
Kateřina Šebková

GMP-project sustainability

RESEARCH CENTRE FOR TOXIC COMPOUNDS IN THE ENVIRONMENT
Faculty of Science, Masaryk University, Brno, Czech Republic
and Stockholm Convention Regional Centre in the Czech Republic (SCRC)



Outline

- Scene setting
- Preparing for the future
- Food for thoughts
- **OBJECTIVE:** steer discussion and get views from countries participating in the meeting on possible elements that could help preparing for the future in the sustainable monitoring of POPs



capacity building project
on POPs monitoring (GMP2)



SCENE SETTING

- monitoring embedded in the Stockholm Convention text (art 16 and 15)
- several reports prepared for COP8 (2017) assessed status quo and provided forward looking recommendations on POPs monitoring
- Stockholm Convention is a dynamic convention and new chemicals are evaluated and listed - challenges for Parties, laboratories and monitoring programmes

Setting the scene for POPs monitoring

- **Monitoring data** gathered through the global monitoring plan are compiled and analysed every six years in the regional monitoring reports and the global monitoring report. The global monitoring report is developed on the basis of the regional monitoring reports and constitutes **one of the major sources of information for the effectiveness evaluation** under Article 16 of the Stockholm Convention.
- Two sets of the **Global Monitoring Plan regional reports** (2008 and 2014) - approved by COP4 (2009) and COP6 (2015) :

<http://chm.pops.int/Programmes/GlobalMonitoringPlan/MonitoringReports/tabid/525/Default.aspx>

- Two rounds of large **capacity building projects** for POPs monitoring in three UN regions - Africa, Asia, Pacific and GRULAC

“GMP1” - completed

“GMP2” - ongoing

future - ?

- Effectiveness evaluation report of the Stockholm Convention (released for COP8) in 2017 also looked into progress in implementation and provided **conclusions and some recommendations**

<http://chm.pops.int/TheConvention/ConferenceoftheParties/Meetings/COP8/tabid/5309/Default.aspx>

Main findings in relation to POPs monitoring

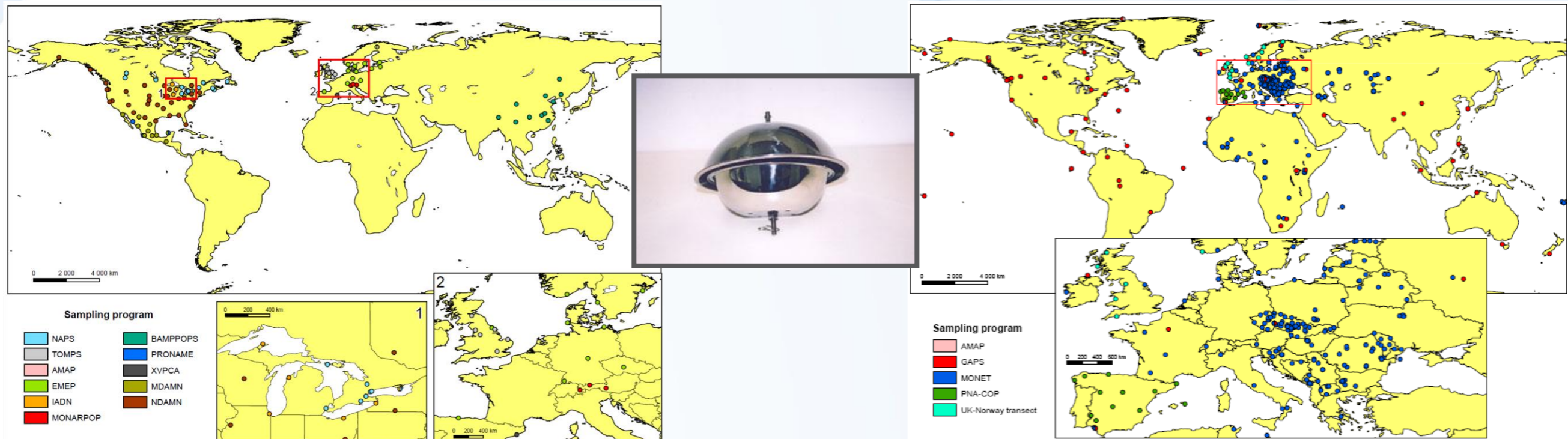
- **Air:** For most “legacy POPs” (those 12 substances listed when the Convention entered into force in 2004), concentrations in air have declined and continue to decline or remain at low levels due to restrictions on POPs that predated the Stockholm Convention and have been maintained since. For many “newly listed POPs” (those POPs listed after 2004) concentrations in air in some regions are beginning to show declining tendencies, although in a few instances, increasing and/or stable levels are observed.
- **Human tissues:** In regions with sufficient data to evaluate changes over time, levels of legacy POPs such as polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF), polychlorinated biphenyls (PCB), and DDT/DDE, including their transformation products, have generally declined in human tissues. For the newly listed POPs, information regarding changes over time is very limited. Based on studies available from the Western Europe and Others Group and from Asia Pacific, the levels of brominated diphenyl ethers (BDEs) and perfluorooctane sulfonic acid (PFOS) seem to be gradually declining.
- **Water:** Temporal trend information for PFOS in water is very limited. Differences in sampling locations and in detection limits preclude any robust assessment of trends for now.

Main findings in relation to POPs monitoring

- Since its entry into force, the **Stockholm Convention** has **catalyzed POPs monitoring activities and research worldwide** and triggered increased awareness and knowledge about these chemicals.
- These developments have been underpinned by **increased POPs monitoring data availability and coverage at the global scale, most notably due to the capacity-building activities carried out in the regions, strategic partnerships in place between emerging and well-established monitoring programmes, increased national commitment and sustained donor support.**
- **Long term viability of existing monitoring programmes (air and human bio-monitoring) was and continues to be essential** to ensure that changes in concentrations over time can be investigated to support the evaluation of the effectiveness of the Convention.

Ambient air monitoring

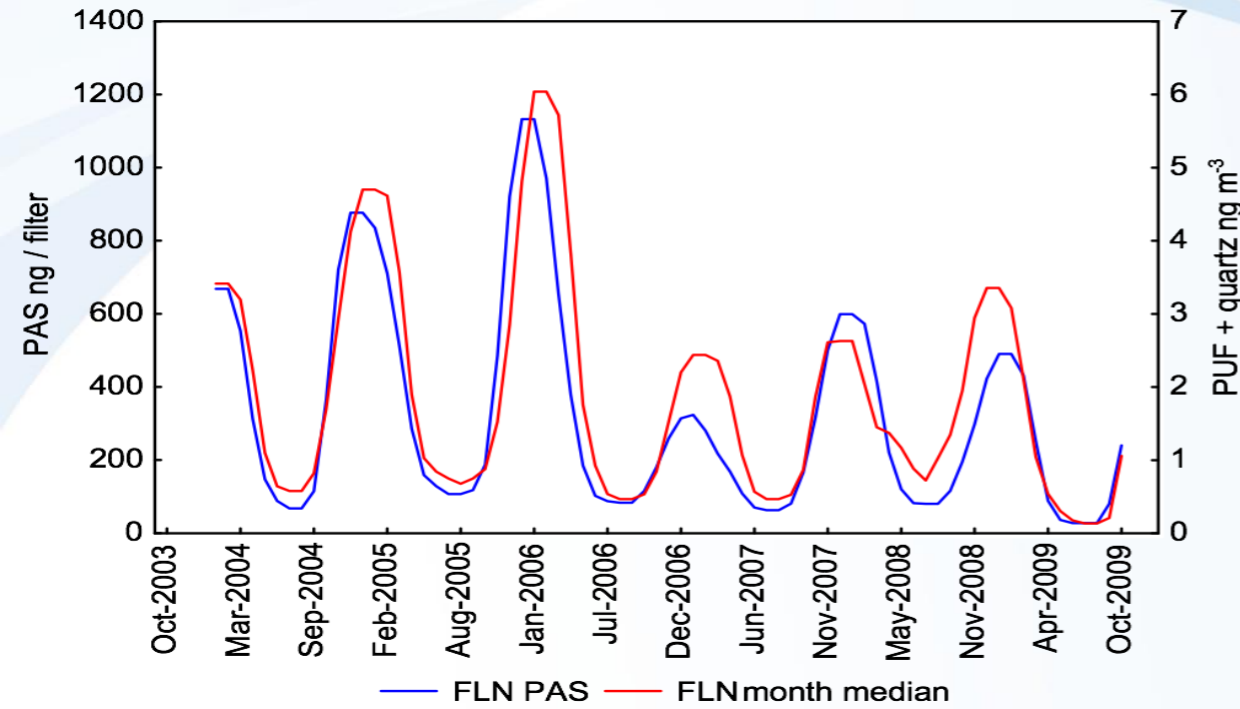
- Coordinated activities in Europe (EMEP) and North America (IADN)
- Development of the passive air monitoring networks was driven by the scientists: GAPS, MONET, LAPAN, and other regional networks



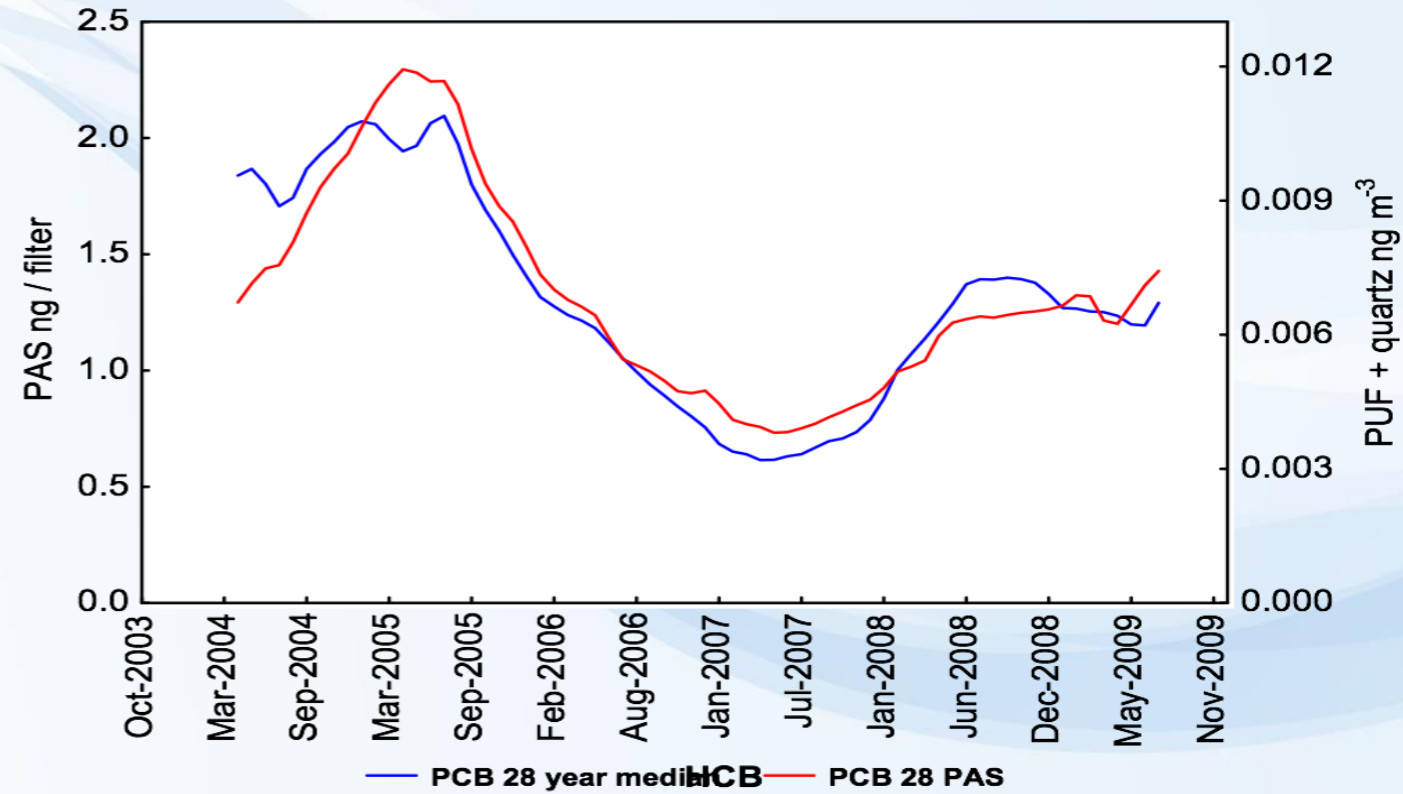
- Methodological studies improved understanding and interpretation of data from passive sampling networks
- Available data are already sufficient for assessment of long-term trends
- Local efforts and capacity building stem from existing large-scale efforts

Active and passive air sampling techniques

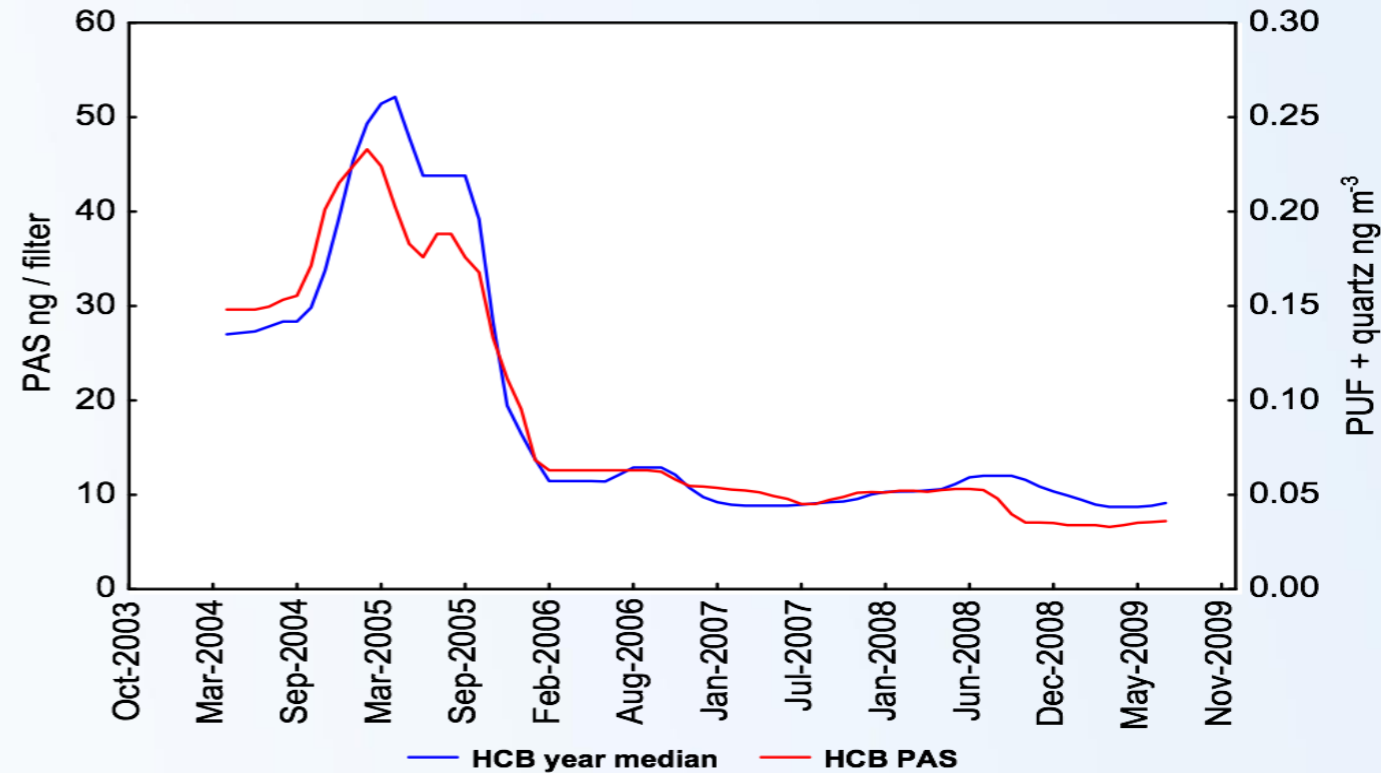
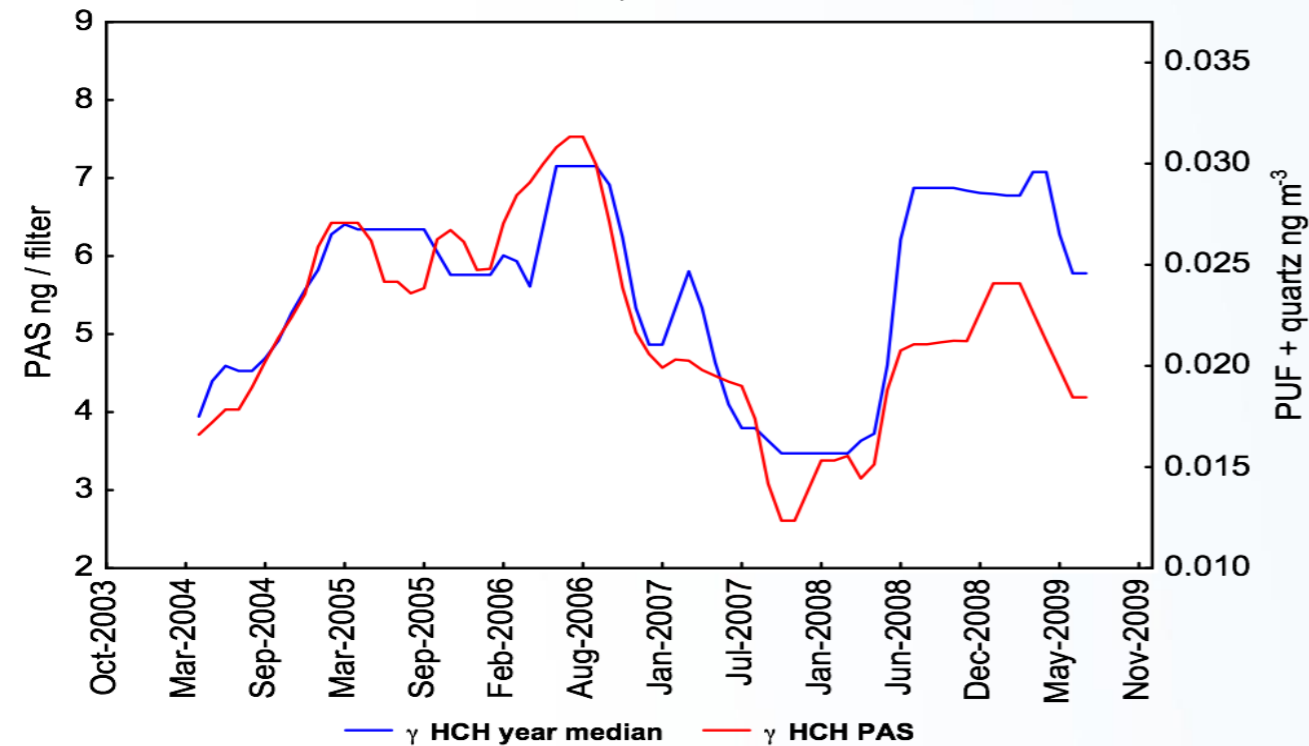
FLN



PCB 28

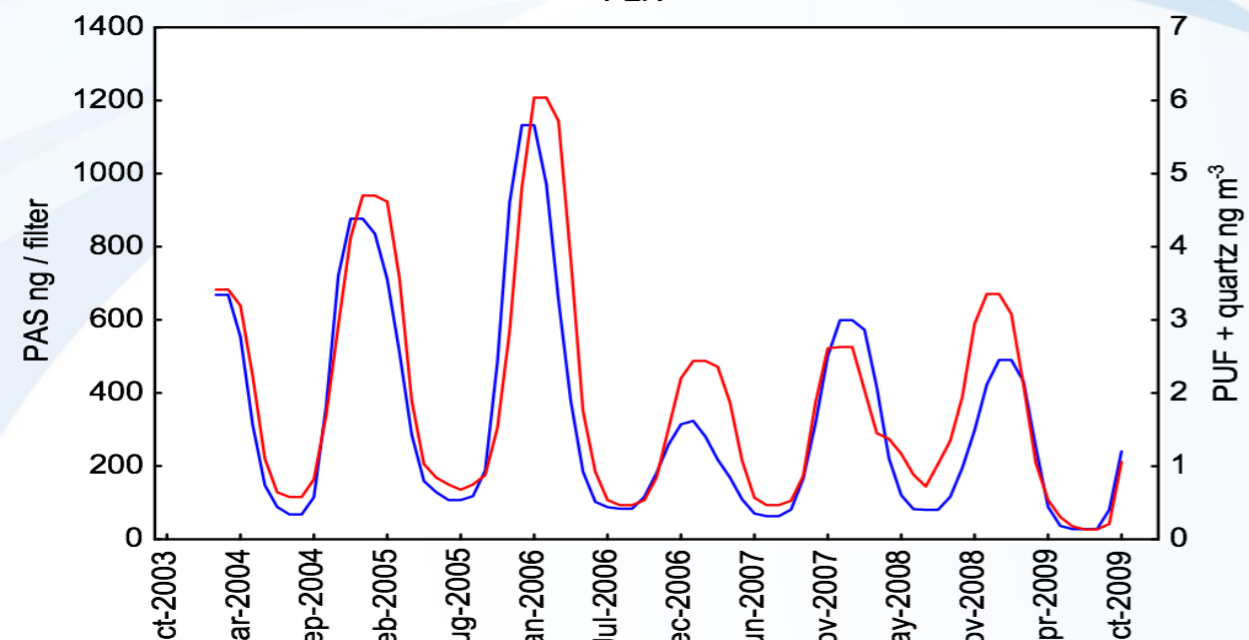


γ HCH

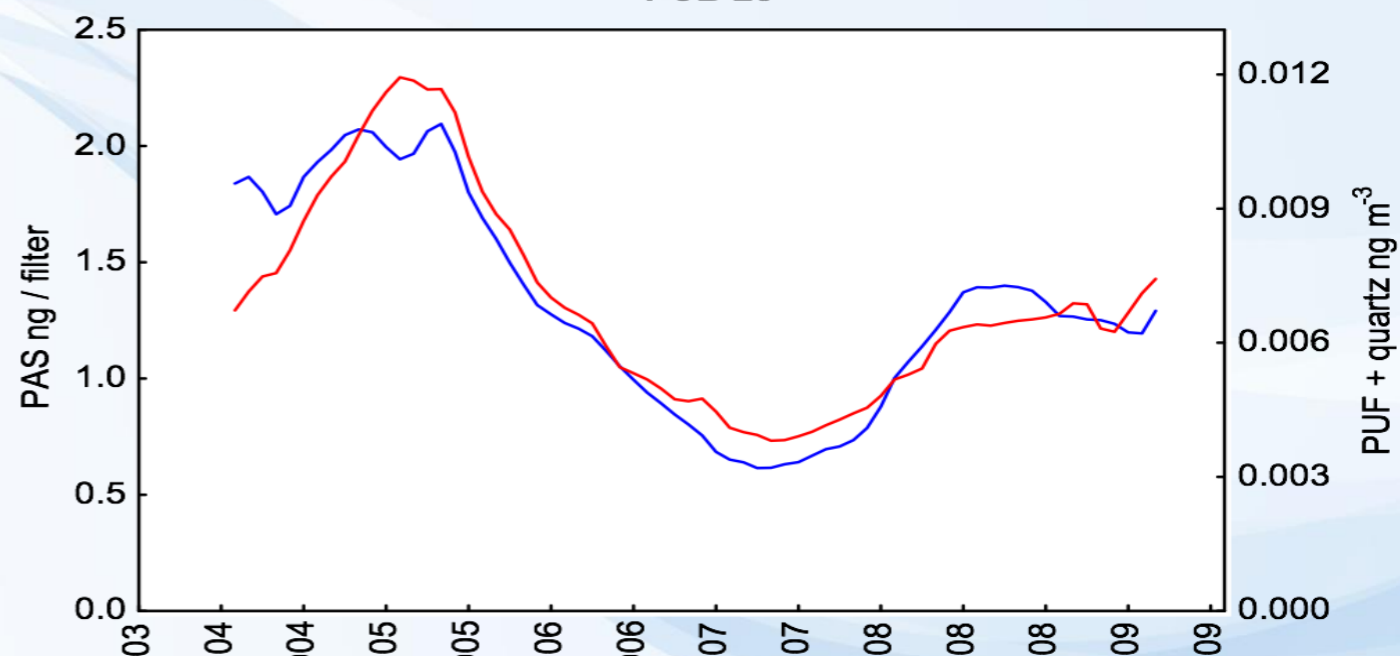


Active and passive air sampling techniques

FLN

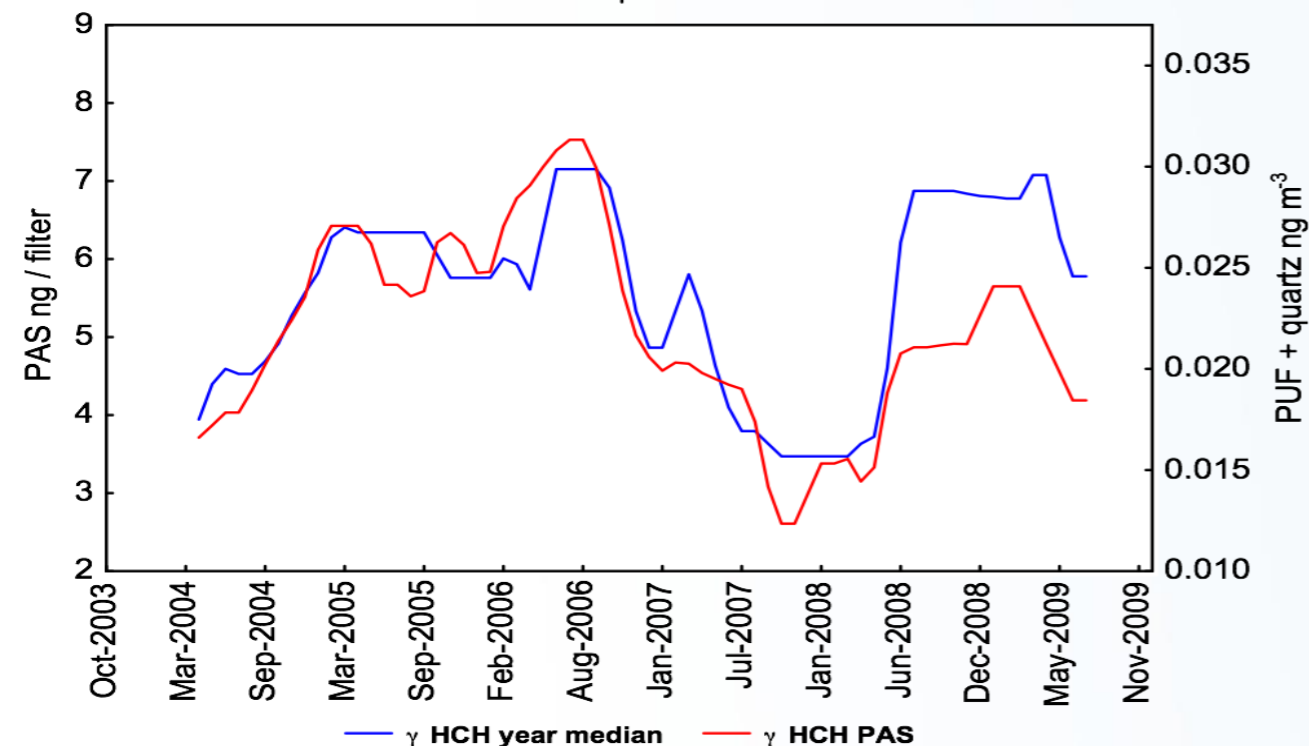


PCB 28



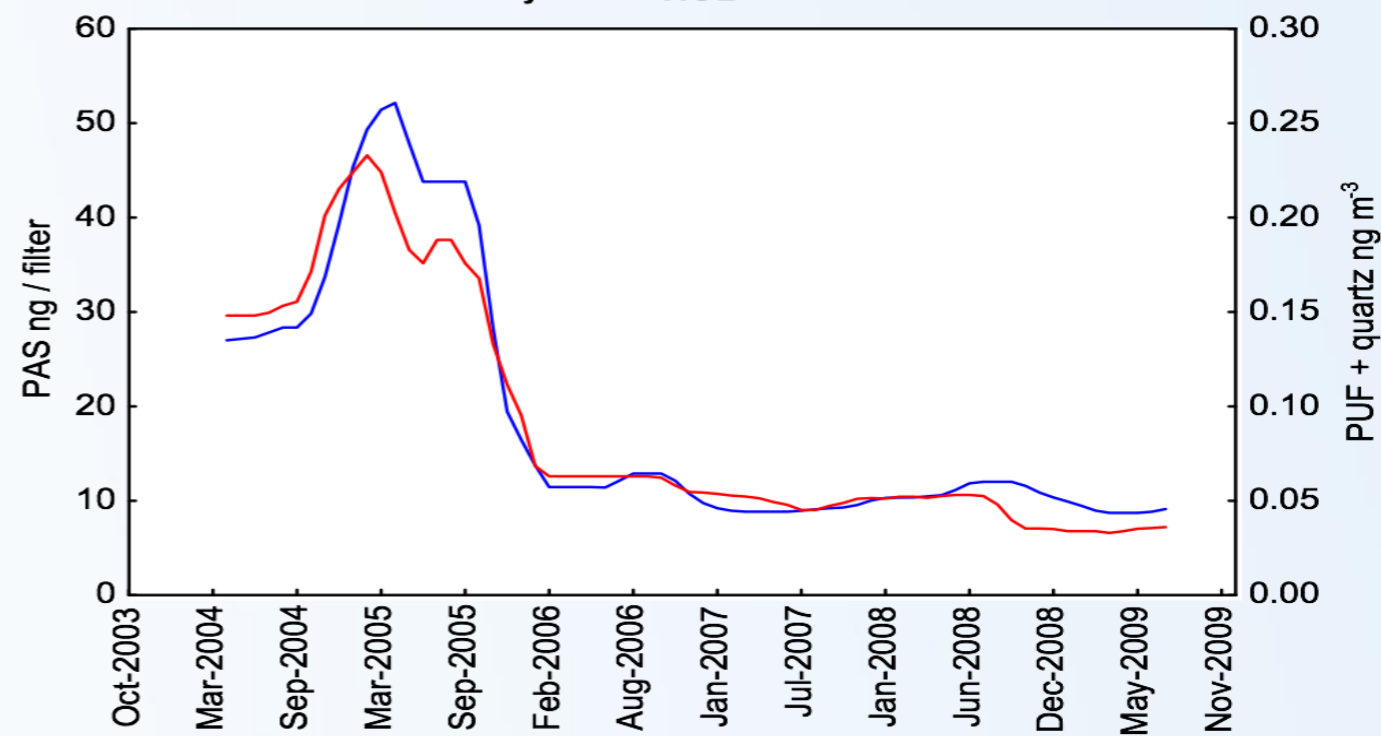
Klánová, J., Čupr, P., Kohoutek, J., Harner, T.: Assessing meteorological parameters on the performance of PUF disks passive air samplers for POPs. *Environ. Sci. Technol.* 2008, 42 (2), 550-555.

γ HCH



— γ HCH year median — γ HCH PAS

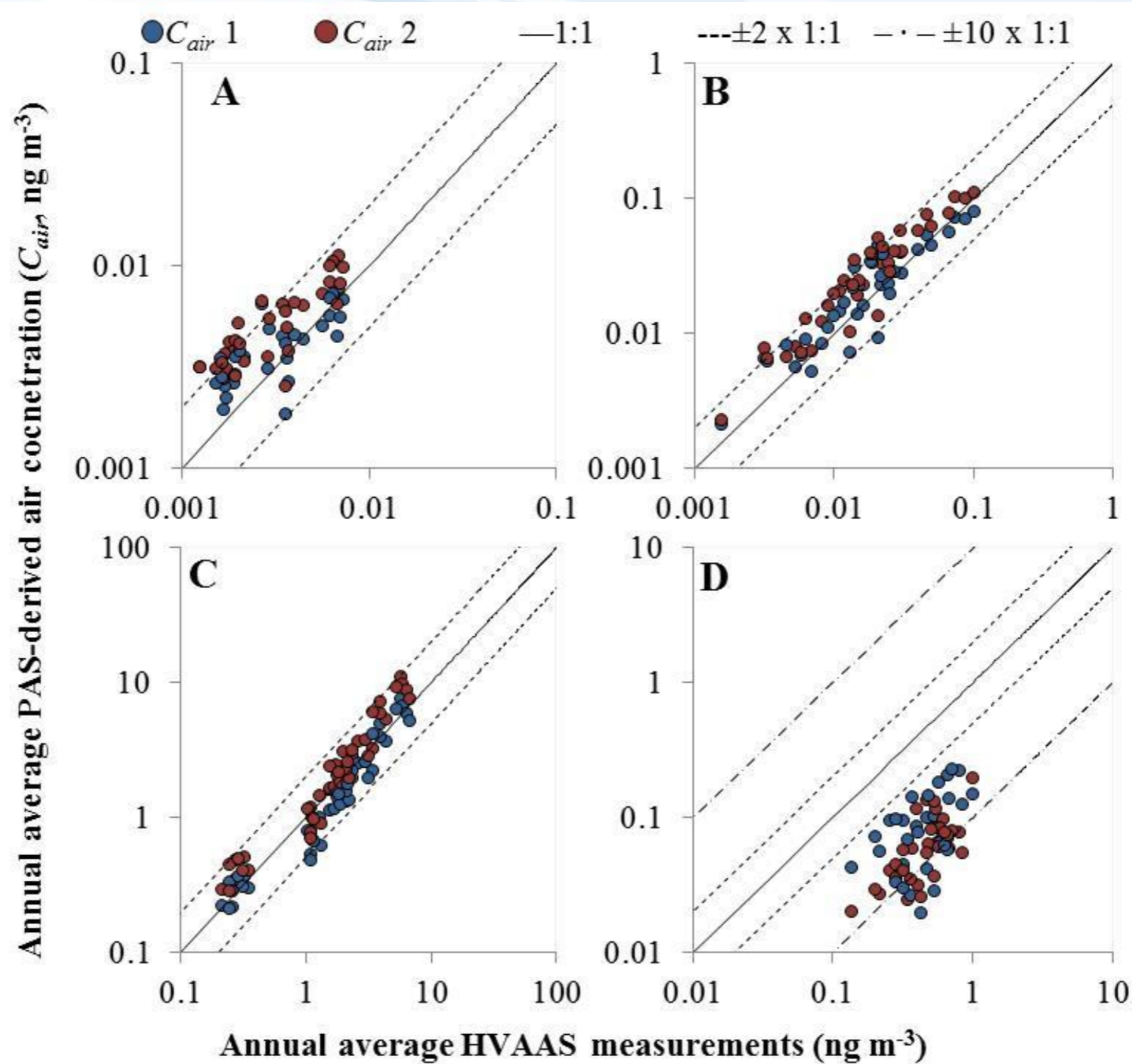
— PCB 28 year median — PCB 28 PAS



— HCB year median — HCB PAS

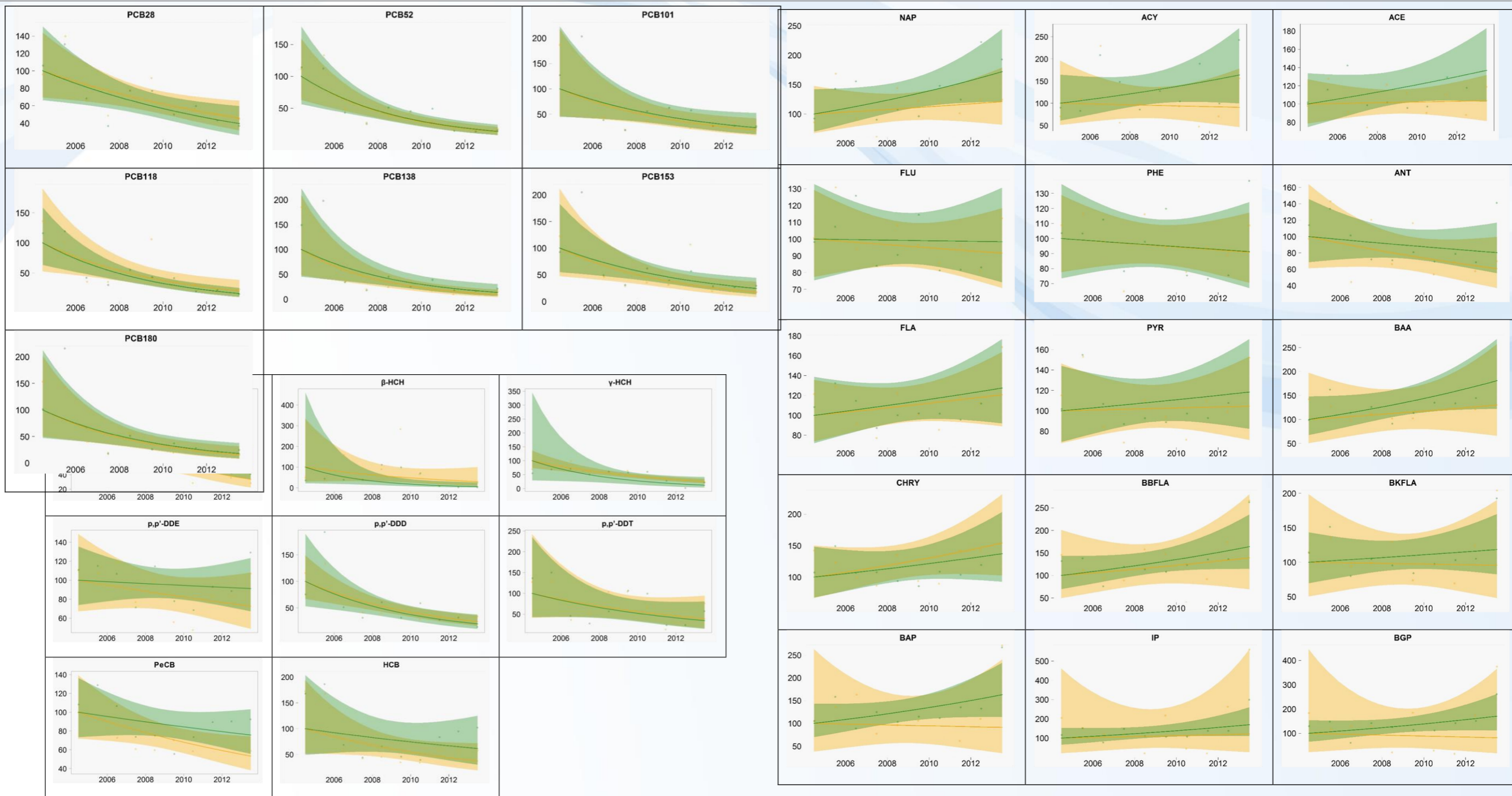


PAS derived air concentrations for PCBs, OCPs, gas- and particle-phase PAHs plotted against HVAAS measurements

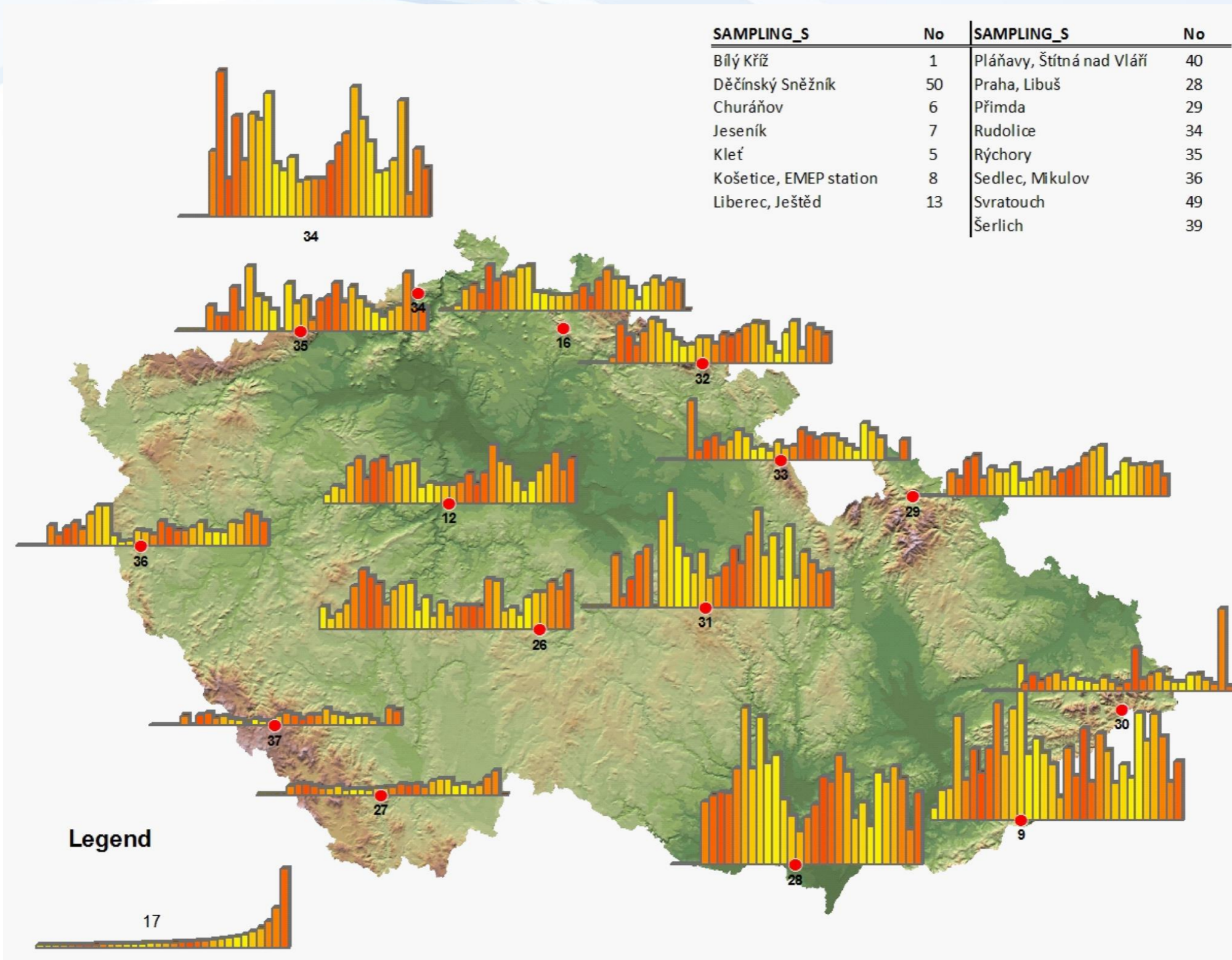


Holt, E., Bohlin-Nizzetto, P., Boruvkova, J., Harner, T., Kalina, J., Melymuk, L., Klanova, J.: Using long-term air monitoring of semi-volatile organic compounds to evaluate the uncertainty in polyurethane-disk passive sampler-derived air concentrations. *Environmental Pollution* 2017, 220, 1100-1111. Part: B

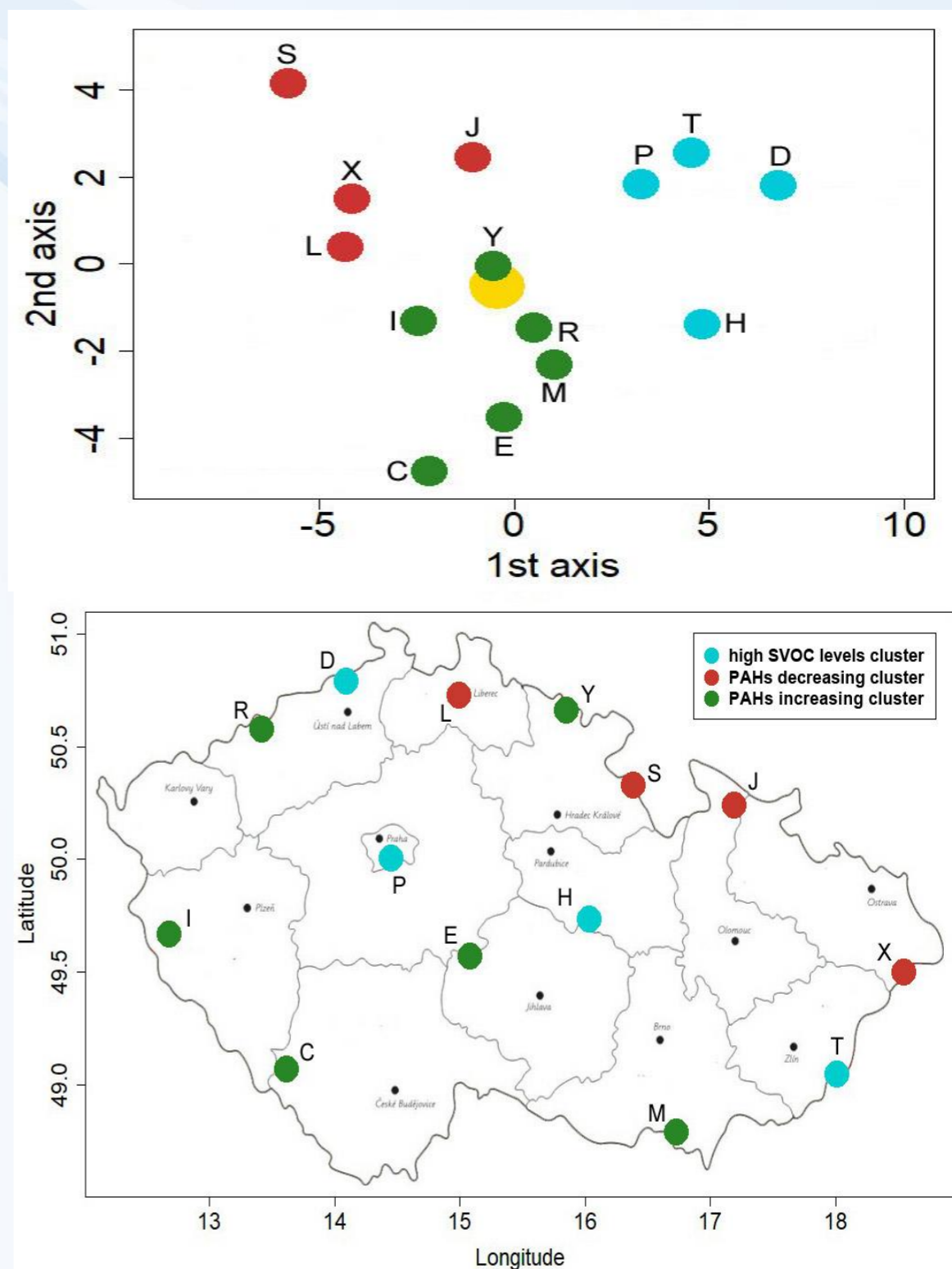
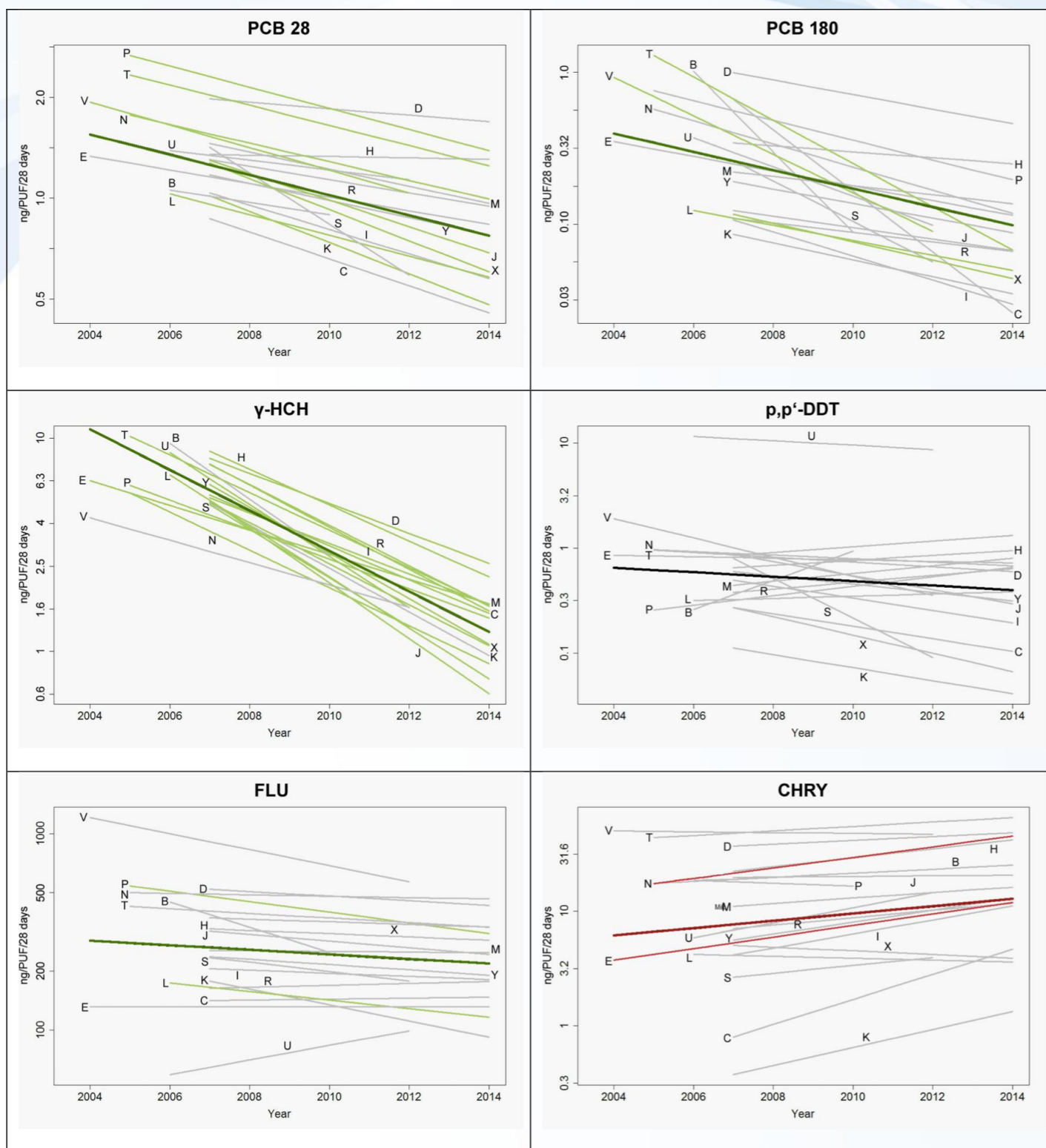
Exponential model estimating time trends of PCBs, OCPs and PAHs (green - AAS, yellow - PAS)



Background sites in the CR, DDTs



Exponential regression of time series of selected PCBs, OCPs and PAHs



PUF Disk - International Comparison Study

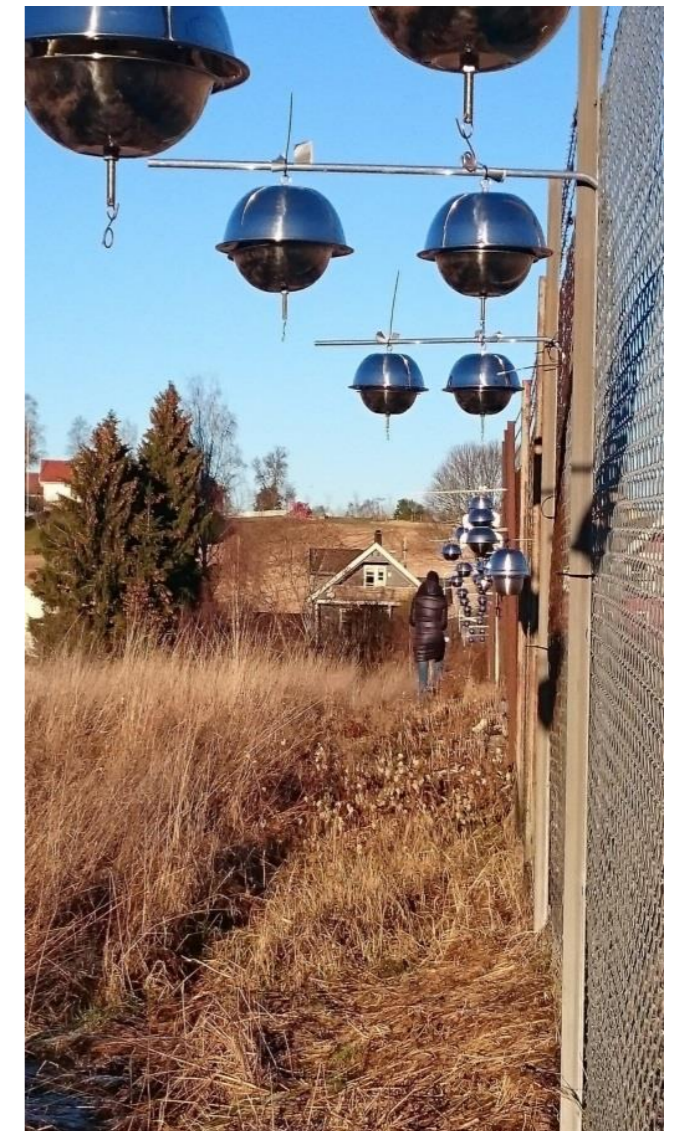
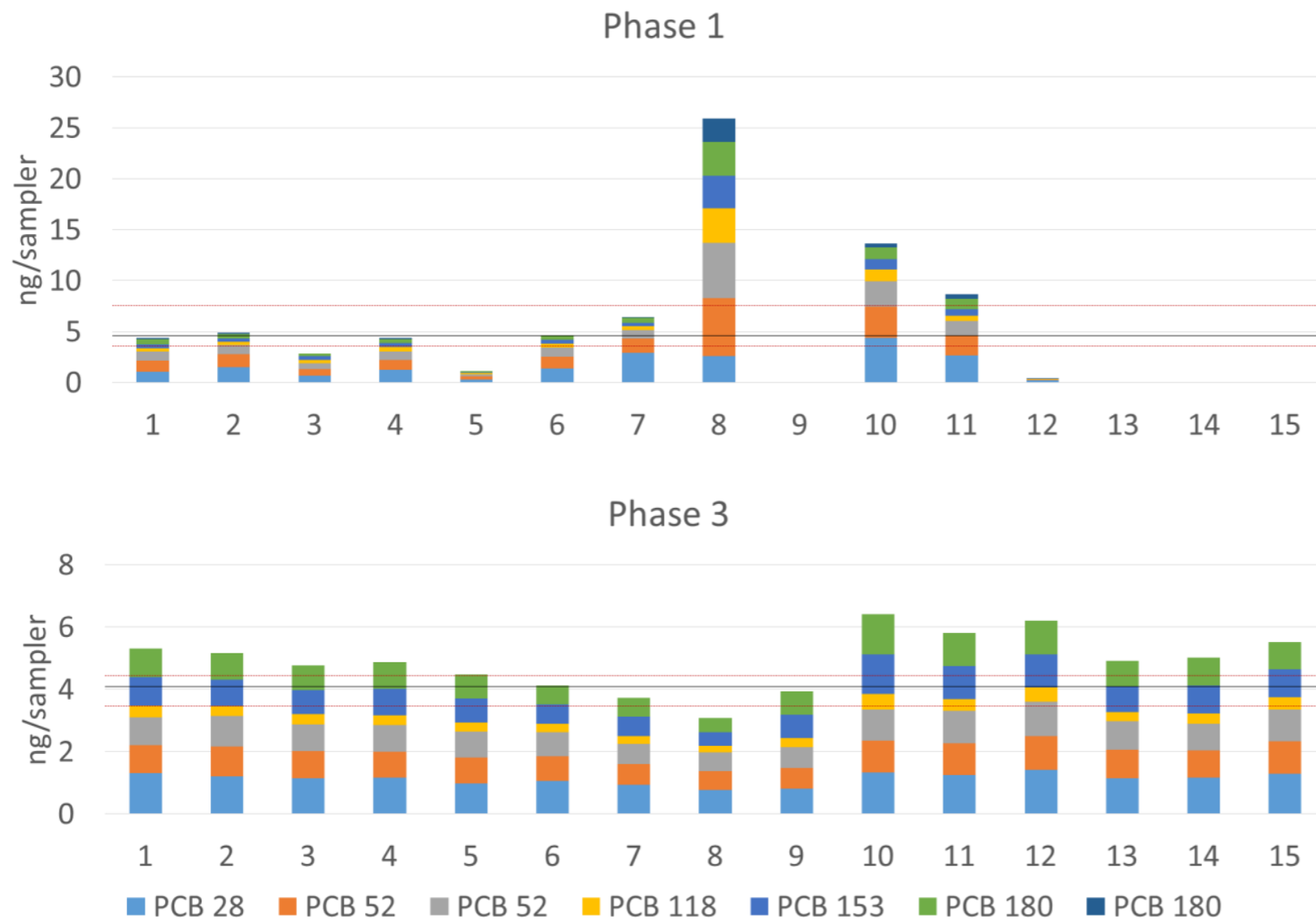


Figure 1: Phase 1 PUF-PAS deployment in Kjeller, Norway (Bohlin Nizetto et al., SETAC 2018 Rome)

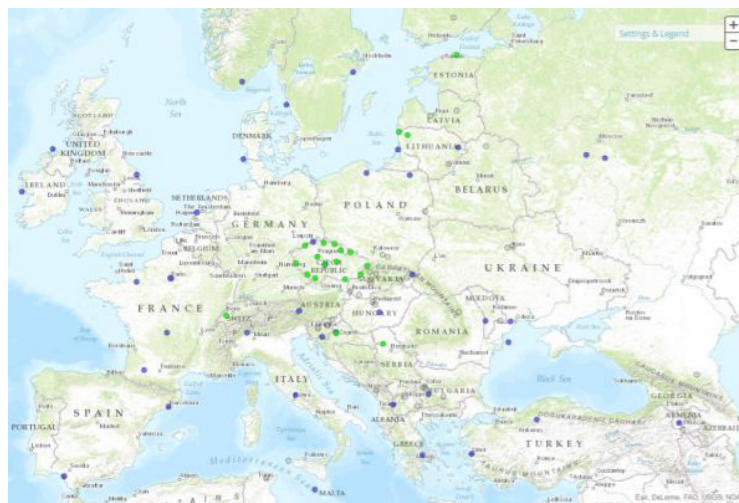
➤ Benefits of using a central laboratory

Main findings in relation to POPs monitoring

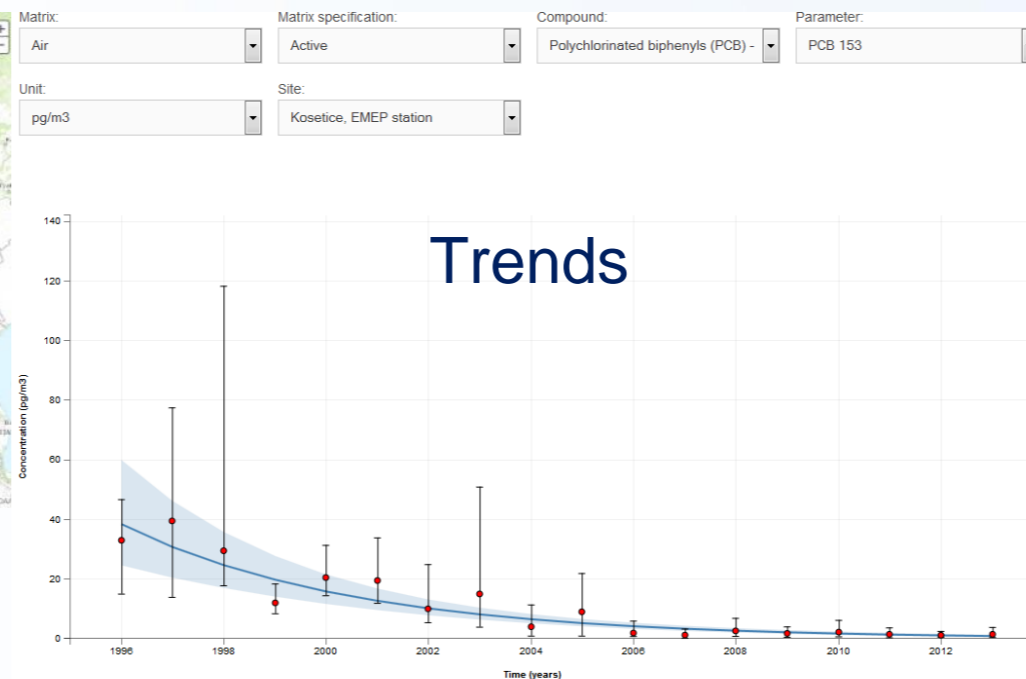
- The implementation of the GMP under the Convention channelled the development of harmonized guidance for monitoring activities worldwide, leading to enhanced comparability within and across monitoring programmes to evaluate changes in levels over time. Quality assurance/quality control practices (QA/QC) have been and continue to be essential for ensuring comparability, along with inter-laboratory comparison assessments.
- New tool supporting harmonized data handling for the collection, processing, storing and presentation of data was established (GMP data warehouse). All monitoring data obtained in the frame of the GMP are publicly available and represent a valuable resource for both policy makers and researchers worldwide.

Global Monitoring Plan of the Stockholm Convention

- Availability and comparability of data is crucial
- Regional and global coordination of monitoring efforts is important but data availability is what really matters
- The GMP data collection tool and data warehouse made a difference: Data are not only available to the research community through the specialized databases and scientific papers but presented to the policy makers and general public in the simple and comprehensive manner



Spatial distribution

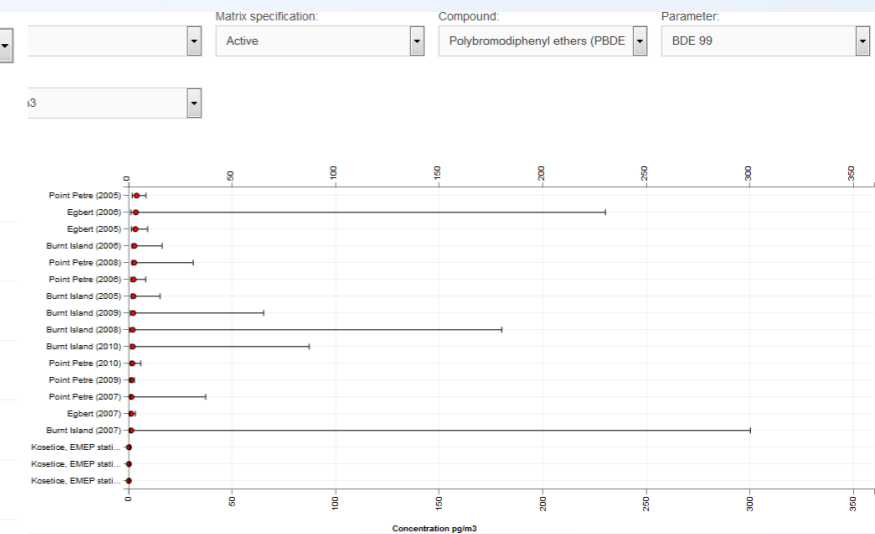


Summary

Mean	11.428 pg/m ³
Median	6.5 pg/m ³
Minimum / maximum	1.15 – 39.5 pg/m ³
5th percentile / 95 percentile	1.1925 – 33.975 pg/m ³

Trend description

Delta	-31.543 pg/m ³
Mann-Kendal test	-0.79085 (p = 2.2949E-7)
Daniels test	-0.9257 (p = 0)



Ranges

Recommendations - Global monitoring report (2)

- Efforts should continue toward ensuring **comparability and consistency in monitoring data at the global level**. The regional and global monitoring reports should be broadly shared and the GMP data warehouse should be maintained to support GMP data handling and to provide on-line access to up-to-date POPs monitoring data.
- The latest version of the guidance should always be used as the reference document.
- Monitoring programmes should be encouraged to maintain long-term sample archives for retrospective analysis.

(UNEP/POPS/COP.8/21/Add.1)

Recommendation from the EE report

- Global monitoring of POPs, as well as data sharing and modelling should be sustained in the long term to confirm decreasing concentrations of legacy POPs in the environment and in humans and to identify trends in the concentrations of the newly listed POPs.

(UNEP/POPS/COP.8/22/Add.1)



Preparing from the future

Recommendations - Global monitoring report (1)

- The third phase of the global monitoring plan should continue to use the amended global monitoring plan, implementation plan and guidance document as its foundation.
- Ensure **sustainability of ongoing monitoring activities in the long-term in all regions** to provide the important information required supporting the effectiveness evaluation of the Stockholm Convention. Intensify and diversify efforts as required to address remaining gaps in data coverage and to monitor newly listed POPs as they are added to the Convention.

(UNEP/POPS/COP.8/21/Add.1)

Preparing for the future

Other findings/challenges/issues

- Systematic capacity-building activities have been carried out in developing countries, including strategic partnerships with well-established monitoring programmes. Despite these efforts, several regions still have limited capacity to monitor POPs. The addition of new POPs to the Convention creates additional demand for training to implement and sustain POPs monitoring activities.
- Limitations in sustained financial resources for existing monitoring programmes and new financial resources for programmes addressing data gaps are a major constraint in ensuring the sustainability of the GMP.
- Data quality, consistency and comparability is key to assess temporal trends and evaluate effectiveness of measures that have been undertaken.
- The growing list of POPs and chemicals proposed for listing adds pressure on monitoring programmes and analytical laboratories.

(UNEP/POPS/COP.8/22/Add.1)



Preparing for the future

- GMP guidance document revision
- new external factors - SDGs, Minamata convention, funding cycles, global strategies, chemicals management beyond SAICM ...
- Can we do better? ... and “a tool”



Food for Thoughts

1. What is the further use of data we are getting from POPs monitoring nationally/regionally?
2. What do we must have in relation to POP monitoring and Stockholm Convention? What could be our criteria when setting priorities in POPs monitoring?
3. What are key pillars of sustainability in POPs monitoring? Is it technical ability and capacity, political support and funding?
4. What do you think are possible elements that could help preparing for the future in the sustainable monitoring of POPs?

Food for Thoughts (2)

5. How to do better in support evidence-based decision making for the Stockholm Convention ?
6. Are there any criteria besides the Convention text? (i.e. harmonized, comparable, validated information)
7. Do we have information gaps in POPs monitoring at regional/national level? Where?
8. How to tackle identified challenges at technical, scientific and political level?

Task to do now

Group exercise:

- Brainstorm in groups for 1 hour on the questions above and tell us your views
- Please bring back bullet points or key words to each question, where possible
- more details to be provided by Jacqueline Alvarez

Thank you for your kind attention!

