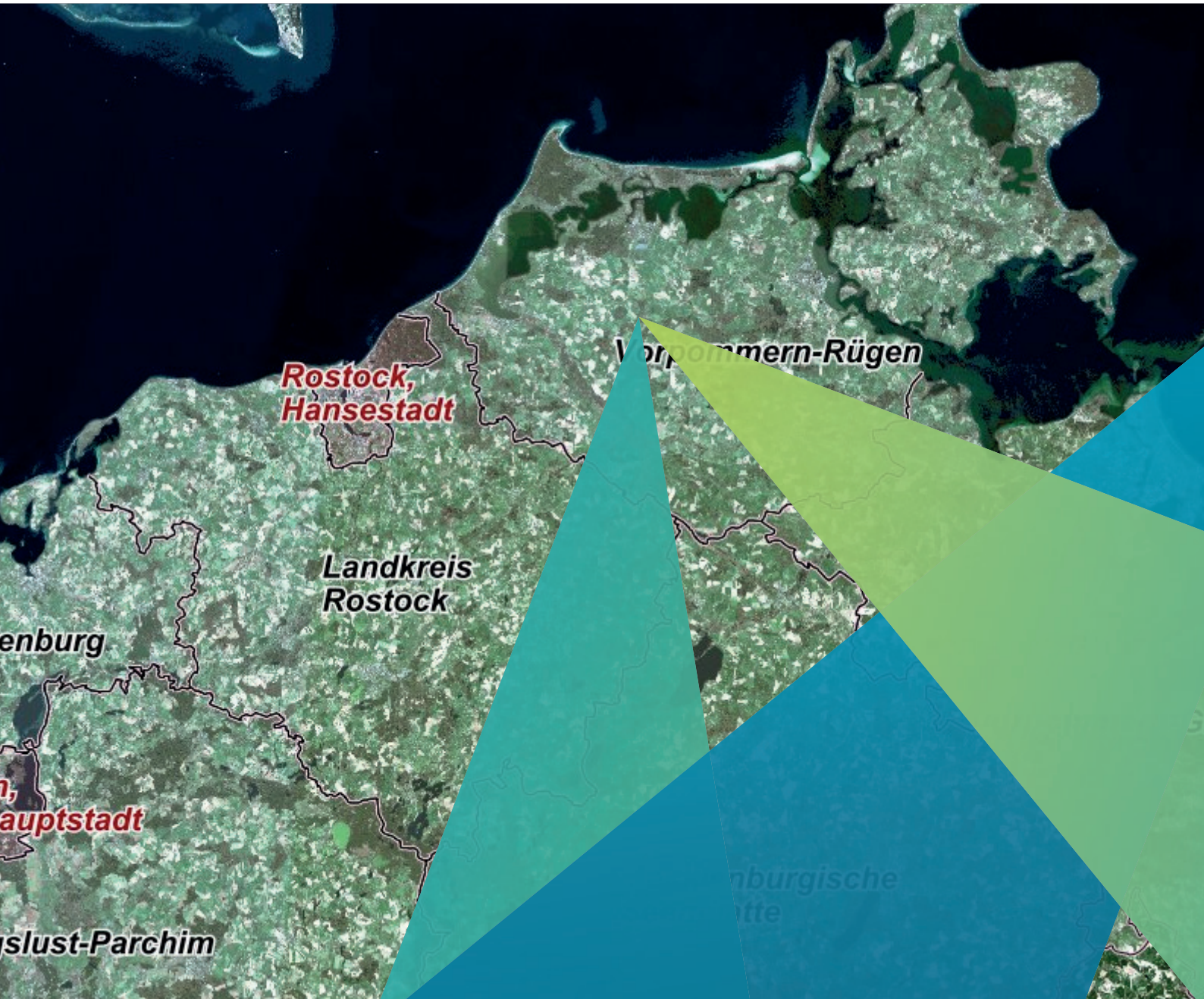
HEXAGON + GEOSYSTEMS
THE GEOSPATIAL EXPERTS

Hexagon Platinum Partner

Case study

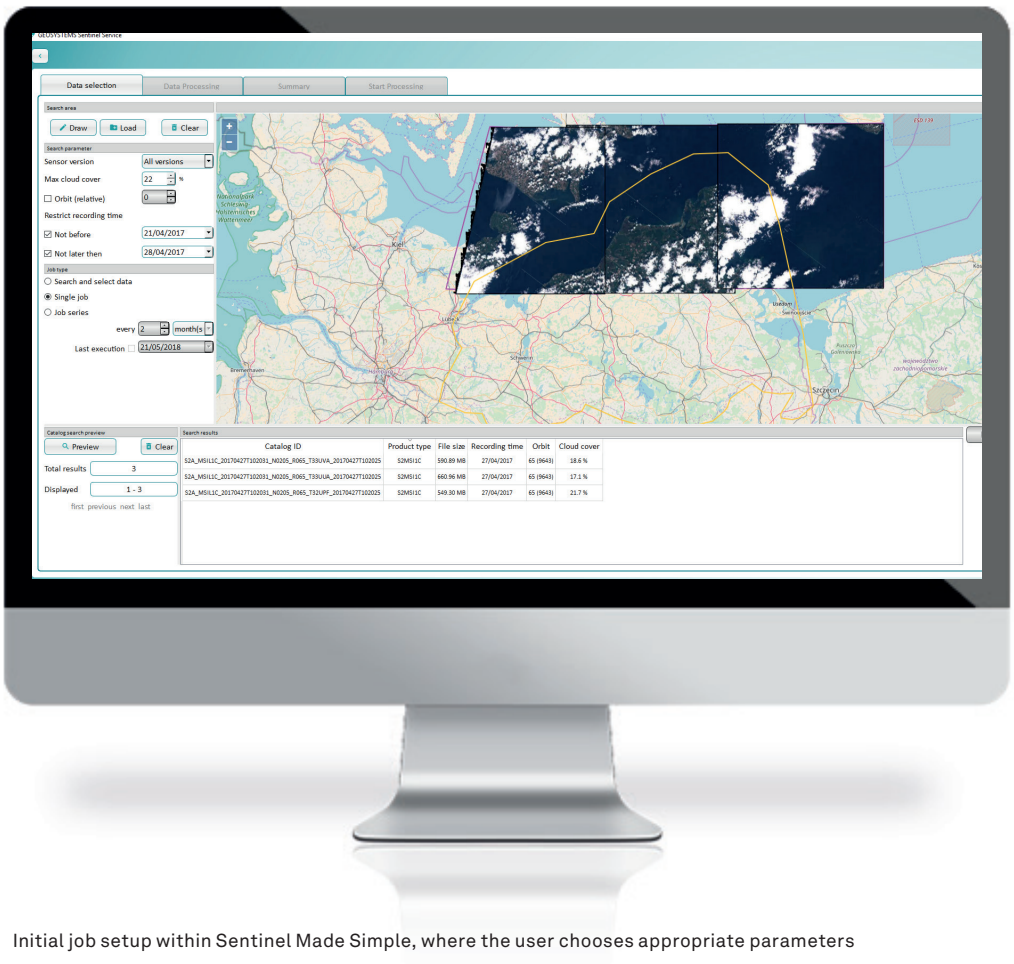
Hexagon and GEOSYSTEMS Solution Allows German Officials to Automatically Download, Process, and Share Terabytes of Data

The land survey offices and geoinformation centers in each of Germany's 16 federal states are regularly tasked with providing other departments and governmental agencies across the country with remote sensing-based spatial information. Until recently, that responsibility was time- and resource-intensive. Requesting agencies need fresh, high-quality satellite data, which is not itself a problem thanks to the European Copernicus program and Sentinel satellites — a perfect source for free, high-resolution imagery and sensor data with a high repetition rate. The challenge many survey offices face is geospatial and location data overload due to variety and velocity. Compounding this challenge is the ongoing frequency of imagery and data requests survey offices receive.



The State Office of Internal Administration in Mecklenburg-Western Pomerania in north Germany has been a pioneer in providing remote-sensing based data to governmental agencies and citizens. Like similar offices across Germany, it individually fulfilled incoming requests from agencies and departments needing geospatial data. To create customized geodata products and services for requesting agencies, the office had to dedicate highly trained personnel, who were often working on other projects.

To eliminate manual processes and efficiently service ongoing geospatial data requests, the State Office of Internal Administration needed a cost-effective solution to help it automate the downloading, processing, and sharing of terabytes of Copernicus and Sentinel satellite data. The office turned to GEOSYSTEMS GmbH, a Hexagon partner, for help.



Initial job setup within Sentinel Made Simple, where the user chooses appropriate parameters

Automatic, Customized Processes

The result is mySentinel, a end-to-end framework GEOSYSTEMS built using technology from Hexagon's Geospatial division. It's a complete solution based on the GEOSYSTEMS stand-alone tool Sentinel Made Simple, Hexagon's ERDAS IMAGINE and ERDAS APOLLO products, and the GEOSYSTEMS add-ons IMAGINE NoClouds and ATCOR Workflow for IMAGINE. It features an automated process to periodically search for and download the specific Sentinel data; it then decompresses the data, performs various corrections, and stores the data in an ERDAS APOLLO catalogue.

The entire process, which would normally be done manually, requires no user interaction outside of a one-time job definition for recurrent processing. This hands-off workflow, where the user sets up the parameters for a specific download and data processing once, with the remaining work running automatically in the background, greatly reduces the number of time-consuming manual data pulls, corrections, and cataloging tasks employees must perform.

Sven Baltrusch, head of the office's Geoinformatic Center, spoke to the efficacy of the solution. "With mySentinel, we have an effective tool for automating workflows related to data storage and processing of Sentinel data," he said. "Depending on our requirements, we save individual tiles or generate and store mosaics of the entire federal state."

mySentinel contains a range of functionalities and can easily be customized for various specifications. For example, Mecklenburg-Western Pomerania is one of the first states in Germany to provide a cloudless imagery mosaic every month. "We are thrilled by the quality of IMAGINE NoClouds for cloudless mosaics and are looking forward to generating even more valuable content by using Sentinel-3 data," said Baltrusch.

Another use case involves agencies concerned with wildlife. Flexible timing is important for them, and mySentinel can accommodate scheduling based on phenological phases (periodic plant and animal life cycle events) to see how these are influenced by variations in climate and habitat factors. This means that mySentinel is a valuable tool for departments ranging from forestry, who might use it to help manage a bark beetle disaster, to urban planning, where infrastructure projects and coastal management are the focus.

Because mySentinel supports all Sentinel sensors and provides processed data that's ready for change detection via multitemporal or time series analysis, every department gets what it needs. As a result, monitoring the growth of algae in coastal zones is just as easy as analyzing crops in agricultural regions.

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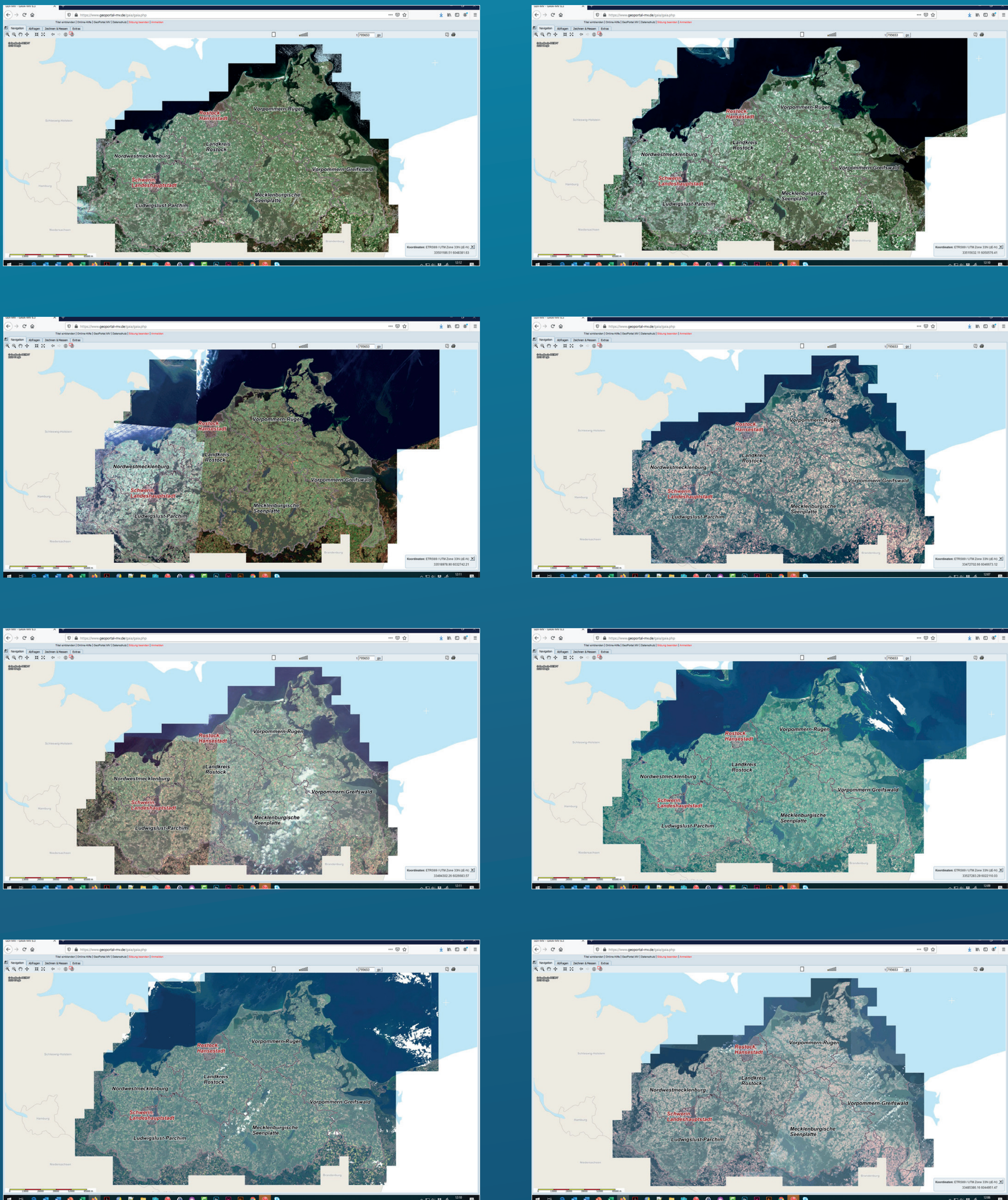


Web portal Gaia-MV with monthly mosaics of the entire territory of Mecklenburg-Western Pomerania (from top left to bottom right: April 2019, June 2019, July 2019, September 2019, January 2020, April 2020, May 2020, June 2020)

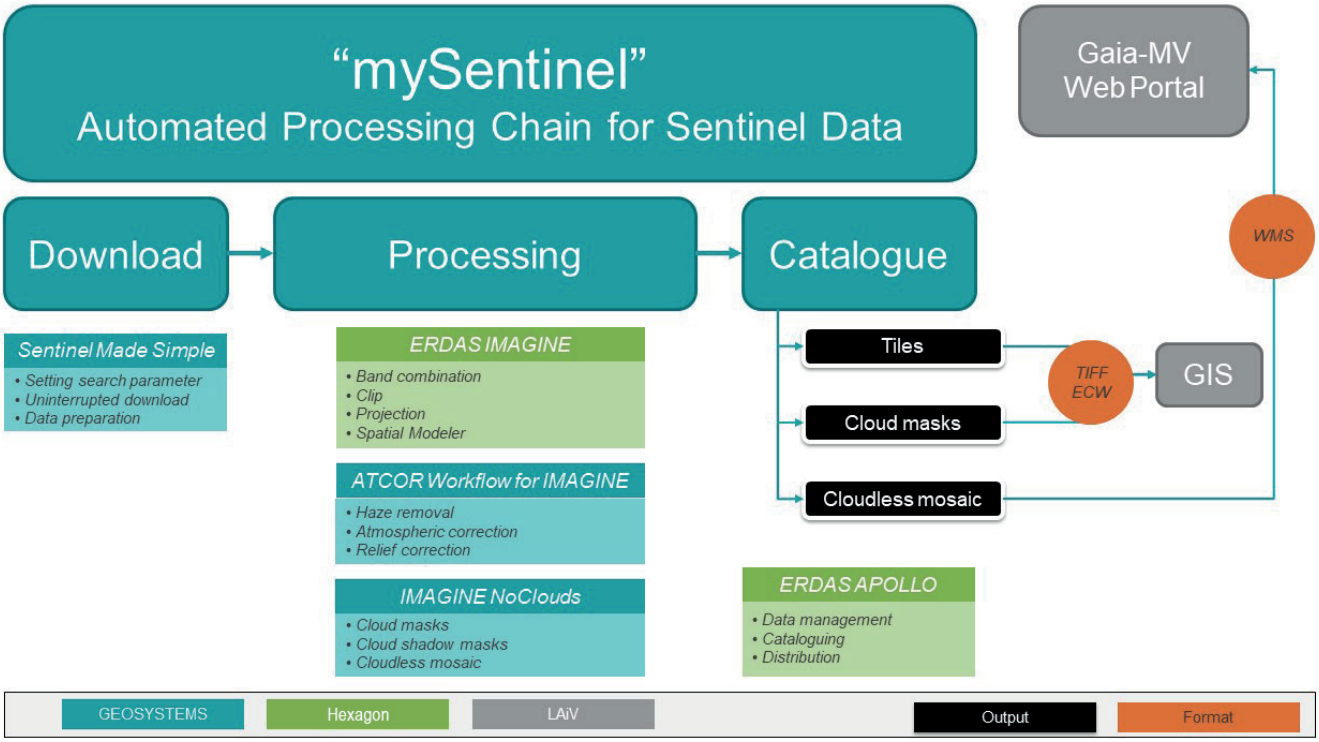
Supporting Multiple Specific Routines

After setting up its own regional Sentinel archive in 2018, the state office quickly realized that providing nationwide data on a monthly basis would require automated routines, including:

- Downloading Sentinel data from the European Space Agency (ESA) data portal according to specific and individually set parameters
- Recognizing server interruptions and restarting disrupted download sequences
- Processing the data from the ESA-specific format into a directly readable format
- Atmospheric correction, including calculating high-quality cloud masks
- Saving all individual tiles in a catalogue
- Generating a cloudless mosaic of the entire state
- Ingesting the mosaic as WMS into the existing regional web portal

To ensure that data collection is effortless and reliable, this full process, from data access to the dissemination of derived information, runs completely automated with mySentinel. To keep users in the loop, an email or alert notification informs specified individuals about the provisioning of new information. Should geospatial data requirements change, the system is flexible enough to be extended or enhanced with additions, such as new indices for forestry management, object classifications, or change detection tasks.

With 30 years of experience in providing cutting-edge solutions for land administration, forestry, agriculture, and defense, GEOSYSTEMS will continue to adapt mySentinel as more customer requirements arise.



Conclusion

Providing geospatial information for an entire state is a massive job. If done manually, it's expensive, time-consuming, and complicated. But the German state of Mecklenburg-Western Pomerania decided to work smarter instead of harder thanks to the efforts of GEOSYSTEMS and Hexagon's software.

With mySentinel, the state office can download, process, and share terabytes of data via one automated, cost-effective system that can be adjusted to suit any department's geospatial data needs. The result is clean, up-to-date imagery produced with minimal human attention or intervention - no specialized staff, no siloed data, and no incompatible software to break up workflows, which has saved the office time and money and improved their daily work.

HEXAGON

Hexagon is a global leader in sensor, software and autonomous solutions. We are putting data to work to boost efficiency, productivity, and quality across industrial, manufacturing, infrastructure, safety, and mobility applications.

Our technologies are shaping urban and production ecosystems to become increasingly connected and autonomous — ensuring a scalable, sustainable future.

Hexagon's Geospatial division creates solutions that deliver a 5D smart digital reality with insight into what was, what is, what could be, what should be, and ultimately, what will be.

Hexagon (Nasdaq Stockholm: HEXA B) has approximately 21,000 employees in 50 countries and net sales of approximately 4.4bn USD. Learn more at **hexagon.com** and follow us @HexagonAB.