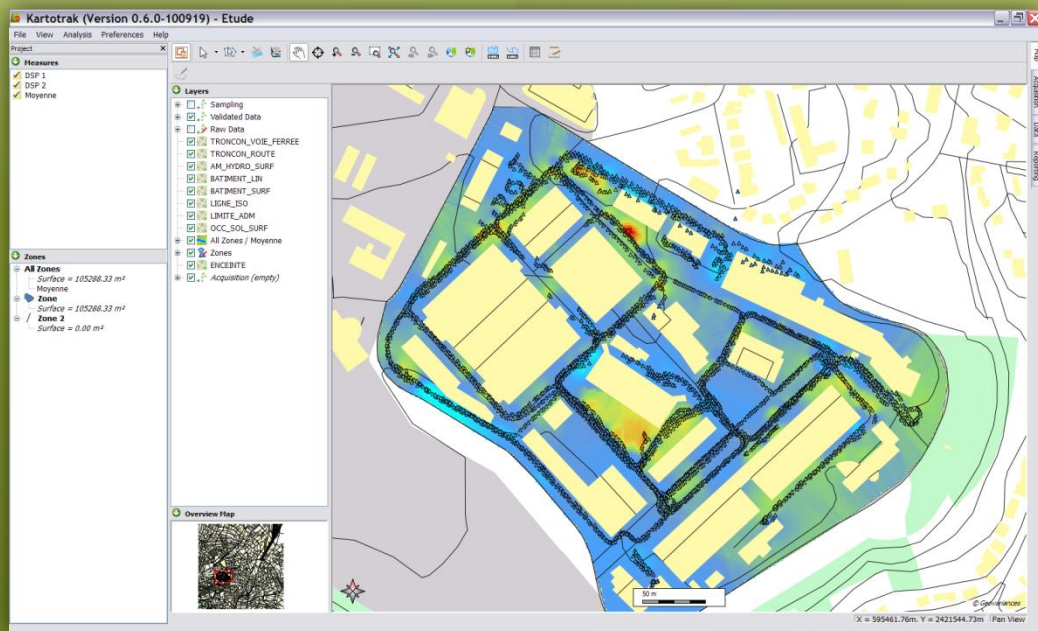


kartotrak



The first all-in-one software
solution for contaminated
site characterization



Geovariances
Where no one has gone before

An innovative software solution

Kartotrak sets new standards for the characterization of radio-contaminated sites

Nowadays, decommissioning and dismantling are critical issues in nuclear countries. Decontamination projects are all the most sensitive since they could last several years and turn out to be highly costly if not well-prepared.

Common approaches focus the decision process on a final control after cleanup based on statistical analyses (guidance for demonstrating site compliance with a dose- or risk-based regulation). By ignoring the importance of a preliminary radiological characterization of the site, such approaches often lead to maximize the amount of soil or concrete wastes.

However, this preliminary characterization strongly helps managing the remediation project and the radiological waste production.

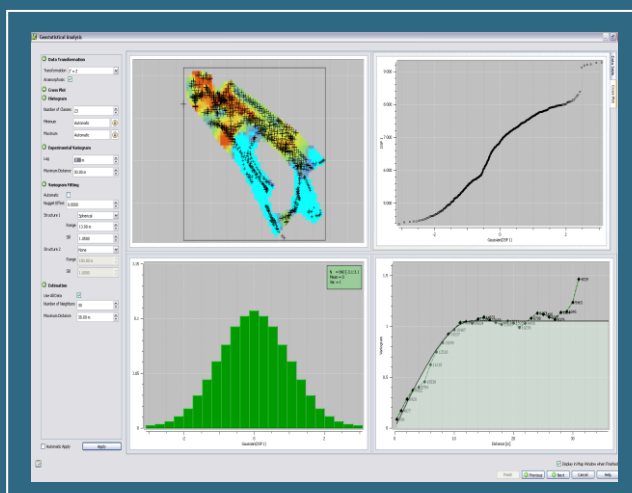
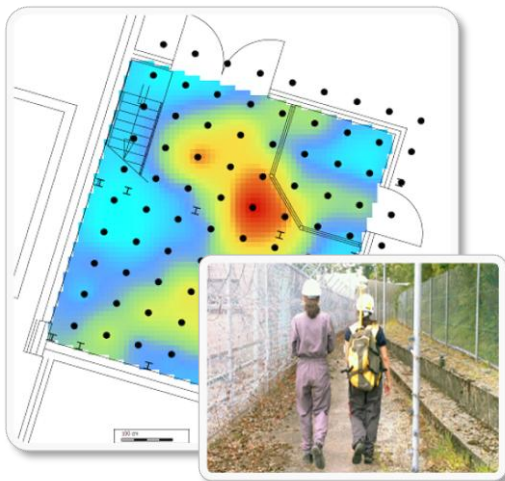
Therefore, the French Atomic Energy Commission CEA has developed over the last 10 years an innovative methodology to fulfill the radwaste categorization which has been validated on more than 100 sites. Born out of a partnership between CEA and Geovariances, **Kartotrak™**, is part of this new approach.

Kartotrak™ is the first nuclear-dedicated software which provides an integrated workflow from in-situ characterization to final control after remediation. It makes use of geostatistics to **valorize data** and precisely **map the contamination at each step of the characterization sequence**. This proven and robust technique also guarantees a **reliable sampling iterative strategy** and an **efficient risk assessment**.



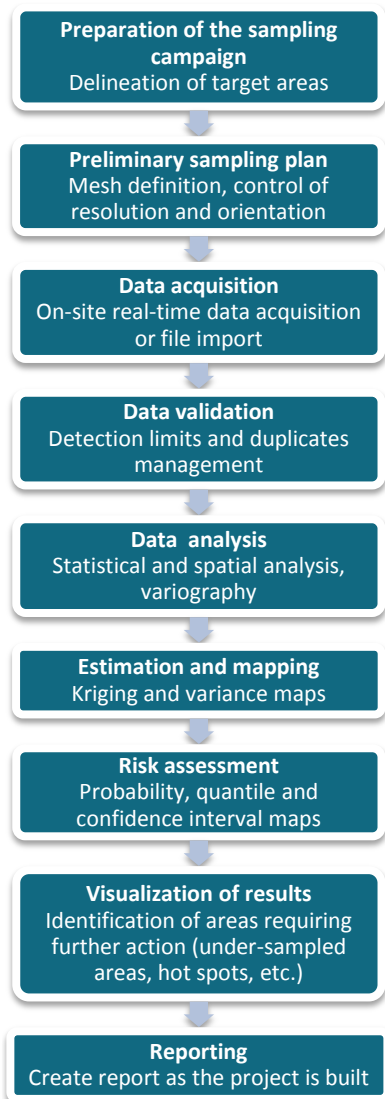
cea

energie atomique • énergies alternatives



Geostatistics, to keep one step ahead of the curve

- ▶ Geostatistics is the ultimate solution when it comes to modeling spatial data in an intelligent way. It guarantees precision and reliability in results and provides an efficient way out for sampling network optimization, data quality control and analysis, mapping, volume estimation, risk assessment.
- ▶ The strength of geostatistics lies in the fact that it allows to take into account the spatial behavior of the data. This spatial behavior is fully described by the variogram which provides information on the spatial correlation between two samples separated by a given distance. The systematic presence of spatial continuity for radiological contaminations (before remediation) has been shown by multiple case studies carried out in partnership with CEA and proves the relevance of geostatistics for such application.



Kartotrak™ is designed for those who are involved in nuclear remediation projects (site owners, safety authorities, contractors) and need to estimate and locate the contaminated soil volumes confidently.

Kartotrak™ opens breakthrough approaches to the nuclear decontamination industry:

- ▶ **Sampling optimization** for a **better planning and monitoring** of site characterization surveys;
- ▶ Instant state-of-the-art data analysis and modeling for **real-time contamination mapping**;
- ▶ Risk and uncertainty assessment to improve **decision-making process** related to site cleanup.

Kartotrak™ is a key tool:

- ▶ **During the pre-characterization phase** of a remediation project to produce contamination maps from non destructive surveys and highlight potential issues. This helps in positioning additional investigation and in iteratively reducing the surface to be thoroughly characterized.
- ▶ **After the decontamination process** to check the site compliance with cleanup regulations.

Kartotrak™ is of benefit:

- ▶ **On-site** for streaming data acquisition, to achieve a simplified exploratory data analysis and a first mapping. In this case, the software is connected to a GPS and several measuring devices, allowing a real-time monitoring of covered areas. **Kartotrak™** may be embedded into investigation vehicles (trucks, four-wheel drive, quads, etc.) or more simply into a computer bag.
- ▶ **At the office** for sampling plan preparation, in-depth data analysis and risk evaluation.

Benefits

▶ Optimize your investigation costs

- Adapt sampling programs according to real-time results using robust techniques allowing the identification of under-sampled, highly-variable or problematical areas.

▶ Improve your decision-making process

- Increase data value with a one-of-a-kind exploration tool: optimal data quality control and validation is guaranteed.
- Assess the risk of exceeding target activity levels and minimize waste quantity.
- Base your decision process on an adequate probabilistic framework.

▶ Rely on a double expertise

- CEA's acknowledged know-how for radiological characterization and cleaning of soils contaminated by radiological compounds.
- Geovariances' expertise based on +25 years experience in geostatistics and software development and on +10 years experience in applying geostatistics for site remediation optimization. That means that **Kartotrak™** guarantees top-quality services: technical support, training, consulting, to ensure optimum performances in an operational context.

▶ Rely on a solution which has proven its efficiency on more than a hundred sites

Over the past few years, **Kartotrak™** helped decision-making on various types of sites - research centers (CEA), power plants (EDF), industrial sites (steriles with radium traces), experimental sites (IRSN) and allowed to properly characterize areas for which classical methodologies were leading to a dead-end in terms of economic feasibility.

Get started in once

- ▶ Fast installation taking only a few minutes
- ▶ Ease of use thanks to integrated technology and workflow
- ▶ User-friendly interface
- ▶ High performances thanks to multi-core processing
- ▶ Easy data visualization and presentation with full GIS and reporting functionalities.

Technical Requirements

- ▶ Minimum system requirements: 1 GHz x86 processor, 1 Gb of system memory, graphic cards and monitor capable of 1024x768 pixels
- ▶ Supported Operating System: Windows XP / Vista / 7, 32 / 64-bit

Connectivity

Kartotrak™ can connect with the following positioning and data delivery systems:

- ▶ GPS with NMEA output
- ▶ NaI detector by ORTEC
- ▶ Germanium detector by CANBERRA
- ▶ DSP detector by SAPHYMO

Should your measuring device not appear in the above list, Geovariances offers development services to interface it with **Kartotrak™**.

Kartotrak™,

the first all-in-one software solution for contaminated site characterization:

- ▶ Positioning facilities, target areas or sampling points
- ▶ Real-time data positioning and acquisition (GPS and measuring devices connections)
- ▶ Sampling plan optimization
- ▶ State-of-the-art data analysis and quality control
- ▶ Accurate and reliable contamination mapping with geostatistics
- ▶ Uncertainty quantification and risk assessment

Brought by the world leader in geostatistics

- ▶ Geovariances aims at providing its customers with the most **complete solution** in Geostatistics: innovative methodologies, software packages, consulting and training services.
- ▶ Geovariances was created in 1986 by geostatisticians from the "Centre de Géostatistique" from the French school Mines ParisTech. The company also develops **Isatis**, the most complete software solution in geostatistics.
- ▶ Geovariances is made of a highly qualified team of engineers and experts in geostatistics, geology, geophysics and environment.



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