FINNISH METEOROLOGICAL INSTITUTE

Wetland extent and inundated area estimates for EU28 and Finland

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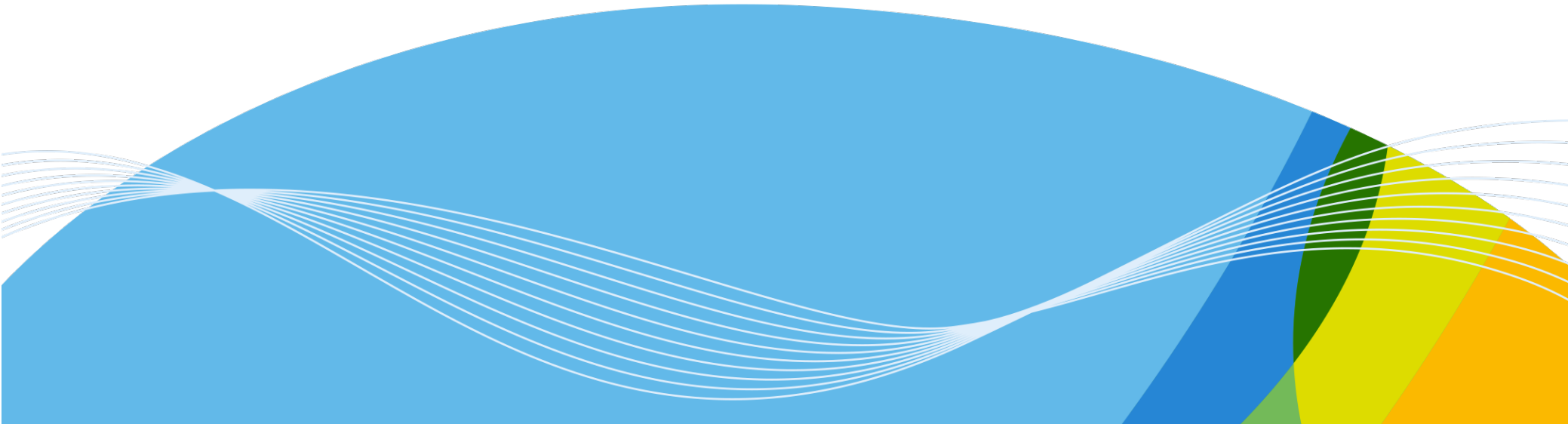
Suo siellä vetelä täällä



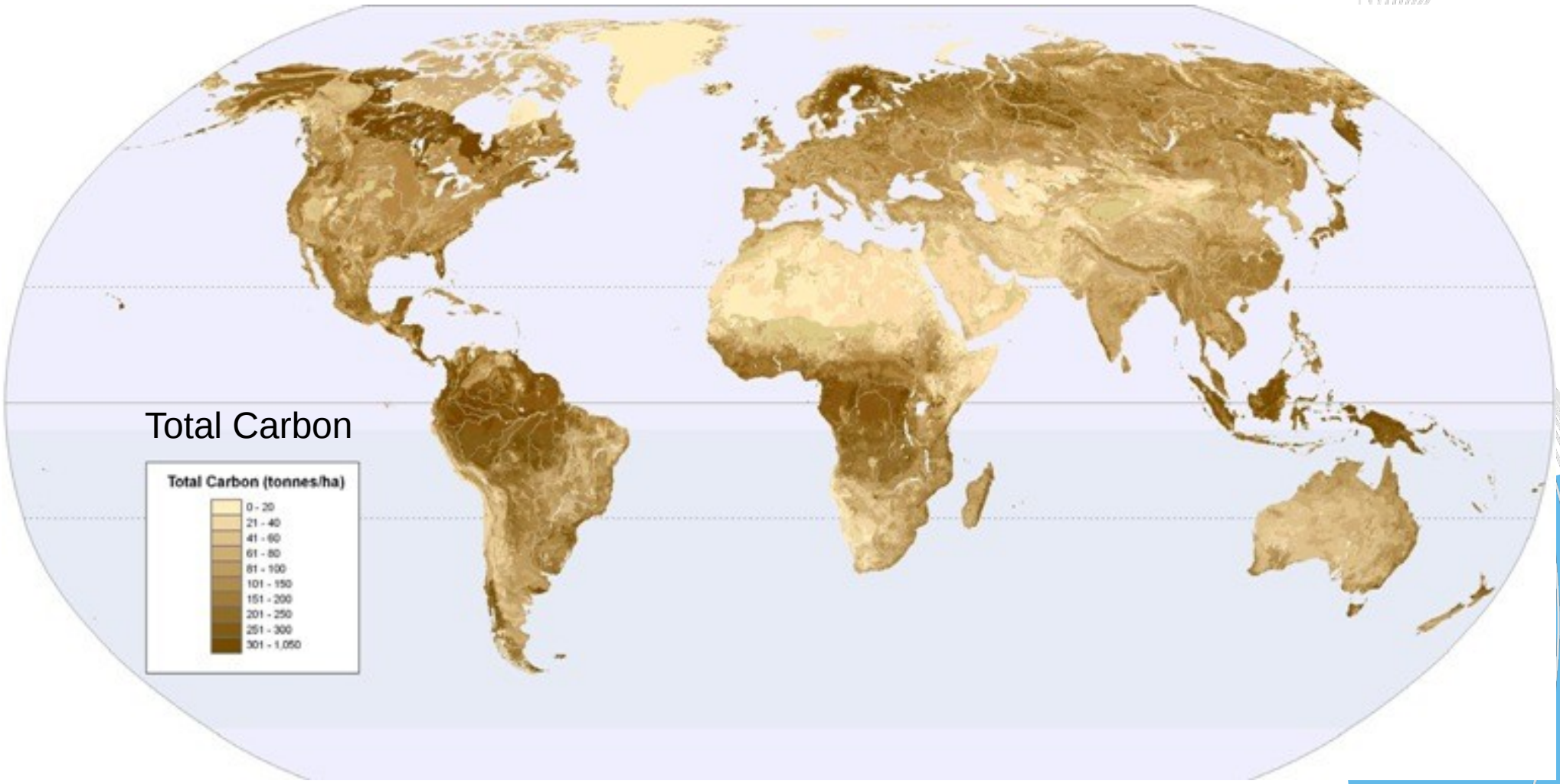
Background

- Need to estimate wetland extent (WE) for
  - EU28 countries in VERIFY project – present day
  - Finland for SOMPA scenarios – up to mid century
- EU28: 10.4W – 31.4E, 36.1N – 71.1N
- Finland: 19E – 31.4E, 58.9N – 70.4N
- First goal is to gain understanding on what exists
  - Estimates, definitions and terminology deviate
  - (data forms, data coverage, units etc deviate as well)
- Then we'll estimate the reliability and usability of the existing

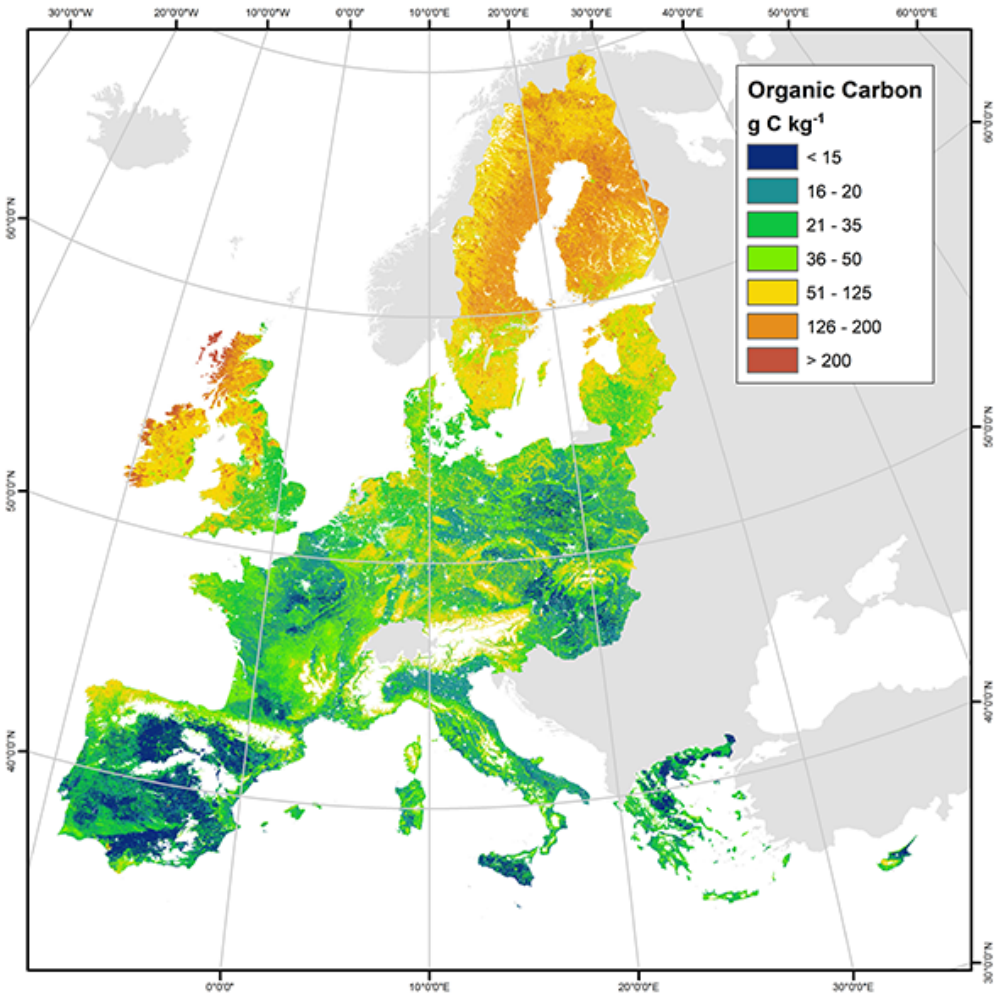
Data sources

- Corine land cover and respective products
- GIEMS (Prigent et al, Papa et al 2001-2012)
  - Active and passive microwaves and VIS and NIR imagery
  - 1993 – 2007 (and to be further extended)
- WETCHIMP model intercomparison project data
  - Some models used prescribed estimates
  - Some models used dynamic wetland models such as TOPMODEL
- Prior data of CarbonTracker-Europe-CH4
  - LPX and two LPJ versions

Soil carbon

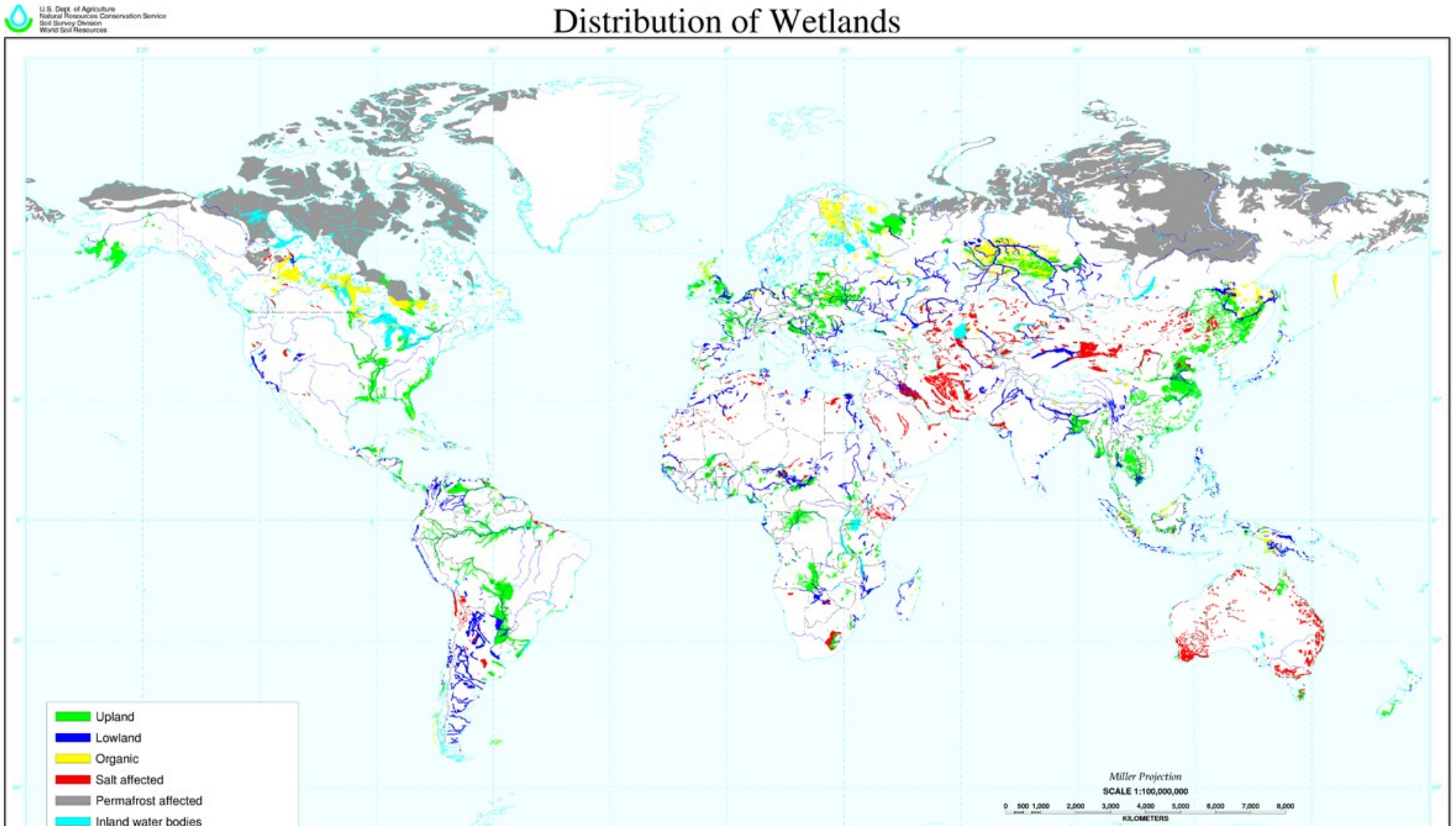

Total Carbon
Total Carbon (tonnes/ha)
0 - 20
21 - 40
41 - 60
61 - 80
81 - 100
101 - 150
151 - 200
201 - 250
251 - 300
301 - 1,050

Soil carbon

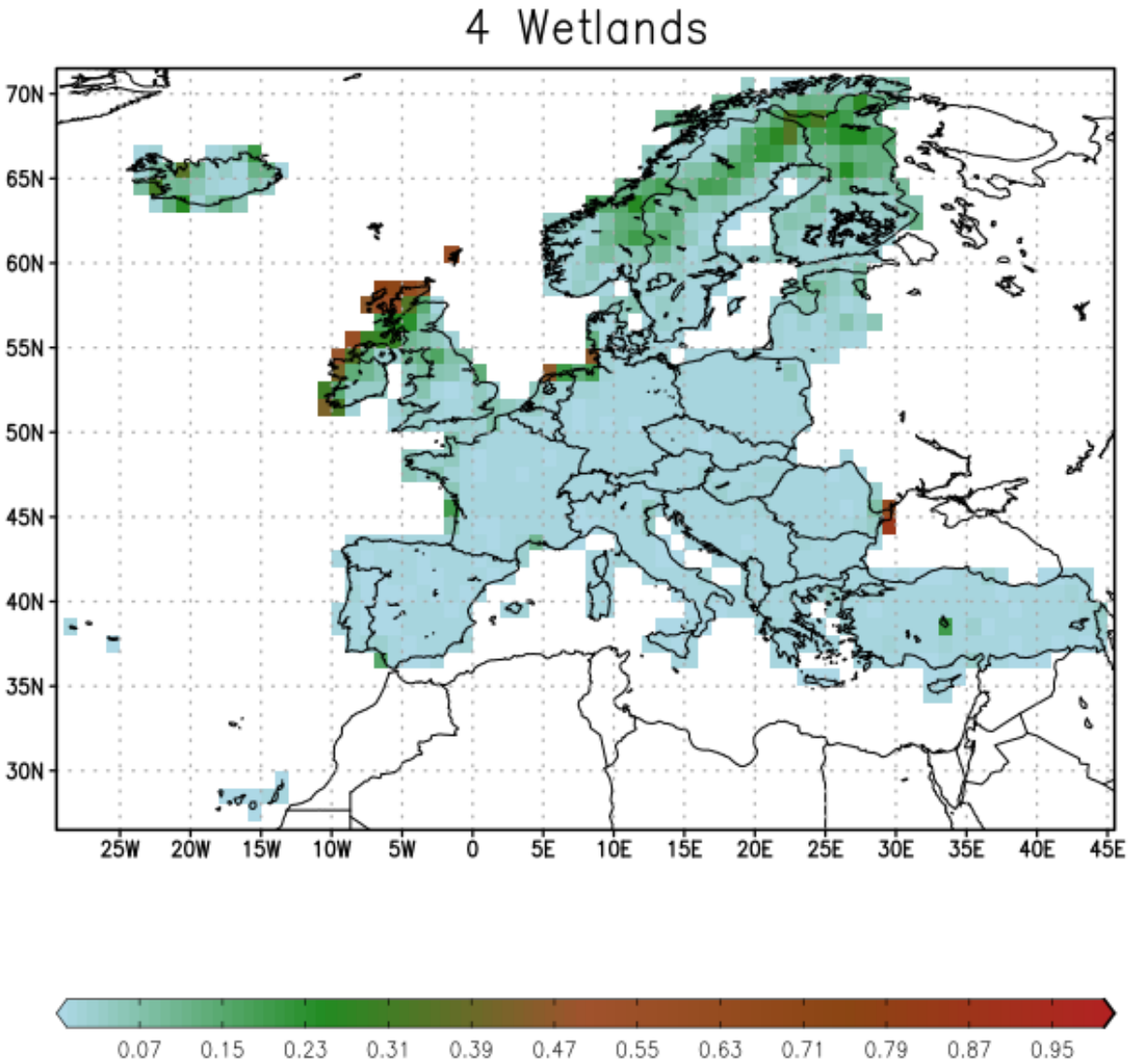


Organic Carbon

Peatsoils and wetlands

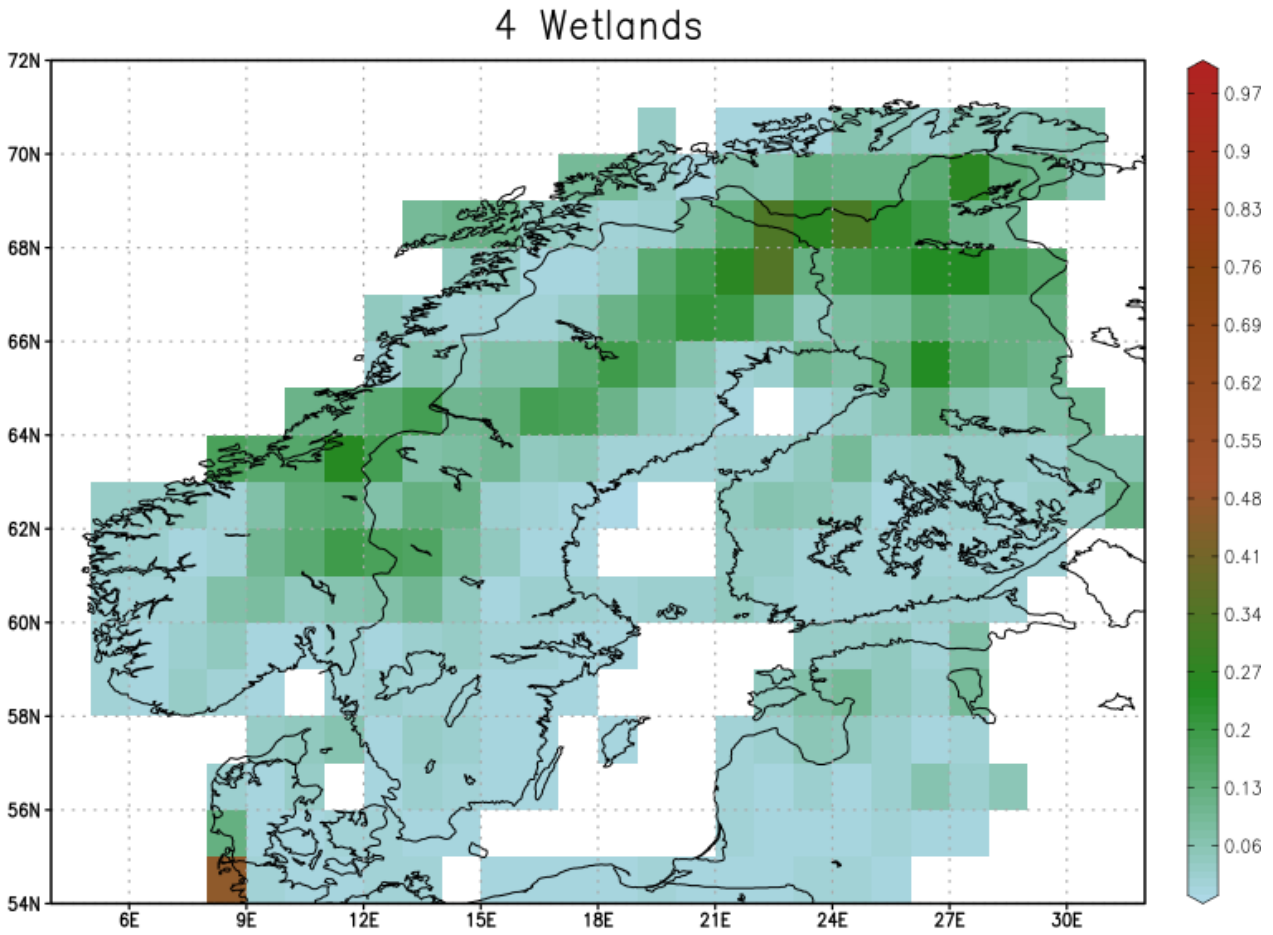


Peatsoils and wetlands - CLC



Pictures: Leif Backman

Peatsoils and wetlands - CLC



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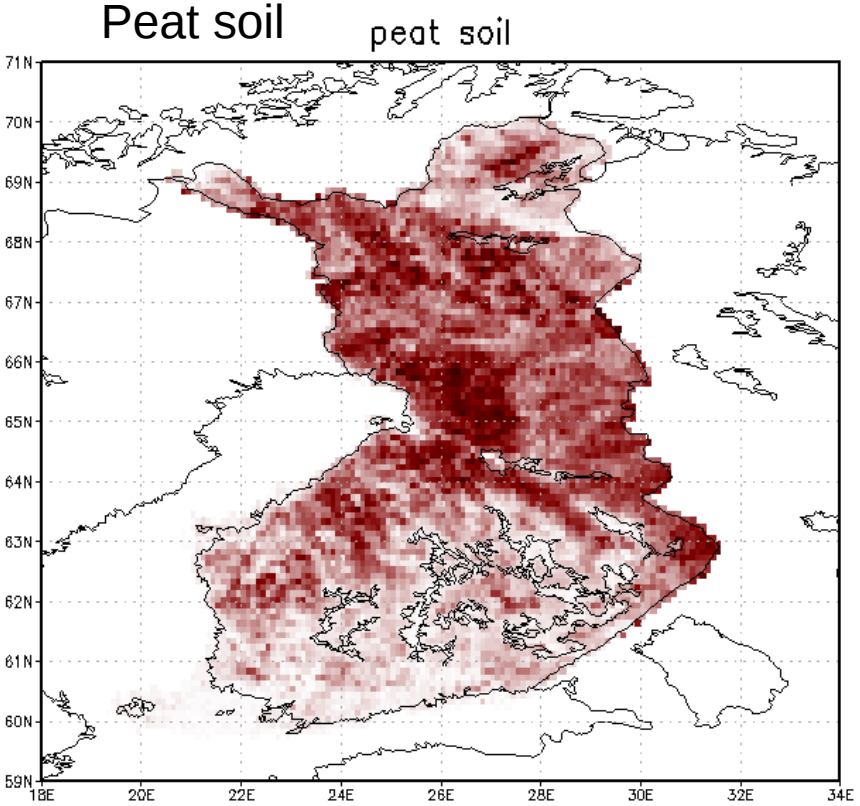
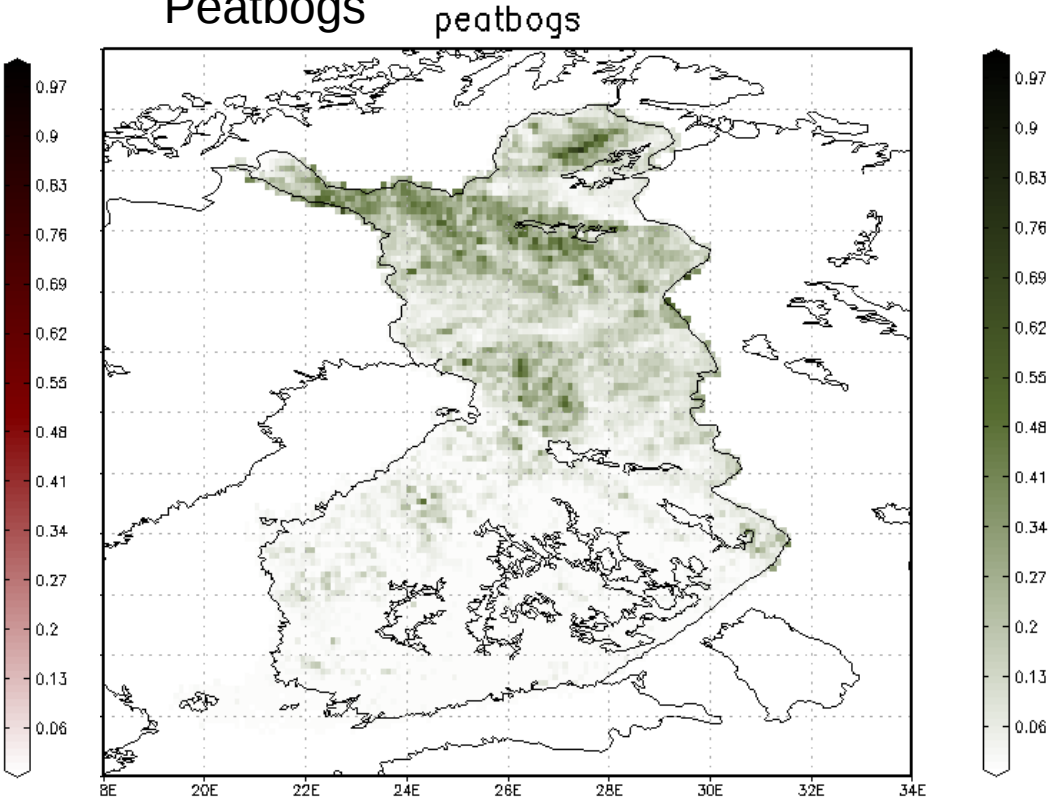
Peatsoils and wetlands – CLC-Fin

Peat soil

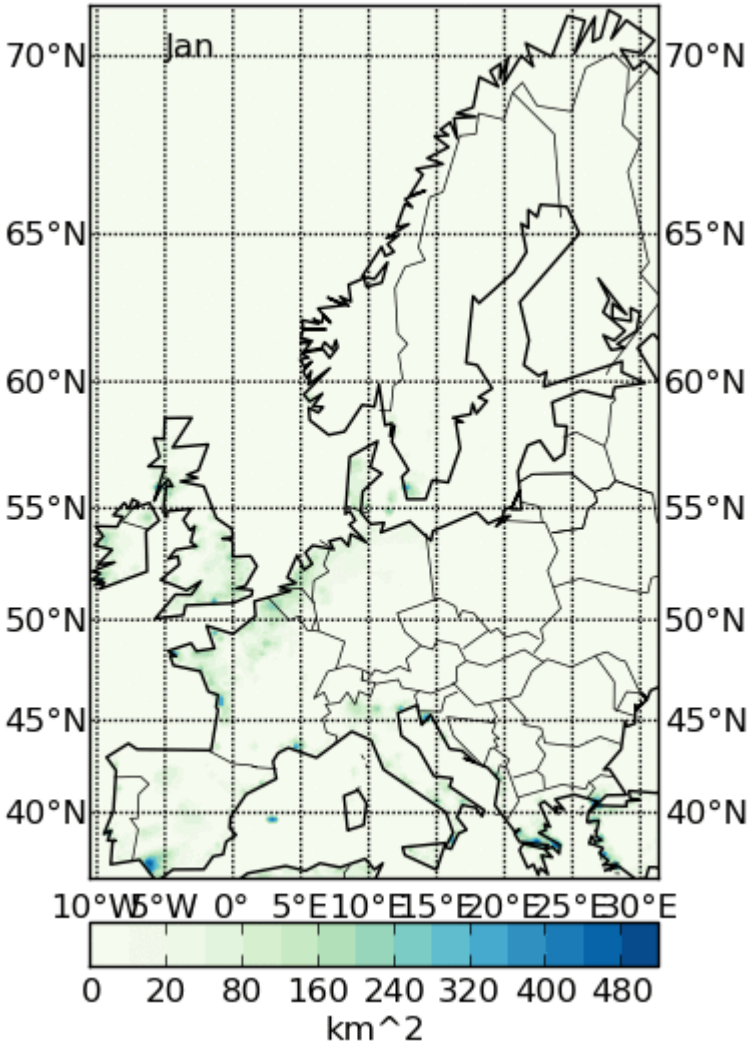


Peatbogs

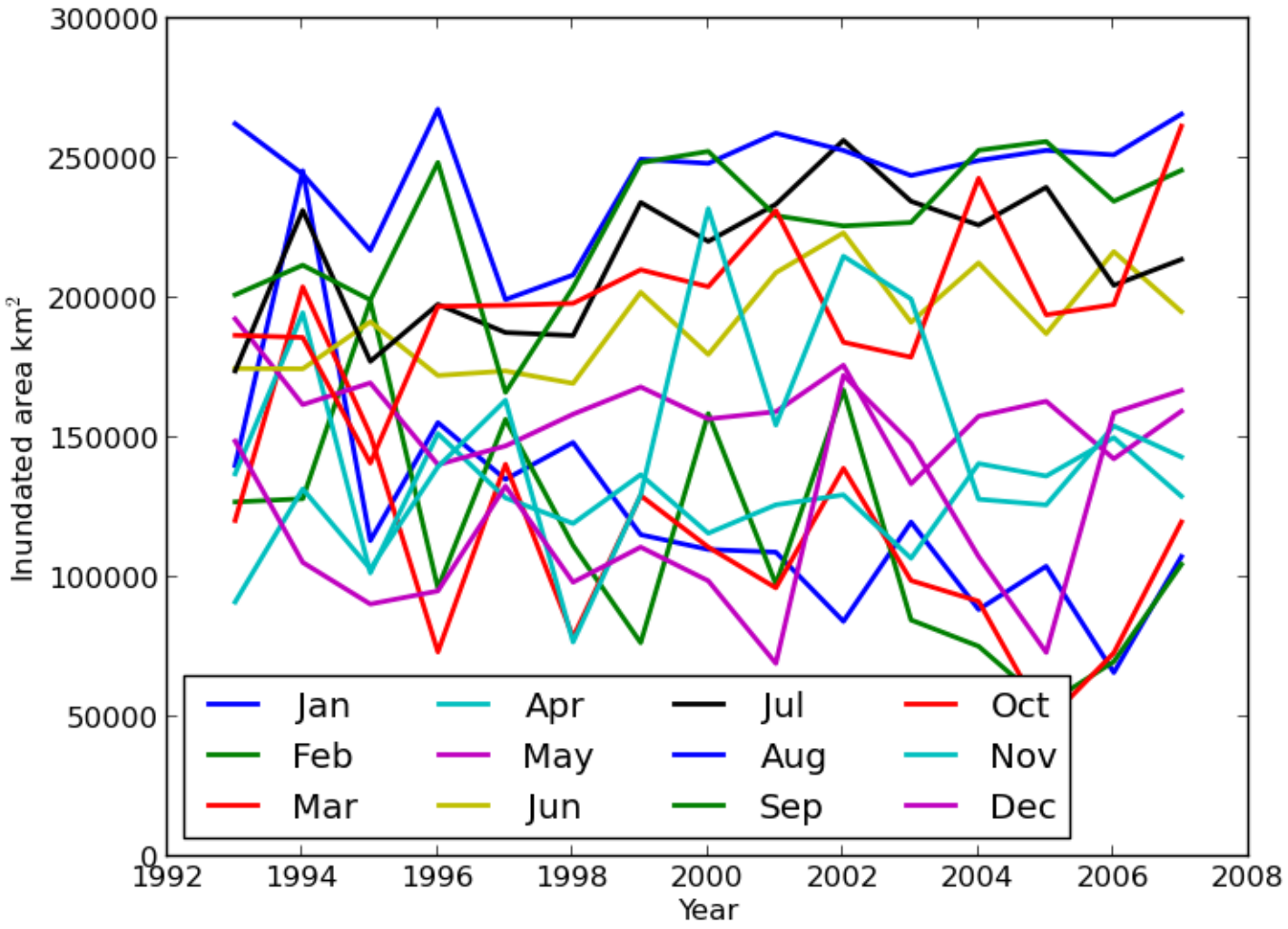


Pictures: Leif Backman

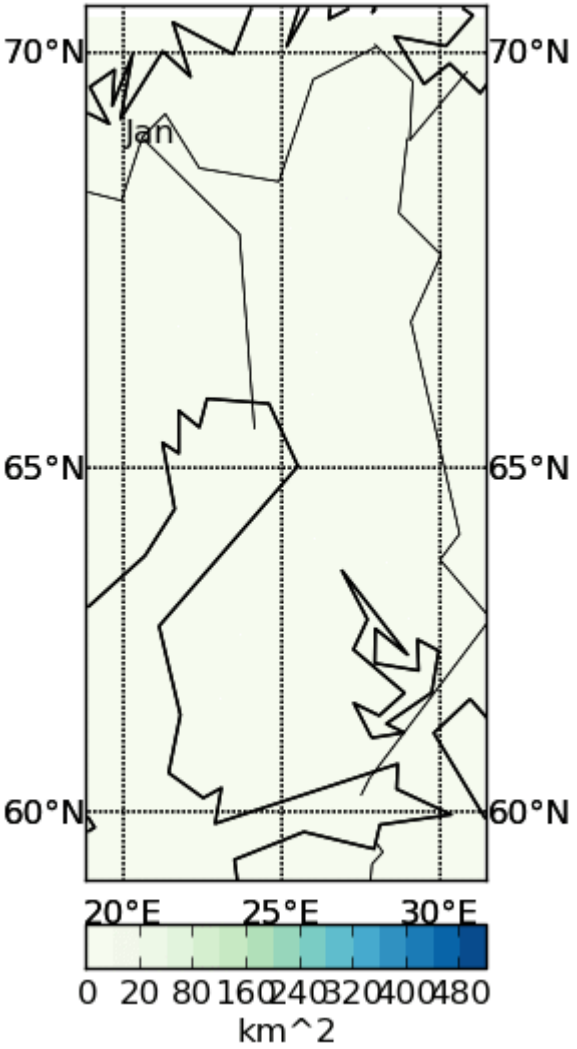
GIEMS inundated area EU28



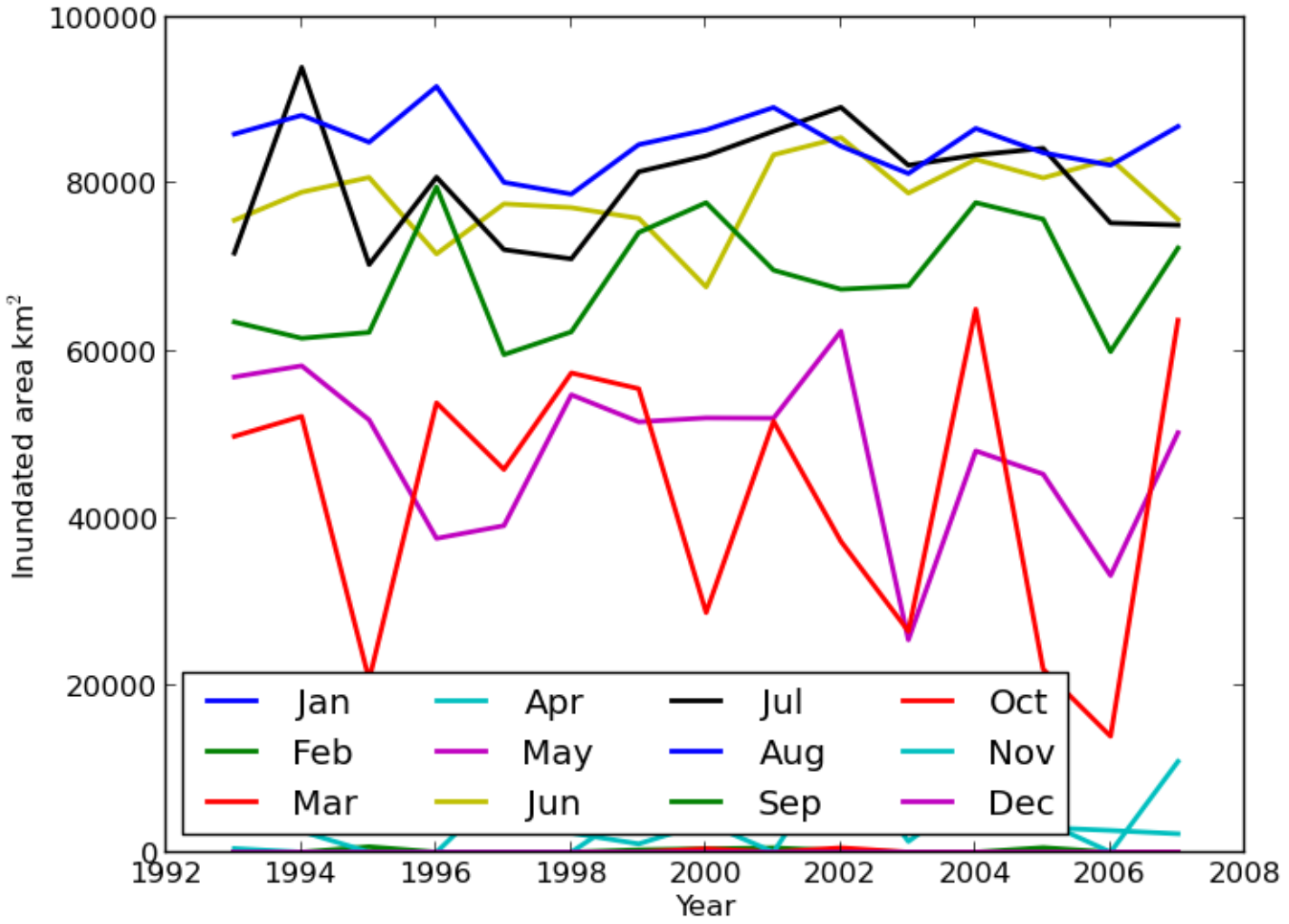
GIEMS inundated area EU28



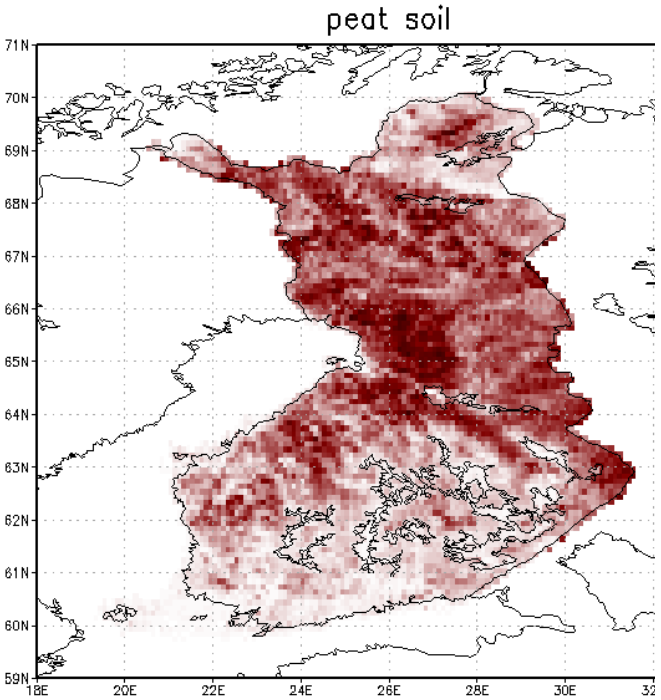
GIEMS inundated area Finland

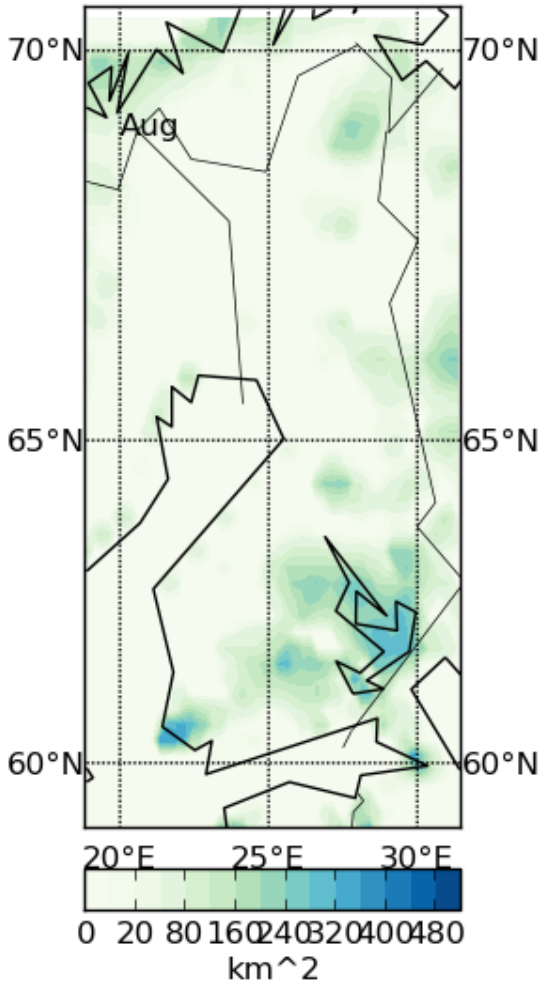


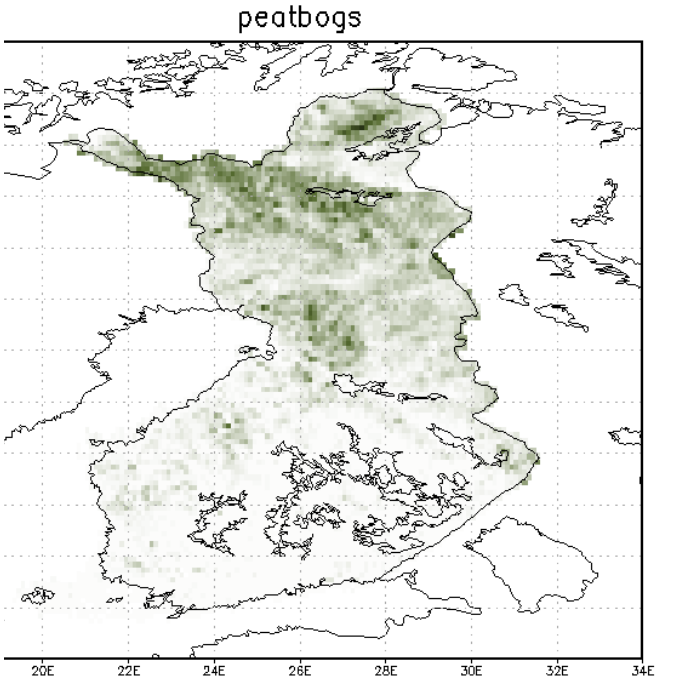
GIEMS inundated area Finland



Comparison to Corine land cover







CTE-CH4 priors inundated areas

- LPX-DYPTOP: 6621 km^2
- LPX-v1: 5678 km^2
- LPJ-Whyme: 4388 km^2

All inundated areas vary in sub-yearly time scale

CTE-CH4 priors wetland/peatland areas

- LPX-DYPTOP*: 10131 km^2
- LPX-v1: 32680 km^2
- LPJ-Whyme: 74569 km^2

*Not exactly constant throughout the century

Wetchimp variable amax_weta ($km^{2)}$

Bern	573937
Bern_norice	573937
Bern_nowetsoil	38533
CLM4Me	19756
DLEM	48224
DLEM_norice	47926
DLEM_rice	534
LPJ-WhyMe	10920
Orchidee_alt	51754
Orchidee_altsat	37581
Orchidee	66616
Orchidee_sat	46578
SDGVM	176436
Uvic	0
Uvic_nointerp	49765
VIC	804
VIC_sat	807
WSL	40780

Wetchimp amax_weta for Finland

Bern	71895
Bern_norice	71895
Bern_nowetsoil	13208
CLM4Me	10890
DLEM	14044
DLEM_norice	14044
DLEM_rice	0
LPJ-WhyMe	4559
Orchidee_alt	13996
Orchidee_altsat	10463
Orchidee	17627
Orchidee_sat	13224
SDGVM	18270
Uvic	0
Uvic_nointerp	6219
VIC	12
VIC_sat	12
WSL	12924

Wetchimp minimum mmax_weta for Finland

Bern	10089
Bern_norice	10089
Bern_nowetsoil	10089
CLM4Me	0
DLEM_norice	4971
DLEM_rice	4971
Orchidee_alt	689
Orchidee_altsat	554
Orchidee	0
Orchidee_sat	0
SDGVM	0
Uvic	0
Uvic_nointerp	0
VIC	9
VIC_sat	12
WSL	2283

Some thoughts

- The WE estimates differ
- WETCHIMP concluded that deviating WE estimates produce similar global CH4 estimates
- However spatial precision is important for inversion modelling

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