

COMPARISON OF RESULTS OF STAGE II COMPUTATIONAL EXPERIMENTS FOR PCB-180

A comparison of results on computational experiments of Stage II for PCB-180 obtained by the participating models is presented in this Annex. Six models participated in this comparison: CAN/POPs; CliMoChem, DEHM-POP, EVN-BETR and UK-MODEL, SimpleBox, and MSCE-POP.

C.1. Distribution of PCB-180 mass between environmental compartments

C.1.1. Comparison of calculated values of PCB-180 mass in the atmosphere

According to the programme of Stage II results of computational experiments on mass balance include masses of PCB-180 contained in the atmosphere within layers of 1 km, 5 km and 10 km height.

Reference data set. Calculation results on PCB-180 mass contained in 1 km layer of the atmosphere (kg) calculated by models on the basis of “reference” data set together with statistical parameters used for evaluation are presented in Table C.1.

Monthly values of PCB-180 mass contained in 1 km layer of the atmosphere calculated by all participating models on the basis of “reference” data set and taking into account non-zero (initial concentrations in media or historical emissions) and zero initial conditions are compared in Fig. C.1 a and b, respectively.

Calculation results on PCB-180 mass contained in 5 km layer of the atmosphere (kg) calculated by models on the basis of “reference” data set together with statistical parameters used for evaluation are presented in Table B.2.

Monthly values of PCB-180 mass contained in 5 km layer of the atmosphere calculated by the models on the basis of “reference” data set are compared in Fig. C.2.

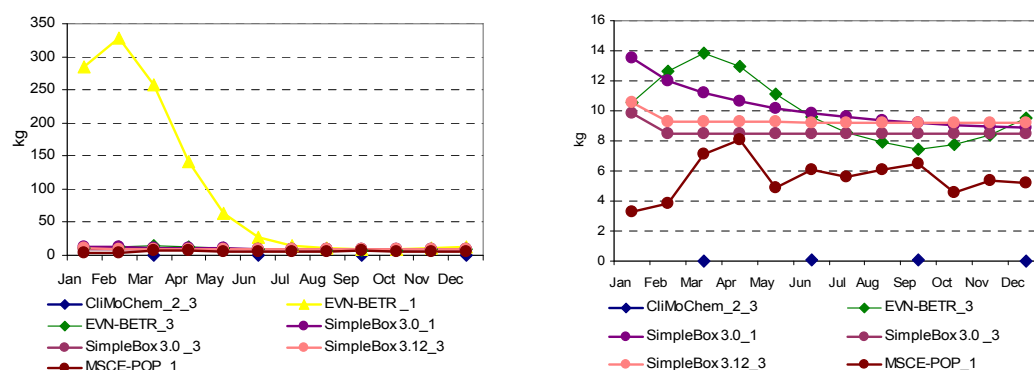


Fig. C.1a. PCB-180 mass in the 1 km layer of the atmosphere (kg) calculated by the participating models on the basis of “reference” data set and non-zero initial conditions

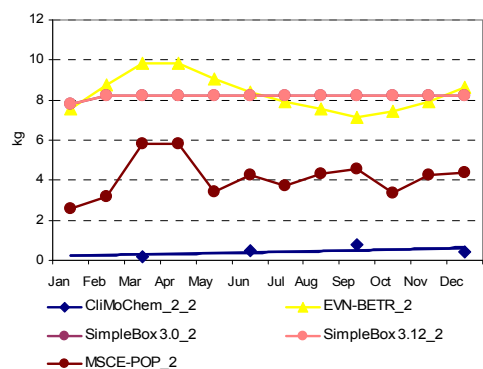


Fig. C.1b. PCB-180 mass in the 1 km layer of the atmosphere (kg) calculated by the participating models on the basis of “reference” data set and zero-initial conditions

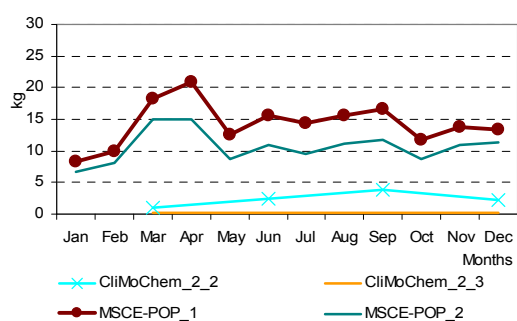


Fig. C.2. PCB-180 mass in the 5 km layer of the atmosphere (kg) calculated by the participating models on the basis of “reference” data set

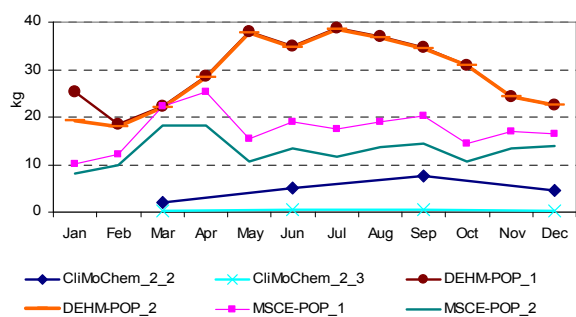


Fig. C.3. PCB-180 mass in the 10 km layer of the atmosphere (kg) calculated by the participating models on the basis of “reference data set

Table C.1. Calculation results: PCB-180 mass contained in 1 km layer of the atmosphere (kg) calculated by models on the basis of “reference” data set and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data			Results obtained on the basis of historical emissions				m	σ	Month	Results obtained on the basis of zero initial concentrations					m	σ
	EVN-BETR_1 ^a	SimpleBox 3.0_1 ^b	MSCE-POP_1	EVN-BETR_3 ^a	CliMoChem_2_3	SimpleBox 3.0_3 ^b	SimpleBox 3.12_3 ^b				EVN-BETR_2 ^a	CliMoChem_2_2	SimpleBox 3.0_2 ^b	SimpleBox 3.12_2 ^b	MSCE-POP_2		
Jan	283.93	13.50	3.24	10.57		9.814	10.55	55.27	112.07	Jan	7.56		7.80	7.80	2.60	6.44	2.56
Feb	327.42	12.04	3.83	12.66		8.498	9.27	62.29	129.93	Feb	8.74		8.21	8.21	3.18	7.09	2.62
Mar	257.02	11.23	7.13	13.83		8.490	9.26	51.16	100.88	Mar	9.87		8.21	8.21	5.83	8.03	1.66
Seas_1	289.46	12.26	4.74	12.35	0.03	8.93	9.69	48.21	106.47	Seas_1	8.72	0.20	8.08	8.08	3.87	5.79	3.67
Apr	141.41	10.63	8.09	12.99		8.485	9.25	31.81	53.72	Apr	9.85		8.22	8.22	5.84	8.03	1.65
May	62.92	10.18	4.89	11.10		8.480	9.24	17.80	22.21	May	9.06		8.22	8.22	3.42	7.23	2.57
Jun	27.81	9.84	6.06	9.59		8.476	9.23	11.83	7.95	Jun	8.42		8.22	8.22	4.28	7.28	2.01
Seas_2	77.38	10.21	6.35	11.23	0.05	8.48	9.24	17.56	26.64	Seas_2	9.11	0.50	8.22	8.22	4.51	6.11	3.60
Jul	14.83	9.57	5.58	8.58		8.472	9.23	9.38	3.02	Jul	7.95		8.22	8.22	3.70	7.02	2.22
Aug	10.47	9.37	6.07	7.92		8.469	9.22	8.59	1.51	Aug	7.54		8.22	8.22	4.33	7.08	1.86
Sep	8.89	9.20	6.46	7.41		8.467	9.22	8.27	1.12	Sep	7.11		8.22	8.22	4.58	7.04	1.72
Seas_3	11.40	9.38	6.03	7.97	0.06	8.47	9.22	7.50	3.66	Seas_3	7.53	0.76	8.22	8.22	4.20	5.79	3.27
Oct	9.24	9.07	4.57	7.79		8.464	9.21	8.06	1.80	Oct	7.46		8.22	8.22	3.37	6.82	2.33
Nov	10.50	8.96	5.37	8.44		8.462	9.20	8.49	1.71	Nov	7.95		8.23	8.23	4.26	7.16	1.94
Dec	13.08	8.87	5.22	9.49		8.460	9.20	9.05	2.51	Dec	8.66		8.23	8.23	4.41	7.38	1.99
Seas_4	10.94	8.97	5.05	8.57	0.03	8.46	9.20	7.32	3.66	Seas_4	8.02	0.44	8.23	8.23	4.01	5.79	3.49
Annual	97.29	10.20	5.54	10.03	0.04	8.59	9.34	20.15	34.21	Annual	8.35	0.48	8.19	8.19	4.15	5.87	3.50

EVN-BETR_1 - EVN-BETR and UK-MODEL results calculated on the basis of initial concentrations given as input data;

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;

CliMoChem_2_2 - CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

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;

^a - EVN-BETR and UK-MODEL results were calculated with the help of a single box version of European model.

^b - SimpleBox data presented here are overall masses calculated as sum of regional and continental level estimates.

Table C.2. Calculation results: PCB-180 mass contained in 5 km layer of the atmosphere (kg) calculated by models on the basis of “reference” data set and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data	Results obtained on the basis of historical emissions	m	σ	Month	Results obtained on the basis of zero initial concentrations		m	σ
	MSCE-POP_1	CliMoChem_2_3				CliMoChem_2_2	MSCE-POP_2		
Jan	8.34				Jan		6.68		
Feb	9.85				Feb		8.16		
Mar	18.31				Mar		14.97		
Seas_1	12.17	0.14	6.16	8.50	Seas_1	1.02	9.94	5.48	6.31
Apr	20.80				Apr		15.00		
May	12.56				May		8.78		
Jun	15.56				Jun		10.99		
Seas_2	16.31	0.23	8.27	11.37	Seas_2	2.52	11.59	7.05	6.42
Jul	14.33				Jul		9.50		
Aug	15.59				Aug		11.12		
Sep	16.59				Sep		11.77		
Seas_3	15.50	0.28	7.89	10.77	Seas_3	3.79	10.80	7.29	4.96
Oct	11.75				Oct		8.67		
Nov	13.79				Nov		10.94		
Dec	13.41				Dec		11.33		
Seas_4	12.98	0.16	6.57	9.07	Seas_4	2.22	10.31	6.27	5.72
Annual	14.24	0.20	7.22	9.93	Annual	2.38	10.66	6.52	5.85

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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.

Calculation results on PCB-180 mass contained in 10 km layer of the atmosphere (kg) calculated by models on the basis of “reference” data set together with statistical parameters used for evaluation are presented in Table C.3.

Monthly values of PCB-180 mass contained in 10 km layer of the atmosphere calculated by the participating models on the basis of “reference” data set are compared in Fig. C.3.

Own/alternative data set. Calculation results on PCB-180 mass contained in 1 km layer of the atmosphere (kg) calculated by models on the basis of “own or alternative” data sets together with statistical parameters used for evaluation are presented in Table C.4.

Monthly values of PCB-180 mass contained in 1 km layer of the atmosphere calculated by participating models on the basis of “own or alternative” data sets and taking into account non-zero (initial concentrations in media or historical emissions) and zero initial conditions are compared in Fig. C.4 a and b, respectively.

Calculation results on PCB-180 mass contained in 5 km layer of the atmosphere (kg) calculated by models on the basis of “own or alternative” data set together with statistical parameters used for evaluation are presented in Table C.5.

Monthly values of PCB-180 mass contained in 5 km layer of the atmosphere calculated by the models on the basis of “own or alternative” data sets are compared in Fig. C.5.

Calculation results on PCB-180 mass contained in 10 km layer of the atmosphere (kg) calculated by models on the basis of “own or alternative” data sets together with statistical parameters used for evaluation are presented in Table C.6.

Monthly values of PCB-180 mass contained in 10 km layer of the atmosphere calculated by the participating models on the basis of “own or alternative” data sets are compared in Fig. C.6.

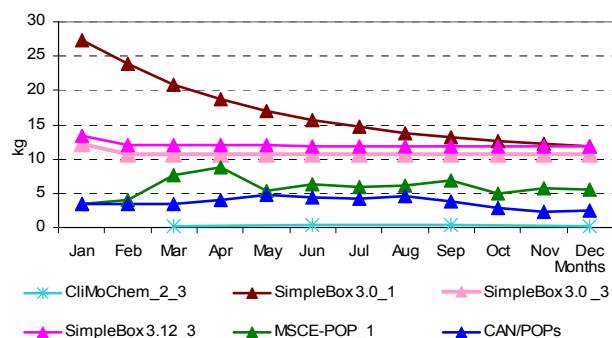


Fig. C.4a. PCB-180 mass contained in 1 km layer of the atmosphere (kg) calculated by the participating models on the basis of “own or alternative” data sets and non-zero initial conditions

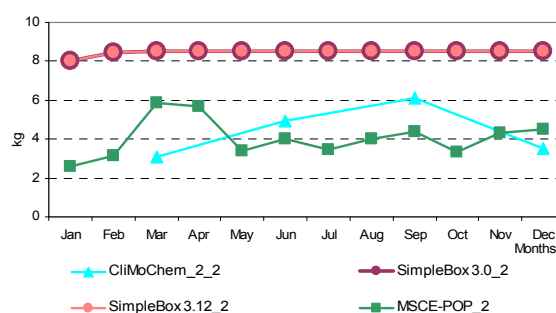


Fig. C.4b. PCB-180 mass contained in 1 km layer of the atmosphere (kg) calculated by the participating models on the basis of “own or alternative” data sets and zero initial conditions

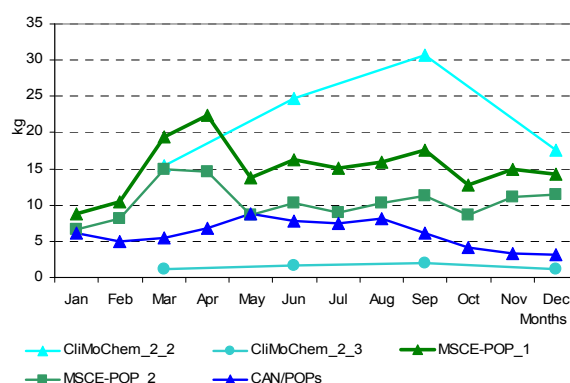


Fig. C.5. PCB-180 mass in the atmosphere (kg) calculated by the participating models on the basis of “own or alternative” data sets

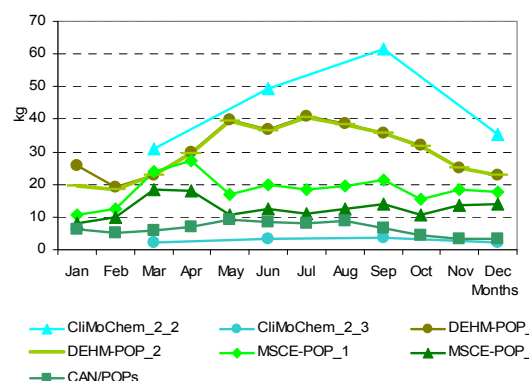


Fig. C.6. PCB-180 mass contained in 10 km layer of the atmosphere (kg) calculated by the participating models on the basis of “own or alternative” data sets

Table C.3. Calculation results: PCB-180 mass contained in 10 km layer of the atmosphere (kg) calculated by models on the basis of “reference” data set and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data		Results obtained on the basis of historical emissions	<i>m</i>	σ	Month	Results obtained on the basis of zero initial concentrations			<i>m</i>	σ
	DEHM-POP_1 ^a	MSCE-POP_1	CliMoChem_2_3				CliMoChem_2_2	DEHM-POP_2 ^a	MSCE-POP_2		
Jan	25.33	10.20		17.76	10.70	Jan		19.20	8.17	13.69	7.80
Feb	18.40	12.05		15.22	4.49	Feb		18.01	9.98	14.00	5.68
Mar	22.21	22.39		22.30	0.13	Mar		21.98	18.31	20.14	2.60
Season_1	21.98	14.88	0.29	12.38	11.06	Season_1	2.04	19.73	12.15	11.31	8.88
Apr	28.67	25.44		27.05	2.29	Apr		28.43	18.34	23.39	7.13
May	38.03	15.37		26.70	16.03	May		37.77	10.74	24.26	19.11
Jun	34.98	19.03		27.01	11.28	Jun		34.71	13.44	24.07	15.04
Season_2	33.89	19.94	0.45	18.10	16.80	Season_2	5.03	33.64	14.17	17.61	14.61
Jul	38.68	17.53		28.10	14.96	Jul		38.41	11.61	25.01	18.95
Aug	36.86	19.07		27.96	12.58	Aug		36.63	13.60	25.12	16.28
Sep	34.57	20.29		27.43	10.10	Sep		34.42	14.39	24.41	14.16
Season_3	36.70	18.96	0.55	18.74	18.08	Season_3	7.57	36.49	13.20	19.09	15.33
Oct	31.01	14.37		22.69	11.77	Oct		30.93	10.60	20.76	14.38
Nov	24.35	16.86		20.61	5.29	Nov		24.30	13.38	18.84	7.72
Dec	22.47	16.40		19.44	4.29	Dec		22.44	13.86	18.15	6.07
Season_4	25.94	15.88	0.31	14.04	12.91	Season_4	4.44	25.89	12.61	14.31	10.83
Annual	29.63	17.42	0.40	15.82	14.68	Annual	4.77	28.94	13.04	15.58	12.28

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and with 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;

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;

* - data of DEHM-POP are given for 15 km layer of the atmosphere.

Table C.4. Calculation results: PCB-180 mass contained in 1 km layer of the atmosphere (kg) calculated by models on the basis of “own or alternative” data sets and statistical parameters used for evaluation.

Month	Results obtained on the basis of initial concentrations given as input data			Results obtained on the basis of historical emissions			m	σ	Month	Results obtained on the basis of zero initial concentrations				m	σ
	SimpleBox 3.0_1 ^a	MSCE-POP_1	CAN/POPs	CliMo Chem_2_3	SimpleBox 3.0_3 ^a	SimpleBox 3.12_3 ^a				CliMo Chem_2_2	SimpleBox 3.0_2 ^a	SimpleBox 3.12_2 ^a	MSCE-POP_2		
Jan	27.26	3.45	3.53		12.21	13.37	11.96	9.74	Jan		8.03	8.03	2.59	6.21	3.14
Feb	23.83	4.04	3.47		10.78	12.01	10.82	8.22	Feb		8.48	8.48	3.17	6.71	3.06
Mar	20.92	7.58	3.42		10.76	11.98	10.93	6.49	Mar		8.49	8.49	5.84	7.60	1.53
Seas_1	24.00	5.02	3.47	0.23	11.25	12.45	9.41	8.54	Seas_1	3.08	8.33	8.33	3.86	5.90	2.82
Apr	18.69	8.73	4.05		10.74	11.97	10.83	5.33	Apr		8.50	8.50	5.70	7.56	1.62
May	16.99	5.34	4.84		10.73	11.95	9.97	5.04	May		8.51	8.51	3.37	6.79	2.97
Jun	15.68	6.33	4.34		10.71	11.94	9.80	4.52	Jun		8.51	8.51	4.02	7.02	2.59
Seas_2	17.12	6.80	4.41	0.32	10.73	11.95	8.56	5.96	Seas_2	4.95	8.51	8.51	4.36	6.58	2.24
Jul	14.65	5.87	4.22		10.70	11.93	9.47	4.33	Jul		8.52	8.52	3.46	6.83	2.92
Aug	13.82	6.20	4.62		10.69	11.92	9.45	3.89	Aug		8.52	8.52	4.03	7.02	2.59
Sep	13.15	6.84	3.86		10.68	11.91	9.29	3.85	Sep		8.53	8.53	4.40	7.15	2.38
Seas_3	13.87	6.31	4.23	0.38	10.69	11.92	7.90	5.14	Seas_3	6.14	8.52	8.52	3.97	6.79	2.19
Oct	12.61	4.94	2.85		10.67	11.90	8.59	4.41	Oct		8.53	8.53	3.35	6.80	2.99
Nov	12.15	5.82	2.37		10.67	11.89	8.58	4.31	Nov		8.53	8.53	4.32	7.13	2.43
Dec	11.77	5.57	2.49		10.66	11.88	8.47	4.23	Dec		8.54	8.54	4.48	7.18	2.34
Seas_4	12.17	5.45	2.57	0.22	10.67	11.89	7.16	5.14	Seas_4	3.53	8.53	8.53	4.05	6.16	2.75
Annual	16.79	5.89	3.67	0.29	10.83	12.05	8.26	6.07	Annual	4.42	8.47	8.47	4.06	6.36	2.45

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

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;

^a - SimpleBox data presented here are overall masses calculated as sum of regional and continental level estimates.

Table C.5. Calculation results: PCB-180 mass contained in 5 km layer of the atmosphere (kg) calculated by models on the basis of “own or alternative” data sets and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data		Results obtained on the basis of historical emissions	<i>m</i>	σ	Month	Results obtained on the basis of zero initial concentrations		<i>m</i>	σ
	MSCE-POP_1	CAN/POPs	CliMoChem_2_3				CliMoChem_2_2	MSCE-POP_2		
Jan	8.86	6.14		7.50	1.93	Jan		6.65		
Feb	10.38	4.97		7.68	3.83	Feb		8.15		
Mar	19.48	5.48		12.48	9.90	Mar		14.99		
Seas_1	12.91	5.53	1.15	6.53	5.94	Seas_1	15.39	9.93	12.66	3.86
Apr	22.42	6.79		14.61	11.05	Apr		14.64		
May	13.73	8.77		11.25	3.51	May		8.65		
Jun	16.28	7.75		12.01	6.03	Jun		10.33		
Seas_2	17.48	7.77	1.61	8.95	8.00	Seas_2	24.75	11.21	17.98	9.58
Jul	15.09	7.41		11.25	5.43	Jul		8.90		
Aug	15.94	8.10		12.02	5.54	Aug		10.36		
Sep	17.58	6.15		11.87	8.08	Sep		11.31		
Seas_3	16.20	7.22	1.92	7.22	7.22	Seas_3	30.71	10.19	20.45	14.51
Oct	12.70	4.09		8.40	6.09	Oct		8.62		
Nov	14.96	3.30		9.13	8.24	Nov		11.11		
Dec	14.32	3.17		8.74	7.89	Dec		11.52		
Seas_4	13.99	3.52	1.09	6.86	6.86	Seas_4	17.64	10.41	14.03	5.11
Annual	15.15	6.01	1.44	7.53	6.98	Annual	22.12	10.44	16.28	8.26

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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.

Table C.6. Calculation results: PCB-180 mass contained in 10 km layer of the atmosphere (kg) calculated by models on the basis of “own or alternative” data sets and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data			Results obtained on the basis of historical emissions	<i>m</i>	σ	Month	Results obtained on the basis of zero initial concentrations			<i>m</i>	σ
	DEHM-POP_1 ^a	MSCE-POP_1	CAN/POPs	CliMoChem_2_3				CliMoChem_2_2	DEHM-POP_2 ^a	MSCE-POP_2		
Jan	25.68	10.84	6.43		14.31	10.09	Jan		19.37	8.13	13.75	7.95
Feb	19.00	12.70	5.26		12.32	6.88	Feb		18.48	9.96	14.22	6.02
Mar	22.97	23.83	5.80		17.53	10.17	Mar		22.69	18.34	20.51	3.08
Seas_1	22.55	15.79	5.83	2.30	11.62	9.26	Seas_1	30.77	20.18	12.14	21.03	9.34
Apr	29.83	27.42	7.11		21.45	12.48	Apr		29.56	17.90	23.73	8.24
May	39.76	16.79	9.29		21.95	15.88	May		39.48	10.58	25.03	20.43
Jun	36.82	19.91	8.37		21.70	14.31	Jun		36.56	12.64	24.60	16.92
Seas_2	35.47	21.37	8.26	3.22	17.08	14.45	Seas_2	49.50	35.20	13.71	32.80	18.02
Jul	40.73	18.45	8.10		22.43	16.67	Jul		40.46	10.89	25.67	20.91
Aug	38.69	19.49	8.85		22.34	15.12	Aug		38.47	12.67	25.57	18.25
Sep	35.87	21.50	6.75		21.37	14.56	Sep		35.73	13.84	24.78	15.48
Seas_3	38.43	19.82	7.90	3.84	17.50	15.52	Seas_3	61.41	38.22	12.46	37.37	24.49
Oct	31.89	15.54	4.37		17.27	13.84	Oct		31.81	10.54	21.17	15.04
Nov	25.01	18.29	3.48		15.59	11.02	Nov		24.97	13.59	19.28	8.05
Dec	22.98	17.51	3.28		14.59	10.17	Dec		22.96	14.08	18.52	6.28
Seas_4	26.63	17.11	3.71	2.19	12.41	11.61	Seas_4	35.28	26.58	12.74	24.87	11.37
Annual	30.77	18.52	6.42	2.89	14.65	12.66	Annual	44.24	30.05	12.76	29.02	15.77

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and with 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;

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;

^a - data of DEHM-POP are given for 15 km layer of the atmosphere.

Comparison between results obtained on the basis of two data sets. The percentage difference between calculation results on PCB-180 mass contained in 1, 5 and 10 km layers of the atmosphere obtained with two data sets of physical-chemical properties (for those models who provided calculations for both these sets) is shown in Tables C.7-C.9.

Table C.7. The percentage difference between calculation results on PCB-180 mass contained in 1 km layer of the atmosphere obtained by models on the basis of two data sets: “reference” and “own or alternative” data sets

Month	CliMoChem_2_2	CliMoChem_2_3	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
Jan			101.9%	2.9%	2.9%	24.4%	26.7%	6.3%	-0.5%
Feb			97.9%	3.2%	3.2%	26.9%	29.5%	5.4%	-0.2%
Mar			86.2%	3.3%	3.3%	26.7%	29.4%	6.4%	0.2%
Seas_1	1411.5%	698.0%	95.8%	3.2%	3.2%	25.9%	28.5%	6.1%	-0.1%
Apr			75.8%	3.4%	3.4%	26.6%	29.4%	7.8%	-2.4%
May			67.0%	3.5%	3.5%	26.5%	29.3%	9.3%	-1.5%
Jun			59.4%	3.6%	3.6%	26.4%	29.3%	4.6%	-6.0%
Seas_2	883.8%	609.6%	67.6%	3.5%	3.5%	26.5%	29.3%	7.2%	-3.3%
Jul			53.0%	3.6%	3.6%	26.3%	29.3%	5.3%	-6.3%
Aug			47.5%	3.6%	3.6%	26.2%	29.2%	2.2%	-6.9%
Sep			42.9%	3.7%	3.7%	26.2%	29.2%	6.0%	-3.9%
Seas_3	711.2%	594.3%	47.9%	3.6%	3.6%	26.2%	29.2%	4.5%	-5.6%
Oct			39.0%	3.7%	3.7%	26.1%	29.2%	8.1%	-0.6%
Nov			35.6%	3.7%	3.7%	26.0%	29.2%	8.5%	1.6%
Dec			32.7%	3.8%	3.8%	26.0%	29.2%	6.8%	1.6%
Seas_4	694.9%	597.7%	35.8%	3.7%	3.7%	26.0%	29.2%	7.8%	1.0%
Annual	827.7%	617.9%	64.6%	3.5%	3.5%	26.2%	29.0%	6.4%	-2.1%

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and with historical emissions for 20-year period;

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.

Table C.8. The percentage difference between calculation results on PCB-180 mass contained in 5 km layer of the atmosphere obtained by models on the basis of two data sets: “reference” and “own or alternative” data sets

Month	CliMoChem_2_2	CliMoChem_2_3	MSCE-POP_1	MSCE-POP_2
Jan			6.3%	-0.5%
Feb			5.4%	-0.2%
Mar			6.4%	0.2%
Seas_1	1411.5%	698.0%	6.1%	-0.1%
Apr			7.8%	-2.4%
May			9.3%	-1.5%
Jun			4.6%	-6.0%
Seas_2	883.8%	609.6%	7.2%	-3.3%
Jul			5.3%	-6.3%
Aug			2.2%	-6.9%
Sep			6.0%	-3.9%
Seas_3	711.2%	594.3%	4.5%	-5.6%
Oct			8.1%	-0.6%
Nov			8.5%	1.6%
Dec			6.8%	1.6%
Seas_4	694.9%	597.7%	7.8%	1.0%
Annual	827.7%	617.9%	6.4%	-2.1%

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations; CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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.

Table C.9. The percentage difference between calculation results on PCB-180 mass contained in 10 km layer of the atmosphere obtained by models on the basis of two data sets: “reference” and “own or alternative” data sets

Month	CliMoChem_2_2	CliMoChem_2_3	DEHM-POP_1	DEHM-POP_2	MSCE-POP_1	MSCE-POP_2
Jan			1.4%	0.9%	6.3%	-0.5%
Feb			3.3%	2.6%	5.4%	-0.2%
Mar			3.4%	3.2%	6.4%	0.2%
Seas_1	1411.5%	698.0%	2.6%	2.3%	6.1%	-0.1%
Apr			4.0%	4.0%	7.8%	-2.4%
May			4.5%	4.5%	9.3%	-1.5%
Jun			5.3%	5.3%	4.6%	-6.0%
Seas_2	883.8%	609.6%	4.7%	4.6%	7.2%	-3.3%
Jul			5.3%	5.3%	5.3%	-6.3%
Aug			5.0%	5.0%	2.2%	-6.9%
Sep			3.8%	3.8%	6.0%	-3.9%
Seas_3	711.2%	594.3%	4.7%	4.8%	4.5%	-5.6%
Oct			2.8%	2.8%	8.1%	-0.6%
Nov			2.7%	2.8%	8.5%	1.6%
Dec			2.3%	2.3%	6.8%	1.6%
Seas_4	694.9%	597.7%	2.6%	2.7%	7.8%	1.0%
Annual	827.7%	617.9%	3.8%	3.8%	6.4%	-2.1%

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations; CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and with 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; 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.

C.1.2. Comparison of calculated values of PCB-180 mass in soil

According to the programme of Stage II results of computational experiments on mass balance include masses of PCB-180 contained in soil within 5 cm and 10 cm depth.

Reference data set. Calculation results on PCB-180 mass contained in 5cm layer of soil (kg) calculated by models on the basis of “reference” data set together with statistical parameters used for evaluation are presented in Table C.10.

Monthly values of PCB-180 mass contained in 5cm layer of soil calculated by the participating models on the basis of “reference” data set and taking into account non-zero (initial concentrations in media or historical emissions) and zero initial conditions are compared in Fig. C.7a and b, respectively.

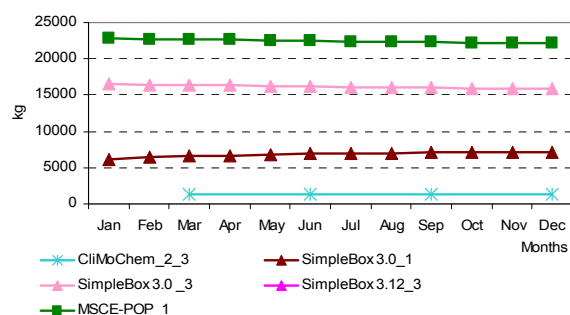


Fig. C.7a. PCB-180 mass contained in 5cm layer of soil (kg) calculated by the participating models on the basis of “reference” data set and non-zero initial conditions

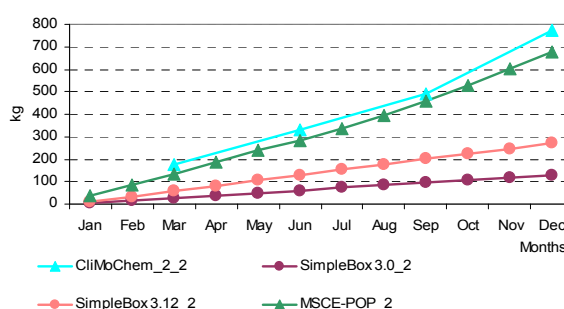


Fig. C.7b. PCB-180 mass contained in 5cm layer of soil (kg) calculated by the participating models on the basis of “reference” data set and zero initial conditions

Calculation results on PCB-180 mass contained in 10 cm layer of soil (kg) calculated by models on the basis of “reference” data set together with statistical parameters used for evaluation are presented in Table C.11.

Monthly values of PCB-180 mass contained in 10 cm layer of soil calculated by the participating models on the basis of “reference” data set and taking into account non-zero (initial concentrations in media or historical emissions) and zero initial conditions are compared in Fig. C.8a and b, respectively.

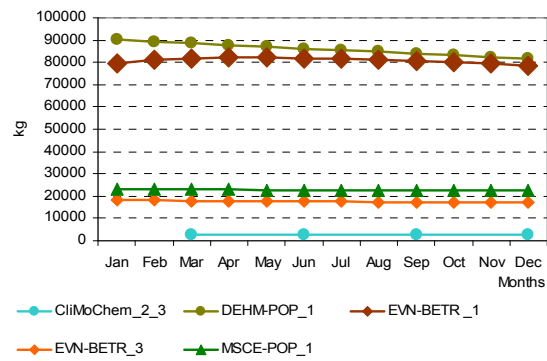


Fig. C.8a. PCB-180 mass contained in 10cm layer of soil (kg) calculated by the participating models on the basis of “reference” data set and non-zero initial conditions

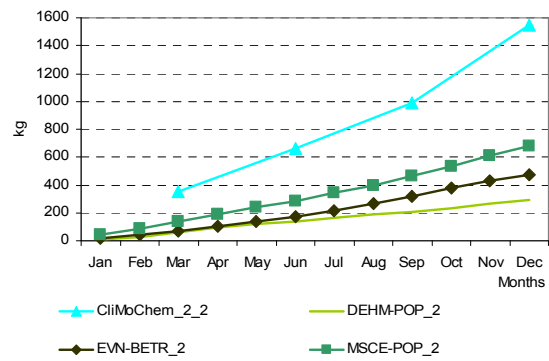


Fig. C.8b. PCB-180 mass contained in 10cm layer of soil (kg) calculated by the participating models on the basis of “reference” data set and zero initial conditions

Table C.10. Calculation results: PCB-180 mass contained in 5cm layer of soil (kg) calculated by models on the basis of “reference” data set and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data		Results obtained on the basis of historical emissions			<i>m</i>	σ	Month	Results obtained on the basis of zero initial concentrations				<i>m</i>	σ
	SimpleBox 3.0_1 ^a	MSCE-POP_1	CliMoChem_2_3	SimpleBox 3.0_3 ^a	SimpleBox 3.12_3 ^a				CliMoChem_2_2	SimpleBox 3.0_2 ^a	SimpleBox 3.12_2 ^a	MSCE-POP_2		
Jan	6160.7	22829.2		16493.9	271374.7	79214.7	128290.8	Jan		5.2	11.0	38.9	18.4	18.0
Feb	6379.7	22763.8		16433.3	270154.4	78932.8	127659.5	Feb		16.2	34.4	86.3	45.6	36.4
Mar	6552.3	22692.0		16373.6	268937.0	78638.7	127039.2	Mar		27.2	57.9	133.8	73.0	54.8
Seas_1	6364.2	22761.7	1356.7	16433.6	270155.4	63414.3	115874.5	Seas_1	177.4	16.2	34.5	86.3	78.6	72.2
Apr	6693.0	22626.8		16312.2	267934.9	78391.7	126531.9	Apr		38.5	80.6	185.9	101.7	76.0
May	6805.6	22558.1		16251.3	266480.4	78023.9	125804.3	May		49.7	105.7	237.8	131.0	96.6
Jun	6897.4	22477.4		16191.0	265262.1	77707.0	125200.4	Jun		60.9	129.5	283.1	157.8	113.8
Seas_2	6798.7	22554.1	1328.4	16251.5	266559.1	62698.4	114257.5	Seas_2	330.4	49.7	105.2	235.6	180.2	126.9
Jul	6971.0	22403.0		16130.9	264052.7	77389.4	124603.4	Jul		72.1	153.2	337.6	187.6	136.0
Aug	7032.5	22335.5		16070.0	260637.1	76518.8	122906.2	Aug		83.5	177.3	393.3	218.0	158.9
Sep	7081.3	22296.1		16010.1	261633.5	76755.2	123410.1	Sep		94.6	200.9	460.3	251.9	188.1
Seas_3	7028.3	22344.9	1301.3	16070.3	262107.8	61770.5	112284.4	Seas_3	493.1	83.4	177.1	397.1	287.7	189.8
Oct	7120.7	22253.4		15950.6	260443.0	76441.9	122824.3	Oct		105.7	224.4	526.1	285.4	216.7
Nov	7152.3	22234.7		15891.0	259254.6	76133.2	122237.5	Nov		116.8	247.9	603.4	322.7	251.8
Dec	7176.5	22208.6		15832.6	258095.0	75828.2	121667.3	Dec		127.7	271.3	675.1	358.0	283.8
Seas_4	7149.8	22232.3	1282.1	15891.4	259264.2	61164.0	111031.9	Seas_4	775.2	116.8	247.9	601.5	435.3	305.4
Annual	6835.3	22473.2	1317.1	16161.7	264521.6	62261.8	113362.0	Annual	444.0	66.5	141.2	330.1	245.5	172.7

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

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;

^a - SimpleBox data presented here are overall masses calculated as sum of regional and continental level estimates.

Own/alternative data set. Calculation results on PCB-180 mass contained in 5cm layer of soil (kg) calculated by the models on the basis of “own or alternative” data sets together with statistical parameters used for evaluation are presented in Table C.12.

Monthly values of PCB-180 mass contained in 5cm layer of soil calculated by all participating models on the basis of “own or alternative” data sets and taking into account non-zero (initial concentrations in media or historical emissions) and zero initial conditions are compared in Fig. C.9a and b, respectively.

Calculation results on PCB-180 mass contained in 10 cm layer of soil (kg) calculated by models on the basis of “own or alternative” data sets together with statistical parameters used for evaluation are presented in Table C.13.

Monthly values of PCB-180 mass contained in 10 cm layer of soil calculated by the participating models on the basis of “own or alternative” data sets and taking into account non-zero (initial concentrations in media or historical emissions) and zero initial conditions are compared in Fig. C.10a and b, respectively.

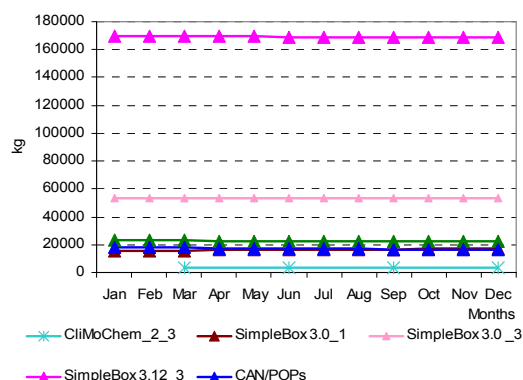


Fig. C.9a. PCB-180 mass contained in 5cm layer of soil (kg) calculated by the participating models on the basis of “own or alternative” data sets and non-zero initial conditions

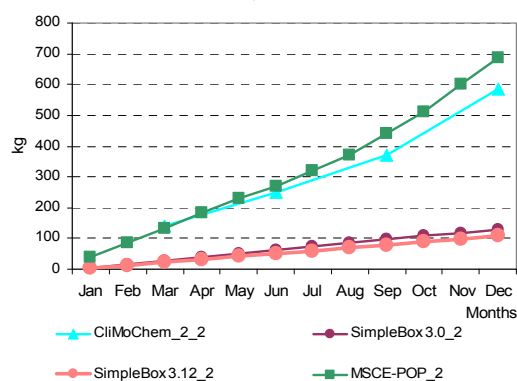


Fig. C.9b. PCB-180 mass contained in 5cm layer of soil (kg) calculated by the participating models on the basis of “own or alternative” data sets and zero initial conditions

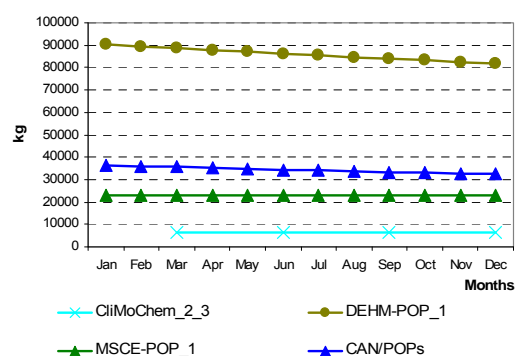


Fig. C.10a. PCB-180 mass contained in 10cm layer of soil (kg) calculated by the participating models on the basis of “own or alternative” data sets and non-zero initial conditions

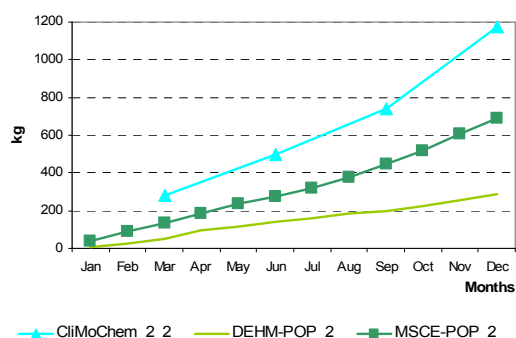


Fig. C.10b. PCB-180 mass contained in 10cm layer of soil (kg) calculated by the participating models on the basis of “own or alternative” data sets and zero initial condition

Table C.11. Calculation results: PCB-180 mass contained in 10 cm layer of soil (kg) calculated by models on the basis of “reference” data set and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data			Results obtained on the basis of historical emissions		<i>m</i>	σ	Month	Results obtained on the basis of zero initial concentrations				<i>m</i>	σ
	DEHM-POP_1 ^a	MSCE-POP_1	EVN-BETR_1 ^b	EVN-BETR_3 ^b	CliMoChem_2_3				EVN-BETR_2 ^a	CliMoChem_2_2	DEHM-POP_2 ^a	MSCE-POP_2		
Jan	90190.0	23078.8	79703.7	18210.8		52795.8	37423.7	Jan	18.4		8.5	39.3	22.1	15.7
Feb	89390.0	23012.6	81123.7	18082.0		52902.1	37566.1	Feb	42.4		29.9	87.3	53.2	30.2
Mar	88610.0	22940.1	81962.8	17955.7		52867.1	37587.9	Mar	69.6		56.2	135.2	87.0	42.3
Seas_1	89396.7	23010.5	80930.1	18082.8	2713.4	42826.7	39479.9	Seas_1	43.4	354.7	31.5	87.3	129.2	152.2
Apr	87830.0	22874.1	82268.0	17831.6		52700.9	37477.9	Apr	100.0		96.8	188.0	128.2	51.8
May	87030.0	22804.7	82195.1	17709.8		52434.9	37266.0	May	133.6		120.5	240.4	164.8	65.8
Jun	86240.0	22723.1	81893.1	17590.1		52111.6	37000.5	Jun	170.2		141.0	286.1	199.1	76.8
Seas_2	87033.3	22800.6	82118.7	17710.5	2656.9	42464.0	39188.4	Seas_2	134.6	660.8	119.4	238.2	288.2	253.9
Jul	85470.0	22647.8	81470.8	17475.1		51766.0	36706.4	Jul	212.0		165.0	341.3	239.4	91.3
Aug	84700.0	22579.7	80989.4	17369.6		51409.7	36391.9	Aug	263.4		187.7	397.6	282.9	106.3
Sep	83930.0	22539.8	80469.3	17271.1		51052.6	36057.5	Sep	321.4		205.9	465.3	330.9	130.0
Seas_3	84700.0	22589.1	80976.5	17371.9	2602.6	41648.0	38331.8	Seas_3	265.6	986.2	186.2	401.4	459.8	362.0
Oct	83190.0	22496.7	79918.1	17172.8		50694.4	35724.9	Oct	378.7		230.3	531.8	380.3	150.8
Nov	82440.0	22477.7	79339.4	17069.5		50331.6	35377.0	Nov	429.8		264.8	610.0	434.9	172.6
Dec	81710.0	22451.4	78736.5	16959.4		49964.3	35032.9	Dec	472.6		293.6	682.5	482.9	194.6
Seas_4	82446.7	22475.3	79331.3	17067.2	2564.3	40777.0	37350.1	Seas_4	427.1	1550.3	262.9	608.1	712.1	576.3
Annual	85894.2	22718.9	80839.2	17558.1	2634.3	41928.9	38581.0	Annual	217.7	888.0	150.0	333.7	397.36	335.78

EVN-BETR_1 - EVN-BETR and UK-MODEL results calculated on the basis of initial concentrations given as input data;

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;

CliMoChem_2_2 - CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and with 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;

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;

^a - data of DEHM-POP are given for 15 cm layer of soil;

^b - EVN-BETR and UK-MODEL results were calculated with the help of a single box version of European model.

Table C.12. Calculation results: PCB-180 mass contained in 5cm layer of soil (kg) calculated by models on the basis of “own or alternative” data sets and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data			Results obtained on the basis of historical emissions			<i>m</i>	σ	Month	Results obtained on the basis of zero initial concentrations				<i>m</i>	σ
	SimpleBox 3.0_1 ^a	CAN/POPs	MSCE-POP_1	CliMo Chem_2_3	SimpleBox 3.0_3 ^a	SimpleBox 3.12_3 ^a				CliMo Chem_2_2	SimpleBox 3.0_2 ^a	SimpleBox 3.12_2 ^a	MSCE-POP_2		
Jan	15442.7	18190.8	22879.2		53549.2	169686.1	55949.6	65387.2	Jan		5.1	4.2	38.7	16.0	19.7
Feb	15704.6	18002.5	22858.5		53530.1	169585.5	55936.3	65333.1	Feb		16.0	13.3	85.8	38.4	41.1
Mar	15922.3	17800.3	22833.4		53513.9	169487.6	55911.5	65289.8	Mar		27.0	22.4	132.8	60.8	62.4
Seas_1	15689.9	17997.9	22857.0	3334.2	53531.1	169586.4	47166.1	62259.1	Seas_1	139.9	16.0	13.3	85.8	63.8	60.8
Apr	16107.8	17599.5	22808.7		53497.3	169418.8	55886.4	65264.2	Apr		38.3	31.3	183.1	84.3	85.7
May	16265.9	17387.0	22777.6		53479.6	169288.7	55839.8	65218.9	May		49.7	41.2	231.4	107.4	107.5
Jun	16402.4	17183.9	22721.9		53461.1	169188.2	55791.5	65191.8	Jun		61.1	50.6	270.1	127.3	123.8
Seas_2	16258.7	17390.1	22769.4	3331.0	53479.3	169298.6	47087.9	62152.6	Seas_2	247.9	49.7	41.1	228.2	141.7	111.6
Jul	16521.2	16991.4	22673.4		53444.2	169088.6	55743.8	65165.4	Jul		72.6	60.1	318.5	150.4	145.7
Aug	16626.7	16814.8	22635.9		53427.4	168786.4	55658.2	65049.4	Aug		84.3	69.8	369.9	174.6	169.2
Sep	16718.4	16649.8	22642.6		53408.9	168887.4	55661.4	65103.6	Sep		95.8	79.3	439.1	204.7	203.1
Seas_3	16622.1	16818.7	22650.6	3325.9	53426.8	168920.8	46960.8	62032.3	Seas_3	369.1	84.2	69.7	375.8	224.7	170.7
Oct	16800.2	16490.0	22654.1		53390.7	168791.1	55625.2	65072.2	Oct		107.4	88.8	511.0	235.7	238.6
Nov	16872.9	16339.1	22699.0		53374.4	168690.5	55595.2	65034.8	Nov		119.0	98.4	599.4	272.3	283.5
Dec	16936.9	16191.0	22741.3		53357.9	168592.5	55563.9	64999.9	Dec		130.4	107.9	685.0	307.8	326.9
Seas_4	16870.0	16340.0	22698.1	3330.7	53374.3	168691.3	46884.1	61959.3	Seas_4	586.4	118.9	98.4	598.4	350.5	279.5
Annual	16360.2	17136.7	22743.8	3330.4	53452.9	169124.3	47024.7	62099.9	Annual	335.8	67.2	55.6	322.1	195.2	154.6

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

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;

^a - SimpleBox data presented here are overall masses calculated as sum of regional and continental level estimates.

Table C.13. Calculation results: PCB-180 mass contained in 10 cm layer of soil (kg) calculated by models on the basis of “own or alternative” data sets and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data			Results obtained on the basis of historical emissions	m	σ	Month	Results obtained on the basis of zero initial concentrations			m	σ
	DEHM-POP_1 ^a	MSCE-POP_1	CAN/POPs ^b					CliMoChem_2_2	DEHM-POP_2 ^a	MSCE-POP_2		
Jan	90190.0	23129.3	36371.4		49896.9	35517.5	Jan		7.9	39.1	23.5	22.1
Feb	89390.0	23108.4	35998.2		49498.9	35142.8	Feb		28.1	86.8	57.4	41.5
Mar	88610.0	23083.0	35614.9		49102.6	34783.4	Mar		53.6	134.3	94.0	57.0
Seas_1	89396.7	23106.9	35994.8	6668.3	38791.7	35807.9	Seas_1	279.8	29.9	86.7	132.1	131.0
Apr	87830.0	23058.0	35232.7		48706.9	34424.1	Apr		94.2	185.1	139.6	64.3
May	87030.0	23026.5	34840.8		48299.1	34058.1	May		117.5	234.0	175.7	82.3
Jun	86240.0	22970.2	34459.7		47890.0	33705.3	Jun		137.5	273.0	205.3	95.8
Seas_2	87033.3	23018.3	34844.4	6662.1	37889.5	34740.4	Seas_2	495.7	116.4	230.7	280.9	194.6
Jul	85470.0	22921.3	34090.0		47493.8	33359.1	Jul		160.7	322.0	241.3	114.0
Aug	84700.0	22883.3	33735.1		47106.1	33006.3	Aug		182.5	373.9	278.2	135.4
Sep	83920.0	22890.0	33396.5		46735.5	32628.4	Sep		200.2	443.9	322.0	172.3
Seas_3	84696.7	22898.2	33740.5	6651.8	36996.8	33692.1	Seas_3	738.2	181.1	379.9	433.1	282.3
Oct	83180.0	22901.7	33064.9		46382.2	32270.4	Oct		224.1	516.6	370.3	206.8
Nov	82440.0	22947.1	32744.1		46043.7	31898.5	Nov		258.1	605.9	432.0	246.0
Dec	81700.0	22989.8	32427.5		45705.8	31527.1	Dec		286.1	692.4	489.3	287.3
Seas_4	82440.0	22946.2	32745.5	6661.4	36198.3	32651.0	Seas_4	1172.7	256.1	605.0	677.9	462.7
Annual	85891.7	22992.4	34331.3	6660.9	37469.1	34221.4	Annual	671.6	145.9	325.6	381.0	267.2

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and with 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;

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;

^a – data of DEHM-POP are given for 15 cm layer of soil;

^b - in CAN/POPs results the second layer of soil is applied as 5cm.

Comparison between results obtained on the basis of two data sets. The percentage difference between calculation results on PCB-180 masses contained in soil within 5 and 10 cm layers obtained with two data sets of physical-chemical properties (for those models who provided calculations for both these sets) is shown in Tables C.14-C.15.

Table C.14. The percentage difference between calculation results on PCB-180 masses contained within 5 cm soil layer obtained by models on the basis of two data sets: “own or alternative” and “reference”

Month	CliMoChem_2_2	CliMoChem_2_3	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
Jan			150.7%	-1.6%	-61.7%	224.7%	-37.5%	0.2%	-0.5%
Feb			146.2%	-1.1%	-61.4%	225.7%	-37.2%	0.4%	-0.6%
Mar			143.0%	-0.7%	-61.3%	226.8%	-37.0%	0.6%	-0.7%
Seas_1	-21.1%	145.8%	146.5%	-0.9%	-61.4%	225.7%	-37.2%	0.4%	-0.6%
Apr			140.7%	-0.3%	-61.1%	228.0%	-36.8%	0.8%	-1.5%
May			139.0%	0.0%	-61.0%	229.1%	-36.5%	1.0%	-2.7%
Jun			137.8%	0.3%	-60.9%	230.2%	-36.2%	1.1%	-4.6%
Seas_2	-25.0%	150.8%	139.1%	0.1%	-61.0%	229.1%	-36.5%	1.0%	-3.1%
Jul			137.0%	0.7%	-60.8%	231.3%	-36.0%	1.2%	-5.7%
Aug			136.4%	1.0%	-60.6%	232.5%	-35.2%	1.3%	-6.0%
Sep			136.1%	1.3%	-60.5%	233.6%	-35.4%	1.6%	-4.6%
Seas_3	-25.1%	155.6%	136.5%	1.0%	-60.6%	232.5%	-35.6%	1.4%	-5.3%
Oct			135.9%	1.5%	-60.4%	234.7%	-35.2%	1.8%	-2.9%
Nov			135.9%	1.8%	-60.3%	235.9%	-34.9%	2.1%	-0.7%
Dec			136.0%	2.1%	-60.2%	237.0%	-34.7%	2.4%	1.5%
Seas_4	-24.4%	159.8%	135.9%	1.9%	-60.3%	235.9%	-34.9%	2.1%	-0.5%
Annual	-24.4%	152.9%	139.3%	1.1%	-60.6%	230.7%	-36.1%	1.2%	-2.4%

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and with historical emissions for 20-year period;

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.

Table C.15. The percentage difference between calculation results on PCB-180 mass contained within 10 cm soil layer obtained by models on the basis of two data sets: “own or alternative” and “reference”

Month	CliMoChem_2_2	CliMoChem_2_3	DEHM-POP_1	DEHM-POP_2	MSCE-POP_1	MSCE-POP_2
Jan			0.00%	-7.91%	0.2%	-0.5%
Feb			0.00%	-6.25%	0.4%	-0.6%
Mar			0.00%	-4.49%	0.6%	-0.7%
Seas_1	-21.1%	145.8%	0.00%	-5.35%	0.4%	-0.6%
Apr			0.00%	-2.70%	0.8%	-1.5%
May			0.00%	-2.49%	1.0%	-2.7%
Jun			0.00%	-2.48%	1.1%	-4.6%
Seas_2	-25.0%	150.8%	0.00%	-2.54%	1.0%	-3.1%
Jul			0.00%	-2.61%	1.2%	-5.7%
Aug			0.00%	-2.77%	1.3%	-6.0%
Sep			-0.01%	-2.77%	1.6%	-4.6%
Seas_3	-25.1%	155.6%	0.00%	-2.72%	1.4%	-5.3%
Oct			-0.01%	-2.69%	1.8%	-2.9%
Nov			0.00%	-2.53%	2.1%	-0.7%
Dec			-0.01%	-2.55%	2.4%	1.5%
Seas_4	-24.4%	159.8%	-0.01%	-2.59%	2.1%	-0.5%
Annual	-24.4%	152.9%	0.00%	-2.77%	1.2%	-2.4%

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and with historical emissions for 20-year period;

DEHM-POP_1 - DEHM-POP results calculated on the basis of initial concentrations given as input data;

MSCE-POP_1 - MSCE-POP results calculated on the basis of initial concentrations given as input data.

C.1.3. Comparison of calculated values of PCB-180 mass in water

According to the programme of Stage II model results of computational experiments on mass balance include masses of PCB-180 contained in sea within a layer of 200 m depth.

Reference data set. Calculation results on PCB-180 mass contained in 200 m layer of seawater (kg) calculated by models on the basis of “reference” data set together with statistical parameters used for evaluation are presented in Table C.16.

Monthly values of PCB-180 mass contained in 200 m layer of seawater calculated by all participating models on the basis of “reference” data set and taking into account non-zero (initial concentrations in media or historical emissions) and zero initial conditions are compared in Fig. C.11a and b, respectively.

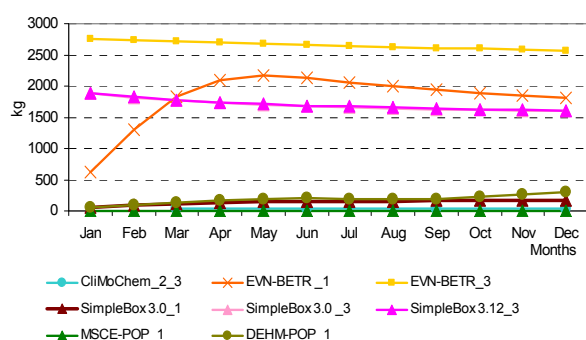


Fig. C.11a. PCB-180 mass contained in 200 m layer of seawater (kg) calculated by the participating models on the basis of “reference” data set and non-zero initial conditions

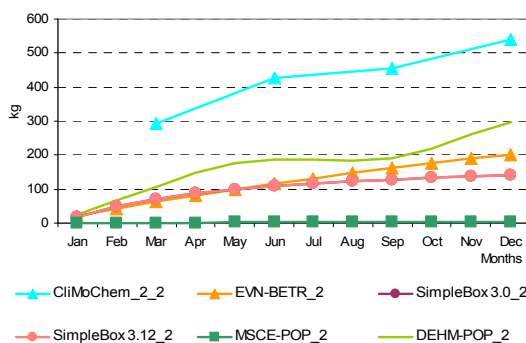


Fig. C.11b. PCB-180 mass contained in 200 m layer of seawater (kg) calculated by the participating models on the basis of “reference” data set and zero initial conditions

Own/alternative data set. Calculation results on PCB-180 mass contained in 200 m layer of water (kg) calculated by models on the basis of “own or alternative” data sets together with statistical parameters used for evaluation are presented in Table C.17.

Monthly values of PCB-180 mass contained in 200 m layer of water calculated by all participating models on the basis of “own or alternative” data sets and taking into account non-zero (initial concentrations in media or historical emissions) and zero initial conditions are compared in Fig. C.12a and b, respectively.

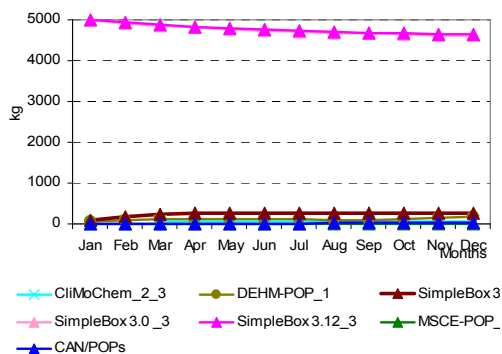


Fig. C.12a. PCB-180 mass contained in 200 m layer of water (kg) calculated by the participating models on the basis of “own or alternative” data sets and non-zero initial conditions

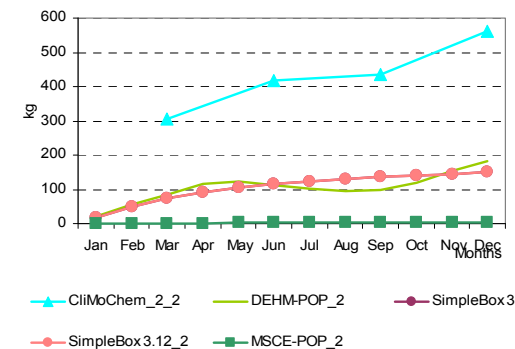


Fig. C.12b. PCB-180 mass contained in 200 m layer of water (kg) calculated by the participating models on the basis of “own or alternative” data sets and zero initial conditions

Table C.16. Calculation results: PCB-180 mass contained in 200 m layer of seawater (kg) calculated by models on the basis of “reference” data set and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data				Results obtained on the basis of historical emissions				<i>m</i>	<i>σ</i>	Month	Results obtained on the basis of zero initial concentrations						<i>m</i>	<i>σ</i>
	DEHM-POP_1	MSCE-POP_1	EVN-BETR_1 ^a	SimpleBox 3.0_1 ^b	EVN-BETR_3 ^a	CliMoChem_2_3	SimpleBox 3.0_3 ^b	SimpleBox 3.12_3 ^b				EVN-BETR_2 ^a	CliMoChem_2_2	SimpleBox 3.0_2 ^b	SimpleBox 3.12_2 ^b	DEHM-POP_2	MSCE-POP_2		
Jan	51.61	0.46	621.67	52.91	2757.49		1886.26	1888.04	1036.9 2	1124.8 7	Jan	22.70		17.47	17.47	23.19	0.37	16.24	9.29
Feb	92.08	0.67	1302.24	94.37	2738.14		1818.56	1823.46	1124.2 2	1079.8 0	Feb	42.88		48.35	48.34	65.36	0.55	41.09	24.19
Mar	127.70	1.05	1827.46	120.26	2717.57		1768.15	1775.32	1191.0 7	1088.0 5	Mar	62.07		70.92	70.91	104.20	0.88	61.80	37.67
Seas_1	90.46	0.73	1250.46	89.18	2737.74	39.02	1824.32	1828.94	982.61	1070.7 5	Seas_1	42.55	292.92	45.58	45.57	64.25	0.60	81.91	105.49
Apr	168.40	1.85	2097.48	136.70	2697.06		1729.63	1738.48	1224.2 3	1098.7 4	Apr	80.98		87.85	87.85	148.10	1.53	81.26	52.23
May	193.40	2.90	2165.12	146.81	2677.58		1700.27	1710.38	1228.0 6	1093.5 8	May	99.15		100.47	100.47	176.50	2.36	95.79	61.84
Jun	199.70	3.17	2128.66	153.05	2659.35		1677.23	1688.28	1215.6 3	1079.0 2	Jun	115.96		110.09	110.08	186.30	2.54	105.00	65.72
Seas_2	187.17	2.64	2130.42	145.52	2678.00	37.73	1702.37	1712.38	1074.5 3	1092.9 3	Seas_2	98.69	427.21	99.47	99.47	170.30	2.15	149.55	146.19
Jul	196.40	3.38	2060.32	156.94	2642.34		1658.71	1670.44	1198.3 6	1062.9 6	Jul	131.56		117.58	117.58	186.20	2.71	111.12	66.88
Aug	193.00	3.76	1993.30	159.48	2627.04		1643.08	1655.40	1182.1 5	1048.4 1	Aug	147.04		123.68	123.67	185.20	2.96	116.51	68.28
Sep	197.00	4.97	1934.46	161.23	2611.87		1629.93	1642.72	1168.8 8	1034.4 1	Sep	161.49		128.63	128.62	190.70	3.88	122.66	71.27
Seas_3	195.47	4.04	1996.03	159.21	2627.08	34.30	1643.90	1656.19	1039.5 3	1052.2 7	Seas_3	146.69	455.91	123.29	123.29	187.37	3.18	173.29	151.47
Oct	225.50	5.54	1885.47	162.57	2596.92		1618.34	1631.53	1160.8 4	1018.5 3	Oct	175.41		132.83	132.83	220.20	4.26	133.11	80.59
Nov	266.00	6.15	1846.40	163.75	2582.40		1607.88	1621.39	1156.2 8	1002.5 7	Nov	189.46		136.53	136.52	261.40	4.72	145.73	94.00
Dec	299.10	6.54	1815.61	164.87	2566.74		1598.34	1612.14	1151.9 1	988.83	Dec	202.78		139.79	139.79	295.10	5.10	156.51	105.87
Seas_4	263.53	6.08	1849.16	163.73	2582.02	35.13	1608.18	1621.69	1016.1 9	1009.8 6	Seas_4	189.22	540.14	136.38	136.38	258.90	4.69	210.95	181.55
Annual	184.16	3.37	1806.52	139.41	2656.21	36.55	1694.70	1704.80	1028.2 1	1048.4 1	Annual	119.29	429.05	101.18	101.18	170.20	2.65	153.93	145.33

EVN-BETR_1 - EVN-BETR and UK-MODEL results calculated on the basis of initial concentrations given as input data;

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;

CliMoChem_2_2 - CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and with 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;

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;

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;

^a - EVN-BETR and UK-MODEL results were calculated with the help of a single box version of European model;

^b - SimpleBox data presented here are masses calculated for continental level.

Table C.17. Calculation results: PCB-180 mass contained in 200 m layer of water (kg) calculated by models on the basis of “own or alternative” data sets and statistical parameters used for evaluation.

Month	Results obtained on the basis of initial concentrations given as input data				Results obtained on the basis of historical emissions			<i>m</i>	σ	Month	Results obtained on the basis of zero initial concentrations					<i>m</i>	σ
	DEHM-POP_1	SimpleBox 3.0_1 ^a	CAN/ POPs	MSCE-POP_1	CliMo Chem_2_3	SimpleBox 3.0_3 ^a	SimpleBox 3.12_3 ^a				CliMo Chem_2_2	SimpleBox 3.0_2 ^a	SimpleBox 3.12_2 ^a	DEHM-POP_2	MSCE-POP_2		
Jan	48.88	84.77	9.76	0.49		4996.43	4998.33	1689.78	2562.23	Jan		17.37	17.37	22.11	0.37	14.31	9.56
Feb	79.77	175.97	10.17	0.71		4920.35	4927.58	1685.76	2509.09	Feb		48.76	48.76	57.43	0.55	38.88	25.88
Mar	103.40	229.26	10.51	1.11		4860.89	4871.73	1679.48	2469.88	Mar		72.35	72.34	85.84	0.88	57.85	38.51
Seas_1	77.35	163.33	10.14	0.77	63.47	4925.89	4932.55	1453.36	2375.06	Seas_1	304.02	46.16	46.16	55.13	0.60	90.41	121.30
Apr	128.40	259.17	10.93	1.93		4812.88	4826.32	1673.27	2438.93	Apr		90.49	90.48	115.00	1.51	74.37	49.93
May	132.30	273.68	11.50	2.98		4773.93	4789.37	1663.96	2416.96	May		104.32	104.31	122.70	2.28	83.40	54.77
Jun	118.80	279.05	12.48	3.22		4741.78	4758.39	1652.29	2401.61	Jun		115.06	115.06	112.60	2.42	86.29	55.92
Seas_2	126.50	270.63	11.64	2.71	60.26	4776.20	4791.36	1434.18	2289.98	Seas_2	416.85	103.29	103.28	116.77	2.07	148.45	156.96
Jul	104.90	279.09	13.97	3.43		4713.97	4732.12	1641.25	2389.20	Jul		123.57	123.56	100.80	2.57	87.62	57.71
Aug	96.90	276.24	15.86	3.82		4689.23	4708.47	1631.75	2377.76	Aug		130.57	130.56	94.03	2.79	89.49	60.31
Sep	98.79	272.11	17.58	5.08		4667.50	4687.66	1624.79	2366.61	Sep		136.28	136.28	96.64	3.66	93.22	62.56
Seas_3	100.20	275.81	15.80	4.11	54.56	4690.24	4709.42	1407.16	2251.13	Seas_3	436.54	130.14	130.13	97.16	3.01	159.40	163.44
Oct	122.70	267.55	18.59	5.71		4647.60	4668.46	1621.77	2353.76	Oct		141.15	141.15	121.00	4.05	101.84	65.88
Nov	157.60	263.08	19.06	6.40		4628.96	4650.52	1620.94	2340.28	Nov		145.42	145.41	156.10	4.54	112.87	72.39
Dec	183.30	259.05	19.39	6.82		4611.61	4633.72	1618.98	2328.64	Dec		149.18	149.17	182.00	4.93	121.32	79.12
Seas_4	154.53	263.23	19.01	6.31	55.71	4629.39	4650.90	1397.01	2217.26	Seas_4	563.01	145.25	145.24	153.03	4.51	202.21	211.05
Annual	114.65	243.25	15.48	3.47	58.50	4755.43	4771.06	1423.12	2283.13	Annual	430.11	106.21	106.20	105.52	2.55	150.12	162.80

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and with 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;

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;

^a - SimpleBox data presented here are overall masses calculated as sum of regional and continental level estimates.

Comparison between results obtained on the basis of two data sets. The percentage difference between calculation results obtained with two data sets of physical-chemical properties (for those models who provided calculations for both these sets) is shown in Table C.18.

Table C.18. The percentage difference between calculation results on PCB-180 mass in water (kg) obtained by models on the basis of two data sets: “own or alternative” and “reference”

Month	CliMo Chem_2_2	CliMo Chem_2_3	DEHM- POP_1	DEHM- POP_2	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
Jan			-5.3%	-4.7%	60.2%	-0.5%	-0.5%	164.9%	164.7%	6.8%	0.6%
Feb			-13.4%	-12.1%	86.5%	0.9%	0.9%	170.6%	170.2%	5.9%	0.2%
Mar			-19.0%	-17.6%	90.6%	2.0%	2.0%	174.9%	174.4%	4.9%	-0.2%
Seas_1	3.8%	62.7%	-14.5%	-14.2%	83.2%	1.3%	1.3%	170.0%	169.7%	5.6%	0.1%
Apr			-23.8%	-22.3%	89.6%	3.0%	3.0%	178.3%	177.6%	4.2%	-1.3%
May			-31.6%	-30.5%	86.4%	3.8%	3.8%	180.8%	180.0%	2.8%	-3.5%
Jun			-40.5%	-39.6%	82.3%	4.5%	4.5%	182.7%	181.8%	1.8%	-4.8%
Seas_2	-2.4%	59.7%	-32.4%	-31.4%	86.0%	3.8%	3.8%	180.6%	179.8%	2.7%	-3.5%
Jul			-46.6%	-45.9%	77.8%	5.1%	5.1%	184.2%	183.3%	1.5%	-5.3%
Aug			-49.8%	-49.2%	73.2%	5.6%	5.6%	185.4%	184.4%	1.4%	-5.9%
Sep			-49.9%	-49.3%	68.8%	6.0%	6.0%	186.4%	185.4%	2.1%	-5.6%
Seas_3	-4.2%	59.0%	-48.7%	-48.1%	73.2%	5.6%	5.5%	185.3%	184.4%	1.7%	-5.6%
Oct			-45.6%	-45.0%	64.6%	6.3%	6.3%	187.2%	186.1%	3.1%	-5.0%
Nov			-40.8%	-40.3%	60.7%	6.5%	6.5%	187.9%	186.8%	4.1%	-3.8%
Dec			-38.7%	-38.3%	57.1%	6.7%	6.7%	188.5%	187.4%	4.2%	-3.2%
Seas_4	4.2%	58.6%	-41.4%	-40.9%	60.8%	6.5%	6.5%	187.9%	186.8%	3.8%	-4.0%
Annual	0.2%	60.1%	-37.7%	-38.0%	74.5%	5.0%	5.0%	180.6%	179.9%	3.1%	-4.1%

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and with 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;

C.1.4. Comparison of calculated values of PCB-180 mass in vegetation

Reference data set. Calculation results on PCB-180 mass in vegetation (kg) calculated by models on the basis of “reference” data set together with statistical parameters used for evaluation are presented in Table C.19.

Monthly values of PCB-180 mass in vegetation calculated by all participating models on the basis of “reference” data set are compared in Fig. C.13.

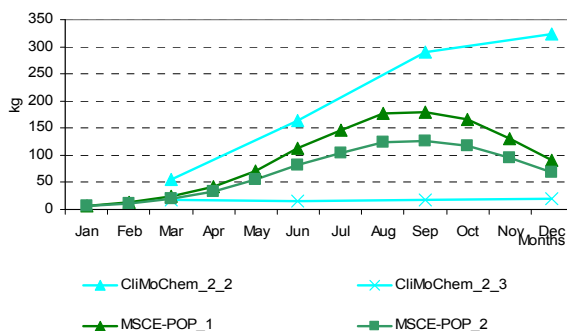


Fig. C.13. PCB-180 mass in vegetation (kg) calculated by the participating models on the basis of “reference” data set

Own/alternative data set. Calculation results on PCB-180 mass in vegetation (kg) calculated by models on the basis of “own or alternative” data sets together with statistical parameters used for evaluation are presented in Table C.20.

Monthly values of PCB-180 mass in vegetation calculated by all participating models on the basis of “own or alternative” data sets are compared in Fig. C.14.

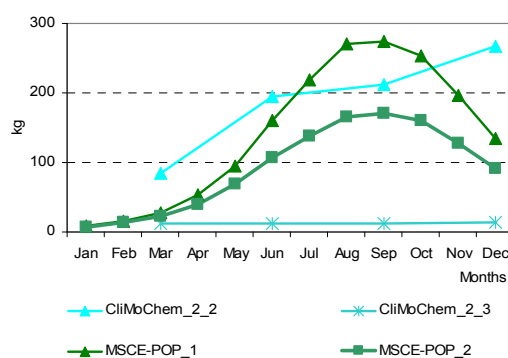


Fig. C.14. PCB-180 mass in vegetation (kg) calculated by the participating models on the basis of “own or alternative” data sets

Table C.19. Calculation results: PCB-180 mass in vegetation (kg) calculated by models on the basis of “reference” data set and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data	Results obtained on the basis of historical emissions	m	σ	Month	Results obtained on the basis of zero initial concentrations		m	σ
	MSCE-POP_1					CliMo Chem_2_2	MSCE-POP_2		
Jan	7.74				Jan		6.64		
Feb	13.96				Feb		11.83		
Mar	23.73				Mar		19.72		
Seas_1	15.14	18.20	16.67	2.16	Seas_1	54.6	12.73	33.7	29.6
Apr	42.39				Apr		33.97		
May	70.91				May		55.27		
Jun	112.00				Jun		82.66		
Seas_2	75.10	14.81	44.96	42.63	Seas_2	164.7	57.30	111.0	75.9
Jul	147.19				Jul		103.90		
Aug	178.27				Aug		123.07		
Sep	180.41				Sep		126.24		
Seas_3	168.62	18.29	93.45	106.30	Seas_3	291.2	117.74	204.5	122.7
Oct	167.02				Oct		118.32		
Nov	130.17				Nov		94.45		
Dec	90.57				Dec		67.80		
Seas_4	129.25	19.17	74.21	77.84	Seas_4	323.4	93.52	208.5	162.5
Annual	97.03	17.62	57.32	56.15	Annual	208.5	70.32	139.4	97.7

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and with historical emissions for 20-year period;

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

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;

^a - SimpleBox data presented here are overall masses calculated as sum of regional and continental level estimates.

Table C.20. Calculation results: PCB-180 mass in vegetation (kg) calculated by models on the basis of “own or alternative” data sets and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data	Results obtained on the basis of historical emissions	<i>m</i>	σ	Month	Results obtained on the basis of zero initial concentrations		<i>m</i>	σ
	MSCE-POP_1	CliMoChem_2_3				CliMoChem_2_2	MSCE-POP_2		
Jan	8.68				Jan		7.13		
Feb	16.24				Feb		13.15		
Mar	28.31				Mar		22.34		
Seas_1	17.74	12.70	15.22	3.57	Seas_1	84.37	14.21	49.29	49.61
Apr	54.17				Apr		40.41		
May	95.45				May		68.25		
Jun	160.53				Jun		106.52		
Seas_2	103.38	12.17	57.78	64.49	Seas_2	195.02	71.73	133.37	87.18
Jul	219.37				Jul		137.54		
Aug	270.65				Aug		165.25		
Sep	273.83				Sep		170.39		
Seas_3	254.61	11.73	133.17	171.74	Seas_3	211.39	157.73	184.56	37.94
Oct	252.85				Oct		160.12		
Nov	196.22				Nov		128.27		
Dec	134.26				Dec		91.43		
Seas_4	194.44	14.49	104.47	127.25	Seas_4	268.01	126.61	197.31	99.99
Annual	142.55	12.77	77.66	91.76	Annual	189.70	92.57	141.13	68.68

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and with historical emissions for 20-year period;

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

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;

^a - SimpleBox data presented here are overall masses calculated as sum of regional and continental level estimates.

Comparison between results obtained on the basis of two data sets. The percentage difference between calculation results obtained with two data sets of physical-chemical properties (for those models who provided calculations for both these sets) is shown in Table C.21.

Table C.21. The percentage difference between calculation results on PCB-180 mass in vegetation (kg) obtained by models on the basis of two data sets: “own or alternative” and “reference”

Month	CliMoChem_2_2	CliMoChem_2_3	MSCE-POP_1	MSCE-POP_2
Jan			12.2%	7.4%
Feb			16.4%	11.1%
Mar			19.3%	13.3%
Seas_1	54.6%	-30.2%	17.2%	11.6%
Apr			27.8%	18.9%
May			34.6%	23.5%
Jun			43.3%	28.9%
Seas_2	18.4%	-17.8%	37.7%	25.2%
Jul			49.0%	32.4%
Aug			51.8%	34.3%
Sep			51.8%	35.0%
Seas_3	-27.4%	-35.9%	51.0%	34.0%
Oct			51.4%	35.3%
Nov			50.7%	35.8%
Dec			48.2%	34.9%
Seas_4	-17.1%	-24.4%	50.4%	35.4%
Annual	-9.0%	-27.5%	46.9%	31.6%

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

C.1.5. Comparison of distribution of PCB-180 mass between environmental media

Mass balance estimates presented in Sections 3.1.1-3.1.4 comprise masses of PCB-180 contained in different environmental compartments calculated by the participating models. The considered estimates of mass distribution in 2000 include results of one-year calculation with zero initial concentrations obtained by DEHM-POP, MSCE-POP, SimpleBox 3.0 and 3.12 models and with initial concentrations in media given as input data calculated by CAN/POPs, DEHM-POP, EVN-BETR and UK-MODEL, MSCE-POP, and SimpleBox 3.0 models; as well as results of long-term calculations for 20-year period with zero initial data with historical emissions carried out by CliMoChem and SimpleBox 3.0 and 3.12 models. Results of CliMoChem, DEHM-POP, MSCE-POP, and SimpleBox models obtained on the basis of two different physical-chemical data sets allow us to reveal sensitivity of these models' calculations to the variations in the input data.

A comparison of absolute values and relative fractions of PCB-180 mass contained in the main environmental compartments is presented in this section. The comparison is made separately for results calculated on the basis of initial concentrations or historical emissions (non-zero initial conditions) and for results based on zero initial conditions.

Atmosphere. Comparison of annual values of PCB-180 masses contained in the atmosphere within 1, 5 and 10 km layers calculated by different models on the basis of zero initial concentrations and with the use of “reference” data set is presented in Fig. C.15a. Fig. C.15b shows the same results but obtained on the basis of initial concentrations or historical emissions. In the latter figure different colour of columns corresponds to the different types of calculations (one-year calculations on the

basis of initial data; and then long-term calculations with historical emissions). The blue line in the plots shows the value of the corresponding parameter averaged between models.

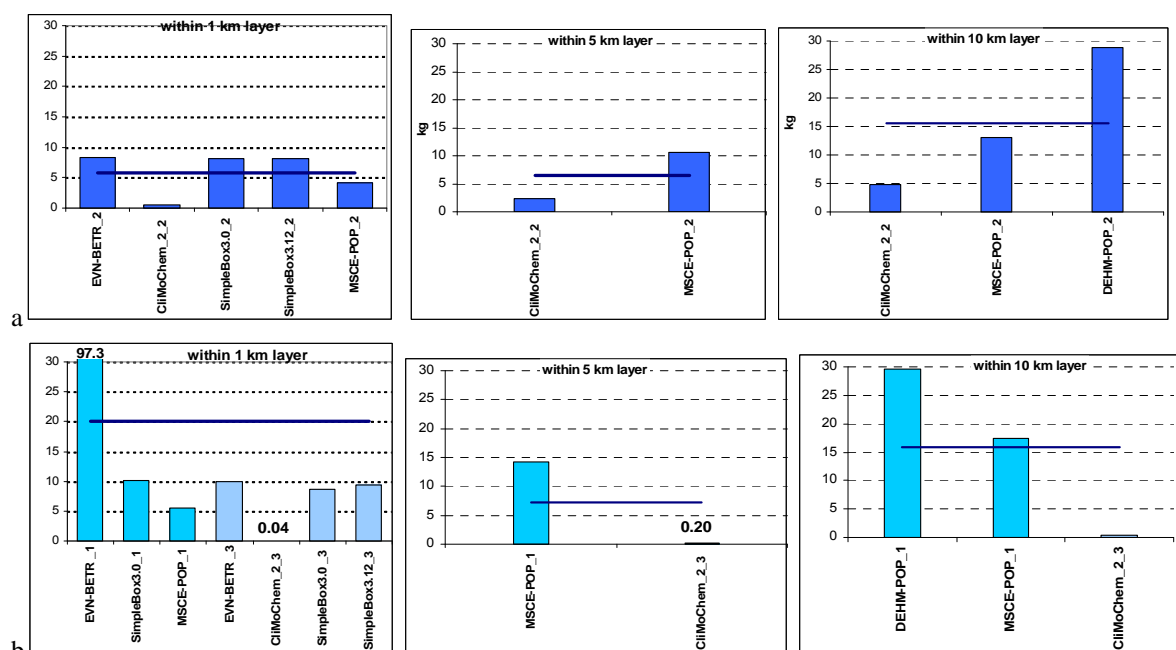


Fig. C.15. Comparison of annual values of PCB-180 masses contained in the atmosphere within 1, 5 and 10 km layers calculated by different models on the basis of “reference” data set (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

Comparison of air content profiles of annual values of PCB-180 mass calculated by MSCE-POP and CliMoChem models for the considered atmospheric layers (1, 5 and 10 km) on the basis of “reference” data set is presented in Fig. C.16.

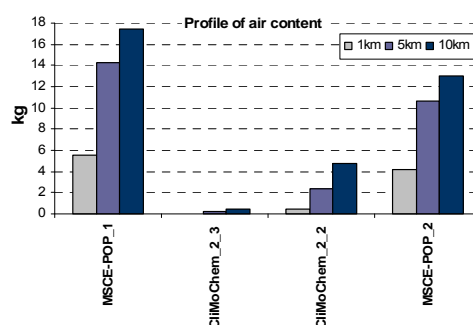


Fig. C.16. Comparison of air content profiles of annual values of PCB-180 mass calculated by four models for the considered atmospheric layers (1, 5 and 10 km) on the basis of “reference” data set

Comparison of annual values of PCB-180 masses contained in the atmosphere within 1, 5 and 10 km layers calculated by different models on the basis of zero initial concentrations and with the use of “own or alternative” data sets is presented in Fig. C.17a. Fig. C.17b shows the same results but obtained on the basis of initial concentrations or historical emissions. In the latter figure different color of columns corresponds to the different types of calculations (one-year calculations on the basis of initial data; then long-term calculations with historical emissions). The blue line in the plots shows the value of the corresponding parameter averaged between models.

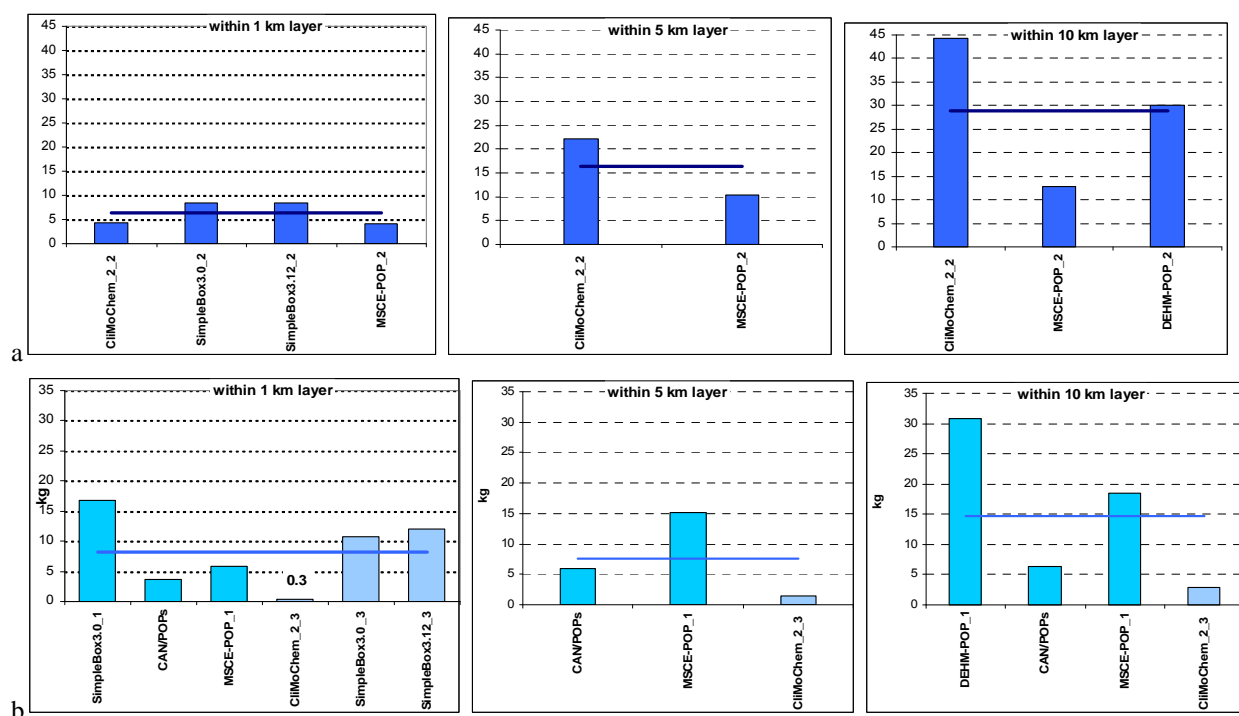


Fig. C.17. Comparison of annual values of PCB-180 masses contained in the atmosphere within 1, 5 and 10 km layers calculated by different models on the basis of “own or alternative” data sets (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

Comparison of air content profiles of annual values of PCB-180 mass calculated by CAN/POPs, MSCE-POP and CliMoChem models for the considered atmospheric layers (1, 5 and 10 km) on the basis of “own or alternative” data sets is presented in Fig. C.18.

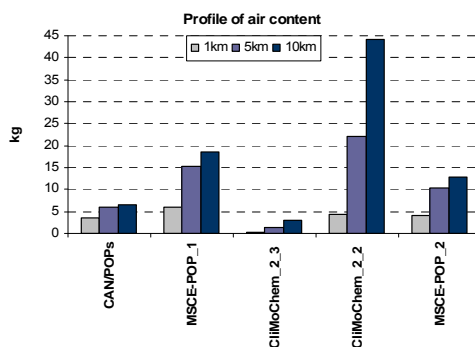


Fig. C.18. Comparison of air content profiles of annual values of PCB-180 mass calculated by five models for the considered atmospheric layers (1, 5 and 10 km) on the basis of “own or alternative data sets”

Comparison of annual values of PCB-180 mass contained in 1, 5 and 10 km layers of the atmosphere obtained by the participating models with the use of “reference” and “own/alternative” data sets is presented in Fig. C.19.

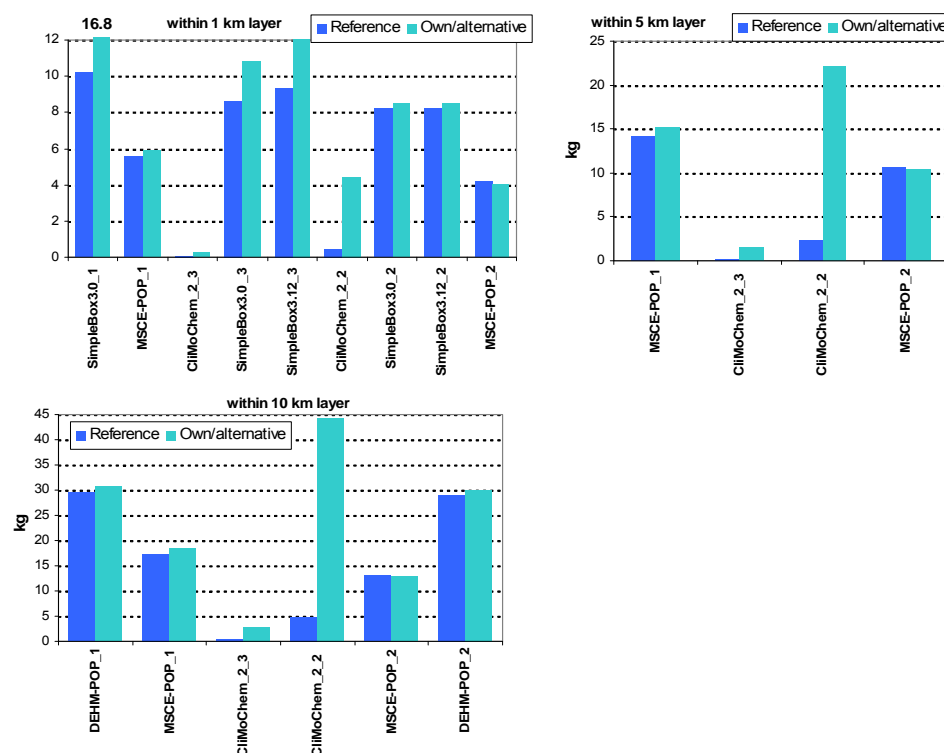


Fig. C.19. Comparison of PCB-180 mass contained in the atmosphere within 1, 5 and 10 km layers calculated by different models on the basis of two data set

Soil. Comparison of annual values of PCB-180 masses contained in soil within 5 and 10 cm layers calculated by different models on the basis of zero initial concentrations and with the use of “reference” data set is presented in Fig. C.20a. Fig. C.20b shows the same results but obtained on the basis of initial concentrations or historical emissions. In the latter figure different colour of columns corresponds to the different types of calculations (one-year calculations on the basis of initial data; and then long-term calculations with historical emissions). The black line in the plots shows the value of the corresponding parameter averaged between models.

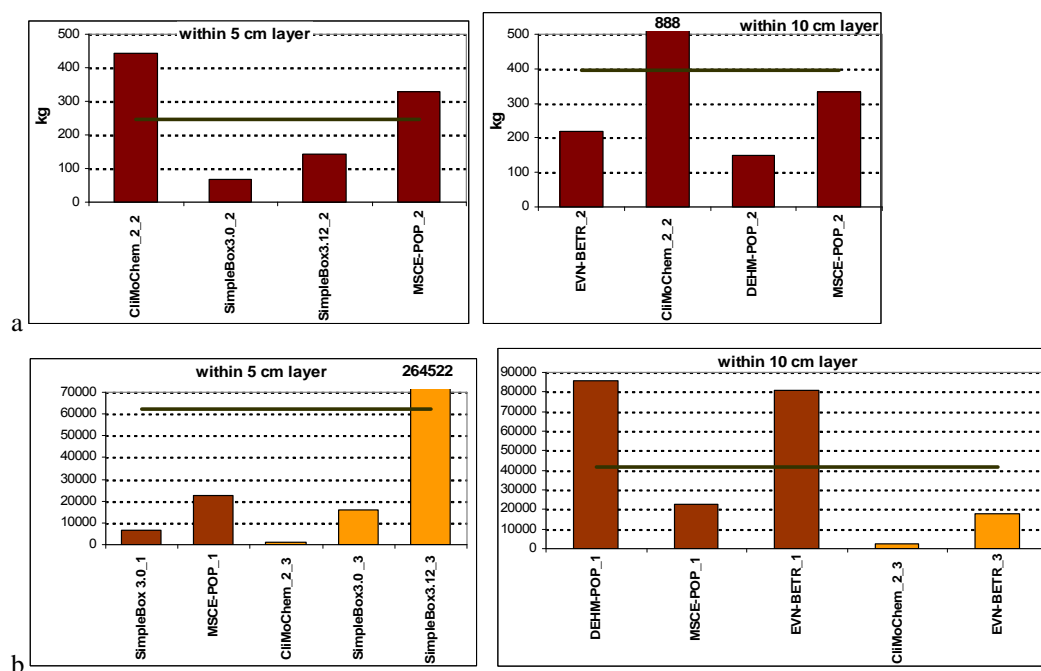


Fig. C.20. Comparison of annual values of PCB-180 masses contained in soil within 5 and 10 cm layers calculated by different models on the basis of “reference” data set (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

Comparison of soil content profiles of annual values of PCB-180 mass calculated by the participating models for the considered soil layers (5 and 10 cm) on the basis of “reference” data set is presented in Fig. C.21.

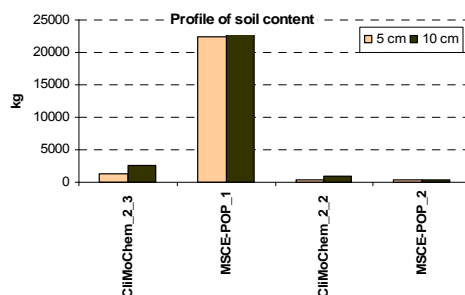


Fig. C.21. Comparison of soil content profiles of annual values of PCB-180 mass calculated by the models for the considered soil layers (5 and 10 cm) on the basis of “reference” data set

Comparison of annual values of PCB-180 masses contained in soil within 5 and 10 cm layers calculated by different models on the basis of zero initial concentrations and with the use of “own or alternative” data sets is presented in Fig. C.22a. Fig. C.22b shows the same results but obtained on the basis of initial concentrations or historical emissions. Different color of columns corresponds to the different types of calculations (one-year calculations on the basis of initial data; and then long-term calculations with historical emissions). The black line in the plots shows the value of the corresponding parameter averaged between models.

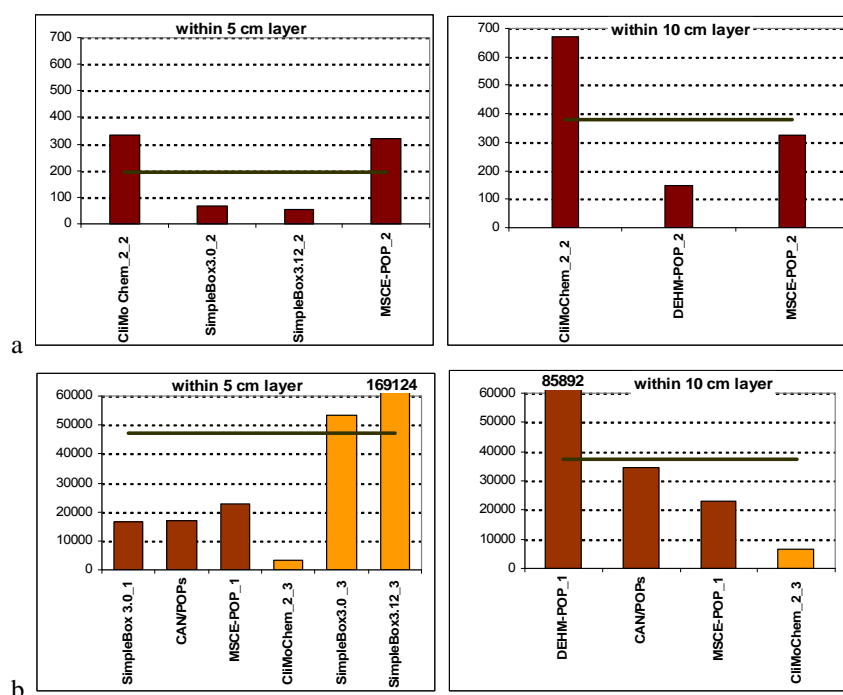


Fig. C.22. Comparison of annual values of PCB-180 masses contained in soil within 5 and 10 cm layers calculated by different models on the basis of “own or alternative” data sets (a – results obtained on the basis of zero initial conditions; b – results based on non- zero initial conditions)

Comparison of soil content profiles of annual values of PCB-180 mass calculated by the participating models for the considered soil layers (5 and 10 cm) on the basis of “own or alternative” data sets is presented in Fig. C.23.

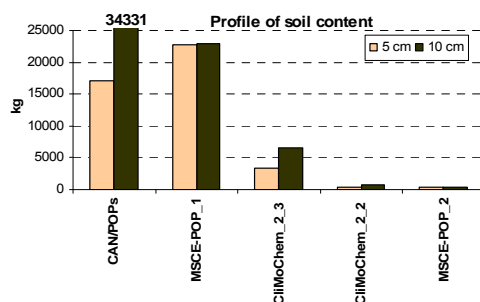


Fig. C.23. Comparison of soil content profiles of annual values of PCB-180 mass calculated by the models for the considered soil layers (5 and 10 cm) on the basis of “own or alternative” data sets

Comparison of annual values of PCB-180 mass contained in the considered different layers of soil obtained with “reference” and “own/alternative” data sets is presented in Fig. C.24.

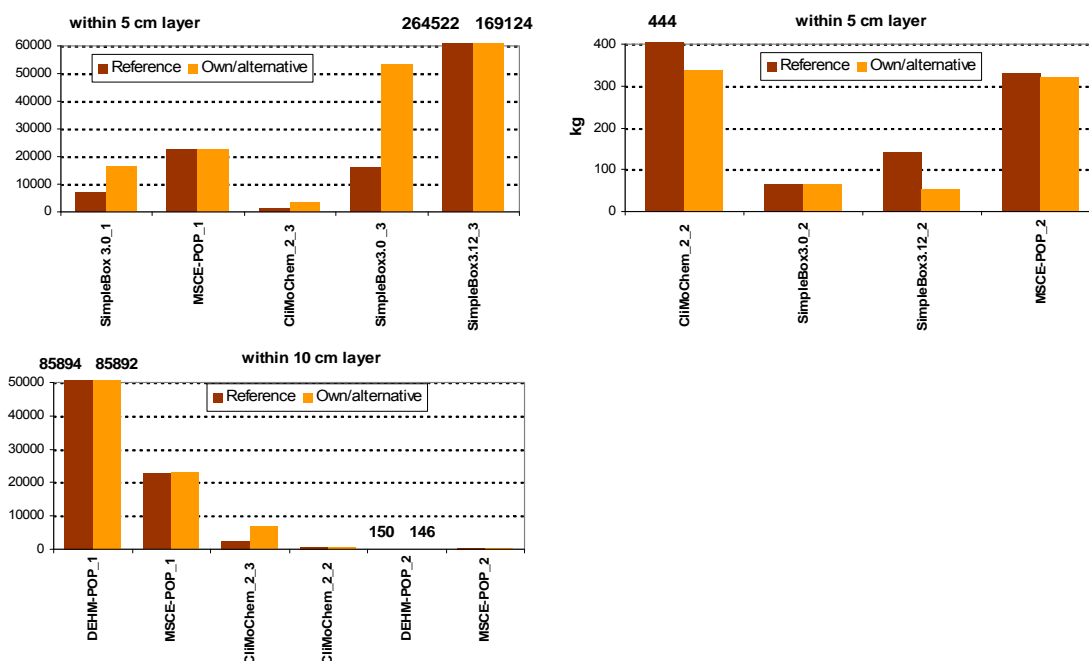


Fig. C.24. Comparison of PCB-180 mass contained within 5 and 10 cm soil layers calculated by different models on the basis of two data set

Water. Comparison of annual values of PCB-180 water content calculated by different models on the basis of zero initial concentrations and with the use of “reference” data set is presented in Fig. C.25a. Fig. C.25b shows the same results but obtained on the basis of initial concentrations or historical emissions. Different colour of columns corresponds to the different types of calculations (one-year calculations on the basis of initial data; then long-term calculations with historical emissions). The blue line in the plot shows the value of the corresponding parameter averaged between models.

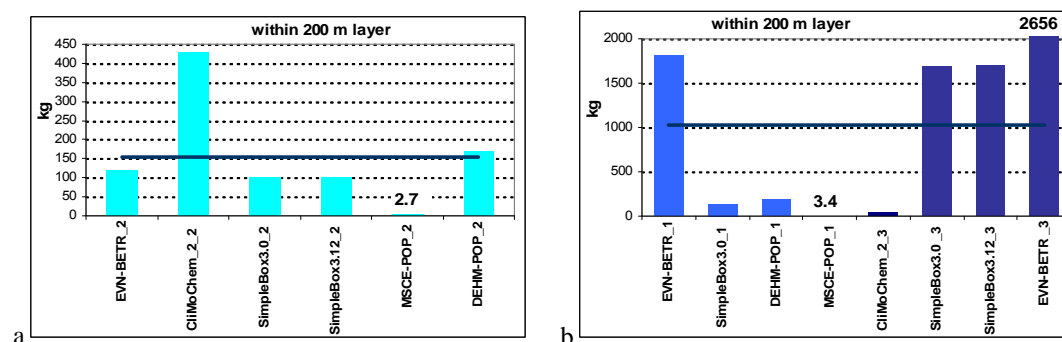


Fig. C.25. Comparison of annual values of PCB-180 masses contained in water within 200 m layer calculated by different models on the basis of “reference” data set (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

Figs.3.26a and 3.26b show the annual values of PCB-180 masses contained in water layer of 200 m and calculated by different models on the basis of “own or alternative” data set and zero and non-zero initial conditions, respectively (blue line corresponds to the averaged value). Different color of columns corresponds to the different types of calculations (a - one-year calculations on the basis of zero initial conditions; b - one-year calculations on the basis of initial data; then long-term calculations with historical emissions).

Relative distribution of PCB mass. The distribution of PCB-180 mass between main environmental compartments averaged for the results obtained by the participating models on the basis of zero and non-zero initial conditions is presented in Fig. C.29a and b, respectively. In this figure results calculated with the use of “reference” and “own/alternative” data sets are given. Of note, absolute values of averaged mass of PCB-180 in each media calculated with two different data sets of physical-chemical properties could not be directly compared since calculation results of different participating models are enclosed in these averaged figures.

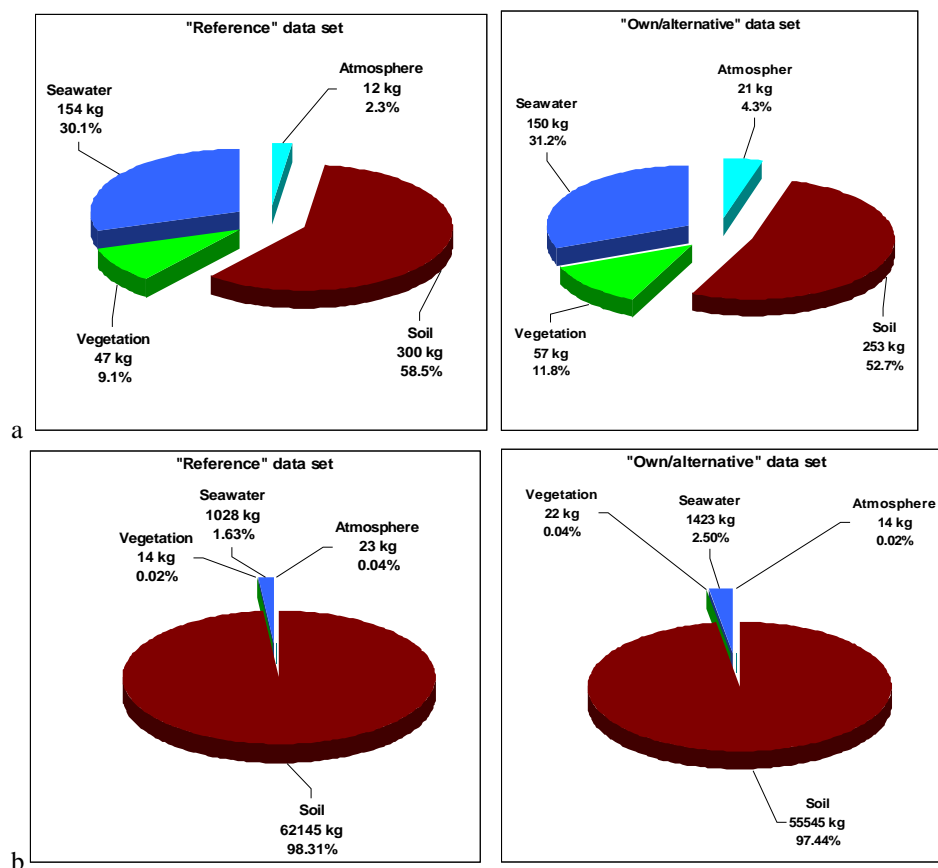


Fig. C.29. Distribution of PCB-180 mass between environmental compartments (kg) averaged for all participating models and calculated on the basis of “reference” and “own or alternative” data sets (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

To show redistribution of the pollutant between main environmental compartments for each participating model in more detail, plots of PCB-180 fractions in different environmental compartments calculated by the models on the basis of zero and non-zero initial conditions are presented in Figs. 3.30a and b, respectively. In these figures fractions of PCB-180 mass in soil calculated by the different models with the use of “reference” and “own/alternative” data sets are also compared. The red line in the plots shows the value of the corresponding fraction averaged between models.

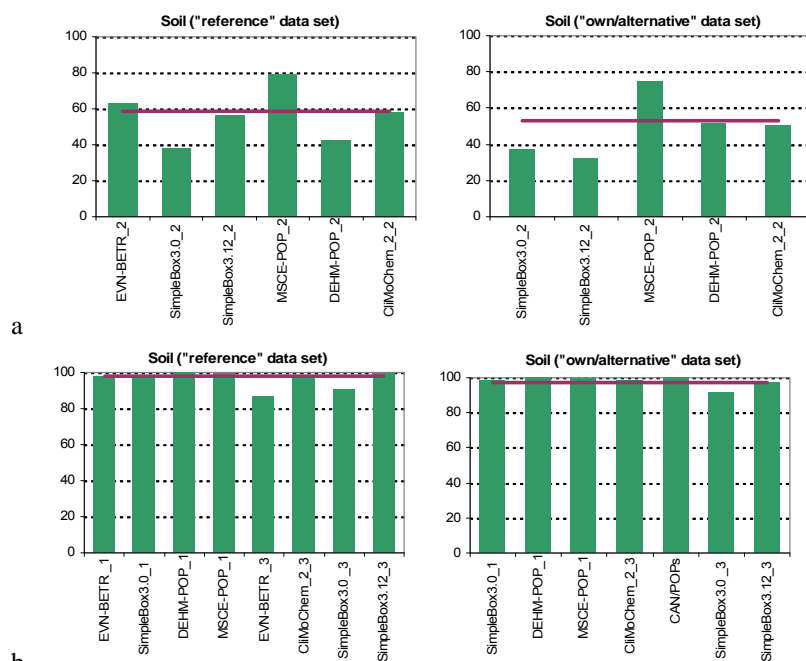


Fig. C.30. Fractions of PCB-180 mass in soil calculated by the participating models on the basis of “reference” and “own or alternative” data sets (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

Fractions of PCB-180 mass in the atmosphere calculated by the participating models on the basis of zero and non-zero initial conditions are presented in Fig. C.31a and b, respectively. In these figures fractions of PCB-180 mass in the atmosphere calculated by the different models with the use of “reference” and “own/alternative” data sets are also compared. The red line in the plots shows the value of the corresponding fraction averaged between models.

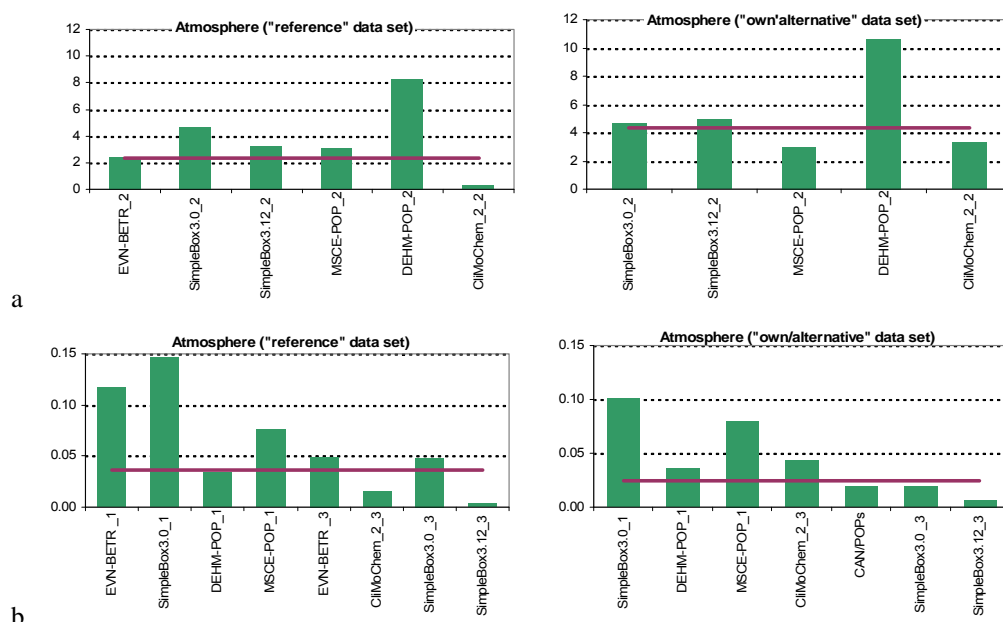


Fig. C.31. Fractions of PCB-180 mass in the atmosphere calculated by the participating models on the basis of “reference” and “own or alternative” data sets (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

Fractions of PCB-180 mass in seawater calculated by the participating models on the basis of zero and non-zero initial conditions are presented in Fig. C.32a and b, respectively. In these figures fractions of PCB-180 mass in seawater calculated by the different models with the use of “reference” and “own/alternative” data sets are also compared. The red line in the plots shows the value of the corresponding fraction averaged between models.

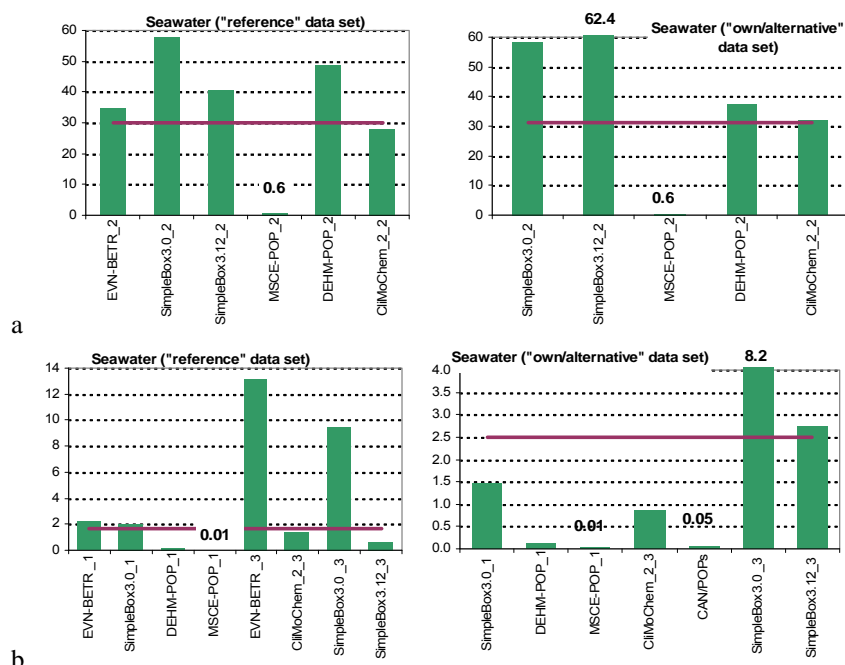


Fig. C.32. Fractions of PCB-180 mass in seawater calculated by the participating models on the basis of “reference” and “own or alternative” data sets (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

Fractions of total environmental mass of PCB-180 contained in vegetation calculated by the participating models on the basis of zero and non-zero initial conditions are presented in Fig. C.33a and b, respectively. In these figures fractions of PCB-180 mass in vegetation calculated by the different models with the use of “reference” and “own/alternative” data sets are also compared. The red line in the plots shows the value of the corresponding fraction averaged between models. Of note, the models, for which vegetation compartment was not included into calculations of mass balance, are also shown in the plots.

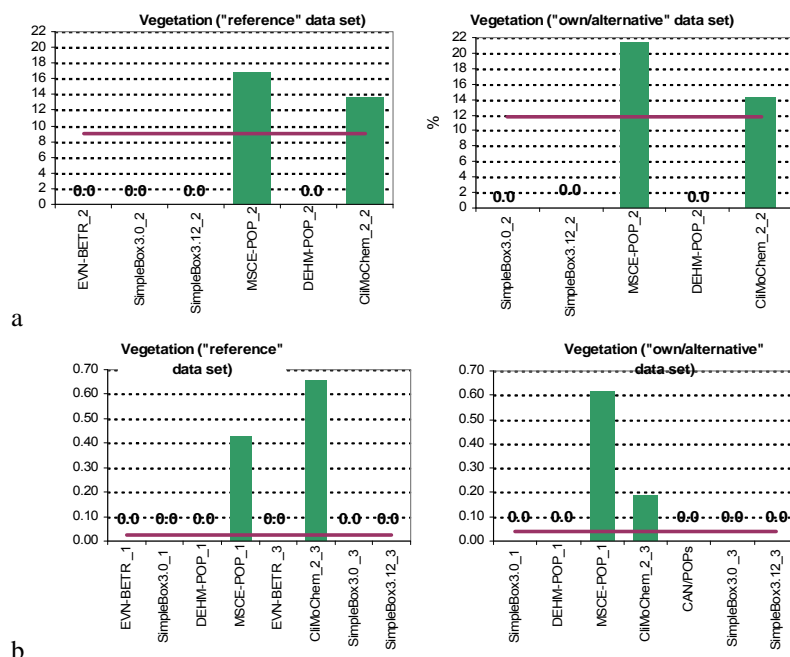


Fig. C.33. Fractions of PCB-180 mass in vegetation calculated by the participating models on the basis of “reference” and “own or alternative” data sets (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

B.2. Masses degraded in the environmental compartments

B.2.1. Comparison of calculated values of PCB-180 mass degraded in the atmosphere

According to the programme of Stage II results of computational experiments on mass balance include masses of PCB-180 degraded in the atmosphere within layers of 1 km, 5 km and 10 km height.

Reference data set. Calculation results on PCB-180 mass degraded in 1 km layer of the atmosphere (kg) calculated by the models on the basis of “reference” data set together with statistical parameters used for evaluation are presented in Table C.22.

Monthly values of PCB-180 mass degraded in 1 km layer of the atmosphere calculated by all participating models on the basis of “reference” data set and taking into account non-zero (initial concentrations in media or historical emissions) and zero initial conditions are compared in Fig. C.34 a and b, respectively. Seasonal variations of low values of mass contained in 1 km layer of the atmosphere calculated by the participating models on the basis of “reference” data set and non-zero initial conditions are also shown in Fig. C.34c in more detail.

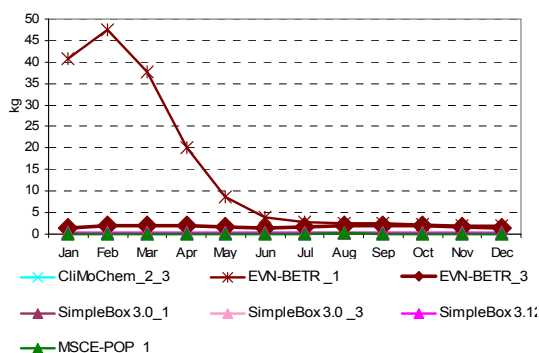


Fig. C.34a. PCB-180 mass degraded in 1 km layer of the atmosphere (kg) calculated by the participating models on the basis of “reference” data set and non-zero initial conditions (all models)

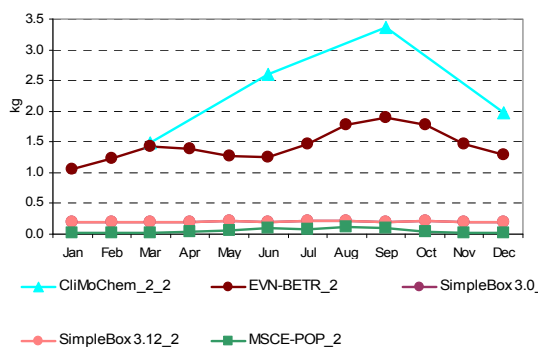


Fig. C.34b. PCB-180 mass degraded in 1 km layer of the atmosphere (kg) calculated by the participating models on the basis of “reference” data set and zero-initial conditions

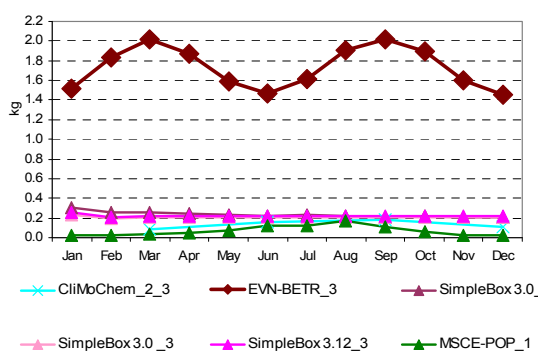


Fig. C.34c. PCB-180 mass degraded in 1 km layer of the atmosphere (kg) calculated by the participating models on the basis of “reference” data set and non-zero initial conditions (models with low values)

Calculation results on PCB-180 mass degraded in 5 km layer of the atmosphere (kg) calculated by models on the basis of “reference” data set together with statistical parameters used for evaluation are presented in Table C.23.

Monthly values of PCB-180 mass degraded in 5 km layer of the atmosphere calculated by the models on the basis of “reference” data set are compared in Fig. C.35.

Calculation results on PCB-180 mass degraded in 10 km layer of the atmosphere (kg) calculated by models on the basis of “reference” data set together with statistical parameters used for evaluation are presented in Table C.24.

Monthly values of PCB-180 mass degraded in 10 km layer of the atmosphere calculated by the participating models on the basis of “reference” data set are compared in Fig. C.36.

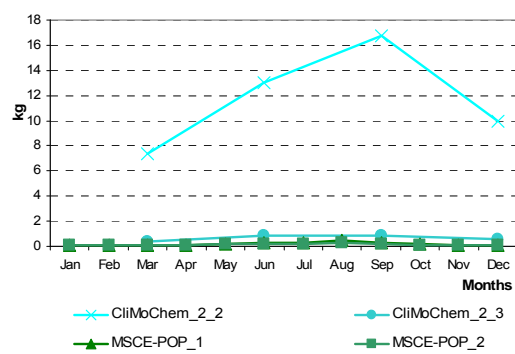


Fig. C.35. PCB-180 mass degraded in 5 km layer of the atmosphere (kg) calculated by the participating models on the basis of “reference” data set

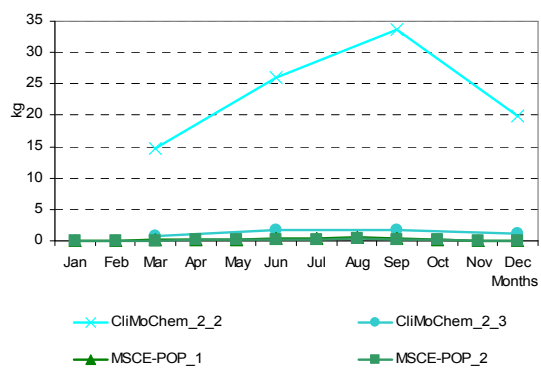


Fig. C.36. PCB-180 mass degraded in 10 km layer of the atmosphere (kg) calculated by the participating models on the basis of “reference” data set

Table C.22. Calculation results: PCB-180 mass degraded in 1 km layer of the atmosphere (kg) calculated by models on the basis of “reference” data set and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data			Results obtained on the basis of historical emissions				<i>m</i>	σ	Month	Results obtained on the basis of zero initial concentrations					<i>m</i>	σ
	MSCE-POP_1	EVN-BETR_1 ^a	SimpleBox 3.0_1 ^b	EVN-BETR_3 ^a	CliMoChem_2_3	SimpleBox 3.0_3 ^b	SimpleBox 3.12_3 ^b				EVN-BETR_2 ^a	CliMoChem_2_2	SimpleBox 3.0_2 ^b	SimpleBox 3.12_2 ^b	MSCE-POP_2		
Jan	0.03	40.65	0.31	1.51		0.24	0.25	7.16	16.41	Jan	1.05		0.20	0.20	0.02	0.37	0.46
Feb	0.03	47.61	0.26	1.83		0.20	0.21	8.35	19.24	Feb	1.24		0.19	0.19	0.02	0.41	0.56
Mar	0.03	37.69	0.26	2.02		0.21	0.23	6.74	15.18	Mar	1.42		0.21	0.21	0.03	0.46	0.64
Seas_1	0.08	125.94	0.83	5.36	0.08	0.65	0.69	19.09	47.15	Seas_1	3.71	1.48	0.59	0.59	0.07	1.29	1.45
Apr	0.04	20.16	0.24	1.88		0.20	0.22	3.79	8.05	Apr	1.40		0.20	0.20	0.03	0.46	0.63
May	0.08	8.61	0.24	1.58		0.21	0.23	1.82	3.37	May	1.26		0.21	0.21	0.06	0.43	0.56
Jun	0.12	3.99	0.22	1.46		0.20	0.22	1.04	1.54	Jun	1.25		0.20	0.20	0.09	0.44	0.55
Seas_2	0.24	32.76	0.70	4.92	0.16	0.62	0.66	5.73	12.04	Seas_2	3.91	2.61	0.60	0.60	0.19	1.58	1.61
Jul	0.12	2.67	0.23	1.62		0.21	0.22	0.84	1.06	Jul	1.46		0.21	0.21	0.08	0.49	0.65
Aug	0.17	2.47	0.22	1.91		0.21	0.22	0.87	1.04	Aug	1.78		0.21	0.21	0.13	0.58	0.80
Sep	0.11	2.38	0.21	2.02		0.20	0.22	0.86	1.05	Sep	1.90		0.20	0.20	0.09	0.60	0.87
Seas_3	0.40	7.52	0.66	5.54	0.18	0.63	0.67	2.23	3.00	Seas_3	5.15	3.36	0.61	0.61	0.30	2.00	2.15
Oct	0.06	2.20	0.22	1.89		0.21	0.22	0.80	0.97	Oct	1.78		0.21	0.21	0.04	0.56	0.82
Nov	0.03	1.93	0.21	1.60		0.20	0.22	0.70	0.84	Nov	1.47		0.20	0.20	0.02	0.47	0.67
Dec	0.03	1.92	0.21	1.45		0.20	0.22	0.67	0.80	Dec	1.30		0.20	0.20	0.02	0.43	0.58
Seas_4	0.11	6.04	0.63	4.95	0.11	0.62	0.66	1.87	2.50	Seas_4	4.55	1.98	0.60	0.60	0.09	1.56	1.81
Annual	0.84	172.26	2.83	20.78	0.53	2.51	2.68	28.92	63.61	Annual	17.32	9.43	2.41	2.41	0.65	6.44	6.95

EVN-BETR_1 - EVN-BETR and UK-MODEL results calculated on the basis of initial concentrations given as input data;

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;

CliMoChem_2_2 - CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

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;

^a - EVN-BETR and UK-MODEL results were calculated with the help of a single box version of European model;

^b - SimpleBox data presented here are overall masses calculated as sum of regional and continental level estimates.

Table C.23. Calculation results: PCB-180 mass degraded in 5 km layer of the atmosphere (kg) calculated by models on the basis of “reference” data set and statistical parameters used for evaluation.

Month	Results obtained on the basis of initial concentrations given as input data	Results obtained on the basis of historical emissions	m	σ	Month	Results obtained on the basis of zero initial concentrations		m	σ
	MSCE-POP_1	CliMoChem_2_3				CliMoChem_2_2	MSCE-POP_2		
Jan	0.06				Jan		0.06		
Feb	0.07				Feb		0.06		
Mar	0.08				Mar		0.07		
Season_1	0.21	0.41	0.31	0.14	Season_1	7.39	0.18	3.79	5.10
Apr	0.11				Apr		0.09		
May	0.20				May		0.16		
Jun	0.31				Jun		0.23		
Season_2	0.63	0.82	0.72	0.13	Season_2	13.03	0.48	6.76	8.88
Jul	0.30				Jul		0.22		
Aug	0.44				Aug		0.32		
Sep	0.29				Sep		0.23		
Season_3	1.03	0.89	0.96	0.10	Season_3	16.79	0.77	8.78	11.33
Oct	0.14				Oct		0.11		
Nov	0.07				Nov		0.06		
Dec	0.07				Dec		0.06		
Season_4	0.29	0.54	0.41	0.18	Season_4	9.91	0.23	5.07	6.85
Annual	2.15	2.65	2.40	0.35	Annual	47.13	1.66	24.39	32.15

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations; CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

Table C.24. Calculation results: PCB-180 mass degraded in 10 km layer of the atmosphere (kg) calculated by models on the basis of “reference” data set and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data	Results obtained on the basis of historical emissions	m	σ	Month	Results obtained on the basis of zero initial concentrations		m	σ
	MSCE-POP_1	CliMoChem_2_3				CliMoChem_2_2	MSCE-POP_2		
Jan	0.08				Jan		0.07		
Feb	0.08				Feb		0.07		
Mar	0.10				Mar		0.09		
Seas_1	0.26	0.82	0.54	0.39	Seas_1	14.79	0.23	7.51	10.30
Apr	0.13				Apr		0.10		
May	0.25				May		0.20		
Jun	0.38				Jun		0.29		
Seas_2	0.77	1.63	1.20	0.61	Seas_2	26.06	0.59	13.32	18.02
Jul	0.37				Jul		0.27		
Aug	0.53				Aug		0.40		
Sep	0.35				Sep		0.28		
Seas_3	1.25	1.78	1.52	0.37	Seas_3	33.58	0.94	17.26	23.08
Oct	0.18				Oct		0.14		
Nov	0.09				Nov		0.07		
Dec	0.09				Dec		0.07		
Seas_4	0.35	1.07	0.71	0.51	Seas_4	19.82	0.28	10.05	13.82
Annual	2.63	5.30	3.97	1.89	Annual	94.25	2.03	48.14	65.21

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations; CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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.

Own/alternative data set. Calculation results on PCB-180 mass degraded in 1 km layer of the atmosphere (kg) calculated by models on the basis of “own or alternative” data sets together with statistical parameters used for evaluation are presented in Table C.25.

Monthly values of PCB-180 mass degraded in 1 km layer of the atmosphere calculated by all participating models on the basis of “own or alternative” and taking into account non-zero (initial concentrations in media or historical emissions) and zero initial conditions are compared in Fig. C.37 a and b, respectively.

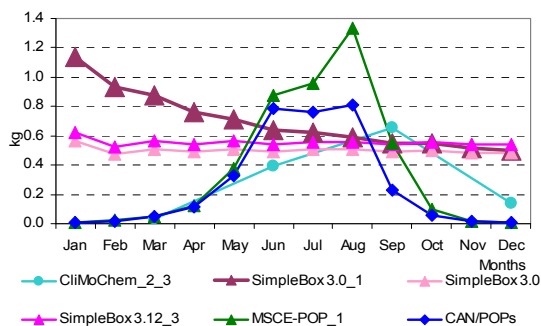


Fig. C.37a. PCB-180 mass degraded in 1 km layer of the atmosphere (kg) calculated by the participating models on the basis of “own/alternative” data set and non-zero initial conditions (all models)

Calculation results on PCB-180 mass degraded in 5 km layer of the atmosphere (kg) calculated by models on the basis of “own or alternative” data set together with statistical parameters used for evaluation are presented in Table C.26.

Monthly values of PCB-180 mass degraded in 5 km layer of the atmosphere calculated by the models on the basis of “reference” data set are compared in Fig. C.38.

Calculation results on PCB-180 mass degraded in 10 km layer of the atmosphere (kg) calculated by models on the basis of “own or alternative data sets” together with statistical parameters used for evaluation are presented in Table C.27.

Monthly values of PCB-180 mass degraded in 10 km layer of the atmosphere calculated by the participating models on the basis of “own or alternative” data sets are compared in Fig. C.39.

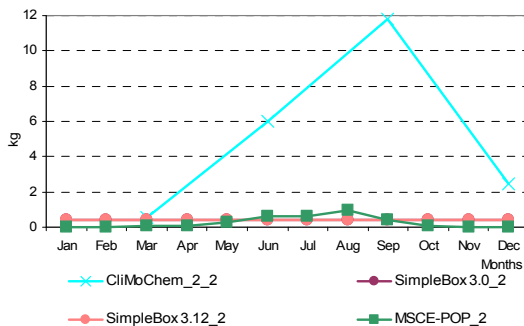


Fig. C.37b. PCB-180 mass degraded in 1 km layer of the atmosphere (kg) calculated by the participating models on the basis of “own/alternative” data set and zero-initial conditions

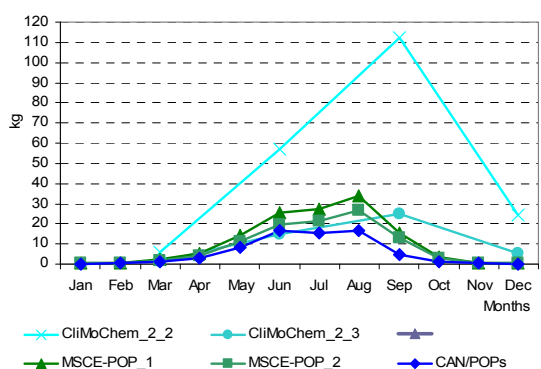


Fig. C.38. PCB-180 mass degraded in 5 km layer of the atmosphere (kg) calculated by the participating models on the basis of “own/alternative” data set

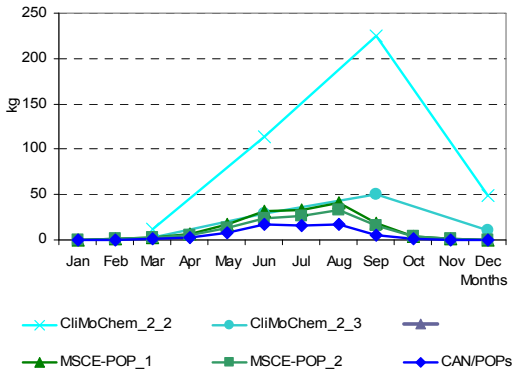


Fig. C.39. PCB-180 mass degraded in 10 km layer of the atmosphere (kg) calculated by the participating models on the basis of “own/alternative” data set

Table C.25. Calculation results: PCB-180 mass degraded in 1 km layer of the atmosphere (kg) calculated by models on the basis of “own or alternative” data sets and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data			Results obtained on the basis of historical emissions			<i>m</i>	σ	Month	Results obtained on the basis of zero initial concentrations				<i>m</i>	σ
	MSCE-POP_1	SimpleBox 3.0_1 ^a	CAN/ POPS	CliMo Chem_2_3	SimpleBox 3.0_3 ^a	SimpleBox 3.12_3 ^a				CliMo Chem_2_2	SimpleBox 3.0_2 ^a	SimpleBox 3.12_2 ^a	MSCE-POP_2		
Jan	0.01	1.14	0.01		0.56	0.62	0.47	0.47	Jan		0.39	0.39	0.01	0.26	0.22
Feb	0.02	0.93	0.02		0.47	0.53	0.39	0.39	Feb		0.38	0.38	0.02	0.26	0.21
Mar	0.05	0.87	0.05		0.51	0.56	0.41	0.36	Mar		0.40	0.40	0.04	0.28	0.21
Seas_1	0.08	2.95	0.08	0.03	1.55	1.71	1.07	1.20	Seas_1	0.56	1.17	1.17	0.07	0.74	0.53
Apr	0.12	0.76	0.12		0.49	0.54	0.41	0.28	Apr		0.39	0.39	0.09	0.29	0.18
May	0.37	0.71	0.33		0.51	0.56	0.50	0.15	May		0.40	0.40	0.28	0.36	0.07
Jun	0.88	0.64	0.79		0.49	0.54	0.67	0.16	Jun		0.39	0.39	0.60	0.46	0.12
Seas_2	1.37	2.11	1.24	0.39	1.48	1.65	1.37	0.57	Seas_2	6.02	1.19	1.19	0.96	2.34	2.45
Jul	0.96	0.62	0.76		0.50	0.56	0.68	0.18	Jul		0.41	0.41	0.64	0.48	0.14
Aug	1.33	0.59	0.81		0.50	0.56	0.76	0.34	Aug		0.41	0.41	0.93	0.58	0.30
Sep	0.55	0.55	0.23		0.49	0.54	0.47	0.14	Sep		0.39	0.39	0.42	0.40	0.02
Seas_3	2.84	1.76	1.80	0.65	1.50	1.66	1.70	0.70	Seas_3	11.79	1.20	1.20	1.99	4.05	5.18
Oct	0.10	0.55	0.06		0.50	0.56	0.35	0.25	Oct		0.41	0.41	0.07	0.29	0.19
Nov	0.02	0.51	0.01		0.49	0.54	0.31	0.27	Nov		0.39	0.39	0.01	0.27	0.22
Dec	0.01	0.50	0.01		0.49	0.54	0.31	0.28	Dec		0.39	0.39	0.01	0.26	0.22
Seas_4	0.12	1.56	0.08	0.14	1.48	1.64	0.84	0.79	Seas_4	2.47	1.19	1.19	0.09	1.24	0.97
Annual	4.41	8.37	3.19	1.22	6.00	6.66	4.98	2.57	Annual	20.84	4.75	4.75	3.12	8.36	8.35

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

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;

^a - SimpleBox data presented here are overall masses calculated as sum of regional and continental level estimates.

Table C.26. Calculation results: PCB-180 mass degraded in 5 km layer of the atmosphere (kg) calculated by models on the basis of “own or alternative” data sets and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data		Results obtained on the basis of historical emissions	m	σ	Month	Results obtained on the basis of zero initial concentrations		m	σ
	CAN/POPs	MSCE-POP_1	CliMoChem_2_3				CliMoChem_2_2	MSCE-POP_2		
Jan	0.01	0.03		0.02	0.01	Jan		0.02		
Feb	0.02	0.06		0.04	0.03	Feb		0.05		
Mar	0.06	0.13		0.09	0.05	Mar		0.11		
Seas_1	0.09	0.21	0.16	0.16	0.06	Seas_1	2.81	0.18	1.50	1.86
Apr	0.13	0.31		0.22	0.12	Apr		0.22		
May	0.39	0.96		0.68	0.41	May		0.72		
Jun	0.96	2.26		1.61	0.92	Jun		1.54		
Seas_2	1.48	3.53	1.97	2.33	1.07	Seas_2	30.09	2.47	16.28	19.53
Jul	0.93	2.46		1.70	1.08	Jul		1.65		
Aug	1.00	3.42		2.21	1.71	Aug		2.38		
Sep	0.28	1.41		0.84	0.80	Sep		1.09		
Seas_3	2.22	7.29	3.27	4.26	2.68	Seas_3	58.96	5.12	32.04	38.07
Oct	0.07	0.25		0.16	0.12	Oct		0.19		
Nov	0.02	0.04		0.03	0.02	Nov		0.03		
Dec	0.01	0.02		0.01	0.01	Dec		0.02		
Seas_4	0.09	0.31	0.69	0.36	0.30	Seas_4	12.33	0.24	6.28	8.55
Annual	3.88	11.34	6.09	7.10	3.83	Annual	104.19	8.01	56.10	68.01

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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.

Table C.27. Calculation results: PCB-180 mass degraded in 10 km layer of the atmosphere (kg) calculated by models on the basis of “own or alternative” data sets and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data		Results obtained on the basis of historical emissions	<i>m</i>	σ	Month	Results obtained on the basis of zero initial concentrations		<i>m</i>	σ
	MSCE-POP_1	CAN/POPs	CliMoChem_2_3				CliMoChem_2_2	MSCE-POP_2		
Jan	0.03	0.01		0.02	0.02	Jan		0.03		
Feb	0.07	0.02		0.04	0.03	Feb		0.06		
Mar	0.16	0.06		0.11	0.07	Mar		0.13		
Seas_1	0.26	0.09	0.33	0.23	0.12	Seas_1	5.63	0.22	2.92	3.82
Apr	0.38	0.13		0.26	0.17	Apr		0.27		
May	1.18	0.39		0.78	0.56	May		0.88		
Jun	2.76	0.96		1.86	1.27	Jun		1.88		
Seas_2	4.31	1.48	3.94	3.25	1.54	Seas_2	60.18	3.03	31.60	40.41
Jul	3.01	0.93		1.97	1.47	Jul		2.02		
Aug	4.18	1.00		2.59	2.25	Aug		2.91		
Sep	1.72	0.28		1.00	1.02	Sep		1.33		
Seas_3	8.91	2.22	6.54	5.89	3.39	Seas_3	117.91	6.26	62.08	78.95
Oct	0.30	0.07		0.19	0.16	Oct		0.23		
Nov	0.05	0.02		0.03	0.03	Nov		0.04		
Dec	0.02	0.01		0.02	0.01	Dec		0.02		
Seas_4	0.38	0.09	1.38	0.62	0.68	Seas_4	24.66	0.29	12.47	17.23
Annual	13.87	3.88	12.19	9.98	5.35	Annual	208.38	9.79	109.09	140.42

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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.

Comparison between results obtained on the basis of two data sets. The percentage difference between calculation results on PCB-180 mass degraded in 1, 5 and 10 km layers of obtained with two data sets of physical-chemical properties (for those models who provided calculations for both these sets) is shown in Tables 3.28 – 3.30.

Table C.28. The percentage difference between calculation results on PCB-180 mass degraded in 1 km layer of the atmosphere obtained by models on the basis of two data sets: “reference” and “own or alternative” data sets

Month	CliMoChem_2_2	CliMoChem_2_3	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
Jan			272%	96%	96%	138%	146%	-56%	-57%
Feb			259%	97%	97%	140%	150%	-15%	-18%
Mar			236%	97%	97%	140%	149%	59%	54%
Season_1	-62%	-60%	257%	97%	97%	139%	148%	1%	-3%
Apr			217%	97%	97%	140%	149%	180%	161%
May			200%	97%	97%	140%	149%	379%	348%
Jun			186%	97%	97%	140%	149%	617%	556%
Season_2	131%	142%	201%	97%	97%	140%	149%	464%	417%
Jul			174%	97%	97%	139%	149%	713%	660%
Aug			165%	97%	97%	139%	149%	685%	634%
Sep			157%	97%	97%	139%	149%	390%	374%
Season_3	251%	267%	165%	97%	97%	139%	149%	611%	564%
Oct			150%	98%	97%	139%	149%	70%	67%
Nov			145%	98%	98%	139%	149%	-41%	-41%
Dec			140%	98%	98%	139%	149%	-71%	-72%
Season_4	24%	29%	145%	98%	98%	139%	149%	7%	4%
Annual	121%	130%	196%	97%	97%	139%	149%	427%	381%

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 – CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

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.

Table C.29. The percentage difference between calculation results on PCB-180 mass degraded in 5 km layer of the atmosphere obtained by models on the basis of two data sets: “reference” and “own or alternative” data sets

Month	CliMoChem_2_2	CliMoChem_2_3	MSCE-POP_1	MSCE-POP_2
Jan			-56%	-57%
Feb			-15%	-18%
Mar			59%	54%
Season_1	-62%	-60%	1%	-3%
Apr			180%	161%
May			379%	348%
Jun			617%	556%
Season_2	131%	142%	464%	417%
Jul			713%	660%
Aug			685%	634%
Sep			390%	374%
Season_3	251%	267%	611%	564%
Oct			70%	67%
Nov			-41%	-41%
Dec			-71%	-72%
Season_4	24%	29%	7%	4%
Annual	121%	130%	427%	381%

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 – CliMoChem results calculated on the basis of Land Cover Data given as input data and 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.

Table C.30. The percentage difference between calculation results on PCB-180 mass degraded in 10 km layer of the atmosphere obtained by models on the basis of two data sets: “reference” and “own or alternative” data sets

Month	CliMoChem_2_2	CliMoChem_2_3	MSCE-POP_1	MSCE-POP_2
Jan			-56%	-57%
Feb			-15%	-18%
Mar			59%	54%
Season_1	-62%	-60%	1%	-3%
Apr			180%	161%
May			379%	348%
Jun			617%	556%
Season_2	131%	142%	464%	417%
Jul			713%	660%
Aug			685%	634%
Sep			390%	374%
Season_3	251%	267%	611%	564%
Oct			70%	67%
Nov			-41%	-41%
Dec			-71%	-72%
Season_4	24%	29%	7%	4%
Annual	121%	130%	427%	381%

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and with historical emissions for 20-year period;

MSCE-POP_1 - MSCE-POP results calculated on the basis of initial concentrations given as input data;

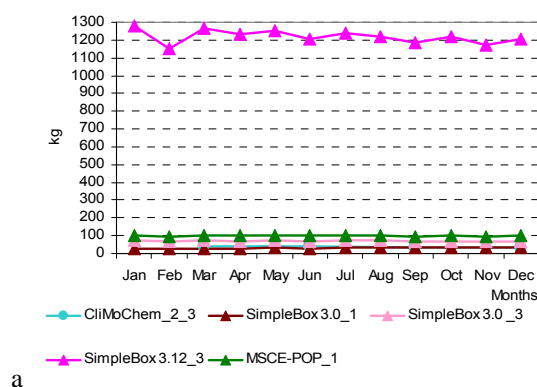
MSCE-POP_2 - MSCE-POP results calculated on the basis of zero initial concentrations.

C.2.2. Comparison of calculated values of PCB-180 mass degraded in soil

According to the programme of Stage II results of computational experiments on mass balance include masses of PCB-180 degraded in soil within 5 cm and 10 cm depth.

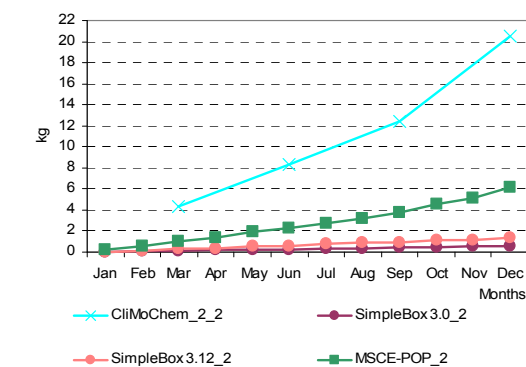
Reference data set. Calculation results on PCB-180 mass degraded in 5cm layer of soil (kg) calculated by models on the basis of “reference” data set together with statistical parameters used for evaluation are presented in Table C.31.

Monthly values of PCB-180 mass degraded in 5cm layer of soil calculated by the participating models on the basis of “reference” data set and taking into account non-zero (initial concentrations in media or historical emissions) and zero initial conditions are compared in Fig. C.40a and b, respectively. Seasonal variations of low values of mass in 5cm layer of soil calculated by the participating models on the basis of “reference” data set and non-zero initial conditions are also shown in Fig. C.40c in more detail.



a

Fig. C.40a. PCB-180 mass degraded in 5 cm layer of soil (kg) calculated by the participating models on the basis of “reference” data set and non-zero initial conditions



b

Fig. C.40b. PCB-180 mass degraded in 5 cm layer of soil (kg) calculated by the participating models on the basis of “reference” data set and zero initial conditions

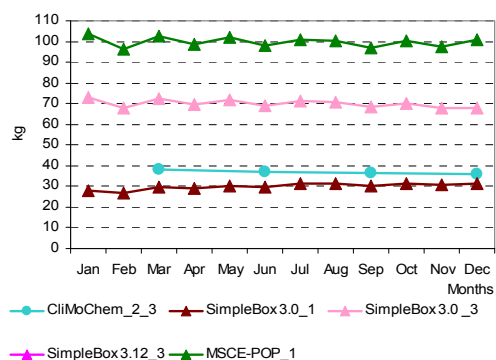


Fig. C.40c. PCB-180 mass degraded in 5 cm layer of soil (kg) calculated by the participating models on the basis of “reference” data set and non-zero initial conditions (models with low values)

Calculation results on PCB-180 mass degraded in 10 cm layer of soil (kg) calculated by models on the basis of “reference” data set together with statistical parameters used for evaluation are presented in Table C.32.

Monthly values of PCB-180 mass degraded in 10 cm layer of soil calculated by the participating models on the basis of “reference” data set and taking into account non-zero (initial concentrations in media or historical emissions) and zero initial conditions are compared in Fig. C.41a and b, respectively. Seasonal variations of low values of mass degraded in 10 cm layer of soil calculated by the participating models on the basis of “reference” data set and non-zero initial conditions are also shown in Fig. C.41c in more detail.

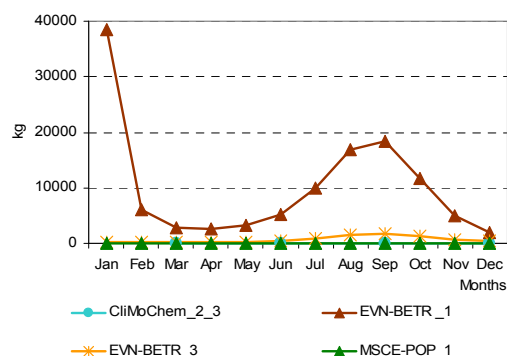


Fig. C.41a. PCB-180 mass degraded in 10cm layer of soil (kg) calculated by the participating models on the basis of “reference” data set and non-zero initial conditions (all models)

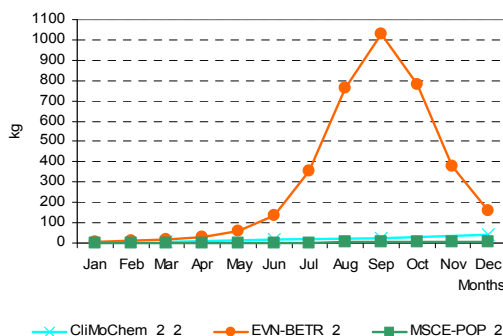


Fig. C.41b. PCB-180 mass degraded in 10cm layer of soil (kg) calculated by the participating models on the basis of “reference” data set and zero-initial conditions

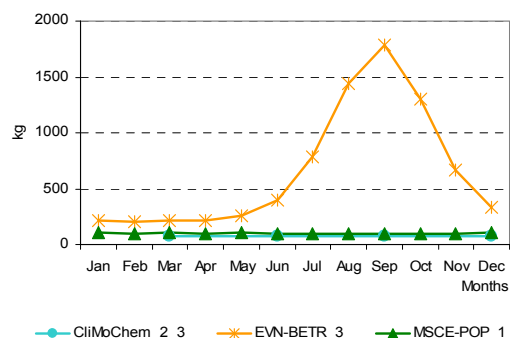


Fig. C.41c. PCB-153 mass degraded in 10cm layer of soil (kg) calculated by the participating models on the basis of “reference” data set and non-zero initial conditions (models with low values)

Table C.31. Calculation results: PCB-180 mass degraded in 5cm layer of soil (kg) calculated by models on the basis of “reference” data set and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data		Results obtained on the basis of historical emissions			<i>m</i>	σ	Month	Results obtained on the basis of zero initial concentrations				<i>m</i>	σ
	MSCE-POP_1	SimpleBox 3.0_1 ^a	CliMo Chem_2_3	SimpleBox 3.0_3 ^a	SimpleBox 3.12_3 ^a				CliMo Chem_2_2	SimpleBox 3.0_2 ^a	SimpleBox 3.12_2 ^a	MSCE-POP_2		
Jan	103.54	27.68		73.04	1278.43	370.7	606.0	Jan		0.02	0.1	0.2	0.1	0.1
Feb	96.39	26.79		68.04	1148.52	334.9	543.1	Feb		0.1	0.2	0.5	0.3	0.3
Mar	102.59	29.38		72.42	1264.76	367.3	599.1	Mar		0.1	0.3	1.0	0.5	0.5
Seas_1	302.52	83.8	37.91	213.5	3691.7	865.9	1583.1	Seas_1	4.3	0.2	0.5	1.7	1.7	1.9
Apr	98.88	29.00		69.77	1232.42	357.5	584.0	Apr		0.2	0.4	1.4	0.7	0.7
May	101.75	30.43		71.78	1251.02	363.7	592.2	May		0.2	0.5	1.9	0.9	0.9
Jun	97.99	29.80		69.16	1204.08	350.3	569.9	Jun		0.3	0.6	2.2	1.0	1.0
Seas_2	298.62	89.2	37.11	210.7	3687.5	864.6	1581.4	Seas_2	8.4	0.7	1.5	5.5	4.0	3.6
Jul	100.78	31.08		71.16	1237.47	360.1	585.6	Jul		0.3	0.8	2.7	1.3	1.3
Aug	100.40	31.31		70.84	1222.31	356.2	578.1	Aug		0.4	0.9	3.2	1.5	1.5
Sep	97.09	30.47		68.26	1184.53	345.1	560.3	Sep		0.4	1.0	3.7	1.7	1.8
Seas_3	298.27	92.9	36.33	210.3	3644.3	856.4	1561.8	Seas_3	12.4	1.2	2.6	9.7	6.4	5.4
Oct	100.44	31.62		70.22	1217.40	354.9	575.7	Oct		0.5	1.1	4.5	2.0	2.2
Nov	97.47	30.70		67.66	1171.75	341.9	553.9	Nov		0.5	1.2	5.2	2.3	2.5
Dec	101.12	31.18		67.76	1204.36	351.1	569.6	Dec		0.6	1.3	6.2	2.7	3.0
Seas_4	299.03	93.5	35.80	205.6	3593.5	845.5	1539.5	Seas_4	20.5	1.6	3.6	15.9	10.4	9.2
Annual	1198.43	359.44	147.16	840.11	14617.05	3432.4	6265.8	Annual	45.5	3.7	8.2	32.8	22.6	20.0

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

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;

^a - SimpleBox data presented here are overall masses calculated as sum of regional and continental level estimates.

Table C.32. Calculation results: PCB-180 mass degraded in 10 cm layer of soil (kg) calculated by models on the basis of “reference” data set and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data		Results obtained on the basis of historical emissions		<i>m</i>	σ	Month	Results obtained on the basis of zero initial concentrations			<i>m</i>	σ
	EVN-BETR_1 ^a	MSCE-POP_1	EVN-BETR_3 ^a	CliMoChem_2_3				EVN-BETR_2 ^a	CliMoChem_2_2	MSCE-POP_2		
Jan	38411.4	104.7	214.3		12910.1	22084.8	Jan	7.3		0.2	3.7	5.0
Feb	6077.2	97.4	204.3		2126.3	3422.0	Feb	13.2		0.5	6.9	9.0
Mar	2776.1	103.7	212.5		1030.7	1512.5	Mar	19.5		1.0	10.3	13.1
Seas_1	47264.6	305.8	631.1	75.8	12069.3	23464.6	Seas_1	40.1	8.6	1.7	16.8	20.4
Apr	2531.3	100.0	220.1		950.5	1370.4	Apr	31.2		1.4	16.3	21.1
May	3139.3	102.9	256.0		1166.0	1710.6	May	59.0		1.9	30.4	40.4
Jun	5175.2	99.1	398.6		1891.0	2848.2	Jun	138.0		2.3	70.1	96.0
Seas_2	10845.8	301.9	874.8	74.2	3024.2	5225.3	Seas_2	228.2	16.7	5.6	83.5	125.5
Jul	10011.3	101.9	788.3		3633.8	5533.7	Jul	356.6		2.8	179.7	250.2
Aug	16873.2	101.5	1445.1		6140.0	9319.5	Aug	763.6		3.2	383.4	537.7
Sep	18483.8	98.2	1780.9		6787.6	10164.1	Sep	1026.8		3.8	515.3	723.4
Seas_3	45368.3	301.5	4014.4	72.7	12439.2	22027.0	Seas_3	2147.0	24.8	9.8	727.2	1229.6
Oct	11735.9	101.5	1305.9		4381.1	6397.9	Oct	777.9		4.6	391.2	546.8
Nov	4998.2	98.5	665.3		1920.7	2680.2	Nov	380.3		5.2	192.8	265.2
Dec	2045.9	102.2	333.9		827.3	1061.7	Dec	162.5		6.2	84.4	110.5
Seas_4	18780.1	302.3	2305.1	71.6	5364.8	8999.6	Seas_4	1320.7	41.0	16.0	459.2	746.1
Annual	122258.8	1211.5	7825.3	294.3	32897.5	59668.6	Annual	3736.0	91.1	33.1	1286.7	2121.3

EVN-BETR_1 - EVN-BETR and UK-MODEL results calculated on the basis of initial concentrations given as input data;

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;

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

a - EVN-BETR and UK-MODEL results were calculated with the help of a single box version of European model.

Own/alternative data set. Calculation results on PCB-180 mass degraded in 5cm layer of soil (kg) calculated by the models on the basis of “own or alternative” data sets together with statistical parameters used for evaluation are presented in Table C.33.

Monthly values of PCB-180 mass degraded in 5cm layer of soil calculated by the participating models on the basis of “own or alternative” data sets and taking into account non-zero (initial concentrations in media or historical emissions) and zero initial conditions are compared in Fig. C.42a and b, respectively.

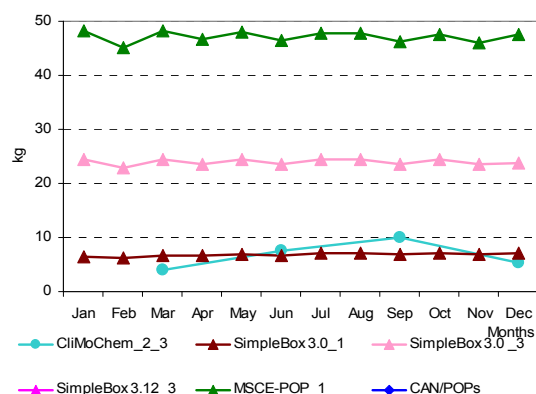


Fig. C.42a. PCB-180 mass degraded in 5cm layer of soil (kg) calculated by the participating models on the basis of “own or alternative” data sets and non-zero initial conditions

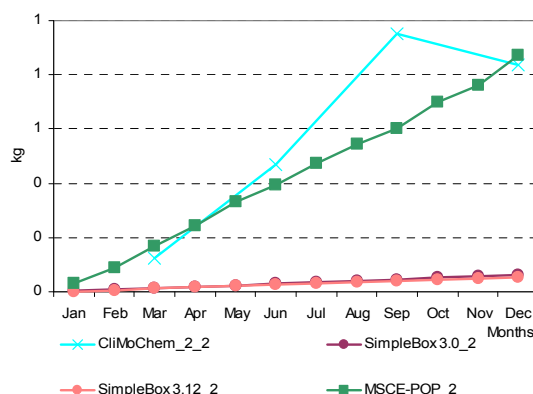


Fig. C.42b. PCB-180 mass degraded in 5cm layer of soil (kg) calculated by the participating models on the basis of “own or alternative” data sets and zero initial conditions

Table C.33. Calculation results: PCB-180 mass degraded in 5cm layer of soil (kg) calculated by models on the basis of “own or alternative” data sets and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data			Results obtained on the basis of historical emissions			m	σ	Month	Results obtained on the basis of zero initial concentrations				m	σ
	CAN/POPs	MSCE-POP_1	SimpleBox 3.0_1 ^a	CliMo Chem_2_3	SimpleBox 3.0_3 ^a	SimpleBox 3.12_3 ^a				CliMo Chem_2_2	SimpleBox 3.0_2 ^a	SimpleBox 3.12_2 ^a	MSCE-POP_2		
Jan	166.4	48.3	6.6		24.5	98.1	68.8	64.5	Jan		0.003	0.002	0.03	0.01	0.02
Feb	154.0	45.1	6.2		22.9	88.5	63.4	59.3	Feb		0.01	0.01	0.1	0.03	0.05
Mar	162.7	48.2	6.8		24.4	98.0	68.0	63.1	Mar		0.01	0.01	0.2	0.1	0.1
Seas_1	483.1	141.6	19.6	4.1	71.8	284.6	167.5	185.3	Seas_1	0.1	0.02	0.02	0.3	0.1	0.1
Apr	155.6	46.6	6.6		23.7	96.4	65.8	60.5	Apr		0.02	0.02	0.2	0.1	0.1
May	158.8	48.1	6.9		24.4	97.8	67.2	61.6	May		0.02	0.02	0.3	0.1	0.2
Jun	151.9	46.4	6.8		23.6	94.6	64.7	58.9	Jun		0.03	0.03	0.4	0.1	0.2
Seas_2	466.3	141.1	20.3	7.6	71.7	288.9	166.0	179.5	Seas_2	0.5	0.07	0.06	1.0	0.4	0.4
Jul	155.1	47.9	7.1		24.4	97.7	66.4	60.2	Jul		0.04	0.03	0.5	0.2	0.3
Aug	153.5	47.8	7.1		24.4	97.5	66.1	59.5	Aug		0.04	0.04	0.5	0.2	0.3
Sep	147.0	46.2	6.9		23.6	94.4	63.6	57.1	Sep		0.05	0.04	0.6	0.2	0.3
Seas_3	455.6	141.8	21.1	9.9	72.4	289.6	165.1	175.4	Seas_3	1.0	0.12	0.11	1.6	0.7	0.7
Oct	150.4	47.6	7.2		24.4	97.5	65.4	58.4	Oct		0.05	0.05	0.7	0.3	0.4
Nov	144.2	46.0	7.0		23.6	94.3	63.0	56.0	Nov		0.06	0.05	0.8	0.3	0.4
Dec	147.6	47.5	7.1		23.7	97.3	64.6	57.5	Dec		0.06	0.06	0.9	0.3	0.5
Seas_4	442.2	141.2	21.2	5.3	71.7	289.1	161.8	171.8	Seas_4	0.8	0.17	0.15	2.3	0.9	1.0
Annual	1847.1	519.1	82.2	26.9	287.6	1152.2	652.5	713.4	Annual	2.4	0.39	0.34	5.0	2.0	2.2

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

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;

a - SimpleBox data presented here are overall masses calculated as sum of regional and continental level estimates.

Calculation results on PCB-180 mass degraded in 10 cm layer of soil (kg) calculated by models on the basis of “own or alternative” data sets together with statistical parameters used for evaluation are presented in Table C.34.

Table C.34. Calculation results: PCB-180 mass degraded in 10 cm layer of soil (kg) calculated by models on the basis of “own or alternative” data sets and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data		Results obtained on the basis of historical emissions	<i>m</i>	σ	Month	Results obtained on the basis of zero initial concentrations		<i>m</i>	σ
	CAN/POPs	MSCE-POP_1					CliMoChem_2_2	MSCE-POP_2		
Jan	332.7	48.8		190.8	200.7	Jan		0.03		
Feb	307.9	45.6		176.8	185.5	Feb		0.1		
Mar	325.6	48.7		187.1	195.8	Mar		0.2		
Seas_1	966.2	143.2	8.1	372.5	518.5	Seas_1	0.2	0.3	0.3	0.0
Apr	311.6	47.1		179.3	187.0	Apr		0.2		
May	318.3	48.6		183.4	190.7	May		0.3		
Jun	304.6	47.0		175.8	182.2	Jun		0.4		
Seas_2	934.4	142.7	15.2	364.1	498.0	Seas_2	0.9	1.0	1.0	0.0
Jul	311.2	48.4		179.8	185.8	Jul		0.5		
Aug	307.9	48.3		178.1	183.6	Aug		0.6		
Sep	294.9	46.7		170.8	175.5	Sep		0.6		
Seas_3	914.0	143.4	19.9	359.1	484.5	Seas_3	1.9	1.6	1.8	0.2
Oct	301.6	48.1		174.9	179.2	Oct		0.7		
Nov	288.9	46.5		167.7	171.4	Nov		0.8		
Dec	295.6	48.0		171.8	175.1	Dec		0.9		
Seas_4	886.1	142.7	10.6	346.5	472.0	Seas_4	1.7	2.4	2.0	0.5
Annual	3700.7	571.9	53.8	1442.1	1973.1	Annual	4.8	5.3	5.0	0.4

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 – CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

a – EVN-BETR and UK-MODEL results were calculated with the help of a single box version of European model on the basis of initial concentrations given as input data;

^b – in CAN/POPs results the second layer of soil is applied as 5cm;

Monthly values of PCB-180 mass degraded in 10 cm layer of soil calculated by the participating models on the basis of “own or alternative” data sets and taking into account non-zero (initial concentrations in media or historical emissions) and zero initial conditions are compared in Fig. C.43a and b, respectively.

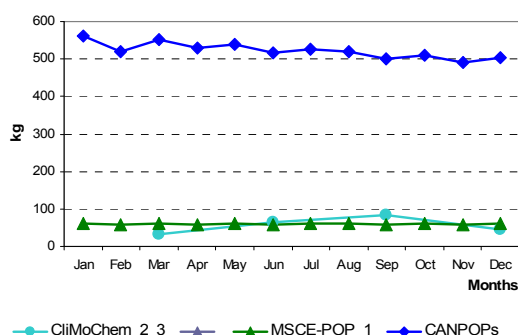


Fig. C.43a. PCB-180 mass degraded in 10cm layer of soil (kg) calculated by the participating models on the basis of “own or alternative” data sets and non-zero initial conditions

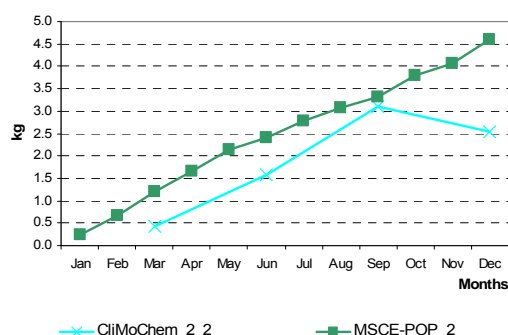


Fig. C.43b. PCB-180 mass degraded in 10cm layer of soil (kg) calculated by the participating models on the basis of “own or alternative” data sets and zero initial conditions

Comparison between results obtained on the basis of two data sets. The percentage difference between calculation results on PCB-180 mass degraded in soil within 5 and 10 cm layers obtained with two different data sets of physical-chemical properties (for those models who provided calculations for both these sets) is shown in Tables 3.35-3.36.

Table C.35. The percentage difference between calculation results on PCB-180 mass degraded within 5 cm soil layer obtained by models on the basis of two data sets: “own or alternative” and “reference”

Month	CliMoChem_2_2	CliMoChem_2_3	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
Jan			-76%	-90%	-96%	-66%	-92%	-53%	-83%
Feb			-77%	-90%	-96%	-66%	-92%	-53%	-83%
Mar			-77%	-90%	-96%	-66%	-92%	-53%	-83%
Season_1	-97%	-89%	-77%	-90%	-96%	-66%	-92%	-53%	-83%
Apr			-77%	-90%	-96%	-66%	-92%	-53%	-83%
May			-77%	-90%	-96%	-66%	-92%	-53%	-82%
Jun			-77%	-90%	-96%	-66%	-92%	-53%	-82%
Season_2	-94%	-80%	-77%	-90%	-96%	-66%	-92%	-53%	-83%
Jul			-77%	-90%	-96%	-66%	-92%	-52%	-83%
Aug			-77%	-89%	-96%	-66%	-92%	-52%	-83%
Sep			-77%	-89%	-96%	-65%	-92%	-52%	-84%
Season_3	-92%	-73%	-77%	-89%	-96%	-66%	-92%	-52%	-83%
Oct			-77%	-89%	-96%	-65%	-92%	-53%	-85%
Nov			-77%	-89%	-96%	-65%	-92%	-53%	-85%
Dec			-77%	-89%	-96%	-65%	-92%	-53%	-86%
Season_4	-96%	-85%	-77%	-89%	-96%	-65%	-92%	-53%	-85%
Annual	-95%	-82%	-77%	-89%	-96%	-66%	-92%	-57%	-85%

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations; CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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; 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.

Table C.36. The percentage difference between calculation results on PCB-180 mass degraded within 10 cm soil layer obtained by models on the basis of two data sets: “own or alternative” and “reference”

Month	CliMoChem_2_2	CliMoChem_2_3	MSCE-POP_1	MSCE-POP_2
Jan			-53%	-83%
Feb			-53%	-83%
Mar			-53%	-83%
Season_1	-97%	-89%	-53%	-83%
Apr			-53%	-83%
May			-53%	-82%
Jun			-53%	-82%
Season_2	-94%	-80%	-53%	-83%
Jul			-52%	-83%
Aug			-52%	-83%
Sep			-52%	-84%
Season_3	-92%	-73%	-52%	-83%
Oct			-53%	-85%
Nov			-53%	-85%
Dec			-53%	-86%
Season_4	-96%	-85%	-53%	-85%
Annual	-95%	-82%	-53%	-84%

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations; CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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.

C.2.3. Comparison of calculated values of PCB-180 mass degraded in water

According to the programme of Stage II model results of computational experiments on mass balance include masses of PCB-180 degraded in sea within a layer of 200 m depth.

Reference data set. Calculation results on PCB-180 mass degraded in 200 m layer of water (kg) calculated by models on the basis of “reference” data set together with statistical parameters used for evaluation are presented in Table C.37.

Monthly values of PCB-180 mass degraded in 200 m layer of water calculated by all participating models on the basis of “reference” data set and taking into account non-zero (initial concentrations in media or historical emissions) and zero initial conditions are compared in Fig. C.44a and b, respectively. Seasonal variations of low values of mass degraded in 200 m layer of water calculated by the participating models on the basis of “reference” data set and non-zero initial conditions are also shown in Fig. C.44c in more detail.

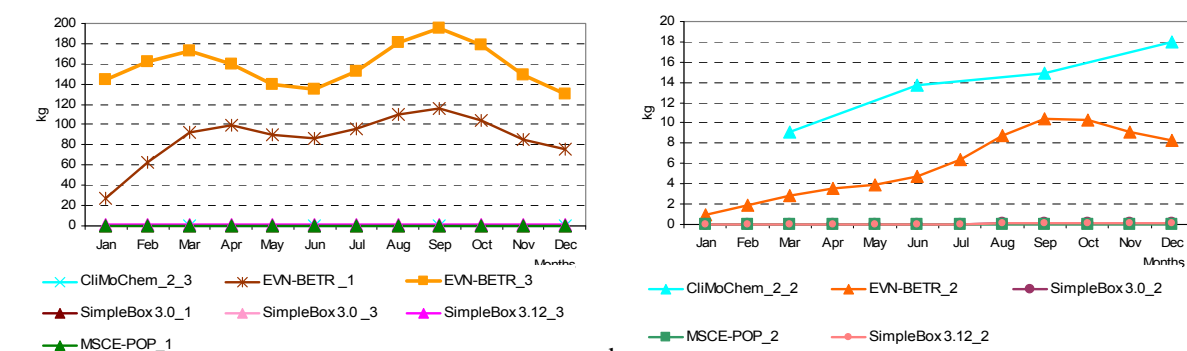


Fig. C.44a. PCB-180 mass degraded in 200 m layer of water (kg) calculated by the participating models on the basis of “reference” data set and non-zero initial conditions

Fig. C.44b. PCB-180 mass degraded in 200 m layer of water (kg) calculated by the participating models on the basis of “reference” data set and zero initial conditions

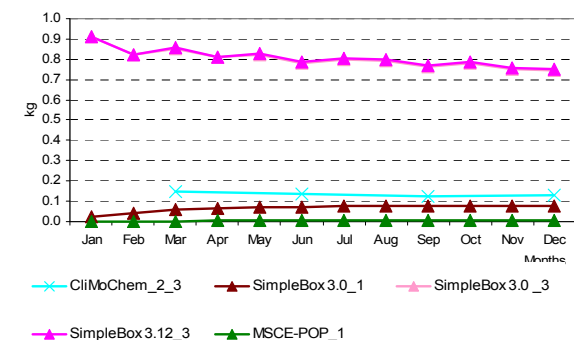


Fig. C.44c. PCB-180 mass degraded in 200 m layer of water (kg) calculated by the participating models on the basis of “reference” data set and non-zero initial conditions (models with low values)

Table C.37. Calculation results: PCB-180 mass degraded in 200 m layer of water (kg) calculated by models on the basis of “reference” data set and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data			Results obtained on the basis of historical emissions				<i>m</i>	σ	Month	Results obtained on the basis of zero initial concentrations					<i>m</i>	σ
	EVN-BETR_1 ^a	SimpleBox 3.0_1 ^b	MSCE-POP_1	EVN-BETR_3 ^a	CliMoChem_2_3	SimpleBox 3.0_3 ^b	SimpleBox 3.12_3 ^b				EVN-BETR_2 ^a	CliMoChem_2_2	SimpleBox 3.0_2 ^b	SimpleBox 3.12_2 ^b	MSCE-POP_2		
Jan	27.08	0.03	0.002	144.08		0.91	0.91	28.83	57.45	Jan	0.90		0.01	0.01	0.001	0.23	0.45
Feb	62.32	0.04	0.002	162.60		0.82	0.82	37.77	65.98	Feb	1.86		0.02	0.02	0.002	0.48	0.92
Mar	92.70	0.06	0.003	173.03		0.85	0.86	44.58	72.95	Mar	2.87		0.03	0.03	0.002	0.74	1.43
Seas_1	182.10	0.13	0.006	479.71	0.15	2.59	2.59	95.32	182.43	Seas_1	5.64	9.09	0.06	0.06	0.005	2.97	4.19
Apr	99.23	0.06	0.004	160.06		0.81	0.81	43.50	69.45	Apr	3.55		0.04	0.04	0.003	0.91	1.76
May	90.44	0.07	0.004	139.70		0.82	0.83	38.64	61.22	May	3.96		0.05	0.05	0.004	1.02	1.96
Jun	86.88	0.07	0.005	135.02		0.78	0.79	37.26	59.08	Jun	4.72		0.05	0.05	0.004	1.21	2.34
Seas_2	276.55	0.21	0.01	434.79	0.14	2.41	2.43	102.36	178.97	Seas_2	12.24	13.70	0.14	0.14	0.011	5.25	7.07
Jul	95.81	0.08	0.01	152.37		0.80	0.81	41.64	66.32	Jul	6.37		0.06	0.06	0.004	1.62	3.17
Aug	110.63	0.08	0.01	180.75		0.79	0.80	48.84	78.23	Aug	8.74		0.06	0.06	0.004	2.22	4.35
Sep	115.94	0.08	0.01	194.95		0.76	0.77	52.08	83.87	Sep	10.47		0.06	0.06	0.01	2.65	5.21
Seas_3	322.37	0.23	0.02	528.07	0.12	2.36	2.37	122.22	215.34	Seas_3	25.58	14.91	0.18	0.18	0.01	8.17	11.65
Oct	103.84	0.08	0.01	179.05		0.78	0.79	47.43	76.62	Oct	10.32		0.06	0.06	0.01	2.61	5.14
Nov	85.65	0.08	0.01	149.21		0.75	0.76	39.41	63.69	Nov	9.08		0.06	0.06	0.01	2.30	4.52
Dec	75.56	0.08	0.01	130.30		0.75	0.75	34.57	55.71	Dec	8.34		0.07	0.07	0.01	2.12	4.15
Seas_4	265.05	0.23	0.03	458.56	0.13	2.28	2.30	104.08	184.71	Seas_4	27.75	18.00	0.19	0.19	0.02	9.23	12.92
Annual	1046.07	0.79	0.06	1901.13	0.54	9.63	9.69	423.99	758.33	Annual	71.20	55.70	0.58	0.58	0.05	25.62	34.96

EVN-BETR_1 - EVN-BETR and UK-MODEL results calculated on the basis of initial concentrations given as input data;

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;

CliMoChem_2_2 - CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

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;

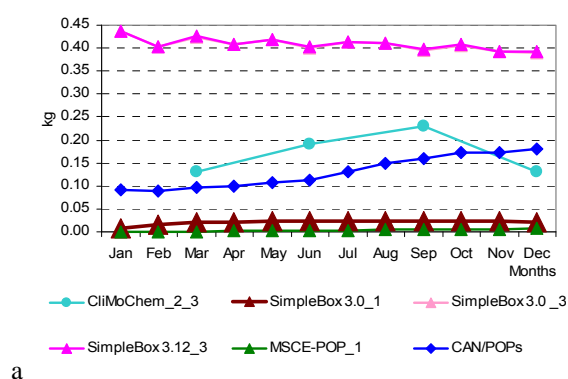
SimpleBox 3.0_3 and SimpleBox 3.12_3 - SimpleBox results of versions 3.0 and 3.12, respectively, calculated with historical emissions for 20-year period;

^a - EVN-BETR and UK-MODEL results were calculated with the help of a single box version of European model;

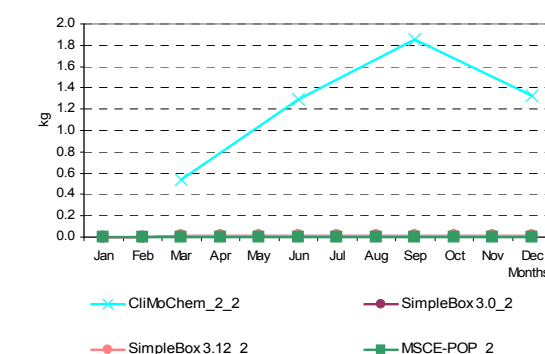
^b - SimpleBox data presented here are overall masses calculated as sum of regional and continental level estimates.

Own/alternative data set. Calculation results on PCB-180 mass degraded in 200 m layer of water (kg) calculated by models on the basis of “own or alternative” data sets together with statistical parameters used for evaluation are presented in Table C.38.

Monthly values of PCB-180 mass degraded in 200 m layer of water calculated by the participating models on the basis of “own or alternative” data sets and taking into account non-zero (initial concentrations in media or historical emissions) and zero initial conditions are compared in Fig. C.45a and b, respectively. Seasonal variations of low values of mass degraded in 200 m layer of water calculated by the participating models on the basis of “own or alternative” data set and zero initial conditions are also shown in Fig. C.45c in more detail.



a



b

Fig. C.45a. PCB-180 mass degraded in 200 m layer of water (kg) calculated by the participating models on the basis of “own or alternative” data sets and non-zero initial conditions

Fig. C.45b. PCB-180 mass degraded in 200 m layer of water (kg) calculated by the participating models on the basis of “own or alternative” data sets and zero initial conditions

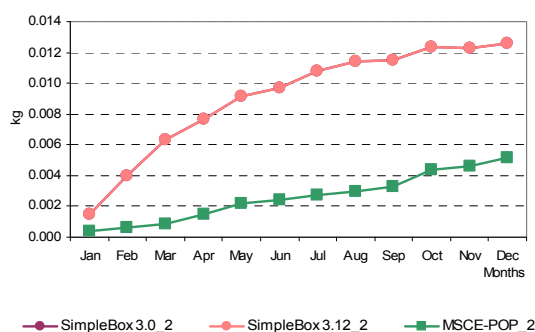


Fig. C.45c. PCB-180 mass degraded in 200 m layer of water (kg) calculated by the participating models on the basis of “reference” data set and zero initial conditions (models with low values)

Table C.38. Calculation results: PCB-180 mass degraded in 200 m layer of water (kg) calculated by models on the basis of “own or alternative” data sets and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data			Results obtained on the basis of historical emissions			m	σ	Month	Results obtained on the basis of zero initial concentrations				m	σ
	CAN/POPs	SimpleBox 3.0_1a	MSCE-POP_1	CliMo Chem_2_3	SimpleBox 3.0_3a	SimpleBox 3.12_3a				CliMo Chem_2_2	SimpleBox 3.0_2a	SimpleBox 3.12_2a	MSCE-POP_2		
Jan	0.09	0.01	0.0005		0.44	0.44	0.19	0.22	Jan		0.002	0.002	0.0004	0.001	0.001
Feb	0.09	0.01	0.001		0.40	0.40	0.18	0.20	Feb		0.004	0.004	0.001	0.003	0.002
Mar	0.10	0.02	0.001		0.42	0.43	0.19	0.21	Mar		0.006	0.006	0.001	0.005	0.003
Seas_1	0.28	0.04	0.002	0.13	1.26	1.27	0.50	0.60	Seas_1	0.54	0.012	0.012	0.002	0.14	0.27
Apr	0.10	0.02	0.002		0.41	0.41	0.19	0.20	Apr		0.008	0.008	0.001	0.01	0.00
May	0.11	0.02	0.003		0.42	0.42	0.19	0.21	May		0.009	0.009	0.002	0.01	0.00
Jun	0.11	0.02	0.003		0.40	0.40	0.19	0.20	Jun		0.010	0.010	0.002	0.01	0.00
Seas_2	0.32	0.07	0.008	0.19	1.23	1.23	0.51	0.57	Seas_2	1.29	0.027	0.027	0.006	0.34	0.63
Jul	0.13	0.02	0.004		0.41	0.41	0.20	0.20	Jul		0.011	0.011	0.003	0.01	0.00
Aug	0.15	0.02	0.004		0.41	0.41	0.20	0.20	Aug		0.011	0.011	0.003	0.01	0.00
Sep	0.16	0.02	0.005		0.39	0.40	0.20	0.19	Sep		0.012	0.012	0.003	0.01	0.00
Seas_3	0.44	0.07	0.012	0.23	1.22	1.22	0.53	0.55	Seas_3	1.85	0.034	0.034	0.009	0.48	0.91
Oct	0.17	0.02	0.006		0.41	0.41	0.20	0.20	Oct		0.012	0.012	0.004	0.01	0.00
Nov	0.17	0.02	0.007		0.39	0.39	0.20	0.19	Nov		0.012	0.012	0.005	0.01	0.00
Dec	0.18	0.02	0.007		0.39	0.39	0.20	0.19	Dec		0.013	0.013	0.005	0.01	0.00
Seas_4	0.53	0.07	0.020	0.13	1.19	1.19	0.52	0.55	Seas_4	1.32	0.037	0.037	0.014	0.35	0.65
Annual	1.56	0.25	0.043	0.68	4.89	4.91	2.06	2.27	Annual	5.01	0.109	0.109	0.031	1.31	2.46

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

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;

^a - SimpleBox data presented here are overall masses calculated as sum of regional and continental level estimates.

Comparison between results obtained on the basis of two data sets. The percentage difference between calculation results obtained with two data sets of physical-chemical properties (for those models who provided calculations for both these sets) is shown in Table C.39.

Table C.39. The percentage difference between calculation results on PCB-180 mass degraded in 200 m layer of water obtained by models on the basis of two data sets: “own or alternative” and “reference”

Month	CliMo Chem_2_2	CliMo Chem_2_3	Simple Box 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
Jan			-71%	-82%	-82%	-52%	-52%	-69%	-71%
Feb			-66%	-82%	-82%	-51%	-51%	-63%	-65%
Mar			-65%	-82%	-82%	-50%	-50%	-57%	-59%
Seas_1	-94%	-9%	-67%	-82%	-82%	-51%	-51%	-62%	-64%
Apr			-66%	-81%	-81%	-50%	-50%	-51%	-54%
May			-66%	-81%	-81%	-49%	-49%	-37%	-41%
Jun			-67%	-81%	-81%	-49%	-49%	-33%	-37%
Seas_2	-91%	38%	-66%	-81%	-81%	-49%	-49%	-40%	-43%
Jul			-68%	-81%	-81%	-49%	-49%	-32%	-36%
Aug			-69%	-81%	-81%	-48%	-48%	-29%	-34%
Sep			-69%	-81%	-81%	-48%	-48%	-28%	-34%
Seas_3	-88%	84%	-69%	-81%	-81%	-48%	-49%	-30%	-35%
Oct			-70%	-81%	-81%	-48%	-48%	-25%	-32%
Nov			-71%	-81%	-81%	-48%	-48%	-25%	-32%
Dec			-72%	-81%	-81%	-48%	-48%	-17%	-25%
Seas_4	-93%	1%	-71%	-81%	-81%	-48%	-48%	-22%	-29%
Annual	-91%	27%	-68%	-81%	-81%	-49%	-49%	-32%	-38%

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

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.

B.2.4. Comparison of calculated values of PCB-180 mass degraded in vegetation

Reference data set. Values of PCB-180 mass degraded in vegetation (kg) obtained by CliMoChem_2_2 and CliMoChem_2_3 models on the basis of “reference” data set are equal to zero.

Own/alternative data set. Calculation results on PCB-180 mass degraded in vegetation (kg) calculated by models on the basis of “own or alternative” data sets together with statistical parameters used for evaluation are presented in Table C.40.

Table C.40. Calculation results: PCB-180 mass degraded in vegetation (kg) calculated by models on the basis of “own or alternative” data sets and statistical parameters used for evaluation

Month	Results obtained on the basis of historical emissions	Results obtained on the basis of zero initial concentrations	m	σ
	CliMoChem_2_3	CliMoChem_2_2		
Jan				
Feb				
Mar				
Seas_1	3.35	18.38	10.86	7.52
Apr				
May				
Jun				
Seas_2	8.05	123.10	65.57	57.53
Jul				
Aug				
Sep				
Seas_3	15.18	274.91	145.04	129.87
Oct				
Nov				
Dec				
Seas_4	7.77	142.38	75.08	67.31
Annual	34.34	558.78	296.56	262.22

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and with historical emissions for 20-year period;

* - In MSCE-POP model degradation in vegetation is not taken into account.

Monthly values of PCB-180 mass degraded in vegetation calculated by the participating models on the basis of “own or alternative” data sets are compared in Fig. C.46.

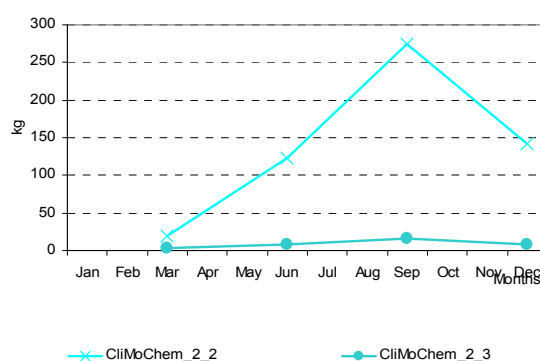


Fig. C.46. PCB-180 mass degraded in vegetation (kg) calculated by the participating models on the basis of “own or alternative” data sets

C.2.5. Comparison of distribution of PCB-180 mass degraded in the environment

Sections from 3.2.1 to 3.2.4 above are devoted to the comparison between the results of participating models on PCB-180 mass degraded in the main environmental compartments (atmosphere, soil, water and vegetation). The comparison includes results of one-year calculations made on the basis of initial conditions (CAN/POPs, EVN-BETR and UK-MODEL, MSCE-POP, SimpleBox) and zero initial concentrations (CliMoChem, MSCE-POP and SimpleBox) along with results of long-term calculations performed with historical emissions (CliMoChem, EVN-BETR and UK-MODEL, and SimpleBox).

Calculation results obtained with the use of two different physical-chemical data sets are submitted by CliMoChem, MSCE-POP and SimpleBox models.

A preliminary analysis of the main results on comparison of absolute and relative values of PCB-180 mass degraded in the main environmental compartments is presented in this section. The analysis is made separately for results calculated on the basis of initial concentrations or historical emissions and for results based on zero-initial conditions.

Atmosphere. Comparison of annual values of PCB-180 masses degraded in the atmosphere within 1, 5 and 10 km layers calculated by different models on the basis of zero initial concentrations and with the use of “**reference**” data set is presented in Fig. C.47a. Fig. C.47b shows the same results but obtained on the basis of initial concentrations or historical emissions. In the latter figure different color of columns corresponds to the different types of calculations (one-year calculations on the basis of initial data; then long-term calculations with historical emissions). The blue line in the plots shows the value of the corresponding parameter averaged between models.

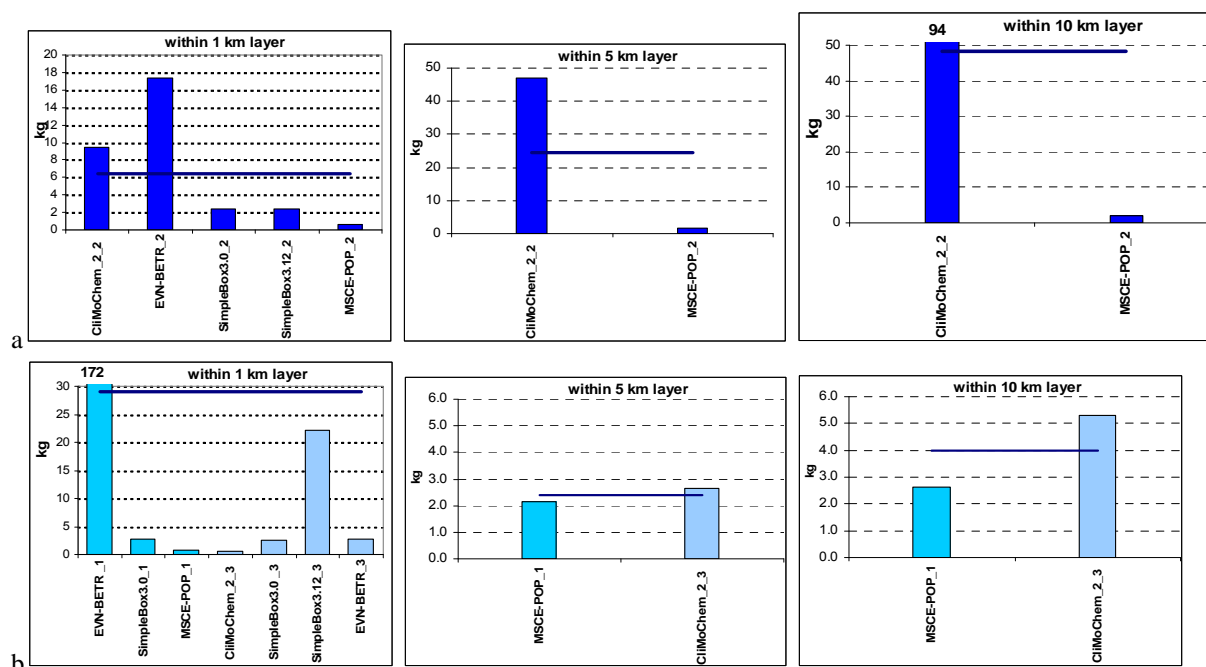


Fig. C.47. Comparison of annual values of PCB-180 masses degraded in the atmosphere within 1, 5 and 10 km layers calculated by different models on the basis of “reference” data set (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

Comparison of profiles of annual values of PCB-180 degraded mass calculated by CliMoChem and MSCE-POP models for the considered atmospheric layers (1, 5 and 10 km) on the basis of “reference” data set is presented in Fig. C.48.

Comparison of annual values of PCB-180 masses degraded in the atmosphere within 1, 5 and 10 km layers calculated by different models on the basis of zero initial concentrations and with the use of “**own**

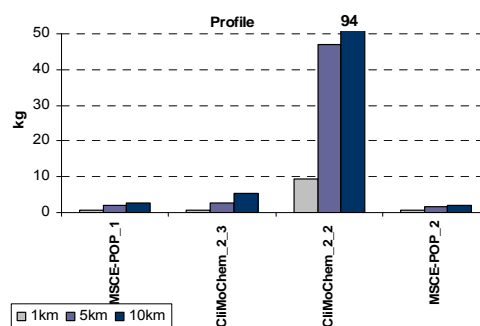


Fig. C.48. Comparison of profiles of annual values of PCB-180 degraded mass calculated by four models for the considered atmospheric layers (1, 5 and 10 km) on the basis of “reference data set»

or alternative” data sets is presented in Fig. C.49a. Fig. C.49b shows the same results but obtained on the basis of initial concentrations or historical emissions. In the latter figure different color of columns corresponds to the different types of calculations (one-year calculations on the basis of initial data; then long-term calculations with historical emissions). The blue line in the plots shows the value of the corresponding parameter averaged between models.

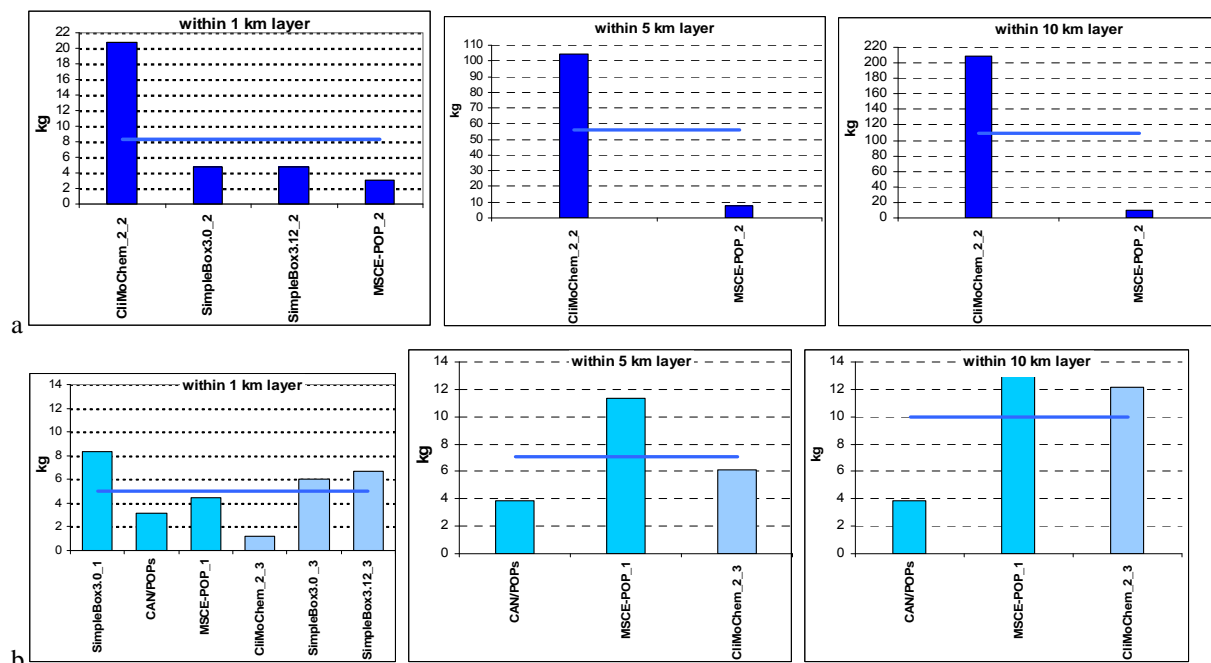


Fig. C.49. Comparison of annual values of PCB-180 masses degraded in the atmosphere within 1, 5 and 10 km layers calculated by different models on the basis of “own or alternative” data sets (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

Comparison of profiles of annual values of PCB-180 degraded mass calculated by three models (CAN/POPs, CLIMoChem and MSCE-POP) for the considered atmospheric layers (1, 5 and 10 km) on the basis of “own or alternative” data sets is presented in Fig. C.50.

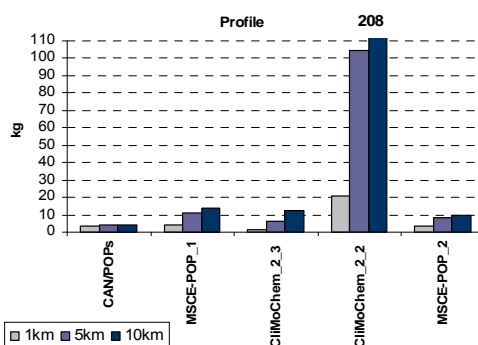


Fig. C.50. Comparison of profiles of annual values of PCB-180 degraded mass calculated by the models for the considered atmospheric layers (1, 5 and 10 km) on the basis of “own or alternative data sets”

Comparison of annual values of PCB-180 mass degraded in the considered different layers of the atmosphere obtained with “reference” and “own/alternative” data sets is presented in Fig. C.51.

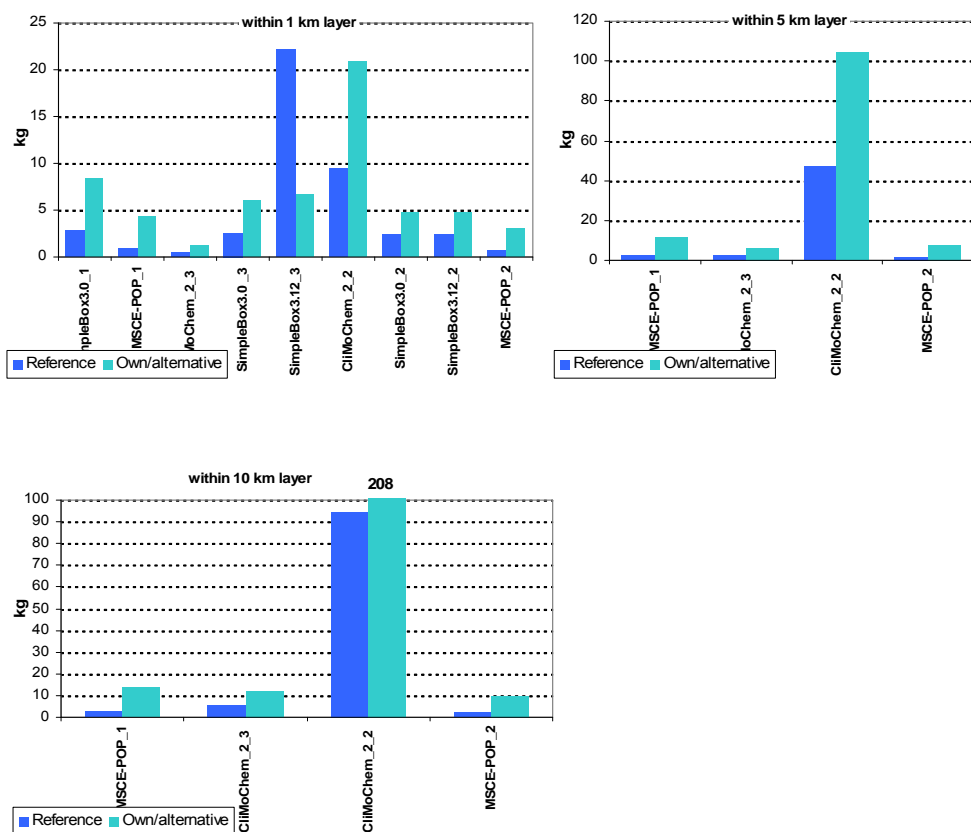


Fig. C.51. Comparison of PCB-180 mass degraded in the atmosphere within 1, 5 and 10 km layers calculated by different models on the basis of two data set

Soil. Comparison of annual values of PCB-180 masses degraded in soil within 5 and 10 cm layers calculated by different models on the basis of zero initial concentrations and with the use of “**reference**” data set is presented in Fig. C.52a. Fig. C.52b shows the same results but obtained on the basis of initial concentrations or historical emissions. In the latter figure different color of columns corresponds to the different types of calculations (one-year calculations on the basis of initial data; then long-term calculations with historical emissions). The black line in the plots shows the value of the corresponding parameter averaged between models.

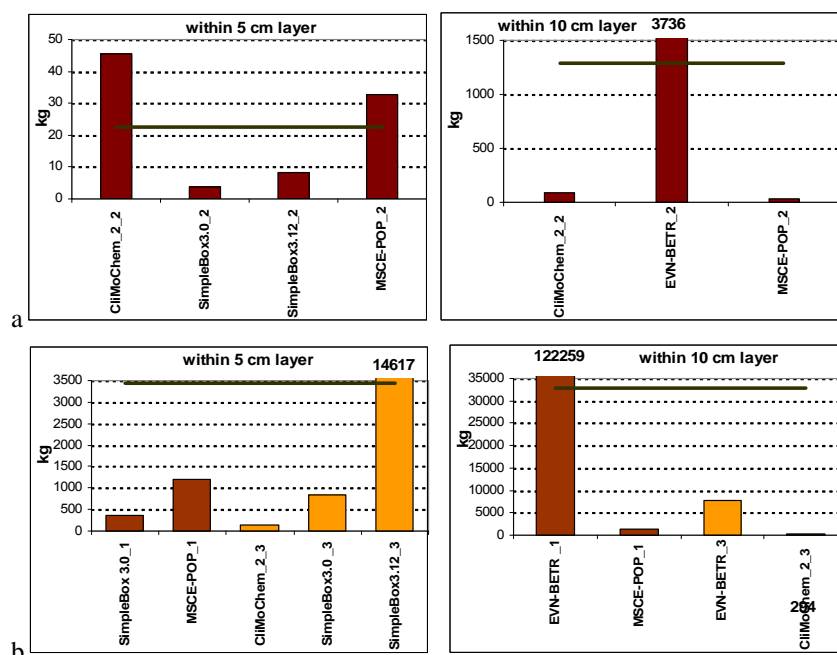


Fig. C.52. Comparison of annual values of PCB-180 masses degraded in soil within 5 and 10 cm layers calculated by different models on the basis of “reference” data set (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

Comparison of profiles of annual values of PCB-180 degraded mass calculated by the participating models for the considered soil layers (5 and 10 cm) on the basis of “reference” data set is presented in Fig. C.53.

Comparison of annual values of PCB-180 masses degraded in soil within 5 and 10 cm layers calculated by different models on the basis of zero initial concentrations and with the use of “**own or alternative**” data sets is presented in Fig. C.54a. Fig. C.54b shows the same results but obtained on the basis of initial concentrations or historical emissions. In the latter figure different color of columns corresponds to the different types of calculations (one-year calculations on the basis of initial data; then long-term calculations with historical emissions). The black line in the plots shows the value of the corresponding parameter averaged between models.

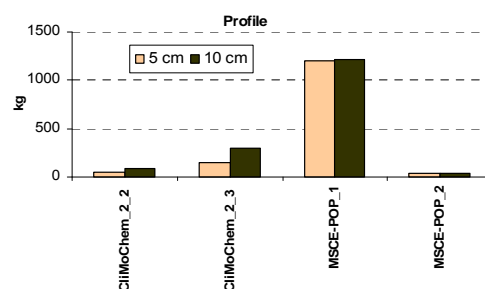


Fig. C.53. Comparison of profiles of annual values of PCB-180 degraded mass calculated by the models for the considered soil layers (5 and 10 cm) on the basis of “reference data set”

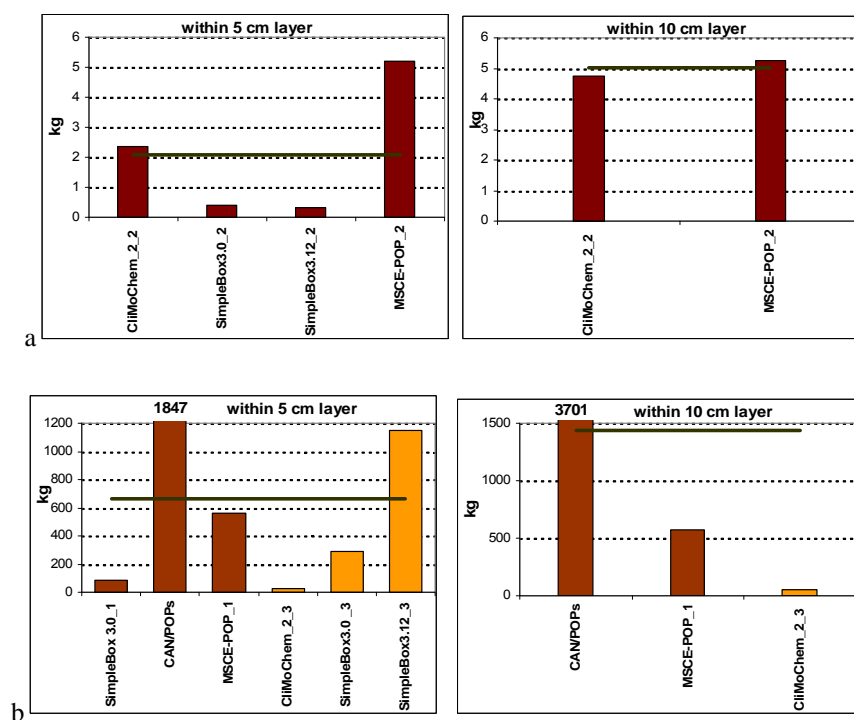


Fig. C.54. Comparison of annual values of PCB-180 masses degraded in soil within 5 and 10 cm layers calculated by different models on the basis of “own or alternative” data sets (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

Comparison of profiles of annual values of PCB-180 degraded mass calculated by the participating models for the considered soil layers (5 and 10 cm) on the basis of “own or alternative” data sets is presented in Fig. C.55.

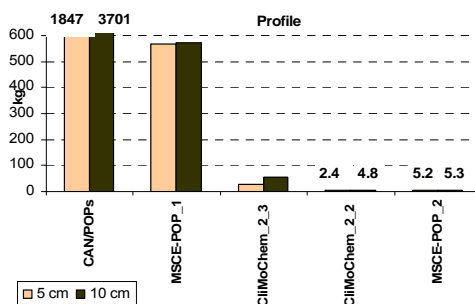


Fig. C.55. Comparison of profiles of annual values of PCB-180 degraded mass calculated by the models for the considered soil layers (5 and 10 cm) on the basis of “own or alternative” data sets”

Comparison of annual values of PCB-180 mass degraded in the considered different layers of soil obtained with “reference” and “own/alternative” data sets is presented in Fig. C.56.

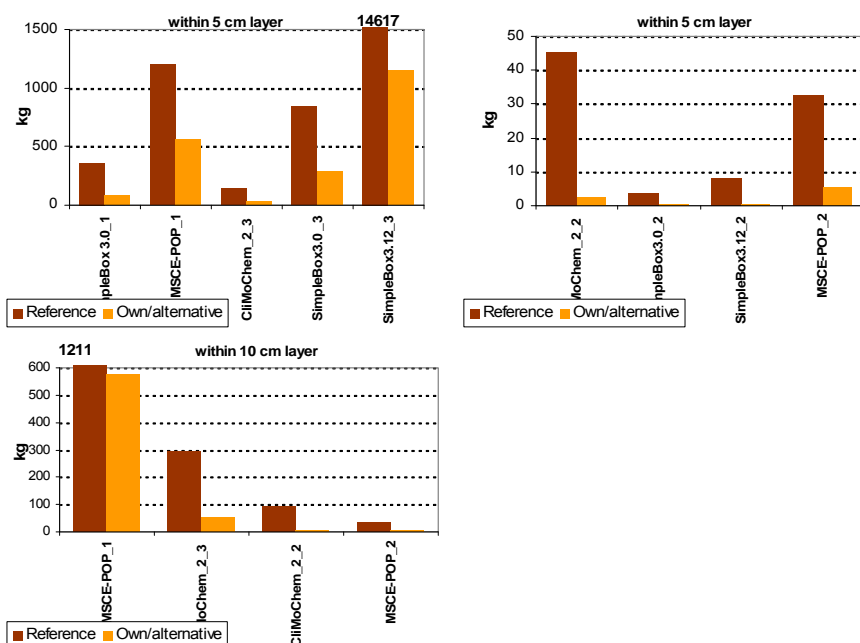


Fig. C.56. Comparison of PCB-180 mass degraded within 5 and 10 cm soil layers calculated by different models on the basis of two data set

Water. Comparison of annual values of PCB-180 masses degraded in water layer of 200 m calculated by different models on the basis of zero initial concentrations and with the use of “**reference**” data set is presented in Fig. C.57a. Fig. C.57b shows the same results but obtained on the basis of initial concentrations or historical emissions. In the latter figure different color of columns corresponds to the different types of calculations (one-year calculations on the basis of initial data; then long-term calculations with historical emissions). The blue line in the plot shows the value of the corresponding parameter averaged between models.

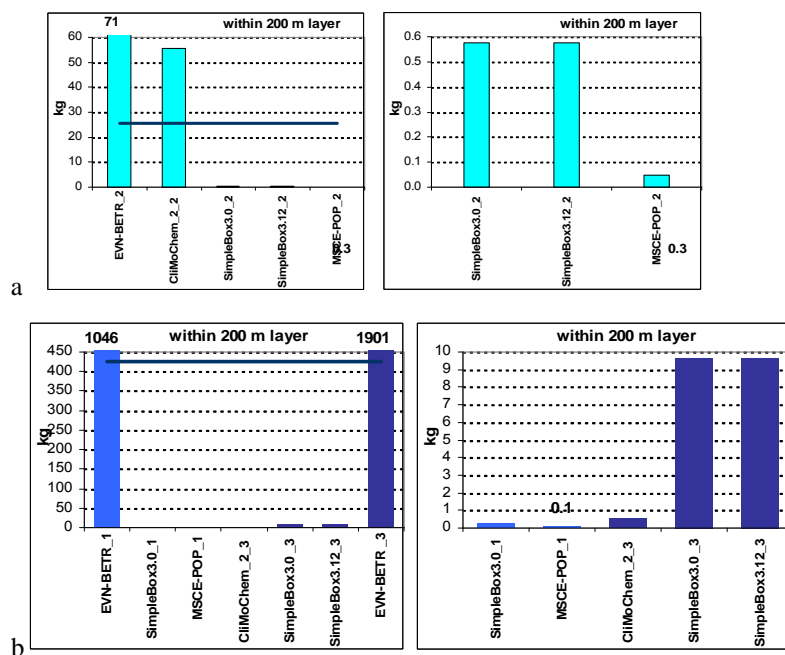


Fig. C.57. Comparison of annual values of PCB-180 masses degraded in water within 200 m layer calculated by different models on the basis of “reference” data set (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

Comparison of annual values of PCB-180 masses degraded in water layer of 200 m calculated by different models on the basis of zero initial concentrations and with the use of “*own or alternative*” data sets is presented in Fig. C.58a (blue line corresponds to the averaged value). Fig. C.58b shows the same results but obtained on the basis of initial concentrations or historical emissions. In the latter figure different color of columns corresponds to the different types of calculations (one-year calculations on the basis of initial data; then long-term calculations with historical emissions).

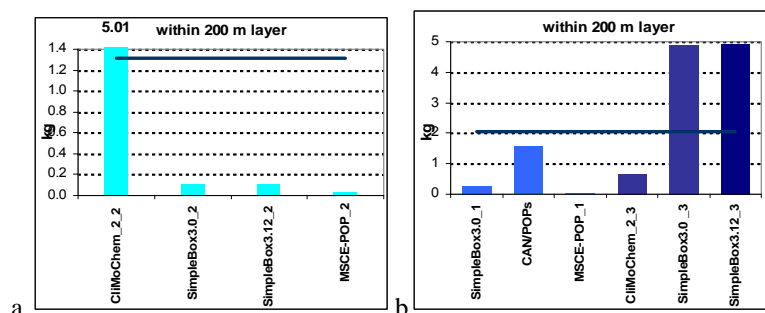


Fig. C.58. Comparison of annual values of PCB-180 masses degraded in water within 200 m layer calculated by different models on the basis of “own or alternative” data sets (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

Annual values of PCB-180 mass degraded in the 200m layer of water obtained by the participating models on the basis of “reference” and “own/alternative” data sets are compared in Fig. C.59.

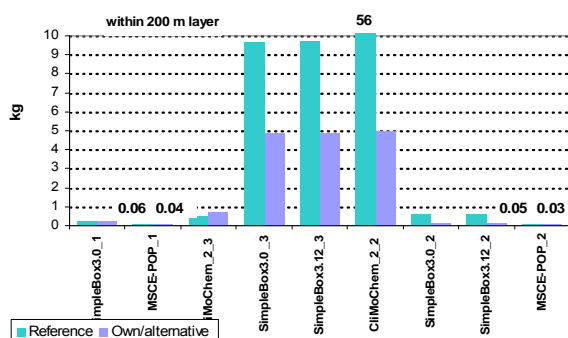


Fig. C.59. Comparison of PCB-180 mass degraded within 200 m water layer calculated by different models on the basis of two data sets

Vegetation. Annual values of PCB-180 mass degraded in vegetation obtained by the participating models on the basis of “reference” and “own/alternative” data sets are shown in Fig. C.60.

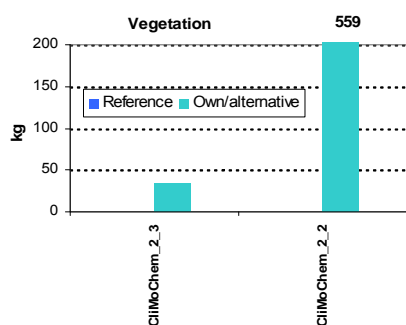


Fig. C.60. Comparison of PCB-180 mass degraded in vegetation calculated by different models on the basis of two data sets

Relative distribution of PCB mass degraded in the environmental compartments

The presented estimates of PCB-180 masses degraded in the main environmental compartments allow one to reveal the relative contributions of degradation process occurs in this or that media to the overall mass of PCB-180 in the whole environment. Below, the comparison of relative fractions of PCB-180 mass degraded in the main environmental media in relation to the mass balance estimates is presented. Of note, here and hereinafter fractions of mass degraded in different media are the ratios of the degraded mass and the mass contained in the considered compartment (taking into account also degraded mass).

Fractions of PCB-180 mass degraded in the atmosphere calculated by the participating models on the basis of zero and non-zero initial conditions are presented in Figs. 3.61a and b, respectively. In these figures fractions of PCB-180 mass degraded in the atmosphere calculated by the different models with the use of “reference” and “own/alternative” data sets are also compared.

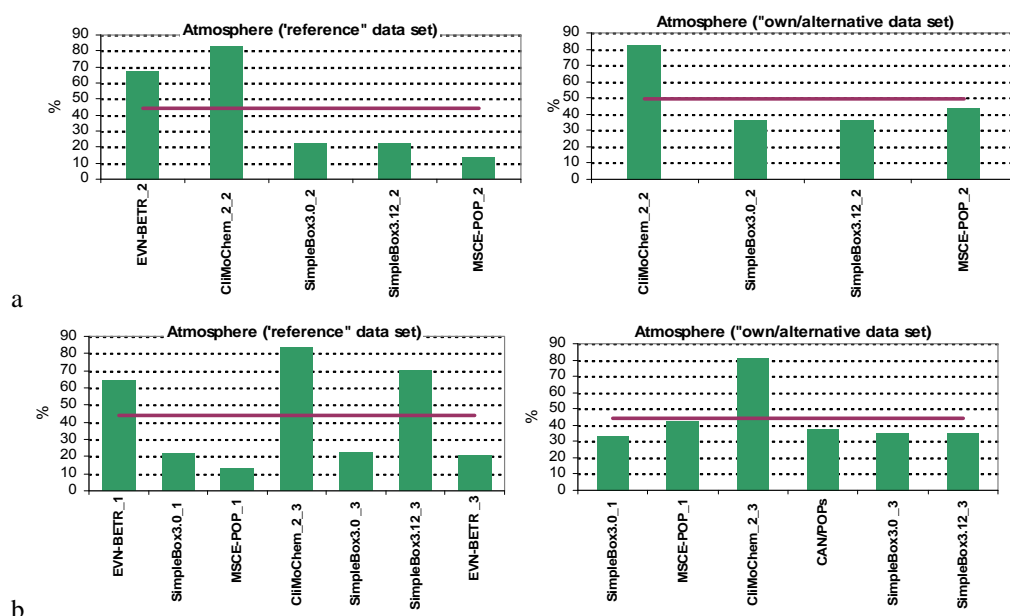


Fig. C.61. Fractions of PCB-180 mass degraded in the atmosphere calculated by the participating models on the basis of “reference” and “own or alternative” data sets (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

In Fig. C.62 a and b fractions of PCB-180 mass degraded in soil calculated by the different models on the basis of zero and non-zero initial conditions are presented, respectively. In these figures fractions of PCB-180 mass degraded in soil calculated by the different models with the use of “reference” and “own/alternative” data sets are also compared.

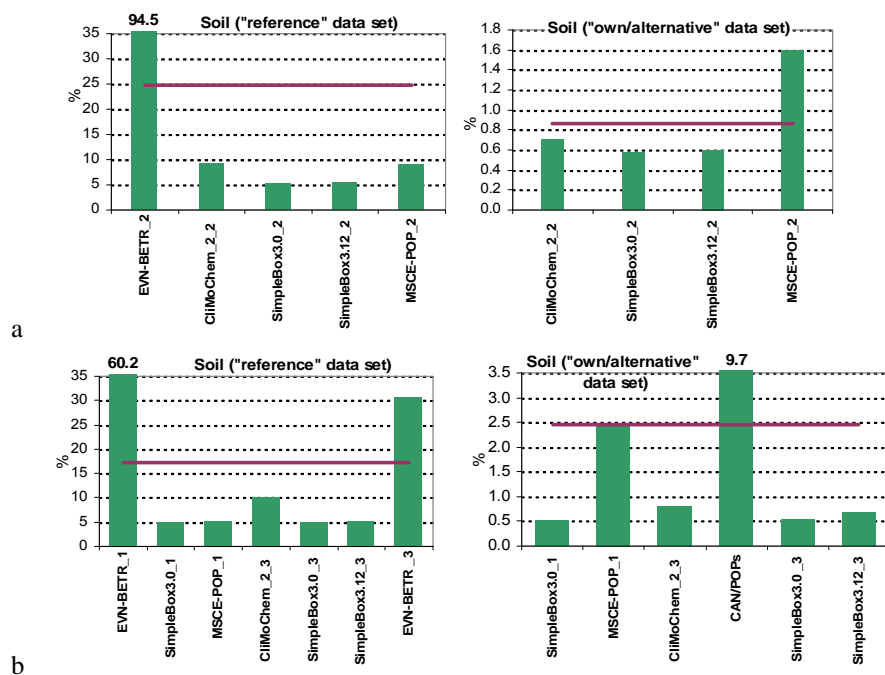


Fig. C.62. Fractions of PCB-180 mass degraded in soil calculated by the participating models on the basis of “reference” and “own or alternative” data sets (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

Fractions of PCB-180 mass degraded in seawater calculated by the participating on the basis of zero and non-zero initial conditions are presented in Figs. 3.63a and b, respectively. In these figures fractions of PCB-180 mass degraded in the atmosphere calculated by the different models with the use of “reference” and “own/alternative” data sets are also compared.

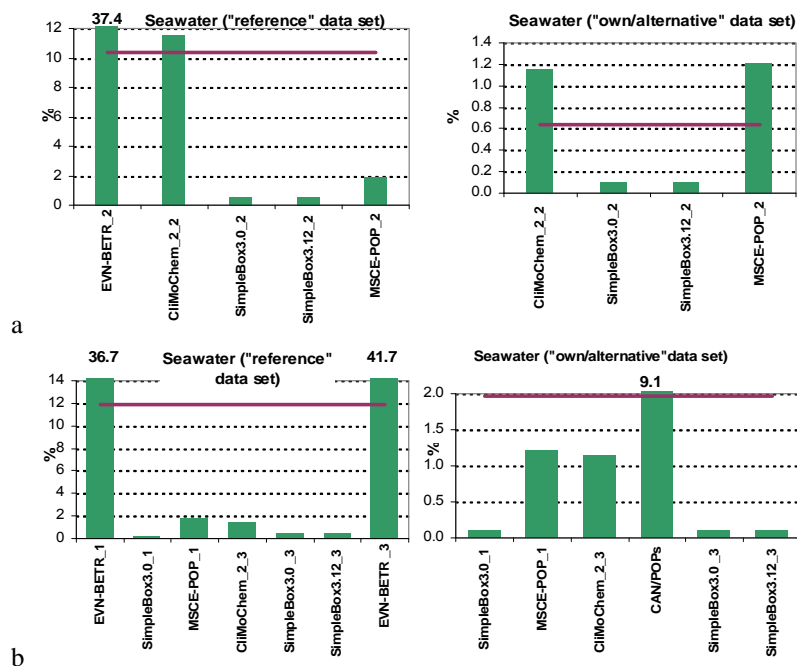


Fig. C.63. Fractions of PCB-180 mass degraded in seawater calculated by the participating models on the basis of “reference” and “own or alternative” data sets (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

For the participating models, which consider process of degradation in vegetation, fractions of PCB-180 mass degraded in vegetation calculated on the basis of zero and non-zero initial conditions are presented in Figs. 3.64.

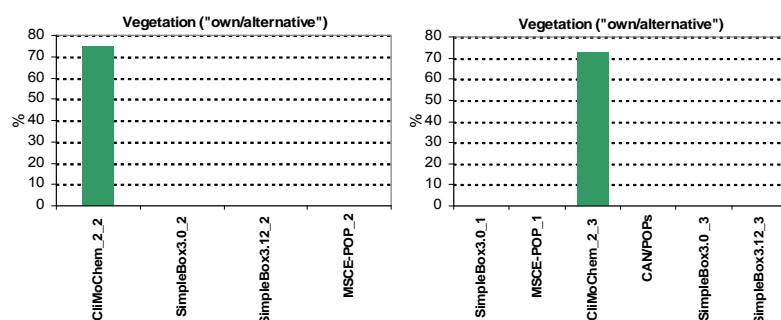


Fig. C.64. Fractions of PCB-180 mass degraded in vegetation calculated by the participating models on the basis of “own or alternative” data sets

3.2.6. Comparison of calculated values of PCB-180 mass deposited into deep sea

In this section a comparison of results calculated by CliMoChem model with historical emission scenario on the basis of their own Land Cover Data [DeFries and Townshend, 1994] and Land Cover Data given as input data for this intercomparison study [Guo and Chen, 1994] is presented. Of note, contrary to the calculations discussed in the previous and subsequent sections in this simulation, PCB-180 is emitted as pulse emission into air each year at the beginning of season one.

Reference data set. Two sets of calculated values of PCB-180 mass deposited into deep sea (kg) obtained by CliMoChem model on the basis of “reference” data set together with statistical parameters used for evaluation are presented in Table C.41.

Table C.41. Calculation results: PCB-180 mass deposited into deep sea (kg) calculated by CliMoChem model on the basis of “reference” data set and statistical parameters used for evaluation

Month	CliMoChem_1_3	CliMoChem_2_3	m	σ
Season_1	37.38	41.72	39.55	3.07
Season_2	23.75	26.39	25.07	1.87
Season_3	14.31	15.85	15.08	1.09
Season_4	10.31	11.48	10.90	0.83
Annual	85.75	95.45	90.60	6.86

CliMoChem_1_3 – CliMoChem results calculated on the basis of their own Land Cover Data;

CliMoChem_2_3 – CliMoChem results calculated on the basis of Land Cover Data given as input data for this intercomparison study

Seasonal values of PCB-180 mass deposited into deep sea calculated by CliMoChem model on the basis of “reference” data set are compared in Fig. C.65.

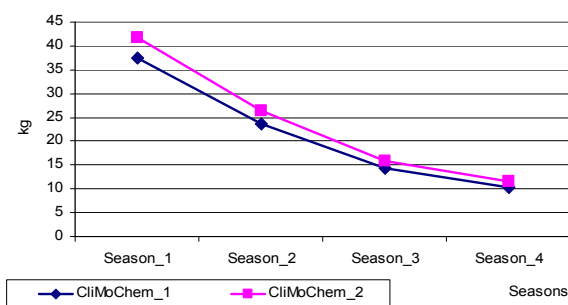


Fig. C.65. PCB-180 mass deposited into deep sea (kg) calculated by CliMoChem model on the basis of “reference” data set

Own/alternative data set. Two versions of calculation results on PCB-180 mass deposited into deep sea (kg) obtained by CliMoChem model on the basis of “own or alternative” data sets together with statistical parameters used for evaluation are presented in Table C.42.

Table C.42. Calculation results: PCB-180 mass deposited into deep sea (kg) calculated by CliMoChem model on the basis of “own or alternative” data sets and statistical parameters used for evaluation.

Month	CliMoChem_1_3	CliMoChem_2_3	<i>m</i>	σ
Season_1	27.70	32.71	30.20	3.54
Season_2	22.39	26.62	24.51	2.99
Season_3	16.39	19.57	17.98	2.25
Season_4	13.67	16.48	15.08	1.98
Annual	80.16	95.37	87.77	10.76

CliMoChem_1_3 – CliMoChem results calculated on the basis of their own Land Cover Data;

CliMoChem_2_3 – CliMoChem results calculated on the basis of Land Cover Data given as input data for this intercomparison study

Seasonal values of PCB-180 mass deposited into deep sea calculated by CliMoChem model on the basis of “own or alternative” data sets are compared in Fig. C.66.

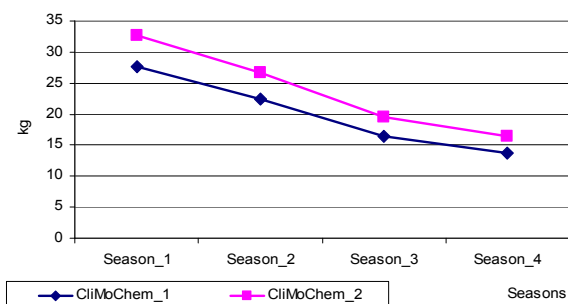


Fig. C.66. PCB-180 mass deposited into deep sea (kg) calculated by CliMoChem model on the basis of “own or alternative” data sets

Comparison between results obtained on the basis of two data sets. The percentage difference between calculation results obtained with two data sets of physical-chemical properties (for those models who provided calculations for both these sets) is shown in Table C.45.

Table C.45. The percentage difference between calculation results on PCB-180 mass deposited into deep sea obtained by CliMoChem model on the basis of two data sets: “reference” and “own or alternative” data sets

Month	CliMoChem_1_3	CliMoChem_2_3
Season_1	-26%	-22%
Season_2	-6%	1%
Season_3	15%	23%
Season_4	33%	43%
Annual	-7%	-0.1%

CliMoChem_1_3 – CliMoChem results calculated on the basis of their own Land Cover Data;

CliMoChem_2_3 – CliMoChem results calculated on the basis of Land Cover Data given as input data for this intercomparison study

C.3. Mass flows transported in/out the specified domain: inflow and outflow

Mass flows of PCB-180 transported in/out the specified domain (inflow and outflow) are calculated by the participating models on the basis of atmospheric emission estimates presented by [Breivik *et al.* 2002a] (see also www.nilu.no/projects/globalpcb/). The higher (or worst-case) emission estimates for 1981-2000 are applied.

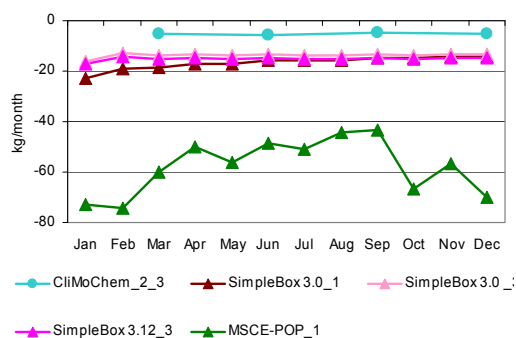
All amount of emissions is released into the atmosphere and is uniformly distributed throughout a year. In calculations of CAN/POPs, SimpleBox and MSCE-POP models, a value of PCB-180 total annual emissions in 2000 equals on average 1511 kg. In CliMoChem model the global emission data were summarized to zone-specific emissions (10 zones) and for the specified domain emission data for the model zones 2 and 3 (of 10) are used. At that emission value in 2000 used by CliMoChem for PCB-180 totals to 2216 kg.

It should be noted that transport into the calculation domain is supposed to be positive.

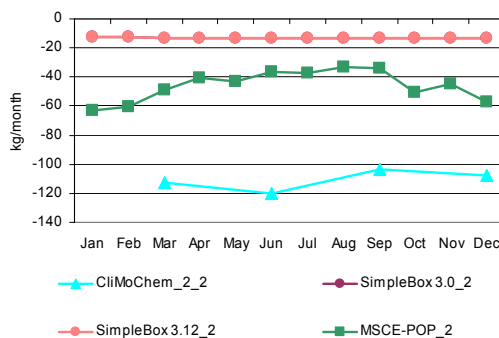
C.3.1. Comparison of calculated values of PCB-180 mass flows transported in/out the calculation domain through the atmosphere.

Reference data set. Calculation results on PCB-180 mass flows transported in/out the calculation domain through the atmosphere calculated by the models on the basis of “reference” data set together with statistical parameters used for evaluation are presented in Table C.44.

Monthly values of PCB-180 mass flows transported in/out the calculation domain through the atmosphere calculated by all participating models on the basis of “reference” data set and taking into account non-zero (initial concentrations in media or historical emissions) and zero initial conditions are compared in Fig. C.67 a and b, respectively.



a



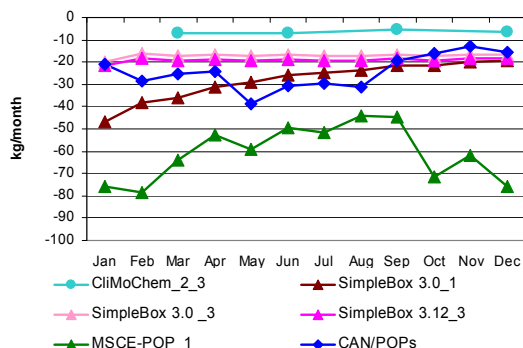
b

Fig. C.67a. PCB-180 mass flows transported in/out the calculation domain through the atmosphere (kg/month) calculated by the participating models on the basis of “reference” data set and non-zero initial conditions

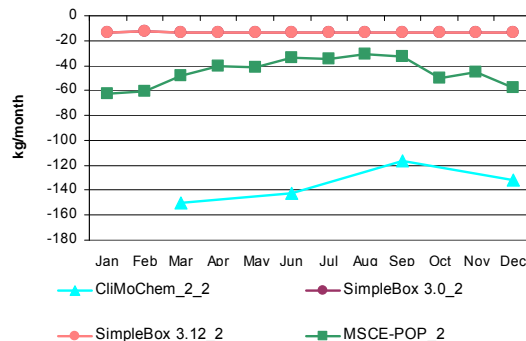
Fig. C.67b. PCB-180 mass flows transported in/out the calculation domain through the atmosphere (kg/month) calculated by the participating models on the basis of “reference” data set and zero initial conditions

Own/alternative data set. Calculation results on PCB-180 mass flows transported in/out the calculation domain through the atmosphere calculated by models on the basis of “own or alternative” data sets together with statistical parameters used for evaluation are presented in Table C.45.

Monthly values of PCB-180 mass flows transported in/out of the calculation domain through atmosphere calculated by the participating models on the basis of “own or alternative” data sets and taking into account non-zero (initial concentrations in media or historical emissions) and zero initial conditions are compared in Fig. C.68 a and b, respectively.



a



b

Fig. C.68a. PCB-180 mass flows transported in/out the calculation domain through the atmosphere (kg/month) calculated by the participating models on the basis of “own or alternative” data set and non-zero initial conditions

Fig. C.68b. PCB-180 mass flows transported in/out the calculation domain through the atmosphere (kg/month) calculated by the participating models on the basis of “own or alternative” data set and zero initial conditions

Comparison between results obtained on the basis of two data sets. A comparison of the calculation results obtained with two data sets of physical-chemical properties (for those models who provided calculations for both these sets) is shown in Table C.46.

Table C.44. Calculation results: PCB-180 mass flows transported in/out the calculation domain through the atmosphere (kg/month) calculated by models on the basis of “reference” data set and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data		Results obtained on the basis of historical emissions			<i>m</i>	σ	Month	Results obtained on the basis of zero initial concentrations				<i>m</i>	σ
	SimpleBox 3.0_1 ^a	MSCE-POP_1	CliMoChem_2_3	SimpleBox 3.0_3 ^a	SimpleBox 3.12_3 ^a				CliMoChem_2_2	SimpleBox 3.0_2 ^a	SimpleBox 3.12_2 ^a	MSCE-POP_2		
Jan	-22.7	-72.7		-16.1	-17.4	-32.2	27.1	Jan		-12.7	-12.7	-62.7	-29.3	28.9
Feb	-18.9	-74.1		-12.9	-14.2	-30.0	29.5	Feb		-12.5	-12.5	-60.3	-28.4	27.6
Mar	-18.8	-60.0		-13.8	-15.1	-26.9	22.1	Mar		-13.4	-13.4	-48.5	-25.1	20.3
Seas_1	-60.4	-206.7	-16.1	-42.9	-46.7	-74.5	75.6	Seas_1	-339.2	-38.5	-38.5	-171.4	-146.9	142.7
Apr	-17.2	-49.9		-13.4	-14.6	-23.8	17.5	Apr		-12.9	-12.9	-40.8	-22.2	16.1
May	-16.9	-56.2		-13.8	-15.1	-25.5	20.5	May		-13.4	-13.4	-43.4	-23.4	17.3
Jun	-15.8	-48.6		-13.4	-14.6	-23.1	17.0	Jun		-12.9	-12.9	-36.3	-20.7	13.5
Seas_2	-49.9	-154.7	-17.3	-40.5	-44.3	-61.4	53.6	Seas_2	-360.0	-39.3	-39.3	-120.5	-139.7	151.7
Jul	-15.9	-50.7		-13.8	-15.1	-23.9	17.9	Jul		-13.4	-13.4	-37.3	-21.4	13.8
Aug	-15.5	-44.2		-13.8	-15.1	-22.1	14.7	Aug		-13.4	-13.4	-33.1	-20.0	11.4
Sep	-14.7	-43.4		-13.3	-14.6	-21.5	14.6	Sep		-13.0	-13.0	-33.9	-20.0	12.1
Seas_3	-46.1	-138.4	-14.9	-40.9	-44.7	-57.0	47.2	Seas_3	-310.3	-39.7	-39.7	-104.4	-123.5	128.2
Oct	-15.0	-66.5		-13.8	-15.0	-27.6	25.9	Oct		-13.4	-13.4	-50.5	-25.7	21.4
Nov	-14.3	-56.9		-13.3	-14.6	-24.8	21.4	Nov		-13.0	-13.0	-44.5	-23.5	18.2
Dec	-14.1	-70.2		-13.3	-14.5	-28.1	28.1	Dec		-13.0	-13.0	-56.8	-27.6	25.3
Seas_4	-43.4	-193.5	-15.7	-40.4	-44.2	-67.4	71.4	Seas_4	-322.3	-39.3	-39.3	-151.8	-138.2	133.7
Annual	-199.8	-693.3	-64.1	-164.8	-179.9	-260.4	247.6	Annual	-1331.7	-156.9	-156.9	-548.0	-548.4	553.8

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

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;

^a - SimpleBox data are presented for moderate scale.

Table C.45. Calculation results: PCB-180 mass flows transported in/out the calculation domain through the atmosphere (kg/month) calculated by models on the basis of “own or alternative” data sets and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data			Results obtained on the basis of historical emissions			<i>m</i>	σ	Month	Results obtained on the basis of zero initial concentrations				<i>m</i>	σ
	CAN/POPs	SimpleBox 3.0_1 ^a	MSCE-POP_1	CliMo Chem_2_3	SimpleBox 3.0_3 ^a	SimpleBox 3.12_3 ^a				CliMo Chem_2_2	SimpleBox 3.0_2 ^a	SimpleBox 3.12_2 ^a	MSCE-POP_2		
Jan	-21.00	-46.81	-75.86		-19.81	-21.68	-37.0	24.5	Jan		-13.05	-13.05	-62.57	-29.6	28.6
Feb	-28.42	-38.23	-78.56		-16.24	-18.08	-35.9	25.4	Feb		-12.93	-12.93	-60.19	-28.7	27.3
Mar	-25.49	-35.87	-63.74		-17.32	-19.29	-32.3	19.0	Mar		-13.84	-13.84	-48.35	-25.3	19.9
Seas_1	-74.91	-120.91	-218.15	-21.33	-53.37	-59.05	-91.3	70.2	Seas_1	-450.21	-39.82	-39.82	-171.11	-175.2	193.5
Apr	-24.05	-30.99	-52.85		-16.73	-18.64	-28.7	14.6	Apr		-13.41	-13.41	-40.54	-22.5	15.7
May	-38.70	-29.08	-58.89		-17.26	-19.23	-32.6	17.0	May		-13.87	-13.87	-41.66	-23.1	16.0
Jun	-30.43	-25.92	-49.34		-16.68	-18.59	-28.2	13.1	Jun		-13.43	-13.43	-33.75	-20.2	11.7
Seas_2	-93.17	-86.00	-161.08	-20.74	-50.66	-56.46	-78.0	48.3	Seas_2	-427.65	-40.71	-40.71	-115.94	-156.3	184.4
Jul	-29.54	-24.98	-51.52		-17.21	-19.19	-28.5	13.8	Jul		-13.89	-13.89	-34.89	-20.9	12.1
Aug	-31.18	-23.51	-43.91		-17.20	-19.17	-27.0	10.9	Aug		-13.90	-13.90	-30.33	-19.4	9.5
Sep	-19.10	-21.60	-44.45		-16.63	-18.54	-24.1	11.5	Sep		-13.46	-13.46	-32.26	-19.7	10.9
Seas_3	-79.82	-70.09	-139.87	-16.75	-51.04	-56.90	-69.1	40.8	Seas_3	-349.14	-41.24	-41.24	-97.49	-132.3	147.0
Oct	-16.18	-21.35	-71.46		-17.17	-19.14	-29.1	23.8	Oct		-13.91	-13.91	-50.02	-25.9	20.9
Nov	-12.66	-19.86	-61.86		-16.60	-18.51	-25.9	20.3	Nov		-13.47	-13.47	-45.06	-24.0	18.2
Dec	-15.81	-19.20	-75.95		-16.59	-18.50	-29.2	26.2	Dec		-13.47	-13.47	-57.69	-28.2	25.5
Seas_4	-44.65	-60.40	-209.27	-19.08	-50.35	-56.15	-73.3	68.2	Seas_4	-395.73	-40.85	-40.85	-152.78	-157.6	167.3
Annual	-292.55	-337.40	-728.38	-77.89	-205.42	-228.57	-311.7	222.5	Annual	-1622.73	-162.61	-162.61	-537.32	-621.3	690.6

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

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;

a - SimpleBox data are presented for moderate scale.

Table C.46. Comparison of the calculation results on PCB-180 mass flows transported in/out the calculation domain through the atmosphere (kg/month) obtained by models on the basis of two data sets: “reference” and “own or alternative”

Month	CliMoChem_2_3		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		CliMoChem_2_2	
	ref	own	ref	alt	ref	alt	ref	own	ref	alt	ref	alt	ref	own	ref	own	ref	own
Jan			-22.74	-46.81	-12.7	-13.05	-12.7	-13.05	-16.10	-19.81	-17.35	-21.68	-72.68	-75.86	-62.7	-62.57		
Feb			-18.85	-38.23	-12.5	-12.93	-12.5	-12.93	-12.94	-16.24	-14.17	-18.08	-74.06	-78.56	-60.3	-60.19		
Mar			-18.77	-35.87	-13.4	-13.84	-13.4	-13.84	-13.82	-17.32	-15.13	-19.29	-59.97	-63.74	-48.5	-48.35		
Seas_1	-16.12	-21.33	-60.37	-120.91	-38.5	-39.82	-38.5	-39.82	-42.87	-53.37	-46.66	-59.05	-206.71	-218.15	-171.4	-171.11	-339.21	-450.21
Apr			-17.16	-30.99	-12.9	-13.41	-12.9	-13.41	-13.37	-16.73	-14.63	-18.64	-49.90	-52.85	-40.8	-40.54		
May			-16.94	-29.08	-13.4	-13.87	-13.4	-13.87	-13.81	-17.26	-15.10	-19.23	-56.19	-58.89	-43.4	-41.66		
Jun			-15.82	-25.92	-12.9	-13.43	-12.9	-13.43	-13.35	-16.68	-14.60	-18.59	-48.58	-49.34	-36.3	-33.75		
Seas_2	-17.35	-20.74	-49.92	-86.00	-39.3	-40.71	-39.3	-40.71	-40.53	-50.66	-44.34	-56.46	-154.68	-161.08	-120.5	-115.94	-359.97	-427.65
Jul			-15.88	-24.98	-13.4	-13.89	-13.4	-13.89	-13.79	-17.21	-15.08	-19.19	-50.74	-51.52	-37.3	-34.89		
Aug			-15.50	-23.51	-13.4	-13.90	-13.4	-13.90	-13.79	-17.20	-15.07	-19.17	-44.21	-43.91	-33.1	-30.33		
Sep			-14.72	-21.60	-13.0	-13.46	-13.0	-13.46	-13.34	-16.63	-14.57	-18.54	-43.40	-44.45	-33.9	-32.26		
Seas_3	-14.92	-16.75	-46.10	-70.09	-39.7	-41.24	-39.7	-41.24	-40.92	-51.04	-44.72	-56.90	-138.36	-139.87	-104.4	-97.49	-310.28	-349.14
Oct			-14.96	-21.35	-13.4	-13.91	-13.4	-13.91	-13.78	-17.17	-15.05	-19.14	-66.46	-71.46	-50.5	-50.02		
Nov			-14.29	-19.86	-13.0	-13.47	-13.0	-13.47	-13.33	-16.60	-14.56	-18.51	-56.86	-61.86	-44.5	-45.06		
Dec			-14.13	-19.20	-13.0	-13.47	-13.0	-13.47	-13.33	-16.59	-14.55	-18.50	-70.20	-75.95	-56.8	-57.69		
Seas_4	-15.74	-19.08	-43.38	-60.40	-39.3	-40.85	-39.3	-40.85	-40.44	-50.35	-44.15	-56.15	-193.52	-209.27	-151.8	-152.78	-322.25	-395.73
Annual	-64.13	-77.89	-199.76	-337.40	-156.9	-162.61	-156.9	-162.61	-164.76	-205.42	-179.87	-228.57	-693.27	-728.38	-548.0	-537.32	-1331.71	-1622.73

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

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.

C.3.2. Comparison of calculated values of PCB-180 mass flows transported in/out the calculation domain through ocean

Reference data set. Calculation results on PCB-180 mass flows transported in/out the calculation domain through ocean calculated by the models on the basis of “reference” data set together with statistical parameters used for evaluation are presented in Table C.47.

Monthly values of PCB-180 mass flows transported in/out the calculation domain through ocean calculated by all participating models on the basis of “reference” data set and taking into account non-zero (initial concentrations in media or historical emissions) and zero initial conditions are compared in Fig. C.69 a and b, respectively.

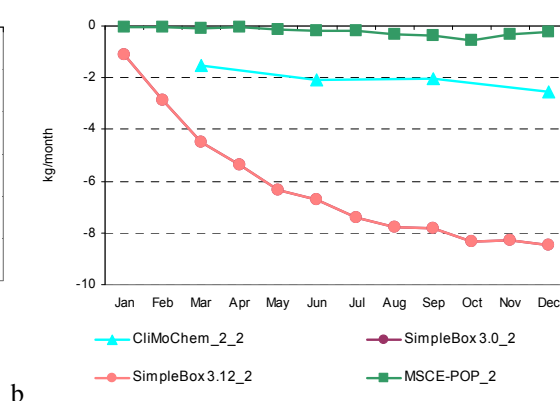
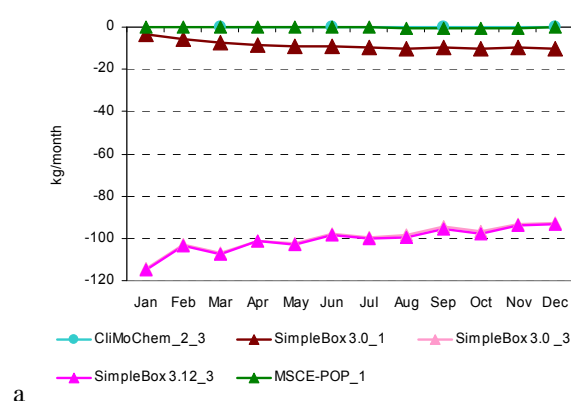


Fig. C.69a. PCB-180 mass flows transported in/out the calculation domain through ocean (kg/month) calculated by the participating models on the basis of “reference” data set and non-zero initial conditions

Fig. C.69b. PCB-180 mass flows transported in/out the calculation domain through ocean (kg/month) calculated by the participating models on the basis of “reference” data set and zero initial conditions

Own/alternative data set. Calculation results on PCB-180 mass flows transported in/out the calculation domain through ocean calculated by models on the basis of “own or alternative” data sets together with statistical parameters used for evaluation are presented in Table C.48.

Monthly values of PCB-180 mass flows transported in/out the calculation domain through ocean calculated by all participating models on the basis of “own or alternative” data sets and taking into account non-zero (initial concentrations in media or historical emissions) and zero initial conditions are compared in Fig. C.70 a and b, respectively.

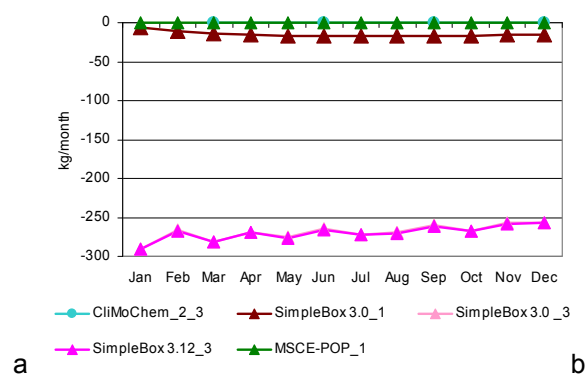


Fig. C.70a. PCB-180 mass flows transported in/out the calculation domain through ocean (kg/month) calculated by the participating models on the basis of “own or alternative” data set and non-zero initial conditions

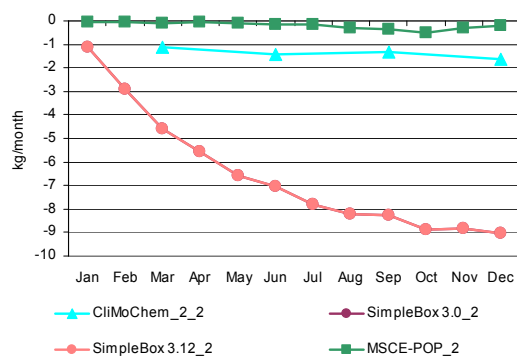


Fig. C.70b. PCB-180 mass flows transported in/out the calculation domain through ocean (kg/month) calculated by the participating models on the basis of “own or alternative” data set and zero initial conditions

Comparison between results obtained on the basis of two data sets. A comparison of the calculation results obtained with two data sets of physical-chemical properties (for those models who provided calculations for both these sets) is shown in Table C.49.

Table C.47. Calculation results: PCB-180 mass flows transported in/out the calculation domain through ocean (kg/month) calculated by models on the basis of “reference” data set and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data		Results obtained on the basis of historical emissions			<i>m</i>	σ	Month	Results obtained on the basis of zero initial concentrations				<i>m</i>	σ
	MSCE-POP_1	SimpleBox 3.0_1 ^a	CliMoChem_2_3	SimpleBox 3.0_3 ^a	SimpleBox 3.12_3 ^a				CliMoChem_2_2	SimpleBox 3.0_2 ^a	SimpleBox 3.12_2 ^a	MSCE-POP_2		
Jan	-0.03	-3.37		-114.59	-114.64	-58.16	65.21	Jan		-1.11	-1.11	-0.03	-0.75	0.63
Feb	-0.06	-5.60		-103.08	-103.30	-53.01	57.98	Feb		-2.87	-2.87	-0.06	-1.93	1.62
Mar	-0.09	-7.62		-106.89	-107.27	-55.47	59.68	Mar		-4.49	-4.49	-0.08	-3.02	2.55
Seas_1	-0.18	-16.59	-0.58	-324.56	-325.20	-133.42	174.90	Seas_1	-4.61	-8.48	-8.47	-0.16	-5.43	3.96
Apr	-0.08	-8.37		-100.99	-101.46	-52.72	56.11	Apr		-5.38	-5.38	-0.07	-3.61	3.07
May	-0.14	-9.27		-102.42	-102.98	-53.70	56.70	May		-6.35	-6.35	-0.12	-4.27	3.60
Jun	-0.21	-9.34		-97.64	-98.23	-51.36	53.92	Jun		-6.72	-6.72	-0.17	-4.54	3.78
Seas_2	-0.42	-26.98	-0.66	-301.06	-302.67	-126.36	160.58	Seas_2	-6.26	-18.46	-18.44	-0.36	-10.88	9.07
Jul	-0.21	-9.88		-99.66	-100.31	-52.51	54.96	Jul		-7.41	-7.41	-0.17	-4.99	4.18
Aug	-0.41	-10.02		-98.62	-99.30	-52.09	54.26	Aug		-7.78	-7.78	-0.33	-5.30	4.30
Sep	-0.49	-9.79		-94.58	-95.27	-50.03	51.98	Sep		-7.82	-7.82	-0.37	-5.34	4.30
Seas_3	-1.11	-29.69	-0.63	-292.86	-294.88	-123.83	155.67	Seas_3	-6.17	-23.02	-23.00	-0.86	-13.26	11.46
Oct	-0.73	-10.19		-96.95	-97.68	-51.39	53.18	Oct		-8.34	-8.33	-0.56	-5.74	4.49
Nov	-0.42	-9.92		-93.14	-93.87	-49.34	51.15	Nov		-8.28	-8.28	-0.32	-5.63	4.59
Dec	-0.27	-9.97		-92.52	-93.26	-49.00	50.83	Dec		-8.47	-8.47	-0.21	-5.72	4.77
Seas_4	-1.42	-30.07	-0.54	-282.61	-284.80	-119.89	150.02	Seas_4	-7.68	-25.09	-25.08	-1.10	-14.74	12.25
Annual	-3.13	-103.33	-2.42	-1201.09	-1207.55	-503.51	641.07	Annual	-24.72	-75.04	-75.00	-2.48	-44.31	36.61

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

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;

^a - SimpleBox data are presented for moderate scale.

Table C.48. Calculation results: PCB-180 mass flows transported in/out the calculation domain through ocean (kg/month) calculated by models on the basis of “own or alternative” data sets and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data		Results obtained on the basis of historical emissions			<i>m</i>	σ	Month	Results obtained on the basis of zero initial concentrations				<i>m</i>	σ
	SimpleBox 3.0_1 ^a	MSCE-POP_1	CliMo Chem_2_3	SimpleBox 3.0_3 ^a	SimpleBox 3.12_3 ^a				CliMo Chem_2_2	SimpleBox 3.0_2 ^a	SimpleBox 3.12_2 ^a	MSCE-POP_2		
Jan	-5.39	-0.03		-290.09	-290.03	-146.39	165.92	Jan		-1.10	-1.10	-0.03	-0.74	0.62
Feb	-10.45	-0.07		-266.74	-267.00	-136.06	151.10	Feb		-2.90	-2.89	-0.06	-1.95	1.64
Mar	-14.53	-0.09		-281.26	-281.76	-144.41	158.42	Mar		-4.59	-4.58	-0.08	-3.08	2.60
Seas_1	-30.36	-0.19	-0.61	-838.09	-838.79	-341.61	453.71	Seas_1	-3.37	-8.58	-8.58	-0.16	-5.17	4.15
Apr	-15.86	-0.08		-269.14	-269.79	-138.72	151.11	Apr		-5.54	-5.54	-0.07	-3.72	3.16
May	-17.28	-0.13		-275.55	-276.34	-142.33	154.45	May		-6.59	-6.59	-0.11	-4.43	3.74
Jun	-17.02	-0.21		-264.61	-265.44	-136.82	148.20	Jun		-7.03	-7.02	-0.16	-4.74	3.96
Seas_2	-50.16	-0.42	-0.68	-809.30	-811.58	-334.43	435.01	Seas_2	-4.32	-19.16	-19.15	-0.34	-10.74	9.85
Jul	-17.56	-0.21		-271.59	-272.55	-140.48	152.12	Jul		-7.79	-7.78	-0.16	-5.24	4.41
Aug	-17.34	-0.41		-269.95	-270.97	-139.67	151.18	Aug		-8.22	-8.21	-0.30	-5.58	4.57
Sep	-16.50	-0.49		-259.84	-260.88	-134.43	145.56	Sep		-8.29	-8.28	-0.34	-5.64	4.59
Seas_3	-51.40	-1.12	-0.60	-801.38	-804.40	-331.78	430.56	Seas_3	-3.91	-24.30	-24.28	-0.80	-13.32	12.73
Oct	-16.74	-0.74		-267.18	-268.30	-138.24	149.68	Oct		-8.86	-8.86	-0.51	-6.08	4.82
Nov	-15.90	-0.42		-257.35	-258.48	-133.04	144.33	Nov		-8.82	-8.82	-0.30	-5.98	4.92
Dec	-15.63	-0.26		-256.23	-257.39	-132.38	143.82	Dec		-9.04	-9.03	-0.19	-6.09	5.11
Seas_4	-48.27	-1.42	-0.55	-780.76	-784.16	-323.03	419.85	Seas_4	-4.91	-26.72	-26.71	-1.00	-14.84	13.81
Annual	-180.20	-3.15	-2.44	-3229.53	-3238.93	-1330.85	1739.06	Annual	-16.51	-78.77	-78.72	-2.30	-44.08	40.45

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

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;

a - SimpleBox data are presented for moderate scale.

Table C.49. Comparison of the calculation results on PCB-180 mass flows transported in/out the calculation domain through ocean (kg/month) obtained by models on the basis of two data sets: “reference” and “own or alternative” data sets

Month	CliMoChem_2_3		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		CliMoChem_2_2	
	ref	own	ref	alt	ref	alt	ref	alt	ref	alt	ref	alt	ref	own	ref	own	ref	own
Jan			-3.37	-5.39	-1.11	-1.10	-1.11	-1.10	-114.59	-290.09	-114.64	-290.03	-0.03	-0.03	-0.03	-0.03		
Feb			-5.60	-10.45	-2.87	-2.90	-2.87	-2.89	-103.08	-266.74	-103.30	-267.00	-0.06	-0.07	-0.06	-0.06		
Mar			-7.62	-14.53	-4.49	-4.59	-4.49	-4.58	-106.89	-281.26	-107.27	-281.76	-0.09	-0.09	-0.08	-0.08		
Seas_1	-0.58	-0.61	-16.59	-30.36	-8.48	-8.58	-8.47	-8.58	-324.56	-838.09	-325.20	-838.79	-0.18	-0.19	-0.16	-0.16	-4.61	-3.37
Apr			-8.37	-15.86	-5.38	-5.54	-5.38	-5.54	-100.99	-269.14	-101.46	-269.79	-0.08	-0.08	-0.07	-0.07		
May			-9.27	-17.28	-6.35	-6.59	-6.35	-6.59	-102.42	-275.55	-102.98	-276.34	-0.14	-0.13	-0.12	-0.11		
Jun			-9.34	-17.02	-6.72	-7.03	-6.72	-7.02	-97.64	-264.61	-98.23	-265.44	-0.21	-0.21	-0.17	-0.16		
Seas_2	-0.66	-0.68	-26.98	-50.16	-18.46	-19.16	-18.44	-19.15	-301.06	-809.30	-302.67	-811.58	-0.42	-0.42	-0.36	-0.34	-6.26	-4.32
Jul			-9.88	-17.56	-7.41	-7.79	-7.41	-7.78	-99.66	-271.59	-100.31	-272.55	-0.21	-0.21	-0.17	-0.16		
Aug			-10.02	-17.34	-7.78	-8.22	-7.78	-8.21	-98.62	-269.95	-99.30	-270.97	-0.41	-0.41	-0.33	-0.30		
Sep			-9.79	-16.50	-7.82	-8.29	-7.82	-8.28	-94.58	-259.84	-95.27	-260.88	-0.49	-0.49	-0.37	-0.34		
Seas_3	-0.63	-0.60	-29.69	-51.40	-23.02	-24.30	-23.00	-24.28	-292.86	-801.38	-294.88	-804.40	-1.11	-1.12	-0.86	-0.80	-6.17	-3.91
Oct			-10.19	-16.74	-8.34	-8.86	-8.33	-8.86	-96.95	-267.18	-97.68	-268.30	-0.73	-0.74	-0.56	-0.51		
Nov			-9.92	-15.90	-8.28	-8.82	-8.28	-8.82	-93.14	-257.35	-93.87	-258.48	-0.42	-0.42	-0.32	-0.30		
Dec			-9.97	-15.63	-8.47	-9.04	-8.47	-9.03	-92.52	-256.23	-93.26	-257.39	-0.27	-0.26	-0.21	-0.19		
Seas_4	-0.54	-0.55	-30.07	-48.27	-25.09	-26.72	-25.08	-26.71	-282.61	-780.76	-284.80	-784.16	-1.42	-1.42	-1.10	-1.00	-7.68	-4.91
Annual	-2.42	-2.44	-103.33	-180.20	-75.04	-78.77	-75.00	-78.72	-1201.09	-3229.53	-1207.55	-3238.93	-3.13	-3.15	-2.48	-2.30	-24.72	-16.51

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

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.

C.3.3. Calculated values of PCB-180 mass flows transported in/out the calculation domain through other compartments

Reference data set. Calculation results on PCB-180 mass flows transported in/out the calculation domain through sediments, soil and vegetation calculated by SimpleBox model on the basis of “reference” data set together with statistical parameters used for evaluation are presented in Table C.50.

Monthly values of PCB-180 mass flows transported in/out the calculation domain through sediments, soil and vegetation calculated by SimpleBox model on the basis of “reference” data set are presented in Fig. C.71.

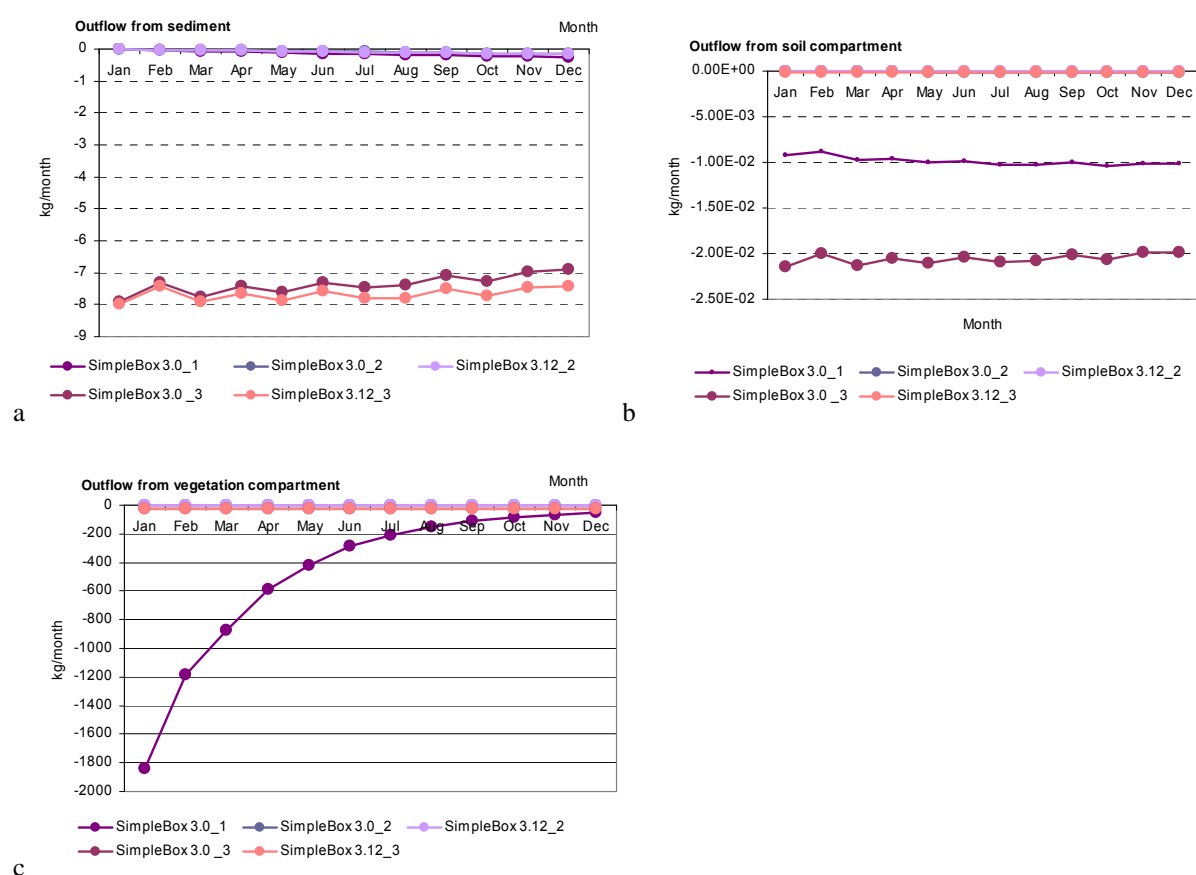


Fig. C.71. PCB-180 mass flows transported in/out the calculation domain through sediment (a), soil (b) and vegetation (c) calculated by SimpleBox on the basis of “reference” data set

Own/alternative data set. Calculation results on PCB-180 mass flows transported in/out the calculation domain through sediments, soil and vegetation calculated by SimpleBox model on the basis of “alternative” data sets together with statistical parameters used for evaluation are presented in Table C.51.

Monthly values of PCB-180 mass flows transported in/out the calculation domain through sediments, soil and vegetation calculated by SimpleBox model on the basis of “alternative” data set are compared in Fig. C.72.

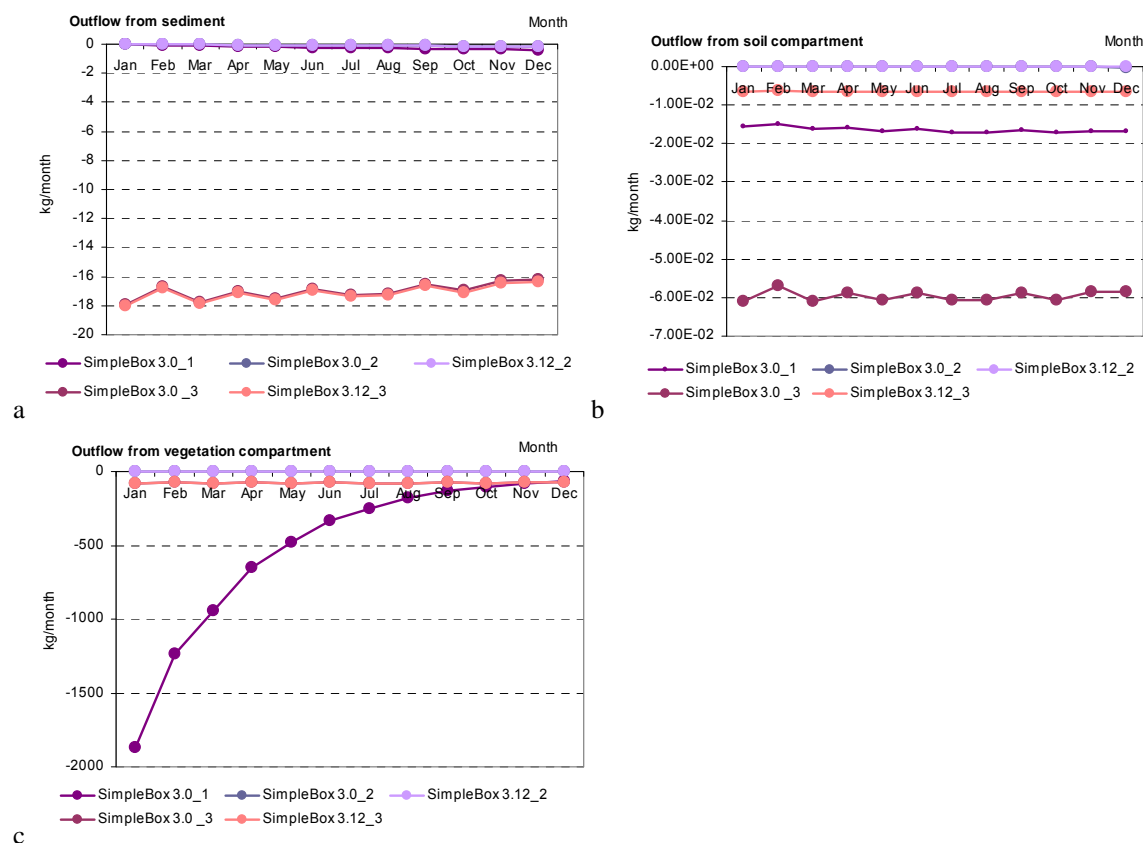


Fig. C.72. PCB-180 mass flows transported in/out the calculation domain through sediment (a), soil (b) and vegetation(c) calculated by SimpleBox on the basis of “alternative” data sets

Comparison between results obtained on the basis of two data sets. The percentage difference between calculation results obtained with two different data sets of physical-chemical properties (for SimpleBox model) is shown in Table C.52.

Table C.50. Calculation results: PCB-180 mass flows transported in/out the calculation domain through sediments, soil and vegetation (kg/month) calculated by SimpleBox on the basis of “reference” data set

Month	Sediment					Soil					Vegetation				
	Outflow from sediment compartment = burial					Outflow from soil compartment = leaching					Outflow from vegetation compartment = harvest of agricultural vegetation				
	SimpleBox 3.0_1	SimpleBox 3.0_2	SimpleBox 3.12_2	SimpleBox 3.0_3	SimpleBox 3.12_3	SimpleBox 3.0_1	SimpleBox 3.0_2	SimpleBox 3.12_2	SimpleBox 3.0_3	SimpleBox 3.12_3	SimpleBox 3.0_1	SimpleBox 3.0_2	SimpleBox 3.12_2	SimpleBox 3.0_3	SimpleBox 3.12_3
Jan	-0.02	-0.01	-0.01	-7.89	-7.98	-9.15E-03	-7.32E-06	-2.09E-09	-2.15E-02	-8.69E-05	-1842.5	-0.2	-0.2	-29.0	-29.1
Feb	-0.04	-0.02	-0.02	-7.32	-7.44	-8.85E-03	-2.13E-05	-5.98E-09	-2.00E-02	-8.06E-05	-1185.1	-0.4	-0.4	-26.4	-26.4
Mar	-0.07	-0.04	-0.04	-7.75	-7.92	-9.70E-03	-3.84E-05	-1.07E-08	-2.13E-02	-8.54E-05	-875.6	-0.7	-0.6	-27.5	-27.6
Apr	-0.09	-0.05	-0.05	-7.44	-7.64	-9.57E-03	-5.24E-05	-1.45E-08	-2.05E-02	-8.19E-05	-584.4	-0.8	-0.7	-26.2	-26.2
May	-0.12	-0.06	-0.07	-7.61	-7.87	-1.00E-02	-7.00E-05	-1.92E-08	-2.11E-02	-8.39E-05	-419.8	-1.0	-0.9	-26.7	-26.7
Jun	-0.14	-0.08	-0.08	-7.30	-7.59	-9.82E-03	-8.30E-05	-2.27E-08	-2.03E-02	-8.05E-05	-285.0	-1.0	-0.9	-25.6	-25.6
Jul	-0.16	-0.09	-0.09	-7.48	-7.81	-1.02E-02	-1.01E-04	-2.77E-08	-2.09E-02	-8.24E-05	-209.6	-1.1	-1.0	-26.2	-26.2
Aug	-0.19	-0.11	-0.11	-7.41	-7.78	-1.03E-02	-1.17E-04	-3.19E-08	-2.09E-02	-8.16E-05	-150.9	-1.2	-1.0	-26.0	-26.0
Sep	-0.20	-0.12	-0.12	-7.10	-7.51	-1.00E-02	-1.29E-04	-3.49E-08	-2.01E-02	-7.83E-05	-108.1	-1.2	-1.0	-25.0	-25.0
Oct	-0.23	-0.14	-0.14	-7.27	-7.73	-1.04E-02	-1.49E-04	-4.01E-08	-2.07E-02	-8.02E-05	-85.1	-1.3	-1.1	-25.6	-25.7
Nov	-0.24	-0.14	-0.15	-6.98	-7.45	-1.01E-02	-1.59E-04	-4.27E-08	-1.99E-02	-7.69E-05	-64.7	-1.2	-1.0	-24.7	-24.7
Dec	-0.26	-0.16	-0.16	-6.91	-7.43	-1.01E-02	-1.73E-04	-4.66E-08	-1.98E-02	-7.62E-05	-52.9	-1.3	-1.0	-24.5	-24.6
Annual	-1.75	-1.01	-1.02	-88.46	-92.14	-1.18E-01	-1.10E-03	-2.99E-07	-2.47E-01	-9.75E-04	-5863.8	-11.4	-9.9	-313.3	-313.8

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;

* - SimpleBox data are presented for moderate scale

Table C.51. Calculation results: PCB-180 mass flows transported in/out the calculation domain through sediment, soil and vegetation (kg/month) calculated by SimpleBox on the basis of “alternative” data set

Month	Sediment					Soil					Vegetation				
	Outflow from sediment compartment = burial					Outflow from soil compartment = leaching					Outflow from vegetation compartment = harvest of agricultural vegetation				
	SimpleBox 3.0_1	SimpleBox 3.0_2	SimpleBox 3.12_2	SimpleBox 3.0_3	SimpleBox 3.12_3	SimpleBox 3.0_1	SimpleBox 3.0_2	SimpleBox 3.12_2	SimpleBox 3.0_3	SimpleBox 3.12_3	SimpleBox 3.0_1	SimpleBox 3.0_2	SimpleBox 3.12_2	SimpleBox 3.0_3	SimpleBo x 3.12_3
Jan	-0.03	-0.01	-0.01	-17.96	-18.05	-1.56E-02	-6.93E-06	-1.51E-07	-6.09E-02	-6.68E-03	-1870.7	-0.2	-0.2	-80.2	-80.3
Feb	-0.07	-0.02	-0.02	-16.70	-16.78	-1.50E-02	-2.02E-05	-4.42E-07	-5.70E-02	-6.25E-03	-1239.8	-0.6	-0.5	-74.4	-74.5
Mar	-0.12	-0.03	-0.04	-17.73	-17.83	-1.63E-02	-3.65E-05	-7.99E-07	-6.08E-02	-6.68E-03	-942.8	-0.9	-0.8	-79.1	-79.2
Apr	-0.15	-0.05	-0.05	-17.05	-17.15	-1.60E-02	-5.00E-05	-1.10E-06	-5.88E-02	-6.46E-03	-647.2	-1.0	-1.0	-76.2	-76.4
May	-0.19	-0.06	-0.06	-17.50	-17.61	-1.67E-02	-6.69E-05	-1.47E-06	-6.08E-02	-6.67E-03	-477.4	-1.2	-1.2	-78.4	-78.7
Jun	-0.22	-0.08	-0.08	-16.83	-16.94	-1.63E-02	-7.96E-05	-1.75E-06	-5.88E-02	-6.45E-03	-332.1	-1.3	-1.2	-75.7	-75.9
Jul	-0.26	-0.09	-0.09	-17.28	-17.40	-1.70E-02	-9.76E-05	-2.14E-06	-6.07E-02	-6.66E-03	-249.3	-1.4	-1.3	-78.0	-78.3
Aug	-0.29	-0.11	-0.11	-17.16	-17.29	-1.71E-02	-1.13E-04	-2.49E-06	-6.07E-02	-6.65E-03	-182.6	-1.5	-1.4	-77.9	-78.2
Sep	-0.30	-0.12	-0.12	-16.50	-16.63	-1.66E-02	-1.25E-04	-2.73E-06	-5.87E-02	-6.44E-03	-132.4	-1.5	-1.4	-75.3	-75.6
Oct	-0.34	-0.14	-0.14	-16.94	-17.08	-1.72E-02	-1.44E-04	-3.16E-06	-6.06E-02	-6.65E-03	-104.7	-1.6	-1.4	-77.7	-78.0
Nov	-0.35	-0.14	-0.15	-16.29	-16.43	-1.67E-02	-1.54E-04	-3.39E-06	-5.86E-02	-6.43E-03	-79.6	-1.6	-1.4	-75.1	-75.4
Dec	-0.38	-0.16	-0.16	-16.18	-16.33	-1.68E-02	-1.69E-04	-3.72E-06	-5.86E-02	-6.42E-03	-64.6	-1.6	-1.4	-75.0	-75.4
Annual	-2.69	-1.00	-1.02	-204.13	-205.50	-1.97E-01	-1.06E-03	-2.33E-05	-7.15E-01	-7.84E-02	-6323.2	-14.4	-13.3	-922.9	-926.0

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;

* - SimpleBox data are presented for moderate scale.

Table C.52. The percentage difference between calculation results on PCB-180 mass flows transported in/out the calculation domain through sediments, soil and vegetation calculated by SimpleBox model on the basis of two data sets: “reference” and “alternative”

Month	Sediment					Soil					Vegetation				
	Outflow from sediment compartment = burial					Outflow from soil compartment = leaching					Outflow from vegetation compartment = harvest of agricultural vegetation				
	SimpleBox 3.0_1	SimpleBox 3.0_2	SimpleBox 3.12_2	SimpleBox 3.0_3	SimpleBox 3.12_3	SimpleBox 3.0_1	SimpleBox 3.0_2	SimpleBox 3.12_2	SimpleBox 3.0_3	SimpleBox 3.12_3	SimpleBox 3.0_1	SimpleBox 3.0_2	SimpleBox 3.12_2	SimpleBox 3.0_3	SimpleBox 3.12_3
Jan	66.8%	-2.6%	-2.6%	127.6%	126.3%	71%	-5%	7109%	184%	7588%	2%	24%	28%	176%	176%
Feb	72.3%	-1.9%	-1.9%	128.1%	125.7%	69%	-5%	7304%	185%	7651%	5%	26%	30%	182%	183%
Mar	69.8%	-1.6%	-1.5%	128.7%	125.1%	68%	-5%	7395%	186%	7715%	8%	27%	31%	187%	187%
Apr	66.4%	-1.3%	-1.2%	129.3%	124.5%	67%	-5%	7466%	187%	7781%	11%	27%	33%	191%	191%
May	62.9%	-1.1%	-1.0%	129.9%	123.9%	66%	-4%	7528%	188%	7847%	14%	27%	34%	194%	194%
Jun	59.7%	-0.8%	-0.8%	130.5%	123.3%	66%	-4%	7585%	189%	7914%	16%	28%	35%	196%	197%
Jul	56.7%	-0.6%	-0.5%	131.1%	122.7%	66%	-4%	7639%	190%	7982%	19%	27%	36%	198%	199%
Aug	54.0%	-0.4%	-0.3%	131.7%	122.1%	66%	-3%	7691%	191%	8051%	21%	27%	36%	200%	201%
Sep	51.6%	-0.2%	-0.1%	132.3%	121.5%	66%	-3%	7740%	192%	8119%	22%	27%	37%	201%	202%
Oct	49.3%	0.0%	0.2%	132.9%	120.9%	66%	-3%	7787%	193%	8189%	23%	26%	37%	203%	204%
Nov	47.3%	0.3%	0.4%	133.5%	120.4%	66%	-3%	7833%	194%	8259%	23%	25%	37%	204%	205%
Dec	45.5%	0.5%	0.6%	134.1%	119.8%	67%	-2%	7877%	195%	8328%	22%	25%	37%	205%	207%
Annual	54.0%	-0.3%	-0.2%	130.8%	123.0%	67%	-3%	7702%	189%	7945%	8%	26%	35%	195%	195%

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;

C.3.4. Comparison of calculated values of PCB-180 total mass flows transported in/out the specified domain

Values of total mass flow transported in/out the calculation domain are calculated as sum of inflow (emissions) and all outflows through the main transport media.

Reference data set. Calculation results on PCB-180 total mass flows transported in/out the specified domain calculated by the models on the basis of “reference” data set together with statistical parameters used for evaluation are presented in Table C.53.

Monthly values of PCB-180 total mass flows transported in/out the specified domain calculated by the participating models on the basis of “reference” data set and taking into account non-zero (initial concentrations in media or historical emissions) and zero initial conditions are compared in Fig. C.73 a and b, respectively.

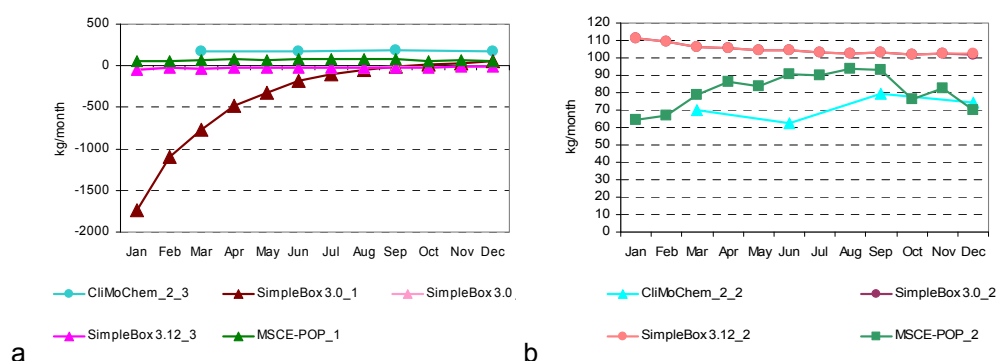


Fig. C.73a. PCB-180 mass flows transported in/out the specified domain (kg/month) calculated by the participating models on the basis of “reference” data set and non-zero initial conditions

Fig. C.73b. PCB-180 mass flows transported in/out the specified domain (kg/month) calculated by the participating models on the basis of “reference” data set and zero initial conditions

Own/alternative data set. Calculation results on PCB-180 total mass flows transported in/out the specified domain calculated by the models on the basis of “own or alternative” data sets together with statistical parameters used for evaluation are presented in Table C.54.

Monthly values of PCB-180 mass flows transported in/out the specified domain calculated by the participating models on the basis of “own or alternative” data sets and taking into account non-zero (initial concentrations in media or historical emissions) and zero initial conditions are compared in Fig. C.74 a and b, respectively.

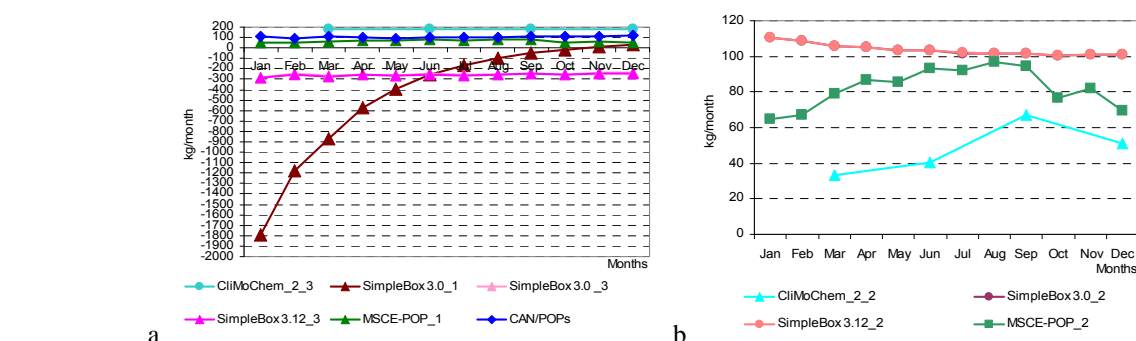


Fig. C.74a. PCB-180 mass flows transported in/out the specified domain (kg/month) calculated by the participating models on the basis of “own or alternative” data set and non-zero initial conditions

Fig. C.74b. PCB-180 mass flows transported in/out the specified domain (kg/month) calculated by the participating models on the basis of “own or alternative” data set and zero initial conditions

Comparison between results obtained on the basis of two data sets. A comparison of the calculation results obtained with two data sets of physical-chemical properties (for those models who provided calculations for both these sets) is shown in Table C.55.

Table C.53. Calculation results: PCB-180 total mass flows transported in/out the specified domain (kg/month) calculated by models on the basis of “reference” data set and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data		Results obtained on the basis of historical emissions			<i>m</i>	<i>σ</i>	Month	Results obtained on the basis of zero initial concentrations				<i>m</i>	<i>σ</i>
	SimpleBox 3.0_1 ^a	MSCE-POP_1	CliMo Chem_2_3	SimpleBox 3.0_3 ^a	SimpleBox 3.12_3 ^a				CliMo Chem_2_2	SimpleBox 3.0_2 ^a	SimpleBox 3.12_2 ^a	MSCE-POP_2		
Jan	-1741.2	54.5		-42.6	-44.0	-443.3	866.5	Jan		111.0	111.1	64.6	95.6	26.8
Feb	-1094.5	53.1		-24.7	-26.3	-273.1	548.9	Feb		109.2	109.2	66.9	95.1	24.4
Mar	-774.7	67.2		-31.0	-32.9	-192.8	390.7	Mar		106.4	106.5	78.7	97.2	16.0
Seas_1	-3610.4	174.9	537.3	-98.3	-103.2	-620.0	1692.1	Seas_1	210.1	326.6	326.7	210.2	268.4	67.3
Apr	-486.7	77.3		-23.0	-24.9	-114.3	252.8	Apr		105.8	105.9	86.4	99.4	11.2
May	-318.7	70.9		-25.5	-27.7	-75.3	168.7	May		104.3	104.4	83.7	97.5	11.9
Jun	-187.0	78.5		-18.9	-21.0	-37.1	110.2	Jun		104.2	104.4	90.8	99.8	7.8
Seas_2	-992.5	226.7	536.0	-67.4	-73.6	-74.2	571.4	Seas_2	187.7	314.3	314.6	260.9	269.4	60.0
Jul	-108.1	76.3		-22.1	-24.4	-19.6	75.4	Jul		103.0	103.1	89.8	98.6	7.7
Aug	-49.2	82.6		-20.8	-23.2	-2.6	58.3	Aug		102.6	102.7	93.8	99.7	5.1
Sep	-9.5	83.4		-15.0	-17.3	10.4	48.8	Sep		102.9	103.1	92.9	99.7	5.8
Seas_3	-166.9	242.3	538.4	-57.9	-64.9	98.2	289.7	Seas_3	237.5	308.5	309.0	276.5	282.9	33.9
Oct	16.9	60.1		-18.7	-21.1	9.3	38.0	Oct		101.9	102.1	76.2	93.4	14.9
Nov	34.1	70.0		-13.1	-15.6	18.8	41.0	Nov		102.4	102.6	82.4	95.8	11.6
Dec	50.2	56.8		-12.3	-14.8	20.0	38.8	Dec		102.1	102.4	70.3	91.6	18.5
Seas_4	101.2	186.8	537.7	-44.1	-51.5	146.0	241.0	Seas_4	224.0	306.4	307.1	228.9	266.6	46.4
Annual	-4668.6	830.7	2149.3	-267.7	-293.2	-449.9	2561.8	Annual	859.4	1255.9	1257.4	976.6	1087.3	201.3

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

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;

a - SimpleBox data are presented for moderate scale.

Table C.54. Calculation results: PCB-180 total mass flows transported in/out the specified domain (kg/month) calculated by models on the basis of “own or alternative” data sets and statistical parameters used for evaluation

Month	Results obtained on the basis of initial concentrations given as input data			Results obtained on the basis of historical emissions			m	σ	Month	Results obtained on the basis of zero initial concentrations				m	σ
	CAN/POPs	SimpleBox 3.0_1 ^a	MSCE-POP_1	CliMo Chem_2_3	SimpleBox 3.0_3 ^a	SimpleBox 3.12_3 ^a				CliMo Chem_2_2	SimpleBox 3.0_2 ^a	SimpleBox 3.12_2 ^a	MSCE-POP_2		
Jan	110.9	-1795.6	51.4		-283.1	-285.0	-440.3	779.6	Jan		110.6	110.6	64.7	95.3	26.5
Feb	95.0	-1173.5	48.6		-249.1	-251.4	-306.1	511.2	Feb		108.6	108.6	67.0	94.8	24.0
Mar	106.4	-865.9	63.4		-270.4	-273.1	-247.9	389.1	Mar		105.7	105.7	78.8	96.7	15.5
Seas_1	312.2	-3835.0	163.4	532.0	-802.7	-809.5	-739.9	1620.4	Seas_1	100.4	324.9	325.0	210.5	240.2	107.7
Apr	103.6	-571.0	74.3		-254.1	-256.9	-180.8	278.1	Apr		105.0	105.0	86.7	98.9	10.6
May	93.2	-396.6	68.2		-263.8	-266.8	-153.2	220.3	May		103.3	103.3	85.5	97.4	10.3
Jun	97.2	-251.9	77.7		-248.8	-251.9	-115.6	185.5	Jun		103.2	103.3	93.3	99.9	5.7
Seas_2	294.0	-1219.5	220.3	532.5	-766.7	-775.7	-285.9	721.8	Seas_2	122.0	311.4	311.6	265.5	252.6	89.8
Jul	102.3	-164.7	75.5		-259.2	-262.5	-101.7	178.6	Jul		101.8	101.9	92.2	98.7	5.6
Aug	100.7	-96.4	82.9		-257.2	-260.6	-86.1	175.6	Aug		101.3	101.4	96.6	99.8	2.7
Sep	108.5	-47.5	82.3		-243.3	-246.6	-69.3	170.9	Sep		101.7	101.8	94.6	99.4	4.1
Seas_3	311.6	-308.5	240.8	536.6	-759.7	-769.7	-124.8	568.2	Seas_3	200.9	304.8	305.1	283.5	273.6	49.5
Oct	115.7	-15.8	55.1		-254.0	-257.5	-71.3	174.7	Oct		100.5	100.7	76.7	92.6	13.8
Nov	115.0	7.6	65.0		-240.4	-243.9	-59.3	171.1	Nov		101.0	101.2	81.9	94.7	11.1
Dec	116.1	27.6	51.1		-239.0	-242.6	-57.4	170.6	Dec		100.8	100.9	69.4	90.3	18.2
Seas_4	346.7	19.5	171.1	534.3	-733.4	-744.0	-67.6	547.6	Seas_4	153.3	302.3	302.8	228.0	246.6	71.4
Annual	1264.5	-5343.5	795.6	2135.5	-3062.5	-3098.9	-1218.2	3014.1	Annual	576.6	1243.4	1244.5	987.5	1013.0	315.1

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

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;

a - SimpleBox data are presented for moderate scale.

Table C.55. Comparison of the calculation results on PCB-180 mass flows transported in/out the specified domain (kg/month) obtained by models on the basis of two data sets: “reference” and “own or alternative”

Month	CliMoChem_2_3		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		CliMoChem_2_2	
	ref	own	ref	alt	ref	alt	ref	alt	ref	alt	ref	alt	ref	own	ref	own	ref	own
Jan			-1741.2	-1795.6	111.0	110.6	111.1	110.6	-42.6	-283.1	-44.0	-285.0	54.5	51.4	64.6	64.7		
Feb			-1094.5	-1173.5	109.2	108.6	109.2	108.6	-24.7	-249.1	-26.3	-251.4	53.1	48.6	66.9	67.0		
Mar			-774.7	-865.9	106.4	105.7	106.5	105.7	-31.0	-270.4	-32.9	-273.1	67.2	63.4	78.7	78.8		
Seas_1	537.3	532.0	-3610.4	-3835.0	326.6	324.9	326.7	325.0	-98.3	-802.7	-103.2	-809.5	174.9	163.4	210.2	210.5	210.1	100.4
Apr			-486.7	-571.0	105.8	105.0	105.9	105.0	-23.0	-254.1	-24.9	-256.9	77.3	74.3	86.4	86.7		
May			-318.7	-396.6	104.3	103.3	104.4	103.3	-25.5	-263.8	-27.7	-266.8	70.9	68.2	83.7	85.5		
Jun			-187.0	-251.9	104.2	103.2	104.4	103.3	-18.9	-248.8	-21.0	-251.9	78.5	77.7	90.8	93.3		
Seas_2	536.0	532.5	-992.5	-1219.5	314.3	311.4	314.6	311.6	-67.4	-766.7	-73.6	-775.7	226.7	220.3	260.9	265.5	187.7	122.0
Jul			-108.1	-164.7	103.0	101.8	103.1	101.9	-22.1	-259.2	-24.4	-262.5	76.3	75.5	89.8	92.2		
Aug			-49.2	-96.4	102.6	101.3	102.7	101.4	-20.8	-257.2	-23.2	-260.6	82.6	82.9	93.8	96.6		
Sep			-9.5	-47.5	102.9	101.7	103.1	101.8	-15.0	-243.3	-17.3	-246.6	83.4	82.3	92.9	94.6		
Seas_3	538.4	536.6	-166.9	-308.5	308.5	304.8	309.0	305.1	-57.9	-759.7	-64.9	-769.7	242.3	240.8	276.5	283.5	237.5	200.9
Oct			16.9	-15.8	101.9	100.5	102.1	100.7	-18.7	-254.0	-21.1	-257.5	60.1	55.1	76.2	76.7		
Nov			34.1	7.6	102.4	101.0	102.6	101.2	-13.1	-240.4	-15.6	-243.9	70.0	65.0	82.4	81.9		
Dec			50.2	27.6	102.1	100.8	102.4	100.9	-12.3	-239.0	-14.8	-242.6	56.8	51.1	70.3	69.4		
Seas_4	537.7	534.3	101.2	19.5	306.4	302.3	307.1	302.8	-44.1	-733.4	-51.5	-744.0	186.8	171.1	228.9	228.0	224.0	153.3
Annual	2149.3	2135.5	-4668.6	-5343.5	1255.9	1243.4	1257.4	1244.5	-267.7	-3062.5	-293.2	-3098.9	830.7	795.6	976.6	987.5	859.4	576.6

CliMoChem_2_2 – CliMoChem results calculated on the basis of Land Cover Data given as input data and with zero initial concentrations;

CliMoChem_2_3 - CliMoChem results calculated on the basis of Land Cover Data given as input data and 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;

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;

C.3.5. Comparison of PCB-180 mass flows transported in/out the specified domain

The calculation results on PCB-180 transport inside and outside the calculation domain through main transport media such as atmosphere and seawater are discussed in this subsection. Transport of this pollutant from sediment, soil and vegetation compartments due to such processes as burial, leaching and harvest of agricultural vegetation, respectively, is considered in SimpleBox model.

The results considered in Sections 3.3.1-3.3.4 above are obtained with one-year calculations with zero initial concentrations (CliMoChem, MSCE-POP, SimpleBox) and with initial concentrations in media (CAN/POPs, MSCE-POP, SimpleBox); and with long-term calculations with historical emissions (CliMoChem, SimpleBox). CliMoChem, MSCE-POP, and SimpleBox models presented results obtained on the basis of two different physical-chemical data sets. Of note, the calculated values compared below are negative in the case if a model predicted PCB-180 transport out the calculation domain through the considered media.

A preliminary analysis of the comparison of absolute values PCB-180 transport mass flows inside and outside the calculation domain through main transport media is presented in this section. The analysis is made separately for results calculated on the basis of initial concentrations or historical emissions and for results based on zero initial conditions.

Transport through the atmosphere. Comparison of annual values of PCB-180 mass flows transported out the calculation domain through the atmosphere calculated by different models on the basis of zero initial concentrations and with the use of “reference” data set is presented in Fig. C.75a together with the averaged value given as the blue line. Fig. C.75b shows the same results but obtained on the basis of initial concentrations and historical emissions. In the latter figure different color of columns corresponds to the different types of calculations (one-year calculations on the basis of initial data; then long-term calculations with historical emissions).

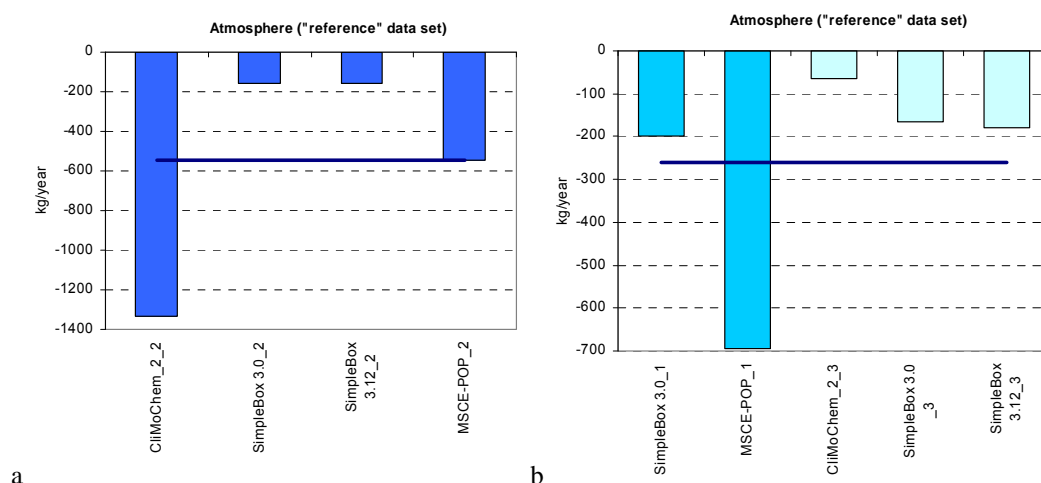


Fig. C.75. Comparison of annual values of PCB-180 mass flows transported in/out the calculation domain through the atmosphere calculated by different models on the basis of “reference” data set (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

Fig. C.76a demonstrates the comparison of the annual values of PCB-180 mass flows transported out the calculation domain through the atmosphere calculated on the basis of zero initial concentrations and with the use of “own or alternative” data sets. Fig. C.76b shows the same results but obtained on the basis of initial concentrations and historical emissions. In the latter figure Different color of columns corresponds to the different types of calculations (one-year calculations on the basis of initial

data; then long-term calculations with historical emissions). The blue line in the plots shows the value of the corresponding parameter averaged between models.

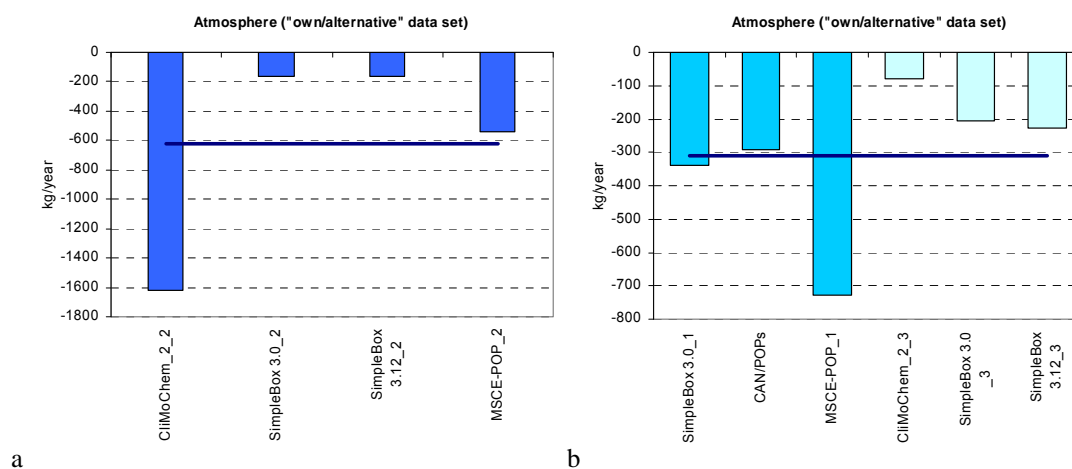


Fig. C.76. Comparison of annual values of PCB-180 mass flows transported in/out the calculation domain through the atmosphere calculated by different models on the basis of “own or alternative” data sets (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

Comparison of annual values of PCB-180 mass flows transported out the calculation domain through the atmosphere obtained with “reference” and “own/alternative” data sets is presented in and in Fig. C.77 (see also Table C.46 given in Section 3.3.1).

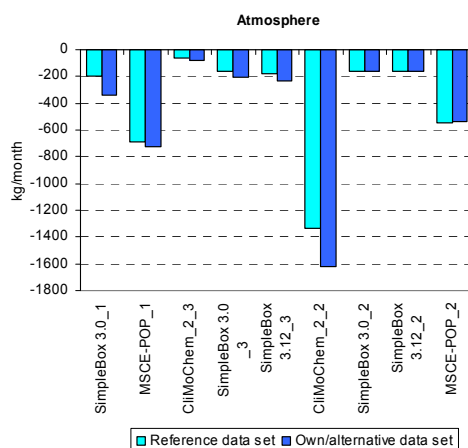


Fig. C.77. Comparison of PCB-180 mass flows transported in/out the calculation domain through the atmosphere calculated by different models on the basis of two physical-chemical data sets

Transport through ocean. Comparison of annual values of PCB-180 mass flows transported out the calculation domain through ocean calculated by different models on the basis of zero initial concentrations and with the use of “reference” data set is presented in Fig. C.78a. Fig. C.78b shows the same results but obtained on the basis of initial concentrations and historical emissions. In the latter figure different color of columns corresponds to the different types of calculations (one-year calculations on the basis of initial data; then long-term calculations with historical emissions). The blue line in the plots shows the value of the corresponding parameter averaged between models.

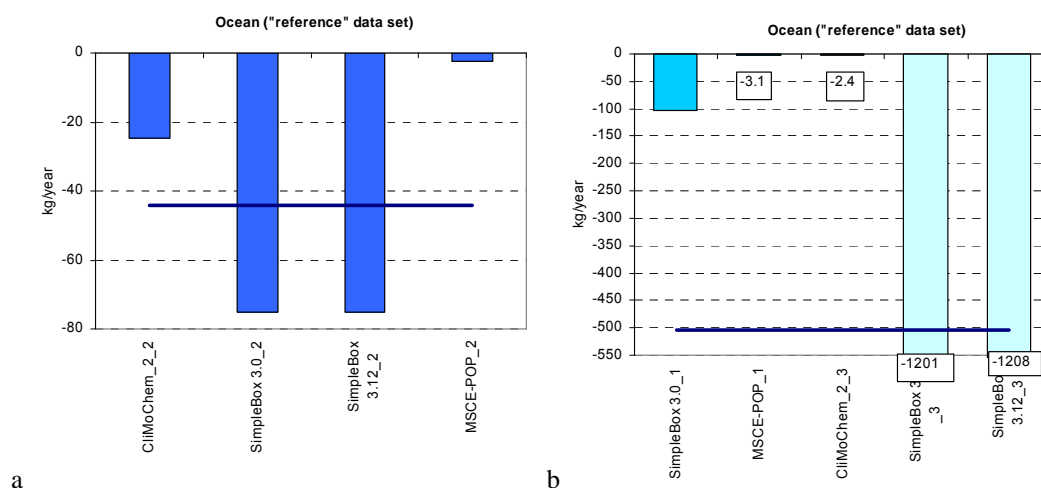


Fig. C.78. Comparison of annual values of PCB-180 mass flows transported in/out the calculation domain through ocean calculated by different models on the basis of “reference” data set (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

Comparison of annual values of PCB-180 mass flows transported out the calculation domain through ocean calculated by different models on the basis of zero initial concentrations and with the use of “**own or alternative**” data sets is presented in Fig. C.79a. Fig. C.79b shows the same results but obtained on the basis of initial concentrations and historical emissions. In the latter figure different colour of columns corresponds to the different types of calculations (one-year calculations on the basis of initial data; then long-term calculations with historical emissions). The blue line in the plots shows the value of the corresponding parameter averaged between models.

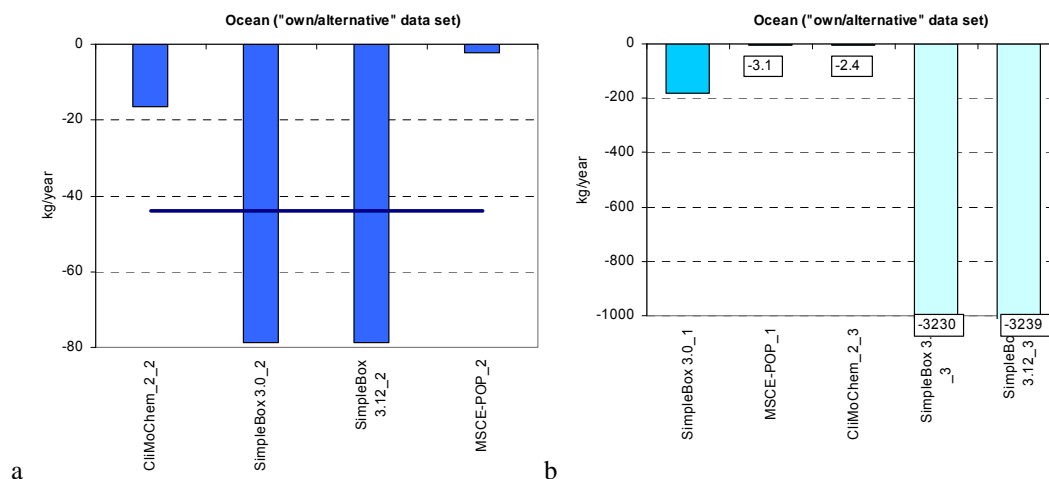


Fig. C.79. Comparison of annual values of PCB-180 mass flows transported in/out the calculation domain through ocean calculated by different models on the basis of “own or alternative” data sets (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

Comparison of annual values of PCB-180 mass flows transported out the calculation domain through ocean obtained with “reference” and “own/alternative” data sets is presented in Table C.49 given in Section 3.3.2 and in Fig. C.80a below. The same data for models with low values of mass flows transported out the calculation domain through ocean are also shown in Fig. C.80b in more detail.

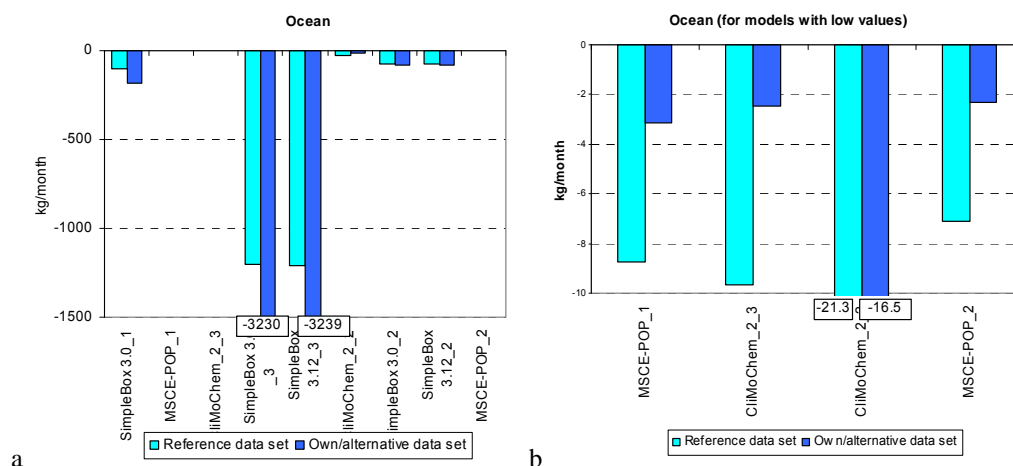


Fig. C.80. Comparison of PCB-180 mass flows transported in/out the calculation domain through ocean calculated by different models on the basis of two data sets (a - all models; b – models with low values of PCB-180 mass flows transported in/out of ocean).

Transport through other media. In addition to the results on mass flows of PCB-180 transported out the calculation domain via the atmosphere and ocean, Simple Box model presented calculated values of outflows from sediments, soil and vegetation. Transport of this pollutant from these compartments is considered to be due to such processes as burial, leaching and harvest of agricultural vegetation, respectively.

Comparison of annual values of PCB-180 mass flows transported in/out the calculation domain through three media as a whole (sediment, soil and vegetation) calculated by SimpleBox model on the basis of zero initial concentrations and with the use of “reference” data set is presented in Fig. C.81a. Fig. C.81b shows the same results but obtained on the basis of initial concentrations and historical emissions. In the latter figure different color of columns corresponds to the different types of calculations (one-year calculations on the basis of initial data; then long-term calculations with historical emissions). The blue line in the plots shows the value of the corresponding parameter averaged between calculations of different types.

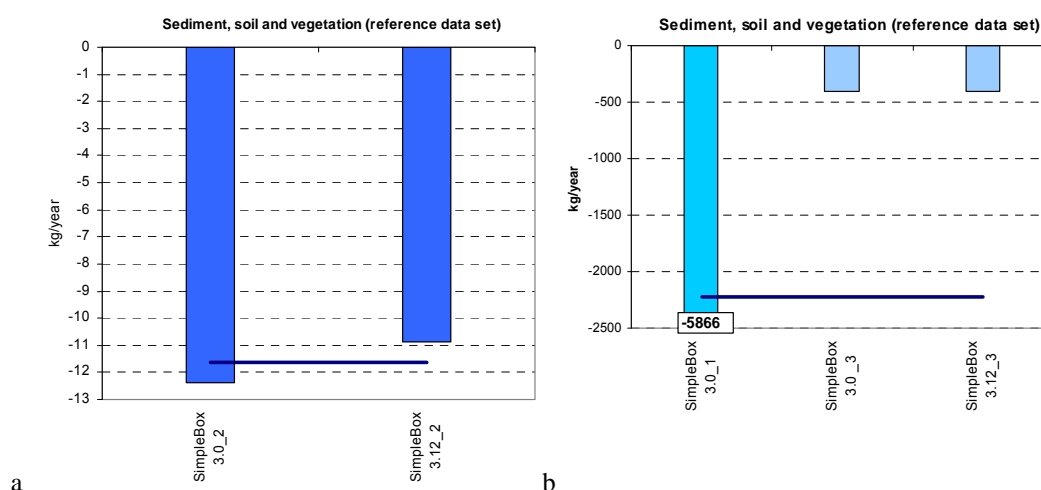


Fig. C.81. Comparison of annual values of PCB-180 mass flows transported in/out the calculation domain through three media as a whole (sediment, soil and vegetation) calculated by SimpleBox model on the basis of “reference” data set (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions).

The annual values of PCB-180 mass flows transported out the calculation domain through three considered media calculated by SimpleBox model on the basis of zero initial concentrations and “**alternative**” data set are compared in Fig. C.82a. Fig. C.82b shows the same results but obtained on the basis of initial concentrations and historical emissions. In the latter figure different color of columns corresponds to the different types of calculations (one-year calculations on the basis of initial data; then long-term calculations with historical emissions). The blue line in the plots shows the value of the corresponding parameter averaged between different versions of this model.

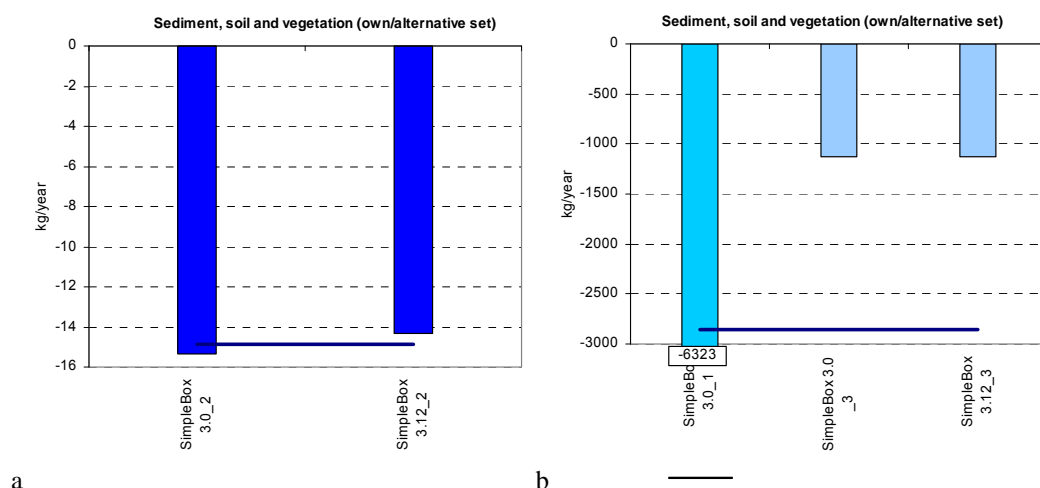


Fig. C.82. Comparison of annual values of PCB-180 mass flows transported in/out the calculation domain through three media as a whole (sediment, soil and vegetation) calculated by SimpleBox model on the basis of “own or alternative” data sets (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

Annual values of PCB-180 mass flows transported out the calculation domain through such media as sediment, soil and vegetation obtained with “reference” and “own/alternative” data sets are compared in Fig. C.83.

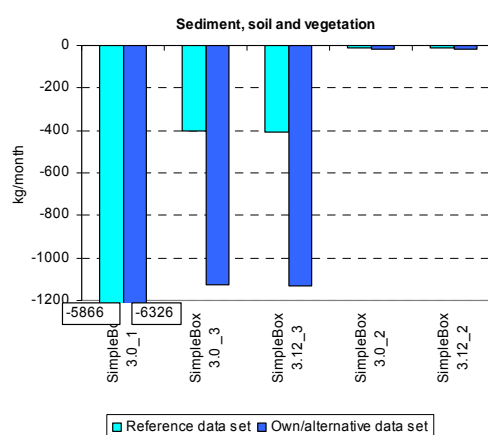


Fig. C.83. Comparison of PCB-180 mass flows transported in/out the calculation domain through the atmosphere (a), other media (sediment, soil and vegetation)(b) and seawater(c, d) calculated by different models on the basis of two data sets

Total mass flow. Comparison of annual values of PCB-180 total mass flows transported in/out the calculation domain calculated by different models on the basis of zero initial concentrations and with the use of “**reference**” data set is presented in Fig. C.84a. Fig. C.84b shows the same results but obtained on the basis of initial concentrations and historical emissions. In the latter figure different

color of columns corresponds to the different types of calculations (one-year calculations on the basis of initial data; then long-term calculations with historical emissions). The blue line in the plots shows the value of the corresponding parameter averaged between models.

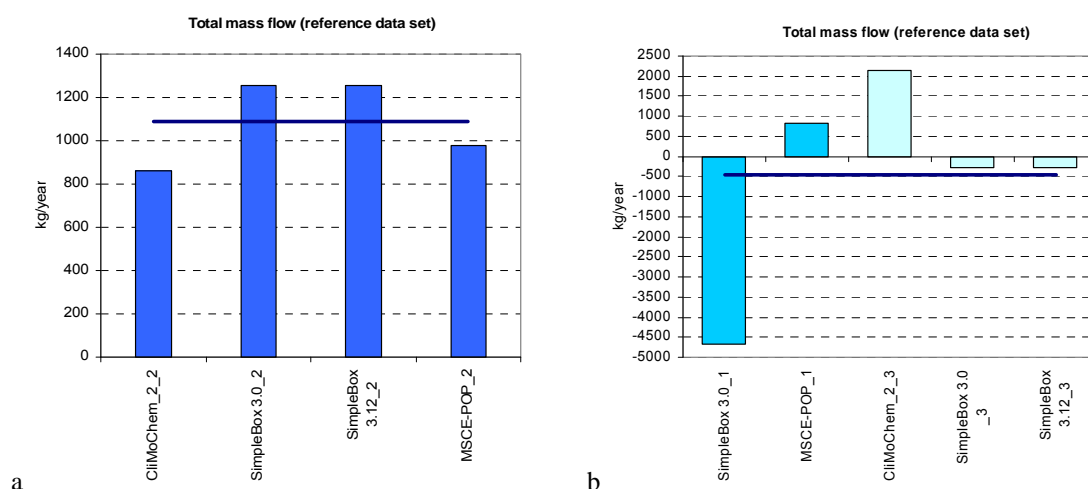


Fig. C.84. Comparison of annual values of PCB-180 total mass flows transported in/out the calculation domain calculated by different models on the basis of “reference” data set (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

Comparison of annual values of PCB-180 total mass flows transported in/out the calculation domain calculated by different models on the basis of zero initial concentrations and “**own or alternative**” data sets is presented in Fig. C.85a. Fig. C.85b shows the same results but obtained on the basis of initial concentrations and historical emissions. In the latter figure different color of columns corresponds to the different types of calculations (one-year calculations on the basis of initial data; then long-term calculations with historical emissions). The blue line in the plots shows the value of the corresponding parameter averaged between models.

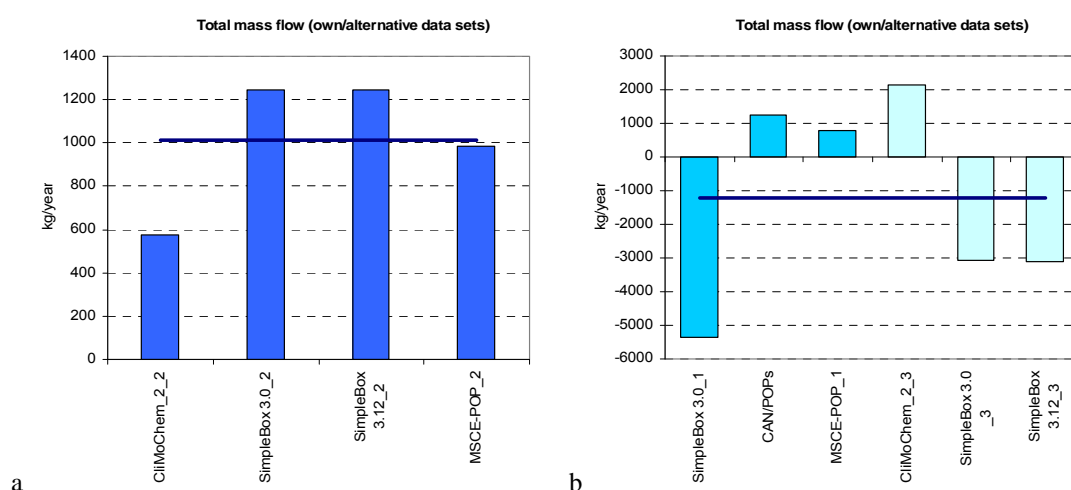


Fig. C.85. Comparison of annual values of PCB-180 total mass flows transported in/out the calculation domain calculated by different models on the basis of “own or alternative” data sets (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)

For models performed calculations on two data sets, the annual values of PCB-180 mass flow transported inside and outside the calculation domain (taking into account emissions) obtained with

“reference” and “own/alternative” data sets are compared in Fig. C.86a. Fig. C.86b presents also the comparison of absolute values of overall mass flow transported outside the calculation domain (not taking into account emission value).

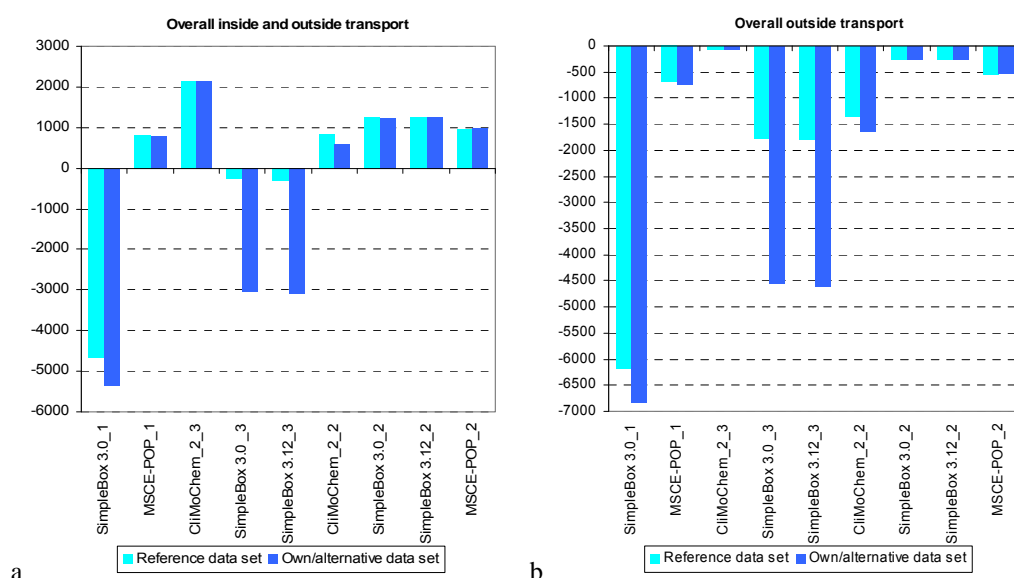


Fig. C.86. Comparison of PCB-180 overall transport inside and outside the calculation domain (taking into account emissions) (a) and overall transport outside the calculation domain (b) calculated by different models on the basis of two data sets

Fractions of overall outside transport through atmosphere, ocean and other media (sediment, soil and vegetation) calculated on the basis of zero and non-zero initial conditions are presented in Figs. 3.87a and b, respectively. In these figures fractions of PCB-180 mass in soil calculated by the different models with the use of “reference” and “own/alternative” data sets are also compared.

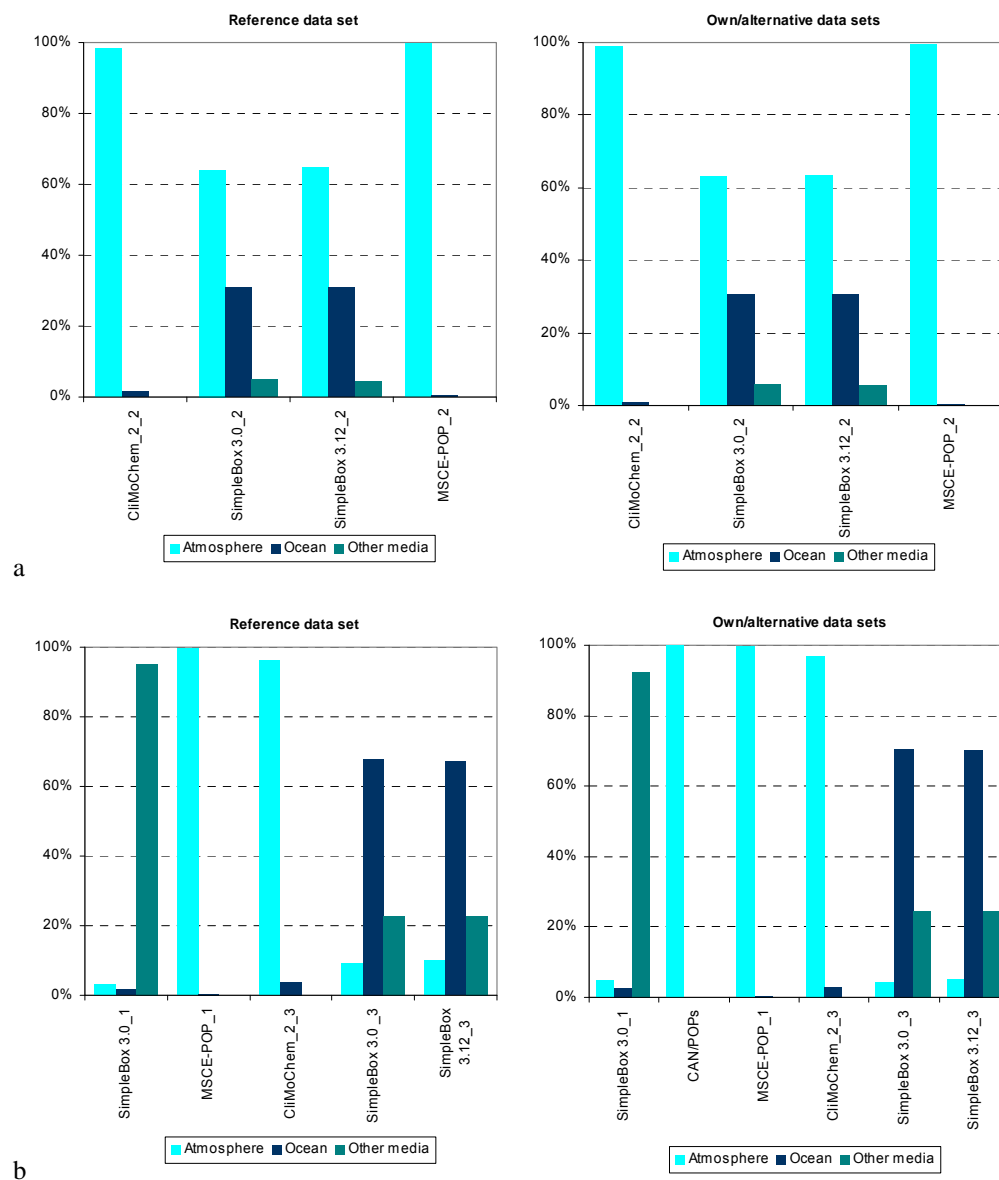


Fig. C.87. Comparison of PCB-180 fractions of overall outside transport through atmosphere, ocean and other media (sediment, soil and vegetation) calculated by different models on the basis of “reference” and “own or alternative” data sets (a – results obtained on the basis of zero initial conditions; b – results based on non-zero initial conditions)