

Working with the DateView, StratDB and Deplso databases and web interfaces

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Introduction

This document provides information for users needing to use any of the databases and web-server interfaces for the DateView geochronology database, StratDB lithostratigraphy/deposit/LIP database and the DepIso deposit isotope database.

Anybody with questions about the databases or their interfaces is welcome to contact Bruce Eglington at bruce.eglington@usask.ca.

Overview of the database management software and physical databases

The physical database file system comprises several separate but programmatically interlinked databases. Users should be aware that multiple physical databases are used but do not need to concern themselves about how the process works, just that some information gets stored in one database and then gets automatically replicated (copied) to the other database after entry or modification.

General Program and Database Information on the Initial Access Windows

Each web-server program interface displays the title of the database/interface, the display name of the users once they have logged in and some information which the database administrator wishes to provide.

An example window, in this case for the **StratDB.FDB** database, is provided in Figure 1.

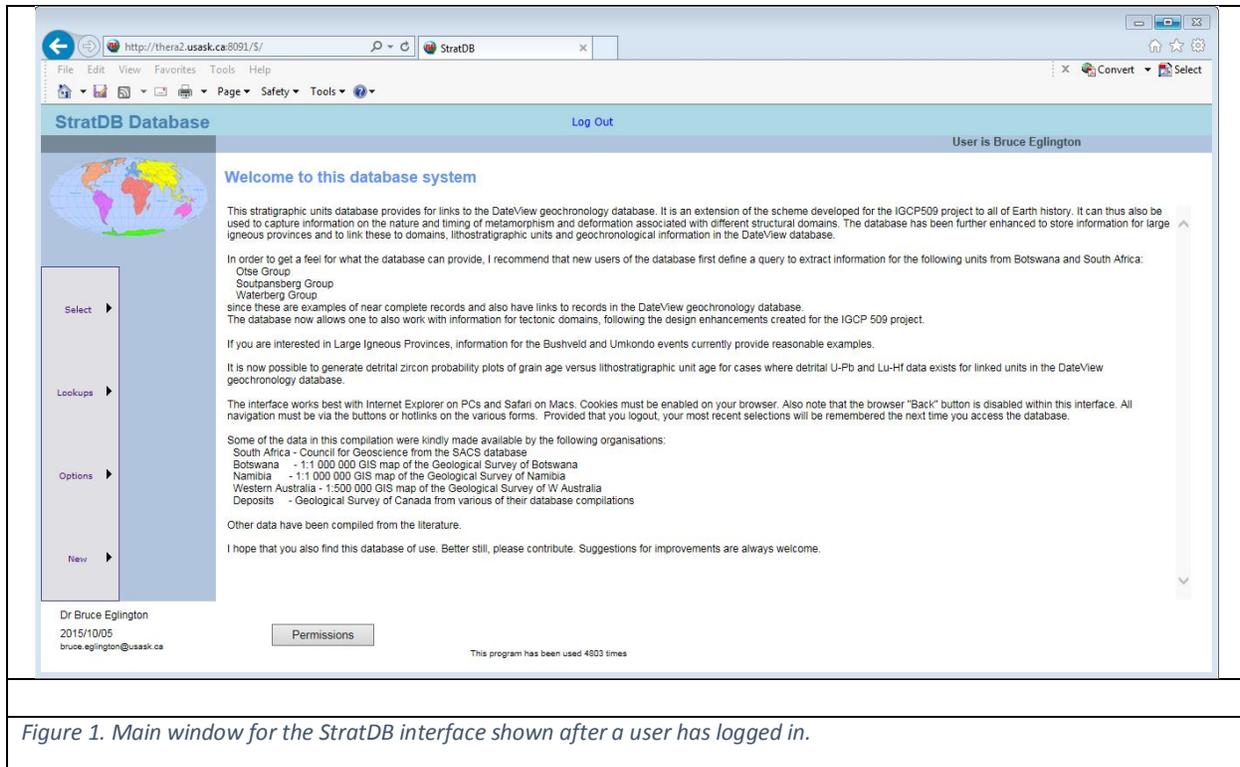


Figure 1. Main window for the StratDB interface shown after a user has logged in.

All users should be aware that the 'Back' button, a common feature of most web browsers, will not work in these web-server programs. This is by-design since the ability to modify and insert records into databases requires that the web-server interfaces keep track of 'state' i.e. they need to know what previous web requests have been issued by a user and responded to by the server. Standard web browser interfaces, which only serve existing data, do not have this requirement so they can use the back button to rerun preceding queries without confusing the system. All navigation in these *DVIW.EXE*, *STRATDB.EXE* and *DEPISO.EXE* web-server interface must be via specific buttons or 'hot-links' on the web pages and never via the 'Back' button..

Users are encouraged to logout of an interface when they finish a session, i.e. not to just click on the close X for a page. If this is done, then the details of the last query they ran will be stored for the next time they login to the system.

Using the Database Interface Programs

Introduction

Each database system and its interface will naturally have its own set of relevant fields and queries but all systems are based on a common conceptual architecture. The consequence is that once one has mastered one interface, the process to create and run queries will be the same across all systems.

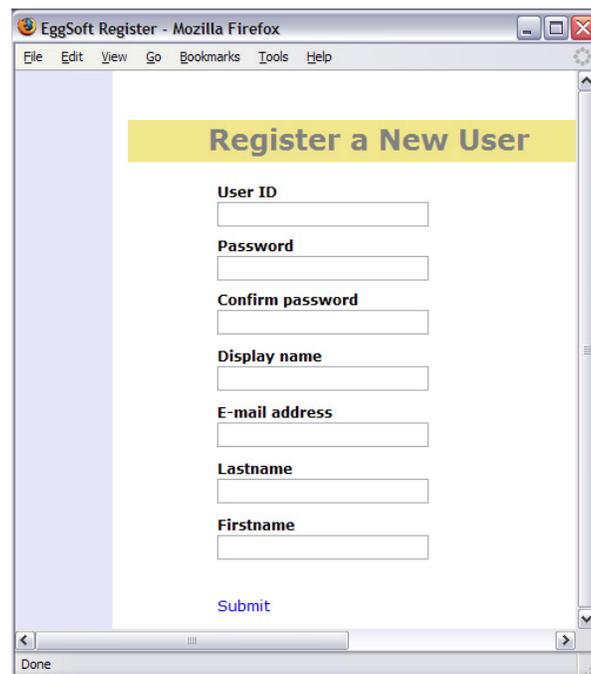
All users need to login to their selected web-server interface by clicking on the login 'hot-link' near the top of the web page. They will then be asked to provide a userid and password, both of which are case sensitive. Passwords have a maximum length of 8 ASCII alphanumeric characters.

Using the StratDB Database

The StratDB.FDB database is the principal mechanism to facilitate the construction of time-space correlation charts. Details are provided elsewhere on how to contribute data and to construct the time-space correlation charts, utilising information in StratDB and DateView.

Log In or Register as a New User

If all has worked as it should, you will see the following window.



The screenshot shows a web browser window titled "EggSoft Register - Mozilla Firefox". The browser's menu bar includes "File", "Edit", "View", "Go", "Bookmarks", "Tools", and "Help". The main content area features a yellow header with the text "Register a New User". Below the header, there is a registration form with the following fields and labels: "User ID", "Password", "Confirm password", "Display name", "E-mail address", "Lastname", and "Firstname". Each field is represented by a text input box. At the bottom of the form, there is a blue "Submit" button. The browser's status bar at the bottom shows "Done".

Figure 2. Registration window for a new user.

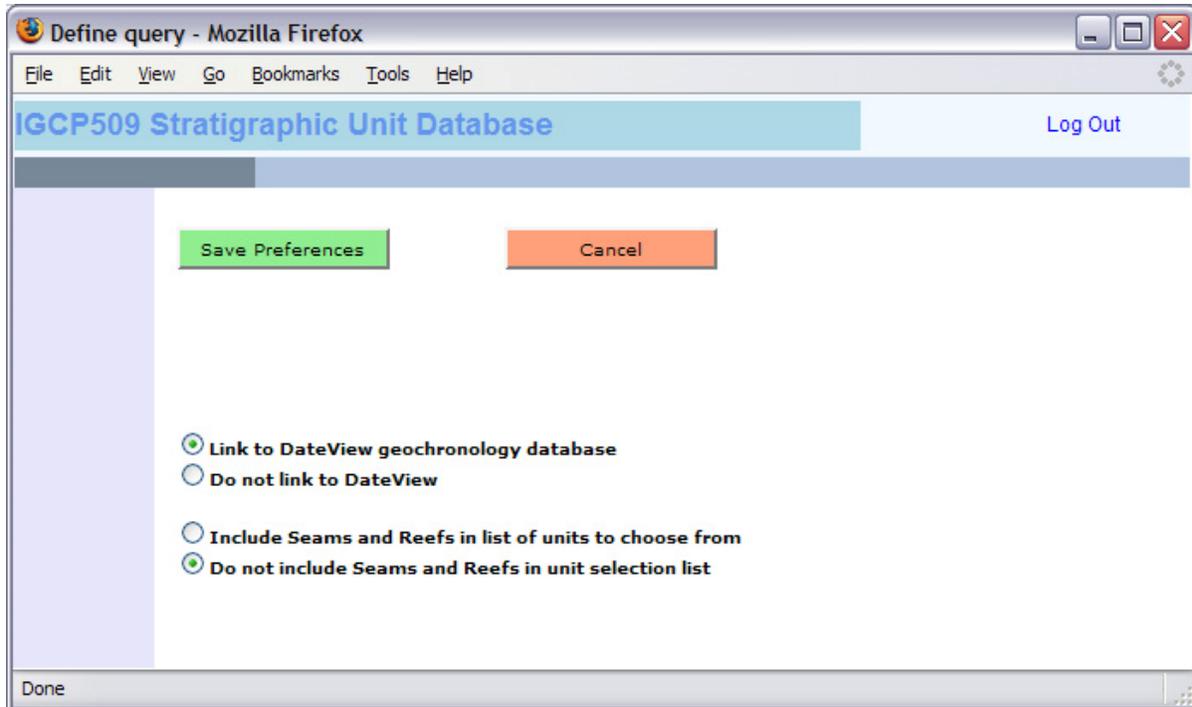
If you are a new user and have not previously used either DateView or StratDB, then you will need to register with the system. Registration and use of the database systems is free, but various levels of access permission are provided in the different database systems, depending on whether one will contribute data or not. For some databases, for instance in DateView, users may capture their own, confidential information. The database needs to know who you are to manage this process and you will need to contact the database administrator to have new user-group associations created..

If you have forgotten your password, clicking on the appropriate link in the log-in screen will email the details to the email address provided during registration. If you change address, please update you details in the database.

Once you have logged in to the database, you will see the Main Menu window (see below). Top-level hot-links to the various components of the database interface are provided on the left and a window with messages about the current state of the database appears on the right. Be sure to log out from the system, using the "Log Out" hot-link at the top of any screen if you want to save your query definitions for when you return another time.

Please note that browser navigation behaviour in this interface is somewhat different to that in most browsers. Specifically, the browser's "Back" button is disabled and all navigation needs to be performed using buttons or hot-links provided on the various forms. This is done to ensure that 'state' information is carried across from one form to another, which facilitates keeping track of the user's personal queries and preferences.

One of the first things to do when using the StratDB interface for the first time, is to set up your personal preferences. This is done by clicking on the "Options" hot-link. This will bring up a window in which you can specify whether you want to see linked data from the DateView geochronology database and the level of detail required when running lithostratigraphic queries.



Querying the Database

A number of types of query may be performed using the IGCP509/StratDB interface:

- select particular lithostratigraphic units;
- choose various structural domains
- choose various deposits/mineral occurrences
- select large igneous provinces

The first two of these will be of most relevance to the IGCP project. Querying in all of these is similar, so only one is illustrated here. After clicking on the "Select Units" menu hot-link, you will be asked to select one or more continents from a list. Use standard 'click' or "Shift-Click" approaches to select the continents for which you wish to see information.

Please note that a more refined query will take less time to execute than one which returns a huge amount of information. You, as user, will need to choose an optimum degree of detail to specify in your query. Many users tend to over-specify their queries with too much detail. Rather start broader, and then focus in by refining the query with additional search field constraints.

Define query - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

IGCP509 Stratigraphic Unit Database Log Out

Include selection from Continents

Africa
Antarctica
Australia & Oceania
North America
Undefined

Select the Continents from which you wish to obtain data. Note that the values selected here will influence subsequent lists used to further refine search conditions and will also influence the final query.

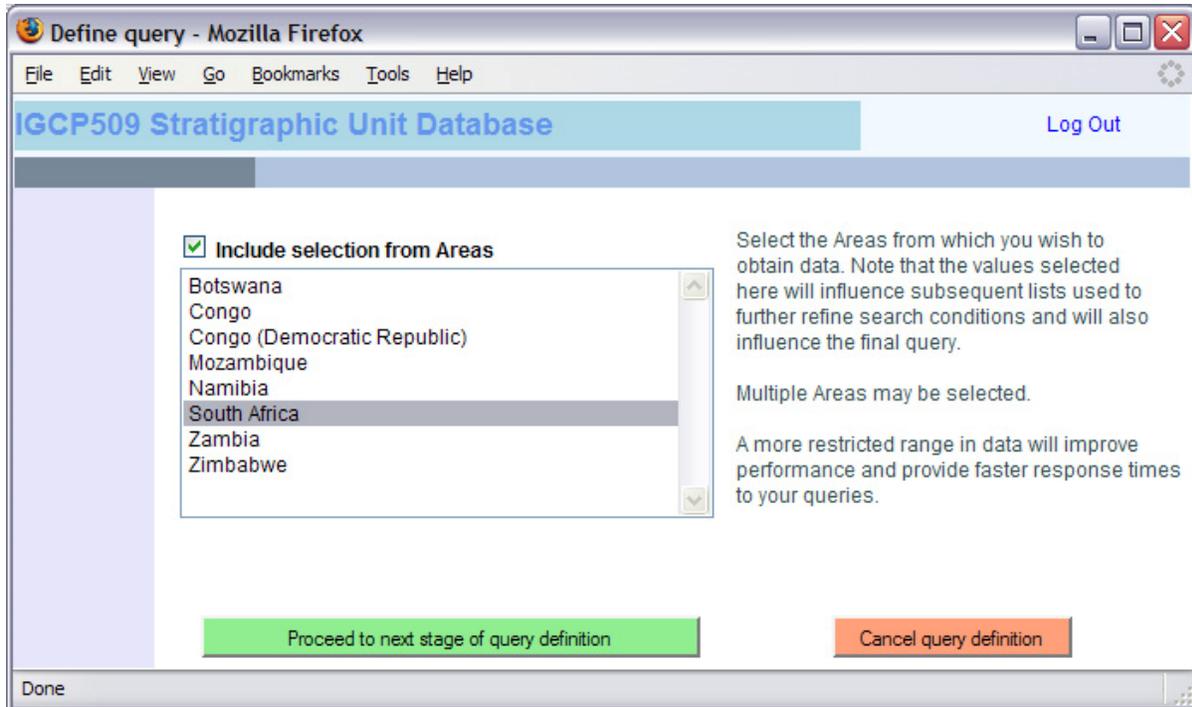
Multiple Continents may be selected.

A more restricted range in data will improve performance and provide faster response times to your queries.

Proceed to next stage of query definition Cancel query definition

Done

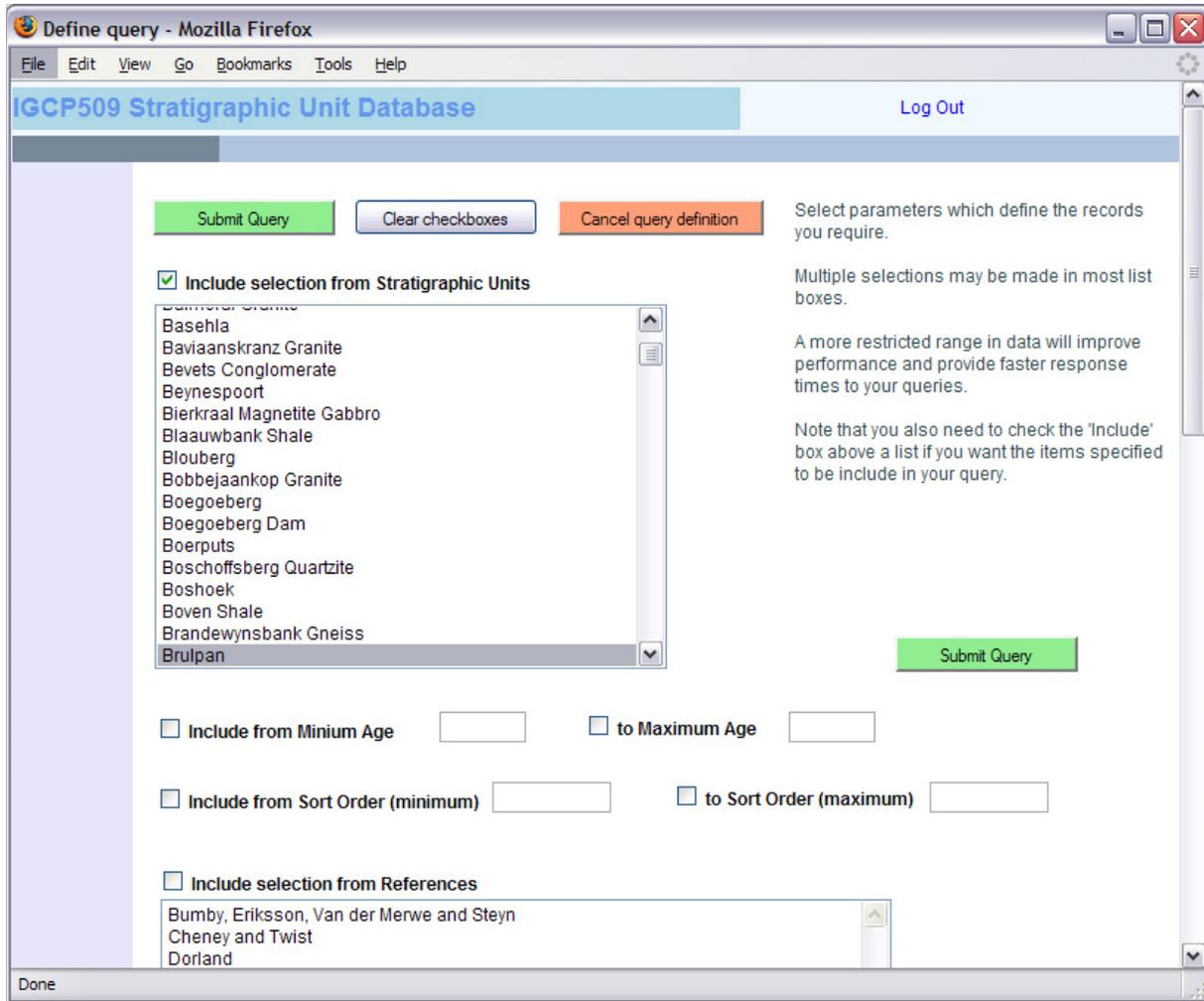
You will now be prompted with a list of countries within the continents you selected. **You will notice a checkbox at the top left of the list of countries. Similar checkboxes appear in many other query definition forms. You must check this box if you want to include the field in a query.** This checkbox is provided to facilitate repeat queries in which users want to include/exclude particular fields without continually needing to search for and check all items in the list. You may select one or more countries or, in this case, none (do not check the checkbox if this is what you want). Omitting any countries from the selection will effectively select data from all the countries in the selected continents.



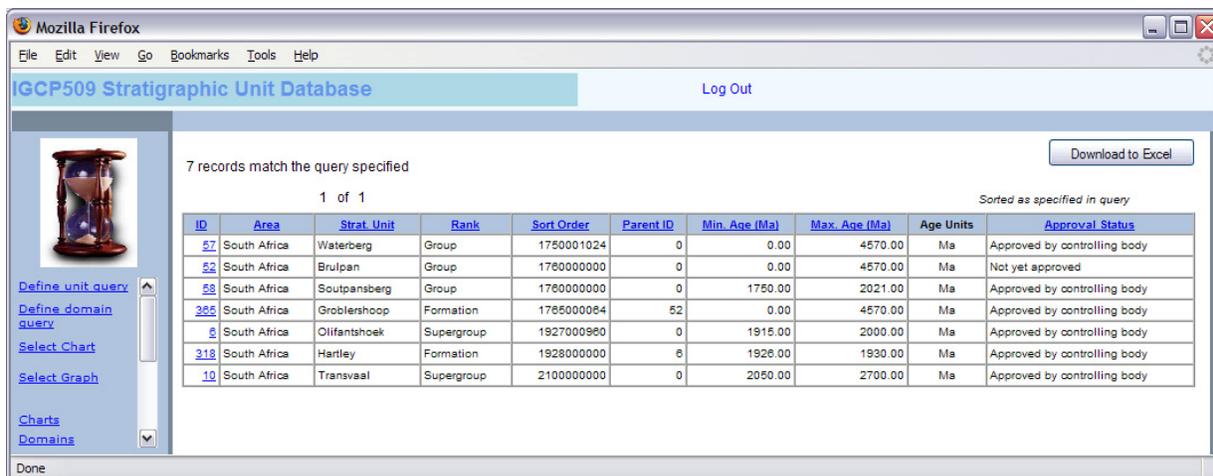
Now, you need to select from a number of different options, such as:

- lithostratigraphic units from the selected countries
- minimum and maximum ages of the units
- sort order of the units
- references associated with particular lithostratigraphic units
- structural domains with which units are associated
- validation status of the units

All lithostratigraphic units are hierarchically linked to a 'parent unit'. One may thus also limit the results to those units at the top of the hierarchy. Finally, one may select from a number of options for sorting of the output data.



At this point, you will be provided with a list of lithostratigraphic units which matched your query conditions, arranged in pages of twenty-five results per page.



It is possible to change the sort order of the results by clicking on the heading of an appropriate column in the results grid. Alternatively, one may drill down to more detailed information for each selected unit by clicking on the hot-link unique ID at the left of the grid.

Once one has drilled down to a specific unit, one may navigate up and down the hierarchical relationships captured by clicking on appropriate hot-links or buttons.

A button also provides an Excel download of all the selected units and their hierarchically organised subordinate units. More details of this capability are provided below.

Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://127.0.0.1:8091/EXEC

Stratigraphic Unit Database [Log Out](#)

[Return to results list](#) [Edit this record](#)

Unit : [Add Unit to DataView](#)

Stratigr. unit **Test unit 1** Rank **Supergroup**

Unit ID **-100** Status **Informal**

Area **Test country** Sort order = **2050000000**

Minimum age = **2050.00** Maximum age = **2450.00** Units = **Ma**

Parent unit **no higher unit in heirarchy** Rank **None**

Parent ID **0**

Rock Class **Mixed / Not applicable** Tectonic Setting **Setting not known**

Timescale unit **Palaeoproterozoic**

Description

GIS IDs

Map Name	GIS_ID (int)	GIS_ID (str)

Sub-units :

ID	Strat. Unit	Rank	Min. Age	Max. Age	Sort Order
-99	Test unit 2	Group	2050.00	2200.00	2050000001
-98	Test unit 3	Group	2300.00	2400.00	2300000000

Succeeded by :

ID	Relationship	Strat. Unit	Rank	Min. Age	Max. Age

Preceded by :

ID	Relationship	Strat. Unit	Rank	Min. Age	Max. Age

Synonyms

ID	Unit	Rank	Status

Correlatives

ID	Unit	Rank	Country

Download hierarchical Information from the Database

Once you have defined and run a query, it is possible to download aspects of the results to an Excel spreadsheet. These include the hierarchical relationships between the various units, as illustrated below. Note that one can minimise 'parent' units so as to limit the hierarchical view in the spreadsheet.

ID	Country	Strat. Unit	Rank	Parent ID	Sort Order	Min. Age	Max. Age	Age Units
10	South Africa	Transvaal	Supergroup	0	2100000000	2050.00	2700.00	Ma
8528		Elim	Group	10	1910000000	0.00	4570.00	Ma
305		Glentig	Formation	10	2055000064	0.00	4570.00	Ma
306		Rust De Winter	Formation	10	2055000064	0.00	4570.00	Ma
304		Loskop	Formation	10	2057200000	0.00	4570.00	Ma
41		Rooiberg	Group	10	2057299968	0.00	4570.00	Ma
303		Schrikkloof	Formation	41	2056000000	0.00	4570.00	Ma
1320		Rinkhalskop	Formation	41	2056000000	0.00	4570.00	Ma
302		Kwaggasnek	Formation	41	2057299968	0.00	4570.00	Ma
703		Union Tin Tuff	Member	302	2057299968	0.00	4570.00	Ma
300		Damwal	Formation	41	2057400064	0.00	4570.00	Ma
40		Pretoria	Group	10	2100000000	0.00	4570.00	Ma
296		Dullstroom	Formation	40	2100999936	0.00	4570.00	Ma
298		Smelterskop	Formation	40	2101100032	0.00	4570.00	Ma
295		Houtenbek	Formation	40	2102000000	0.00	4570.00	Ma
294		Steenkampsberg	Formation	40	2110000000	0.00	4570.00	Ma
293		Nederhorst	Formation	40	2120000000	0.00	4570.00	Ma
292		Lakenvalei	Formation	40	2130000000	0.00	4570.00	Ma
299		Makeckaan	Subgroup	40	2131000064	0.00	4570.00	Ma
1319		Salle Slaat	Formation	299	2131200000	0.00	4570.00	Ma
1318		Riffontein	Formation	299	2131400064	0.00	4570.00	Ma
1317		...	Formation	299	2131600000	0.00	4570.00	Ma

It is also possible to download equivalent Excel spreadsheet views of the hierarchical relationships between structural domains, Large Igneous Provinces, deposits and of geological timescale subdivisions.

Modifying Information in the Database

Once one has drilled down to a specific unit, one may edit details of the unit if one has been given edit permission by the database administrator. This level of permission is not provided to everybody as there is an increased chance that database records may be corrupted as more users are permitted to change the contents of records.

Before you can edit information for a record, you will need to click on the "Edit" button. Once all changes have been made, the "Apply updates" button must be clicked before moving to another record or moving to another form. If this is not done, the changes will be lost. If a mistake is made, clicking on the "Cancel updates" button will return the

database information for the current record to the same state it was before editing commenced. **Please be very careful during editing as there is no way to reverse a change which has been saved!**

Raise an Objection Against Specific Record Information in the Database

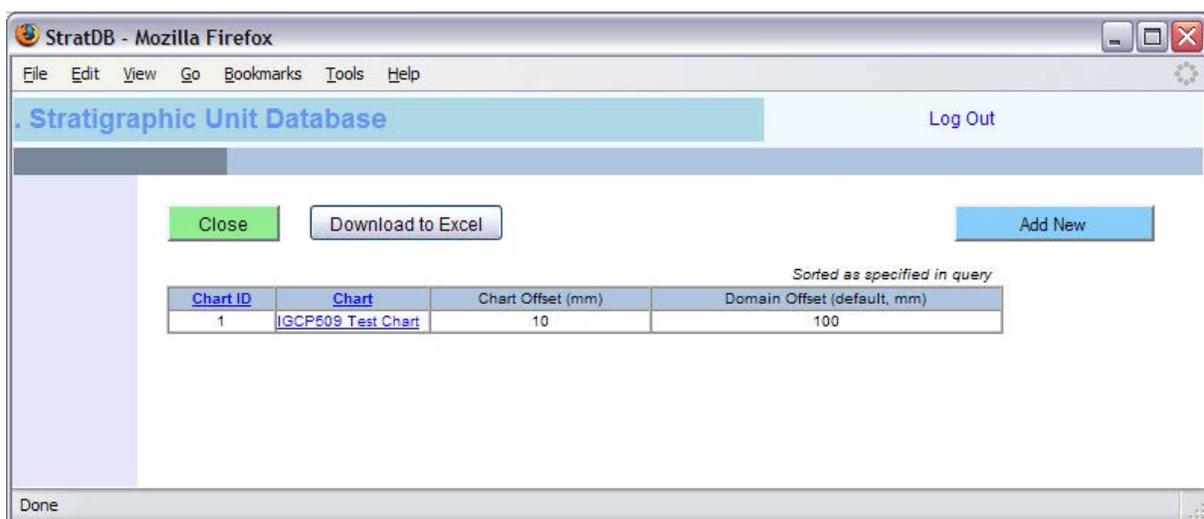
I have also implemented a system to facilitate moderation (termed 'Validation') in the database interface. Various regional coordinators will be assigned the role of checking that the contents of the database are correct in their areas of expertise. Any user may "raise an objection" to any aspect of the current contents and these objections will be adjudicated by the 'Validators' in an attempt to reach a compromise. In extreme cases, this might even entail adding new records to capture distinctly different views of the lithostratigraphy or metamorphic or deformation history of an area. If you feel that you have appropriate local knowledge and are prepared to take on the role of 'Validator', please contact Bruce Eglington.

Create a Time-Space Correlation Chart

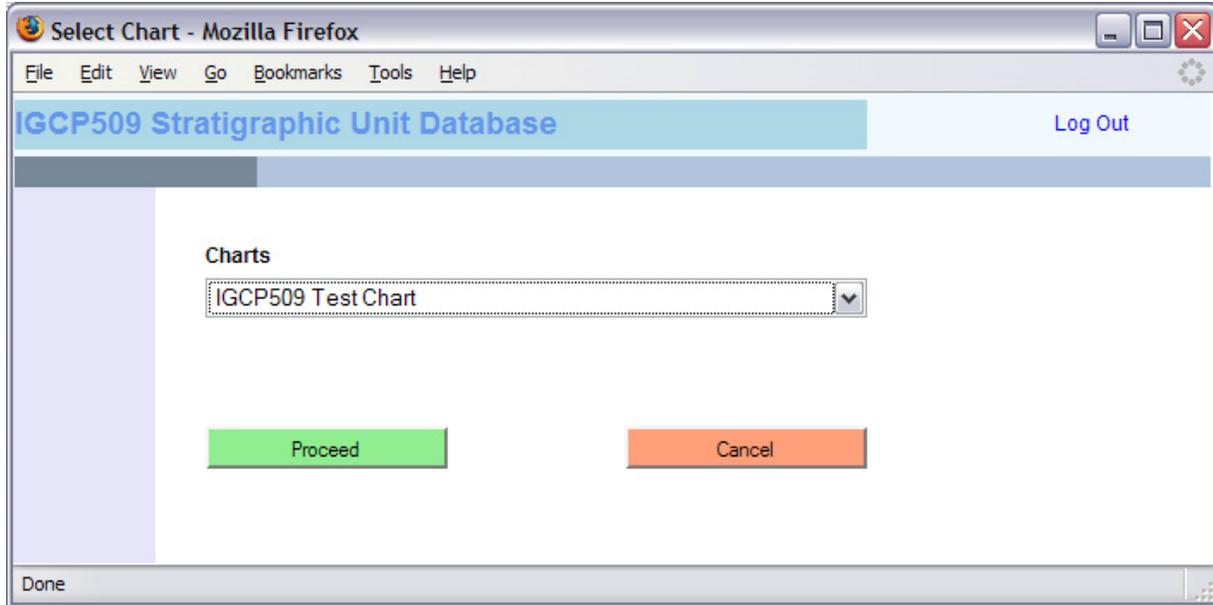
One of the major reasons for developing the StratDB database system was to facilitate the compilation of time-space correlation charts for the IGCP 509 project and this continues to be important for the IGCP 648 project although the latter project also emphasises development of geodynamic and depositional setting maps with equivalent symbology to the correlation charts.

Individual users may download information suitable for the construction of these charts. The details for each user's chart is stored individually so you cannot overwrite somebody else's chart.

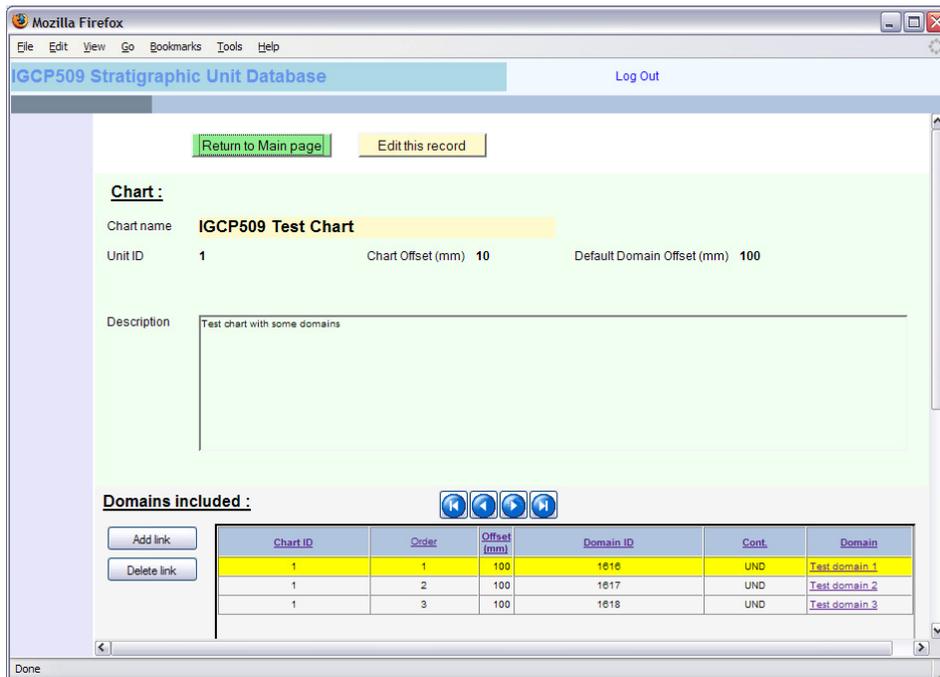
First, one needs to define a chart name and some basic details. In this way, individuals may draw the information from the database so as to construct any number of charts for different parts of the world or for different domains. The following image shows the window which lists charts defined by a user.

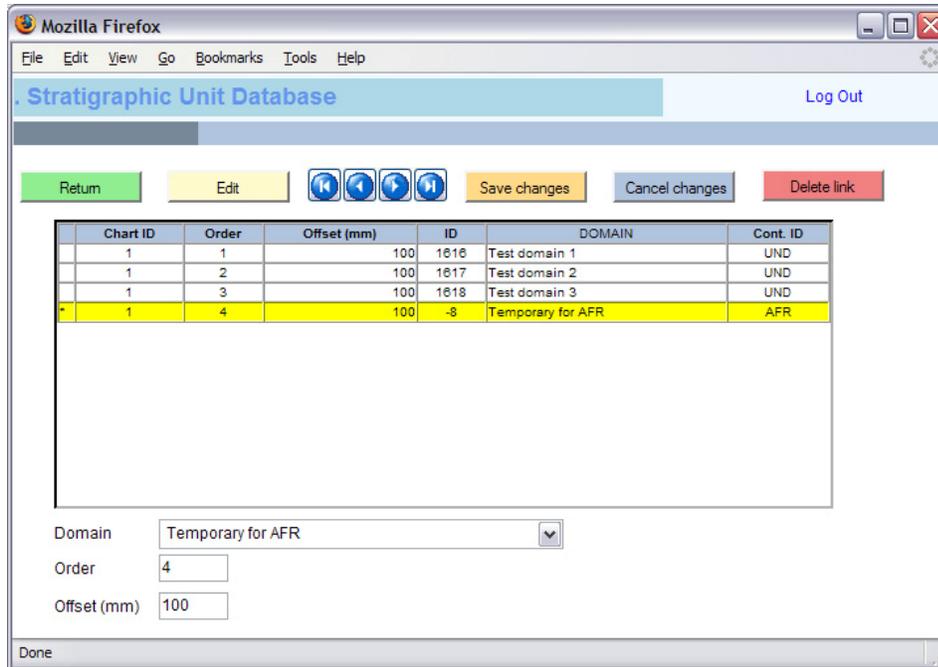


You now need to assign various domains to a chart. First, one needs to select an existing chart definition, as shown below.



Then one must select the domain.

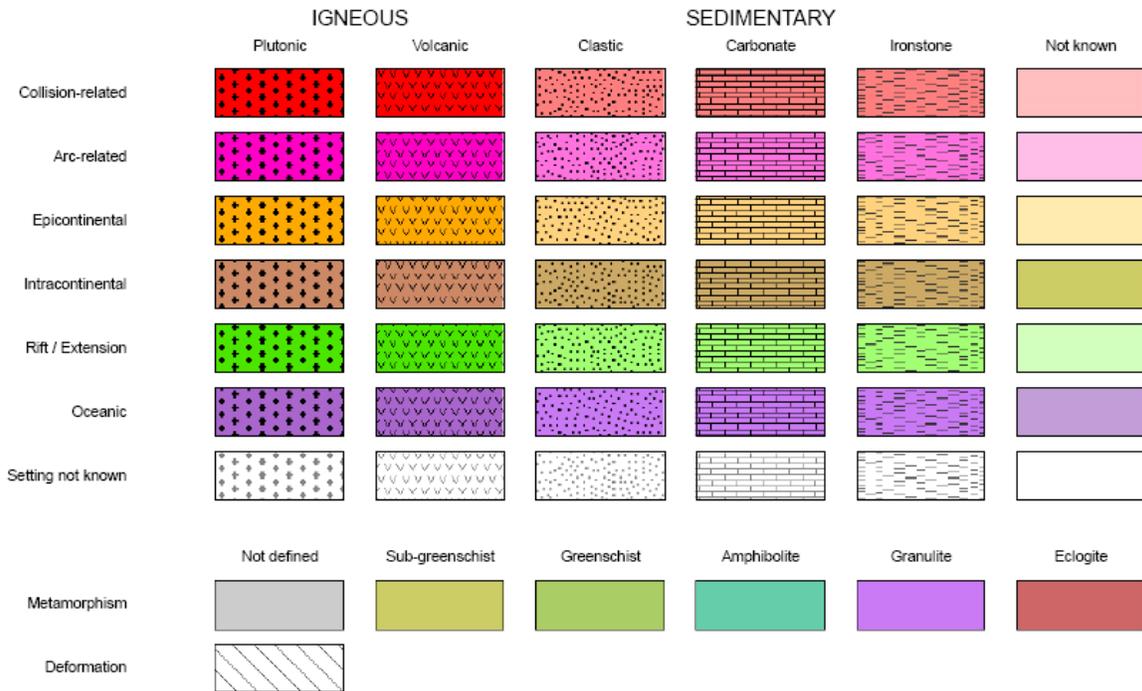




Add all required domains in the order you want them (from left to right across the final time-space correlation chart), by iterating through these selection steps for each required domain.

A legend has been designed for the IGCP 648 time-space correlation charts which will, hopefully, permit users to illustrate the fundamental aspects of the development of various regions. The current version of this legend is illustrated below. Please note that this legend will probably change and is shown here to illustrate current thinking and to provide a better understanding of the database design and capabilities.

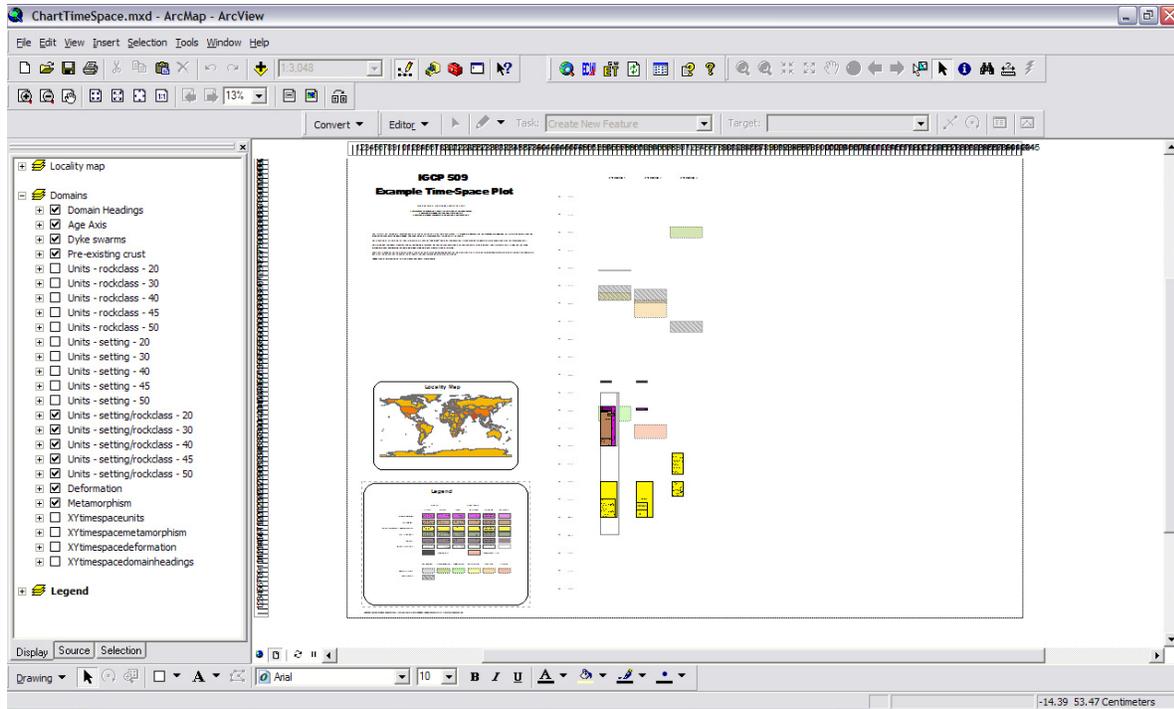
Legend



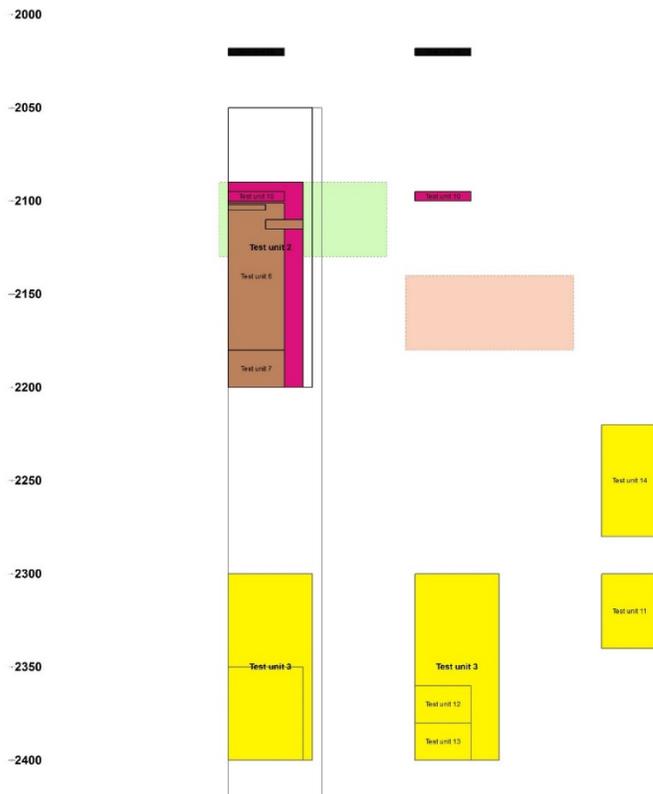
Once all domains have been added to a user's chart, all the information required to create the time-space correlation chart should be downloaded into various Excel spreadsheets, using the buttons at the bottom of the Chart Selection window. The details in these spreadsheets may then be imported into a GIS package, as described elsewhere.

Please do not modify the spreadsheet contents before importing them to GIS. The layout of each spreadsheet is specifically designed to provide all necessary information for creating appropriately coloured rectangles (polygons) and correctly positioned boxes and text.

Once imported to a GIS package, such as ARCGIS, the time-space correlation chart will look something like the image shown below. Here, information for various hypothetical lithostratigraphic units associated with three artificial tectonic domains have been used to test ideas for chart construction, layout, etc.



And here is an enlarged view of some of the polygons for various units and metamorphic episodes. In this case, unit polygons are colour coded according to their tectonic settings.



More detailed labelling is possible by converting ARCGIS labels to annotation and moving these to optimal positions. Alternatively, annotation may also be added manually.

Compiling and Submitting Data for StratDB

StratDB is a web-enabled extension of an earlier desktop system which captured information for lithostratigraphic units recognised by the South African Committee for Stratigraphy, with several enhancements specifically developed for the IGCP 509 project by Bruce Eglington, Steve Reddy and Dave Evans. Data are stored in a Firebird open-source relational database management system which provides full referential integrity. Although open-source, Firebird provides similar capabilities to major commercial database systems such as Oracle and is very easy to manage. The web interface to the database has been programmed by Bruce Eglington, using the Delphi language and Intraweb components.

Data for the StratDB database have been provided by a number of organisations or have been captured from digital (GIS) geological maps. In particular, the Geological Survey of Canada has made available all its world ore deposit database information. Only selected fields have been incorporated in StratDB but link fields are provided to the original compilations for those who require more detailed information.

A few 'central' tables in the IGCP509 database contain essential information for each lithostratigraphic unit, structural domain, large igneous province or deposit. Other tables provide referential, look-up values or linkage fields to draw together information from various of the database tables.

Contributors will need to populate certain essential information, but may also populate information in various of the supplementary data tables if they wish and have the time. The emphasis of the IGCP 509 project was on the Palaeoproterozoic and immediately time-adjacent time intervals (approximately 1500 Ma to 2600 Ma), but all information contributed will be available via the StratDB database. Obviously, the more information is provided, the greater the benefit will be to future researchers.

Contributors may also choose to add data to the DateView geochronology database, in which case, provided that appropriate records exist in both the IGCP509/StratDB and DateView databases for the dated units, users will be able to see geochronological information associated with individual lithostratigraphic units and tectonic/metamorphic domains. Information on how to contribute to the DateView database is provided elsewhere.

How data may be submitted

Data may be contributed to the IGCP509 / StratDB database in two ways:

- Modify individual records from within the StratDB interface,
- Offline, by submitting compilations as Microsoft Access database tables or as Microsoft Excel spreadsheets.

The first technique is the most robust in that it ensures that all referential integrity links are correct but is only applicable if the basic information is already in the database. It is most appropriate for small data sets. If you wish to contribute data in this way, you will need to email your database administrator with your database UserID so that you can be given permission to modify records.

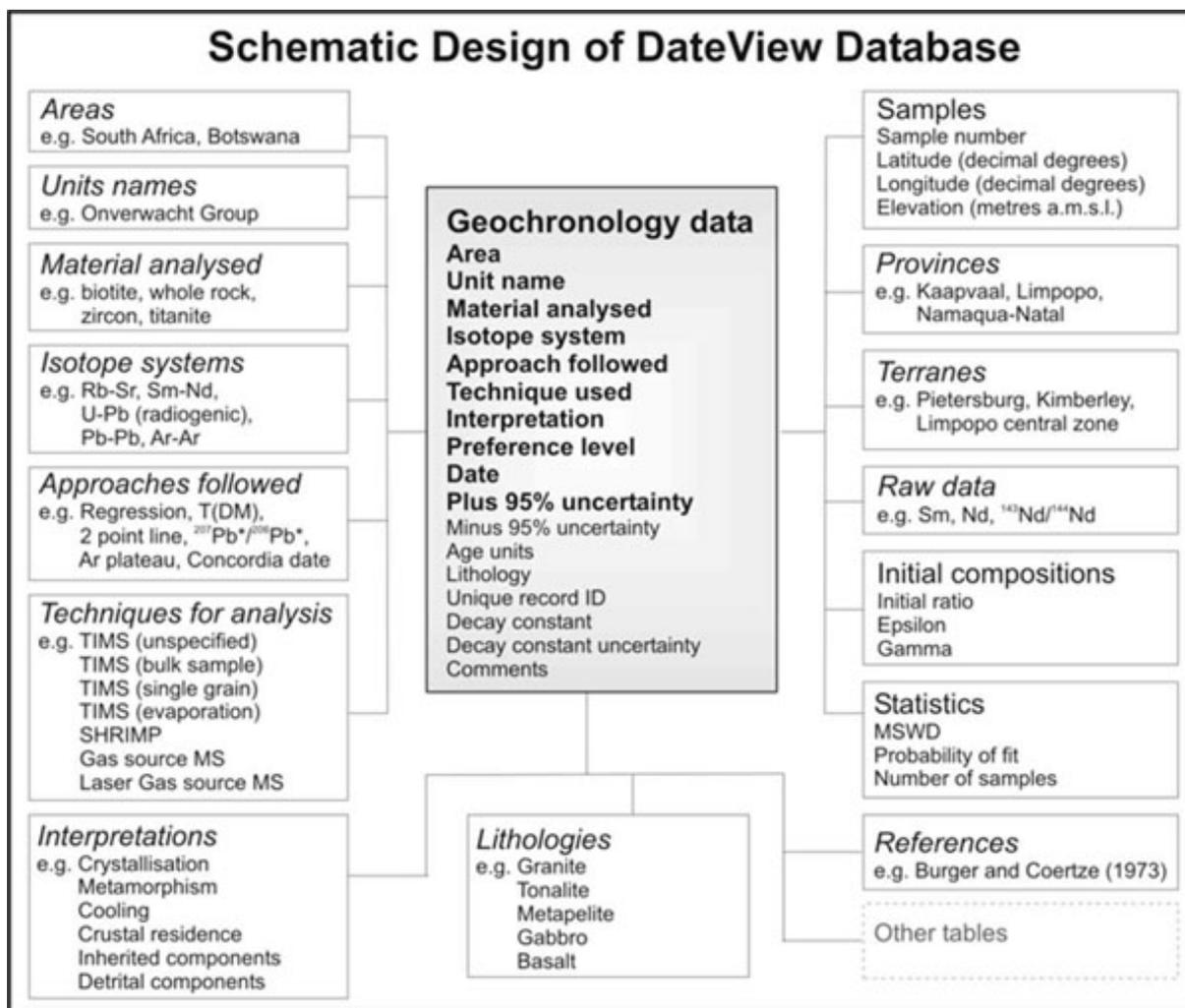
The second technique is more convenient and faster for large data sets but requires more care from both the data compiler and the database administrator to ensure that there are no conflicts with data already in the database. Compilers will need to ensure that values entered in the spreadsheets are the same as referential integrity values already in the database (or will need to organise for new key values to be added). Users may download spreadsheet summaries of the main tables within StratDB. ***Please be sure to check what already exists in the database before compiling new information.***

If you have access to existing GIS shapefiles or coverages for an area, it is much easier to capture the information from the associated attribute tables than to start from scratch. A further advantage of this approach is that the unique ID's used for each unit in the GIS system may also be captured, so permitting those who have copies of the GIS files to link all attributes stored in StratDB to the polygons on the GIS maps. If you plan to follow this route, please contact Bruce Eglington for more details and assistance.

DateView Geochronology Database Overview

General Structure

The DateView database has been developed using a standard open-source relational database management system (Firebird) and the interface has been developed using the Delphi programming language and Intraweb components. The table structure is designed to ensure referential integrity i.e. to ensure that typographic errors are minimised. The diagram below illustrates the structure of the database in a semi-conceptual sense.



A main database table contains the principle information, but is supported by other, linked tables (bold, normal font in the diagram above). Numerous 'lookup' tables ensure referential integrity (bold, italic font in the diagram above).

Log in to DateView

In order to access the DateView database system, one first needs to login.



First-time users will need to register. Login and registration is required in order to control access permissions for different users. For instance, not all users need to modify records or insert new records. Some users have the added responsibility of validating records in the database. Users should also ensure that they log out from the interface so that their most recent query design is stored and remembered for the next time they use the system. The default permission for new users is read-only. If this needs to be changed, please contact Bruce Eglington (bruce.eglington@usask.ca) and specify your UserID in the email.

You will then be taken to the main form from which one can define options, run a query, create graphs of the results of queries, or access the contents of the various lookup tables.

User Control - Mozilla Firefox

File Edit View Go Bookmarks Tools Help

http://127.0.0.1:8085/EXEC

DateView International Geochronology Database [Log Out](#) [Donate](#)

Welcome to DateView

Whilst I am still adding features to the interface, practically all of those available in the desktop version (Eglington, 2004, Computers and Geoscience) are available on the web.

This interface works best with Internet Explorer on PCs and Safari on Macs. Note that, to use DateView, cookies must be enabled on your browser. Also note that the browser "Back" button is disabled within DateView. All navigation must be via the buttons or hotlinks on the DateView forms. Provided that you logout, your most recent selections will be remembered the next time you start DateView. Also note that you do not need to select every possible lithology, stratigraphic unit or whatever in order to see the associated records. This is far too time consuming an activity. Rather specify one of the other parameters e.g. "Radiometric" to get all data. Performance will be even better if you select only certain isotope systems, interpretations or time intervals.

New users need to register for a personal ID and associated password. Users who wish to contribute data to the database should register and then contact me in order to be granted edit rights for the database.

Links to the StratDB/IGCP509 stratigraphy database have been enhanced to facilitate work on the IGCP 509 project. I have increased the speed of response for most forms and for the main graphs. Further performance enhancements will follow. Please bear with me as I continue to develop the software and do not hesitate to send suggestions for improvements or notification of problems/errors you encounter.

Those wishing to compile data for inclusion in the database may download spreadsheet versions of most of the lookup tables so as to use values already in the database. Obviously, one can also add more but, in most cases, you will need to contact me to have these added on your behalf. If you intend to contribute data, I strongly recommend that you first add stratigraphic unit and tectonic domain information to then StratDB database and export from there to DateView. This will ensure that links between the two databases are in place.

Users who have forgotten their userid or password may request that the details be emailed to the address they specified when registering. Registration details may now also be changed.

If you have trouble using this database, please don't hesitate to contact me at the address provided below.

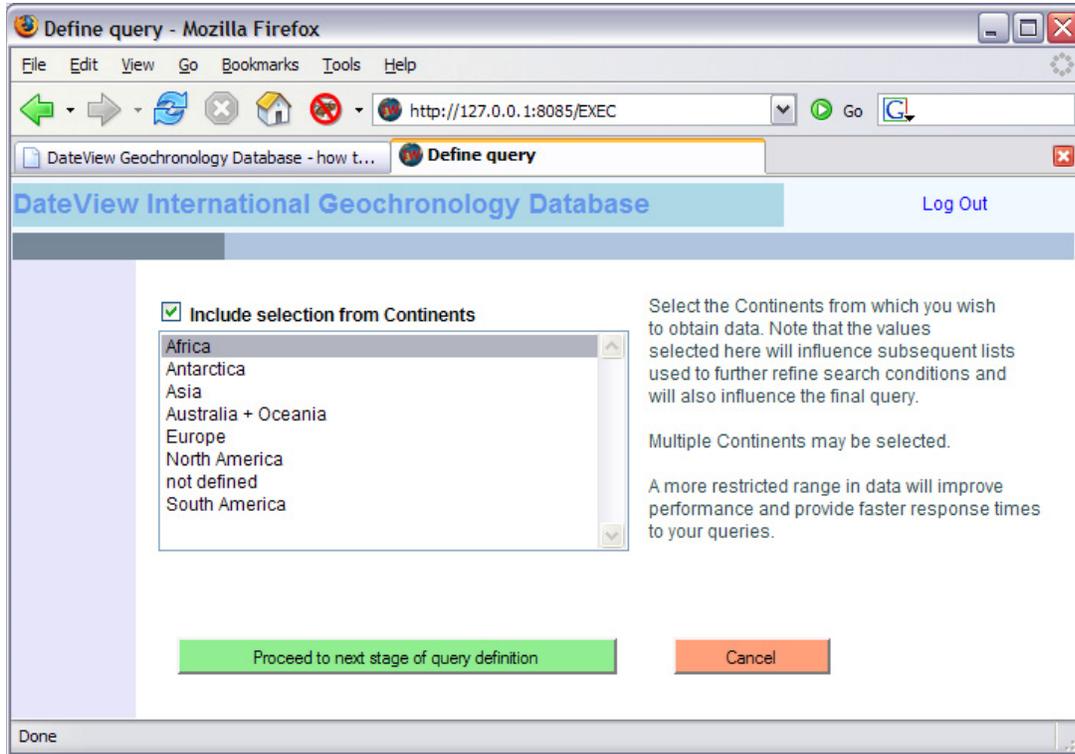
Dr Bruce Eglington
16/04/2007 1:45:14 PM
bruce.eglington@usask.ca

Total # records in database =	45640
Total public records in database =	31814
Last counted on	2007/05/10
This program has	

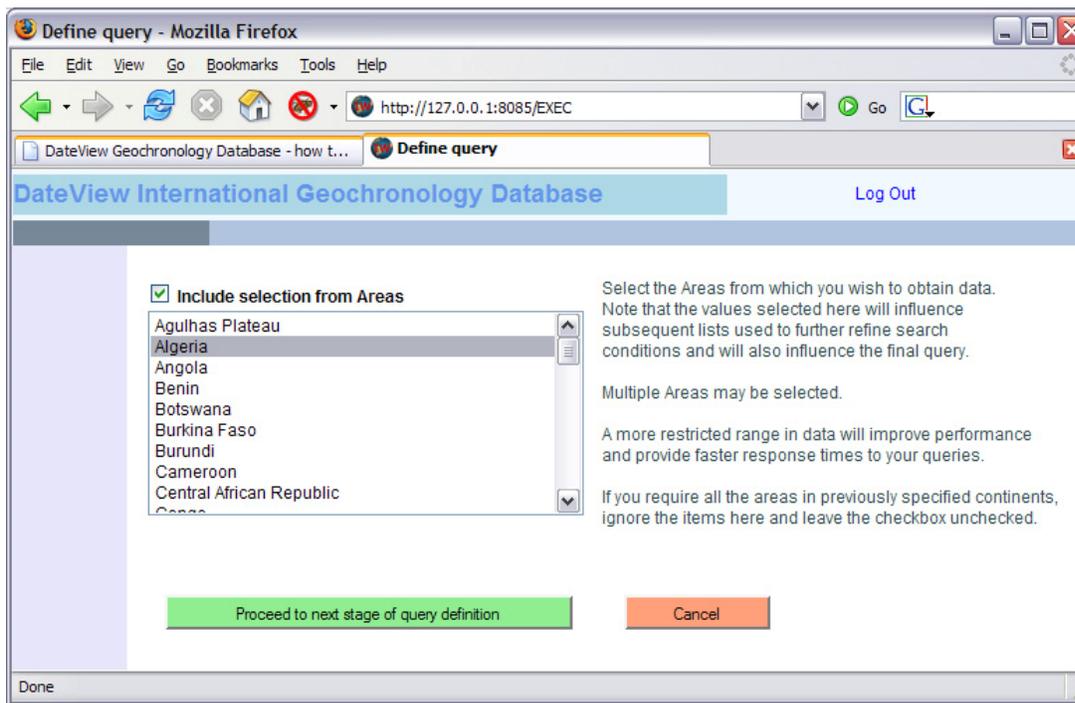
Done

Define a Query

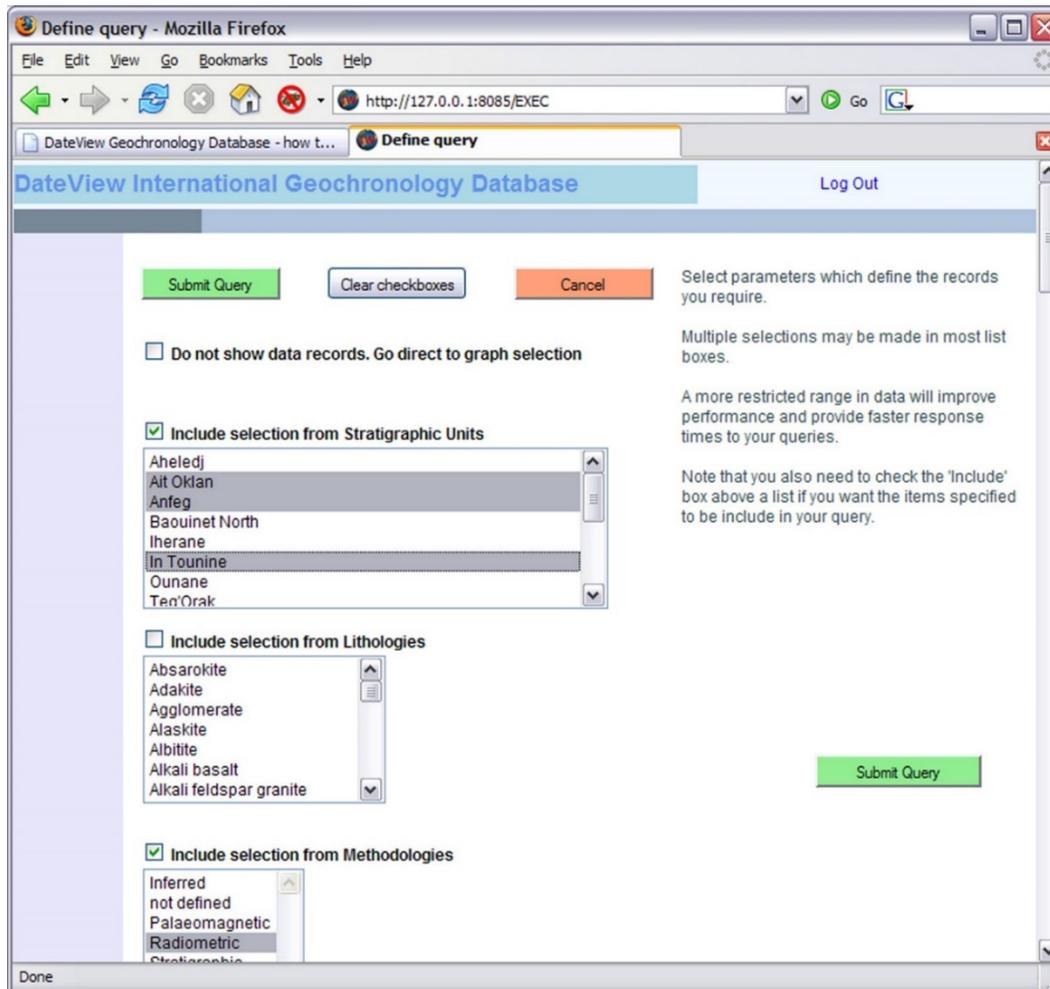
Query definition occurs in three steps. First, one needs to define the continents within which to search.



Then one needs to select areas (countries) which are expected to contain the data one wants. If no countries are selected (or the checkbox is not ticked), then all stratigraphic units in all the continents specified will form the basis of the third form.



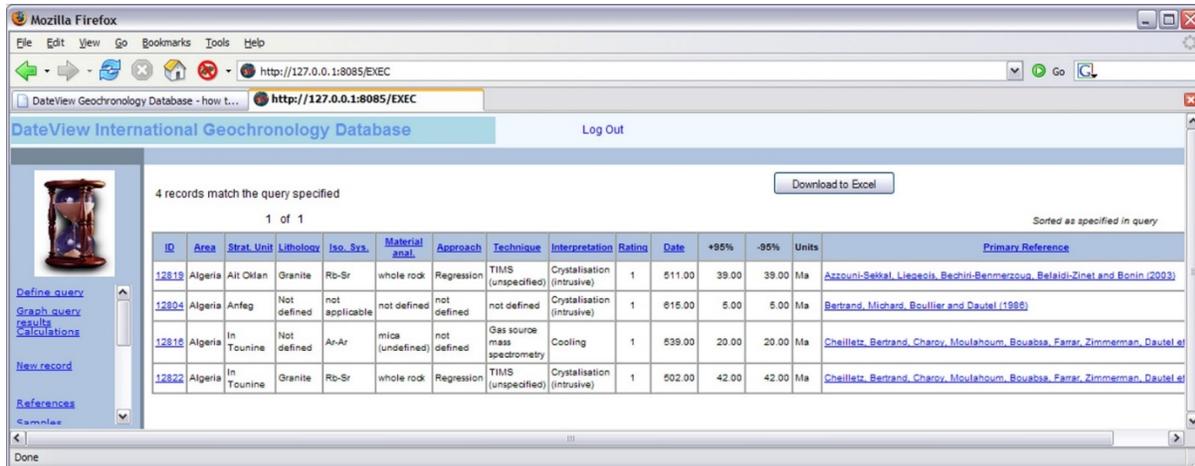
This brings one to a form in which one can select from a list of stratigraphic units, material analysed, interpretation, structural province, and many more.



Do not over-specify the query. For instance, it is not necessary to specify all the lithologies you might be interested in unless you specifically want to limit your search results to a select group of lithologies. Similarly, if you want all igneous ages from a particular country, it is not necessary to select each and every stratigraphic unit. Rather just select the two types of igneous crystallisation in the interpretation list (volcanic and plutonic crystallisation). If too many items get selected from some of the lists. The SQL query command created by the software interface will exceed the maximum length permitted by the database management system and the query will fail.

Query Results

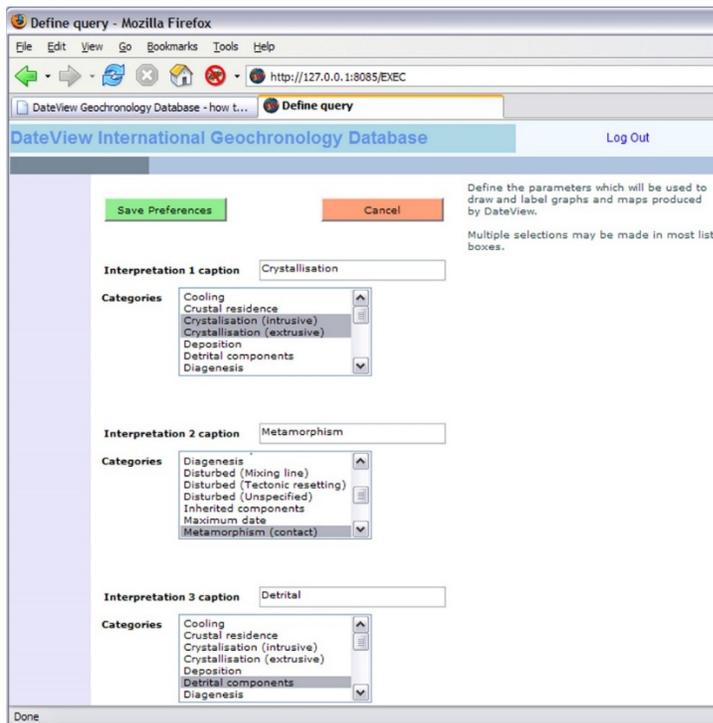
The results of the query are presented in a summary table. One can click on the column title to resort the records or on a hotlink unique record identifier at the left of each row to proceed to more detailed information for the record.



Buttons above the results grid provide a mechanism to download the query results to spreadsheets for offline use in other programs such as GIS. Note that, for situations such as GIS where one needs both attribute data and geographic locality data, one needs to download these separately (there are buttons for each operation) and then join the records in GIS or via a personal geodatabase, based on the field RecordID which occurs in both outputs.

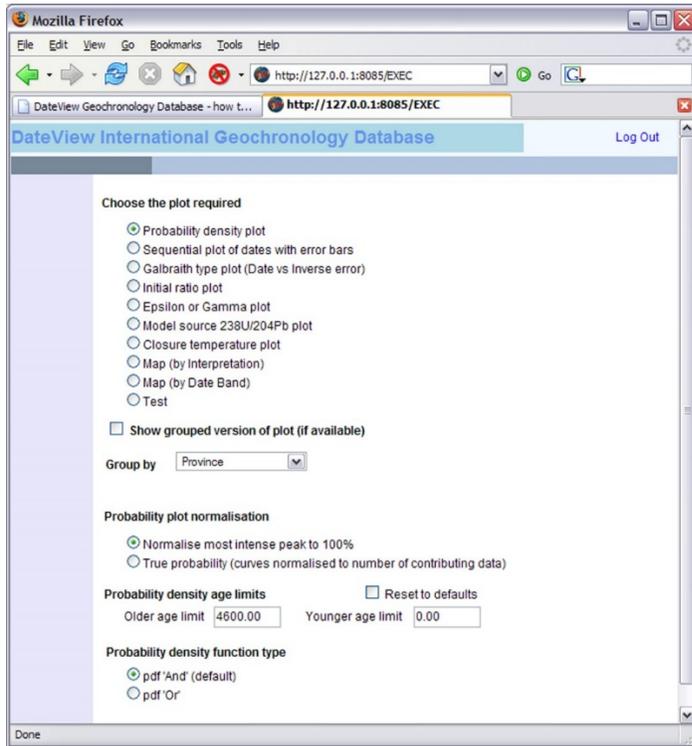
Defining Options

If one has not already done so, one may define a variety of options which control how graphs are to be created. To do so, click on the Options hotlink at the left of the main form. Be sure to save your options before continuing.

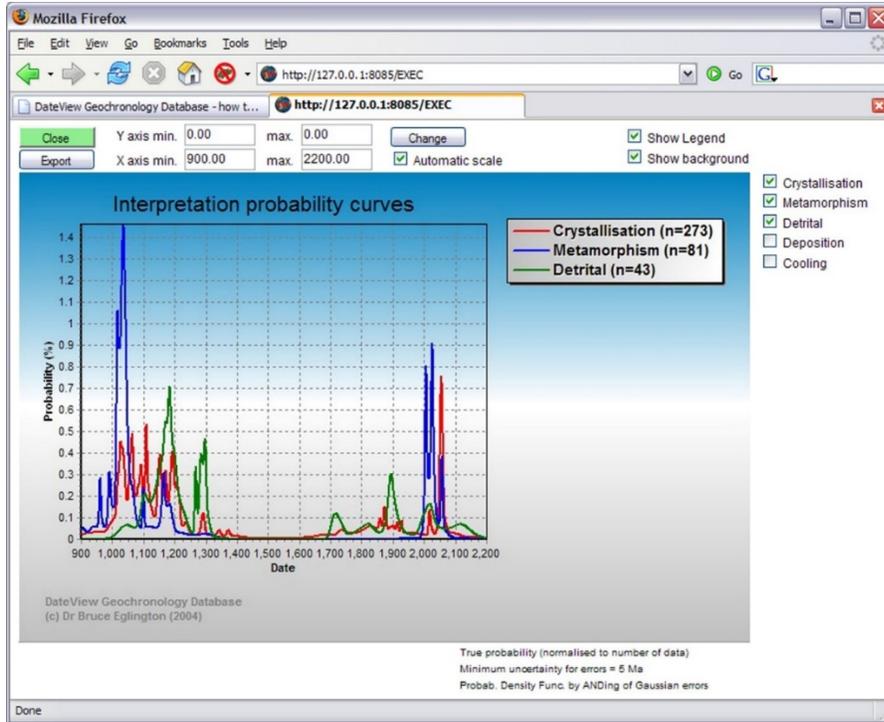


Graphing Data

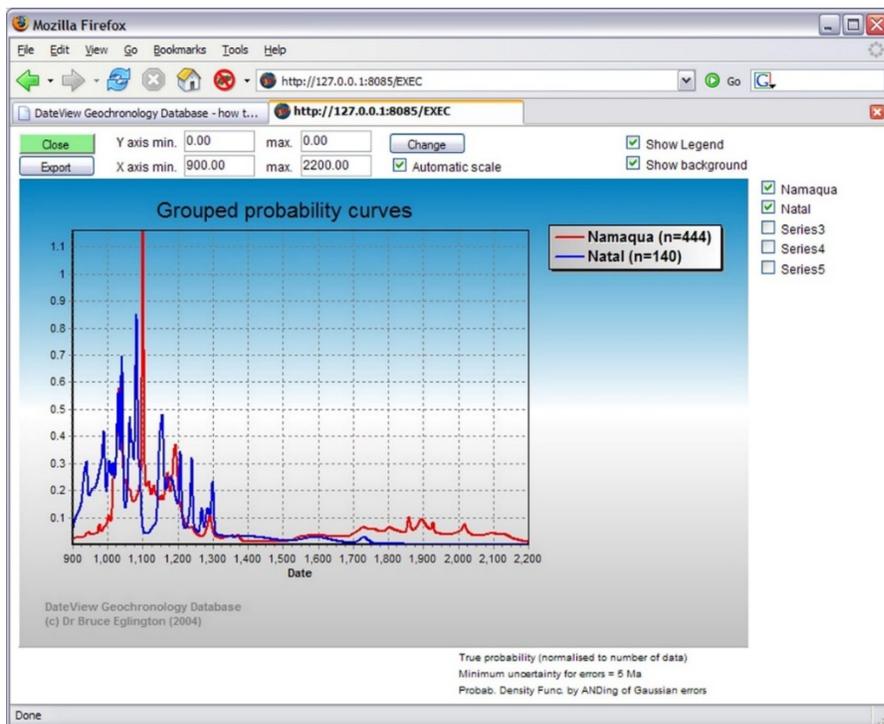
If one chooses to graph the data selected, there are a number of ways to do this.



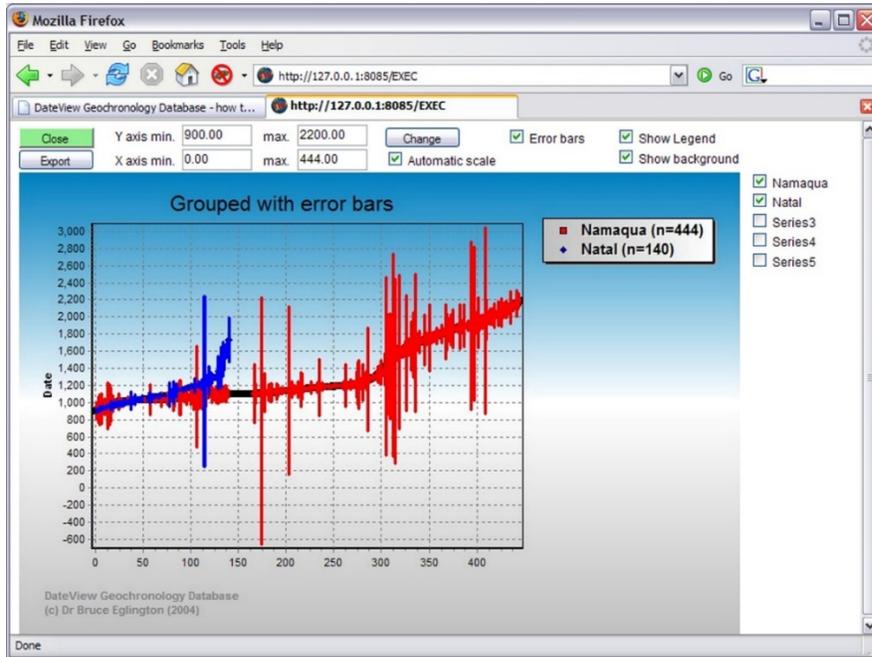
One may graph the dates selected in the form of a probability distribution function and may choose to modify the axis limits or (for users with 'Plus' permissions) omit particular interpretation categories from the graph.



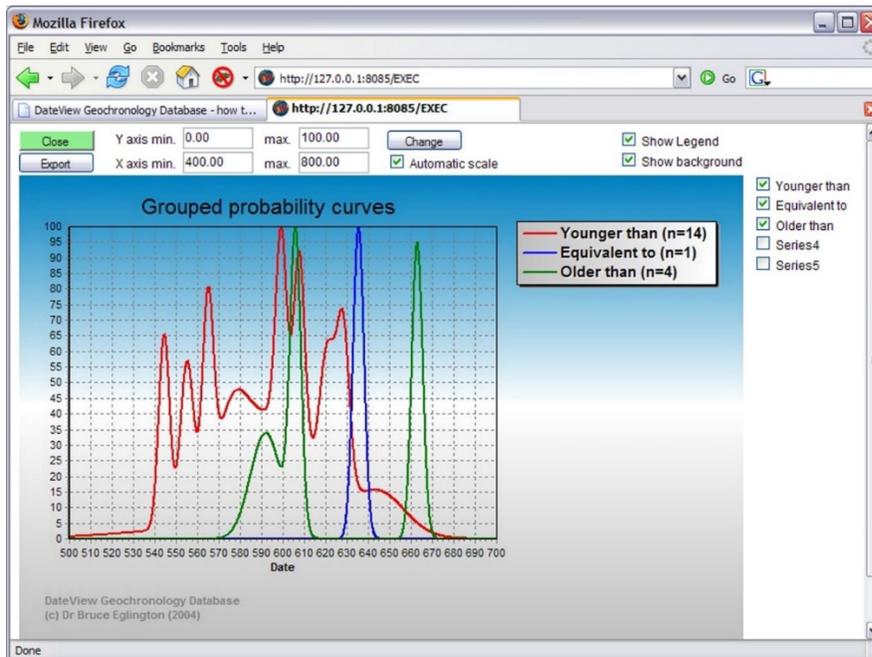
If the data selection is based on one of the grouping categories (structural provinces, terranes, geochemical association, tectonic association, etc), one can choose to compare these associations. The following graph does this for two structural domains from the Mesoproterozoic of southern Africa.



It is also possible to graph data as symbols with error bars. The graph below illustrates the same data as shown in the pdf above.

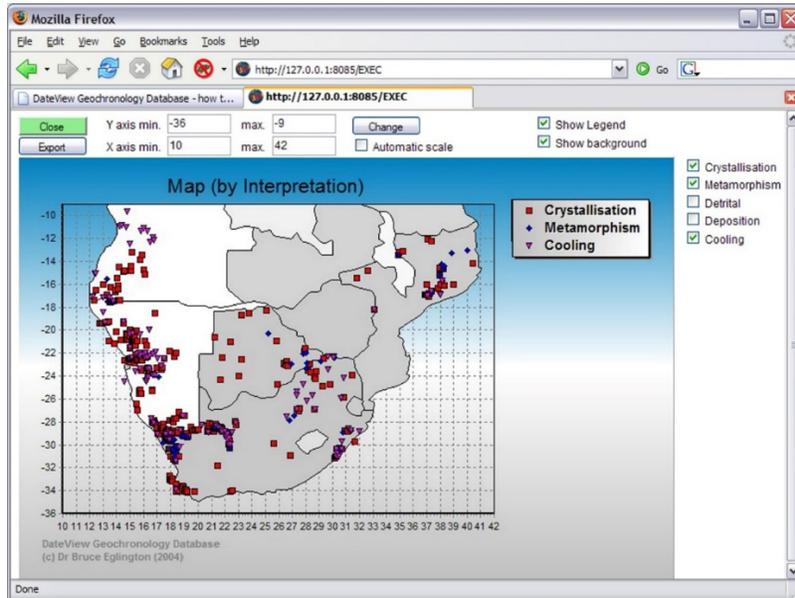


If one has selected data grouped by a specific boundary, one can graph these dates according to whether they precede, succeed or coincide with the boundary, as shown below for some dates for the Marinoan glaciation. With this approach, it is easy to identify dates which contradict others.

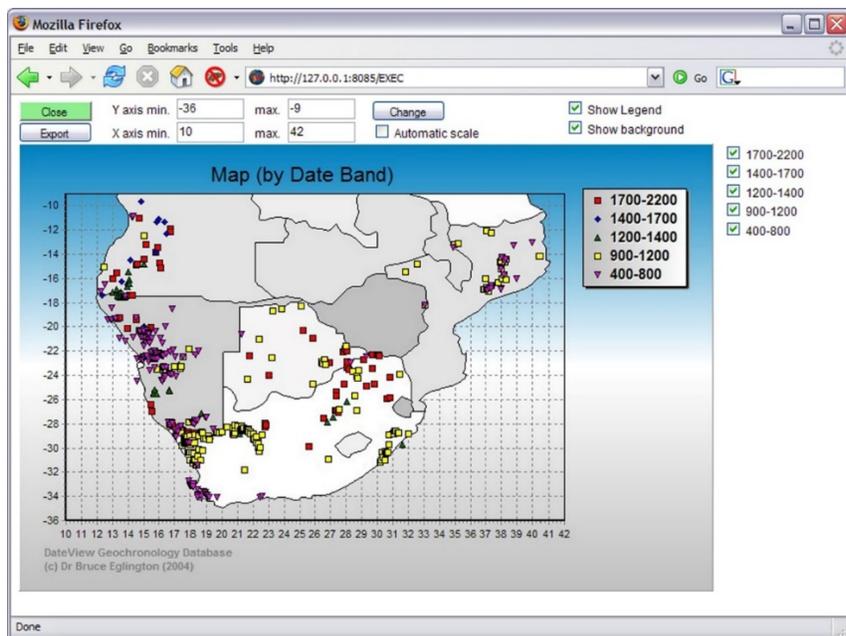


Data may also be graphed on a pseudo-map, utilising the same interpretations as in some of the graphs above. If all areas selected are from one continent, then the continent and its

countries are provided as a backdrop to the point data. Users may zoom in to particular latitude-longitude regions.



It is also possible to illustrate the data on a pseudo-map graph with symbols based on the five user-defined date bands.



Raw data may also be collated in DateView and presented in a variety of additional graphs, primarily with detrital data in mind.

Compiling and Submitting Summary Data for DateView

How data may be submitted

Data may be contributed to the DateView database in two ways:

- Enter individual records from within the DateView interface,
- Offline, by submitting compilations as Microsoft Access database tables or as Microsoft Excel spreadsheets.

This section refers only to the addition of new 'summary' results i.e. ages derived from one or more individual analyses. If you need to add the individual analyses, i.e. data which are termed 'raw' data in the DateView system, then you should check out a later section of this documentation for the methodology to apply.

Overview of online entry for new data records

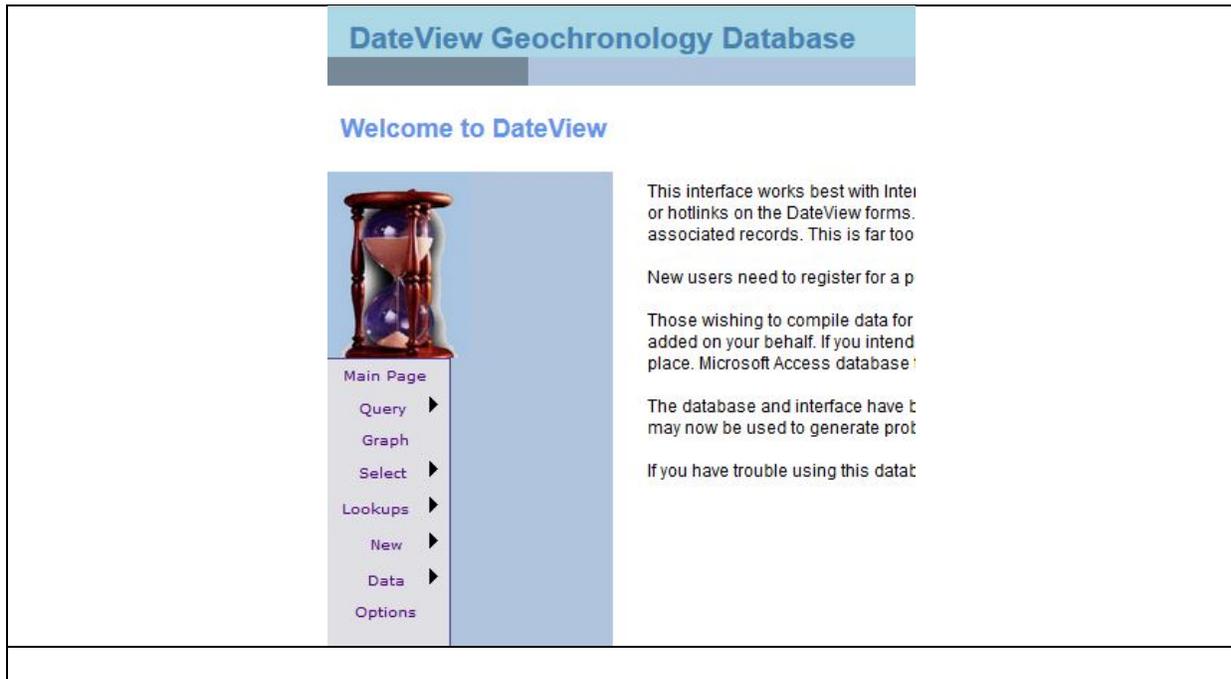
The first technique is the most robust in that it ensures that all referential integrity links are correct. This is most appropriate for small data sets. If you wish to contribute data in this way, you will need to email the database administrator your USERID so that you can be given permission to modify and insert records.

Whilst it is possible to enter various aspects of new data in a variety of orders, there is one sequence that is most efficient and which reduces the need to revisit multiple web pages to create new links to additional information. This sequence is:

- Connect to the StratDB interface and run a query to check whether the reference source for your new data is already in the system. If not, add the new reference source.
- While still in the StratDB interface, check whether the lithostratigraphic unit, deposit or large igneous province is already in the database. If not, create a new record entry with a basic level of information. In the case of lithostratigraphic units, be sure to export the unit name and ID to the DateView database by clicking on the appropriate button near the top right of the screen. You should receive a confirmation message indicating whether transfer was successful or not. Unsuccessful attempts generally indicate that a unit with the same name is already in DateView.
- Logout of StratDB and login to DateView
- Check whether the samples associated with the new geochronology or isotope geochemistry records that you plan to enter are already in the database. It is very important to ensure that samples with similar sample numbers (ID's) are the ones you want and from the appropriate geographic location. If necessary, create new entries and add geographic coordinate information. Ensure that the sample numbers (ID's) are unique, if necessary by adding an appropriate prefix. If the sample number is modified relative to that used in the publication, please store the original, published value in the 'Original number' field. All geographic coordinates are stored in decimal degrees with positions north and east of the equator and prime meridian being positive whereas those south and west are negative. Values should be relative to the WGS84 datum. For all practical purposes, NAD83 (for North America) and GDS80 (for Australia) are equivalent to WGS84. Values based on a different map datum should be converted to WGS84 before entry to DateView. Remember to enter precision estimates for the geographic coordinates, in particular where locations are estimated from small map diagrams.
- With all of these in place in the database system, you may start entering new 'summary' geochronology or isotope geochemistry records

Online entry for new 'summary' data records

Once you are sure that appropriate reference details are stored in StratDB and that all sample details have been entered in DateView, one can start to enter information for individual 'summary' records. The process starts with the 'New' menu item (shown below) and sub-menu item 'Record'.



You will be asked to select the continent, followed by country, for the data entry you plan to make. The image, below, shows an expanded drop-down list of permissible values for continents and oceans. Your choice here will limit the available countries in the next menu provided for countries / regions.

The screenshot shows the 'DateView International Geochronology Database' interface. At the top, there is a blue header with the title. Below the header, there are two buttons: a green 'Proceed to next step' button and an orange 'Cancel' button. The main area contains a 'Continent' dropdown menu. The dropdown is open, showing a list of continents and oceans: Australia + Oceania, Africa, Antarctica, Asia (highlighted in blue), Atlantic Ocean, Australia + Oceania, Europe, Indian Ocean, North America, not defined, Pacific Ocean, and South America. To the right of the dropdown, there is a text instruction: 'Specify the Continent within which the new record and samples are located. Note that the value specified here will influence subsequent lists.'

Below the drop-down list of areas (countries or regions), one needs to provide information which will limit the amount of information sent across the internet to every user. This limitation improves processing demands on the server, reduces network traffic and provides the user with shorter lists of items from which to choose in the next data entry window.

Specifications for the 'from' and 'to' fields need to take into account the way text strings get sorted on computers. All strings which look like numeric values (i.e. 0 to 9) get sorted before upper case letters (A .. Z) which get sorted before lower case letters (a .. z). The widest possible list of items is provided by setting constraints as '0' to 'zzz'. Make sure that your selection will provide the range of values you expect, otherwise you will end up with no values to select from in the next window.

One needs to enter selection constraints for unit name, the short reference field and unique sample number. If you want to create associations with specific geological province and terrane values (which must already exist in DateView), then limit the range of values for these fields, otherwise leave them blank. One can always populate these links later if needed.

DateView International Geochronology D

Area

Strat. Unit from **to**

Reference from **to**

Sample from **to**

Province from **to**

Terrane from **to**

DateView International Geochronology Database
Log Out

Stratigraphic unit	Xucun
Lithology	Granite (Megacrystic)
Material analysed	zircon
Isotope system	Lu-Hf
Approach	Model initial ratio assuming formation age
Technique	Sector Laser ablation ICP MS
Method	Radiometric
Interpretation	Model initial/epsilon/gamma/mu
Rating	3 - Geologically reasonable + statistically valid
Date =	792 + <input type="text" value="2"/> - <input type="text" value="3"/> Ma
Reference	Wang,L S Shu,Xing,Zhou,Tang,X J Shu,Qi,Hu(2012)

Accessible by

- Gold Fields of Namibia
- Gold Fields of South Africa
- In press
- Medig 01
- Published
- Rainbird and Rayner unpublished
- Submitted for publication

Laboratory	not defined
Sample	07XC-1-5
Province	<input checked="" type="checkbox"/>
Terrane	<input checked="" type="checkbox"/>

Submit new data record

Cancel and return to main page

Overview of offline compilation for new data records

The second technique is more convenient and faster for large data sets but requires more care from both the data compiler and the database administrator to ensure that there are no conflicts with data already in DateView. Compilers will need to ensure that values entered in the spreadsheets are the same as referential integrity values already in the database (or will need to organise for new key values to be added). Users may download spreadsheet summaries of the main lookup tables within DateView but a number of these are provided below for convenience. The most up-to-date values will, however, only be available direct from DateView. A main spreadsheet file, with columns suitable for most compilations, and a Microsoft Access database file are also provided below.

Of the two offline compilation methods, the Microsoft Access approach should be used whenever possible as it allows the compiler to check the integrity of the data during data capture. If necessary, lookup values may be downloaded from DateView and imported into the Access tables to ensure compatibility with existing records.

Compilers who intend to use both the StratDB and DateView databases should first compile the unit names and basic information in StratDB and then export the names and unique ID's to DateView, then download the unit names and import them to the MS Access DateView database. In this way, associations between the two databases will be automatic.

Main Submission Tables and Files

- [Excel spreadsheet](#)
- [Microsoft Access tables](#)

Lookup Values

- [Approaches](#)
- [Continents](#)
- [Countries / Areas](#)
- [Interpretations](#)
- [Isotope Systems](#)
- [Laboratories](#)
- [Lithologies](#)
- [Material Analysed](#)
- [Orogenic periods](#)
- [Techniques](#)

Using the MS Access database to compile summary data

It is relatively easy to compile data in the provided MS Access database but this approach does assume that you know your way around the program as one needs to work with individual tables and queries. No special interface has been created because users needing such an interface are expected to rather use the online web interface for DateView. If you are not sure of the relevance of some of the fields in the MS Access database, it may be useful running a few queries in DateView first and investigating values used for similar information.

It is often useful to change some of the default values for certain fields from the "design view" for specific tables so as to reduce the amount of typing needed. This is particularly useful if one person is compiling data for a single country in a given continent. Other fields which are usefully set as defaults in certain tables are IsotopeSystem and MaterialAbr

There is a logical sequence in which new data ought to be entered so as to avoid having to jump between tables and refresh data sets so as to have appropriate lookup values available. This sequence of activity is outlined below:

- Add your DateView userid to table USERS and make it the default userid for table ISOVALID.
- Create a list of unique RecordID values in the table RECORDIDS. These will later be modified so as to avoid conflicts with records already in DateView.
- Add the details for the source of the information being compiled into table SOURCELISTA. If the source reference already exists in DateView or StratDB, this value may be added. Alternatively, choose some arbitrary integer ID and this will be changed as necessary prior to importing data to DateView.
- Add sample names and locality information in table SMPLOC. If there is any chance that the sample number may conflict with another sample (quite likely for integer numbers or short strings), append additional characters to ensure that the sample

number will be unique when added to DateView. The original sample name may be entered in the OriginalNo field. Latitude and Longitude should be in decimal degrees (positive north and east, negative south and west) and be based on the WGS84 datum. Elevation, if recorded, should be in metres.

- Add the lithostratigraphic unit names in table SUITE with arbitrary integer Unit ID values. If you know that a unit already exists in DateView, use the unique value from DateView.
- Ensure that the laboratory at which the analyses were done is included in table LABORATORIES. If the laboratory and its ID are not already in DateView, please email the database administrator and ask to have it added to DateView.
- Now one is ready to start compiling summary data such as individual ages, etc in table ISORGR30. Each record must be associated with a unique RecordID and link to fields such as country, material analysed, simple interpretation, etc. To avoid problems introduced by different relational database management systems storing floating point numbers in different ways, users are also expected to multiply ages and age uncertainties by 1000 and truncate them for storage as integers in fields IAGE, IAGEPERERROR (95% confidence plus error) and IAGEMERROR (95% confidence minus error). The units used for the original ages may be either Ma (for most geological samples), ka (mostly archaeological or some young geological samples) and BP for young archaeological samples.
- Define links between the individual data records and their source references in table SOURCEA.
- Add statistical information in table ISOSTATISTICS for each record.
- Add analytical laboratory information in table ISOLAB.
- If the age is based on regression with a second relevant intercept, add this other intercept value in ISOOTHER.
- If there are initial ratios, mu, gamma or epsilon values associated with the records, add these in table ISOINIT.
- If some of your data are to be classified as confidential, add an appropriate value in table FORLIST. If all are to use this value make it the default value in table ISOFOR. When all data are compiled, run query INSERTISOFOR.
- Make your UserID the default value for the DoneBy field in table ISOVALID. Run the query INSERTISOVALID.

Your data are now ready to submit to the DateView database administrator for uploading to DateView. He will interact with you to check that all ID values are appropriate for the online database and do some basic data integrity checks prior to uploading the data, at which point you will be asked to check the new records in DateView.

'Raw' Isotope Data

It is also possible to compile 'raw' isotope data in DateView. More details of the procedures to follow are provided in a later section of this documentation. Essentially, the process entails offline data compilation in Excel spreadsheets, followed by the creation of a simple Excel template spreadsheet which defines what variables are stored in what columns of the compilation spreadsheet. A separate offline program is then used to import the data to a temporary database prior to uploading to the main database system

First steps in this process require users to determine the unique ID for the reference source for the data. This unique ID is an integer value. If the reference source is not already in

StratDB, create a new record and take note of its unique ID for entry into an appropriate column of the data entry spreadsheet.

The second step is to enter unique sample numbers (ID's) for each sample into DateView. Ensure that there is an exact match between the text in the database and in the compilation spreadsheet otherwise the process will not work or new data may be associated with inappropriate samples, potentially from very different sites.

The layout in Excel spreadsheets for raw data is up to the user except that variables are expected in columns with a separate row for each sample aliquot analysis. A separate 'data definitions' spreadsheet needs to be compiled, linking specific variable ID values to the columns in which the data are stored. The variable ID values may be downloaded from the lookups section of DateView and example spreadsheets are available from the database administrator.

These raw data are used in various diagrams and recalculations in DateView; in StratDB, a lithostratigraphy unit database which also draws on information from DateView and in Deplso, a database for isotope data for ore deposits. Detrital zircon U-Pb, Lu-Hf and O isotope data may be interrogated in DateView (for individual or multiple samples) and in StratDB (for multiple lithostratigraphic units). StratDB allows one to create a new form of probability distribution graph which illustrates grain age relative to deposition age while still capturing the essence of where major probability peaks occur.

If the ages for major peaks in probability distributions have been captured in DateView as summary detrital ages, it is also possible to extract all matching ages from selected regions from the DateView database, so obtaining a geospatial list of potential provenance sources which may then be plotted offline in a GIS package.

Any Other Issues?

If you are not sure of anything, please contact Bruce Eglington. It is much easier to sort it out at the beginning of a compilation than to make changes later.

'Raw' data Compilation

Overview

Most of the DateView interface evident to users exposes 'summary data i.e. data results derived from a series of individual analyses. Examples are weighted average ages, initial ratios, etc. The DateView database design allows users to compile individual 'raw' data for a variety of variables and these may be stored behind the scenes. Owing to the complexity of these 'raw' data, especially the variable order in which they may be presented by different publications, a separate offline compilation procedure has been developed. This process reads data for specific, predefined variables from Excel spreadsheets into a separate, offline database using a standalone program called DVRawData.exe. The data are stored in a local Firebird database which can then be emailed to the database administrator for uploading to the main DateView database.

The most common use for the 'raw' data option in DateView is to be able to work with detrital zircon U-Pb and Lu-Hf analyses but any 'raw' geochemical or isotopic data may be compiled. In addition to detrital zircon U-Pb and Lu-Hf analyses, other common data sets are igneous zircon U-Pb and Lu-Hf analyses, Sm-Nd and Rb-Sr whole-rock and mineral analyses or Pb-Pb analyses for rocks or minerals from ore deposits. The DepIso deposit database makes use of this structure with links to StratDB to facilitate the compilation of Pb-Pb, Re-Os, S and O isotope data for a variety of deposits.

In order to facilitate the process, users need to create an Excel 'template' file which defines what variables occur in specific column in each Excel data file. Every different arrangement of data requires a separate data definition template. Multiple template definitions may be provided in a single Excel template file, in which case the ImportSpec column distinguished between different definitions.

Steps to follow

The suggested process for compiling 'raw' data is as follows:

1. Download and install a copy of the DVRawdata program and database from the Saskatchewan Isotope Laboratory's software web page. Accept the default installation options or be prepared to change details in the DVRawData.INI file which should be stored in C:\ProgramData\EggSoft. Note that, at this stage, this program runs only under Windows as an operating system so Mac users will need to install it in a virtual box.
2. If you already use the Firebird database engine, from the Firebird organisation website (currently <https://www.firebirdsql.org/en/server-packages/>), and plan to access the 'raw' data database simultaneously from multiple programs, then you will need to modify the DVRawData.INI file to set "VendorLib=???\fbclient.dll" where ??? is the path to the fbclient.dll file on your computer. If not using separate instances of Firebird programs, accept the default installation situation for this software.
3. Download the list of acceptable, recognised variable definition names from DateView. If variables that you need are not already listed, arrange with the database administrator to have new variables added.
4. Download the list of accepted and recognised standards from DateView. Also ensure that standard values exist for each variable you plan to use when associated with the

standards utilised. Arrange with the database administrator to add new standards and standard values as necessary.

5. Add each new reference or source of the data to StratDB and take note of the unique integer value assigned to each reference source. You will need to enter this value as a field column in the 'raw' data Excel file for every row of data associated with this reference.
6. Add all new sample numbers to DateView, ensuring that you also define the lithology and provide latitude, longitude and, where appropriate, elevation values. Specify measurement precisions for the location variables.
7. Create a template file which defines which variables are associated with what columns in the data file (see further details later).
8. Run the DVRawData.EXE program, empty existing Sample Lists, Sample-Fraction combinations and Sample data if necessary.
9. Define and read in the data definition spreadsheet values.
10. Define and open the Excel spreadsheet containing the 'raw' data. Define the specific definition association to use (from a drop-down list of previously defined definitions), specify the first and last rows to be read, and start the process.
11. Iterate through as many data definition files and data files as you need to compile at any given time.
12. Transfer data from the SmpData table to both the SmpList and SmpFrac tables by using appropriate menu items under the main "File" menu item.
13. You may check aspects of your data compilation integrity from the "Check" menu item, including plotting several basic diagrams for user-selected samples and isotope systems.
14. Once completed, send the Firebird database file (typically DVRawData.FDB, stored in C:\Data\Firebird\) to the database administrator for uploading to DateView.

Structure of a data definition spreadsheet template

The data definition spreadsheet needs to be organised similar to the example provided in the figure below. The first column contains a unique name for each set of definitions (to allow one to read in more than one definition arrangement at a time), followed by a column with the order of each entry. Only the first six rows of each definition set must be provided with exactly the same values and ID's, all others may be in any order the user chooses. The required entries are:

Import Spec Name	Position	Variable ID	Column Letter	Isotope System	Normalising Standard	Standard Value	Normalising Factor
MyName	-5	RefNum		na	nd	1	1
MyName	-4	SampleNo		na	nd	1	1
MyName	-3	Frac		na	nd	1	1
MyName	-2	ZoneID		na	nd	1	1
MyName	-1	TechAbr		na	nd	1	1
MyName	0	MaterialAbr		na	nd	1	1

Note that the VariableID terms must correspond exactly with ones expected by the DateView database software (in content and case, without any inserted blanks). The same order (position values) must be repeated for each required definition setup. Isotope System for these variable should always be “na” and normalising standard should always be “nd” for these variables (see table above).

Additional variables, dependent on the specific set of ‘raw’ data to be entered, should start at a position value of 1 and increment upwards. Duplicate position values are not permitted

SpecName	Position	Variable ID	Column	Iso System	Normaliz	Standard	Normalizing Facto
MyUPb	-5	RefNum	A	na	na	1	1
MyUPb	-4	SampleNo	B	na	na	1	1
MyUPb	-3	Frac	C	na	na	1	1
MyUPb	-2	ZoneID	D	na	na	1	1
MyUPb	-1	TechAbr	E	na	na	1	1
MyUPb	0	MaterialAbr	F	na	na	1	1
MyUPb	1	IncludeThis	G	UPb	na	1	1
MyUPb	2	U_ppm	L	UPb	6266	1	1
MyUPb	3	Th_ppm	M	UPb	6266	1	1
MyUPb	4	ThU	N	UPb	6266	1	1
MyUPb	5	206Pb_ppm	O	UPb	6266	1	1
MyUPb	6	204Pb*206Pb*	P	UPb	6266	1	1
MyUPb	8	s204Pb*206Pb*	Q	UPb	6266	1	1
MyUPb	9	e204Pb*206Pb*	H	UPb	6266	1	1
MyUPb	7	208Pb*206Pb*	S	UPb	6266	1	1
MyUPb	8	s208Pb*206Pb*	T	UPb	6266	1	1
MyUPb	9	e208Pb*206Pb*	H	UPb	6266	1	1

Figure 3. Part of an example ‘raw’ data definition template.

Structure of a ‘raw’ data spreadsheet

The following three images illustrate different parts of a ‘raw’ data spreadsheets. The first shows some of the reference source, sample and fraction numbering, etc; the second shows some of the ratios, calculated ages and their uncertainties and the third shows some of the fields needed for plotting and compilation of probability distribution curves. The latter may be produced via DateView and StratDB or with a separate offline program called FitPDF (available from the software page of the Saskatchewan Isotope Laboratory).

A	B	C	D	E	F	G	H	I	J	K	L	M	N
RefNum	SampleNo	Frac	ZoneID	TechAbr	MaterialA	IncludeTh	ErrTypAct	ErrTypPC	Other	Spot name	U (ppm)	Th (ppm)	Th U
20151	FF-07-1-4-1	9560-2.1	nd	ICL	zr	1	0	1	FF-07-1-4	9560-2.1	599	257	0.44
20151	FF-07-1-4-1	9560-4.1	nd	ICL	zr	0	0	1	FF-07-1-4	9560-4.1	67	0.4	0.01
20151	FF-07-1-4-1	9560-10.1	nd	ICL	zr	0	0	1	FF-07-1-4	9560-10.1	480	78	0.17
20151	FF-07-1-4-1	9560-12.1	nd	ICL	zr	1	0	1	FF-07-1-4	9560-12.1	366	194	0.55
20151	FF-07-1-4-1	9560-13.1	nd	ICL	zr	1	0	1	FF-07-1-4	9560-13.1	464	237	0.53
20151	FF-07-1-4-1	9560-16.1	nd	ICL	zr	0	0	1	FF-07-1-4	9560-16.1	302	325	1.11
20151	FF-07-1-4-1	9560-19.1	nd	ICL	zr	1	0	1	FF-07-1-4	9560-19.1	383	641	1.73
20151	FF-07-1-4-1	9560-21.1	nd	ICL	zr	1	0	1	FF-07-1-4	9560-21.1	584	124	0.22
20151	FF-07-1-4-1	9560-24.1	nd	ICL	zr	1	0	1	FF-07-1-4	9560-24.1	438	173	0.41
20151	FF-07-1-4-1	9560-23.1	nd	ICL	zr	1	0	1	FF-07-1-4	9560-23.1	232	59	0.26

Figure 4. Example 'raw' data spreadsheet (1).

Note that every parameter value that needs to be compiled in the database must be associated with a reference source, SampleID, Frac and ZoneID and that the combination of SampleID and Frac needs to uniquely define the records so as to facilitate comparison of different variables. Column G, (above, relating to a VariableID called IncludeThis) specifies whether the original data source included or excluded the row of data (1=include, 0=exclude).

W	X	Y	Z	AA	AB	AC	AD	AE
^{208}Pb		Corr	^{207}Pb		^{206}Pb	$\pm^{206}\text{Pb}$	^{207}Pb	$\pm^{207}\text{Pb}$
^{238}U	\pm	Coeff	^{208}Pb	\pm	^{238}U	^{238}U	^{206}Pb	^{206}Pb
0.3549	0.0052	0.9566	0.12132	0.00057	1958.13	24.87	1975.69	8.39
0.4932	0.0169	0.7736	0.18226	0.00575	2584.39	73.31	2673.58	53.15
0.4677	0.0068	0.7634	0.16952	0.00234	2473.61	29.78	2552.88	23.31
0.4527	0.0069	0.9731	0.15727	0.00059	2407.35	30.74	2426.48	6.38
0.3335	0.0052	0.9127	0.11521	0.00086	1855.18	25.21	1883.15	13.50
0.5062	0.0557	0.8130	0.18578	0.01622	2640.48	242.95	2705.19	151.85
0.5588	0.0082	0.9690	0.21673	0.00084	2861.73	33.95	2956.59	6.29
0.4723	0.0068	0.9854	0.16434	0.00042	2493.48	29.88	2500.82	4.32
0.5739	0.0083	0.9780	0.21761	0.0007	2923.83	34.17	2963.06	5.17
0.3206	0.0048	0.9015	0.11393	0.00088	1792.72	23.62	1862.95	14.08
0.4503	0.0404	0.7445	0.1623	0.01485	2396.58	182.26	2479.76	163.18

Figure 5. Example 'raw' data spreadsheet (2).

AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP
conc %	PreferredAge	SigmaPrefAge	Incl.	DepositionAge		Data	Sigma	Depos	Extra
99.1	1975.69	8.39	1	1615		1975.69	8.39	1615	0.44321
96.7	2673.58	53.15	0	1615					
96.9	2552.88	23.31	0	1615					
99.2	2426.48	6.38	1	1615		2426.48	6.38	1615	0.5492
98.5	1883.15	13.50	1	1615		1883.15	13.5	1615	0.52689
97.6	2705.19	151.85	0	1615					
96.8	2956.59	6.29	1	1615		2956.59	6.29	1615	1.72852
99.7	2500.82	4.32	1	1615		2500.82	4.32	1615	0.21897
98.7	2963.06	5.17	1	1615		2963.06	5.17	1615	0.40714
96.2	1862.95	14.08	1	1615		1862.95	14.08	1615	0.26332
96.6	2479.76	163.18	0	1615					

Figure 6. Example 'raw' data spreadsheet (3).

Most numeric variables, especially the isotope ratio variables, need to specify both the variable value, a one sigma uncertainty and the nature of the uncertainty. If original values in source spreadsheets are 2 sigma or 95% confidence, then columns should be added to convert these to 1 sigma. Since the uncertainties are sometimes quoted as percentages and at other times in absolute terms, one also needs to specify the nature of the uncertainty. Columns H and I in the example above facilitate this and the template file will refer to whichever column applies. For examples, column W (below) contains the $^{206}\text{Pb}^*/^{238}\text{U}$ ratio for a spot analysis while column X contains the 1 sigma uncertainty, expressed in absolute terms (hence a value of 0 is drawn from column H). The definitions for these variables would be:

Import Spec Name	Position	Variable ID	Column Letter	Isotope System	Normalising Standard	Standard Value	Normalising Factor
MyName	21	$^{206}\text{Pb}^*/^{238}\text{U}$	W	UPb	6266	1	1
MyName	22	$s^{206}\text{Pb}^*/^{238}\text{U}$	X	UPb	6266	1	1
MyName	23	$e^{206}\text{Pb}^*/^{238}\text{U}$	H	UPb	6266	1	1

These variables all belong to the U-Pb system and were measured relative to the standard "6266". No specific values or additional normalisation relative to the standard is required so the StandardValue and NormalisingFactor are both specified as having values of 1.0.

GIS Aspects of Creating Time-Space Correlation Charts

Overview

As described earlier in this document, StratDB provides an interface page from which one can download various spreadsheets in which data are ready organised for direct import into a personal geodatabase and use in GIS. Some examples of the various spreadsheet outputs include:

- Lithostratigraphic units – spreadsheet links units to each domain column in the correlation chart, including X and Y plot values. Unit names, various geodynamic, rockclass and deposition setting values are provided; together with X, Y coordinates for the nodes defining rectangular boxes for each unit. Igneous intrusive units are automatically offset to the right of volcanosedimentary units and the width of the boxes relates to lithostratigraphic hierarchy with more 'senior' classifications being wider than more 'junior ones e.g. Supergroup is wider than Group which is wider than Formation.
- X, Y coordinate values for columns delineating each domain on the chart
- X, Y coordinates and heading string values for each domain column
- X, Y coordinates and definition codes for boxes to represent metamorphic and deformation episodes
- X, Y coordinates and attribute values for geochronology symbols within each domain column
- X, Y coordinates of probability distribution curves for various classifications of geochronology information for each domain column

More to be added later.