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Effective and reliable site investigation at large sites by the use of initial screening methods

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Background

Conventional site investigations (soil and groundwater sampling), may **involve uncertainties** due to insufficient historical data or sampling density due to limited budgets.

Initial screening methods can be applied faster and with higher sampling density to **target other screening methods** for the most relevant areas.

Initial screening methods can be applied as a part of the screening strategy in a **step wise approach**.

Tree coring and **soil gas sampling** are rapid, low-invasive and cost-efficient initial screening methods.

Initial screening methods are well suited at **large sites** or at sites with **insufficient historical information**, and also at sites where conventional drilling is risky (urban, swampy, military sites).

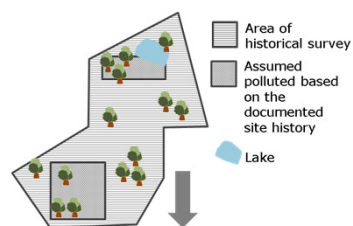
The Szprotawa test site

- A **former military airbase** contaminated with jet fuel and **BTEX** in high risk areas 50-70 mg/kg, outside 2.15 mg/kg.
- **Geology**: relatively homogeneous; a silty cover, followed by sediments, sands and gravels. **Groundwater table** 0.2-7 m (typically 2-3 m) bgs.

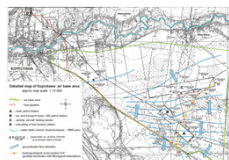


Stepwise method application

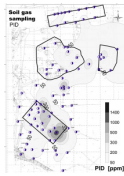
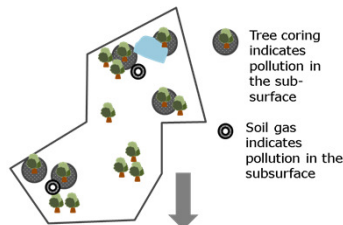
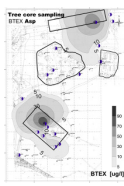
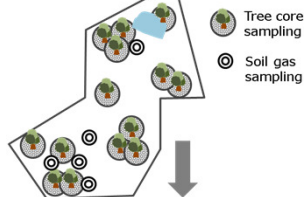
For illustration:



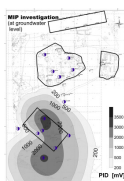
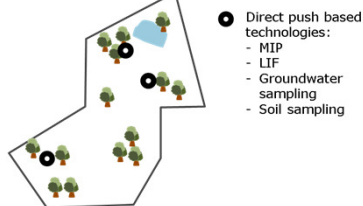
Historical survey



Initial screening

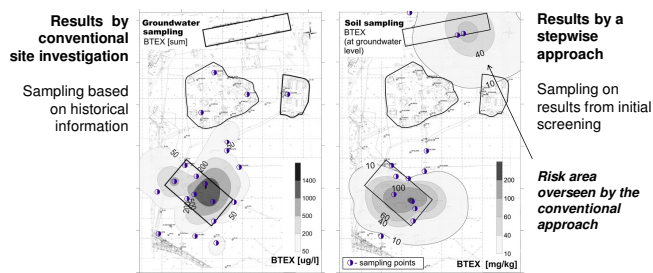


Detailed screening

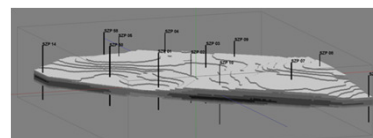


Outcome from the site investigation

- The stepwise approach can lead to **more effective and reliable site investigations**
- **More areas are investigated**, more data are available
- Initial screening methods can **minimize the risk** of overlooking hot spots or unknown sources



- MIP (Membrane Interface Probe) and LIF (Laser Induced Fluorescence) provided **3D information**



Spatial distribution of the high risk area derived from LIF sensing

- The use of multiple (initial) screening methods can deliver more data for the **design of remediation strategies**

Literature:

- <http://www.timbre-project.eu/>
- Effective and reliable site characterization at megasites by the use of pre-screening methods. (2015). Algreen, M.; Kalisz, M.; Stalder, M.; Martac, E.; Krupanek, J.; Trapp, S.; Bartke, S. Environ. Sci. Pollut. Res. In press