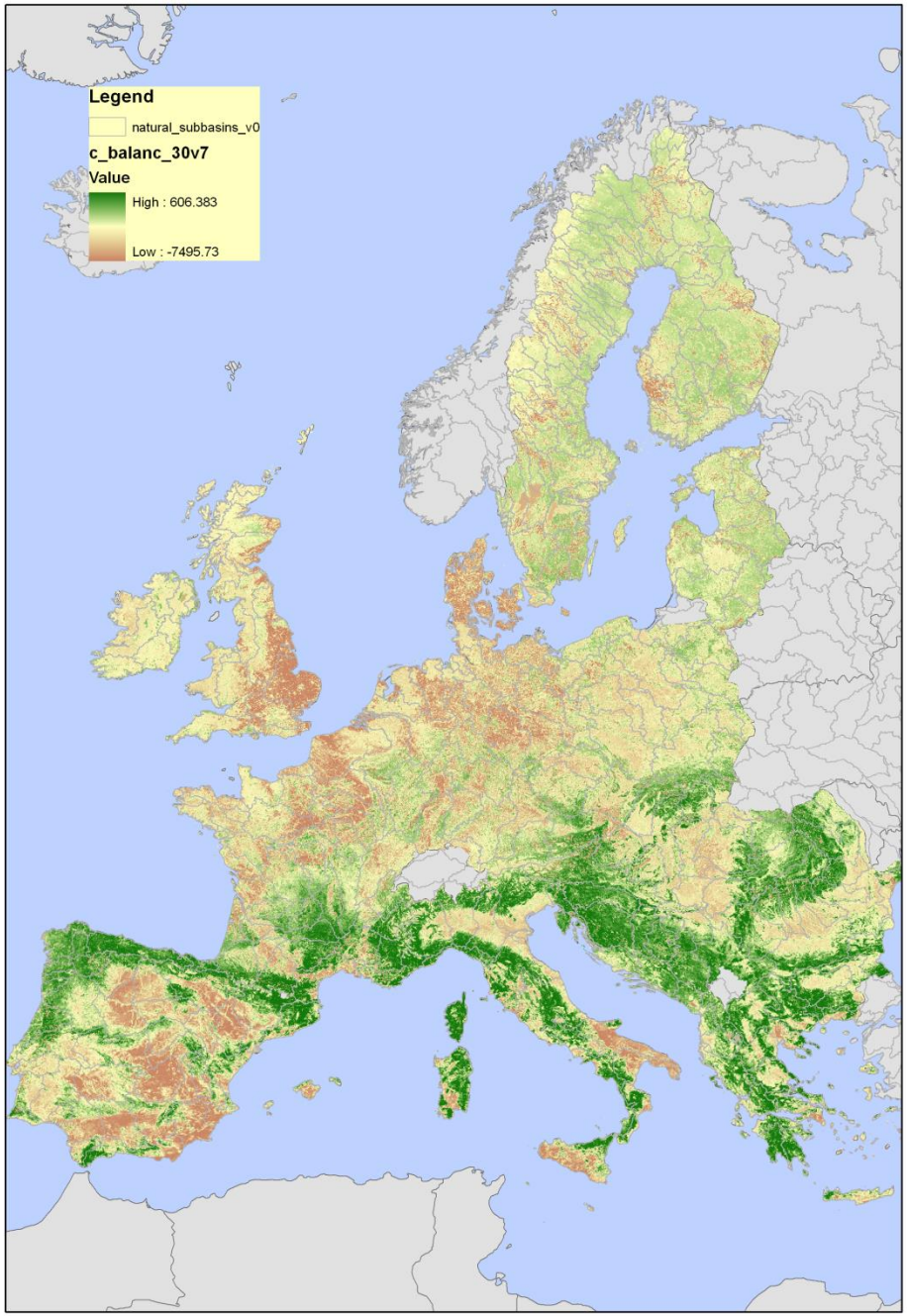
+

DOWNSCALED TIMBER year 2000

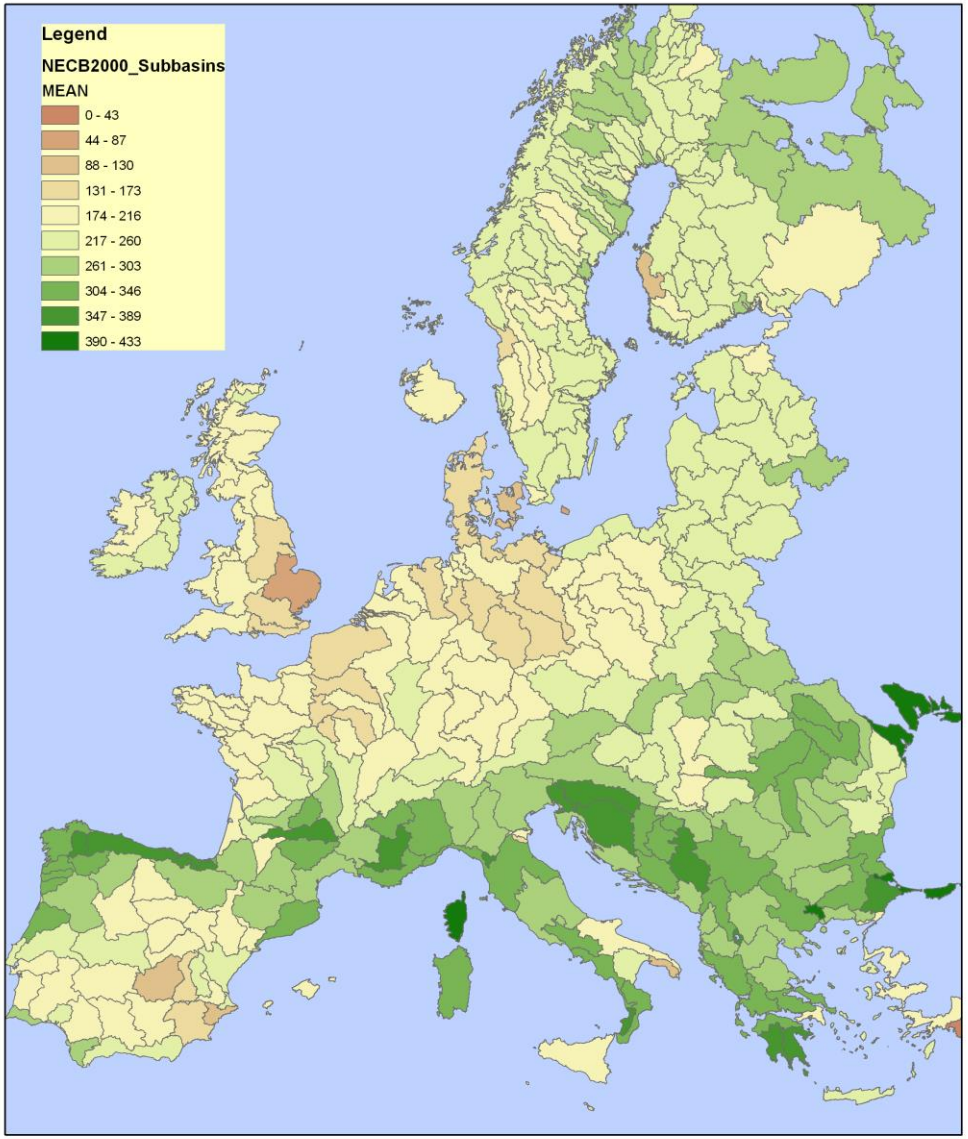


On decreased NDVI * % forest land cover in 1 km grid

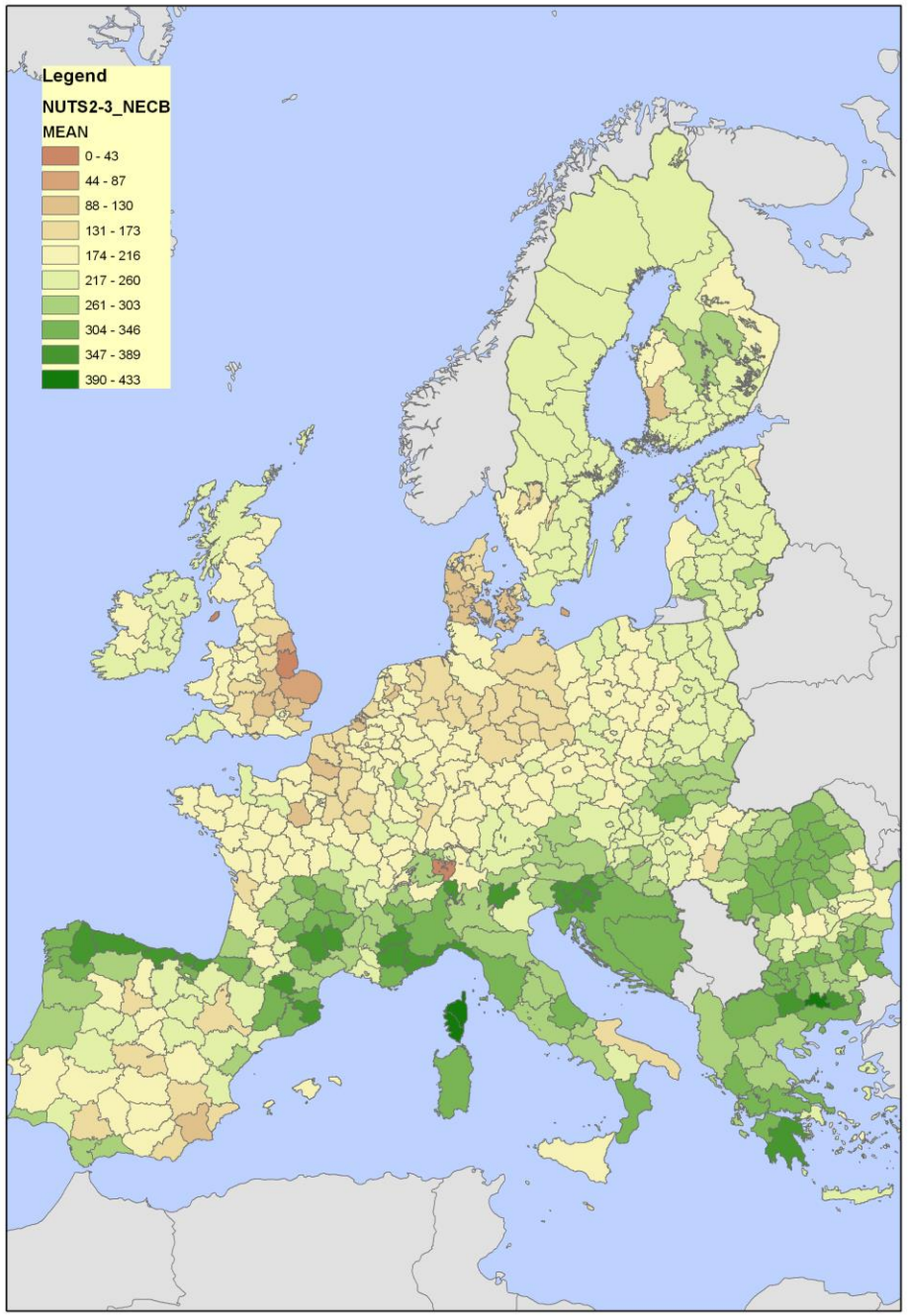
CARBON BALANCE for year 2000
1 – GRID cells, 1km²



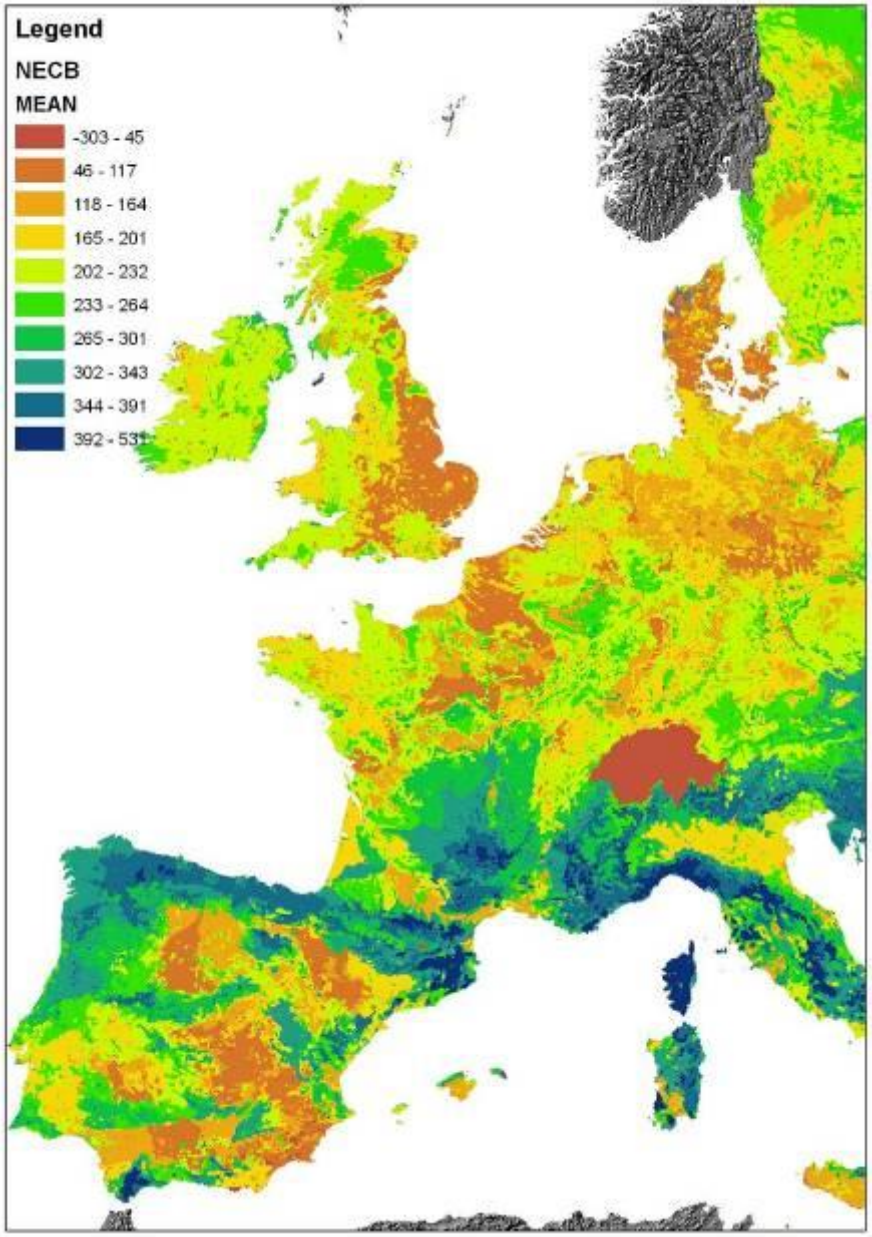
CARBON BALANCE for year 2000
2 – River basins

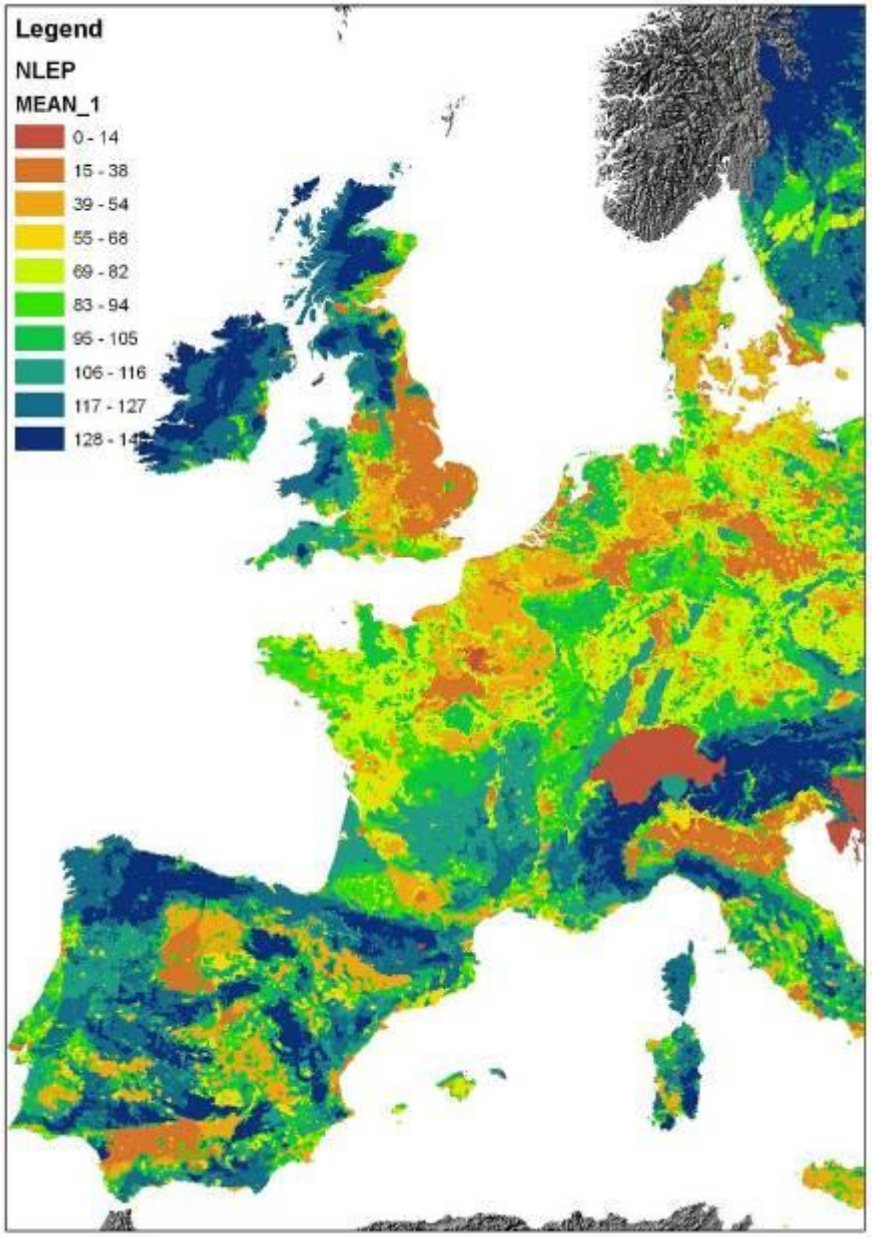


CARBON BALANCE for year 2000
3 – Administrative regions (NUTS)



Mean of NECB and NLEP per ecosystem accounting unit (SELU)





THANK YOU VERY MUCH!

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