

AquaChem 3.7 Mapping and Spatial Analysis

Session Objectives

- Information Types: (Stored in ArcInfo or other database)
- Importing from ArcInfo or other databases. (Data & Maps)
- Spatial Trend Analysis: Map Setup

Types of Information Stored in ArcInfo

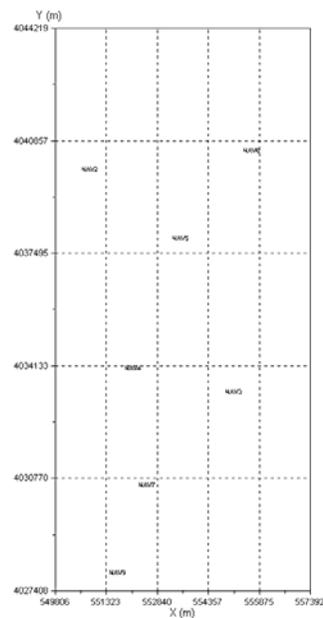
- Maps (Vector, Point, Polygon)
- Data (Geochemical and Geographical)
- Elevations (Z values)
- Geographical Coordinates (X and Y values)

Map Data

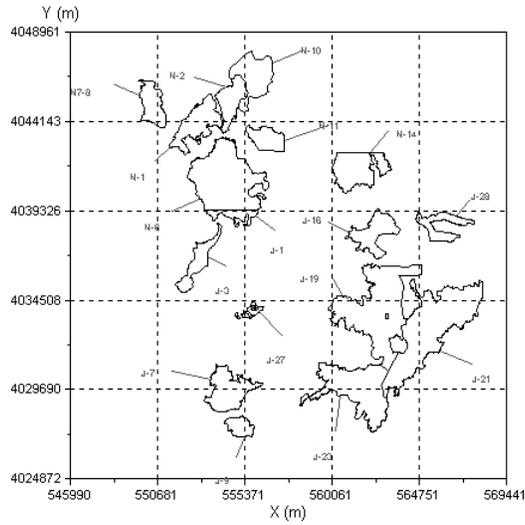
- **Vector data (lines)**
 - Roads
 - Rivers & Streams
 - Railroads
- **Point data (Dots)**
 - Streams Stations
 - Springs
 - Wells
 - Mine discharge Points
- **Polygons (Closed Multi-sided shapes)**
 - Coal Leases
 - Permit Boundaries
 - Mining Areas

Sampling Locations

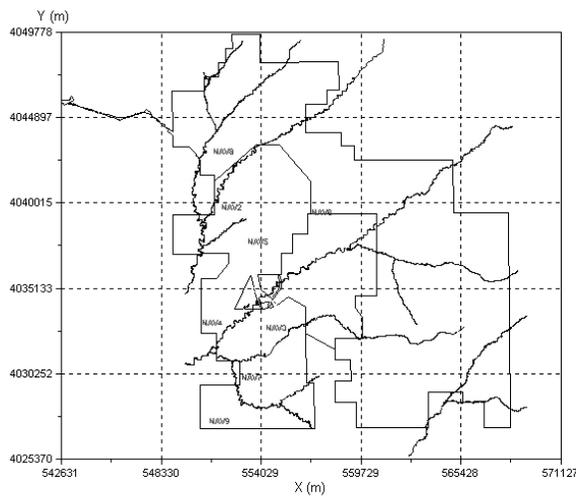
Point data



Mining Areas



Streams, Permit Areas, & Wells Combined Data



Importing Maps to AquaChem

- Uses a single, Version 12 Autocad DXF file.
- Multiple maps easily created.(Configuration can be saved.)
- Match coordinate system between spreadsheet and map.

Importing Geochemistry to AquaChem

- Export data in text file from ArcInfo or other database.
- Assemble in Spreadsheet format; Tab Delimited ASCII file
- Import to AquaChem

Importing XYZ Data to AquaChem

- Sample Site Coordinates (UTMs or other grid)
- Export as text file from ArcInfo
- Assemble in spreadsheet with Geochemical data
- Save as Tab delimited file.
- Import to AquaChem

Database Queries

Queries can be used to select a sub group of sample sites or samples based on defined selection criteria

Selection Criteria can be:

- Parameter values greater than a specified concentration.
- Multiple parameter values meeting selection criteria.
- Geographic areas
- Depth of well completion
- Geologic information

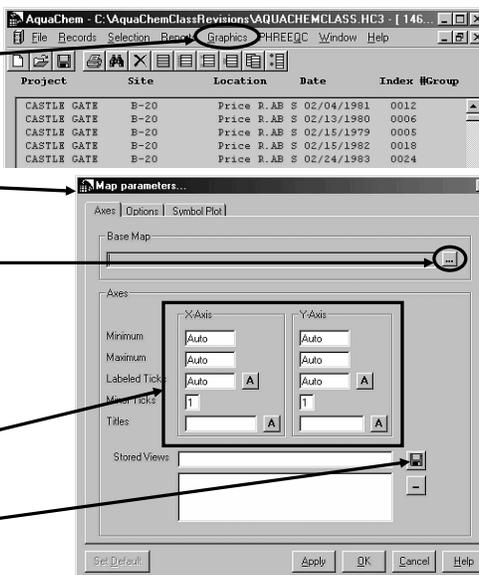
Spatial Trend Analysis

Although the time series plot is very useful for interpreting temporal changes, they give no orientation to the relative position of sampling points on a site.

To analyze spatial trends as a snapshot in time, the sampling results can be plotted on a map. (Spatial Analysis)

Spatial Trend Analysis Creating a Map: Axes Options

- To create a new map in AquaChem, Click on **Graphics**, then **New, Map**.
- A Map Parameters Dialogue box appears.
- The base DXF file is selected in the base map window. The ... button allows browsing to select the base map DXF file.
- The map axes default to those in the the base map or they may be user specified to zoom into portions of the base map.
- Views may be saved for future use.

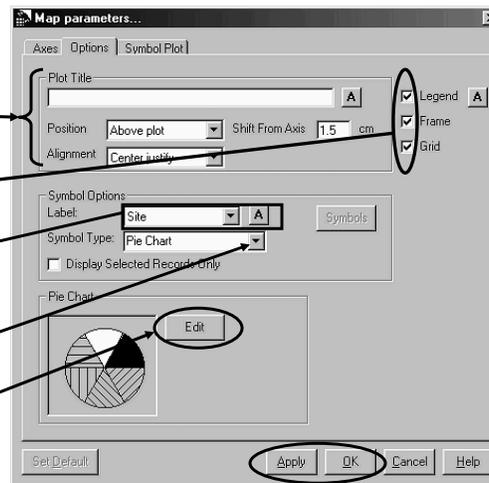


Spatial Trend Analysis

Creating a Map: Map Options

The Map Options tab:

- Provides for a Plot Title, and Position and Alignment options.
- Add Legend, Frames & Grids.
- Select labels for display.
- Select Symbol types from drop down menu.
- Edit plot type setup. (Parameters)



Spatial Trend Analysis

Creating Maps: Symbol Plot Options

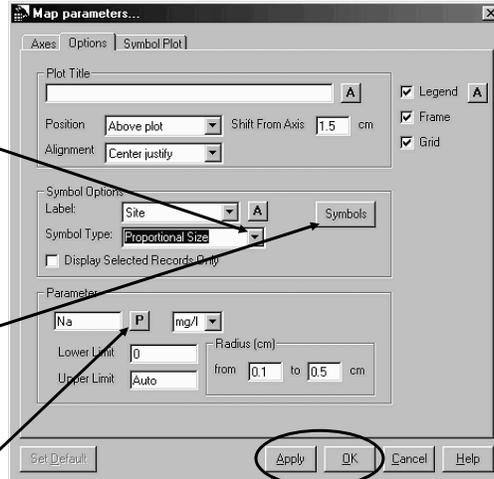
AquaChem can plot various symbols on maps to display data.

- **Plain:** plots symbol shapes, sizes and colors as they are defined by the user for each sample group.
- **Proportional Size:** plots defined symbols at each location with symbol size determined by sample concentration of a selected parameter.
- **Proportional Grayscale:** plots defined symbols at each location with a grayscale determined by sample concentration of a selected parameter.
- **Water Facies:** plots the calculated water type for each sample location
- **Pie Chart:** plots a pie chart of the selected parameters at each sample location.
- **Radial Diagram:** Plots a radial diagram of the selected parameters at each sample location.
- **Stiff Diagram:** plots a Stiff diagram of the selected parameters at each location.

Spatial Trend Analysis

Creating Maps: Proportional Plot Options

- To select a symbol type to use on the map, click on the Symbol Type drop down menu and select the symbol type desired.
 - Plain,
 - Proportional Size
 - Water Facies
 - Proportional Grayscale
 - Pie Chart
 - Radial Diagram
 - Stiff Diagram
- The Symbols Button is used to define group symbols to various data sets the same way they were set up in the database structure.
- The parameter used for plotting proportional size and grayscale can be selected from a parameter window by clicking the **P** button.



Click **Apply** or **OK** when complete.

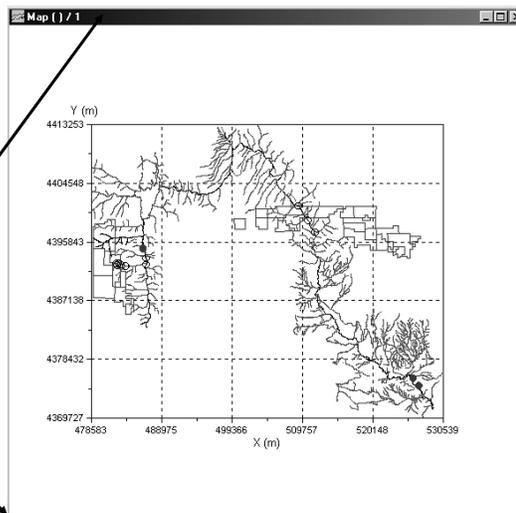
Spatial Trend Analysis

Plain Symbol Map Display

A map window appears with the sampling points plotted with their respective symbol.

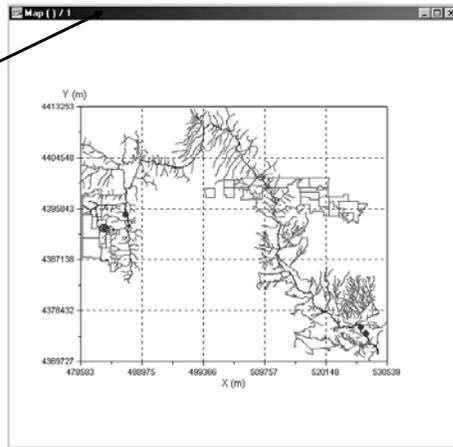
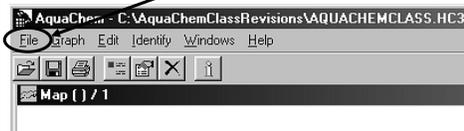
NOTE:

- A window can be moved by clicking and dragging the dialogue header bar to a new location.
- The graphics window can be re-sized by clicking and dragging a window corner.

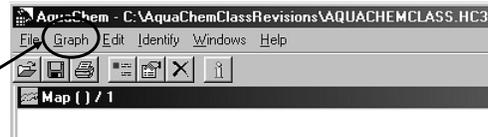


Spatial Trend Analysis

- The current graphic/map can be saved by selecting the header bar for the graphic,
- then click **File, Save Configuration**.



- Close the graphics window. The quickest way to do this is to select **Graph** from the main menu, **Close All Graph Windows** from the Main menu bar.



Summary

- Time series plots are good for temporal data analysis, but they give no orientation to the relative position of sampling points.
- **Maps** can be very useful to **display spatial trends**.
- **Geographic** and **Geochemical data** can be **stored and retrieved** from **ArctInfo** or **other databases**.
- Data can be imported into AquaChem using **Tab Delimited text file**.
- Maps can be imported using a single, **version 12 AutoCad DXF file**.
- **Map Plots** can display:
 - **Site info** (Plain Plots & Labels)
 - **Parameter concentrations** (Proportional or Grayscale plots)
 - **Chemical composition**. (Pie Chart, Stiff Diagram, Radial Diagram, or Water Facies)
- Maps **configurations can be saved** for future use.

This ends the session on AquaChem mapping