GeoStudio

SOLUTION BRIEF

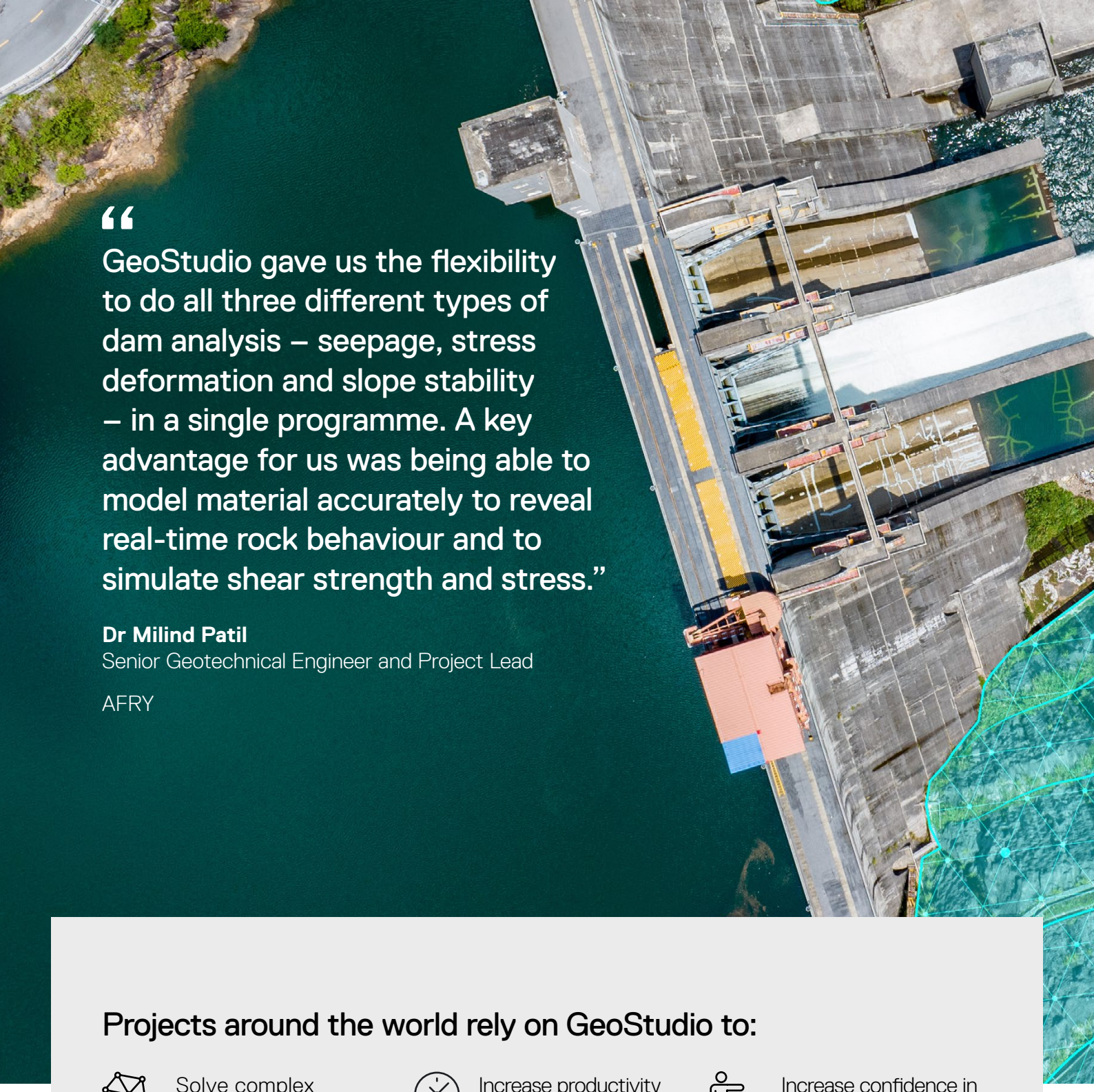
UNDERSTAND THE UNDERGROUND: MAKE BETTER GEOTECHNICAL AND ENVIRONMENTAL DECISIONS WITH GEOSTUDIO

Understanding how soil and rock respond to construction and environmental pressures is critical to the success and safety of any geotechnical project across the civil engineering, mining, environmental, and energy sectors.

Seequent's GeoStudio is an industry-leading geotechnical analysis software suite designed specifically for geotechnical and mining engineers, environmental scientists, and civil engineering consultants. It offers advanced tools for slope stability analysis, groundwater flow modelling, ground movement, and environmental impact analysis. With intuitive workflows, robust multi-physics modelling, and powerful visualisation tools, GeoStudio empowers professionals to tackle complex challenges with confidence and efficiency.

SEEQUENT

Seequent, The Bentley Subsurface Company



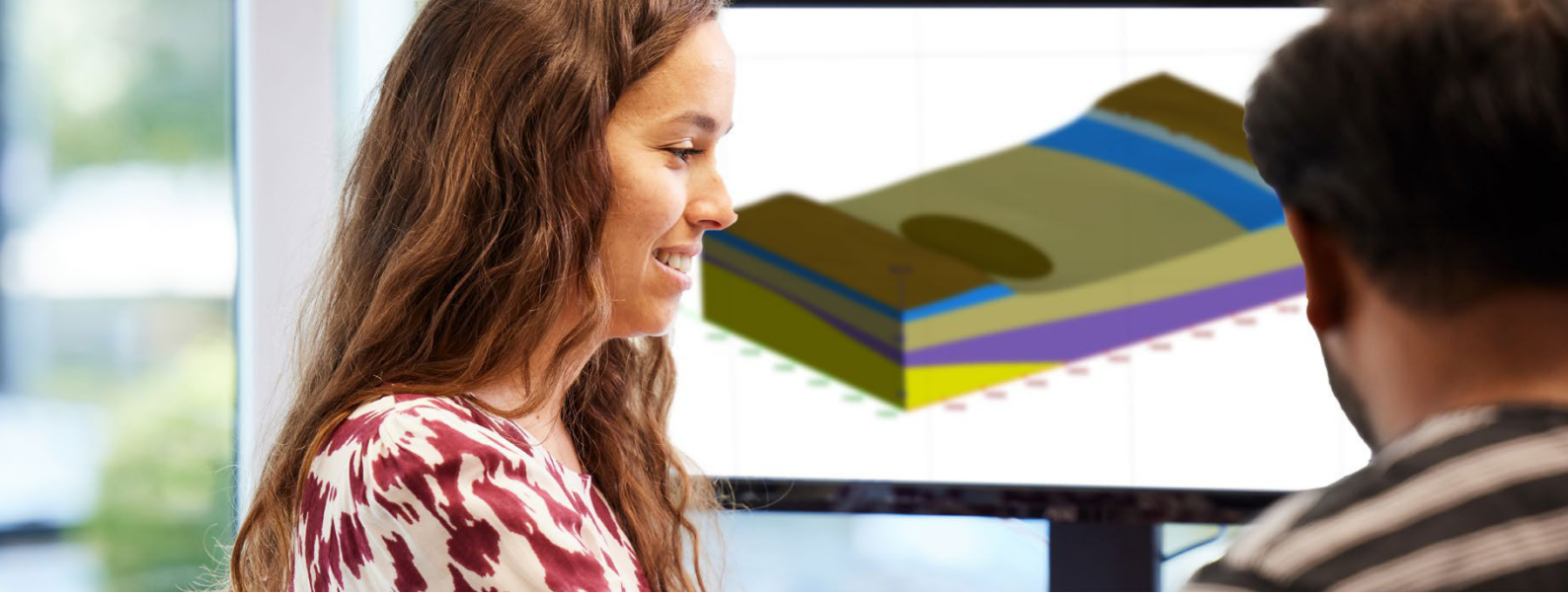
“GeoStudio gave us the flexibility to do all three different types of dam analysis – seepage, stress deformation and slope stability – in a single programme. A key advantage for us was being able to model material accurately to reveal real-time rock behaviour and to simulate shear strength and stress.”

Dr Milind Patil
Senior Geotechnical Engineer and Project Lead

AFRY

Projects around the world rely on GeoStudio to:

- Solve complex challenges with advanced numerical modelling
- Increase productivity with connected multi-geometry and multi-physics workflows
- Increase confidence in decision-making with powerful 2D and 3D visualisation of results



Successful projects are powered by GeoStudio

Solve complex challenges with advanced numerical modelling

Perform comprehensive slope stability, groundwater flow, and stress-strain analyses with confidence. GeoStudio's robust multi-physics modelling enables engineers and scientists to tackle complex problems in soil and rock—whether on civil infrastructure projects, mining operations, or environmental remediation sites.

Increase productivity with connected, multi-geometry and multi-physics workflows

As a key component of Seequent's Connected Geotechnical Workflow, GeoStudio integrates with Leapfrog Works and PLAXIS to ensure the latest geological data is consistently used in geotechnical analyses. Its multi-geometry and multi-physics capabilities streamline project delivery by allowing professionals to build, compare, and iterate multiple analysis types within a single project file. The advanced scripting API supports Python, JavaScript, and C#, offering powerful automation and customisation options to enhance efficiency.

Make informed decisions with powerful simulation and result visualisation

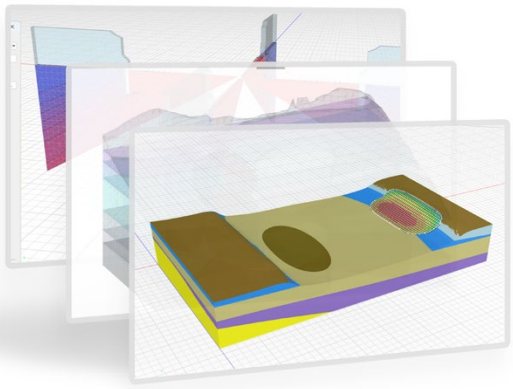
GeoStudio's advanced simulation tools provide reliable insights into ground behavior, groundwater flow, and environmental impacts under various conditions. By simulating real-world scenarios, GeoStudio delivers critical data for smarter decision-making. Its intuitive visualisation features transform complex analyses into clear, actionable insights, helping teams communicate effectively with stakeholders.

Applications

Civil	**Dams, embankments, and levees:** Design and analyse safe, reliable structures with integrated stability and flow analyses. **Excavations:** Assess the stability of slopes and develop efficient dewatering systems for surface excavations. **Ground improvement:** Assess techniques like ground freezing to enhance ground stability. **Permafrost impact analysis:** Investigate the impact of civil infrastructure on the thermal regime in cold regions and design remedial measures to limit permafrost degradation.
Mining	**Open pit stability and dewatering:** Evaluate slope stability and design effective dewatering systems for mining operations. **Tailings storage facilities:** Analyse and mitigate risks associated with tailings dams through comprehensive stability and flow modelling. **Reclamation design:** Plan and assess reclamation strategies to ensure environmental compliance and safety.
Energy	**Environment:** Investigate groundwater flow regimes, aquifer recharge and storage, and human impacts on groundwater systems. **Contaminated site assessment:** Model contaminant transport to evaluate remediation strategies. **Climate impact analysis:** Assess the effects of climate change on infrastructure and natural systems. **Waste cover design:** Design and evaluate soil cover systems for waste containment to prevent environmental contamination.

Understand the underground: Comprehensive geotechnical and environmental analysis with GeoStudio

GeoStudio equips geotechnical and mining engineers, environmental scientists, and civil engineering consultants with tools to model, simulate, and interpret complex subsurface conditions.



Fast numerical modelling

Accelerate project timelines with advanced numerical modelling:

- Limit equilibrium analyses for stability, flow, and environmental impact assessments
- Model coupled processes to assess solute or heat transport and groundwater flow
- Assess the impacts of climate change on geotechnical structures

Multi-physics analysis

Model complex ground behavior with advanced multi-physics capabilities:

- Simulate slope stability, groundwater flow, and stress-strain behavior
- Analyse both steady-state and transient conditions in saturated and unsaturated soils
- Model solute transport and assess environmental impacts of groundwater flow

Integrated slope stability analysis

Deliver confident slope stability assessments:

- Limit equilibrium methods (LEM and FEM) in a single model
- Evaluate safety factors and predict slope failure mechanisms accurately
- Integrate with Leapfrog models to enhance data-driven decisions

Groundwater flow modelling

Understand subsurface water behavior to manage risks effectively:

- Simulate groundwater flow through soil and rock in 2D and 3D
- Analyse steady-state, transient, and unsaturated flow scenarios
- Model complex scenarios like relief wells, rapid drawdown, land-climate interactions, and free convection

Visualisation and reporting tools Transform complex data into clear insights:	▪ Generate high-quality graphs, cross-sections, and 3D visualisations ▪ Create professional reports with automated data export and sharing features ▪ Improve communications with stakeholders using detailed visuals
Automated scripting and customisation Simplify workflows:	▪ Automatically update piezometric surfaces from sensor data and connect with third-party inverse modelling software for material parameter calibration ▪ Extract analysis results—even if not cached in the project file—to generate graphs of any parameter ▪ Build tailored scripts for optimised outcomes
Construction sequencing Model real-world construction processes with advanced staging capabilities:	▪ Simulate changes in geometry, loading, and boundary conditions over time ▪ Model construction phases for embankments or excavations ▪ Reduce project risks by understanding the impacts of each construction stage on ground stability and pore water pressures
Integration with Seequent ecosystem Maximise efficiency with connected workflows and tools:	▪ Connect with Seequent solutions like Leapfrog and PLAXIS ▪ Share models, geometry, and data through a cloud-based environment ▪ Collaborate effectively with project teams, clients, and stakeholders

A world of support at your fingertips

Beyond the powerful features of GeoStudio, Seequent—the Bentley Subsurface Company—offers comprehensive support and learning resources to help you get the most out of your investment.

Learning Centre

Maximise the value of GeoStudio with a range of flexible learning opportunities through our Learning Centre. Whether you prefer online learning paths, on-demand videos, or instructor-led courses, there are resources tailored to your needs.

Explore learning opportunities →

4.9/5
rating for Seequent e-learning from 16,000+ reviews

Community

Connect with a global network of geotechnical engineers and environmental scientists through our community. Whether you're looking for peer support, insights from industry experts, or practical tips to get the most from GeoStudio, the community offers a space for shared learning and collaboration.

Join the Community →

7,400+
customers in 145+ countries

Support

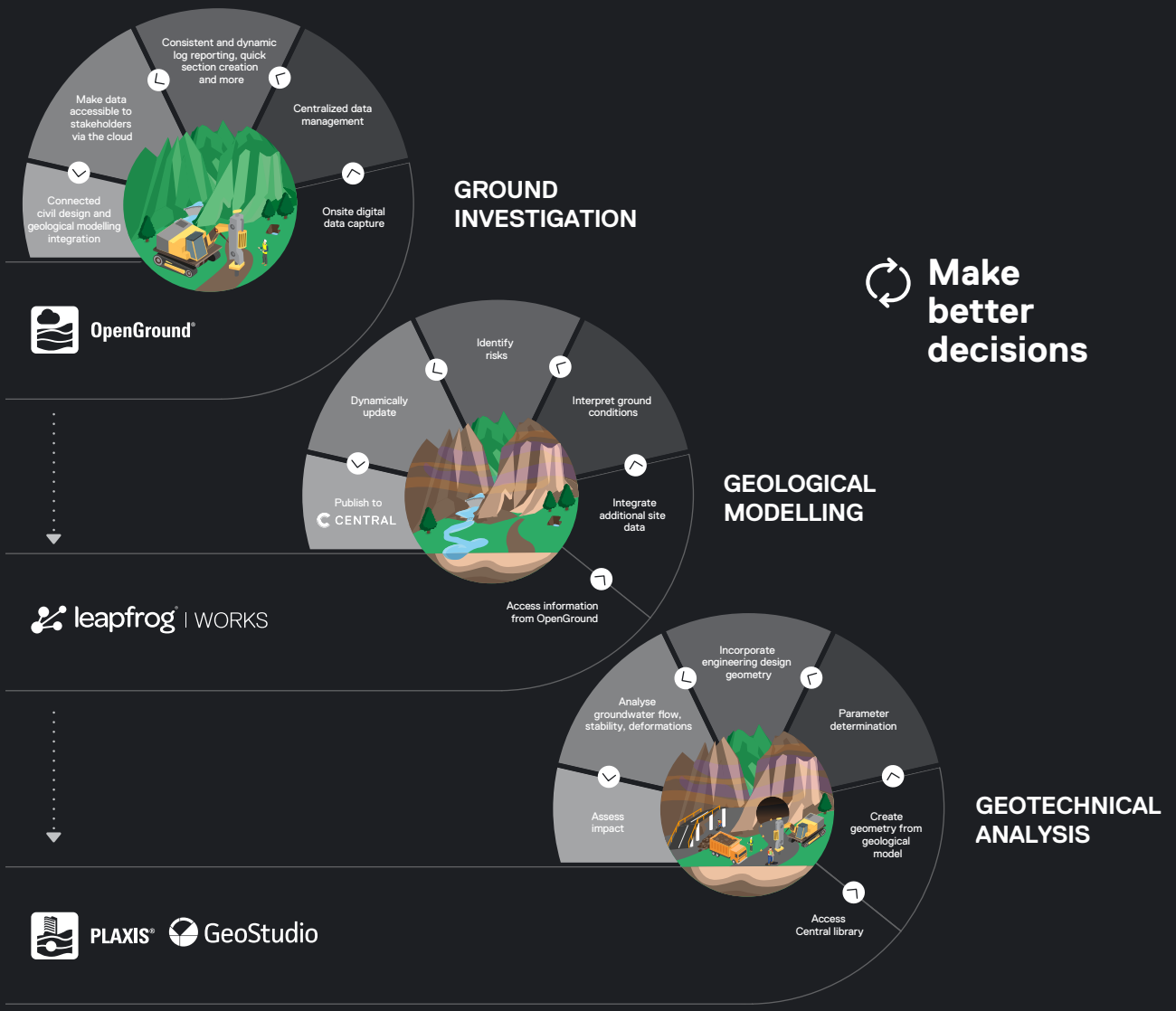
Get the most from GeoStudio, anytime, anywhere. Access our knowledge base, connect with technical experts, or explore specific support options for all Seequent and Bentley products, keeping your projects running smoothly and efficiently.

Get support →

95%
satisfaction with our front-line help and support

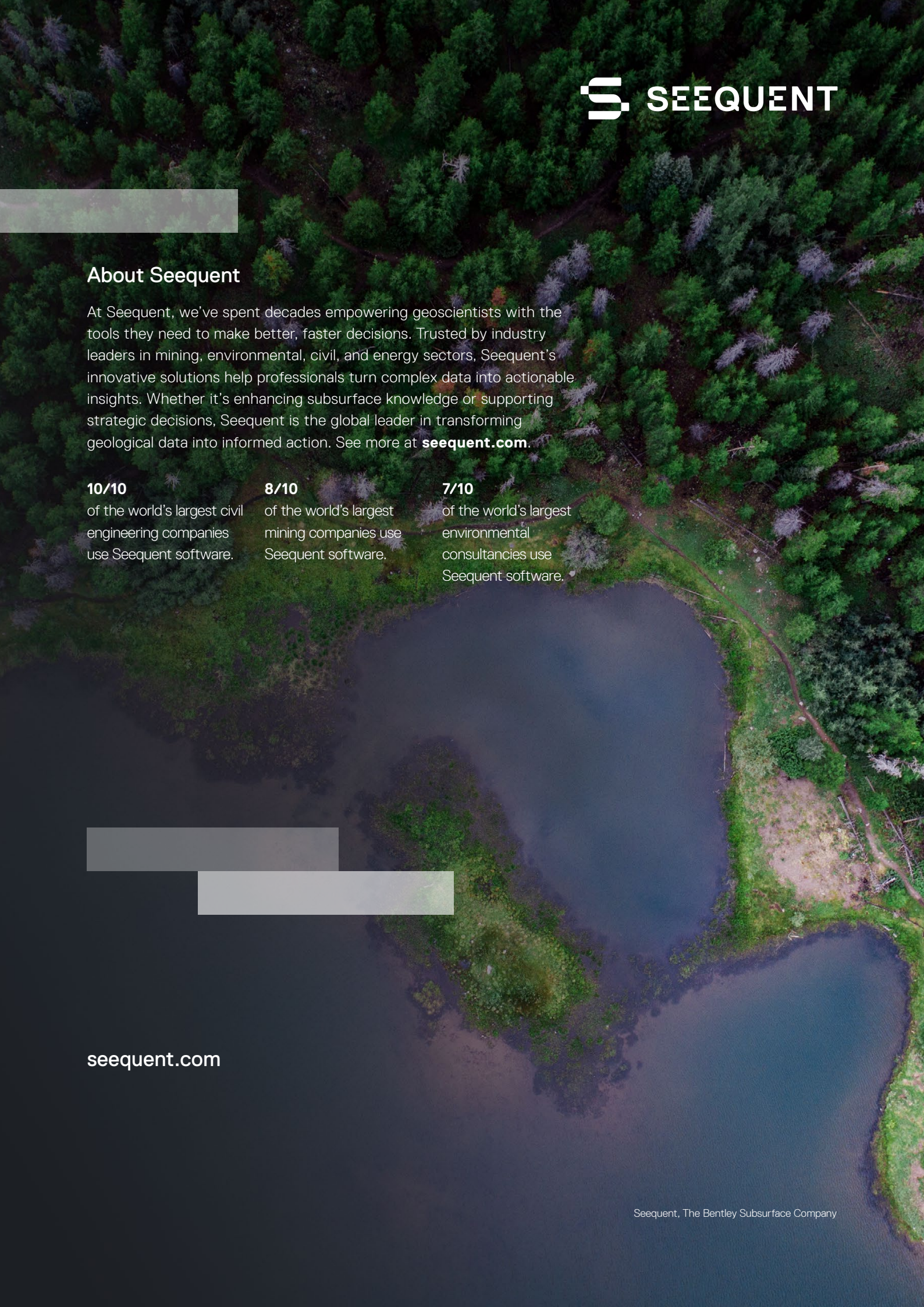
Seequent’s Connected Geotechnical Product Workflow

Reduce errors and accelerate geotechnical understanding, collaboration, and productivity with an end-to-end solution



Discover the power of GeoStudio

Visit seequent.com/geostudio to explore product videos and customer success stories, or request a free 30-day evaluation license or live demo.



SEEQUENT

About Seequent

At Seequent, we've spent decades empowering geoscientists with the tools they need to make better, faster decisions. Trusted by industry leaders in mining, environmental, civil, and energy sectors, Seequent's innovative solutions help professionals turn complex data into actionable insights. Whether it's enhancing subsurface knowledge or supporting strategic decisions, Seequent is the global leader in transforming geological data into informed action. See more at **seequent.com**.

10/10
of the world's largest civil engineering companies use Seequent software.

8/10
of the world's largest mining companies use Seequent software.

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of the world's largest environmental consultancies use Seequent software.

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