

The U.S. Army Corps of Engineers Revolutionizes Their Subsurface Data Management

Dataforensics Used OpenGround® to Move Subsurface Data to the Cloud, Saving Two Years and 62,700 Work Hours

FROM FRAGMENTATION TO INTEGRATION

For decades, the United States Army Corps of Engineers (USACE) has been gathering subsurface data essential to its operations—millions of linear feet of it—for thousands of projects scattered around the world. The USACE owns and maintains over 700 dams, 2,000 levee systems, 236 navigation lock chambers, 25,000 miles of navigable waterways, and a range of military and environmental programs and missions that incorporate structures with life-saving implications. With a staff of 37,000 military and civilian personnel, the USACE is also one of the world's largest public engineering, design and construction agencies.

The USACE had accumulated more than 500 separate and disparate database structures, leading to increasing issues with accessibility, collaboration, interoperability, and workflow. The massive volume of data presented challenges with exporting it and creating a single source of truth.

As the problems and resulting inefficiencies mounted, USACE made the strategic decision to introduce a global standardization for its subsurface geotechnical data management and put cloud-based geotechnical information management solution at the heart of its enterprise data management. To move the agency to a new, cloud-based enterprise solution, Dataforensics needed to clean, standardize, and transfer data from the original system.

ACHIEVING DATA CONSISTENCY

Dataforensics' top priority was to compile and migrate all existing historical subsurface data, which encompassed borehole, laboratory testing, and in-situ testing. Before the data could be loaded, it would first need to be cleaned and standardized,

and that was where the magnitude of the exercise became apparent. To do the job by hand would have likely taken years, if not decades.

USACE had been primarily using gINT® software to manage their borehole data. However, there was no standard in place and each of the district offices was managing their information on separate servers with their own formats and reports. By shifting to an enterprise-level cloud solution, USACE would be able to implement a standard database structure across all districts and projects.

ENHANCING QUALITY THROUGH AUTOMATED MIGRATION PROCESSES

Dataforensics developed a data migration application to automate processes, dramatically decreasing the amount of time needed to migrate existing datasets into OpenGround, while improving data quality and robustness. The team began by correcting typographical mistakes in date values, fixing data types in scenarios where numeric values were stored in text fields in gINT, and ultimately standardizing vast quantities of gINT data. Additionally, there were numerous soil properties from lab test results such as soil classifications, or interpreted results from particle size distribution tests, which were shown on gINT reports but not actually stored as data in the database.

Once all the files were organized into similar database structures so that could all be migrated at the same time, the team generated PDF log reports for each gINT project. They then set up a data cleanup/conversion template for each set of similar database structures and performed calculations that are often reported in gINT but do not exist in the gINT database. Lastly, the converted the data into an OpenGround-compatible format, uploaded the data into the application, and uploaded PDF documents of gINT logs.

PROJECT SUMMARY ORGANIZATION

Dataforensics/USACE

SOLUTION

Subsurface Modeling and Analysis

LOCATION

Washington, District of Columbia, United States

PROJECT OBJECTIVES

- ◆ To introduce global standardization for subsurface geotechnical data management.
- ◆ To improve data export and create a single source of truth for all data.

PROJECT PLAYBOOK

GeoStudio®, Leapfrog®, OpenGround, PLAXIS®

FAST FACTS

- ◆ The USACE had accumulated more than 500 separate and disparate database structures.
 - ◆ Dataforensics developed a data migration application to automate processes, dramatically decreasing the amount of time needed to migrate existing datasets into OpenGround.
 - ◆ Going digital allowed USACE to unlock a tremendous asset and improve the quality of their subsurface data.
- ## ROI
- ◆ By spending USD 50,000 on this project, USACE now has a USD 50-million asset.
 - ◆ Left to a human without autonomous support, Dataforensics calculated that it would have taken 20 times as many hours to reach the end of the task, a saving of 67,000 hours.
 - ◆ The project was completed in just two years.

“With the combination of Dataforensics Data Migration Tool for OpenGround, Corps-wide training initiatives, and Bentley’s OpenGround, USACE has improved efficiencies across the enterprise for subsurface data management of millions of linear feet of data.”

– Georgette Hleppas, Geology and Materials Community of Practice Lead, USACE Geotechnical Headquarters

All except the data cleanup and conversion were able to run autonomously with human oversight to check each step had been completed successfully, saving significant time.

UNLOCKING VALUE THROUGH DIGITAL TRANSFORMATION

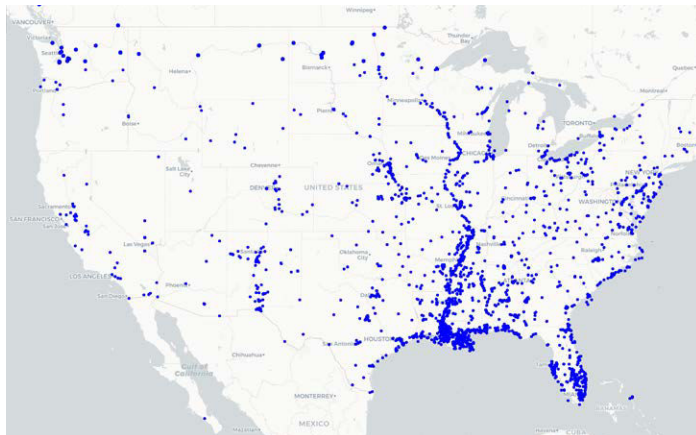
Updating from gINT to OpenGround allowed USACE to unlock a tremendous asset and improve the quality of their subsurface data. By spending USD 50,000 on this project, USACE now has a USD 50-million asset. Left to a human without autonomous support, Dataforensics calculated that it would have taken 20 times as many hours to reach the end of the task, a saving of 67,000 hours. In fact, the project was completed in just two years.

Apart from giving USACE vastly improved access to its data, and the ability to extract greater value from it, the shift to OpenGround enhanced operations by improving collaboration between offices and contractors. Standardized data from contractors means that USACE now gets all the data required for

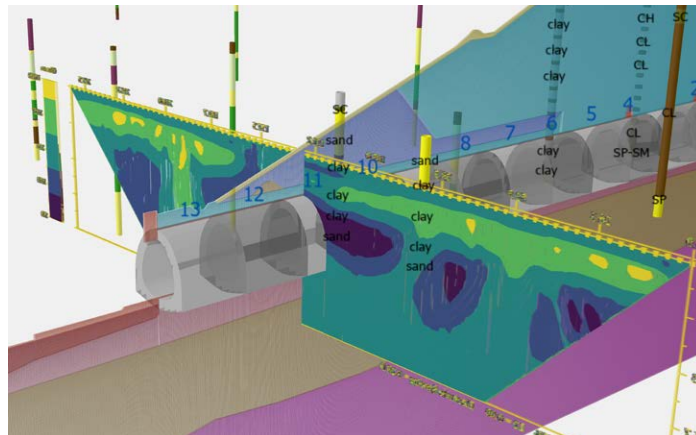
contractors to complete their investigation projects so the datasets they are receiving are more complete, available in a format they can reuse, and extract additional value from in the future.

Data was now more easily integrated into software. In particular, the ability to import borehole information into the same platform as geophysical data and a variety of other data greatly improved workflows and the ability to visualize data sets together. Having information easily available in OpenGround means that teams can more quickly leverage historical data to reduce risk in ongoing projects, and lessen carbon footprint by avoided re-drilling boreholes at the same locations.

The improvements of efficiency using a standardized geotechnical data management system, as well as the associated cost and time savings, are substantial. USACE can collaborate more effectively across the supply chain, which saves work hours and increases productivity. Moving USACE from a paper-based to a digital agency was a complex task, but one that has left the organization infinitely better prepared for its future.



USACE map of the existing projects, approximately: 8500 projects, 200,000 locations and more than 8 million feet of drilling.



Red Rock Dam project site using modern data collection methods displayed Leapfrog Works and OpenGround.