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**United Nations  
Environment  
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**Conference of the Parties to the Stockholm Convention  
on Persistent Organic Pollutants**

**Second meeting**

Geneva, 1–5 May 2006

Item 5 (j) of the provisional agenda\*

**Matters for consideration or action by the Conference of the Parties:**

**Effectiveness evaluation**

**Existing human health and environmental monitoring  
programmes\*\***

**Note by the Secretariat**

1. At its first meeting, the Conference of the Parties of the Stockholm Convention on Persistent Organic Pollutants, in paragraph 2 of its decision SC-1/13 on effectiveness evaluation, requested the Secretariat to make use of existing monitoring programmes and datasets where possible in providing the Conference with comparable monitoring data. To identify such monitoring programmes and datasets, the Secretariat has developed the compilation of datasets provided in the present document.
2. Information on existing monitoring programmes and datasets was drawn from the following:
  - (a) Regionally based assessment of persistent toxic substances (UNEP Chemicals, 2003);
  - (b) Global inventory of persistent organic pollutants laboratories (UNEP Chemicals, 2004);
  - (c) Survey of global monitoring programmes (UNEP Chemicals, 2005);
  - (d) UNEP workshop to develop a global monitoring programme (March 2003);
  - (e) Master list of actions on the reduction and/or elimination of releases of persistent organic pollutants, fifth edition (UNEP Chemicals, 2003);
  - (f) National persistent organic pollutants profiles and assessments undertaken in the national implementation plan preparation process (from both final submissions and interim reports as of 31 December 2005);
  - (g) Websites of the regional and global monitoring programmes and activities listed in annex III to the present note.

\* UNEP/POPS/COP.2/1.

\*\* Stockholm Convention, Article 16; report of the Conference of the Parties on the work of its first meeting (UNEP/POPS/COP.1/31), annex I, decision SC-1/13, paragraph 2.

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3. Information on existing national monitoring programmes and datasets, organized according to United Nations regions, is set forth in annex I to the present note. An analysis of the current status, including regional gaps in terms of monitoring programmes and datasets is given in annex II. Information on regional and global monitoring programmes and datasets is shown in annex III to the present note.
4. The annexes to the present note have not been formally edited.

## Annex I: Existing national monitoring programmes and datasets

Provided below is information about existing national monitoring programmes and data sets. Where it is indicated “no data” reports were available from countries indicating that they did not have any data. Where a cell is blank this indicates that no information was received from the country. The full names and descriptions of the regional and global programmes listed are provided in annex III of the present document. Regarding the “Tiers” listed in the laboratories column:

UNEP Chemicals has performed a tier assignment based on the information supplied by each laboratory. Criteria for the tier level assignment is based on the outcome of the discussions of the workshop on global monitoring of POPs organized by UNEP Chemicals in March 2003. The tier assignment only refers to the capacities to perform analysis of the Stockholm Convention POPs and does not indicate overall performance of a laboratory.

The tier level is assigned according to the following criteria:

**Tier 1** – Performs congener specific PCB and PCDD/F analysis using HRGC/HRMS in at least one of the GMP matrices. Has participated in at least one international inter-calibration including at least one of the GMP matrices and Stockholm Conventions POPs, during the last three years.

**Tier 2** – Performs congener specific PCB analysis ( $\Sigma\text{PCB}_7$ ) using HRGC/LRMS in at least one of the GMP matrices.

**Tier 3** – Performs congener specific PCB analysis ( $\Sigma\text{PCB}_7$ ) using HRGC/ECD in at least one of the GMP matrices.

**Tier 4** – Laboratories that analyse POPs in other matrices than the GMP matrices, or laboratories that do not do congener specific PCB analysis ( $\Sigma\text{PCB}_7$ ).

**I. AFRICAN STATES**

**A. NORTHERN AFRICA**

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or datasets <sup>1</sup>	Laboratories
Algeria		Analysis of pesticides, PAHs, PCBs, dioxins and furans in water air, soil and coastal sediment samples have been implemented at research level. However, PTSs are not routinely monitored in the country.	MEDPOL	
Egypt	An environmental Information Monitoring Program is implemented by the Egyptian Environment Agency (EEAA) with support from the Danish international development assistance. Its aims are to establish programs to monitor ambient air and coastal waters but no data has been shown yet.		MEDPOL	<ul style="list-style-type: none"> <li>• Cairo Central Centre Egyptian Environmental Affairs Agency <b>Laboratory without POPs analysis</b></li> <li>• Central Laboratory of Residue Analysis of Pesticides and Heavy Metals in Food <b>Tier 1</b></li> </ul>
Libyan Arab Jamahiriya			MEDPOL	
Morocco			MEDPOL	Department Toxicology National Institute of Hygiene INH <b>Tier 4</b>
Tunisia		<p>The ministry of environment implemented a monitoring program in 1999 to survey the quality of the Medjerda Oued and the lagoon of Korba.</p> <p>The International Centre of Environmental Technologies of Tunis (CITET) under the ministry of the environment and the co-operation of the IAEA and the MEDPOL programme is monitoring the coastal marine environment.</p>	MEDPOL	Marine Environment Laboratory/Organic Unit Centre INSTM – Port de Pecche <b>Tier 4</b>

<sup>1</sup> The full names of the organizations abbreviated are provided in annex III to the present document.

## B. SUB-SAHARAN AFRICA

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or datasets	Laboratories
Angola	No data			
Benin	Inventaire des dioxines et furanes	Une insuffisance de personnel qualifié, une absence de laboratoires spécialisés		
Botswana	No data			
Burkina Faso	No data			Waste Water Analysis Laboratory <b>Laboratory without POPs analysis</b>
Burundi	No data			
Cameroon	No data			
Central African Republic	No data			
Chad	One-off project on pesticides management at Sahel (1998-2001)			
Comoros	No data			
Congo (Brazzaville)	No data			
Côte d'Ivoire	Limited data			No laboratory
Democratic Republic of the Congo	No data	Has the necessary scientists to carry out dioxins and furans		
Djibouti	No data			No laboratory
Equatorial Guinea	No data			
Eritrea	No data			
Ethiopia	No data			
Gabon	No data			
Gambia	One-off project: Case Study on Inventory of PCBs			
Ghana	<ul style="list-style-type: none"> <li>• Monitoring of Pesticides (1998-2005)</li> <li>• Monitoring of pesticides in cocoa beans (1987-2001)</li> </ul> Limited data			<ul style="list-style-type: none"> <li>• Ghana Standards Board Chemical Science Lab <b>Tier 4</b></li> <li>• Water Research Organic Laboratory CSIR-Water Research Institute <b>Tier 4</b></li> <li>• Department of Chemistry National Nuclear Research Institute <b>Tier 4</b></li> </ul>
Guinea-Bissau	No data			
Guinea	Absence of monitoring programme			Laboratoire d'analyses environnementales <b>Laboratory without POPs analysis</b>
Kenya	Limited data			Department of Chemistry University of Nairobi <b>Tier 4</b>

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or datasets	Laboratories
Lesotho	No data			
Liberia	No data			No laboratory
Madagascar	Limited data			
Malawi	Limited data			
Mali	No data			Laboratoire central Vétérinaire – labo de toxicology <b>Tier 4</b>
Mauritania	No data			
Mauritius	Limited data			National Environmental Laboratory National Laboratories Complex <b>Laboratory without POPs analysis</b>
Mozambique	No data			
Namibia	Limited data			Department of Chemistry University of Namibia <b>Laboratory without POPs analysis</b>
Niger	Coordination technique interministérielle chargée des polluants organiques persistants au Niger (5 ans)			Analytical Services Laboratory/ Soil Chemistry Laboratory <b>Laboratory without POPs analysis</b>
Nigeria	Limited data	Has the necessary scientists to carry out dioxins and furans		
Rwanda	No data			
São Tomé and Príncipe	No data			
Senegal	No data			Environmental Chemistry Laboratory of CERES-LOCUSTOX <b>Tier 4</b>
Seychelles	Limited data			
Sierra Leone	No data			
Somalia	No data			
South Africa		Has the necessary scientists to carry out dioxins and furans		<ul style="list-style-type: none"> <li>• Chromatography and Mass Spectrometry Department of Chemistry University of Pretoria <b>Tier 4</b></li> <li>• Chromatographic Services Testing and Conformity Services (Pty) Ltd <b>Tier 2</b></li> <li>• POPs Bioassay/analytical laboratory <b>Tier 2</b></li> </ul>
Sudan	Limited data	Has the necessary scientists to carry out dioxins and furans		Laboratory of Metabolism and Toxicology The Agric. Research Corporation,

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or datasets	Laboratories
				Entomology Section <b>Tier 4</b>
Swaziland	No data			
Tanzania (United Republic of)	No data			Chemical and Process Engineering Department University of Dar es Salaam <b>Laboratory without POPs analysis</b>
Togo	No data	Importateurs, producteurs, utilisateurs, professionnels, ONGs écologiques, société civile : devant fournir les informations de terrain		
Uganda	Limited data			Pesticide Residue Analytical Laboratory Chemistry Department <b>Tier 4</b>
Zambia	PCB Management Project  Limited data			University of Zambia, Department of Chemistry <b>Tier 4</b>
Zimbabwe	Limited data			

## II. ASIAN AND PACIFIC STATES

### A. PACIFIC ISLANDS

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or datasets	Laboratories
American Samoa	Limited data	Has effective monitoring capacity as a result of requirements under local EPA as well as USEPA and other Federal Acts.		
Cook Islands	No data			
Fiji	Several of heavy metals have detected hotspots of tin and lead. POPs studies are limited.	Some laboratories capable of testing for PTS.		Institute of Applied Science <b>Tier 3</b>
French Polynesia				

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or datasets	Laboratories
Guam	Regular water monitoring is carried out.	Has effective monitoring capacity as a result of requirements under local EPA as well as USEPA and other Federal Acts.  Has adequate funding and access to facilities to carry out monitoring.		
Kiribati	No data reported except for one heavy metal study.			
Micronesia (Fed. States of)	No data			
Marshall Islands	No data reported. However, given the situation in other US territories, data from around military bases may exist but not be readily available.			
Nauru	No data			
New Caledonia	It is expected that there has been much research on heavy metal pollution but none was available.	Some laboratories capable of testing for PTS.		
Niue	No data			
N. Mariana Islands				
Palau (Republic of)	No data			Palau Environmental Quality Protection Board Laboratory <b>Tier Laboratory without POPs analysis</b>
Papua New Guinea				
Pitcairn Islands				
Samoa	Limited data	Some laboratories capable of testing for PTS.		
Solomon Islands	Limited data			
Tokelau	No data			
Tonga	Limited data	Some laboratory capacity to test for some of the PTS		Department of Environment (tier missing)
Tuvalu	No data			
Vanuatu	Limited data			
Wallis & Futuna				

## B. SOUTH AND EASTERN ASIA

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or datasets	Laboratories
Afghanistan				
Bangladesh				
Bhutan				
Brunei Darussalam			Project on inventory of sources of dioxins and furans emissions in selected Asian Countries	
Cambodia	National Focal Point for the Stockholm Convention Department of Pollution Control Ministry of Environment			<b>Tier</b> <b>Contact Person (no laboratories available)</b>
China		In China there are standardized methods to monitor PTS in certain goods or products as is required by foreign trade, but not all such products are monitored.	<ul style="list-style-type: none"> <li>• Endocrine Disruptive Compounds in East Asia EDC</li> <li>• GAPS (The Global Atmospheric Passive Sampling) survey led by Canada in 4 East Asian countries: China, Japan, South Korea, Singapore</li> <li>• UNU POPs Monitoring Database</li> </ul>	<ul style="list-style-type: none"> <li>• Croucher Institute for Environmental Sciences (CIES) <b>Tier 2</b></li> <li>• Government Laboratory Hong Kong SAR <b>Tier 1</b></li> <li>• Dioxin Analysis Laboratory, College of Mechanical and Energy Engineering, Zhejiang University <b>Tier 4</b></li> </ul>
India	<ul style="list-style-type: none"> <li>• Extensive nationwide monitoring of agricultural produce, vegetables, water and animal produce is carried out at 16 centres under an All India Coordinated Research Project (AICRP).</li> <li>• Extensive monitoring for DDT and HCH</li> <li>• Environmental monitoring of the combustion by-products PCDD/Fs has been initiated.</li> </ul>			Regional Research Laboratory <b>Tier 4</b>

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or datasets	Laboratories
Indonesia			<ul style="list-style-type: none"> <li>• Endocrine Disruptive Compounds in East Asia EDC</li> <li>• Trial Air POPs</li> </ul> Monitoring project hosted by Japan in 4 East Asian countries: Japan, South Korea, Indonesia and Vietnam <ul style="list-style-type: none"> <li>• UNU POPs Monitoring Database</li> </ul>	
Japan	<ul style="list-style-type: none"> <li>• POPs Monitoring in Japan</li> <li>• Pollutant Release and Transfer Register</li> <li>• Monitoring of hazardous water pollutants (PCBs, dioxins and furans are included) (1971-continuing)</li> <li>• Environment Survey and Wildlife Monitoring (1974-continuing)</li> <li>• Monitoring of hazardous air pollutant (dioxins, furans and co-planar PCBs included) (1986-continuing)</li> <li>• Preparation of an emission inventory for dioxins, furans and co-planar PCBs (1999-continuing)</li> <li>• Environmental survey &amp; Monitoring of Chemicals: Human Sample Survey</li> </ul>	The Ministry of the Environment carries out national POPs monitoring in Japan	<ul style="list-style-type: none"> <li>• Endocrine Disruptive Compounds in East Asia EDC</li> <li>• Trial Air POPs</li> </ul> Monitoring project hosted by Japan in 4 East Asian countries: Japan, South Korea, Indonesia and Vietnam <ul style="list-style-type: none"> <li>• GAPS (The Global Atmospheric Passive Sampling) survey led by Canada in 4 East Asian countries: China, Japan, South Korea, Singapore</li> </ul>	
Kazakhstan	Identification and Hygienic Assessment of Dioxins Distribution (two months)	Regular monitoring of the PAHs in air is conducted in all industrial cities.  Regular monitoring of pesticides in foodstuffs, soils and fresh water.	Caspian Environment Programme CEP	Lab for Physical and Chemical Methods Analysis <b>Tier 4</b>
Korea (DPRK)				

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or datasets	Laboratories
Korea (Republic of)	<ul style="list-style-type: none"> <li>National Marine Environment Monitoring (1997-)</li> <li>Preliminary Environmental survey on POPs (1998) monitoring of POPs in the coastal area of Korea (1999-2001)</li> </ul>	The Ministry of Environment has been carrying out monitoring of EDCs including POPs since 1999.	<ul style="list-style-type: none"> <li>Endocrine Disruptive Compounds in East Asia EDC</li> <li>Trial Air POPs Monitoring project hosted by Japan in 4 East Asian countries: Japan, South Korea, Indonesia and Vietnam</li> <li>GAPS (The Global Atmospheric Passive Sampling) survey led by Canada in 4 East Asian countries: China, Japan, South Korea, Singapore</li> <li>UNU POPs Monitoring Database</li> </ul>	<ul style="list-style-type: none"> <li>Chonbuk National University, Environmental Management Lab. <b>Tier 1</b></li> <li>Marin Environmental Research Laboratory <b>Tier 2</b></li> <li>Analytical Research Centre of the Environmental Management Corporation <b>Tier 1</b></li> <li>Environmental Analysis Team, Korea Testing Laboratory <b>Tier 1</b></li> <li>Hazardous Substance Research Team, Korea Basic Science Institute <b>Tier 1</b></li> <li>National Fisheries Research &amp; Development Institute (NRFDI) <b>Tier 2</b></li> <li>The Center for instrumental analysis in Kyungnam University (CIAK) <b>Tier 2</b></li> <li>Scientific Environmental Analytical Laboratory (SEAL) School of Environ. Sci. &amp; Eng. POSTECH <b>Tier 1</b></li> <li>Labfrontier <b>Tier 2</b></li> </ul>
Kyrgyzstan	Environmental Pollution Assessment by the POPs reminders (since 1976)	Regular monitoring of pesticides in foodstuffs, soils and fresh water.		
Lao People's Republic	POPs chemical survey and data collection within country (2000)			
Malaysia	The Development of National Programme to Control POPs	Developing capability to analyse for PCDD/PCDF	<ul style="list-style-type: none"> <li>Endocrine Disruptive Compounds in East Asia EDC</li> <li>UNU POPs Monitoring Database</li> </ul>	<ul style="list-style-type: none"> <li>Doping Control Centre <b>Tier 1</b></li> <li>Environment &amp; Bioprocess Technology Centre (Build. 15) SIRIM Berhad <b>Tier 4</b></li> <li>Department of Chemistry <b>Tier 2</b></li> </ul>
Maldives				
Mongolia		Regular monitoring of pesticides in foodstuffs, soils and fresh water.		
Myanmar	Preliminary evaluation study of Inly Lake Region for POPs concentration			National Health Laboratory <b>Tier Laboratory without POPs analysis</b>
Nepal	Case Study report about POPs in use in agriculture and industry in Nepal (6 months)	Extensive monitoring for DDT and HCH		

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or datasets	Laboratories
Pakistan		Extensive monitoring for DDT and HCH		<ul style="list-style-type: none"> <li>Chromatography Lab. NCD, PINSTECH <b>Laboratory without POPs analysis</b></li> <li>Chromatography Central Analytical Facility Division Pakistan Institute of Nuclear Science &amp; Technology <b>Laboratory without POPs analysis</b></li> <li>PCSIR Laboratories Complex <b>Tier 3</b></li> <li>PCRWR Water Quality Laboratory <b>Laboratory without POPs analysis</b></li> </ul>
Philippines	<ul style="list-style-type: none"> <li>Pesticide Monitoring System Development Project (1997-2002)</li> <li>Implementation of Toxic and Hazardous and Nuclear Waste Act</li> </ul>		UNU POPs Monitoring Database	Research and Analytical Services Laboratory, Natural Sciences Research Institute <b>Tier 2</b>
Singapore	<p>Programme to phase out PCB-contaminated transformers</p> <p>Extensive data</p>	<p>The water department has monitored concentrations of several PTS in lake, river and processed water for drinking</p> <p>Developing capability to analyse for PCDD/PCDF</p>	<ul style="list-style-type: none"> <li>Endocrine Disruptive Compounds in East Asia EDC</li> <li>GAPS (The Global Atmospheric Passive Sampling) survey led by Canada in 4 East Asian countries: China, Japan, South Korea, Singapore</li> <li>UNU POPs Monitoring Database</li> </ul>	Environmental Monitoring and Assessment Unit, Pollution Control Department <b>Tier 4</b>
Sri Lanka	Monitoring of Organochlorines and Pesticides in water bodies including PCBs (continuous)	Extensive monitoring for DDT and HCH		<ul style="list-style-type: none"> <li>Central Environmental Authority <b>Laboratory without POPs analysis</b></li> <li>Laboratory Services Group, CETD Industrial Technology Institute <b>Tier 2</b></li> </ul>
Tajikistan		Regular monitoring of pesticides in foodstuffs, soils and fresh water.		Service on Analytical Control of the State Committee on Nature Protection and Forestry of the Republic of Tajikistan <b>Tier 4</b>

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or datasets	Laboratories
Thailand	<ul style="list-style-type: none"> <li>Monitoring Programme for organochlorine pesticides and polychlorinated biphenyls (PCBs) (routine activities)</li> <li>National Inventory of Sources of Dioxins and Furans Emissions in Thailand (1998-2000)</li> </ul> <p>Some monitoring data on several PTS are available in the Agricultural Department of Thailand annual reports.</p>	Developing capability to analyze for PCDD/PCDF	<ul style="list-style-type: none"> <li>Endocrine Disruptive Compounds in East Asia EDC</li> <li>UNU POPs Monitoring Database</li> </ul>	Environmental Quality and Laboratory <b>Tier 4</b>
Turkmenistan			Caspian Environment Programme CEP	
Uzbekistan		Regular monitoring of pesticides in foodstuffs, soils and fresh water.		
Vietnam	<p>POPs monitoring has not yet been put into the national environmental monitoring networks although a few small scale monitoring programs have been implemented in frame of international cooperative projects, which have produced some POPs data, e.g. DDTs residues at Balat estuary between 1990-2004.</p>	<p>Capable of conducting trace analysis of OCPs and PCBs in water and sediments, but not air and biological samples.</p> <p>More than dozen laboratories have capability of analyzing POPs at various levels.</p>	<ul style="list-style-type: none"> <li>Endocrine Disruptive Compounds in East Asia</li> <li>Trial Air POPs Monitoring project hosted by Japan in 4 East Asian countries: Japan, South Korea, Indonesia and Vietnam</li> <li>UNU POPs Monitoring Database</li> </ul>	Research Centre for Environmental Technology and Sustainable Development (CETASD) <b>Tier 2</b>

## C. WESTERN ASIA

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or datasets	Laboratories
Bahrain		Environmental monitoring of the combustion by-products PCDD/Fs has been initiated.		Department of Chemistry College of Science, University of Bahrain <b>Tier 4</b>
Cyprus	<p>No comprehensive program for monitoring PTS in air.</p> <p>One-off project: Monitoring of the Xenobiotics in the Food Chains (3 years)</p>	Industrial installations that produce dioxin emissions are obliged to provide monitoring data for these compounds.	MEDPOL	State General Laboratory, Ministry of Health <b>Tier 2</b>
Iran (Islamic Republic of)		Extensive monitoring for DDT and HCH	Caspian Environment Programme CEP	

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or datasets	Laboratories
Iraq				
Jordan	Side effects of pesticides on the environment in Jordan	Organochlorine pesticides have been monitored in water for over 10 years.  Pesticide residues on agricultural crops have been tested for since the early 80s.  Dioxins PCBs and other toxic substances are not being monitored in any compartments known so far.		Chromatographic Lab Environmental Organics Analysis Lab <b>Tier 4</b>
Kuwait		Environmental monitoring of the combustion by-products PCDD/Fs has been initiated.		Industrial Environment Lab. <b>Laboratory without POPs analysis</b>
Lebanon	Addressing Dioxins in Solid Matrices in some suspected Industries	No comprehensive monitoring program for PTS.	MEDPOL	Environment Core Laboratory (ECL) <b>Tier 4</b>
Oman				
Palestine				
Qatar				
Saudi Arabia	Monitoring of obsolete and banned Agrochemicals in the Kingdom of Saudi Arabia Project			
Syrian Arab Republic			MEDPOL	
United Arab Emirates		Environmental monitoring of the combustion by-products PCDD/Fs has been initiated.		
Yemen				

### III. CENTRAL AND EASTERN EUROPEAN STATES

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or datasets	Laboratories
Albania			MEDPOL	
Armenia	One-off case study on exposure and measurement of POPs sources			
Azerbaijan				Azecolab <b>Tier 4</b>

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or datasets	Laboratories
Belarus		No air monitoring and little information on other environmental compartments		<ul style="list-style-type: none"> <li>• Central Laboratory of the Ministry of Natural Resources and Environmental Protection <b>Tier 4</b></li> <li>• The department of organization of analytical control of the Ministry of natural resources and environmental protection <b>Tier 2</b></li> </ul>
Bosnia and Herzegovina			MEDPOL	
Bulgaria				<ul style="list-style-type: none"> <li>• Instrumental Method of Analysis, Analytical Directorate, Executive Environment Agency <b>Tier 4</b></li> <li>• Central Lab for Control of Pesticides <b>Tier 4</b></li> <li>• Executive Environment Agency, Regional Laboratory <b>Tier 4</b></li> <li>• Food Chemistry <b>Tier 4</b></li> </ul>

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or datasets	Laboratories
Croatia		PTSs monitoring is not conducted at state level. Organochlorine pesticides and PCDD/Fs are determined in a limited number of samples for research purposes.	MEDPOL	<ul style="list-style-type: none"> <li>• Institute of Public Health Department for protection and improvement of the environment <b>Tier 4</b></li> <li>• Department for Food Examination; Laboratory for GC analyses <b>Tier 4</b></li> <li>• Health Ecology Department <b>Tier 4</b></li> <li>• Institute for Medical Research and Occupational Health <b>Tier 2</b></li> <li>• Health Ecology Department – Public Health Institution of Osijek – Baranja County <b>Tier 4</b></li> <li>• Sisak Institute of Public Health, Dept. of Ecology and Sanitary Chemistry <b>Tier 4</b></li> <li>• Zagreb Public Health Institute, Analytical Chemistry Department <b>Tier 2</b></li> </ul>
Czech Republic	<p>Many one-off projects of which some ran for a few years:</p> <ul style="list-style-type: none"> <li>• Monitoring of POPs Chemicals in Breast Milk (3 years)</li> <li>• Regional background monitoring of POPs</li> <li>• Monitoring of selected POPs in various types of soils.</li> </ul>		EMEP*	<ul style="list-style-type: none"> <li>• RECETOX <b>Tier 2</b></li> <li>• Povdi Moravy, Water Lab Department and Water Inst. <b>Tier 4</b></li> <li>• Zdravotní ústav se sídlem v Ostrave <b>Tier 2</b></li> <li>• Toxicants and Contaminants – Calibration laboratory <b>Tier 2</b></li> <li>• Zdravotní ústav se sídlem v Hradci Králové <b>Tier 2</b></li> <li>• Výzkumný ústav organických syntéz <b>Tier 4</b></li> <li>• Bioanalytika CZ <b>Tier 4</b></li> <li>• Analytical laboratories of Division EKOTECHNIKA <b>Tier 4</b></li> <li>• State Veterinay Institute Olomouc <b>Tier 3</b></li> </ul>
Estonia	<ul style="list-style-type: none"> <li>• European Dioxin Project 1998</li> <li>• Assistance in Implementing of the Disposal of PCBs/PCTs Directive in Estonia 1999</li> </ul>			<ul style="list-style-type: none"> <li>• Estonian Environmental Research Centre <b>Tier 3</b></li> <li>• Health Protection Inspectorate <b>Tier 2</b></li> </ul>

\* Information based on EMEP measurement network

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or datasets	Laboratories
Georgia				Laboratory of Neurochemistry <b>Tier Laboratory without POPs analysis</b>
Hungary	<ul style="list-style-type: none"> <li>Environmental health risk assessment of chlorinated organic pollutants. Concentrations of PCBs, DDT and Metabolites and HCL isomers in the breast milk.</li> <li>Annual monitoring programme of chlorinated hydrocarbons in import crops</li> </ul>			National Centre for Public Health, National Institute of Food Hygiene and Nutrition, Chemical Toxicological Laboratory <b>Tier 3</b>
Latvia	<ul style="list-style-type: none"> <li>Animal and animal origin product pesticide residue control program</li> <li>Pesticide residue control program for products of plant origin</li> <li>Dioxin control program</li> <li>National Environmental Monitoring Program sub-programs including drinking water monitoring and marine monitoring</li> </ul> <p>The above programs have produced some information on POPs pesticides, PCBs and dioxin. There exist Information system on POPs and State Statistic Reports</p>	<p>There are several laboratories that are capable of providing POPs pesticide and PCB analyses of environmental and food samples but these labs need more resources to strengthen their capabilities. None of Latvia's laboratories currently performs dioxin analyses.</p> <p>Latvia is currently conducting no human POPs monitoring.</p>		Latvian Environment Agency Laboratory Department <b>Tier 4</b>
Lithuania	State Programme for Environmental Monitoring (PCB monitoring included)		EMEP	Chemical Analysis Division of Environmental Research Department of the Environmental Protection Agency <b>Tier 4</b>
Macedonia (the FYR of)	No regular monitoring of POPs in any of environmental compartments. No sufficient data for national assessment on POPs contamination., although there are some research studies related to POPs pesticides.	<p>Lack of adequately equipped laboratories and properly trained staff for POPs analyses.</p> <p>The National Agency for Health Protection and the Veterinary Institute is able to make analyses on some POPs pesticides.</p>		

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or datasets	Laboratories
Moldova (Republic of)	<ul style="list-style-type: none"> <li>• ENVREC9701 Prut River Water Management (certain POPs included) (1998-2000)</li> <li>• Monitoring of pollution of surface water in Danube River Basin, including certain POPs (1998-1999)</li> </ul> <p>In general, only DDT and its metabolites are regularly monitored at national scale. Data on other POPs are fragmentary. Most monitoring work has been done in soil and water, air monitoring and information in other environmental compartments are deficient.</p>	<p>There are some technical capacity for POPs pesticides analyses, but general laboratory capacity is insufficient, especially for PCBs and unintended POPs.</p> <p>Coordination and exchange of information among monitoring agencies is sporadic; QA/QC is of concern as well as the data handling</p>		<ul style="list-style-type: none"> <li>• Soil Monitoring and Gas Chromatography Laboratory <b>Tier 4</b></li> <li>• Laboratory of Sanitary – Chemical Researches <b>Tier 4</b></li> </ul>
Poland	<ul style="list-style-type: none"> <li>• Elaboration of a system in Poland for preventing environmental contamination from PCB compound sources (1995-1997)</li> <li>• Emission analysis of POPs for the years 1988-1996</li> <li>• Organochlorine pesticide concentrations in the drinking water from a region of extensive agriculture in Poland (1994-2000)</li> </ul>			<ul style="list-style-type: none"> <li>• Laboratory for Trace Organic Analysis, Cracow Univ. of Technology <b>Tier 1</b></li> <li>• Environmental Protection Laboratory, Pulp and Paper Research Inst. <b>Tier 2</b></li> <li>• Military Inst. Of Chemistry and Radiometry, Lab for Chemical Weapons Convention Verification <b>Tier 2</b></li> <li>• Inst. Of Meteorology and Water Management, Maritime Branch <b>Tier 1</b></li> </ul>

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or datasets	Laboratories
Romania	<ul style="list-style-type: none"> <li>• Monitoring of chemical contaminants in food products (1980-2005)</li> <li>• Dioxins monitoring in the environment (2000-2001)</li> <li>• Assessment of body burden with organochlorine pesticides residues (2000-2004)</li> <li>• Researches concerning transboundary pollution with POPs produced by industrial activities from the West Area of Romania (1999-2001)</li> <li>• Elaboration of the emissions inventory for 1998, 1999 concerning the atmospheric pollutants (POPs included) (2000-2001)</li> </ul>			
Russian Federation		<p>Regular monitoring of the PAHs in air is conducted in all industrial cities.</p> <p>Regular monitoring of pesticides in foodstuffs, soils and fresh water.</p>	<ul style="list-style-type: none"> <li>• HELCOM</li> <li>• Caspian Environment Programme CEP</li> <li>• AMAP</li> </ul>	Centre for Environmental Chemistry of SPA "Typhoon" <b>Tier 1</b>
Serbia and Montenegro		<p>Organized active monitoring networks of PTSs do not exist. However, in some regions there are ongoing monitoring activities in certain compartments.</p>		P.I. Centre for Ecotoxicological Research of Montenegro <b>Tier 2</b>

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or datasets	Laboratories
Slovakia	<ul style="list-style-type: none"> <li>• Evaluation of the exposure of the selected population sub-group to POPs (1997-2000)</li> <li>• The burden of the environment and human population in an area contaminated by polychlorinated biphenyls (1997-1999)</li> </ul>			<ul style="list-style-type: none"> <li>• Dept. of Toxic Organic Pollutants, Inst. Of Preventive and Clinical Medicine, Slovak Medical Univ. <b>Tier 1</b></li> <li>• Oddelenie vodohospodárskych laboratórií Piest'any <b>Tier 4</b></li> <li>• East Slovakia Water Works, Regional Laboratory <b>Tier 4</b></li> <li>• BEL/NOVAMANN International, Ltd. <b>Tier 4</b></li> <li>• Regional Office of Public Health <b>Tier 3</b></li> <li>• EL spol. s r. o. <b>Tier 4</b></li> <li>• EKOLAB s.r.o. Kosice <b>Tier 2</b></li> <li>• INGEO-ENVILAB, s.r.o. <b>Tier 4</b></li> <li>• Division of the laboratory services (PHI) <b>Tier 3</b></li> <li>• Geological Survey of Slovak Republic, Geoanalytical Laboratories <b>Tier 4</b></li> </ul>
Slovenia	PHARE programme 1999 (monitoring of certain POPs pesticides in food included)	<p>Some of POPs chemicals are included in different national monitoring, e.g. monitoring of water and air.</p> <p>UNEP/GEF pilot country for NIPs (2002-2004)</p>	MEDPOL	<p>Group for Environmental Analytical Chemistry</p> <p>Laboratory for Organic Analytical Chemistry <b>Tier 2</b></p>
Ukraine	The Elaborating of National Strategy and Action Plan on POPs management and of Program of Atmospheric Emissions Reduce (2000-2001)	No air monitoring and little information on other environmental compartments		<ul style="list-style-type: none"> <li>• Research Dept. Metrological Assurance Measurements <b>Tier 4</b></li> <li>• Dept. of Analytical Control, Ukrainian Sci. Centre Ecology of the Sea <b>Tier 2</b></li> <li>• Kharkiv branch of the Dept. of Deense National Enterprise <b>Tier 4</b></li> </ul>

#### IV. LATIN AMERICAN AND CARIBBEAN STATES

##### A. SOUTH AMERICA

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or Datasets	Laboratories
Argentina	Some one-off projects including: <ul style="list-style-type: none"> <li>• Organochlorine and Organophosphorous pesticides in the Paraná river (1995-1996)</li> <li>• Chlorinated hydrocarbons in the seawater and surface sediments of Blanca Bay (1980-1981)</li> </ul>	Several National services related to food and agriculture have relatively complete laboratories and a long pesticide monitoring tradition in foodstuffs, but unfortunately often with severe limitations for public access to the data.		<ul style="list-style-type: none"> <li>• Cátedra de Toxicología y Química Legal, Facultad de Farmacia y Bioquímica – UBA <b>Tier 3</b></li> <li>• INTI – Organics Contaminants <b>Tier 4</b></li> <li>• INA-CTUA-LETS Laboratorio Experimental de Tecnologías Sustentables <b>Tier 4</b></li> <li>• Laboratorio de Química Ambiental y Biogeoquímica (LAQAB) <b>Tier 2</b></li> <li>• Centro de Investigaciones Toxicológicas <b>Tier 3</b></li> <li>• Water Research Transdisciplinary Centre <b>Tier 4</b></li> <li>• INA-CTUA-LECA <b>Tier 4</b></li> </ul>
Bolivia	Data on PTS is scarce.	Very limited capacity for PTS monitoring		<ul style="list-style-type: none"> <li>• Spectrolab <b>Tier 4</b></li> <li>• Centro de Aguas y Saneamiento Ambiental V.M.S.S. Facultad de Ciencias y Tecnología <b>Tier 4</b></li> <li>• Centro de Analisis Investigación y Desarrollo (CEANID) Facultad de Ciencias y Tecnología <b>Tier</b></li> <li><b>Laboratory without POPs analysis</b></li> <li>• Higiene Industrial y Toxicología Instituto Nacional de Salud Ocupacional <b>Tier</b></li> <li><b>Laboratory without POPs analysis</b></li> <li>• Fundación Instituto de Tecnología de Alimentos <b>Tier 4</b></li> </ul>

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or Datasets	Laboratories
Brazil	<ul style="list-style-type: none"> <li>• Levels of PCDDs, PCDFs and PCBs in Human Milk- Third Round of WHO-coordinated Exposure Study (2000-ongoing)</li> <li>• Monitoring dioxins in pasteurized milk in the state of Rio de Janeiro, Brazil (1999-2000)</li> <li>• Occurrence and distribution of organochlorine compounds in sediment and organisms from estuaries along the Brazilian coast (2002-2005)</li> <li>• A contamination survey of the estuarine system of Santos and São Vicente (1998-2003)</li> <li>• Specimen bank and monitoring of organohalogenated contaminants (1999-ongoing)</li> </ul>	<p>Environmental monitoring is carried out by State agencies but data generation and capacity varies enormously across the country. Recently, there has been an increase in the participation of public and private universities in environmental monitoring.</p>		<ul style="list-style-type: none"> <li>• LAQUAM, Universidade Federal da Bahia <b>Tier 4</b></li> <li>• Cia de Tecnologia de Saneamiento Ambiental (CETESB), Divisão de Análises Físico-Químicas <b>Tier 4</b></li> <li>• Analytical Solutions <b>Tier 1</b></li> <li>• Physical Chemistry Division <b>Tier 4</b></li> <li>• Laboratório de Microcontaminantes Orgânicos e de Ecotoxicologia Aquática (FURG) <b>Tier 2</b></li> <li>• Bioagri Ambiental Ltda <b>Tier 4</b></li> </ul>
Chile	<p>There are no regular monitoring programs specifically designed for PTS. However, other existing monitoring programmes could include tests for PTS in the future.</p> <p>One-off project: Diagnóstico Nacional de Contaminantes Orgánicos Persistentes</p> <p>No programs looking at biota levels or effects exist.</p>	<p>Scientific activity is concentrated in the most important urban centers. This has resulted in an uneven distribution of scientific technical capacities that are particularly deficient in the northern region and the extreme south.</p> <p>There are public and private laboratories that have the necessary analytical techniques and trained personnel for PTS analysis.</p>		<p>Laboratorio de Química del Centro EULA – Chile <b>Tier 4</b></p>
Ecuador	<p>No information on POPs monitoring programmes and datasets</p>	<p>Very limited capacity for PTS monitoring</p>		<ul style="list-style-type: none"> <li>• Pesticides Laboratories of the Ecuadorian Service for Agriculture and Cattle Protection (SESA) <b>Tier 4</b></li> <li>• Ecotoxicology Laboratory <b>Tier 4</b></li> <li>• Laboratorio de Chromatografía Instituto de Ciencias (ICQ) Escuela Superior Politécnica del Litoral (ESPOL) <b>Tier 4</b></li> </ul>
Paraguay	<p>No ongoing monitoring programs.</p>	<p>Monitoring capacities are very limited, with the exception of a state owned laboratory with limited facilities.</p>		

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or Datasets	Laboratories
Peru	<ul style="list-style-type: none"> <li>Determinación de efectos en suelos agrícolas par el uso intensivo de plaguicidas COPs. El proyecto se encuentra en fase de elaboración y formara parte del 'Plan Nacional de Implementación del Convenio de Estocolmo en Perú'</li> <li>Polychlorobiphenyls Source Inventory</li> <li>Obsolete pesticides Inventory</li> </ul>	Monitoring capacity is very limited and performed by a few local universities. The exception is the CEPIS-OPS laboratory which is equipped for chemical analysis but limited for economic reasons.		
Uruguay	Bifenilos policlorados en Uruguay	Several organizations have facilities for performing PTS analysis. However, there are no regular monitoring programs for PTS.		

## B. CENTRAL AMERICA AND THE CARIBBEAN

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or Datasets	Laboratories
Antigua and Barbuda		Limited capacity to carry out monitoring		Government Chemist Laboratory <b>Laboratory without POPs analysis</b>
Bahamas		Has laboratory capacity to conduct monitoring of selected PTS		Public Analyst Laboratory <b>Laboratory without POPs analysis</b>
Barbados		Has laboratory capacity to conduct monitoring of selected PTS  The Barbados Government Analytical Facilities (BGAF) possesses some equipment need for testing. It also has well trained personnel		Government Analytical Services (GAS) <b>Laboratory without POPs analysis</b>
Belize	There is data from an ambient air sampling campaign			
Bermuda				
Colombia	<ul style="list-style-type: none"> <li>Monitoring programme for the upper basin of the Bogotá River: Organochlorinated pesticides; PCBs; HAPs and Phenols</li> <li>Some data on levels of DDT and PCBs in coastal waters</li> </ul>	Monitoring and control of food and drugs is the responsibility of the Ministry of Health through the National Institute of Vigilance of Medicines and Foods		Laboratorio de Calidad Ambiental del IDEAM <b>Tier 4</b>

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or Datasets	Laboratories
Costa Rica	Desarrollo e Implementación de un sistema de Vigilancia de las Intoxicaciones con Plaguicidas. Experiencia en Costa Rica			Laboratory for Pesticide Residue Analysis (LAREP), Central American Institute for Studies on Toxic Substances (IRET) <b>Tier 4</b>
Cuba	One-off projects : <ul style="list-style-type: none"> <li>Estudio sobre la contaminación por plaguicidas y medidas para su control en la Ciénaga de Zapata y su zona costera</li> <li>Distribución, destino y efectos de plaguicidas en el biota ambiente tropical-marino</li> </ul>	The Laboratory infrastructure for the testing of PTSs is located within three Ministries: Agriculture Health and Transport.		<ul style="list-style-type: none"> <li>Residue and Pesticide Environmental Contamination Lab. <b>Tier 4</b></li> <li>Environmental Chemistry Laboratory</li> <li>Petroleum Research Centre</li> <li><b>Laboratory without POPs analysis</b></li> </ul>
Dominica		Very limited capacity to carry out monitoring		
Dominican Republic		No information		
El Salvador				
Grenada		Very limited capacity to carry out monitoring		
Guatemala				Programa de Química Analítica Ambiental (PQAA), Instituto de Investigaciones Universidad del Valle de Guatemala <b>Tier 4</b>
Guyana		Has laboratory capacity to conduct monitoring of selected PTS		
Haiti		No information		
Honduras	Residuos de plaguicidas organoclorados en tres matrices ambientales de la zona sur del país (2001 – 2002)			Centro de Estudios y Control de Contaminantes CESCO <b>Tier 4</b>
Jamaica	No programmes to routinely monitor the levels of POPs Chemicals in the environment.  Established an Inventory of Obsolete Pesticides in Jamaica.  There are some previous studies on the levels of POPs pesticides in the environment.			Pesticide Research Laboratory University of West Indies, Chemistry Department <b>Tier 4</b>

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or Datasets	Laboratories
Mexico	Status Report of the dioxins and furans in Mexico (2001)  Status report on PCBs in Mexico (2001-2002)	A modification to Mexico's environmental protection law as approved in 2001, in which industries will be required to report data on a wide variety of pollutants.	The Sound Management of Chemicals (SMOC) initiative under the North American Agreement on Environmental Cooperation (NAAEC)	<ul style="list-style-type: none"> <li>• Mexican Customs Laboratory</li> <li>• <b>Laboratory without POPs analysis</b></li> <li>• International Centre for Environmental Research and Training <b>Tier 4</b></li> <li>• Centro Nacional de Metrologia <b>Tier 4</b></li> </ul>
Nicaragua	Estudios de contaminación (Mrex) cuencas hídricas por plaguicidas y estudio sobre la contaminación			
Panama	<ul style="list-style-type: none"> <li>• Determinación de la actividad eritocítica y macrofágica ocasionada por DDT.</li> <li>• Control de Calidad de Alimentos presumiblemente contaminados por COPs.</li> <li>• Evaluación de riesgo de exposición a COPs en áreas específicas.</li> </ul>	There are a number of laboratories with well trained staff in Panama capable of conducting testing for PTS.		Instituto de Investigación Agropecuaria de Panamá Laboratorio de Análisis de Residuos de Plaguicidas <b>Tier 4</b>
Saint Kitts and Nevis		Very limited capacity to carry out monitoring		
Saint Lucia		Has laboratory capacity to conduct monitoring of selected PTS.  The Caribbean Environmental Health Institute (CEHI) laboratory is well equipped and has well trained staff.		Caribbean Environmental Health Institute (CEHI) <b>Tier 4</b>
Saint Vincent and the Grenadines		Very limited capacity to carry out monitoring		
Suriname				
Trinidad and Tobago		Has laboratory capacity to conduct monitoring of selected PTS  A number of governmental and private laboratories carry out environmental sampling and analysis. (only three are accredited to perform certain tests)		
Venezuela (Bolivarian Republic of)				

V. WESTERN EUROPEAN AND OTHER STATES

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or Datasets	Laboratories
Andorra				
Australia	<p>-National Dioxins Programme (concurrent) and relevant datasets:</p> <ul style="list-style-type: none"> <li>• Dioxins in Ambient Air in Australia</li> <li>• Dioxins in Soils in Australia</li> <li>• Dioxins in Aquatic Environments in Australia</li> <li>• Dioxins in Fauna in Australia</li> <li>• Dioxins in Agricultural Commodities in Australia</li> <li>• Dioxins in the Australian Population: Levels in Blood</li> <li>• Dioxins in the Australian Population: Levels in Human Milk</li> </ul> <p>-Monitoring PCBs in Australia (1998)</p> <p>-Organo Pesticide levels in Australia (60's to 1999)</p> <p>-Organochlorine Pesticides (OCPs) and Polybrominated Diphenyl Ethers (PBDEs) in the Australian population: Levels in Human Milk</p>	<p>Has capability to analyse for PCDD/PCDF</p>		<p>Australian Government Analytical Laboratories <b>Tier 1</b></p>

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or Datasets	Laboratories
Austria	<ul style="list-style-type: none"> <li>• AWQMS Austrian Water Quality Monitoring System</li> <li>• Milk Monitoring (dioxins)</li> <li>• Food monitoring (dioxins)</li> <li>• Feed monitoring (dioxins)</li> <li>• Austrian air pollutant inventory</li> <li>• Ambient air control programme</li> <li>• Dioxin immission monitoring</li> <li>• POP loads in forest ecosystems (bioindication)</li> <li>• POPs levels in remote Austrian lakes</li> </ul> <p>Some of the above programmes are single activities and provide no time series.</p>		MONARPOP- Monitoring Network in the Alpine Region for Persistent and other Organic pollutants	Umweltbundesamt Ltd. Dept. Environmental Analysis/POPs <b>Tier 1</b>
Belgium	Inventory of PCBs at the federal level		EMEP	<ul style="list-style-type: none"> <li>• Center for analysis of Residues in Traces (CART) <b>Tier 1</b></li> <li>• Institute for Applied Chromatography (IAC) <b>Tier 1</b></li> </ul>

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or Datasets	Laboratories
Canada	<ul style="list-style-type: none"> <li>• National Pollutant Release Inventory (NPRI)</li> <li>• Toxic Substances Research Initiative (TSRI)</li> <li>• Monitoring under the Accelerated Reduction/Elimination of Toxics (ARET)</li> <li>• Assessment of Priority Substances under the Canadian Environmental Protection Act 1999 (CEPA)</li> <li>• The categorization and screening of the domestic substances list under the Canadian Environmental Protection Act 1999 (CEPA)</li> <li>• Chlorinated Substances Action Plan (CSAP)</li> <li>• Ecological Monitoring and Assessment Network (EMAN) Domestic Substances</li> <li>• Safe Environments Programme</li> <li>• Northern Contaminants Program</li> </ul> <p>Extensive data</p>	Comprehensive monitoring capacity and capability	<ul style="list-style-type: none"> <li>• North America's pollutant release and transfer registers (PRTRs)</li> <li>• Monitoring under the Integrated Atmospheric Deposition Network (IADN)</li> <li>• The Great Lakes Binational Toxics Strategy (GLBTS)</li> <li>• AMAP</li> <li>• The Sound Management of Chemicals (SMOC) initiative under the North American Agreement on Environmental Cooperation (NAAEC)</li> <li>• GAPS (The Global Atmospheric Passive Sampling) survey led by Canada in 4 East Asian countries: China, Japan, South Korea, Singapore</li> </ul>	<ul style="list-style-type: none"> <li>• Centre d'expertise en analyse environnementale de Quebec <b>Tier 1</b></li> <li>• National Laboratory for Environmental Testing <b>Tier 3</b></li> <li>• Toxicology Laboratory Institute National de Santé Publique du Quebec <b>Tier 2</b></li> <li>• Laboratory Services Pest Management Registration Agency <b>Tier 4</b></li> <li>• Analysis and Air Quality Division Environmental Technology Centre <b>Tier 1</b></li> </ul>
Denmark	Monitoring and Assessment of POPs in Greenland and the Faroe Islands		<ul style="list-style-type: none"> <li>• AMAP (Thematic Data Centres)</li> </ul>	National Environmental Research Institute <b>Tier 2</b>

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or Datasets	Laboratories
Finland	<ul style="list-style-type: none"> <li>• Monitoring of PCBs; OCs; chlorophenols; anisoles and veratroles; PCDD/Fs in fish and other aquatic organisms in lakes and coastal areas.(1970-ongoing)</li> <li>• Mussel Watch (1988–ongoing)</li> <li>• Monitoring of bioaccumulating compounds in the aquatic environment (1978-ongoing)</li> <li>• Determination of organohalogen compounds from foodstuffs of animal origin (meat, milk, egg, fish) (ongoing)</li> <li>Monitoring of harmful substances in the terrestrial environment (1998–ongoing)</li> <li>• Survey of dioxins in fish for human consumption (2001-2006)</li> <li>• Monitoring of deposition quality in Finland (1990s–ongoing)</li> </ul>	Many ongoing monitoring programs of POPs in different environmental matrices	<ul style="list-style-type: none"> <li>• EMEP</li> <li>• AMAP</li> </ul>	<ul style="list-style-type: none"> <li>• National Public Health Institute Laboratory of Chemistry <b>Tier 1</b></li> <li>• VTT Process <b>Tier 1</b></li> </ul>
France	Réseau National de Bassin (RNB)  Réseaux des eaux souterraines  Réseaux des agences de l'eau	Air monitoring performed at 39 locations.  Monitoring of biological effects is limited to research studies at the moment.	MEDPOL	<ul style="list-style-type: none"> <li>• Micropollutants Technologie <b>Tier 1</b></li> <li>• Centre de Géochimie de la Surface, Laboratoire de Phisico-Chemie de L'atmosphère (LCPA), Université Louis Pasteur <b>Tier 4</b></li> <li>• Laboratoire de Rouen-ETSA <b>Tier 1</b></li> </ul>

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or Datasets	Laboratories
Germany	<ul style="list-style-type: none"> <li>• Ambient Air: "Exposure/Emission Monitoring": wet deposition measurements in the framework of the network of the Environmental Agency (yearly)</li> <li>• Monitoring on Permanent Soil Monitoring Sites (1985–ongoing)</li> <li>• CAMP-Comprehensive Atmospheric Monitoring Programme</li> <li>• Monitoring Programmes of the Federal States of Germany</li> <li>• Analysis of POP substances in sewage sludge (ongoing)</li> <li>• German Environmental Specimen Bank (1985–ongoing)</li> <li>• Dioxin reference measuring programme of the Government and federal states (1994 –ongoing)</li> </ul>	Comprehensive monitoring data	EMEP	<ul style="list-style-type: none"> <li>• ERGO Forschungsgesellschaft GmbH <b>Tier 1</b></li> <li>• Eurofins-Oekometric GmbH <b>Tier 1</b></li> <li>• GSF-National Research Centre for Environment and Health, Institute of Ecological Chemistry, Dioxin Laboratory, <b>Tier 1</b></li> <li>• Federal Institute of Hydrology <b>Tier 4</b></li> <li>• Central Laboratory of the Bavarian EPA <b>Tier 1</b></li> <li>• State Inst. For Chemical and Veterinary Analysis of Food, Dioxin laboratory and pesticide Lab. <b>Tier 1</b></li> </ul>
Greece			MEDPOL	Mass spectrometry and dioxin analysis lab <b>Tier 1</b>
Greenland	Monitoring and Assessment of POPs in Greenland and the Faroe Islands			
Iceland	<ul style="list-style-type: none"> <li>• Temporal trends and spatial variation of POPs in marine biota</li> <li>• Temporal trend monitoring of POPs (in air and precipitation)</li> <li>• Biological effect monitoring in marine biota</li> <li>• Human health monitoring programme (2003), similar datasets from 1993 and 1998 are also available</li> </ul>		<ul style="list-style-type: none"> <li>• EMEP</li> <li>• AMAP</li> </ul>	
Ireland			EMEP	Environmental Protection Agency <b>Tier 4</b>
Israel			MEDPOL	
Italy	<ul style="list-style-type: none"> <li>• Monitoring of the PCB and Dioxin levels in Food Stuffs (permanent)</li> <li>• Evaluation of the PCB and Dioxin levels in the Venice Lagoon (3 years)</li> </ul>	Comprehensive monitoring systems are in place.	MEDPOL	Eco-Research <b>Tier 1</b>
Liechtenstein				
Luxembourg				Luxcontrol SA <b>Tier 4</b>

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or Datasets	Laboratories
Malta		Monitoring is carried out by a number of entities	MEDPOL	
Monaco			MEDPOL	International Atomic Energy Agency, Marine Environment Lab <b>Tier 2</b>
Netherlands			<ul style="list-style-type: none"> <li>• EMEP</li> <li>• The UK-Netherlands Collaborative Monitoring Programme</li> </ul>	<ul style="list-style-type: none"> <li>• Laboratory for Analytical Chemistry RIVM <b>Tier 1</b></li> <li>• Netherlands Institute for Fisheries Research, Dept. of Environment and Food Safety <b>Tier 1</b></li> </ul>
New Zealand	<p>NZ Organochlorines Programme (1999-)</p> <p><b>Available Datasets:</b></p> <ul style="list-style-type: none"> <li>• Concentrations of PCDDs, PCDFs and PCBs in retail foods and an assessment of dietary intake for New Zealanders, November 1998</li> <li>• Ambient concentrations of selected organochlorines in soil, December 1998</li> <li>• Organochlorines Programme Environmental Survey Database and Users Manual, March 1999</li> <li>• Ambient concentrations of selected organochlorines in estuaries, June 1999</li> <li>• Ambient concentrations of selected organochlorines in rivers, December 1998</li> <li>• Ambient concentrations of selected organochlorines in air, December 1999</li> <li>• Concentrations of selected organochlorines in serum from the non-occupationally exposed New Zealand population, May 2001</li> <li>• Investigation of Organochlorine Contaminants in the Milk of New Zealand Women 2001</li> </ul>	<p>Comprehensive monitoring programmes.</p> <p>Has capability to analyse for PCDD/PCDF</p>		AgriQuality Limited <b>Tier 1</b>

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or Datasets	Laboratories
Norway	<ul style="list-style-type: none"> <li>• Atmospheric inputs of pollutants to marine waters (1992-ongoing)</li> <li>• AMAP Norwegian Implementation Plan (status report on POPs in 2002 and 2006)</li> <li>• Joint Assessment and Monitoring Programme (JAMP) in Norway (1981-ongoing)</li> <li>• Monitoring of hazardous substances in fish and shellfish in the Grenland fjords (1980-ongoing)</li> <li>• Monitoring of hazardous substances in air at Svalbard (1993-ongoing )</li> <li>• Heavy metals and persistent organic pollutants in sediments and fish from lakes in Northern and Arctic regions of Norway (1992-1995)</li> </ul>		<ul style="list-style-type: none"> <li>• EMEP</li> <li>• AMAP</li> </ul>	<ul style="list-style-type: none"> <li>• Norwegian Institute for Air Research <b>Tier 2</b></li> <li>• Laboratory of Environmental Toxicology Norwegian School of Veterinary Science <b>Tier 2</b></li> </ul>
Portugal	<ul style="list-style-type: none"> <li>• External Monitoring Programme of LIPOR II (1998-2002)</li> <li>• Measurement of Atmospheric Emissions of Dioxins and Furans in Selected Sources in Portugal (1999-2000)</li> </ul>	<p>Systematic monitoring has been carried out since 1999.</p> <p>Analyses of water, sediment and biota (fish and mussels) are carried out.</p>		Laboratorio de Referencia do Ambiente <b>Tier 1</b>
San Marino				
Spain	<p>The Spanish Network of Atmospheric Pollution monitoring was set up to comply with the requirements of programs EMEP and CAMP.</p> <p>The integrated network for quality of waters (Red ICA) includes all the existing networks related with the quality of waters in Spain.</p>		MEDPOL	POPs Analysis Laboratory of CIEMAT <b>Tier 1</b>

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or Datasets	Laboratories
Sweden	National Environmental Monitoring Programme: Programme's area: POPs chemicals	Extensive POPs monitoring.	<ul style="list-style-type: none"> <li>• EMEP</li> <li>• AMAP</li> </ul>	<ul style="list-style-type: none"> <li>• Laboratory for Analytical Environmental Chemistry <b>Tier 2</b></li> <li>• AnalyCen AB <b>Tier 1</b></li> <li>• Dept of Chemistry, Umea Univ. <b>Tier 1</b></li> <li>• Organic Environmental Chemistry Section Department of Environmental Assessment <b>Tier 2</b></li> </ul>
Switzerland	<ul style="list-style-type: none"> <li>• POPs in Switzerland: Bio-monitoring with lichens (1996-2000)</li> <li>• Monitoring of PCDD/F in cow's milk from Switzerland (1990-2001)</li> <li>• Elimination of PCB-containing material used in the past in window packing (Fugenkitt) (2001-2004)</li> </ul>	Extensive POPs monitoring.		<ul style="list-style-type: none"> <li>• Swiss Federal Lab for Materials Testing and Research (EMPA) <b>Tier 1</b></li> <li>• SECOE/STIPI <b>Tier 4</b></li> <li>• Univ. of Basel, Dept. of Chemistry <b>Tier 4</b></li> </ul>
Turkey	Monitoring of organochlorine pesticides and PCBs in biological and environmental material (1998-2001)		MEDPOL	
United Kingdom of Great Britain and Northern Ireland	<ul style="list-style-type: none"> <li>• The UK National Marine Monitoring Programme</li> <li>• UK soil and herbage pollutant survey (27 months)</li> <li>• Environment Agency Pesticide Monitoring Programme</li> <li>• The UK Atmospheric POPs Monitoring Programme (1997-ongoing)</li> </ul>	Comprehensive monitoring Programmes	The UK-Netherlands Collaborative Monitoring Programme	<ul style="list-style-type: none"> <li>• The Central Science Lab. <b>Tier 1</b></li> <li>• Lancaster Univ. Environmental Organic Chemistry Group <b>Tier 1</b></li> <li>• CEFAS Burnham Laboratory <b>Tier 2</b></li> </ul>

Country	Existing National Monitoring Programs/Datasets	Monitoring Capacity/Capability	Regional/Global Programs or Datasets	Laboratories
United States of America	<ul style="list-style-type: none"> <li>• Toxic Release Inventory (TRI)</li> <li>• National Dioxin Air Monitoring Network (NDAMN)</li> <li>• Environmental Monitoring and Assessment Program (EMAP)</li> <li>• Monitoring Pesticides Residues in Food</li> <li>• Mussel Watch</li> <li>• National Report on Human Exposure to Environmental Chemicals (NHANES)</li> </ul> <p>Extensive data</p>	Comprehensive monitoring.	<ul style="list-style-type: none"> <li>• The Great Lakes Binational Toxics Strategy</li> <li>• North America's pollutant release and transfer registers (PRTRs)</li> <li>• AMAP</li> <li>• Integrated Atmospheric Deposition Network (IADN)</li> <li>• The Sound Management of Chemicals (SMOC) initiative under the North American Agreement on Environmental Cooperation (NAAEC)</li> </ul>	<ul style="list-style-type: none"> <li>• Pace Specialty Analytical Services <b>Tier 1</b></li> <li>• USEPA/OPPTS/OPP/BEAD <b>Tier 1</b></li> <li>• Alta Analytical Laboratory <b>Tier 2</b></li> <li>• Alta Analytical Perspectives, LLC <b>Tier 1</b></li> <li>• Environmental Chemistry Lab. School of Public and Environmental Affairs <b>Tier 2</b></li> <li>• Organic Analytical Toxicology POPs <b>Tier 1</b></li> </ul>

## **Annex II: Analysis of the current status of the geographical coverage of monitoring programmes and datasets<sup>2</sup>**

### **Africa**

In general, this region has neither regular national monitoring programmes on persistent organic pollutants (POPs) in any of global monitoring programme (GMP) matrices, nor regional monitoring programmes except of Northern African part where exists MEDPOL. Most countries have either no data or very limited data of pesticides monitoring generated from one-off projects. Actually, of the 47 countries in sub-Sahara area, only 16 have data related to persistent toxic substances (PTS) levels in the environment. No data on levels of PTS in air. There are very few studies on coastal marine sediments. With the exception of Zimbabwe and South Africa there is no systematic pesticide monitoring in any of the countries of this area.

The region severely lacks of adequate laboratories for POPs analysis but countries like Egypt, Morocco, Tunisia, Ghana, Kenya, Mali, Senegal, South Africa, Sudan, Uganda and Zambia have shown certain analytical capabilities.

### **Asia and the Pacific**

In the Pacific Islands sub-region, many countries appear to have had no POPs analyses performed. Most data has been reported via university research at Guam and the University of the South Pacific. The most significant area where data is lacking in pacific islands is in toxicology and ecotoxicology. There is a lack of data on levels of POPs in air and seawater and very few data on the levels of POPs in humans. Drinking water and food analyses are also very limited. There is limited monitoring capacity in the area. National facilities are only available in some of the larger countries and some are owned by regional institutions. Most remaining smaller countries rely on sending samples to laboratories overseas. The French and US territories have easier access to labs in their respective 'parent' countries. Most analyses have been 'one-off' and no sites have been monitored regularly over a long period of time.

In East Asia area, China, Japan and Korea have operational monitoring programmes in place and have different levels of analytical capability. Japan has established comprehensive monitoring programmes that cover all 12 POPs. There are some measurement experiences in the Philippines and Vietnam. Cambodia, Laos and Mongolia have no monitoring experience.

Around the Indian Ocean area, other than for pesticides there is a lack of data on environmental levels of POPs. Most of the data was generated in India. No data on levels of POPs in air. Almost all the studies were "one-off". There is adequate legislation for the control of POPs pesticide in each country but systematic, nationwide monitoring programmes are lacking in most countries.

In general, this region lacks of systematic and comprehensive regional monitoring programmes although a few countries in Central and Western Asia have participated in the activities of the regional programs like MEDPOL and CEP. Several emerging projects may be encouraging towards developing coordinated regional monitoring activities. These projects are Endocrine Disruptive Compounds (EDC) Pollution Monitoring in the East Asian Coastal Hydrosphere, Japan hosted Trial Air POPs Monitoring project in 4 East Asian countries and there exist UNU's regional POPs monitoring datasets for 8 Asian countries and GAPS POPs survey data in 4 Asian countries.

### **Central and Eastern Europe**

Some countries in this region have their monitoring activities covered by regional programmes like EMEP and MEDPOL. These programmes require regular reports from countries on emissions, concentrations of air pollutants, the quantity and significance of transboundary fluxes etc. and therefore have had datasets for these countries. The monitoring capability in this region is going to be strengthened as EMEP has set up a strategy to further extend its monitoring activities in this region. In addition to the air matrix, WHO/GEMS/Food have conducted several surveys of human milk on the levels and trends of dioxins, PCBs and other POPs over the period 1987-2003 in Europe region. HELCOM has extended its marine monitoring coverage to some countries in this region.

Many countries in this region have their own laboratories to carry out POPs analysis. Many one-off projects in this region have generated valuable datasets in water and soils.

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<sup>2</sup> The full names of the organizations abbreviated in the present annex are provided in annex III to the present document.

**Latin America and the Caribbean**

In the Central America and Caribbean area, data is scattered and difficult to assess due to variability of analytical methods used and lacking of monitoring networks. There exist some POPs data in organochlorine pesticides (mainly DDTs, HCH and toxaphene) and in some cases PCBs but no data on PCDDs or PCDFs. The capacity to monitor POPs across the region varies from country to country with the larger and/or more affluent countries having more sophisticated facilities. Countries in the region have fairly limited facilities in monitoring all the POPs. Six of the 11 English speaking Caribbean countries possess some laboratory capacity to test for selected PTS

In South America, most countries lack routine monitoring programmes. No routine monitoring activities have been performed to obtain a clear picture of POPs levels in soils of the region. POPs monitoring in air is little developed in the region. It has been observed that there are effective monitoring programmes in Argentina, Brazil and Chile which generate a great deal of reliable data, but these data are not always easy to be accessed to.

Some regional monitoring activity on POPs has been conducted in this region, like International Mussel Watch. Its initial monitoring program ran in 1991-1992 at total of 76 sites sampled in South America, Central America, the Caribbean, and Mexico, used bivalves as monitoring matrix and produced a unique high-quality database of chemical contaminants in coastal organisms from this widespread geographic region.

For comparative purposes, standardization of research, assessment methodologies and reporting requirements is needed throughout the Region.

**Western Europe and Other States**

This region has the most comprehensive monitoring programmes, the most complete datasets and the best equipped laboratories for POPs analysis. All the countries in this region have some national programmes related to the study of human exposure and food contamination, but differ in size and scope. Many countries have extensive data available. Some of them have run Mussel Watch program to monitor bivalve matrix.

EMEP monitors the movement of pollutants in the atmosphere across state boundaries. WHO/GEMS/Food have conducted several surveys of human milk on the levels and trends of dioxins, PCBs and other POPs over the period 1987-2003 in Europe region.

HELCOM, OSPAR and CEP are the marine monitoring programmes in this region.

In Arctic area, AMAP has comprehensive monitoring program in all compartments, including humans. There is a large amount of data available on levels of POPs, particularly OC compounds in Arctic air and snow. There are also POPs monitoring activities in wildlife species like fish and shellfish. Few spatial or temporal trends are apparent in the existing data, largely due to poor temporal or spatial coverage or differences in sampling and reporting of data. In the Northern Mediterranean, there is few spatial and long-term temporal trend monitoring of fish, mussels and seabird eggs that have been undertaken.

In North America, loadings of toxic substances from atmospheric deposition are estimated in a number of ecosystems across North America.

### Annex III:

## Summaries of Existing Regional/Global Monitoring Programmes and Datasets on persistent organic pollutants

### I. List of regional monitoring programmes and datasets

PROGRAMMES/DATASETS	REGIONS COVERED
<b>AMAP</b> (Arctic Monitoring and Assessment Programme)	Arctic
<b>CEP</b> (The Caspian Environment Programme)	Five Caspian Littoral States
<b>EMEP</b> (Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe)	Europe
<b>HELCOM</b> (the Convention on the Protection of the Marine Environment of the Baltic Sea Area)	Europe
<b>IADN</b> (Integrated Atmospheric Deposition Network)	North America
<b>International Mussel Watch</b>	Latin America and the Caribbean
<b>MEDPOL</b> (Mediterranean Pollution Monitoring and Research Programme)	Mediterranean region: France, Italy, Spain, Lebanon, Macedonia, Yugoslavia
<b>OSPAR Convention</b> (Convention for the Protection of the Marine Environment of the North-East Atlantic)	Europe
<b>SMOC</b> (Sound Management of Chemicals) programme under North American Regional Action Plans (NARAPs)	Mexico, Canada, USA
<b>Trial Background Air POPs Monitoring Project</b>	East Asia: Indonesia, South Korea, Vietnam
<b>United Nations University</b> (UNU) POPs Monitoring Database	East Asia: China, Indonesia, Malaysia, Philippines, Singapore, South Korea, Thailand, Vietnam

### II. List of global monitoring programmes and datasets

PROGRAMMES/DATASETS	ENVIRONMENTAL MATRICES
<b>GAPS Survey</b> (The Global Atmospheric Passive Sampling)	Air All continents: more than 50 global sites
<b>WHO/GEMS/Food</b> (WHO Global Environmental Monitoring System -Food Contamination Monitoring and Assessment Programme)	Human milks
<b>WMO/GAW</b> (World Meteorological Organization/Global Atmosphere Watch)	Air

### III. Fact sheets on the regional and global monitoring programmes and data bases

#### A. AMAP

AMAP is an international organization established in 1991. The primary function of AMAP is to advise the governments of the eight Arctic countries (Canada, Denmark/Greenland, Finland, Iceland, Norway, Russia, Sweden and the United States) on matters relating to threats to the Arctic region from pollution, and associated issues. AMAP is responsible for: measuring the levels, and assessing the effects of anthropogenic pollutants in all compartments of the Arctic environment, including humans; documenting trends of pollution; documenting sources and pathways of pollutants; examining the impact of pollution on Arctic flora and fauna.

In recent AMAP strategic plan for the period 2004+, contaminant levels, trends and effects in human populations and in the environment have been identified as its work priorities that include:

- monitoring temporal trends in the levels of prioritised contaminants (persistent organic pollutants, heavy metals, radioactivity, acidification, hydrocarbons);
- determining more fully the geographic distribution and magnitude of contaminant levels on a circumpolar basis;
- clarifying the adverse effects of priority contaminants on human populations, especially on child development;
- monitoring and identify chemical and biological effects on Arctic flora and fauna;
- identifying new contaminants that may pose a cause for concern in the Arctic.

AMAP monitoring activities are based, to the greatest extent possible, on ongoing national and international monitoring and research; aiming to harmonize this work and where necessary promote new activities to fill identified gaps in order to meet the AMAP objectives. Practical implementation of a circumpolar programme of measurements is based on coordinated national activities under the AMAP National Implementation Plans (NIPs) of the participating countries, supplemented by additional contributions from, e.g. non-Arctic countries and regional and international organizations. Work under national programmes of the Arctic States, etc., that cover regions outside of the Arctic but which are relevant to the Arctic is also included. AMAP cannot dictate the activities that are incorporated in the national monitoring/research programmes; it can however encourage the countries to include work to address AMAP priorities, and promote harmonization and coordination of the national activities. Such harmonization provides the potential for acquisition of comparable data on a circumpolar scale.

Under the request of Arctic Council, preparing the assessment information to assist in evaluating the effectiveness and sufficiency of agreements for protecting the Arctic environment, including the POPs and Heavy Metals Protocols to the UN ECE LRTAP Convention, and the UNEP Stockholm Convention on POPs has become the First Order Products produced by AMAP.

AMAP has various monitoring activities in which the following are directly related to SC GMP programmes: Atmospheric Monitoring, Terrestrial/freshwater monitoring, Marine monitoring, Human health.

#### **Atmospheric Monitoring**

The primary network of long-range atmospheric transport monitoring stations, particularly for POPs, and associated methodologies have been developed during earlier AMAP activities. Additional monitoring stations need to be established, taking into account gaps in geographical coverage (e.g., eastern part of the Eurasian Arctic), and additional variables included in the circumpolar Arctic monitoring programme (e.g., mercury).

#### **Terrestrial/freshwater monitoring**

Although terrestrial and freshwater environments will be monitored separately, using methodologies and programmes of observation (sampling, analytical protocols, etc.) appropriate to the compartments concerned, they are often considered as a 'joint environment'. Assessment of the transport of contaminants (and other aspects of inter-compartment interaction) requires that freshwater and terrestrial observations be integrated, and implemented within the borders of the same monitoring (key) areas, using common monitoring stations, etc. Terrestrial/freshwater monitoring stations will be linked to atmospheric monitoring if necessary (e.g., in areas where significant local sources of atmospheric emissions exist).

A network of stations within a limited number of key areas will form the basis of future AMAP terrestrial/freshwater monitoring activities, where most of the long- and short-term monitoring programmes will be implemented. These

key areas will cover rather extended territories in which different elements of the trend and effects programmes can be implemented.

### **Marine monitoring**

The marine circumpolar monitoring network is designed to cover the most important marine areas regarding productivity (fish and marine mammals) and global scale processes, including the coastal zone, and to address, to the extent possible, one of the drawbacks of previous marine monitoring activities, namely the uneven spatial distribution of sampling sites.

### **Human health**

The human health activities will focus on exposure and the effects on human health of different pollution issues, both the effects of specific contaminants and combined effects. The human health work will be supported by information from other components of the AMAP Trends and Effects Programme. To ensure effective integration between the human health studies and other components, human health monitoring activities may be conducted within key areas.

In regards to data handling, AMAP assessments utilise data and information from all relevant sources, as long as these are documented to be of sufficient quality. The AMAP assessments are produced by scientific experts nominated by the eight Arctic countries, the permanent participants, and observing countries/organizations. An AMAP Data Policy has been developed to ensure that the results of recent monitoring and research are made available for the AMAP assessments and AMAP Thematic Data Centres (TDCs) are a key component to do that. TDCs for atmospheric, marine, and freshwater/terrestrial data, and for data on radioactivity are currently established. Data on contaminants in human media and related human health data are being compiled at the AMAP Secretariat. It is expected that all of the TDCs will be fully operational to support AMAP activities during the period 2004+.

Since AMAP is based mainly on existing national programmes, each of which employs its own methodologies and quality assurance/quality control (QA/QC) procedures, work aimed at harmonizing these activities and promoting the use of intercomparable methods is essential. The initial AMAP Assessments have shown that there are still substantial deficiencies in data quality that need to be addressed. The AMAP programme does not aim to create its own QA/QC programme or intercomparison systems, but rather to promote (or require) participation of AMAP associated laboratories in existing relevant national and international QA/QC programmes.

Web site: <http://www.amap.no/>

## **B. CEP**

The Caspian Environment Programme (CEP) is a regional umbrella programme developed for and by the five Caspian Littoral States, Azerbaijan, I.R. Iran, Kazakhstan, Russia and Turkmenistan, aiming to halt the deterioration of environmental conditions of the Caspian Sea and to promote sustainable development in the area.

Currently, there are 3 projects under the CEP programme, namely the GEF Phase II Project titled "Towards a Convention and Action Programme for the Protection of the Caspian Sea Environment", in short "CEP-Strategic Action Plan (SAP)"; EU/TACIS Sustainable Management of Fisheries Project; and EU/TACIS Sustainable Development of Coastal Communities Project.

### ***GEF Phase II (CEP-SAP) Project***

The GEF Phase II (CEP-SAP) project is a key element in support of the CEP in the preliminary implementation of the Strategic Action Programme and continuance of the Convention process. Implementation of this project is to be undertaken by UNDP with execution by UNOPS. The objectives of this project are to:

- Commence implementation of the SAP in the priority areas of Biodiversity, Invasive Species and Persistent Toxic Substances.
- Continue with specific capacity building measures to ensure a regionally owed CEP coordination mechanism capable of full implementation of the SAP and regional coordination of the NCAPs and consolidate/update the TDA, SAP and NCAP's following a series of information gap-filling measures.
- Strengthen the environmental legal and policy frameworks operating at the regional and the national levels and where necessary improve implementation and compliance of those frameworks.

Web site: <http://www.caspianenvironment.org/>

### C. EMEP

LRTAP Convention establishes a broad framework for cooperative action on reducing the impact of air pollution and sets up a process for negotiating concrete measures to control emissions of air pollutants through legally binding protocols. In this process, the main objective of the EMEP programme (Co-operative Programme for Monitoring and Evaluation of the Long-range Transmission of Air pollutants in Europe) is to regularly provide qualified scientific information for evaluation of the international protocols on reductions of air emissions. Initially, the EMEP programme focused on assessing the transboundary transport of acidification and eutrophication; later, the scope of the programme has widened to address the formation of ground level ozone and, more recently, of persistent organic pollutants (POPs), heavy metals and particulate matter. The Protocol on POPs was signed in 1998, obliging the Parties to the Convention to take measures for elimination, restriction on use, and reduction of POPs emissions to the environment. In accordance with the Protocol the Parties authorize EMEP to submit to the Executive Body for the CLRTAP the information on POPs transboundary transport in European domain.

The Protocol on POPs focuses on a list of 16 substances that include eleven pesticides, two industrial chemicals and three by-products/contaminants. The ultimate objective is to eliminate any discharges, emissions and losses of POPs. The Protocol bans the production and use of some products outright (aldrin, chlordane, chlordecone, dieldrin, endrin, hexabromobiphenyl, mirex and toxaphene). Others are scheduled for elimination at a later stage (DDT, heptachlor, hexachlorobenzene, PCBs). Finally, the Protocol severely restricts the use of DDT, HCH (including lindane) and PCBs. It also obliges Parties to reduce their emissions of dioxins, furans, PAHs and HCB below their levels in 1990 (or an alternative year between 1985 and 1995).

The EMEP programme relies on three main elements: (1) collection of emission data, (2) measurements of air and precipitation quality and (3) modelling of atmospheric transport and deposition of air pollution. Through the combination of these three elements, EMEP fulfils its required assessment and regularly reports on emissions, concentrations and/or depositions of air pollutants, the quantity and significance of transboundary fluxes and related exceedances to critical loads and threshold levels. The combination of these components provides also a good basis for the evaluation and qualification of the EMEP estimates.

The EMEP Monitoring Strategy 2004-2009 has indicated that the geographical scope of EMEP will have to be extended to take into account the needs of new Parties as well as the impact of intercontinental pollution transport. New stations should be established in areas not sufficiently covered, in particular in the eastern part of the EMEP region, Central Asia and the eastern Mediterranean. Sites in North Africa would also be of value.

An emission database was operated at Meteorological Synthesizing Centre - West (MSC-W).

Web site: <http://www.emep.int/>

### D. GAPS

The Global Atmospheric Passive Sampling (GAPS) study led by Canada aims to investigate the atmospheric concentrations and transport of persistent organic pollutants (POPs) on a global scale. Air is being sampled at 50 sites on seven continents. The main objective for GAPS is to demonstrate the usefulness of passive samplers for conducting global monitoring of POPs in the atmosphere. This study thus tests the feasibility of implementing the UNEP Guidance document for Global POPs Monitoring, which advocated the use of passive air samplers. The simplicity of these samplers, which do not require electricity, makes it logistically and financially feasible to study the large scale spatial distribution of POPs in the atmosphere. A further objective of GAPS is to produce seasonally averaged air concentrations of POPs at background locations around the world. This will help to further develop and evaluate global transport models for POPs, and to assess their long range atmospheric transport. It is hoped that passive sampling approaches such as the ones tested in GAPS can be used to measure long term trends in global air concentrations of POPs. Such trends are instrumental in evaluating the effectiveness of control measures on POPs that are currently being implemented through international protocols such as the Stockholm Convention under UNEP and the POPs LRTAP Protocol under UN-ECE. The success of GAPS relies heavily on existing infrastructure and participation of national and international collaborators and partners including many stations in the Global Atmosphere Watch (GAW) network of the World Meteorological Organization.

GAPS funding is secure until at least the end of the 2006/07 fiscal year. From a Canadian perspective, the GAPS study is seen as supporting the goals and objectives of the HAPs program so there is clearly a case for continuing these efforts with the view to trying to identify potential sources of contaminants to Canada. GAPS will likely be

integrated into projects that are part of the International Polar Year (IPY) in 2007-08 and extended to include additional sites in polar regions.

In year 2004, a large scale large-scale passive air sampling survey was conducted in Asia, specifically in China, Japan, South Korea, and Singapore. Data were collected simultaneously at 77 sites, for polychlorinated biphenyls (PCBs), organochlorine compounds (hexachlorobenzene (HCB), dichlorodiphenyltrichloroethanes (DDTs), chlordane), and polybrominated diphenyl ethers (PBDEs).

## E. HELCOM

The Helsinki Commission, or HELCOM, works to protect the marine environment of the Baltic Sea from all sources of pollution through intergovernmental co-operation between Denmark, Estonia, the European Community, Finland, Germany, Latvia, Lithuania, Poland, Russia and Sweden.

Hazardous substances fell into the priority areas of HELCOM. 42 hazardous substances are selected for immediate priority action. These include pesticides/biocides like aldrin, beta-HCH, chlordane, chlordecone (Kepone), chlordimeform, DDT, dieldrin, endrin, HCH, heptachlor, hexachlorobenzene, lindane, mirex, nitrophen, pentachlorophenol, quitozene, toxaphene and polycyclic halogenated aromatic compounds like, hexabromobiphenyl, PCB, TCDD, PCDD, PCDF (dioxins & furans), etc.

Monitoring is since long a well established function of the Helsinki Convention and covers the whole Baltic Sea Area and its catchment area within the Contracting States. Monitoring of inputs of hazardous substances started in 1998. The focus of the work in HELCOM on hazardous substances at least in the nearest future is to ensure that existing requirements are implemented and to develop a [strategy for data collection on the occurrence of hazardous substances](#) in markets and in use in the Baltic Sea region, with particular focus on Russia. The improved knowledge about the sources and inputs of hazardous substances will facilitate the establishment of national programmes for implementation of the HELCOM objective regarding hazardous substances.

The HELCOM monitoring system consists of several complementary programmes in which the [Pollution Load Compilation](#) programmes (PLC-Air and PLC-Water) quantify emissions of nutrients and hazardous substances to the air, discharges and losses to inland surface waters, and the resulting air and waterborne inputs to the sea and the [COMBINE programme](#) quantifies the impacts of nutrients and hazardous substances in the marine environment, also examining trends in the various compartments of the marine environment (water, biota, sediment).

Regarding data handling, HELCOM has compiled all available data on sources, pathways, markets and the legal situation relating to selected hazardous substances, in order to assess the exposure situation and identify suitable cost-effective measures.

All Contracting Parties should on a continuous basis collect data according to HELCOM Recommendation and manual. All institutes involved should, wherever possible, use the procedures for sampling, analysis and quality assurance and control contained in proper manuals for sampling and analysis and otherwise use procedures that have been recommended in other relevant international fora.

The HELCOM databases are handled by independent data centre(s), preferably thematic data centres, working on contractual agreement with HELCOM. The data centres are responsible for ensuring that:

- adequate reporting formats and procedures are prepared and updated, as necessary,
- data submissions are subjected to relevant quality control procedures,
- adequate inventories and compilations are prepared of the data sets, and
- HELCOM data product requirements are met.

Website: <http://www.helcom.fi/>

## F. IADN

The Integrated Atmospheric Deposition Network (IADN) was established in 1990 by the United States and Canada for conducting air and precipitation monitoring in the Great Lakes Basin. The goals of IADN are to:

- Determine, with a specified degree of confidence the atmospheric loadings and trends (both spatial and temporal) of priority toxic chemicals to the Great Lakes and its basin on, at least, a biennial basis;
- Acquire quality-assured air and precipitation concentration measurements, with attention to continuity and consistency of those measurements, so that trend data are not biased by changes in network operations or personnel; and
- Help determine the sources of the continuing input of those chemicals

56 polychlorinated biphenyl (PCB) congeners or congener groups, 20 organochlorine pesticides (both banned and in use), and 16 polycyclic aromatic hydrocarbons (PAHs) were measured.

With more than ten years worth of data collected, several spatial and temporal trends of POPs in the Great Lakes atmosphere are observed.

Regarding data handling, the Integrated Atmospheric Deposition Network (IADN) implements a quality assurance strategy so that the monitoring data produced is valid, defensible, and of known precision and accuracy. The quality of the data must be high enough for its purpose—to determine atmospheric trends and loadings of toxic chemicals to the Great Lakes. Trends and loadings figures will be used to determine if reduction efforts are successful and if further steps should be taken.

Web sites : [http://www.msc.ec.gc.ca/iadn/index\\_e.html](http://www.msc.ec.gc.ca/iadn/index_e.html)  
[http:// www.epa.gov/glnpo/monitoring/air/iadn/iadn.html](http://www.epa.gov/glnpo/monitoring/air/iadn/iadn.html)

## G. INTERNATIONAL MUSSEL WATCH

The International Mussel Watch (IMW) Program was undertaken under the auspices of the United Nations Educational, Scientific and Cultural Organization (UNESCO) Intergovernmental Oceanographic Commission, and the United Nations Environment Programme (UNEP) Ocean and Coastal Areas Program, to assess the extent of chemical contamination, primarily in the equatorial and subequatorial areas of the southern hemisphere, with particular attention to coastal areas of developing countries. Previous national and international regional efforts had provided a first assessment and several in depth studies for coastal areas of developed countries in the northern hemisphere using bivalves as sentinel organism of chemical contamination of the coastal areas.

A total of 76 sites were sampled in South America, Central America, the Caribbean, and Mexico. Selection of sites included locations near known or suspected contamination sources in addition to non-contaminated sites.

The initial focus of the International Mussel Watch Program was on chlorinated pesticides and individual chlorobiphenyls of the polychlorinated biphenyls (PCBs). The initial set of target analyte chlorinated pesticides were: aldrin, endrin, dieldrin, chlordanes, DDT family, heptachlor, heptachlor epoxide, hexachlorbenzene (HCB), alpha-hexachlorocyclohexane (alpha-HCH), beta-hexachlorocyclohexane (beta-HCH), Lindane (gamma-HCH), trans-nonachlor, and methoxychlor.

The Initial Phase of International Mussel Watch has successfully produced a unique high-quality database of chemical contaminants in coastal organisms from a widespread geographic region.

## H. MEDPOL

The MED POL Programme (Mediterranean Marine Pollution Monitoring and Research Programme) was created in 1975 to answer the specific needs to better assess, qualify and quantify the marine environmental problems of the Mediterranean sea. The Programme was the scientific and technical component of the Mediterranean Action Plan (MAP).

MED POL has gone through three phases:

Phase I (1975-1980) was formulated and co-ordinated by UNEP with the technical and scientific co-operation of five UN specialised Agencies (FAO, WHO, WMO, IOC of UNESCO and IAEA). The Regional Seas Programme of UNEP coordinated the programme until 1980 when a Coordinating Unit for the Mediterranean Action Plan (MEDU), took over the responsibility of managing all the MAP activities including those of MED POL. During Phase I, a regional inter-calibration exercise was launched to ensure the quality of the data gathered. Assistance was provided to all riparian countries to enable all laboratories in the region to fully participate in the Programme activities. This assistance included the purchase and regular maintenance of analytical instruments and a full programme of training.

Phase II (1981-1995) had its efforts concentrated on the establishment of national monitoring programmes in the Mediterranean countries, which included at the same time the provision of assistance for their implementation. A full data quality assurance programme was put in place covering not only intercalibration exercises but also other activities aiming at improving the quality of the data such as training of personnel, maintenance of instruments, good laboratory practice and the preparation of analytical reference methods. A research programme was also undertaken in support of the monitoring which resulted in more than 500 research projects carried out in 16 Mediterranean countries. During this Phase the countries collected a large number of marine pollution data. By the end of the Phase II, the MED POL data bank included a large inventory related to chemical contaminants in biota (over 15,000 samples for 50,000 analyses of heavy metals and halogenated hydrocarbons) and microorganisms in sea water (42,000 samples for 53,000 bacterial counts). Those data, along with others, directly contributed to a more in-depth assessment of the state of the Mediterranean and to the formulation of fifteen pollution control measures, which were later adopted by the Contracting Parties to the Barcelona Convention.

PHASE III (1996-2005) recognized the important events at the global and regional levels: the adoption of Agenda 21 in Rio and of the Global Plan of Action (GPA) at the global level, and Protocol against pollution from land-based sources (LBS Protocol) at the regional level. The MEDPOL Programme had to operate a gradual switch from pollution assessment to pollution control.

Under the assessment component, it includes activities related to the establishment of trends in the levels of pollutants (trend monitoring) and effects of contaminants (biological effects monitoring) as well as the inventory of pollution sources and loads. A MEDPOL database is being set up as a result of the monitoring activities. The trend-monitoring component aims at detecting site-specific temporal trends of selected contaminants at hot spots and coastal/reference areas. Trend monitoring of loads aims to provide estimates of inputs of some major groups of pollutants, hazardous substances and nutrients (all listed in the Land Based-Sources Protocol) to the coastal marine environment via point (rivers, municipal and industrial effluents) sources. 11 countries participate in Phase III monitoring activities: Albania, Algeria, Croatia, Cyprus, Greece, Israel, Morocco, Slovenia, Syria, Tunisia and Turkey.

Under the control component, the Programme includes the monitoring on a continuous basis of the effectiveness of action plans, programmes and measures for pollution control implemented by the Governments (compliance monitoring).

A report on the compliance with the existing national and international legislation is expected from the Governments each year. All the monitoring activities are described in National Programmes agreed upon with the MED POL Secretariat and renewed every year.

Meanwhile, the Programme includes an important assistance component related to data quality assurance, design of the monitoring programme, provision of equipment, training for the analysis and interpretation of the data and training for managerial aspects, such as operation of sewage treatment plants and systems of inspection.

The MED POL Programme is also in charge of the follow up of the Protocol regulating all dumping operations at sea (Dumping Protocol) and the Protocol related to the protection from pollution by transboundary movements of toxic wastes (Hazardous Wastes Protocol)

Web site: <http://www.unepmap.gr/>

## I. OSPAR CONVENTION

The 1992 OSPAR Convention is the current instrument guiding international cooperation on the protection of the marine environment of the North-East Atlantic. It combined and up-dated the 1972 Oslo Convention on dumping waste at sea and the 1974 Paris Convention on land-based sources of marine pollution. The sea area covered by the OSPAR Convention 1992 is defined as extending westwards to the east coast of Greenland, eastwards to the continental North Sea coast, south to the Straits of Gibraltar and northwards to the North Pole. This maritime area

does not include the Baltic or Mediterranean seas; the Helsinki and Barcelona Conventions apply in these sea areas. Contracting Parties to the Convention are: Belgium, Denmark, European Union, Finland, France, Germany, Iceland, Ireland, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and United Kingdom.

The convention has six strategies and the strategy on hazardous substances is one of them. The Hazardous Substances Strategy sets the objective of preventing pollution of the maritime area by continuously reducing discharges, emissions and losses of hazardous substances, with the ultimate aim of achieving concentrations in the marine environment near background values for naturally occurring substances and close to zero for man-made synthetic substances.

OSPAR List of Chemicals for Priority Action includes POPs like polychlorinated biphenyls (PCBs), polychlorinated dibenzodioxins (PCDDs), polychlorinated dibenzofurans (PCDFs)

Under OSPAR, information on chemicals for priority action is gathered in a few ways:

- The comprehensive study of riverine inputs and direct discharges (RID), which measures, and reports annually on lead, cadmium, mercury, PCBs and lindane; RID started in 1990
- The Comprehensive Atmospheric Monitoring Programme (CAMP) which measures, and reports annually on lead, cadmium, mercury, lindane, PCBs and PAHs; collects data from a network of coastal stations. CAMP started in 1987
- the Coordinated Environmental Monitoring Programme (CEMP), which requires Contracting Parties to monitor cadmium, lead, mercury, PCBs, PAHs and organic tin compounds in biota and sediments;
- information in the OSPAR background documents on priority substances;
- information in implementation reports of OSPAR measures concerning particular substances.

Regarding data handling, OSPAR generates the monitoring data and information through its co-ordinated environmental monitoring activities. Such data and information should generally be gathered in accordance with agreed OSPAR guidelines and procedures and thus be comparable across the breadth of the OSPAR maritime area.

All the material available from other organisations collecting information about the marine environment must be used to the fullest possible extent, subject to such checks and precautions as are needed to maintain the quality of the underlying science at a level sufficient for the purposes of each specific assessment. The other organizations include:

- the International Council for the Exploration of the Sea (ICES);
- the European Environment Agency (EEA);
- the monitoring work under the UN ECE Convention on the Long-Range Transport of Air Pollution (LRTAP);
- the Arctic Environmental Monitoring and Assessment Programme (AMAP), especially for the parts of the OSPAR maritime area in the Arctic;
- national environmental monitoring programmes, especially those elements addressing monitoring requirements of relevant EC Directives;
- the Global Oceans Observation System (GOOS);
- the monitoring work under the UNEP POP Convention;
- the regular OSPAR Reports on the chlor alkali industry, the offshore industry, and the dumping of dredged material (and, to the extent that it occurs, other wastes);
- the European Pollutant Emission Register;
- the UN-ECE Pollutant Release and Transfer Register
- the progress report to the 5<sup>th</sup> North Sea Ministerial Conference and the underlying data collected via the HARP-HAZ system.

Web site: <http://www.ospar.org/>

## **J. SMOC PROGRAMME**

The Sound Management of Chemicals (SMOC) initiative is a tri-national effort to reduce the risks of toxic substances to human health and the environment in Canada, Mexico and the United States. It was established by the Council of the Commission for Environmental Cooperation (CEC) of North America in October 1995. The priority of the SMOC project is the management and control of substances that are persistent and toxic.

To date, NARAPs (North America Region Action Plans) have been developed for Chlordane, DDT, PCBs, Mercury and Dioxins, furans and hexachlorobenzene. There is NARAPs on Environmental monitoring and assessment to provide a forum, a framework and mechanisms for facilitating cooperation in monitoring the status and trends of persistent and toxic substances in North America by supporting the SMOC initiative. Its projects include a synoptic, baseline survey that will include the levels of selected persistent and toxic substances in selected environmental media at selected locations in Mexico to provide data on the status of selected persistent toxic substances in Mexico. A North American Reference Network is to be established of designated Integrated Index Sites for the systematic collection of data and information on the concentrations, fluxes and effects of persistent and toxic substances in the North American environment, with particular reference to North American ecosystems and human health. Satellite sites will be recommended and directly associated with the North American Reference Network to address one or more key considerations in monitoring or understanding concentrations, fluxes and effects of persistent toxic substances. A Reference Data Sets, directly associated with the North American Reference Network, will be identified and recommended. These will comprise baseline environmental surveys, epidemiological surveys and studies, and important research findings related to monitoring and understanding concentrations, fluxes and effects of persistent toxic substances.

Web site: <http://www.cec.org/>

## **K. TRIAL BACKGROUND AIR POPS MONITORING PROJECT**

This project aims for contributing to the effectiveness evaluation under the Article 16 of the Stockholm Convention and has importance for the establishment of regional POPs monitoring framework. It is led by Japan and has three East Asian countries participating in its first year monitoring information collection work (2004-2005): Indonesia, South Korea and Vietnam. It has air as its monitoring matrix in line with the UNEP Guidance Document on Global Monitoring Programme and covers 9 POPs pesticides, namely, Aldrin, Dieldrin, Endrin, DDTs, HCB, Chlordanes, Heptachlors, Mirex and Toxaphene, in background areas in the participating countries. At later stage, the trial could be extended to cover other compounds.

The project has so far held three workshops where policy and technical issues on developing regional POPs monitoring activities were discussed. Many countries in East Asia have participated in these workshops, they are Cambodia, China, Indonesia, Japan, Lao, Malaysia, Mongolia, Philippines, Singapore, South Korea, Thailand and Vietnam. Outcomes from the three East Asian countries were reported in October 2005 to the Expert Working Group of 3<sup>rd</sup> Workshop where quality of the data has been examined and the data was generally concluded as satisfactory. Many issues for the field-testing of the monitoring arrangements toward COP3 were discussed in this workshop, including structure of the regional monitoring network, variation in the degree of involvement of countries covered, data generating, number of sampling points for regional assessment, acceptability of existing data. The workshop has also laid out issues for further discussion, e.g. data reporting format, data quality evaluation, criteria for background station to insure representativeness of a region, consideration on the use of passive sampling methods as cost-effective means.

The Ministry of the Environment of Japan stated that it had budget for assisting the background air monitoring in three new countries for FY 2005, and also that it would continue to request budget after FY 2006.

## **L. UNU'S POPS MONITORING**

Since 1996, United Nations University (UNU) has targeted the monitoring of many POPs compounds. This project builds on the previous work and compiled database of POPs, to launch a comprehensive set of monitoring activities linked closely to thematic discussions on environmental quality. This can lead to concrete mechanisms for identifying existing and impending threats from POPs.

In addition to Japan, the project currently has national programmes running in seven eight other countries within Asia. These are China, Indonesia, Korea, Malaysia, Philippines, Singapore, Thailand, and Vietnam. In each country

a laboratory has been selected to participate in the project, including both university research laboratories and government run research centers.

Each laboratory submits an annual report on the monitoring activities. The data that are collected from these reports over the years are stored by UNU in a POPs Monitoring Database.

UNU also holds international symposia and workshops on environmental monitoring of POPs annually. These meetings include country reports on work in each of the participating countries. The findings from these meetings are disseminated in the form of a book as well as over the Internet.

Web site: <http://www.unu.edu/>

#### **M. WHO/GEMS/FOOD**

World Health Organization (WHO) has coordinated three international studies of human milk on the levels and trends of dioxins, dibenzofurans and polychlorinated biphenyls over the period 1987-2003. The third round of these WHO-coordinated exposure studies has been extended as a pilot study to include other Persistent Organic Pollutants (POPs), as well. In responding to the needs of the Stockholm Convention on POPs, WHO and UNEP have signed MOU for cooperation in the POPs Global Monitoring Programme. WHO Global Environment Monitoring System / Food Contamination Monitoring and Assessment Programme (GEMS/Food) has developed a new protocol for a Global Survey of Human Milk for POPs and the fourth survey is now under way.

The first two surveys took place in 1987-1988 and 1992 -1993 and mainly consisted of samples from European countries. From 2000 to 2003, the WHO European Center for Environment and Health in Bilthoven in cooperation with GEMS/Food conducted a third survey of human milk for dioxins, dibenzofurans and dioxin-like PCBs, which included a number of countries outside Europe. Now, the new protocol for the fourth WHO-coordinated survey of human milk for POPs is intended to provide guidance to all countries that have ratified the Stockholm Convention and to countries that have taken part in previous WHO-coordinated exposure studies of human milk for POPs. The protocol is for collection, handling and assessment at the country level. The survey is not primarily intended to compare levels of POPs among countries, but rather to examine those levels within a country over time.

To ensure reliability of exposure data and to improve comparability of analytical results, WHO has coordinated a number of inter-laboratory quality assessment studies. For the third round of WHO-coordinated exposure studies on levels of PCBs, PCDDs and PCDFs in human milk, the State Laboratory for Chemical and Veterinary Drug Analysis of Food (CVUA) in Freiburg, Germany, qualified as reference laboratory. More recently GEMS/Food in collaboration with this reference laboratory has also completed a pilot study of human milk, which confirmed the feasibility of measuring all twelve POPs presently covered under the Stockholm Convention in a single human milk sample by application of additional analytical steps.

The fourth round of survey will provide exposure data that could assist in the evaluation of the effectiveness of Stockholm Convention with regard to the reduction or elimination of POPs' emissions by producing accessible, reliable and comparable data on levels of POPs in human milk from around the world; and by enabling statistical comparisons of levels in relation to temporal, spatial and other relevant factors.

WHO GEMS/Food will maintain databases for all reporting requirements, including raw data from basic- and advanced-POPs laboratories and relevant data from donor questionnaires. Dissemination of results in aggregate form will be made through the WHO SIGHT (Summary of Information on Global Health Trends) portal.

Web site: <http://www.who.int/en/>

#### **N. WMO/GAW**

The World Meteorological Organization (WMO) /Global Atmosphere Watch (GAW) was established in 1989 by the Eleventh World Meteorological Congress (Cg-XI) as a major priority programme. The GAW monitoring programme includes a co-ordinated global network of observing stations along with supporting facilities. GAW provides data for scientific assessments and for early warnings of changes in the chemical composition and related physical characteristics of the atmosphere that may have adverse affects upon our environment. Monitoring priorities have been given to greenhouse gases for possible climate change, ozone and ultraviolet radiation for both climate and biological concerns, and certain reactive gases and the chemistry of precipitation for a multitude of roles in pollution chemistry.

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The GAW programme is guided by a plan that is detailed in the Strategy for implementation of the Global Atmosphere Watch Programme (2001-2007) that includes 8 strategic goals:

- Improve measurements programme for better geographical and temporal coverage and for near real time monitoring capability,
- Complete the quality assurance/quality control system,
- Improve availability of data and promote their use,
- Improve communication and co-operation between all GAW components and with the scientific community,
- Identify and clarify changing roles of GAW components,
- Maintain present and solicit new support and collaborations for the GAW programme,
- Intensify capacity building in developing countries,
- Enhance the capabilities of NMHSs in providing urban-environmental air quality services.

In this plan, GAW noticed that there is growing global concern with regard to atmospheric deposition of heavy metals and persistent organic pollutants (POPs), these will add new considerations in the activities of precipitation chemistry. It is anticipated that the methodologies for these components, when adequately well developed, will be assimilated into the GAW precipitation chemistry programme. The strategy has set up a goal to assess and, if necessary, implement suitable measurement programmes for air/surface exchange including dry deposition as well as for trace metals and POPs in precipitation.

Web site: <http://www.wmo.ch/>

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