GeoStudio® 2012
One Model. One Tool. Many Analyses.

Typical Applications
GeoStudio can be used to model a vast range of geotechnical engineering and earth science problems including:

- Slope stability of earth and rock slopes, including natural and man-made slopes, open pit mines, and excavations;
- Groundwater flow analysis for regional flow systems, de-watering projects, infiltration into dry soils, slope stability analysis;
- Stress and deformation analysis for staged construction and soil-structure interaction, loading induced pore-water pressure analysis, tunnel design;
- Earthquake-induced deformation and pore-water pressure generation;
- Contaminant transport analysis for geo-environmental problems;
- Heat transfer analysis for cold region engineering, artificial ground freezing, and climate change effects;
- Soil cover design for acid mine drainage problems, landfills, mine closure and reclamation;
- plus many more!

GeoStudio is numerical analysis software used by geotechnical engineers, hydrogeologists, and earth scientists. The fully-integrated software suite includes limit equilibrium stability analysis and seven finite element applications for modeling geotechnical and earth science problems.

- SLOPE/W™ Slope stability analysis.
- SEEP/W™ Groundwater seepage analysis.
- SIGMA/W™ Stress-deformation analysis.
- QUAKE/W™ Dynamic earthquake analysis.
- TEMP/W™ Thermal analysis.
- CTRAN/W™ Contaminant transport analysis.
- AIR/W™ Air flow analysis.
- VADOSE/W™ Vadose zone and soil cover analysis.

By acquiring GEO-SLOPE software, you are joining a group located in more than 100 countries, including practicing engineers, university professors, regulators, researchers and students. You can be assured that we will support and continue to enhance the software’s engineering capabilities, making it even more powerful and easy to use.
**SLOPE/W™**

Slope stability analysis.

SLOPE/W is the leading software product for analyzing the stability of earth and rock slopes. SLOPE/W can effectively analyze both simple and complex problems for a variety of failure modes, pore-water pressure conditions, soil properties, loading conditions, and reinforcement options.

SLOPE/W can accommodate pseudo-static analysis, limit state design, probabilistic and sensitivity analysis, and rapid drawdown analysis. It can be combined with SIGMA/W for stress-based stability analysis or QUAKE/W for Newmark deformation. Full integration with other GeoStudio finite element products allows the stability of slopes and excavations to be analyzed through time.

**SEEP/W™**

Groundwater seepage analysis.

SEEP/W can be used for analyzing groundwater flow through porous media such as soil and rock. Its rigorous saturated-unsaturated formulation, along with a robust under-relaxation algorithm, make it possible to analyze the most difficult flow systems in nature.

In addition to traditional saturated-unsaturated flow analysis, SEEP/W can be used for modelling transient processes such as infiltration into dry soil, wetting-front propagation due to flood events, pore-pressure perturbations due to pumping, leakage from containment facilities, and the behaviour of systems subject to environmental changes. SEEP/W can also be combined with CTRAN/W and TEMP/W for modelling density-dependent flow systems.

**SIGMA/W™**

Stress-deformation analysis.

SIGMA/W can be used to perform stress and deformation analyses of earth structures. Its comprehensive formulation makes it possible to analyze both simple and highly complex problems. SIGMA/W can perform a simple linear elastic deformation analysis or a highly sophisticated, nonlinear elastic-plastic effective stress analysis.

The many constitutive soil models allow you to represent a wide range of soils or structural materials. In addition, SIGMA/W can model the pore-water pressure generation and dissipation in a soil structure in response to external loading.

**QUAKE/W™**

Dynamic earthquake analysis.

QUAKE/W can be used for the dynamic analysis of earth structures subjected to earthquake shaking or to point dynamic forces from a blast or a sudden impact load. QUAKE/W determines the motion and excess pore-water pressures that arise due to shaking.

Generalized material property functions let you use laboratory or published data. Constitutive models include a Linear-Elastic model, an Equivalent Linear model, and an effective stress Non-Linear model. QUAKE/W uses the Direct Integration Method to compute the motion and excess pore-water pressures arising from inertial forces at user-defined time steps.

**TEMP/W™**

Thermal analysis.

TEMP/W can be used for analyzing thermal changes in the ground due to environmental changes, alterations to ground surface conditions such as the construction of buildings or pipelines, and the introduction of heat sources or sinks. The comprehensive formulation makes it possible to analyze both simple and highly complex geothermal problems.

TEMP/W is formulated to account for the latent heat of phase change. A robust under-relaxation scheme ensures that the solution is accurate and not subject to numerical oscillation during freeze-thaw. The wide selection of boundary conditions makes it possible to model land-climate interaction, thermoysphons, and freeze pipes. TEMP/W can also be integrated with AIR/W and SEEP/W to analyze convective heat flow.

**AIR/W™**

Air flow analysis.

AIR/W can be used for analyzing air transfer within porous materials such as soil and rock. Its comprehensive formulation allows you to consider analyses ranging from simple, saturated steady-state problems to sophisticated, saturated-unsaturated time-dependent problems.

AIR/W can be applied to both saturated and unsaturated zones, a feature that greatly broadens the range of problems that can be analyzed. In addition to traditional steady-state water flow assumptions where the air contents are fixed, the saturated/unsaturated formulation of AIR/W makes it possible to analyze air flow and seepage as a function of time and to consider such processes as changing air and water contents.
CTRAN/W™
Contaminant transport analysis.
CTRAN/W can be used to model the movement of contaminants through porous materials, such as soil and rock. The comprehensive formulation of CTRAN/W makes it possible to analyze problems varying from simple particle tracking in response to the movement of water, to complex processes involving diffusion, dispersion, adsorption, radioactive decay and density dependencies.

CTRAN/W is designed to be used in conjunction with a seepage analysis, such as SEEP/W, to analyze contaminant transport. SEEP/W computes the water flow velocity, volumetric water content, and water flux, while CTRAN/W uses these parameters to compute the contaminant migration.

VADOSE/W™
Vadose zone and soil cover analysis.
VADOSE/W can be used for analyzing flow from the environment, across the ground surface, through the unsaturated vadose zone and into the local groundwater regime. Its comprehensive formulation allows you to analyze both simple and complex problems, from a simple analysis of ground infiltration due to rainfall, to a sophisticated model considering snow melt, root transpiration, surface evaporation, runoff, ponding, and gas diffusion.

Product Integration
GeoStudio applications are integrated, allowing you to use the analysis results from one product in another one. This unique and powerful feature greatly expands the types of problems you can analyze. Examples of using analysis results from one product to another include:
- Pore-water pressures computed by SEEP/W, SIGMA/W or QUAKE/W can be used in SLOPE/W stability analyses;
- SIGMA/W static stresses or QUAKE/W dynamic stresses can be used in SLOPE/W stability analyses;
- SEEP/W pore-water pressures can be used in a SIGMA/W consolidation analysis;
- plus many more!

Free Student Edition
The GeoStudio Student Edition is a free product designed as an aid to learning geotechnical and earth science numerical modeling. It is an ideal teaching tool for university professors both at the undergraduate and graduate levels. The software contains limited versions of all GeoStudio products.

An integrated dynamic stability analysis of the Upper San Fernando Dam using SEEP/W, SLOPE/W, QUAKE/W and SIGMA/W.
Requirements

- Microsoft® Windows® 8, Windows® 7, Windows Vista®, or Windows® XP with SP3
- Intel® Pentium® 4, AMD Opteron™ or Athlon™ 64 or better (GeoStudio is optimized for Intel multi-core processors)
- 100 MB available disk space
- Minimum screen resolution of 1024x768
- Microsoft® .NET 4.0 is required for Add-Ins
- An Internet connection is required to activate or renew a license

Get help when you need it

When you need assistance with your model, we have helpful services available. Attend one of our workshops, or communicate directly with our experienced numerical modeling professionals. We'll help you to create better models and to gain confidence in your results.

Look for us on social media

Look for us on your favourite social media sites! Subscribe to our YouTube channel for new tutorial videos or Twitter and LinkedIn for product news and updates.

Try out GeoStudio now!

Experience GeoStudio for yourself today! Download the free evaluation software from our web site at www.geo-slope.com/downloads.