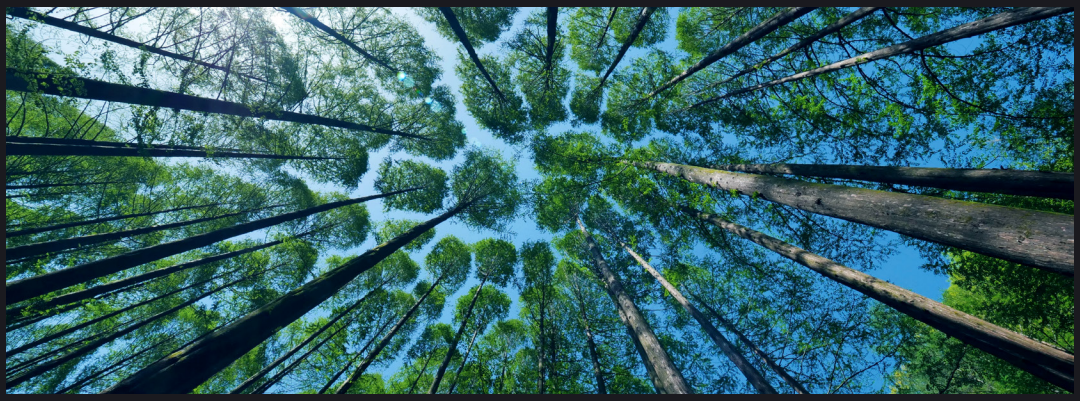
CASE STUDY

Data management for sustainable forestry

Sachsenforst State Enterprise | *Germany*



Industry

- Government & Public Sector

Solutions

- Octave Imagine, Octave Alto Data Management

Challenges

- Very large, heterogeneous datasets
- Difficult data exchange and searching
- Significantly slowed workflows

Results

- Markedly improved daily work, planning and analyses
- 20K digitized historical maps, 300TB of data
- Continuous, automated integration of new data

Sachsenforst State Enterprise manages and administers Saxony's state forests in Germany, and has economic, ecological and social responsibilities. It manages approximately 200,000 hectares (about 494,210 acres) of forest in a sustainable manner, simultaneously protecting natural habitats and ensuring recreational opportunities for residents and visitors.

Notably, it is responsible for managing the Saxon Switzerland National Park, which combines nature conservation and forestry under one roof. In addition, Sachsenforst is involved in research, training and environmental education, and is considered a model in forest and nature management thanks to its certified sustainability standards.

The digitalization of data management and the use of modern remote sensing technologies have revolutionized the foundation for the sustainable management of Saxony's forests. Sachsenforst, represented by the Centre of Competence for Forests and Forestry, also relies on solutions from GEOSYSTEMS Germany that are built with Octave Imagine (formerly ERDAS IMAGINE) and Octave Alto Data Management (formerly ERDAS APOLLO) technologies and have been continuously developed for more than 16 years.

Development of central spatial data management system

Originally, the challenge was to manage very large and heterogeneous datasets. Satellite images from different sensors and resolutions, aerial photographs, digital terrain models, LiDAR data, historical maps and reports were decentralized, with original maps or files in various formats and locations. This made data exchange difficult and searching for relevant information a time-consuming task. In some cases, employees had to manually search through tens of thousands of maps and orthophotos as well as hundreds of terabytes of data, which significantly slowed down workflows and restricted the use of valuable information.

To address these structural disadvantages, a central spatial data management system was developed and implemented with GEOSYSTEMS. Since then, the FGIS_raster platform and its extensions have made it possible to efficiently catalog and centrally store all map, image, aerial photo and LiDAR data. As a result, not just staff in the forestry districts, but all departments, have easy and fast access — including to historical maps, which are particularly relevant for boundary issues and long-term analyses.

A practical example is the selection of forest base maps and orthophotos for sample plots. Because data and metadata are now stored centrally with an intuitive search function, the required files can be selected, visualized and analyzed automatically, in just a few clicks. Previously, this task required lengthy archive searches and many manual steps.

The GEOSYSTEMS solution stood out in the 2008 tender process not only because of the best price-performance ratio, but also its powerful search engine, reliable management of large volumes of data and a resource-efficient IT infrastructure. The system was continuously developed together with the staff of the Centre of Competence for Forests and Forestry in order to meet increasing professional and technical requirements.

The solution in practice

Through the integration of remote sensing data into the GIS, a wide range of information is now available for forest management planning, the Federal Forest Inventory (BWI) and the State Forest Inventory Saxony (WISA). Third parties, such as surveying authorities, also benefit from historical forest maps. In addition, numerous thematic map services (WMS) have been developed that enable hydromorphological analyses — including hydrological modeling of surface runoff, flow profiles and permeability. These services are available via the Geoportal Sachsen and GeoMIS.Sachsen, both in the intranet and on the internet.

The new system has significantly improved the daily work of the forestry administration. Thanks to a centralized data management system, all relevant specialist departments, especially the forestry field offices, can access up-to-date and historical forest information regardless of location. In particular, the long-term observation of forest changes is greatly facilitated by access to extensive archive data.



Archive with thousands of printed maps (Credit: Staatsbetrieb Sachsenforst)

The system currently comprises around 20,000 digitized historical forest maps, dating back to 1711, as well as orthophotos from 1953 onward. This data pool is supplemented by digital elevation models, satellite images, georeferenced soil reports and extensive documentation on peatland sites. The system currently holds around 300 terabytes of data and is continuously being expanded.

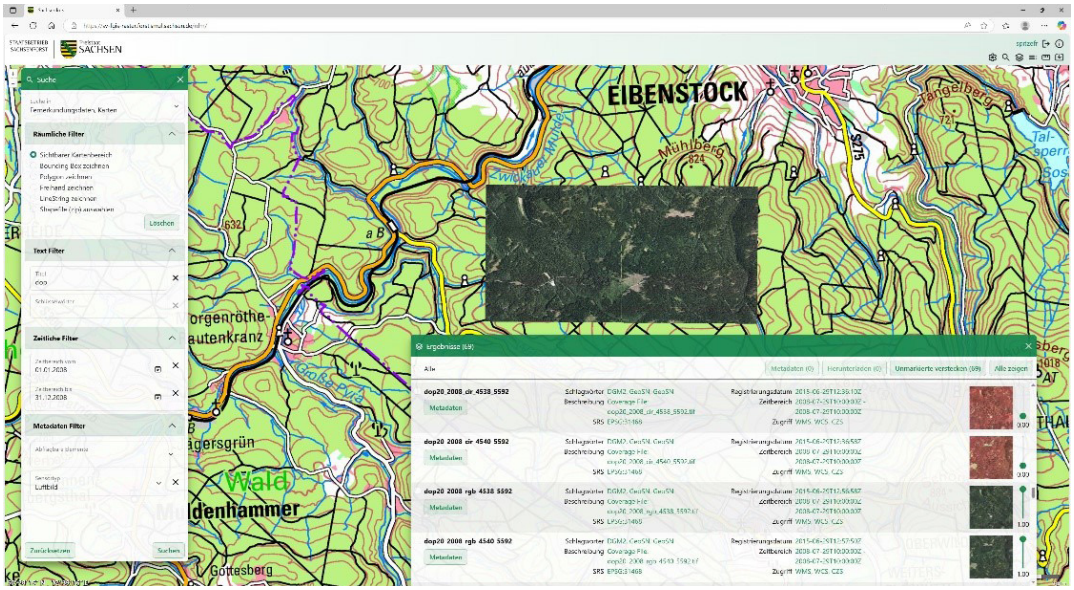
"I was able to use the new Alto Data Management tool immediately in a real-life situation with a boundary issue," said one user. "The ability to look back over 50 years is extremely valuable. Direct comparisons with current data open up completely new possibilities."

New data, such as from current aerial surveys, is quickly and reliably integrated into the system by automated processes and promptly available for further processing.

The advantages for end users and the Centre of Competence for Forests and Forestry are both quantitatively and qualitatively demonstrable. Workflows have been significantly accelerated by the central database and user-friendly web clients, metadata maintenance time has been greatly reduced and data quality has increased. Staff can efficiently supply users with up-to-date geoinformation and make a significant contribution to maintaining sustainable, ecologically healthy forests.

“The solutions developed by GEOSYSTEMS based on Octave technology are the foundation of our data management and remote sensing workflows”.

Karina Hoffmann
Officer for Remote Sensing and Forest Monitoring
Sachsenforst State Enterprise



User interface of FGIS_raster: List of orthophotos from 2008 for a specific area in Saxony (Credit: Staatsbetrieb Sachsenforst)

By integrating additional modules in 2025 such as FGIS_moor, new possibilities are also available for vegetation-ecological monitoring of restored peatland areas, where relevant areas are automatically analyzed and all peatland-related datasets are incorporated into the overall system.

Fit for the future

Continuous development of the system is planned. Sachsenforst’s results show a centralized, automated spatial data management system and close cooperation with a competent technology partner improve process efficiency, decision-making and sustainable forest management. Consistent digitalization, automated data processing and cross-departmental access to both current and historical geodata enable a future-oriented, ecologically responsible forestry sector.

“The solutions developed by GEOSYSTEMS based on Octave technology are the foundation of our data management and remote sensing workflows,” said Karina Hoffmann, officer for remote sensing and forest monitoring at Sachsenforst State Enterprise. “Our staff benefit from user-friendly web clients for archiving, cataloging and analyzing forestry data, and we are able to efficiently support with up-to-date geoinformation, helping to preserve a sustainable, ecologically healthy forest.”

About Octave

Octave is a leader in enterprise software, turning data into decisive action and intelligence into your edge. Our software solves for and simplifies complexity, from the design and build to operations and protection of people, property and assets – for any scope, at any scale. For decades, we’ve partnered with customers to sharpen performance, elevate efficiency and amplify results. From factory floors to entire cities, our solutions are tuned to scale up what’s possible from day one onward.

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