Schlumberger
WATER SERVICES

## Who should attend this course?

This course was designed to be of interest to any environmental or groundwater professional, novice or experienced, who deals with projects that have a component related to integrated environmental data management, analysis and reporting.

## When do I register?

Register now and take advantage of the **Early Registration Special**. Register 3 months prior to the course date and receive a $100 USD discount!

## How do I register?

- Register online at:
  **www.swstechnology.com**
  Click on **Training** and **Register Now**.
- Or complete the registration form on the back and fax it to us!

## Can't make the Course?

Contact us about our "ON-SITE Custom Training" program. We're ready to deliver any one of our popular courses or tailor the course topics to address your specific organizational needs!

## Questions? Contact Us!

Schlumberger Water Services
460 Phillip Street - Suite 101
Waterloo, Ontario, Canada N2L 5J2
Tel: +1 519-746-1798 Fax: +1 519-885-5262
Email: sws-training@slb.com
www.swstechnology.com

## Course Objectives

From hands-on experience, you will learn...

- How to use HGA to develop a project specific environmental database
- How to enter and import disparate data sources into the database
- How to design simple database queries to retrieve data from the database
- How to interpolate data using kriging, natural neighbor and inverse distance
- How to develop cross-sections for interpreting hydrogeology
- How to create effective 2D and 3D images and animations for presenting results

You will also receive …

- Hands-on guidance from experienced instructors
- A complete set of lecture notes and lab exercises
- A CD of lab exercises and a demo copy of HGA

## Course Schedule

***Note: Breaks & lunches are not listed***

**Day 1**

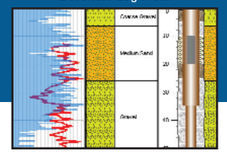
| | |
|---|---|
| Registration | Introductory Remarks |
| Lecture | Introduction to Integrated Data Management |
| Exercise | Intro: Introduction to HGA |
| Lecture | Database Management with HGA |
| Exercise | Grimston: Setting up a Database |

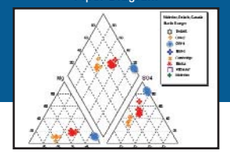
**Day 2**

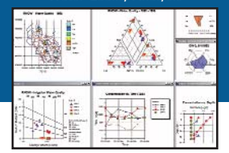
| | |
|---|---|
| Exercise | Grimston: Setting up a Database |
| Lecture | GIS Data Interpolation |
| Exercise | Grimston: Interpolating GIS Data |
| Lecture | Cross-section Analysis using HGA |
| Exercise | Grimston: Developing User-Defined Cross-sections |
| Exercise | Grimston: GIS Export for Modeling |
| Lecture | 3D Visualization for Reporting and Presentations |
| Exercise | Grimston: 3D Visualization and Reporting in HGA |

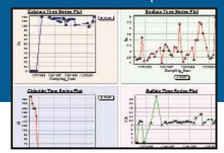
**Day 3**

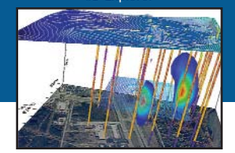
| | |
|---|---|
| Lecture | GIS Data Analysis in Hydrogeology Studies |
| Exercise | Case Study: Redlands Quarry |
| Exercise | Case Study: Chemwest Regional Contaminant Plume |
| Break | Course Evaluations |
| Exercise | Case Study: Chemwest Regional Contaminant Plume |


Borehole Log Plots


Piper Diagram


Water Quality Analysis


Time Series Graphs


3D Explorer

# Making Sense of Environmental Data

## Using Hydro GeoAnalyst

There are increasingly greater amounts of data available to characterize environmental problems. This data comes in many different formats (hard copy reports, electronic databases, spreadsheets, field investigation results, …) swsch can make it difficult to integrate and analyze. The purpose of integrated data management is to acquire, store and analyze environmental data to develop a conceptual hydrogeologic model of a site so that we can design a solution to an environmental problem. This 3-day hands-on course presents an introduction to the management and analysis of environmental data using Hydro GeoAnalyst. This data management begins with the development of a site GIS, using Hydro GeoAnalyst, that integrates the many disparate sources of groundwater data that are common in a hydrogeologic analysis. The data is interpolated and mapped in HGA to generate the conceptual model of the study site. The hydrogeologic conceptualization can then be used in regional hydrogeologic analysis and in the development of groundwater models. Course topics include data types, coordinate systems, datums and map projections in a GIS, data interpolation within the GIS (inverse distance, kriging, natural neighbors), the development of model layers (cross-sectional analysis of site hydrogeology), and the import and export of different types of data from the GIS system to the groundwater model and back to the GIS system. Other topics that will be covered include 2-D and 3-D visualization and animation of the hydrogeologic conceptual model. This course is ideally suited for environmental professionals who wish to develop a more comprehensive understanding of the data sources that are used in hydrogeologic analysis, the interpolation of this data in GIS, and the interchange of information between the GIS system and groundwater models.

### Course Topics

- Introduction to integrated data management
- The use of GIS data management in hydrogeology studies
- Database design, data entry and database querying
- Georeferencing, data interpolation and GIS mapping
- Interpreting borehole cross-sections to conceptualize the flow system
- Interpreting field data to generate model parameter distributions
- Creating 2D and 3D images and animations of the conceptual hydrogeologic model for client presentations

### Hydro GeoAnalyst

Hydro GeoAnalyst is comprehensive data management software designed to efficiently manage all sources of environmental data. This solution is proven to maximize productivity when investigating and interpreting sub-surface environments, by providing the graphical tools necessary to visually assess and report on project data. Hydro GeoAnalyst is used by water supply managers, environmental consultants, urban planners, hydrogeologists and GIS Specialists to manage regional groundwater monitoring networks, complete compliance reporting for remediation projects and assess water supply for groundwater use. In addition, HGA is ideal for compiling data, analyzing borehole logs and mapping spatial data when planning future water supplies.

### Data Management

Hydro GeoAnalyst embeds industry-standard data models, such as the USEPA Region 5 Environmental Data Model, swsle also offering the ability to expand or modify the data model at any point during the life of a project. HGA allows you to enter project information into the database manually, or to use the Data Transfer System to import electronic information into the database from a number of file types (XLS, TXT, MDB, …).

### Borehole Log Plotting and Cross-sectional Analysis

Hydro GeoAnalyst has a Borehole Log Designer with numerous standard environmental borehole log templates that allows you to customize the presentation of your borehole logs. These logs will then be used in the development of cross-sections that allow you to interpret site geology, hydrogeology and layer interface information visually on-screen. The cross-sections can then be presented as part of the products of the conceptual hydrogeologic model, and used in the future development of a groundwater model.

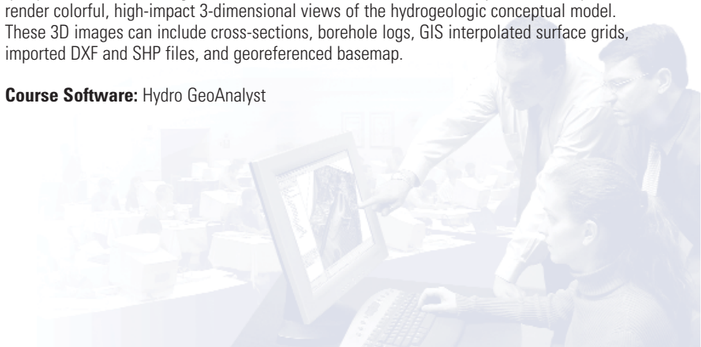
### Map Manager

Hydro GeoAnalyst has a Map Manager that can be used to combine georeferenced basemaps (BMP, TIF files), vector images (DXF, SHP files), and point data (station data and queried borehole data) into one mapping environment. Point data can then be interpolated using kriging, natural neighbor and inverse distance methods to generate contour plots and gridded surfaces for completing the conceptual description of hydrogeology of the site.

### Reporting and 3D Visualization

Hydro GeoAnalyst has a Report Editor that allows you to create and save an unlimited number of dynamic report layouts, swsch can incorporate data values, time-series graphs, query results, borehole logs, cross-sections and 3D views. HGA 3D-Explorer allows you to render colorful, high-impact 3-dimensional views of the hydrogeologic conceptual model. These 3D images can include cross-sections, borehole logs, GIS interpolated surface grids, imported DXF and SHP files, and georeferenced basemap.

**Course Software:** Hydro GeoAnalyst



http://www.swstechnology.com