

## **C.6. Spatial distribution of depositions and concentrations in different compartments (optional)**

Four models present results on spatial distribution of depositions and concentrations of PCB-180 in different environmental compartments: DEHM-POP, EVN-BETR and UK-MODEL, MSCE-POP and SimpleBox.

Calculated fields of PCB-180 concentrations in the atmosphere, soil, water and vegetation and net deposition fluxes in 2000 obtained by the participating models with the use of two different data sets ("reference" and "own or alternative") are compared below. The results on spatial distribution of PCB-180 deposition and concentrations in the main environmental media are obtained with the use of the two physical-chemical data sets by DEHM-POP, MSCE-POP and different versions of SimpleBox model.

The comparison of calculated deposition and concentration fields presented in Sections C.6.1 and C.6.2 below includes results of one-year calculations made on the basis of initial conditions (DEHM-POP, EVN-BETR and UK-MODEL, MSCE-POP, SimpleBox), zero initial concentrations (DEHM-POP, EVN-BETR and UK-MODEL, MSCE-POP and SimpleBox) together with results of long-term calculations performed with historical emissions (EVN-BETR and UK-MODEL, SimpleBox 3.0 and 3.12) (See Table C.109). The model results obtained taking into account initial concentrations of pollutants in media and historical emissions, and on the basis of zero initial concentrations in the environmental media are compared in two different groups.

**Table C.109.** Results on spatial distribution of PCB-180 depositions and concentrations in different compartments presented by the models

Maps	Data set used	DEHM-POP_1	DEHM-POP_2	EVN-BETR_1 <sup>a</sup>	EVN-BETR_2 <sup>a</sup>	EVN-BETR_3 <sup>a</sup>	SimpleBox 3.0_1	SimpleBox 3.0_2	SimpleBox 3.12_2	SimpleBox 3.0_3	SimpleBox 3.12_3	MSCE-POP_1	MSCE-POP_2
Surface atmospheric concentrations, pg/m <sup>3</sup>	ref	+	+	+	+	+	+	+	+	+	+	+	+
	own or alt	+	+				+	+	+	+	+	+	+
Surface soil concentration, ng/g	ref	+	+	+	+	+	+	+	+	+	+	+	+
	own or alt	+	+				+	+	+	+	+	+	+
Surface water concentration, pg/l	ref	+	+	+	+	+	+	+	+	+	+	+	+
	own or alt	+	+				+	+	+	+	+	+	+
Concentration in vegetation, ng/g (optional)	ref			+	+	+	+	+	+	+	+	+	+
	own or alt						+	+	+	+	+	+	+
Net deposition flux, mg/m <sup>2</sup> /hour	ref						+	+	+	+	+	+	+
	own or alt						+	+	+	+	+	+	+
Wet deposition of gaseous phase, mg/m <sup>2</sup> /hour	ref											+	+
	own or alt											+	+
Wet deposition of particle phase, mg/m <sup>2</sup> /hour	ref											+	+
	own or alt											+	+
Wet deposition total, mg/m <sup>2</sup> /hour	ref						+	+	+	+	+	+	+
	own or alt						+	+	+	+	+	+	+
Dry deposition of gaseous phase, mg/m <sup>2</sup> /hour	ref											+	+
	own or alt											+	+
Dry deposition of particle phase, mg/m <sup>2</sup> /hour	ref											+	+
	own or alt											+	+
Dry deposition total, mg/m <sup>2</sup> /hour	ref						+	+	+	+	+	+	+
	own or alt						+	+	+	+	+	+	+

EVN-BETR\_1 - EVN-BETR and UK-MODEL results calculated on the basis of initial concentrations given as input data, the only exception was that the initial conditions for the vegetation were set to zero;

EVN-BETR\_2 - EVN-BETR and UK-MODEL results calculated on the basis of zero initial concentrations;

EVN-BETR\_3 - EVN-BETR and UK-MODEL results calculated on the basis of historical emissions for 20-year period;

DEHM-POP\_1 - DEHM-POP results calculated on the basis of initial concentrations given as input data;

DEHM-POP\_2 - DEHM-POP results calculated on the basis of zero initial concentrations;

SimpleBox 3.0\_1 - SimpleBox results of version 3.0 calculated on the basis of initial concentrations given as input data;

SimpleBox 3.0\_2 and SimpleBox 3.12\_2 – SimpleBox results of versions 3.0 and 3.12, respectively, calculated on the basis of zero initial concentrations;

SimpleBox 3.0\_3 and SimpleBox 3.12\_3 – SimpleBox results of versions 3.0 and 3.12, respectively, calculated with historical emissions for 20-year period.

MSCE-POP\_1 - MSCE-POP results calculated on the basis of initial concentrations given as input data;

MSCE-POP\_2 - MSCE-POP results calculated on the basis of zero initial concentrations;

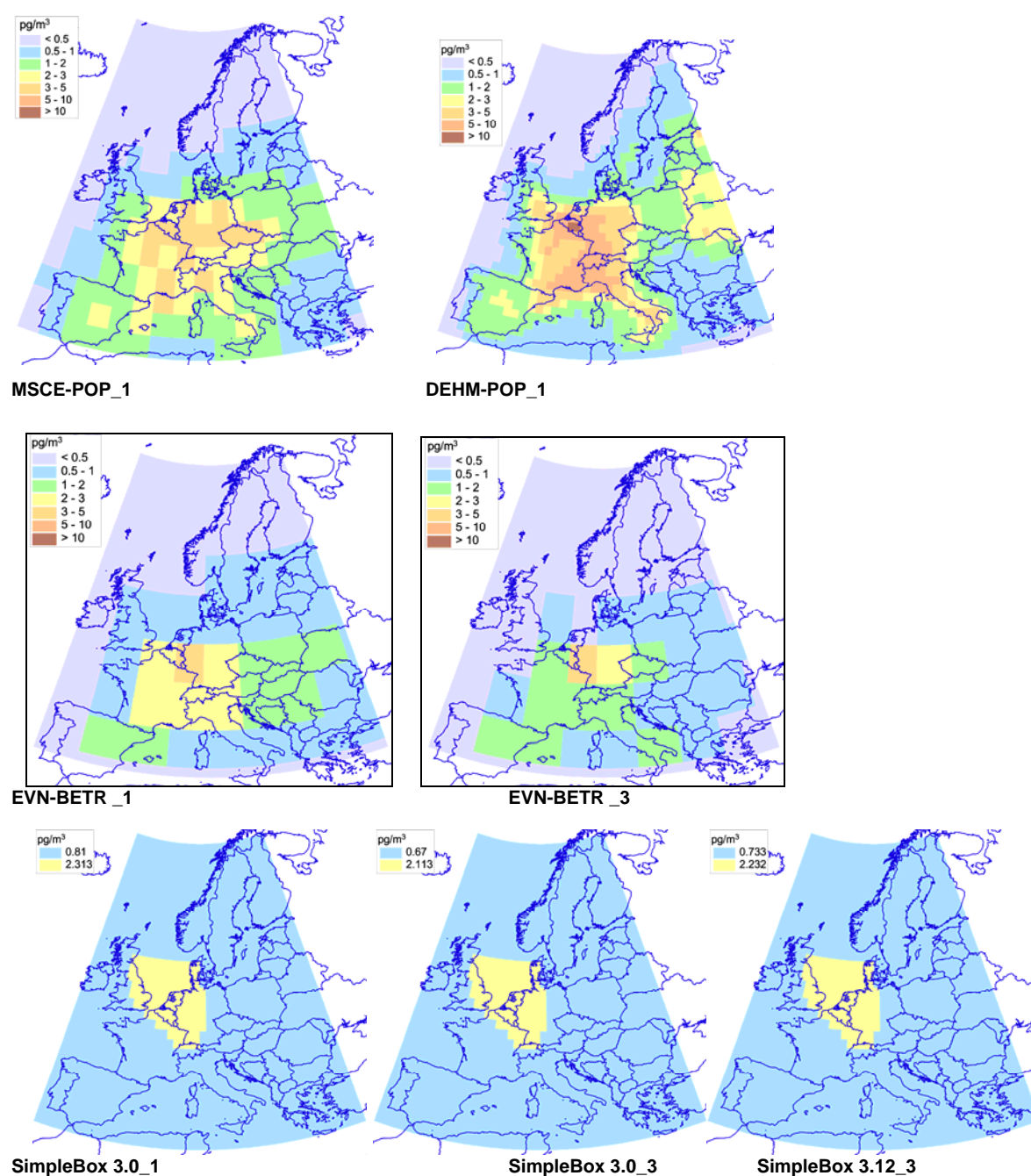
<sup>a</sup> - EVN-BETR and UK-MODEL results were calculated with the help of a spatially resolved version of the model;

<sup>b</sup> – SimpleBox: results were calculated on the basis of initial concentrations given as input data. The concentrations calculated are the bulk concentrations in the compartments. Maps of concentrations are obtained on the basis of annual values of concentrations at regional and continental levels.

### C.6.1. Comparison of results on spatial distribution of PCB-180 depositions and concentrations in different compartments obtained on the basis of “reference” data set

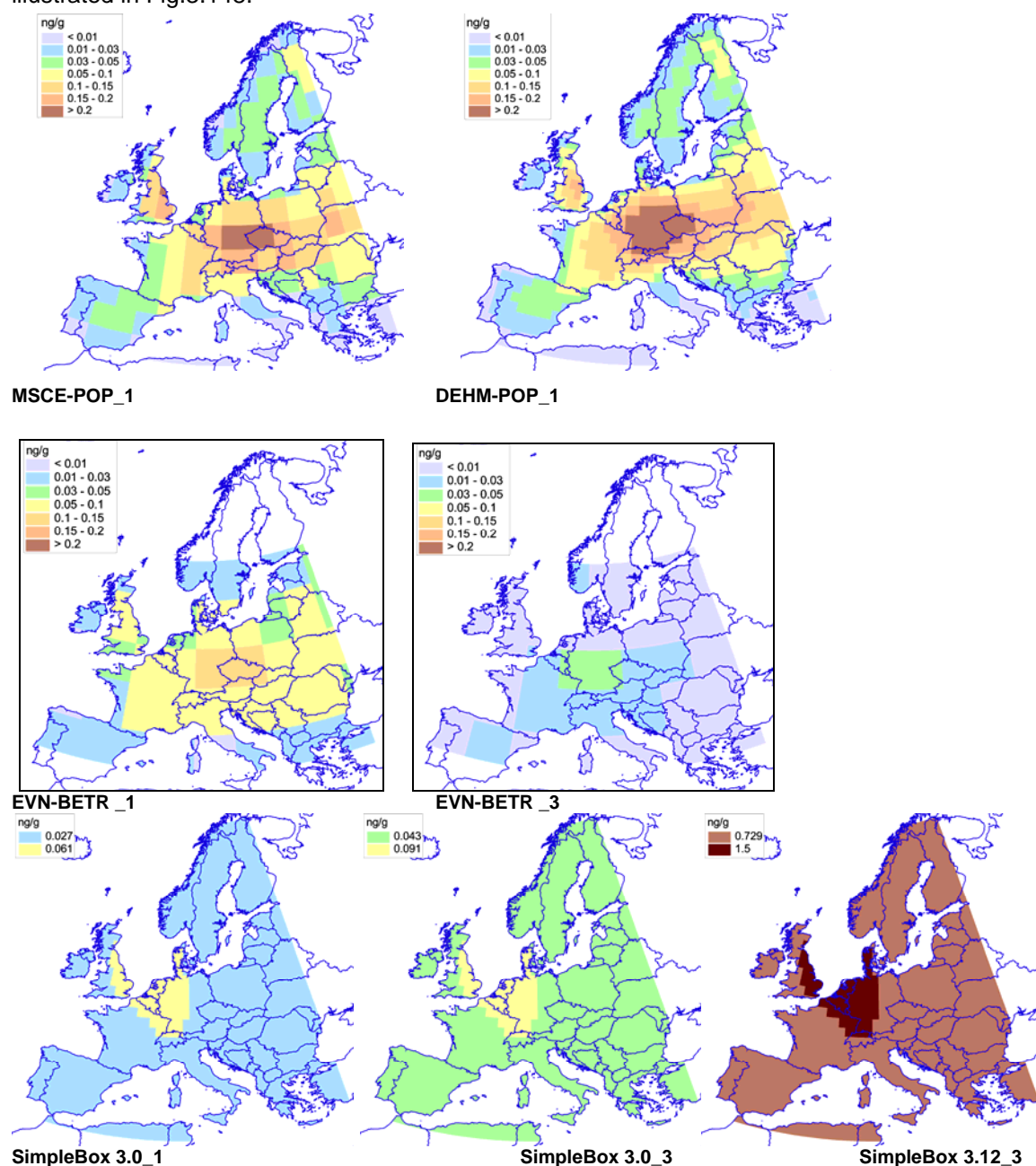
In this section a comparison of spatial distributions of PCB-180 depositions and concentrations in different environmental compartments for 2000 obtained by the participating models with the use of “reference” data set on the basis of initial PCB-180 concentrations in the media, historical emissions and zero initial conditions is presented.

**Concentration in the atmosphere.** The calculated fields of PCB-180 annual concentrations in the atmosphere of the European calculation domain presented by EVN-BETR and UK-MODEL, DEHM-POP, MSCE-POP and SimpleBox models for 2000 are compared in Fig. C.147.



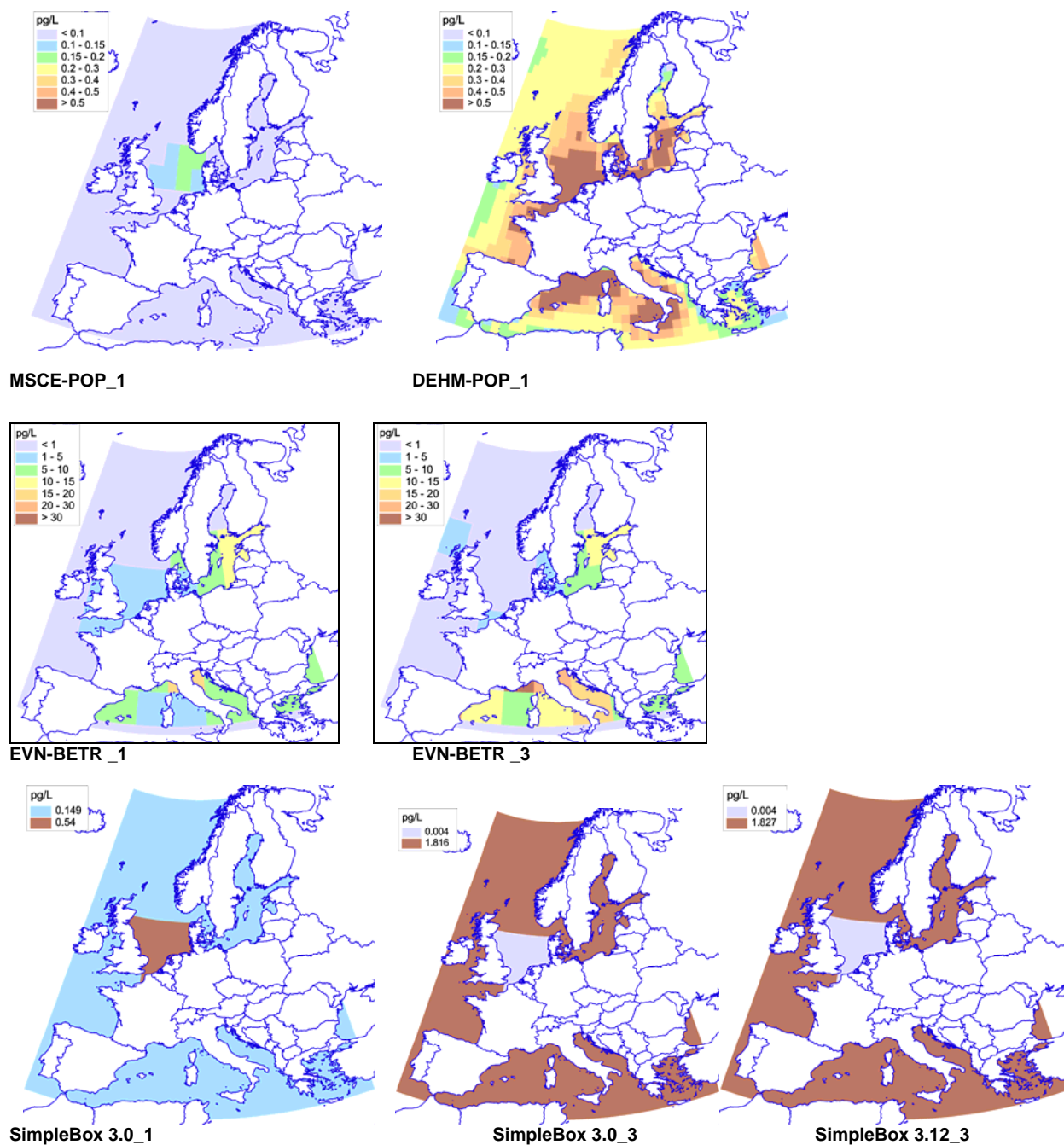
**Fig. C.147.** Spatial distribution of PCB-180 concentrations in the atmosphere calculated by the participating models on the basis of “reference” data set taking into account initial concentrations of pollutants in media or historical emissions

**Soil concentration.** The spatial distributions of PCB-180 concentration in soil of the European region presented by EVN-BETR and UK-MODEL, DEHM-POP, MSCE-POP and SimpleBox models are illustrated in Fig.3.148.



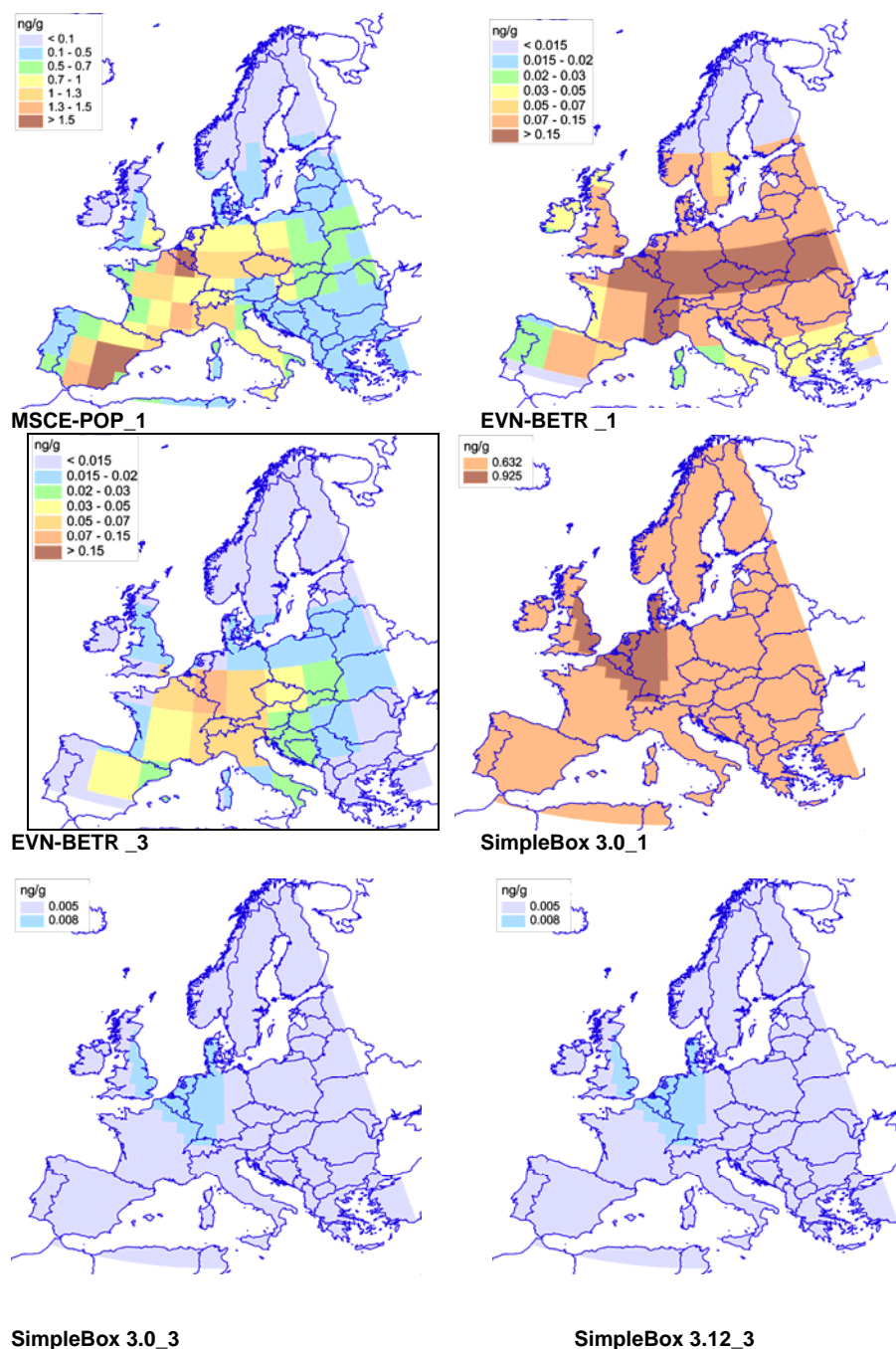
**Fig. C.148.** Spatial distribution of PCB-180 concentrations in soil calculated by the participating models on the basis of "reference" data set taking into account initial concentrations of pollutants in media or historical emissions.

**Water concentration.** The calculated fields of PCB-180 annual concentrations in water of the European calculation domain in 2000 presented by EVN-BETR and UK-MODEL, DEHM-POP, MSCE-POP and SimpleBox models are compared in Fig. C.149.



**Fig. C.149.** Spatial distribution of PCB-180 concentrations in water calculated by the participating models on the basis of “reference” data set taking into account initial concentrations of pollutants in media or historical emissions.

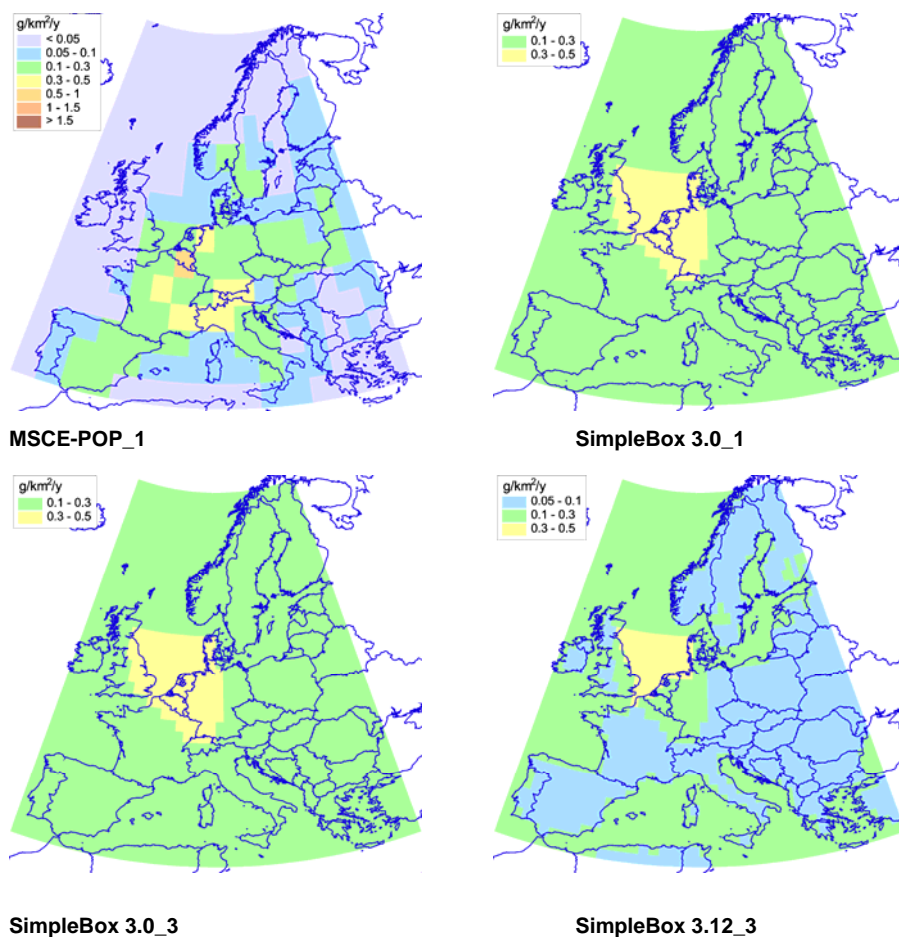
**Concentration in vegetation.** The spatial distributions of PCB-180 concentration in vegetation of the European region presented by EVN-BETR and UK-MODEL, MSCE-POP and SimpleBox models are compared in Fig.3.150.



**Fig. C.150.** Spatial distribution of PCB-180 concentrations in vegetation calculated by the participating models on the basis of “reference” data set taking into account initial concentrations of pollutants in media or historical emissions.

**Net deposition flux.** Spatial distributions of PCB-180 net deposition flux in 2000 presented by MSCE-POP and SimpleBox models are shown in Fig.3.151. The values of net deposition flux include dry and wet depositions and gaseous exchange. Of note, the spatial variability of SimpleBox results in this case is higher than that in the presented above results on concentrations in the media since the deposition values in this model are dependent on the different types of underlying surfaces, which were taken into account in their calculations.

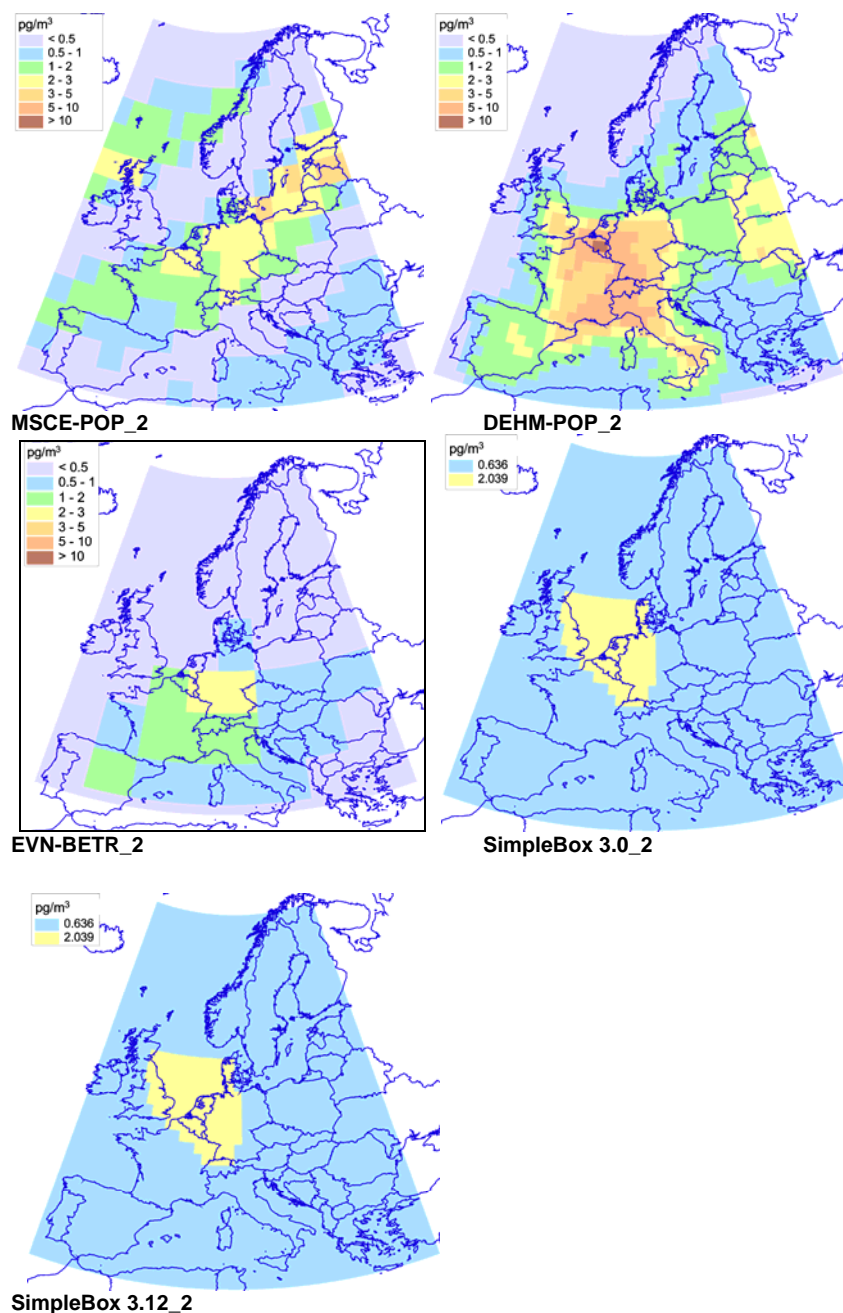




**Fig. C.151.** Spatial distribution of PCB-180 net depositions calculated by the participating models on the basis of “reference” data set taking into account initial concentrations of pollutants in media or historical emissions

Below the comparison of model results obtained on the basis of zero initial concentrations in the environmental media is presented.

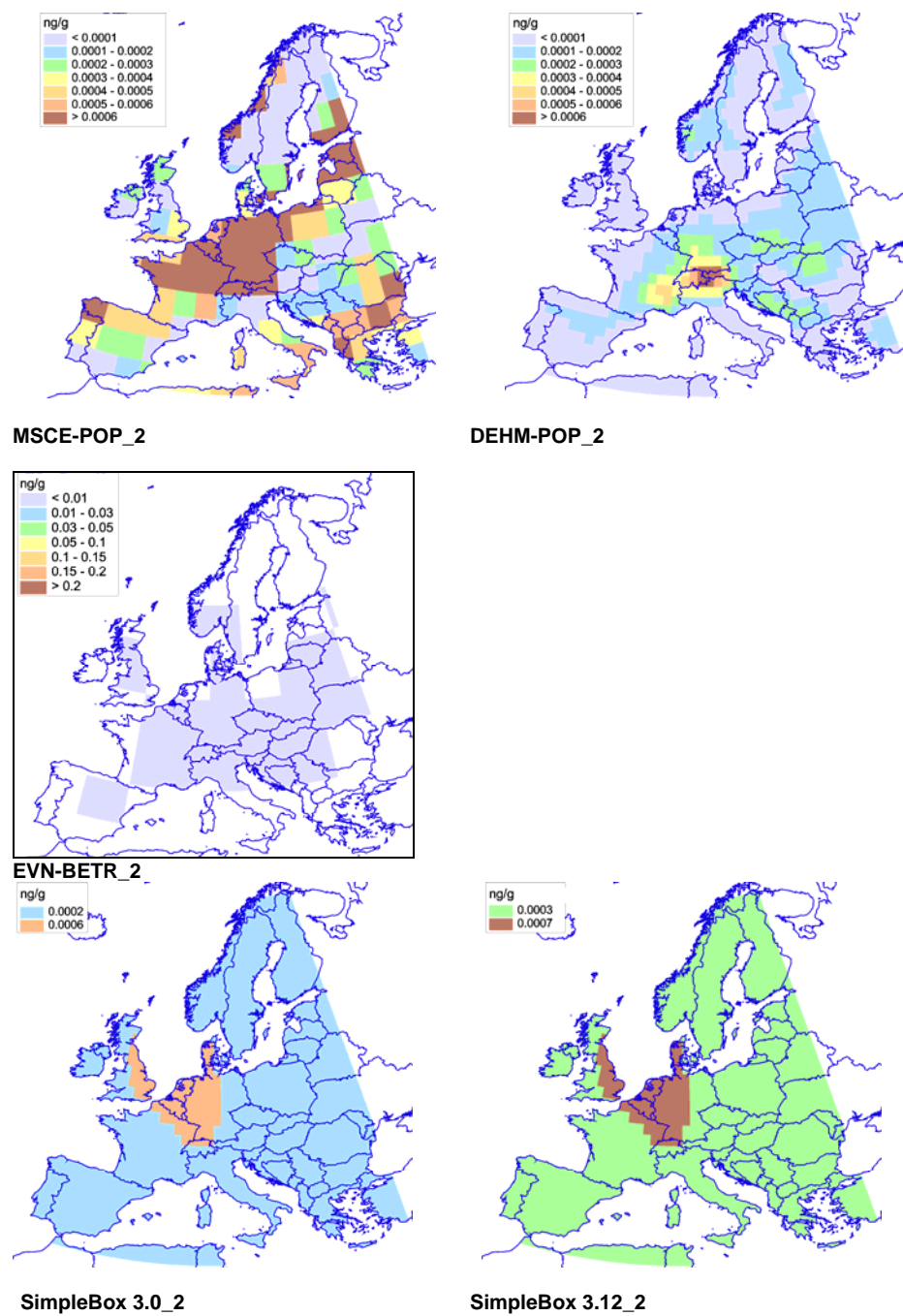
**Concentration in the atmosphere.** The calculated fields of PCB-180 annual concentrations in the atmosphere of the European calculation domain presented by DEHM-POP, EVN-BETR and UK-MODEL, MSCE-POP and SimpleBox models for 2000 are compared in Fig. C.152.



**Fig. C.152.** Spatial distribution of PCB-180 concentrations in the atmosphere calculated by the participating models on the basis of “reference” data set and zero initial concentrations

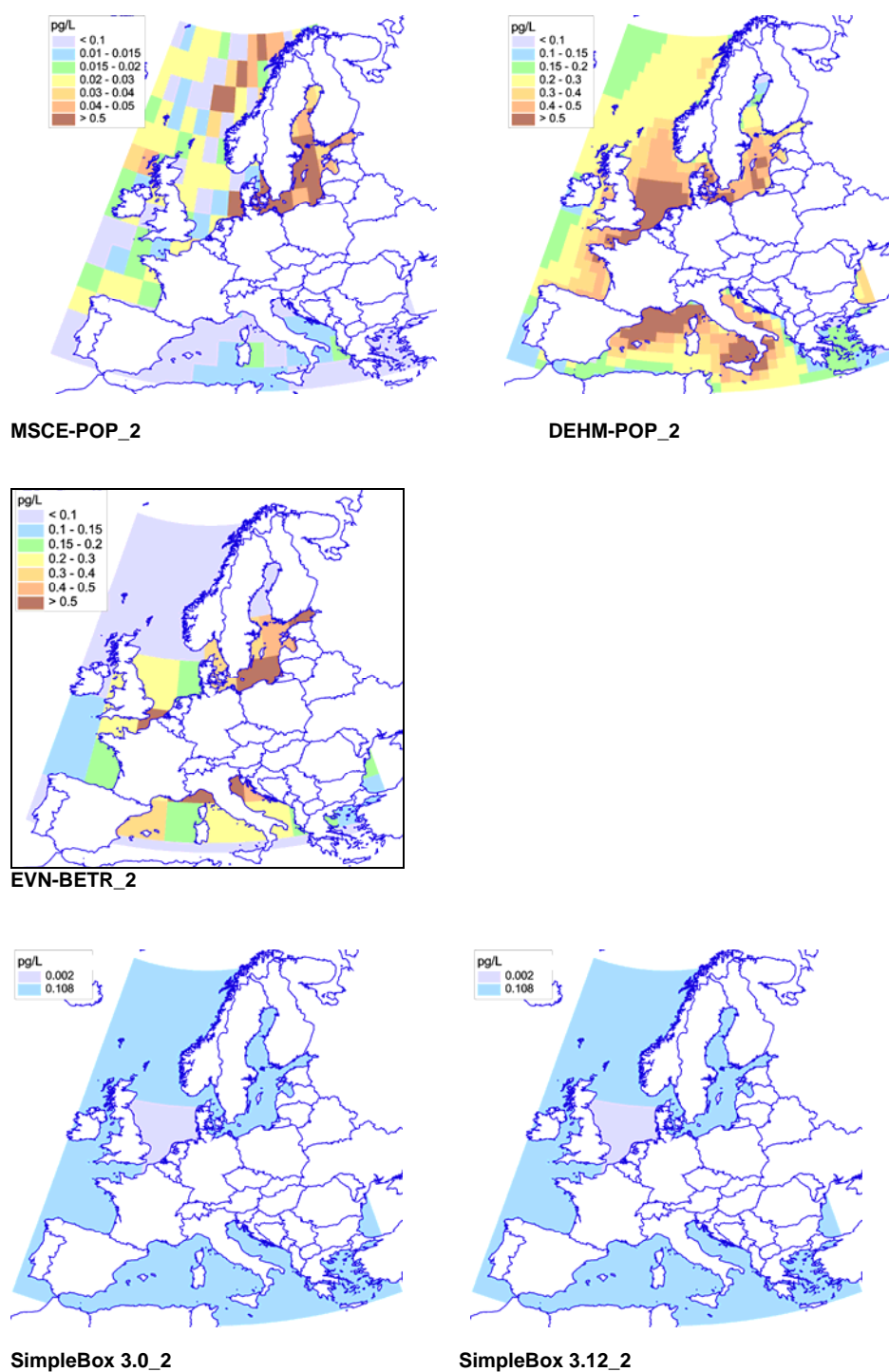
**Soil concentration.** The spatial distributions of PCB-180 concentration in soil of the European region presented by DEHM-POP, EVN-BETR and UK-MODEL, MSCE-POP and SimpleBox models are illustrated in Fig.3.153.





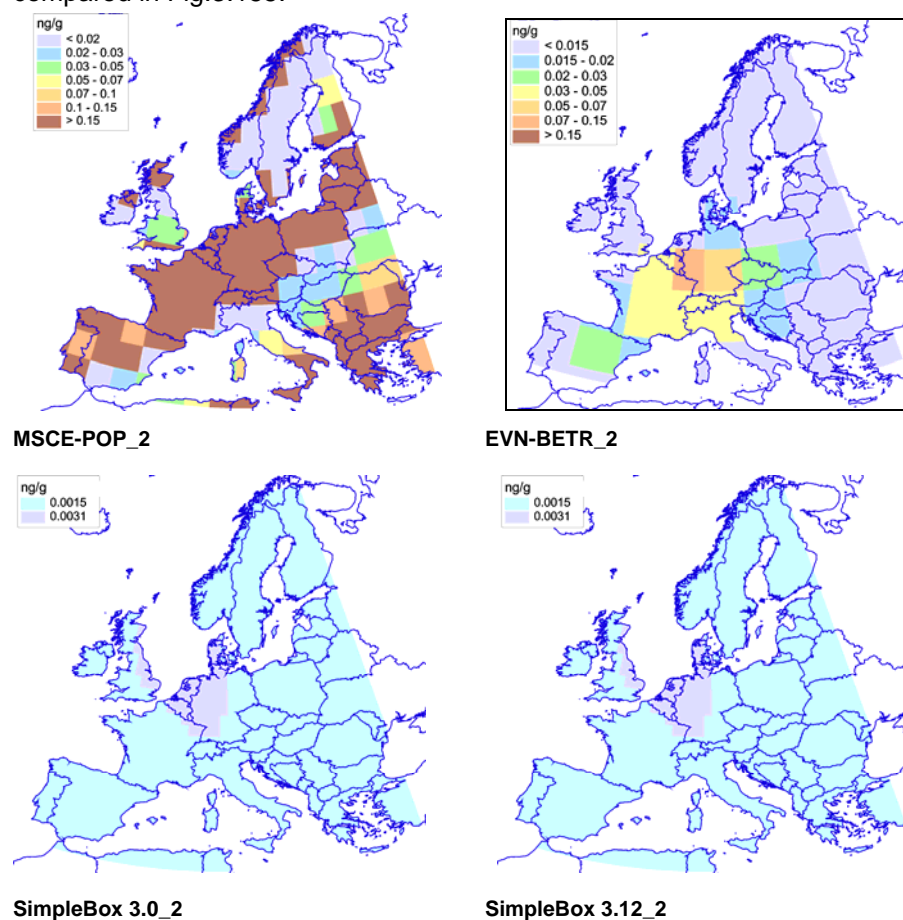
**Fig. C.153.** Spatial distribution of PCB-180 concentrations in soil calculated by the participating models on the basis of “reference” data set and zero initial concentrations

**Water concentration.** The calculated fields of PCB-180 annual concentrations in water of the European calculation domain in 2000 presented by DEHM-POP, EVN-BETR and UK-MODEL, MSCE-POP and SimpleBox models are compared in Fig. C.154.



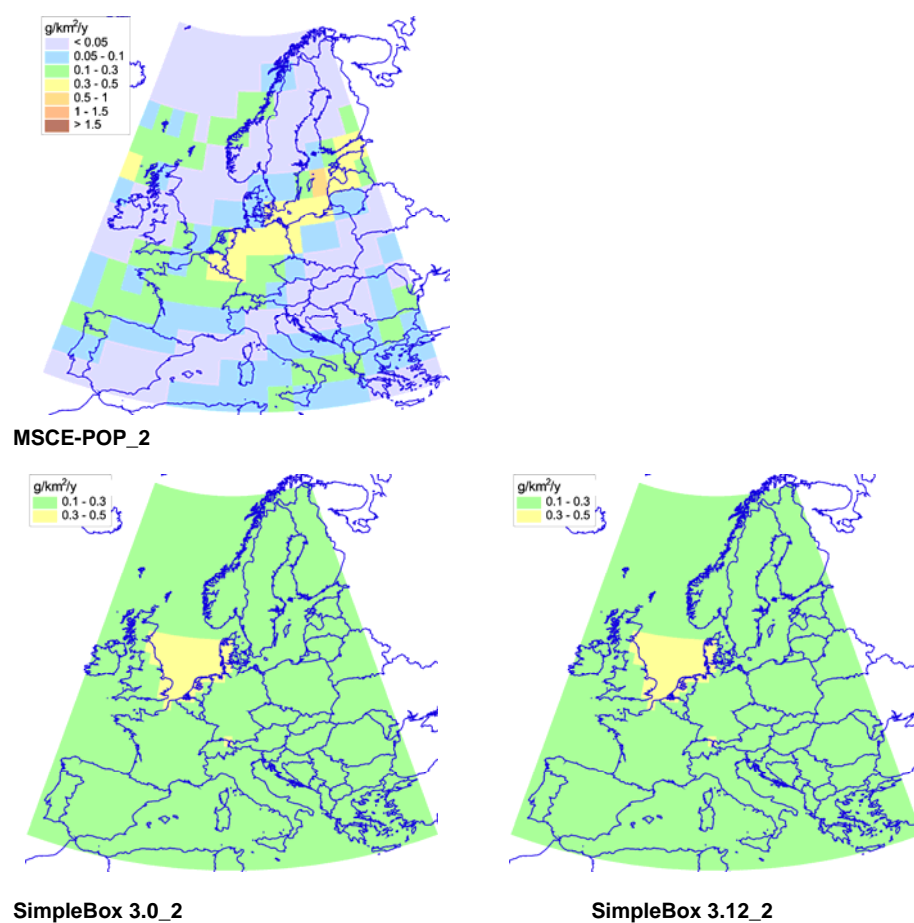
**Fig. C.154.** Spatial distribution of PCB-180 concentrations in water calculated by the participating models on the basis of “reference” data set and zero initial concentrations.

**Concentration in vegetation.** The spatial distributions of PCB-180 concentration in vegetation of the European region presented by EVN-BETR and UK-MODEL, MSCE-POP and SimpleBox models are compared in Fig.3.155.



**Fig. C.155.** Spatial distribution of PCB-180 concentrations in vegetation calculated by the participating models on the basis of “reference” data set and zero initial concentrations.

**Net deposition flux.** Spatial distributions of PCB-180 net deposition flux in 2000 presented by MSCE-POP and SimpleBox models are shown in Fig.3.156. The values of net deposition flux include dry and wet depositions and gaseous exchange.

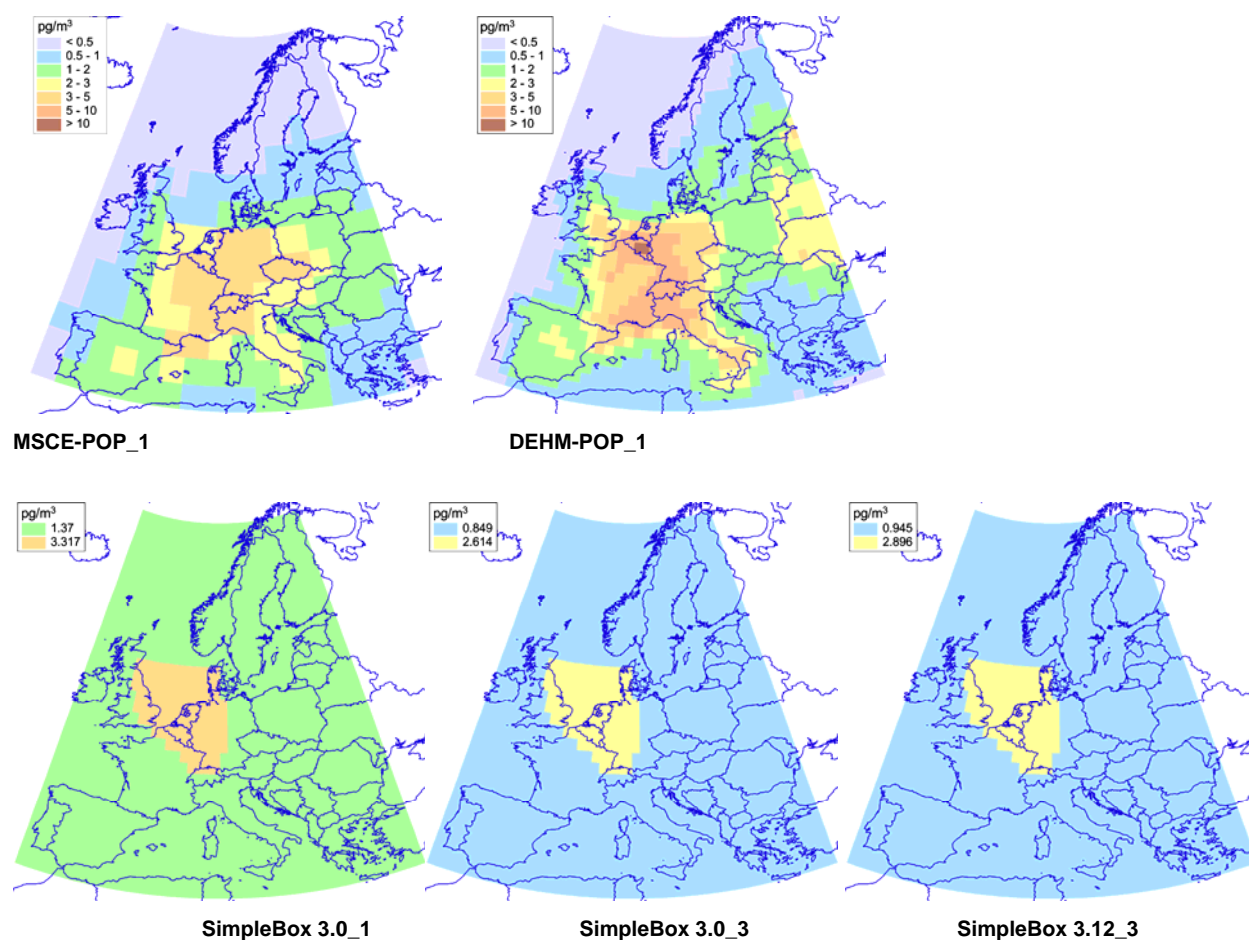


**Fig. C.156.** Spatial distribution of PCB-180 net depositions calculated by the participating models on the basis of “reference” data set and zero initial concentrations

### C.6.2. Comparison of results on spatial distribution of PCB-180 depositions and concentrations in different compartments obtained on the basis of “own or alternative” data sets

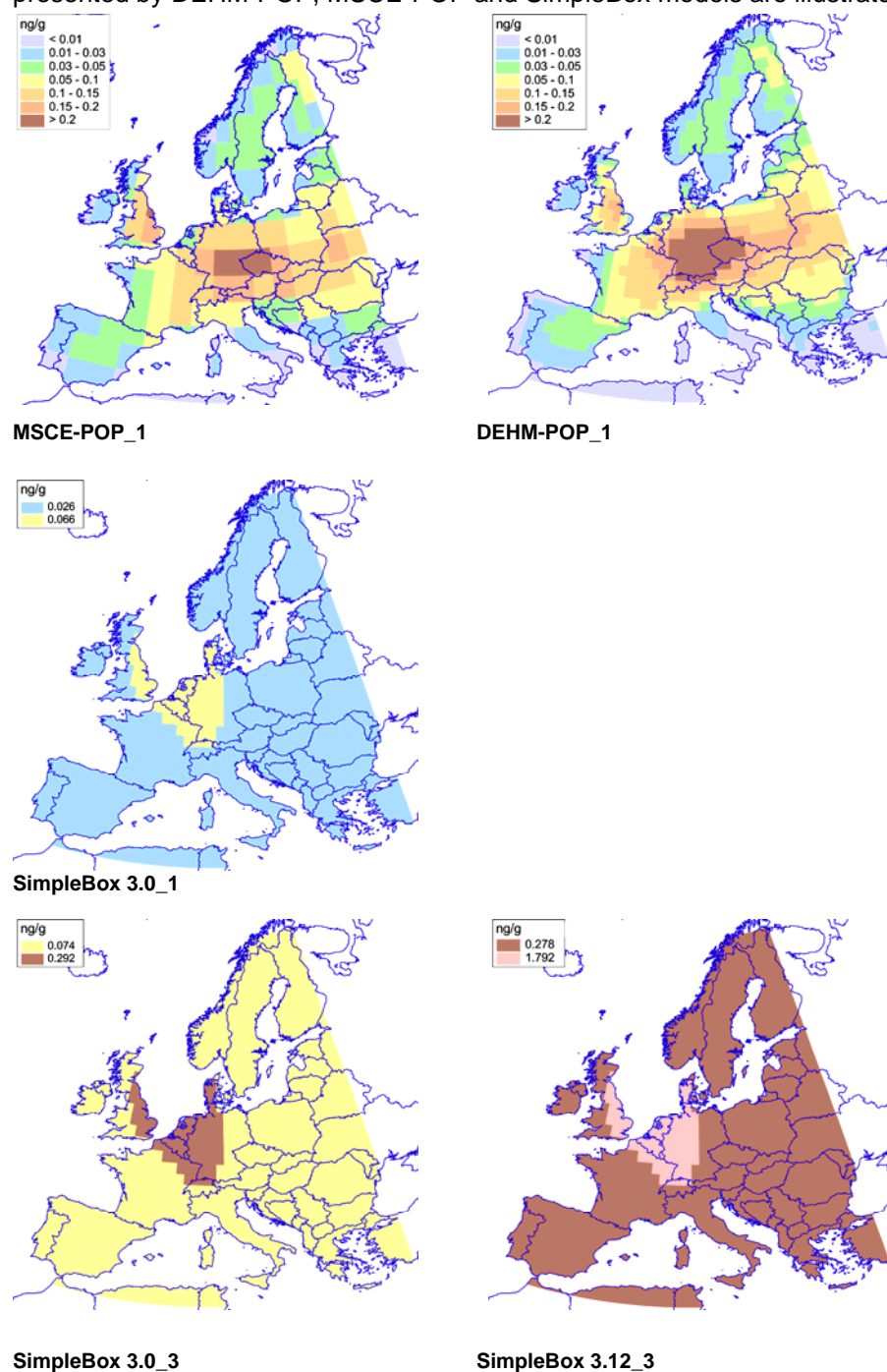
In this section a comparison of spatial distributions of PCB-180 depositions and concentrations in different environmental compartments for 2000 obtained by the participating models “own or alternative” data sets on the basis of initial concentrations of pollutants in media, historical emissions and zero initial conditions is presented.

**Concentration in the atmosphere.** The calculated fields of PCB-180 annual concentrations in the atmosphere of the European calculation domain presented by DEHM-POP, MSCE-POP and SimpleBox models for 2000 are compared in Fig. C.157.



**Fig. C.157.** Spatial distribution of PCB-180 concentrations in the atmosphere calculated by the participating models on the basis of “own or alternative” data sets taking into account initial concentrations of pollutants in media or historical emissions

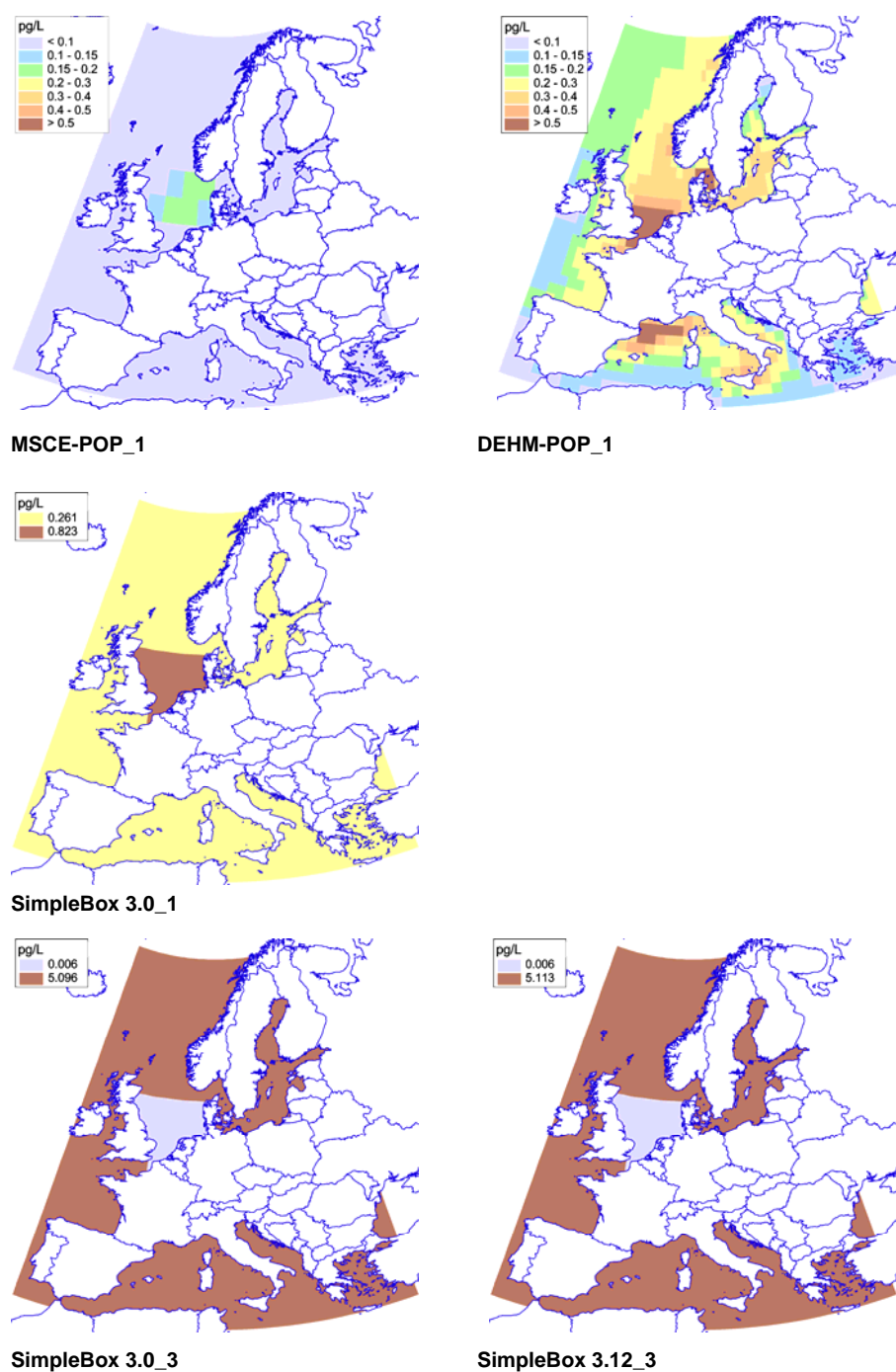
**Soil concentration.** The spatial distributions of PCB-180 concentration in soil of the European region presented by DEHM-POP, MSCE-POP and SimpleBox models are illustrated in Fig.3.158.



**Fig. C.158.** Spatial distribution of PCB-180 concentrations in soil calculated by the participating models on the basis of “own or alternative” data set taking into account initial concentrations of pollutants in media or historical emissions

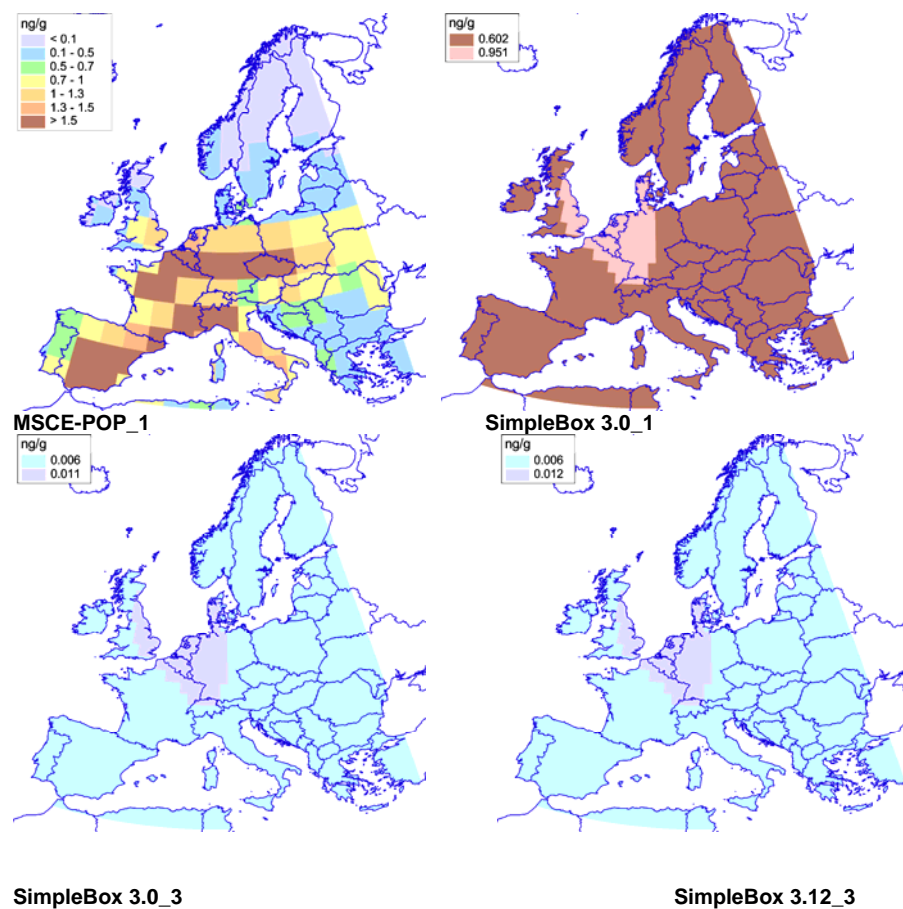


**Water concentration.** The calculated fields of PCB-180 annual concentrations in water of the European calculation domain in 2000 presented by DEHM-POP, MSCE-POP and SimpleBox models are compared in Fig. C.159.



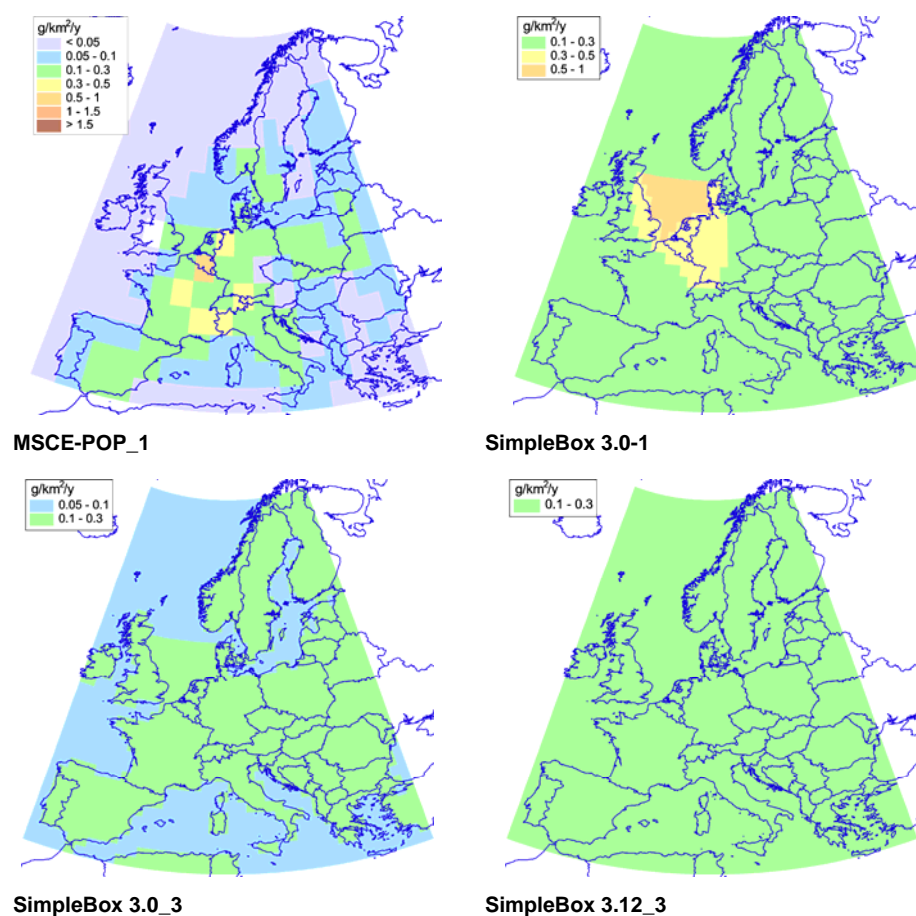
**Fig. C.159.** Spatial distribution of PCB-180 concentrations in water calculated by the participating models on the basis of “own or alternative” data sets taking into account initial concentrations of pollutants in media or historical emissions

**Concentration in vegetation.** The spatial distributions of PCB-180 concentration in vegetation of the European region presented by MSCE-POP and SimpleBox models are compared in Fig.3.160.



**Fig. C.160.** Spatial distribution of PCB-180 concentrations in vegetation calculated by the participating models on the basis of “own or alternative” data sets taking into account initial concentrations of pollutants in media or historical emissions.

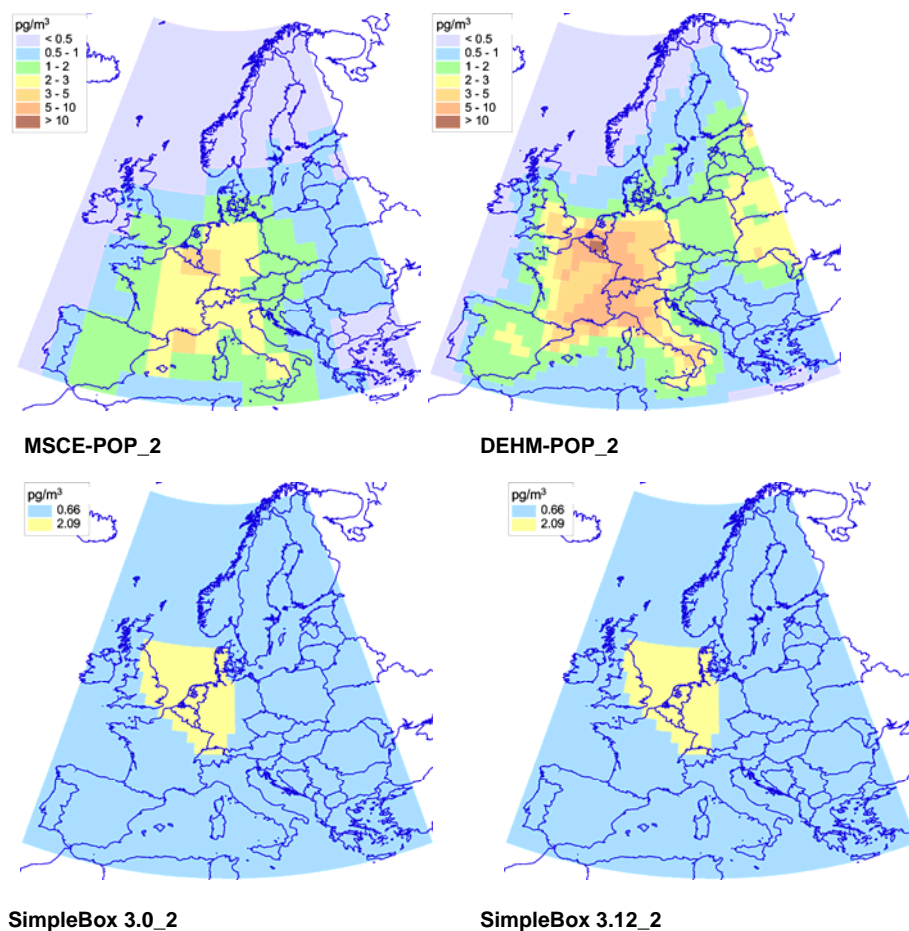
**Net deposition flux.** Spatial distributions of PCB-180 net deposition flux in 2000 presented by MSCE-POP and SimpleBox models are shown in Fig.3.161. The values of net deposition flux include dry and wet depositions and gaseous exchange.



**Fig. C.161.** Spatial distribution of PCB-180 net depositions calculated by the participating models on the basis of “own or alternative” data sets taking into account initial concentrations of pollutants in media or historical emissions.

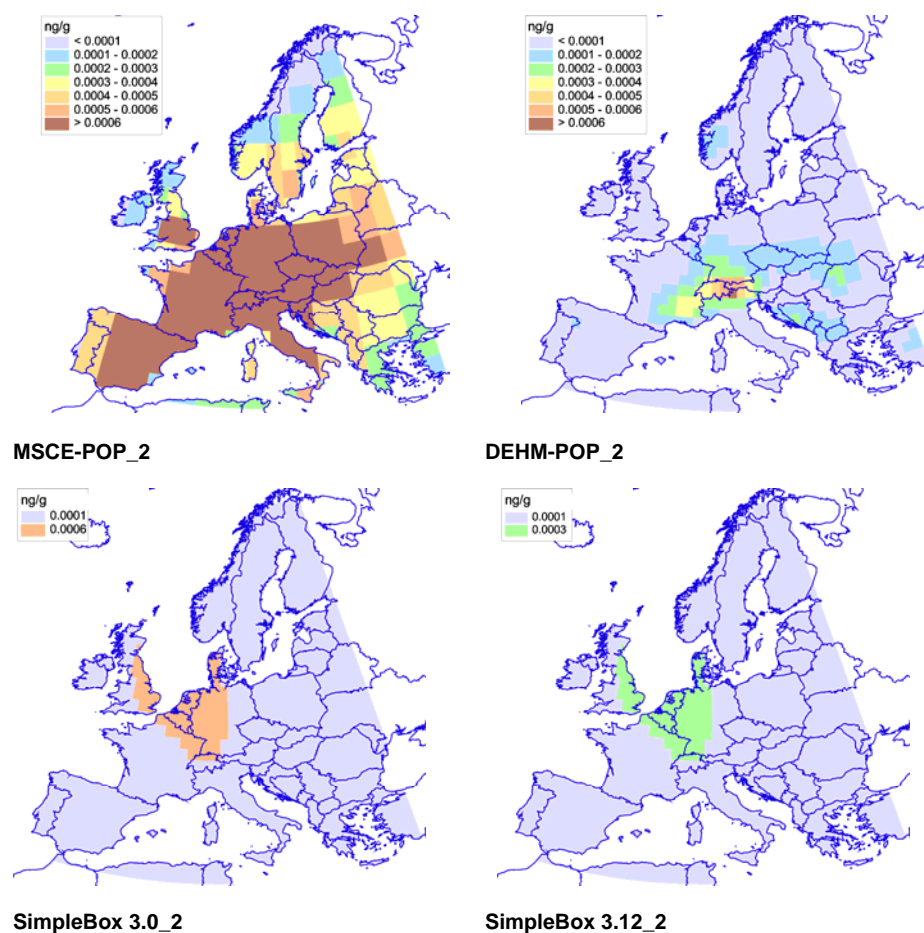
The model results obtained on the basis of zero initial concentrations in the environmental media are compared below.

**Concentration in the atmosphere.** The calculated fields of PCB-180 annual concentrations in the atmosphere of the European calculation domain presented by DEHM-POP, MSCE-POP and SimpleBox models for 2000 are compared in Fig. C.162.



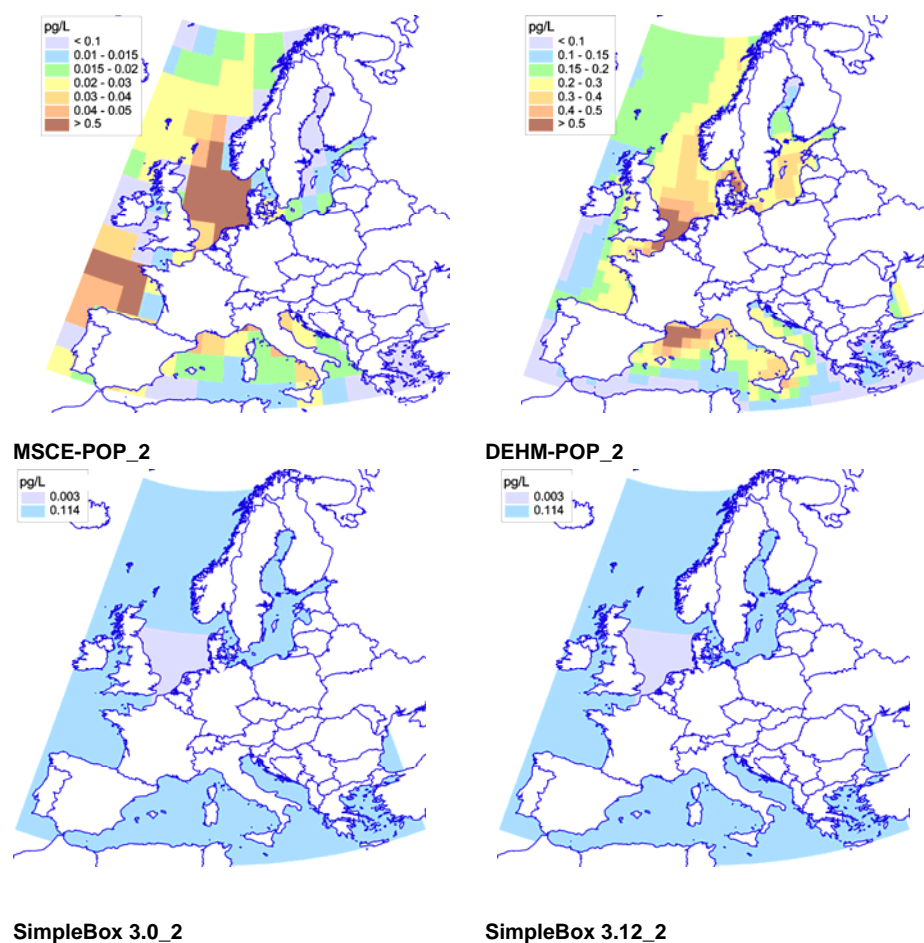
**Fig. C.162.** Spatial distribution of PCB-180 concentrations in the atmosphere calculated by the participating models on the basis of “own or alternative” data sets and zero initial concentrations.

**Soil concentration.** The spatial distributions of PCB-180 concentration in soil of the European region presented by DEHM-POP, MSCE-POP and SimpleBox models are illustrated in Fig.3.163.



**Fig. C.163.** Spatial distribution of PCB-180 concentrations in soil calculated by the participating models on the basis of “own or alternative” data sets and zero initial concentrations.

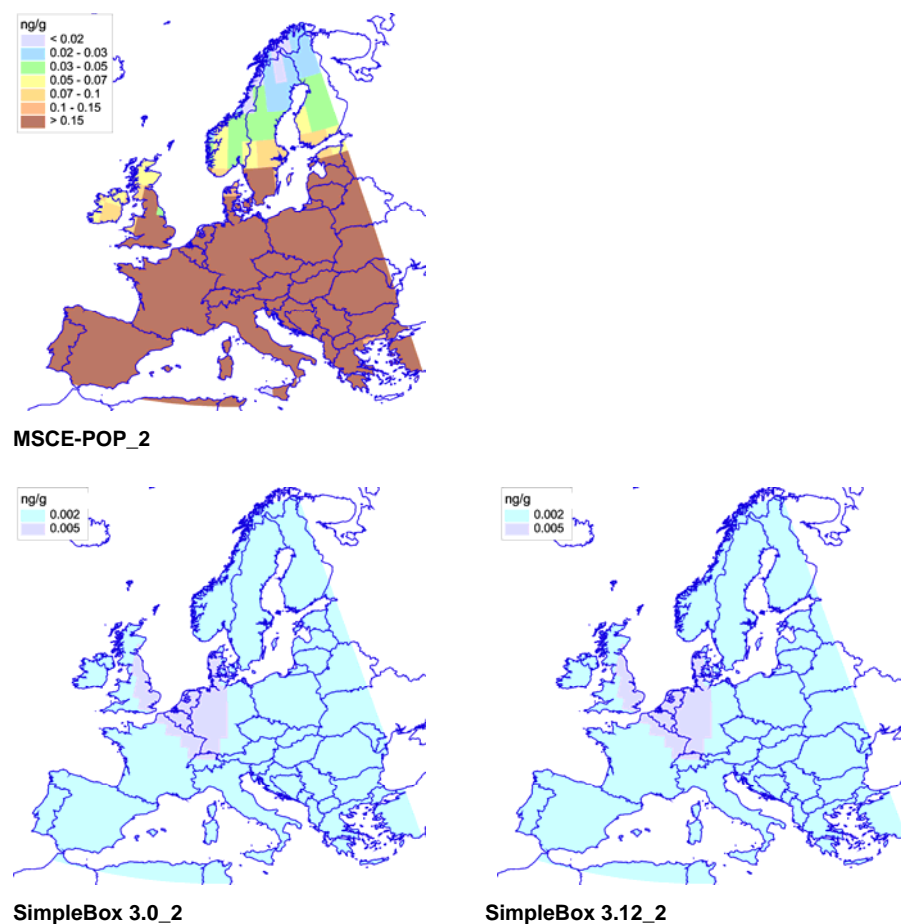
**Water concentration.** The calculated fields of PCB-180 annual concentrations in water of the European calculation domain in 2000 presented by DEHM-POP, MSCE-POP and SimpleBox models are compared in Fig. C.188.



**Fig. C.164.** Spatial distribution of PCB-180 concentrations in water calculated by the participating models on the basis of “own or alternative” data sets and zero initial concentrations

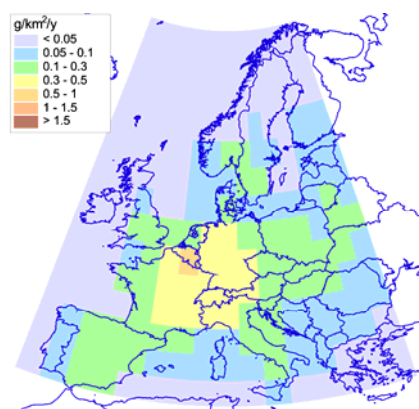


**Concentration in vegetation.** The spatial distributions of PCB-180 concentration in vegetation of the European region presented by MSCE-POP and SimpleBox models are compared in Fig.3.165.



**Fig. C.165.** Spatial distribution of PCB-180 concentrations in vegetation calculated by the participating models on the basis of “own or alternative” data sets and zero initial concentrations

**Net deposition flux.** Spatial distributions of PCB-180 net deposition flux in 2000 presented by MSCE-POP and SimpleBox models are shown in Fig.3.166. The values of net deposition flux include dry and wet depositions and gaseous exchange.



**MSCE-POP\_2**



**SimpleBox 3.0\_2**



**SimpleBox 3.12\_2**

**Fig. C.166.** Spatial distribution of PCB-180 net depositions calculated by the participating models on the basis of “own or alternative” data sets and zero initial concentrations