

Supplementary Information

Cross-cutting Research and Future Directions under the GAPS Networks

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Text S1 – Additional PUF/SIP disk Operation Information

There is some degree of site-to-site variability in sampling rates, with positive deviations associated with sustained high winds at the sampling site (Tuduri et al., 2007; Herkert et al., 2018). Sampling rates for the linear uptake region do not vary substantially across the range of semi-volatile target analytes (log K_{oa} values higher than about 5). Linear sampling rates will begin to decline for chemicals having low octanol-air partition coefficients (K_{oa} values) as they approach equilibrium partitioning between PUF and air. For low volatility chemicals (log K_{oa} greater than 10) and for particles, sampling will remain in the linear uptake phase for several months and even years. SIP disks have a higher sorptive capacity compared to PUF disks and are preferable for use for chemicals having log K_{oa} values less than about 7, which can equilibrate in a PUF disk exposed to air within a few weeks or even less. The use of SIP disk for these chemicals ensures linear-phase sampling during typical deployment periods lasting 2-3 months.

Table S1. Current GAPS network site details.

Site ID	Location	Country	Site Classification
Africa			
AF04	De Aar	South Africa	Background
AF06	Bukasa Island	Uganda	Background
AF07	Mount Kenya	Kenya	Background
AF10	Yaba, Lagos	Nigeria	Urban
AF11	Cape Verde Observatory	Cape Verde	Background
AF12	Cape Point	South Africa	Background
Asia			
AS11	Manila	Philippines	Urban
AS12	Danam Valley	Malaysia	Background
AS13	Bukit Kotobang	Indonesia	Background
AS19	Jeju Island	South Korea	Background
AS21	Abdali	Kuwait	Background
AS27	Hanthana	Sri Lanka	Rural
AS28	Hanimaadhoo	Maldives	Background
GRULAC (Group of Latin America and the Caribbean)			
GR03	Tapanti National Park	Costa Rica	Background
GR04	Arauca	Colombia	Rural
GR12	Ragged Point	Barbados	Background
GR13	Santa Cruz Island	Ecuador	Background
GR16	Sonora	Mexico	Agricultural
GR17	Yucatan	Mexico	Background
GR19	Quito	Ecuador	Urban
GR20	Pierre Auger Observatory	Argentina	Background
GR21	Mendoza Province	Argentina	Rural
GR22	Manizales	Colombia	Background
GR23	São Luís do Maranhã	Brazil	Urban
GR24	São José	Brazil	Background
GR26	Salta	Argentina	Background
GR27	Rio Gallegos	Argentina	Rural
GR28	Concepción	Chile	Urban
GR29	Chacaltaya	Bolivia	Background
Central and Eastern Europe			
EE03	Košetice	Czech Republic	Background
WEOG (Western European and Others Group)			
WE01	Alert	Canada	Polar
WE02	Utqiagvik	USA	Polar
WE05	Bratt's Lake	Canada	Agricultural
WE06	Whistler	Canada	Background
WE09	Downsview	Canada	Urban
WE12	Tudor Hill	Bermuda	Background

WE13	Ny-Ålesund	Norway	Polar
WE14	Stórhöfði	Iceland	Background
WE16	Malin Head	Ireland	Background
WE17	Paris	France	Urban
WE22	Darwin	Australia	Rural
WE23	Cape Grim	Australia	Background
WE25	Little Fox Lake	Canada	Background
WE26	Dyea	USA	Background
WE30	Pallas	Finland	Background
WE32	Fraserdale	Canada	Background
WE33	Ucleuelet	Canada	Background
WE34	Sable Island	Canada	Background
WE35	Point Reyes	USA	Background
WE37	Mauna Loa Observatory	USA	Background
WE38	Tula	American Samoa	Background
WE39	Temple Basin	New Zealand	Background
WE40	Groton	USA	Background
WE41	Doñana National Park	Spain	Background
WE43	Mount Revelstoke	Canada	Background
WE44	Izana	Spain	Background
WE45	Longwoods	Canada	Rural
WE46	Warsaw Caves	Canada	Rural
WE47	Egbert	Canada	Rural

Table S2. Current GAPS Megacity (MC) network site details.

Site ID	Location	Country
Africa		
MC-AF01	Lagos	Nigeria
MC-AF02	Cairo	Egypt
MC-AF03	Nairobi	Kenya
MC-AF04	Johannesburg	South Africa
Asia		
MC-AS01	Kolkata	India
MC-AS02	Beijing	China
MC-AS03	Bangkok	Thailand
MC-AS04	Tokyo	Japan
MC-AS05	New Delhi	India
MC-AS06	Seoul	South Korea
MC-AS07	Riyadh	Saudi Arabia
Central and Eastern Europe		
MC-CEE01	Warsaw	Poland
GRULAC (Group of Latin America and the Caribbean)		
MC-GR01	São Paulo	Brazil
MC-GR02	Bogotá	Colombia
MC-GR03	Mexico City	Mexico
MC-GR04	Santiago	Chile
MC-GR05	Buenos Aires	Argentina
WEOG (Western European and Others Group)		
MC-WE01	Toronto	Canada
MC-WE02	New York City	USA
MC-WE03	Sydney	Australia
MC-WE04	Istanbul	Turkey
MC-WE05	London	United Kingdom
MC-WE06	Madrid	Spain

References

Herkert, Nicholas J, Scott N Spak, Austen Smith, Jasmin K Schuster, Tom Harner, Andres Martinez, and Keri C Hornbuckle. 2018. 'Calibration and evaluation of PUF-PAS sampling rates across the Global Atmospheric Passive Sampling (GAPS) network', Environmental Science: Processes & Impacts.

Tuduri, Ludovic, Harner, Tom. 2006. 'Polyurethane foam (PUF) disks passive air samplers: wind effect on sampling rate', Environmental Pollution.