

ABSTRACT

Recommended Phase I GEMS Monitoring Program

(Asterisks denote that programs are subject to inter-governmental approval of operating manuals specifying site selection criteria, monitoring procedures and methods of chemical or physical analysis.)

Type	No. of Stations	Pollutants and Indicators	Suggested monitoring frequency
(1) Atmosphere			
(a) Stratosphere No GEMS Phase I program recommended.			
(b) Troposphere	(1) Baseline (remote)	10-20	—CO ₂ continuous —turbidity daily —precipitation chemistry: (SO ₄ , Cl, NH ₄ , NO ₃ , Ca, Mg, Na, K, pH, isotopes) (Hg, Pb, Cd, DDT, PCB's)* monthly —fluorcarbon 11* monthly
	(Atmospheric baseline stations are encouraged to undertake local supplementary R. and D. monitoring of Aitken nuclei, SO ₂ , N ₂ O, NO, NO ₂ , NH ₃ , O ₃ , CO, CH ₄ , reactive hydrocarbons, particle size distribution of particles, and total suspended particulates including sulphate and lead fractions.)		
	(2) Regional (intermediate)	150-200	—turbidity daily —precipitation chemistry (same as at baseline stations) monthly —total suspended particulates (plus sulphates and lead) monthly —SO ₂ , NO, NO ₂ , O ₃ , oxidants, dependent reactive hydrocarbons, CO on location and season
(3) Impact*	3 stations per city	—SO ₂	continuous
		—total suspended particulates	daily
		or	
		COH values	2-hourly
(Member States are encouraged to undertake local supplementary monitoring programs, and to coordinate with epidemiological pilot studies.)			
(4) Selected radionuclides	Existing UNSCEAR cooperative programs to continue (See Section 12.1.)		

(2) Oceans and Enclosed Seas

(a) Deep oceans No GEMS Phase I program recommended.

(b) Surface mixed layer

(1) Remote areas*	20	Minimum program will depend on location and season, but may include daily observations of nitrates, nitrites, phosphates, salinity; weekly observations for alkalinity, CO ₂ and petroleum hydrocarbons; and twice-a-year observations of fluorcarbon 11.
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(2) Intermediate areas*		
about 200	As above, but excluding fluorocarbon 11 and with the following possible additions: weekly observations of chlorophyll and selected nutrients; 5-yearly determinations of Pb, Cd, Hg, DDT, PCB, nitrate and nitrite residues in selected marine life; visual observations of oil slicks and tar balls on occurrence.	
(3) Impact areas*		
to be determined	As above but frequency of observations and additional substances to be monitored will be dependent on local conditions and objectives.	
(4) Selected radionuclides		
Existing UNSCEAR cooperative programs to continue (See Section 12.1.)		
(3) Rivers and lakes		
(1) Remote areas*		
5-10 lakes 10 rivers	—pH, BOD, dissolved oxygen, chlorophyll a, phosphorus, nitrogen, coliform bacteria	seasonally
(2) Intermediate areas*		
100 sites	—as above	monthly
(3) Impact areas (Member States are encouraged to undertake pilot studies)		
(4) Ground-water		
No GEMS Phase I program recommended.		
(5) Snow and ice		
No GEMS Phase I program recommended.		
(6) Soils		
(1) Remote areas*		
10-20	—pH, salinity, nitrates, phosphates	seasonally
(2) Intermediate areas*		
100	—as above	seasonally
(3) Impact areas*		
local option	—as above	seasonally
(Member States are encouraged to undertake local supplementary R. and D. monitoring for Hg, Pb, Cd, DDT, PCB's, ammonia, soluble salts of the alkali metals and alkaline earth metals.)		
(7) Vegetation and forests		
(1) Remote areas*		
20	—Hg, Pb, Cd, S, DDT, PCB's in lichens, mosses, edible nuts, berries and grasses	annually
(2) Intermediate areas		
No GEMS Phase I program recommended.		
(3) Impact areas		
No GEMS Phase I program recommended.		
(Terrestrial biome stations are encouraged to undertake local supplementary R. and D. monitoring of the relevant priority pollutants in List 2, Section 5.)		

(8) Foods

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| (1) Remote areas | | (included in vegetation and forests program) |
| (2) Intermediate areas* | 150 | (Minimum program to be decided later) |
| (3) Impact areas* | 200 | (Minimum program to be decided later) |
| (4) Selected radionuclides | | Existing UNSCEAR cooperative programs to continue (See Section 12.1.) |

(9) Drinking Water

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| (1) Remote areas | | (covered in rivers and lakes program) |
| (2) Intermediate areas | | No program recommended |
| (3) Impact areas | | Pilot studies of urban drinking water may be undertaken. |
| (4) Selected radionuclides | | Existing UNSCEAR cooperative programs to continue (See Section 12.1.) |

(10) Animals, birds and birds eggs

No GEMS Phase I program is recommended but pilot studies by Member States and intergovernmental and other regional groups are encouraged, particularly for residues of Hg, Pb, Cd, DDT and PCB's.