

CONTENTS

<i>Introduction</i>		5
<i>Chapter 1.</i>	SELECTED REGIONS OF THE RUSSIAN ARCTIC AND FACTORS AFFECTING THEIR POLLUTION	9
1.1.	Atmospheric circulation in the Arctic region	10
1.2.	The circulation of water and sea ice in the Arctic Ocean	13
<i>Chapter 2.</i>	PHYSICAL-CHEMICAL PROPERTIES OF MERCURY AND SELECTED POPs	19
2.1.	Physical-chemical properties of mercury	19
2.2.	Physical-chemical properties of selected POPs	30
<i>Chapter 3.</i>	MODEL APPROACHES AND INPUT DATA	49
3.1.	Short review of modeling approaches used to the assessment of pollution by Hg, PCBs and HCHs on global/hemispheric scale	49
3.2.	MSCE-Hg-Hem model	52
3.3.	MSCE-POP model	64
3.4.	Meteorological data	81
3.5.	Land cover data	82
3.6.	Leaf Area Index (LAI)	83
3.7.	Chemical reactants data	83
3.8.	Data on sea currents	86
3.9.	Data on sea ice cover	89
<i>Chapter 4.</i>	EMISSION SOURCES	95
4.1.	Hg emissions	96
4.2.	PCB emissions	101
4.3.	γ -HCH emissions	106
<i>Chapter 5.</i>	ATMOSPHERIC TRANSPORT AND DEPOSITION OF MERCURY TO THE ARCTIC REGION	113
5.1.	General description of modeling results	113
5.2.	Comparison of modeling results with measurements	117
5.3.	Arctic region	119
5.4.	Regions of the Russian North	121
5.5.	Concluding remarks	132
<i>Chapter 6.</i>	ATMOSPHERIC TRANSPORT AND DEPOSITION OF PCBs TO THE ARCTIC REGION	135
6.1.	General description of modeling results	136
6.2.	Comparison of modeling results with measurements	142
6.3.	Concentration and deposition levels in the Russian North	146
6.4.	Source-receptor relationships	150
6.5.	Congener composition analysis	157
6.6.	Evaluation of deposition of total PCB mixture to the Russian North	159
6.7.	Concluding remarks	161

<i>Chapter</i>	7.	ATMOSPHERIC TRANSPORT AND DEPOSITION OF γ -HCH TO THE ARCTIC REGION	163
	7.1.	General description of modeling results	163
	7.2.	Comparison of modeling results with measurements	170
	7.3.	Concentration and deposition levels in regions-receptors	173
	7.4.	Source-receptor relationships	178
	7.5.	Concluding remarks	185
<i>Chapter</i>	8.	RELIABILITY OF THE ASSESSMENT RESULTS	187
	8.1.	Model verification and sensitivity analysis	187
	8.2.	Uncertainty of emission data	189
	8.3.	Modeling results vs. measurements	190
	8.4.	Concluding remarks	191
<i>Conclusions</i>			193
<i>Annex</i>	A.	MODELING RESULTS OF TRANSPORT OF PCB-28, 118 AND 180	197
<i>Annex</i>	B.	ATMOSPHERIC TRANSPORT MODULE VERIFICATION	207
<i>Annex</i>	C.	METEOROLOGICAL DATA FOR HEMISPHERIC MODELS	215
<i>Annex</i>	D.	SENSITIVITY ANALYSIS OF THE SOIL MODULE	223
<i>Annex</i>	E.	SENSITIVITY ANALYSIS OF THE OCEANIC TRANSPORT MODULE	231
<i>Annex</i>	F.	ADDITIONAL COMPUTATION EXPERIMENTS	257