



## MONIMET variables in Climateguide.fi

Tiina Markkanen (FMI), Mikko Peltoniemi (LUKE), all MONIMET modellers and Maria Holmberg, Kristin Böttcher, Ismo Lahtinen, Stefan Fronzek and Timothy Carter (SYKE)

- Seven climate change indicators were published in Maps, Graphs and Data section of Climateguide.fi portal (Ilmasto-opas.fi, Klimatguiden.fi)
- 9 climate model – rcp – combinations for JSBACH and 15 for PRELES
- Impact model descriptions given in the Climate Change Explained – Impacts section





## Projected climate change in Finland

Finland's climate changes more in winter than in summer.

Open ►►



## Adaptive capacity and vulnerability

How vulnerable are the elderly to climate change?

Open ►►

## Video of the week



The drift of Antarctic sea-ice is slower than simulated in climate models. Interviewee: Petteri Uotila, Finnish Meteorological Institute. The video is in Finnish.

Go to the video page ►►



## News



## The Finnish Government has adopted the medium-term climate change plan

On 14 September 2017, the Finnish Government adopted the medium-term climate change plan to 2030. The plan 'Towards Climate-Smart Day-to-Day Living' sets out the necessary means to reduce greenhouse gas emissions by 2030 in the non-emissions trading sector, i.e. transport, agriculture, heating and waste management.

Read more ►►

Policy - 19.9.2017 - Ministry of the Environment





# New variables

## New impact category: Terrestrial ecosystems

- Gross primary production
- Net ecosystem exchange
- Total ecosystem respiration
- Length of vegetation active period
- Start of vegetation active period
- End of vegetation active period
- Growth

**Climate and impacts**

- Water resources
- Potential energy demand
- Natural ecosystems
- Terrestrial ecosystems
  - Gross primary production GPP (gC/m<sup>2</sup>)
    - JSBACH
    - PREBAS
  - Net ecosystem exchange NEE (gC/m<sup>2</sup>)
  - Total ecosystem respiration rate TER (gC/m<sup>2</sup>)
  - Length of vegetation active period (days)
  - Start of vegetation active period (day of year)
  - End of vegetation active period (day of year)
  - Growth (m<sup>3</sup>/ha/a)

**Time period**

- 1981 - 2010
- 2011 - 2040
- 2041 - 2070
- 2071 - 2100

**Map option**

- value
- change

Gross primary production GPP (gC/m<sup>2</sup>)

relative to baseline

**Emission scenario:**  
RCP 4.5  
**Climate model:**  
CanESM2  
**Time period:**  
2071 - 2100  
**Unit:**  
%

- 9 - 34.2
- 34.2 - 59.4
- 59.4 - 84.6
- 84.6 - 109.8
- 109.8 - 135

Descriptive statistics for Finland

N:	...	min:	...	AVG:	...	max:	...	SD:	...
percentiles:									
P5:	...	P25:	...	P50:	...	P75:	...	P95:	...

**Explanation**

Map

Maps show estimates of the impacts of climate change in different parts of Finland in a regular grid of 10 x 10 km. Descriptive statistics can be chosen to be shown either for all squares in Finland or for the squares of a selected region.

**Types of impacts**

Different types of impacts can be selected. In this prototype version, maps can be produced showing impacts of climate change on hydrology (water-related factors), energy demand for heating and cooling of buildings and the natural decomposition rate of dead plant material. Maps can also be shown of the estimated changes in climate (temperature and precipitation) themselves. For more information about the models used to generate some of these maps, [see here](#).

Present and future climate

**Climate scenario**

view scenarios

RCP-based scenarios

	RCP 4.5	RCP 8.5
CanESM2	<input checked="" type="radio"/>	<input type="radio"/>
CNRM-CM5	<input type="radio"/>	<input type="radio"/>
GFDL-CM3	<input type="radio"/>	<input type="radio"/>
HadGEM2-ES	<input type="radio"/>	<input type="radio"/>
MIROC5	<input type="radio"/>	<input type="radio"/>

archive





# Selecting an impact variable

## Climate and impacts

- Water resources
- Potential energy demand
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- Gross primary production GPP (g(C)/m<sup>2</sup>/a)
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MIROC5	<input type="radio"/>	<input type="radio"/>

[archive](#)

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Descriptive statistics for Finland

N: ... min: ... AVG: ... max: ... SD: ...

percentiles: PS: ... P25: ... P50: ... P75: ... P95: ...

**Explanation**

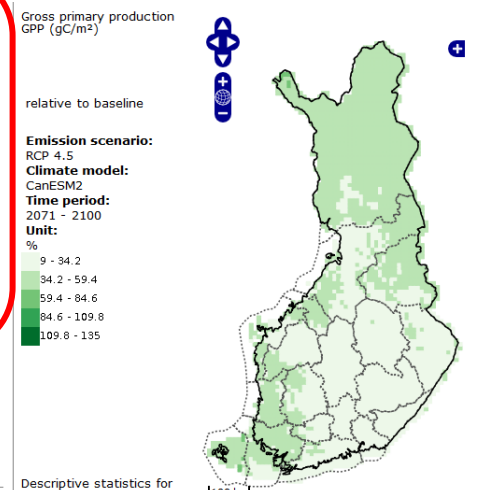
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Present and future climate



HELSINGIN YLIOPISTO  
HELSINGFORS UNIVERSITET  
UNIVERSITY OF HELSINKI







# Selecting climatic driver

RCP-based scenarios

	RCP 2.6	RCP 4.5	RCP 8.5
CanESM2	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
CNRM-CM5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GFDL-CM3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HadGEM2-ES	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MIROC5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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archive

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Present and future climate





# NEE example

Net ecosystem exchange  
 NEE (g(C)/m<sup>2</sup>/a)

**Emission scenario:**

RCP 4.5

**Climate model:**

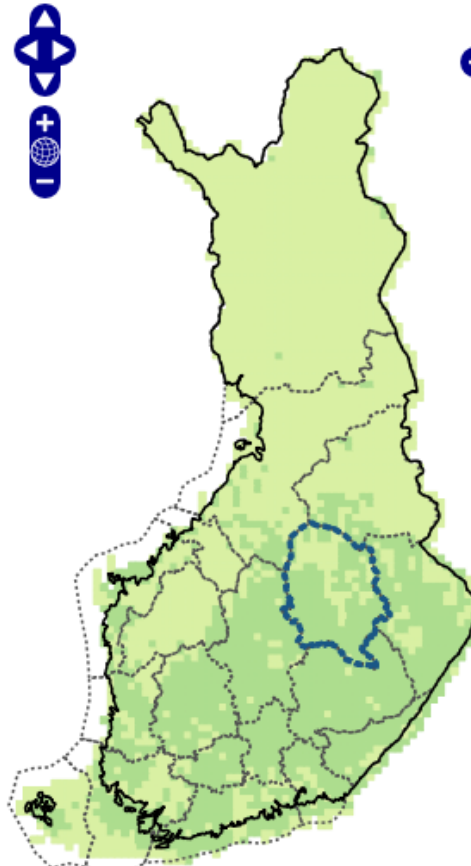
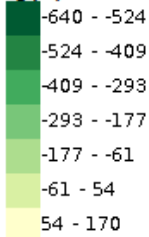
GFDL-CM3

**Time period:**

2011 - 2040

**Unit:**

g(C)/m<sup>2</sup>/a



Descriptive statistics for

Pohjois-Savo  ⓘ

N: 203 min: -80.1 AVG: -64.5 max: -39.4 SD: 6.96  
 percentiles:  
 P5: -73.7 P25: -69.0 P50: -65.8 P75: -60.6 P95: -51.4

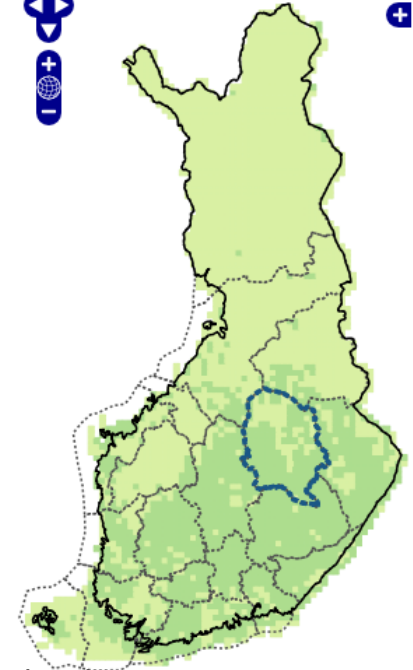
© SYKE, 2017 © MML, 2011





# Descriptive statistics

Net ecosystem exchange  
NEE (g(C)/m2/a)



## Descriptive statistics:

Number: number of 10 x 10 km grid boxes in the chosen area.  
Minimum: lowest grid box value in the chosen area.  
Maximum: highest grid box value in the chosen area.  
Mean: arithmetic mean of grid box values in the chosen area.  
St. Deviation: standard deviation of grid box values in the chosen area.  
Median, P50: Middle value (50th percentile) of ranked grid box values (half of the boxes have higher values than the median and the other half has lower values).  
P25: Lower quartile (25% of grid boxes in the chosen area have lower values).  
P75: Upper quartile (25% of grid boxes in the chosen area have higher values).

Close

Descriptive statistics for  
Pohjois-Savo

AVG: -21.5 max: +1.44  
P50: -22.1 P75: -14.9

Impacts of climate change  
grid of 10 x 10 km. Descriptive statistics can be shown either for all squares or for a selected region.

Emission scenario:  
RCP 4.5  
Climate model:  
GFDL-CM3  
Time period:  
2011 - 2040  
Unit:  
g(C)/m2/a

-640 - -524  
-524 - -409  
-409 - -293  
-293 - -177  
-177 - -61  
-61 - 54  
54 - 170

Descriptive statistics for  
Pohjois-Savo

N: 203 min: -80.1 AVG: -64.5 max: -39.4 SD: 6.96  
percentiles:  
P5: -73.7 P25: -69.0 P50: -65.8 P75: -60.6 P95: -51.4



ILMATIETEEN LAITOS  
METEOROLOGISKA INSTITUTET  
FINNISH METEOROLOGICAL INSTITUTE

# Publication of the Terrestrial ecosystem variables today!



FINNISH METEOROLOGICAL INSTITUTE



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