Proposal for an ESB international collaborative case study on a single chemical of interest

(2009-11-26)

Purpose of the exercise

A number of nations manage and run Environmental Specimen Banks (ESBs), with more forming all the time. It is considered that there might be mutual benefits in pooling expertise, knowledge and ideas amongst ESBs. This could both improve the performance of the ESBs themselves and help demonstrate more widely the many advantages they can offer, helping to strengthen their position with the user communities. At present, ESBs are identified for the Antarctica, Australia, Brazil, Canada, Denmark, Finland, Germany, Norway, Japan (2), Spain (3), Sweden, France (2), Italy (2), UK, USA.

Outline suggestion

This case study intends to give an overview on the potential of environmental specimen banks for the exposure assessment of global pollution. It also aims at fostering networking ideas and communication between international ESBs. At this stage plans to compare time trends and food web kinetics of chemical exposure may be too ambitious. Instead, it is suggested to start with a simple exercise which gives an impression of the spatial area ESBs are currently covering. This involves generating analysis data for a given chemical and a selection of samples of the individual ESB programmes. For the chemical analysis it may be an option to agree on one lab to run the analysis on all samples. If more than one laboratory are involved then exchange of samples are recommended for quality assurance. The case study and its results should be communicated to the scientific public, regulators and industry.

Timescale

Draft outline proposal published in November on the ESB website (www.inter-esb.org) and sent to the Paul Becker list of ESBs.

Consultation completed by January 2010

Project runs in summer 2010 with samples collected in 2009.

Considerations

What chemical?

The case study chemical should be a global pollutant since this is an international project. Global pollutants reach ESB regions with the production and use of agricultural and consumer products and/or with long range transport. Flame retardants (e.g. PBDE, HBCD) and certain surfactants (i.e. PFCs) are currently in the focus of regulatory concern. It is suggested to choose the case study compound from these substances. Most ESBs have already gathered practical experience with PBDEs and PFCs. These data may support results from the ESB case study.

How many samples?

This project is more of a demonstration, or proof of concept piece of work, rather than a robust comprehensive science project. If we can demonstrate the practicality of this cooperation it may lead to more thorough scientific projects in the future. Thus, the question is more what is practical and affordable with our current resources, bearing in mind the costs of analysing large numbers of samples.

Presentation of samples?

Existing environmental specimen banks rely on different strategies when it comes to sampling (sampling sites e.g. reference sites/sites directly exposed to industry/public STP effluents; specimens, i.e. taxonomic group) preparation (e.g. individual/pooled samples) and storing (e.g. temperature at which samples are archived) The intention of this case study is to provide an overview on the various ESB concepts for chemical monitoring. The chemical analyses should therefore follow the routine programme of the dedicated ESBs.

It may be pragmatic to find a common denominator in the case study to facilitate cooperation and dissemination of results, e.g. to focus on a single environmental compartment (e.g. marine, limnic compartment) or a single taxonomic group (e.g. fish, birds, mammals). This might exclude collaborations from some ESBs in the beginning but the aim would be to include more matrices and trophic levels at a later stage. Then it is possible to include more ESBs. A table is provided in the annex for ESB members to select their bioindicator/s of concern.

Sample transport

For the project to succeed it is vital that samples can be sent across borders to the selected laboratory. In the past ESBs have gained experiences with shipping samples (e.g. dry ice). This will require prior research on national regulations, suitable carriers/couriers and means of transport such as dry shippers. Ylva Lind from the Swedish specimen bank will advise us from her experience in this area.

Funding

This will depend on sample handling (already part of most ESB standard procedures), sample transport costs, and the costs of analysis per sample. Currently it is proposed that the funding would be borne by the individual ESBs.

Questionnaire

1) What and how many samples would you recommend?

1)	Antarctica	Australia	Brazil	Canada	Denmark	Finland	Germany	Italy (2)	France (2)	Japan (2)	Norway	Sweden	Spain (3)	UK	USA
compartment							limnic							limnic	
trophic level							2nd order consumer								
taxonomic group							bream							roach	
no. and type of samples							pooled samples							25 individ. samples	
exposure type							1 reference and 12 non-reference sites							1 reference and 1 non-reference site	
matrix							Muscle/ liver								

2) Would you run the analytical work in your ESB? If yes, would you agree with cross analysing a limited number of samples in exchange with other ESBs?

3) Have you gained experiences with shipping samples across borders? If yes, please indicate the shipping method and the courier.

4) What is your recommendation for the chemicals to be analysed?

	Antarctica	Australia	Brazil	Canada	Denmark	Finland	Germany	Italy (2)	France (2)	Japan (2)	Norway	Sweden	Spain (3)	UK	USA
2)							Yes/Yes							No	
3)							Yes. Dry ice, with FedEx and Worldcouri							Worldcourier	

							er								
4)							PBDE, PFC							PBDE	