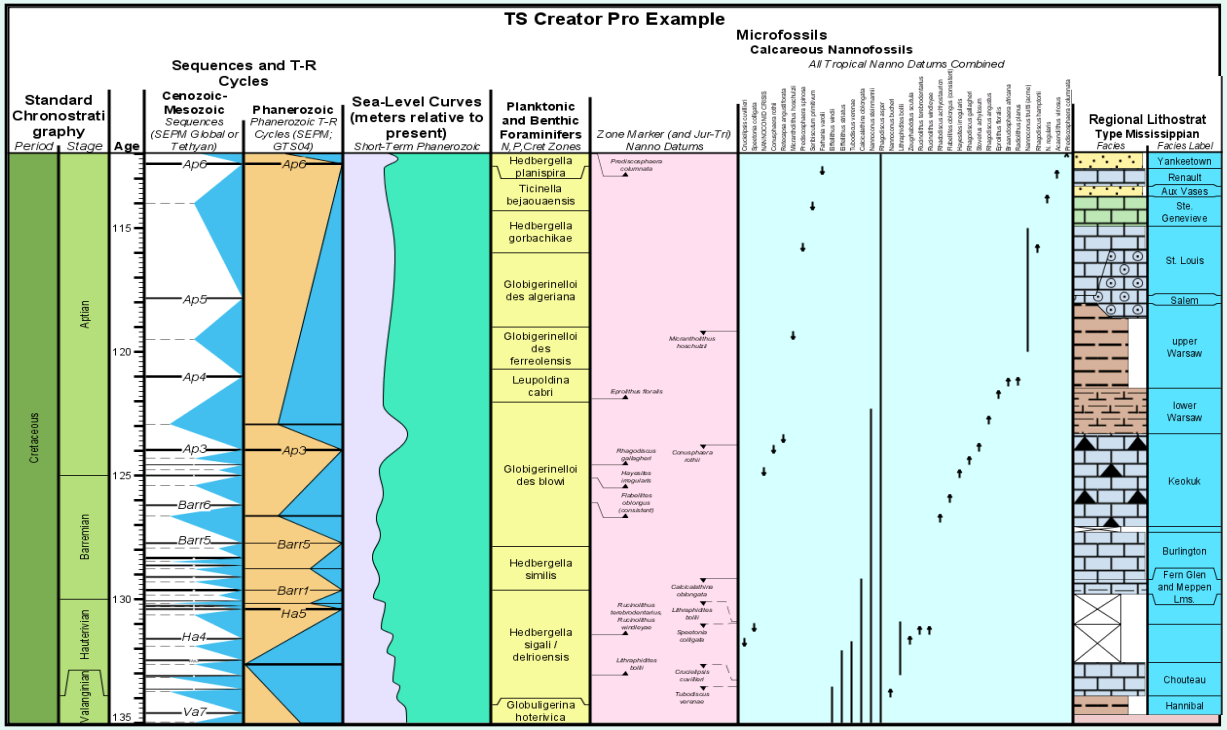
This manual is provided courtesy of: ExxonMobil

Time Scale Creator Manual



TimeScale Creator creates on-screen and downloadable charts of any portion of the geologic time scale with your choice of bio-, magneto-, chemo-, litho- and other events in Earth History.

The *TS Creator* ***Pro*** can load and modify data. Custom data can be created.

Time Scale Creator Manual Contents

TS Creator Features

- *TimeScale Creator* provides screen display of user-selected time-span and selected columns of geologic time scale information such as stages, paleo, magnetics, sea-level curves, chemistry, etc. Vertical scale, column width, color, titles, column ordering, range display and other features are designated by the user. Mouse-activated pop-ups provide additional information on columns and events.
- You can save the final chart as an SVG, PDF or Bitmap (PNG/JPG) file. Bitmaps can be imported into Petrel.
- The columns of biologic, geochemical, sea-level, magnetic and other information have been cross-calibrated by a generation of earth scientists. The age of all these events is computed according to their observed or statistical occurrence relative to each other, to astronomical-climate cycles and to radiometric-age control.

Public *TimeScale Creator* and the PRO version

- *TimeScale Creator* (public version) will now you to upload external datapacks and make screen displays; however, this will disable the ability to save charts as SVG or PDF.

- *TimeScale Creator* ***PRO*** (*licensed version*) allows uploading, modifying and saving datapacks; plus saving all products as SVG or PDF. PRO also includes access to several other specialty datapacks.

- In this Manual, the pages which concern datapack formatting, or items specific to PRO, will have a light-brown background color.

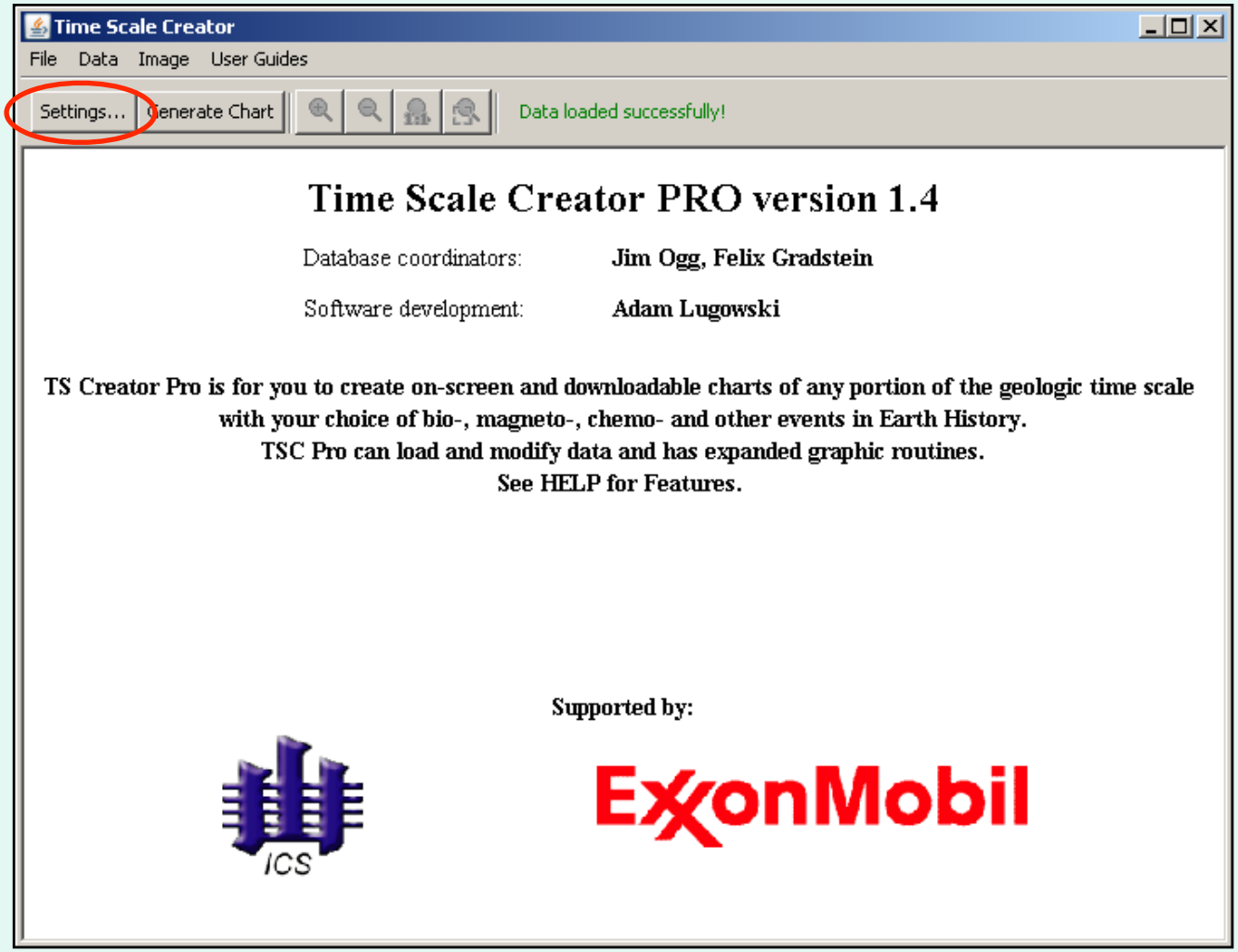
Getting Started (both public version, and PRO version)

When the program starts, it automatically loads the ***default datapack*** of over 200 stratigraphic columns grouped into categories spanning the past 550 million years with approximately 15,000 event-ages.

A copy of the default datapack can be saved and edited, but the original datapack is not editable.

First step:

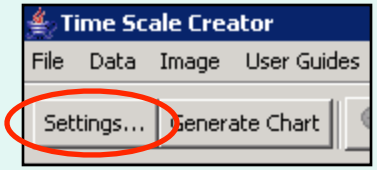
Click on Settings to specify chart parameters.



Workflow: Settings

To generate a chart, first click on **Settings** to describe the chart.

Fill in the parameters in the **'Choose Time Interval' tab.**



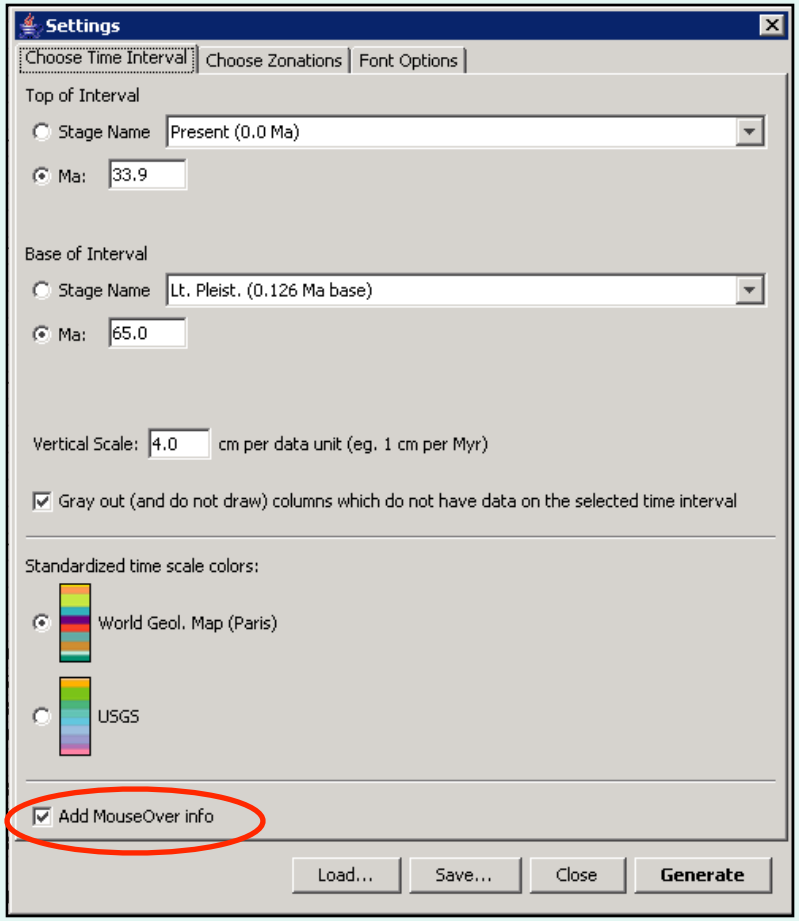
Select **Top and Base of Interval** to be displayed by either Stage Name or by a specific age (in millions of years).

For a first run, try limiting the time span to 100 Myr or less.

Input a **vertical scale** in cm per Myr

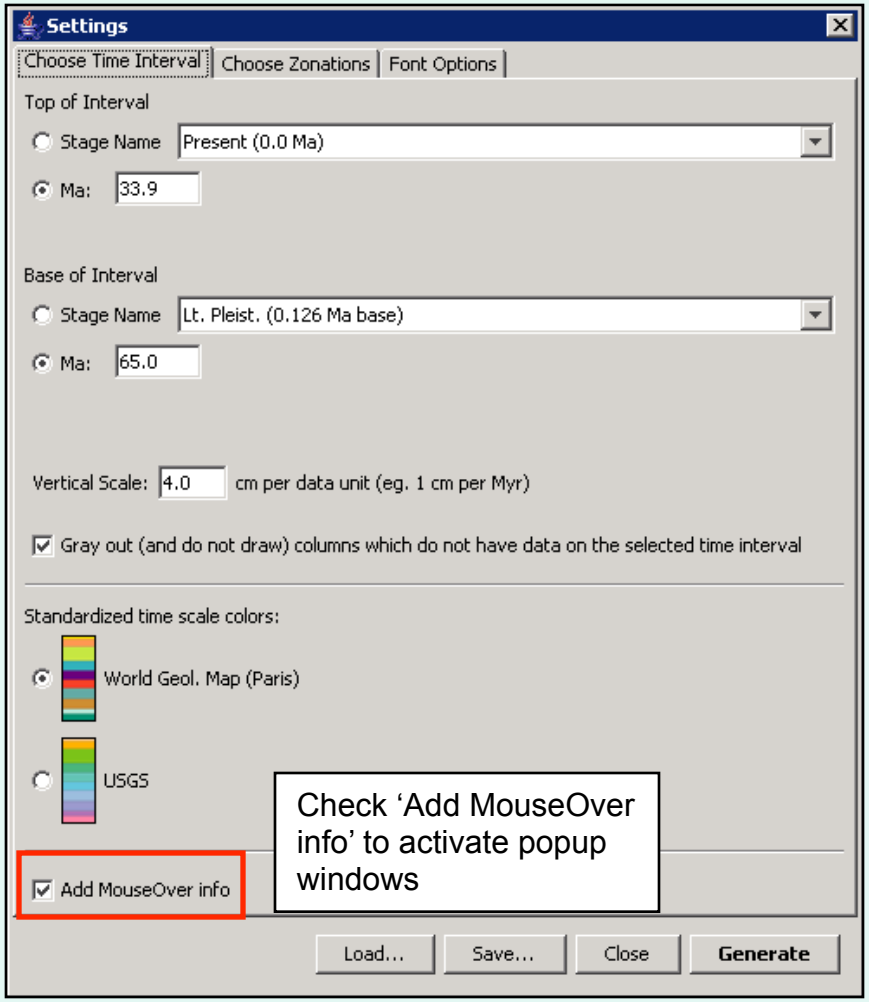
Select a **color** set

Allow **popups**

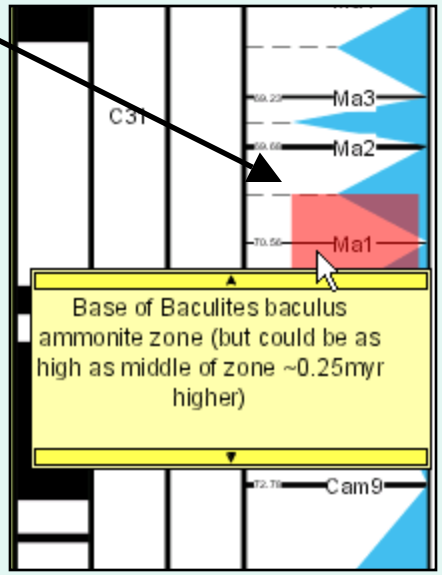


Pop-ups

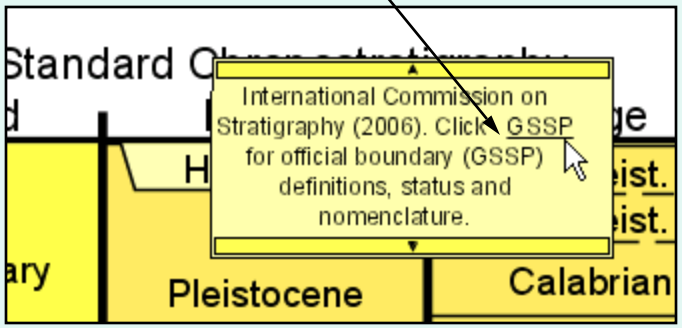
Popups (or MouseOver info) are windows which contain extra information that does not fit into a standard chart. Most Header rows and many data rows support a popup. When enabled in Settings, popups appear as **red highlighted areas** as the cursor is placed over an item. Clicking on the red area will bring up the popup window.



Check 'Add MouseOver info' to activate popup windows



Note: Some popups contain internet links.

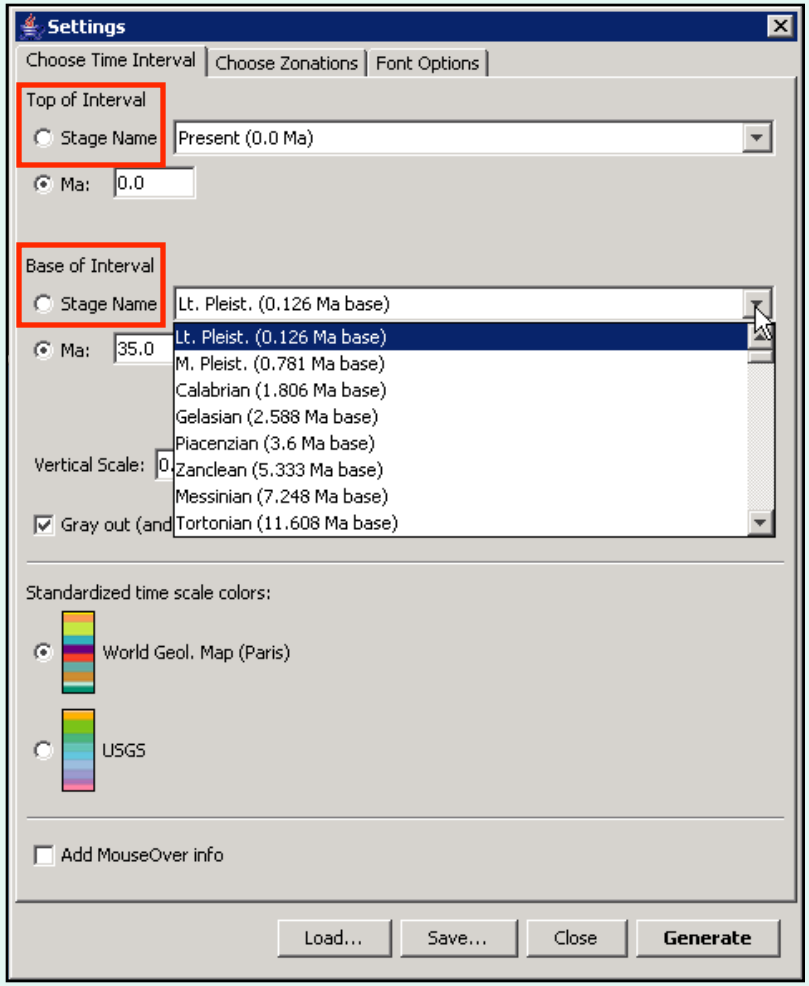


Settings: Top and Base of Interval - Stage Names

TS Creator reads **Stage Names** for Top and Base of Interval (in Settings) directly from the datapack's **Standard Chronostratigraphy column, Stage data**.

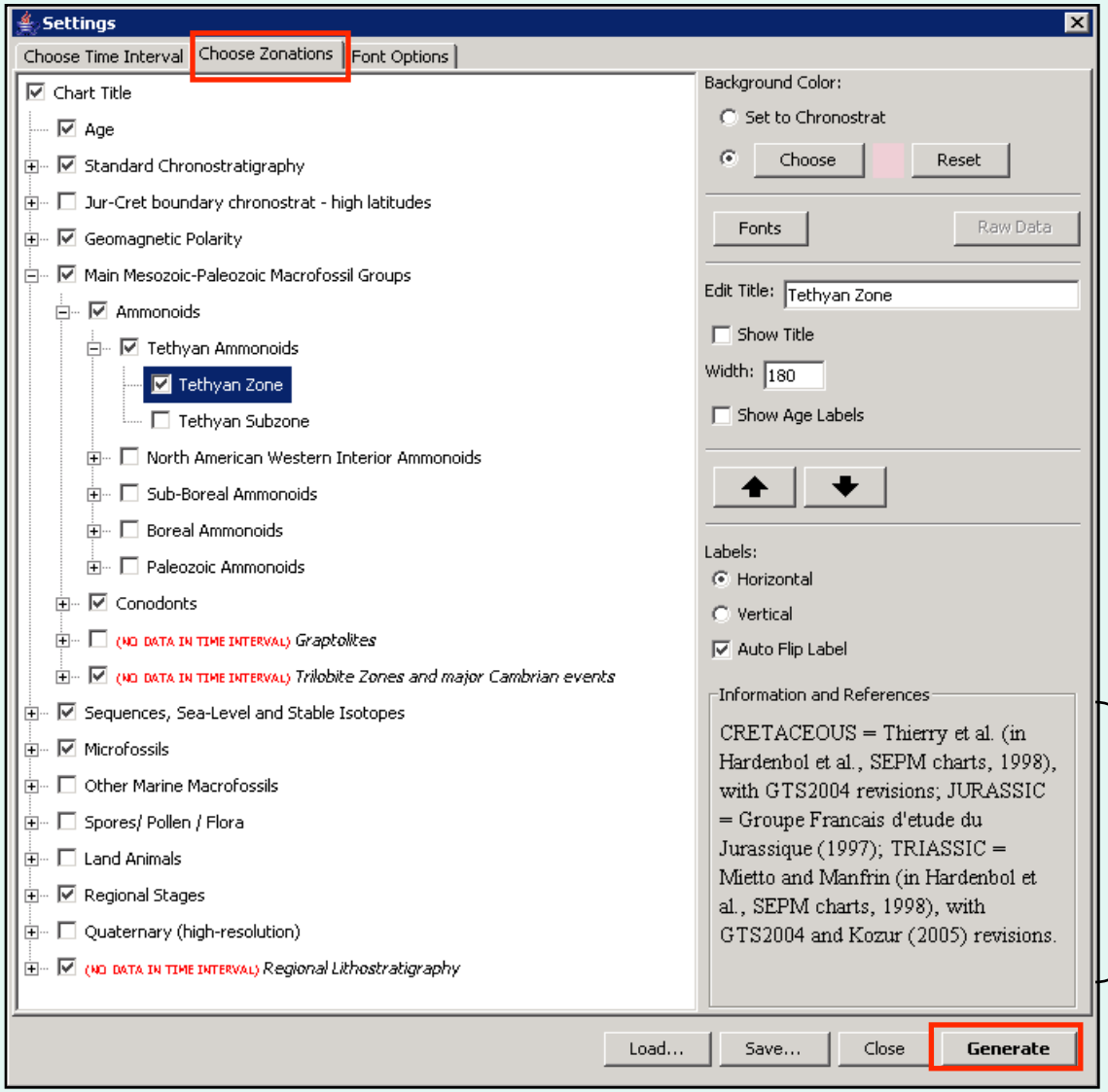
Datapack:

Stage	block	100	USGS
	TOP	0.0117	
	Lt. Pleist.	0.126	dashed
	M. Pleist.	0.781	dashed
	Calabrian	1.806	solid
	Gelasian	2.588	solid
	Piacenzian	3.6	solid
	Zanclean	5.333	solid
	Messinian	7.248	solid
	Tortonian	11.608	solid
	Serravallian	13.82	solid



Note: if the datapack does not contain a Standard Chronostratigraphy column or a Stage sub-column, the Stage Name selection will be blank in Settings, and top and base will have to be input in millions of years.

Settings: Choose Zonations Tab



In the **Choose Zonations** tab, **select columns** and sub-columns for display in the chart.

Red text indicates where there is no data for an item in the time interval specified.

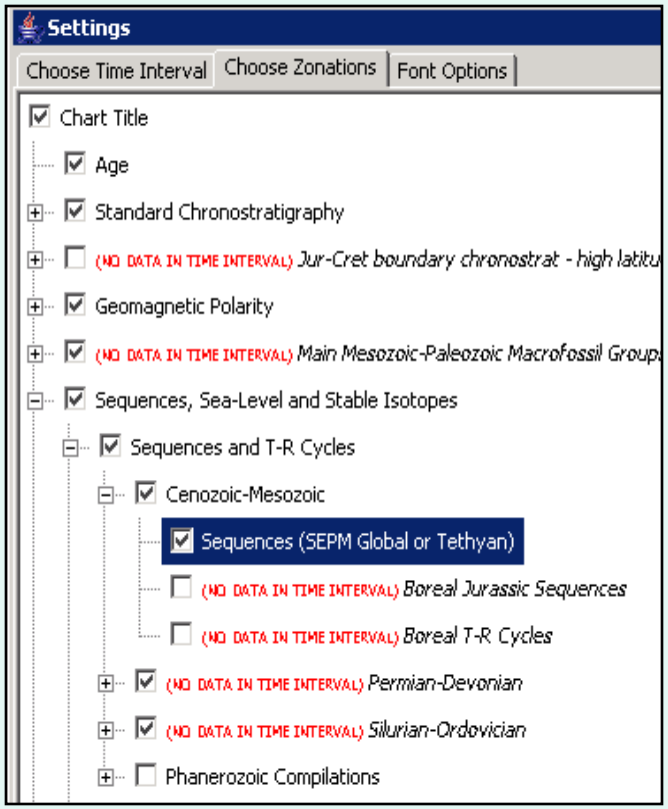
The right side of the window allows editing of the display for the highlighted column: turn features on or off, title, line display features, horizontal ranges, fonts and colors, background color, age labels, column width, label orientation, etc.

'Information and References' for the highlighted column is shown here. (This text is the **popup** information that will appear in the column header.)

Click on **Generate** to create a chart.

Settings: Choose Zonations Tab

Expand each category to select sub-columns.

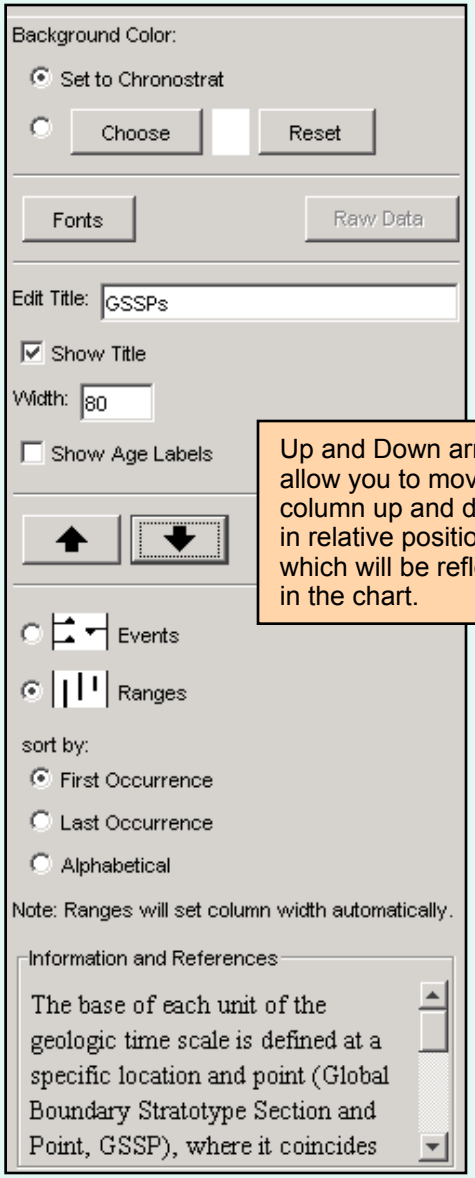


Highlight a column or sub-column to activate its parameters panel

Parameters to Set: (varies with column type)

- Color of background
- Title
- Column width
- Text Fonts
- Age labels
- Relative column arrangement
- Choice of range or event chart display
- Sort criteria

>Also displays popup Information and References



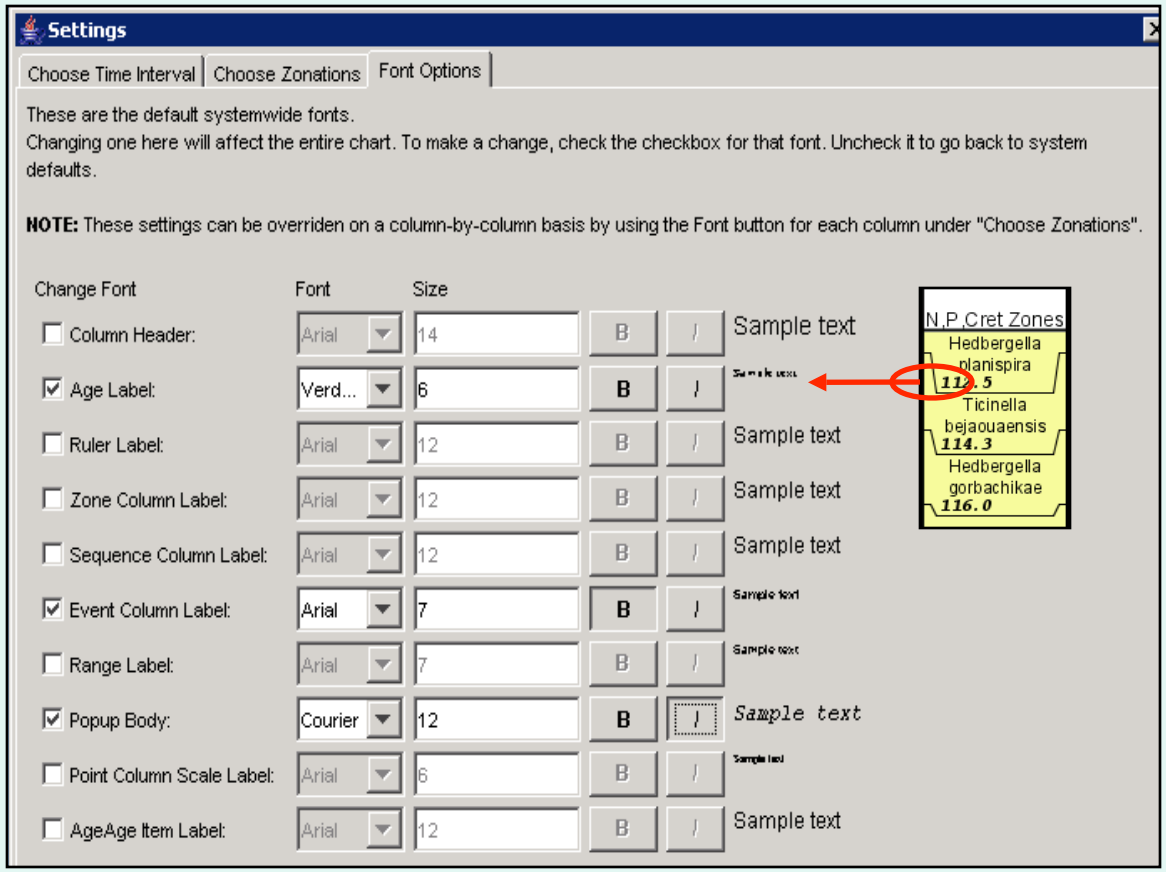
Up and Down arrows allow you to move a column up and down in relative position which will be reflected in the chart.

Settings: Fonts

Font Options tab: change font appearance for all columns in the chart. These settings can be overridden on a column-by-column basis by using the Font button for each column (and sub-columns) under the Choose Zonations tab.

Text affected:

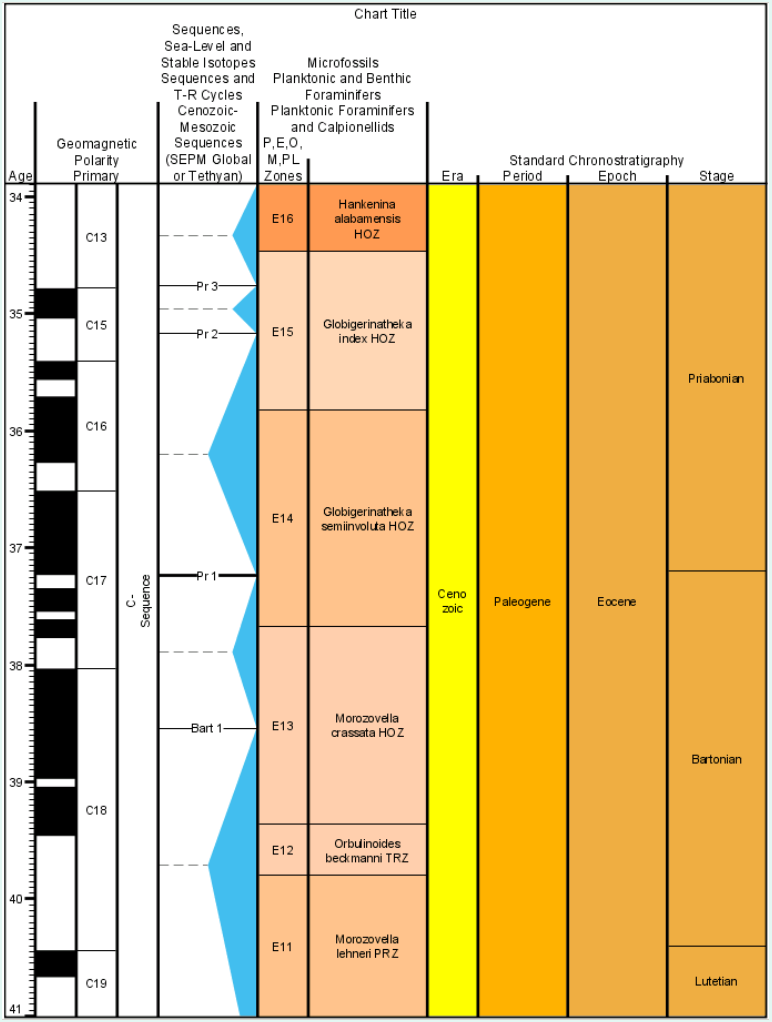
- **Column Header**: all Column Header Text.
- **Age Label**: age labels inside any column (except the Age column)
- **Ruler Label**: age labels inside the Age column
- **Zone Column Label**: text inside Block columns and Chron and Facies Label and Series columns
- **Sequence Column Label**: text inside Sequence and Trend columns
- **Event Column Label**: text inside Event columns with Event displays. (does not affect Event columns with Range displays)
- **Range Label**: fossil names in the header of an Event column with a Range display
- **Popup Body**: the Popup window text
- **Point Column Scale Label**: the scale range values in the header of a Point column



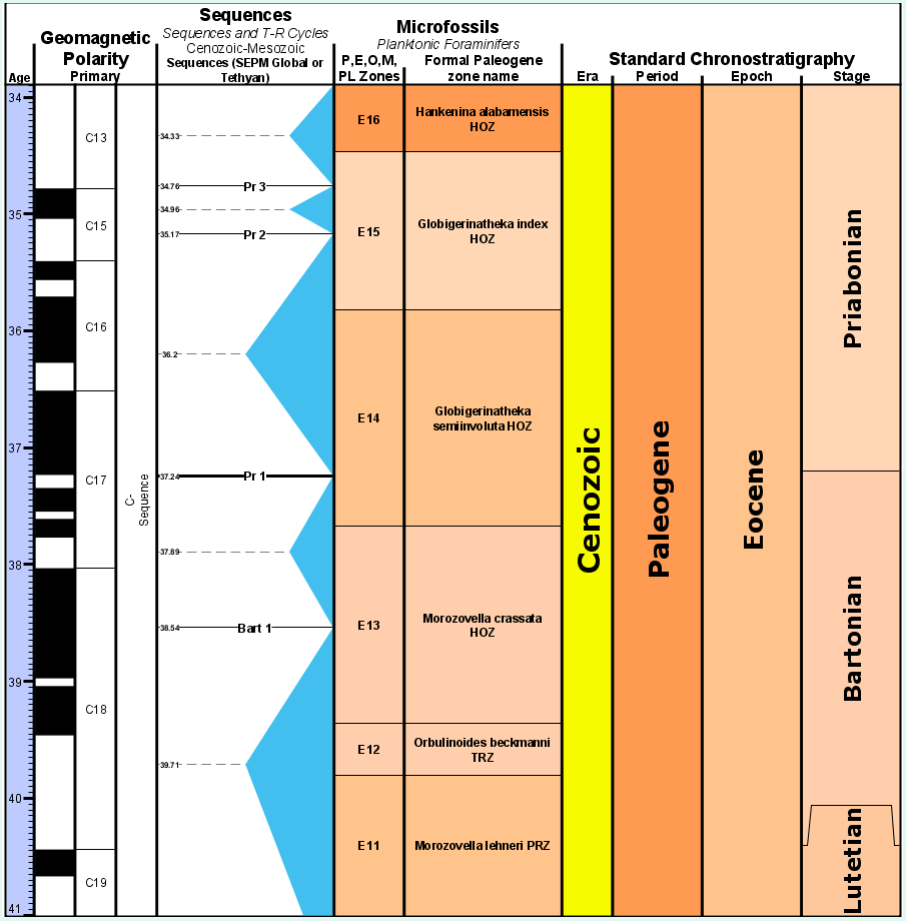
Note: You can find the **column type** for each column listed in Choose Zonations by examining the datapack in Excel.

Settings: Fonts

Default chart: all fonts are the same size

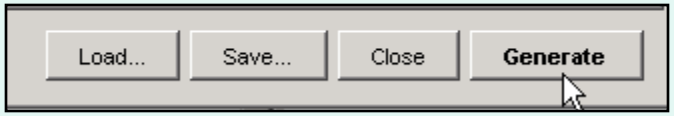


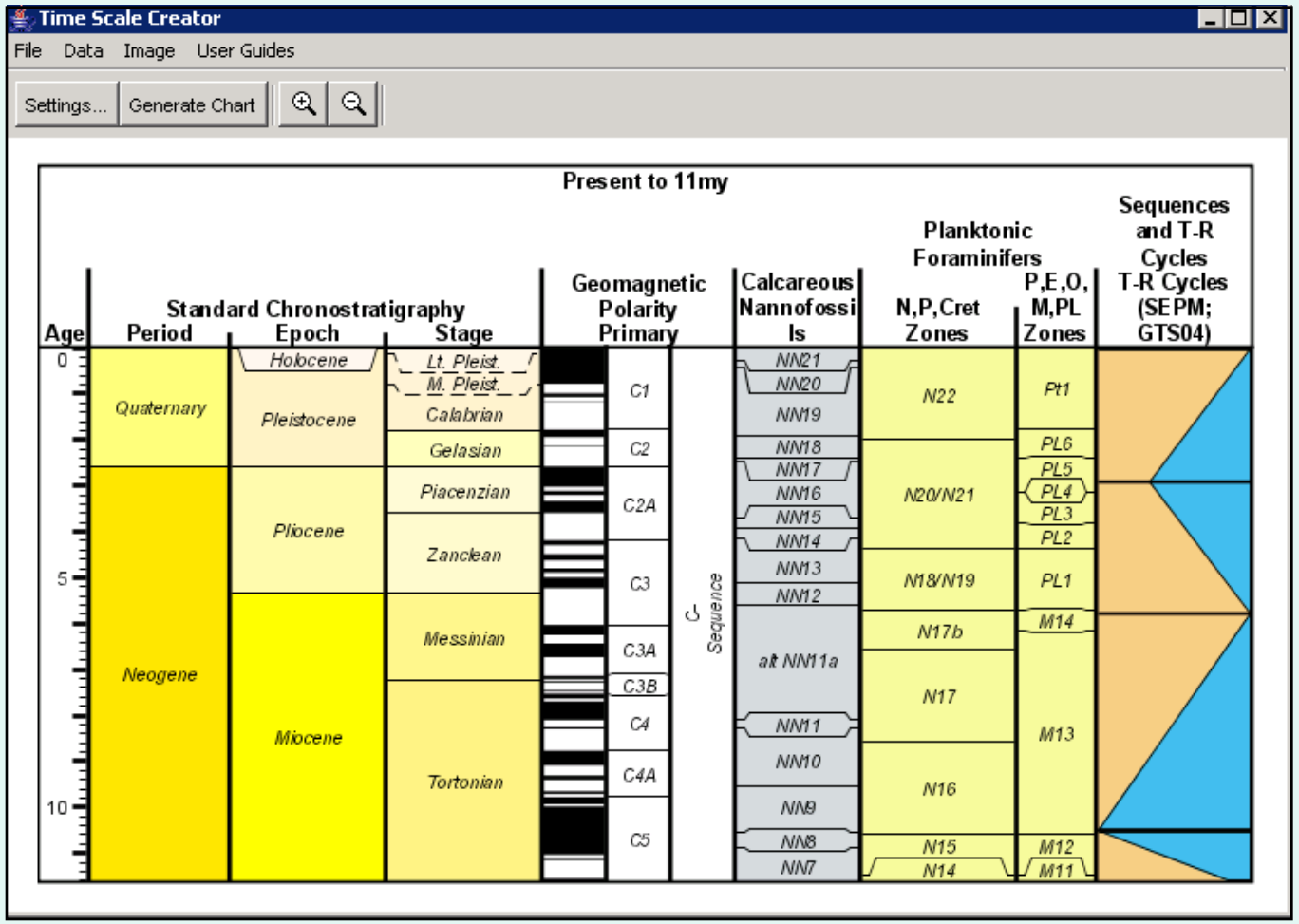
Edited chart: varying font size, type and other parameters results in a more readable chart.



Generate a Chart

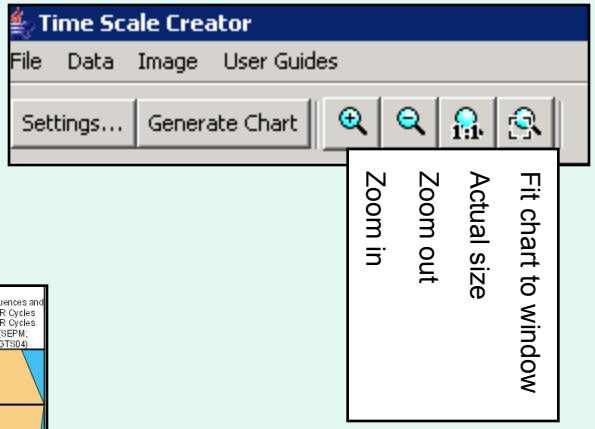
Click on **Generate** to create the chart

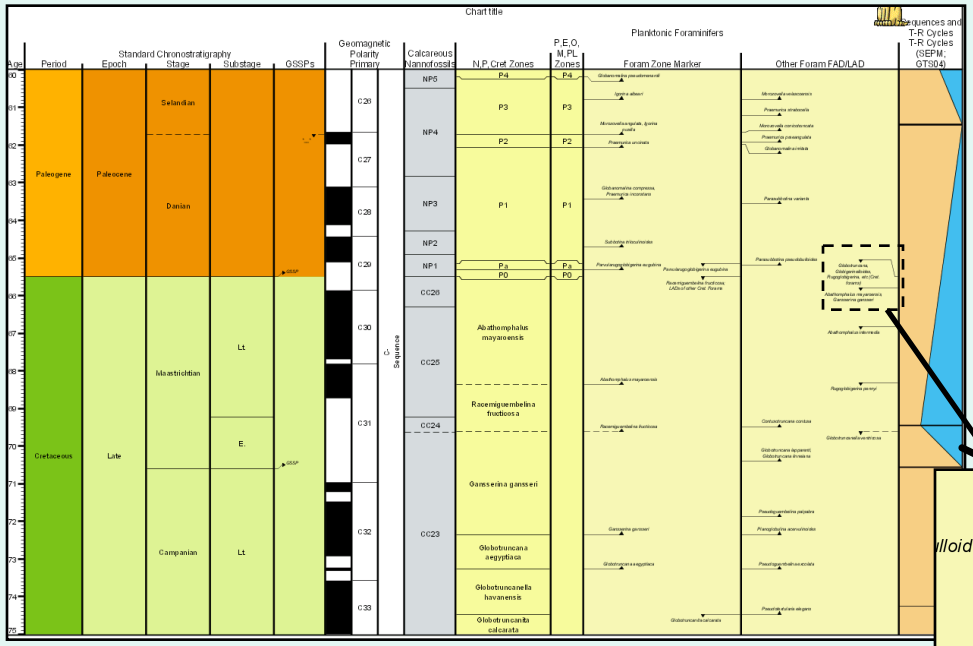


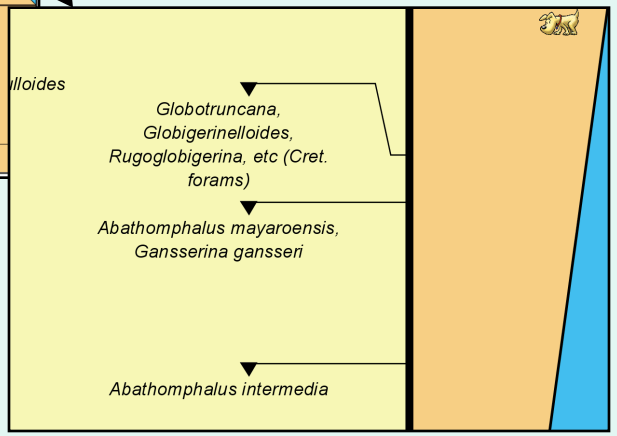


Zoom Options

Zoom buttons are located in the main window, and under the Image pull-down.





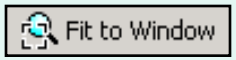


WINDOWS: Use **<CNTRL> MB1** and sweep to window-in on a portion of the display. MAC: Use **<CNTRL> Left-Mouse** and sweep.

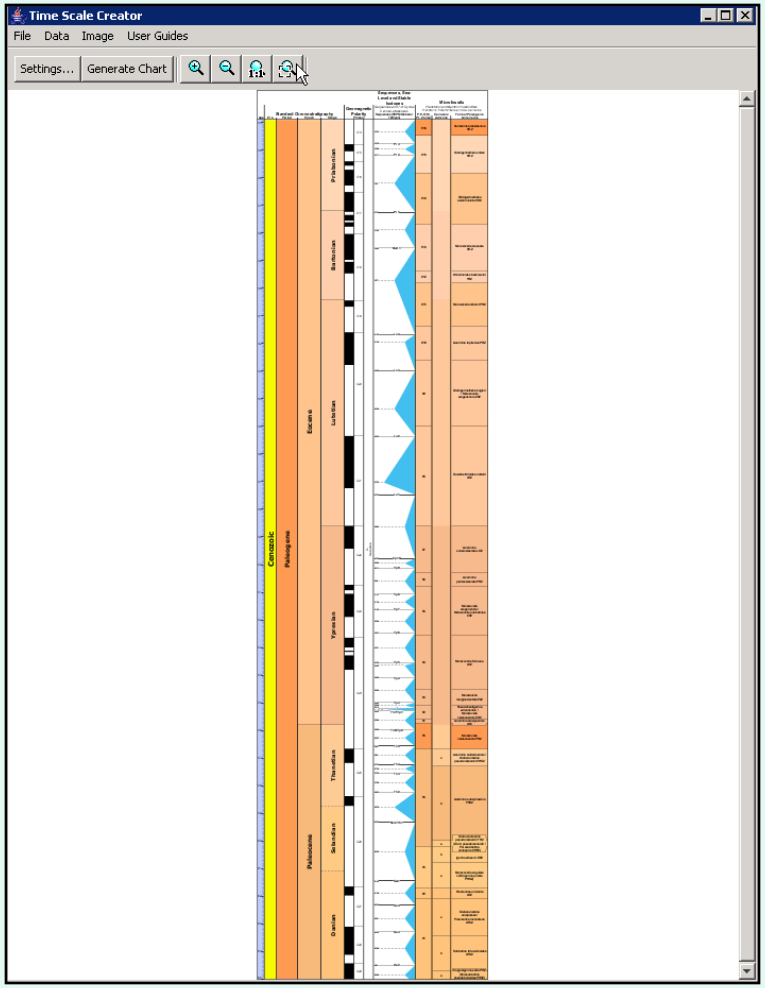
Use '*Fit Chart to Window*', Generate or multiple zoom outs to return to larger display.

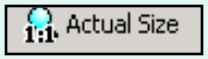
WINDOWS: <SHIFT> MB1 will translate the chart to a different location.

Zoom Options

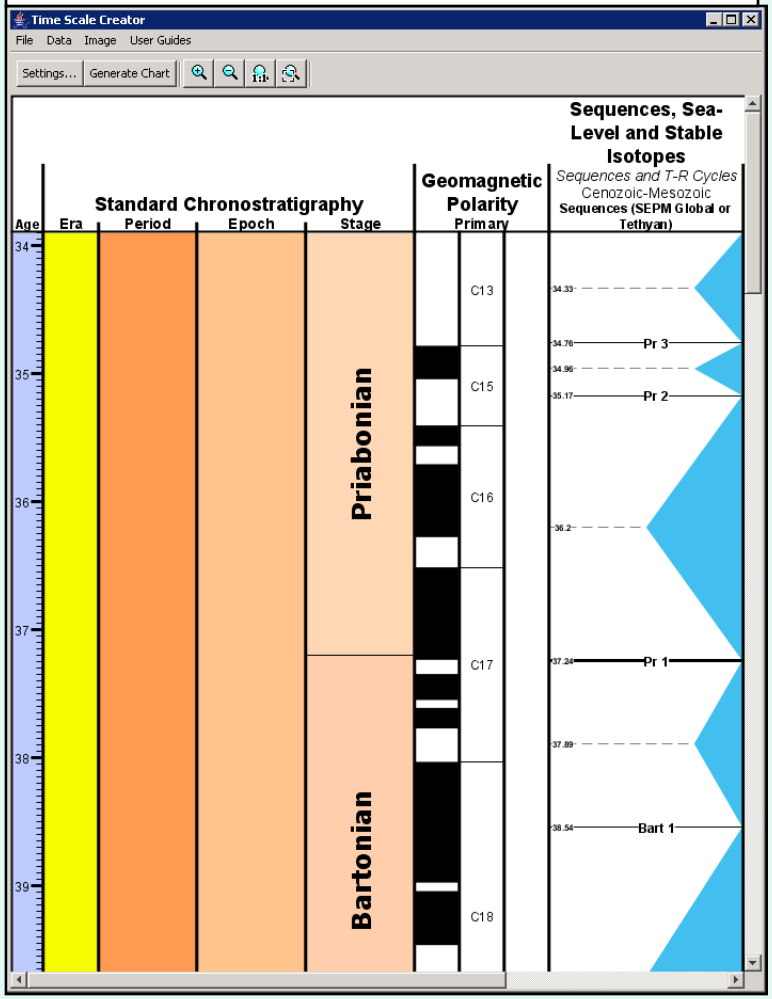


Fit to Window shows entire chart in the window.



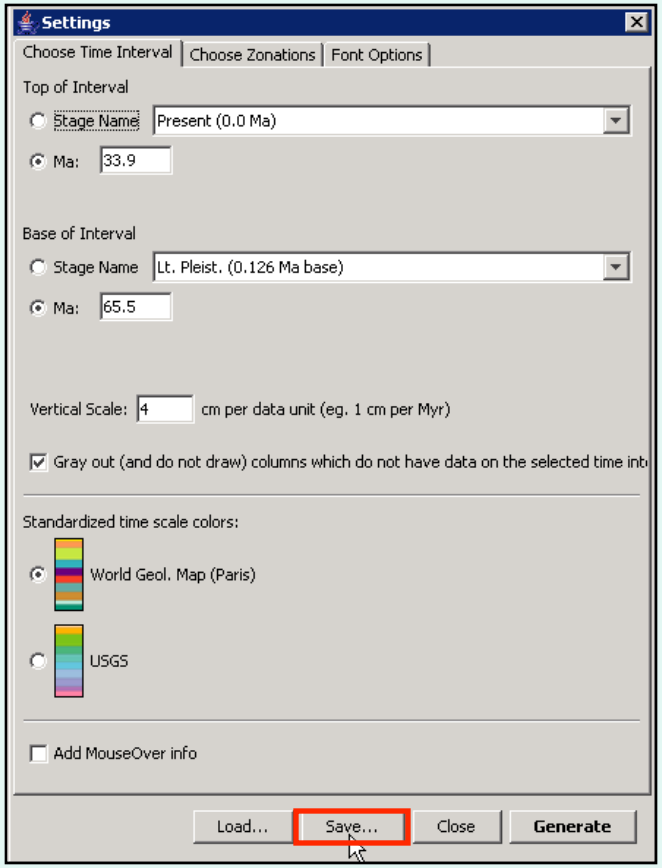


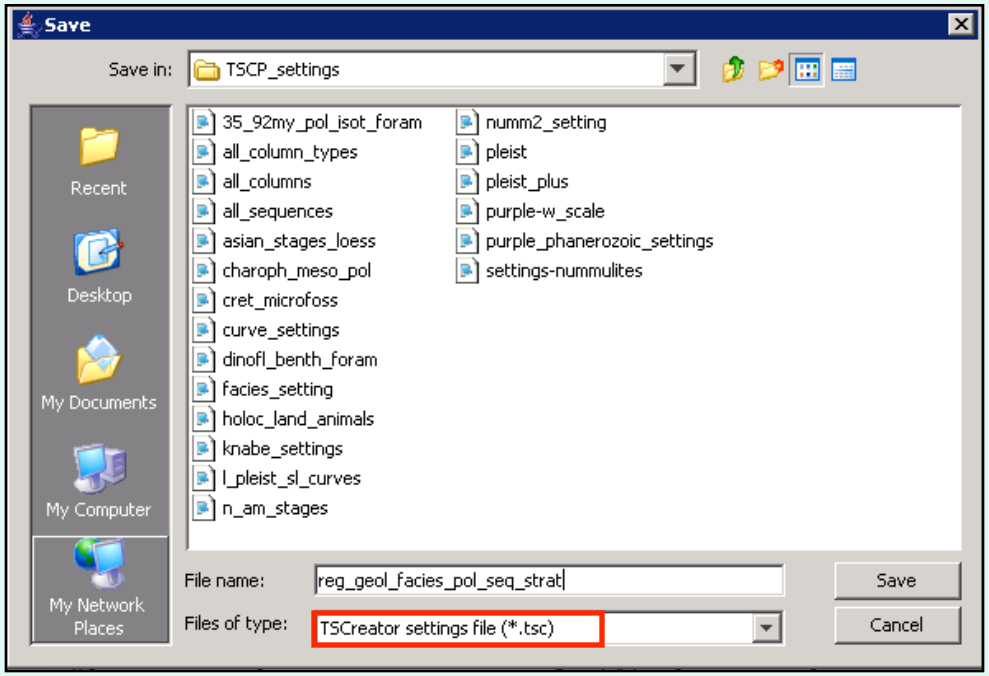
Actual Size shows the output (plotting) size of the Chart.
(not all of chart may be visible in window)



Saving Settings

After Chart settings have been selected/edited, to **save the settings** that will re-create the Chart, click on **Save** in the Settings window. This brings up a Save window. The Settings file has the extension **'.tsc'**. Create a 'settings' subdirectory to store all Settings files. Use detailed names for each Settings file for future reference. Example: l_pleist_sl_curves.tsc





To load a Settings file, open Settings and click on **Load**. The Settings file will load all settings needed to re-create the Chart (assumes the same datapack is loaded).

Hint: When working on a detailed chart, save settings throughout the creation of the chart for back reference.

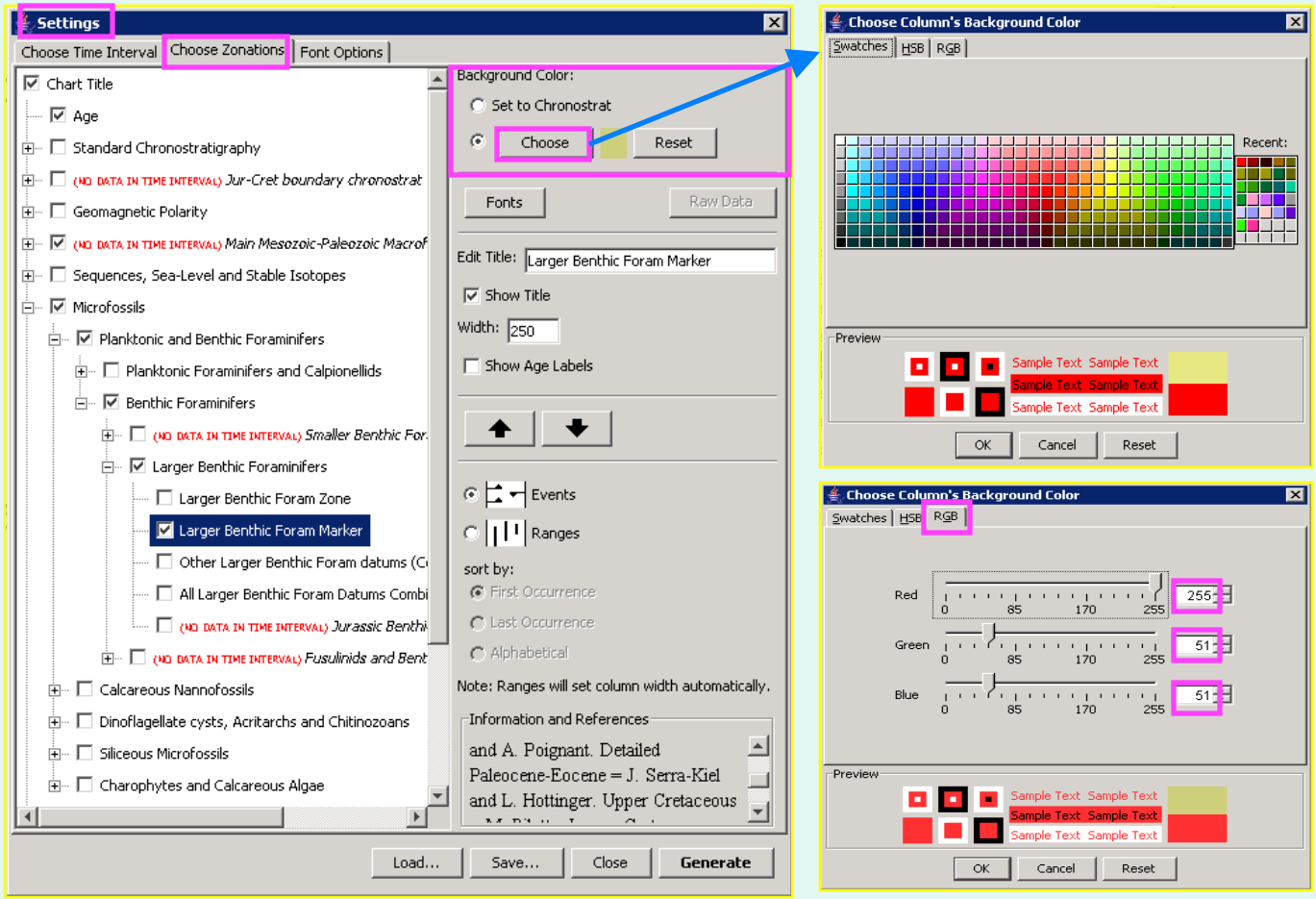
Color Options: color in the datapack is defined in terms of R/G/B values

Color Cell

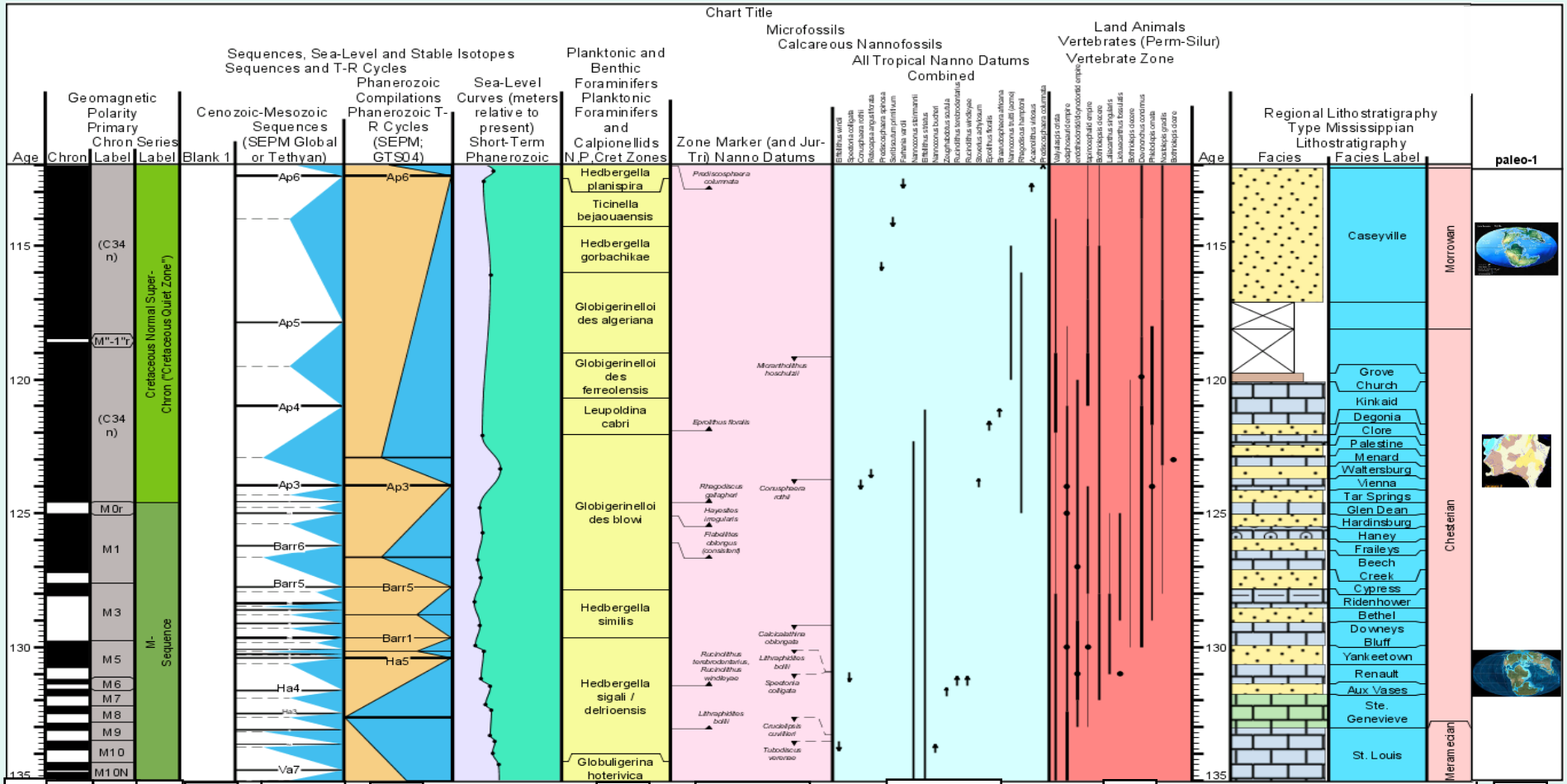
Boreal Benthic Foram Zone	block	180	204/204/82
	TOP	275.6	
	Parafusulina jenkinsi - P. solidissima	277.8	solid
	Parafusulina lutugini - Pseudofusulina s	280.11	solid
	Pseudofusulina concavutas	284.4	solid

The **easiest way** to edit color is inside TS Creator Pro.

In Settings/Choose Zonations, click on the **Choose** button under Background Color, select the color from the swatches and generate the chart and/ or save the datapack OR select the RGB tab, note the values and edit the datapack in Excel to include the new RGB values.



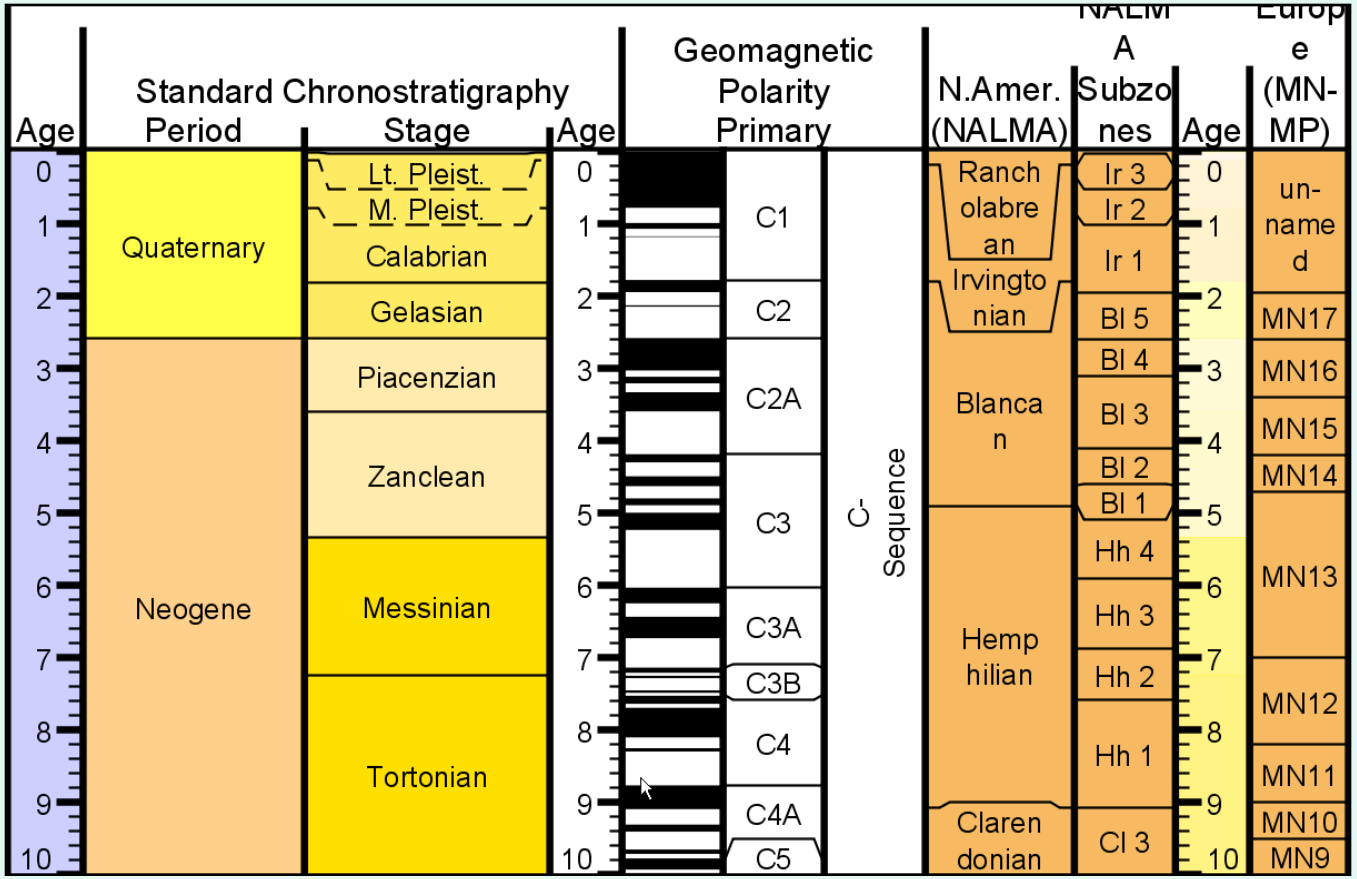
Column Types: there are 11 column types



Note: Facies and Chron columns have 3 component columns.

Age Column: shows age in the datapack's units, usually millions of years

The Age column can be inserted multiple times, in any location.
Age values can be left or right justified. Width is automatically set.

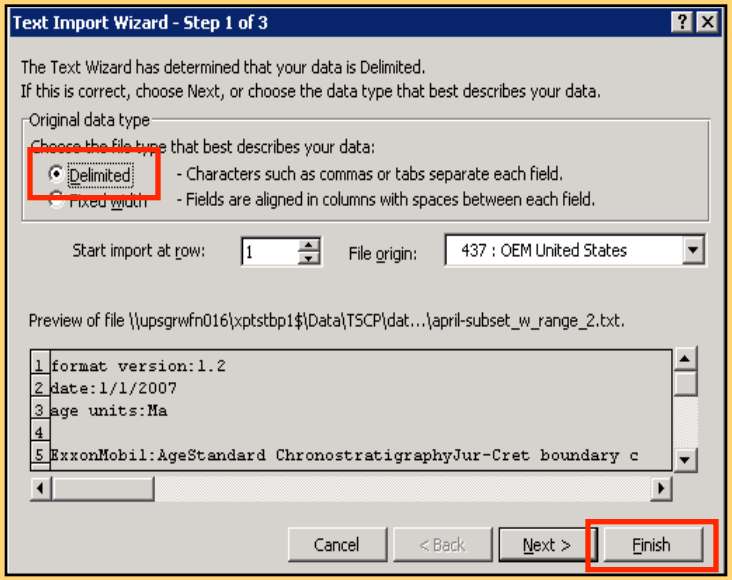


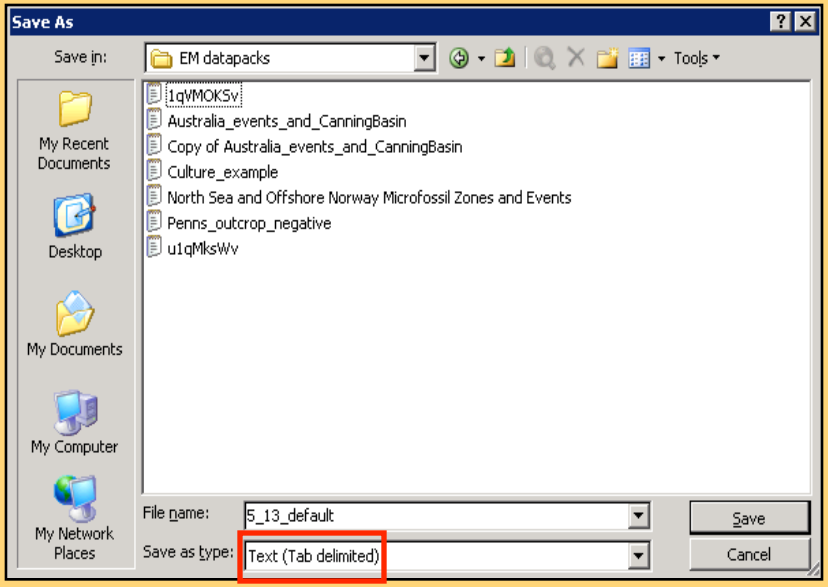
Age columns must be inserted in Settings or the Editor. Currently there is no format for adding age columns in the datapack. **Create a Settings file to recreate more than one Age column.**

Datapack Format

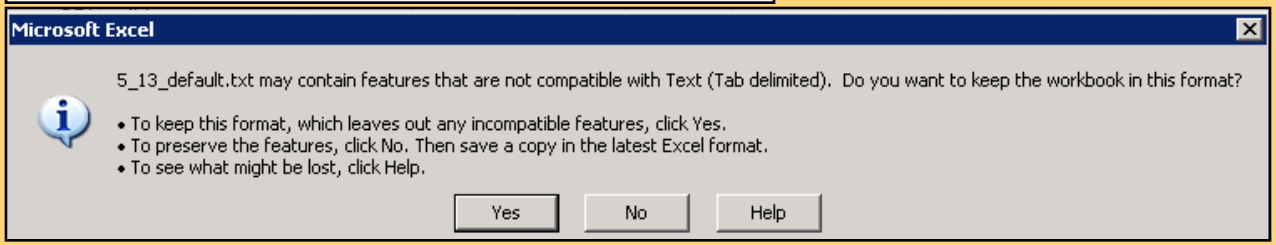
The TS Creator Pro data file, called a datapack, is structured as a **tab-delimited text file**. The tabs are used to separate cells, each cell containing some data. This structure means that the data files can be opened directly in a spreadsheet program like **Excel**. In Excel the cells will be neatly aligned, and it is the preferred method of editing data outside of TS Creator Pro.

- When entering Excel, select 'Delimited' for original data type (then click 'Finish').
- When exiting Excel, save the file as a tab-delimited text file.





If this warning appears while saving, select Yes.



Datapack: File Header Definition

Every column type begins with a one-line **header row**, followed by the data rows. (Some columns have additional, optional headers, ex. Series) One or more blank lines signals the end of a column.

Header Row:

<TITLE>	<type>	<width>	<color>	notitle	on or off	<popup>

Cell definitions:

- **<TITLE>** is the name of the column
- **<type>** is the column type
- **<width>** is the width of the column in SVG units.
- **<color>** is the background color of the column, specified in RGB values
- '**notitle**' will turn the title off when the column is displayed. Default is normally a blank cell (meaning title will be on).
- **'on' or 'off'** turns on or off the default display of the column (puts checkmarks in Settings/Choose Zonations list of columns)
- **<popup>** is the text that will appear in **MouseOver info**. MouseOver is activated in the 'Choose Time Interval' tab of Settings.

Note: In the following slides with column descriptions, 'notitle', 'on or off' and <popup> cells will be omitted for simplicity, although they exist on every column's header row.

Group Column: creates column suites

Columns can be grouped together by column suites under one heading using a **grouping column**.

Format:

<Title>	:	<sub-column1>	<sub-column2>	< sub-column3>	**…more sub-columns**

Required fields:

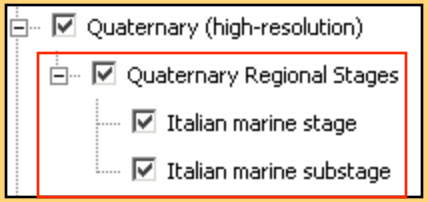
- A **Title** (Example: Standard Chronostratigraphy)
- A **colon** in cell two
- Cells after the colon contain **sub-column** names (**at least one is required**) (Example: Italian marine stage)

Datapack:

sub-column1 | sub-column2

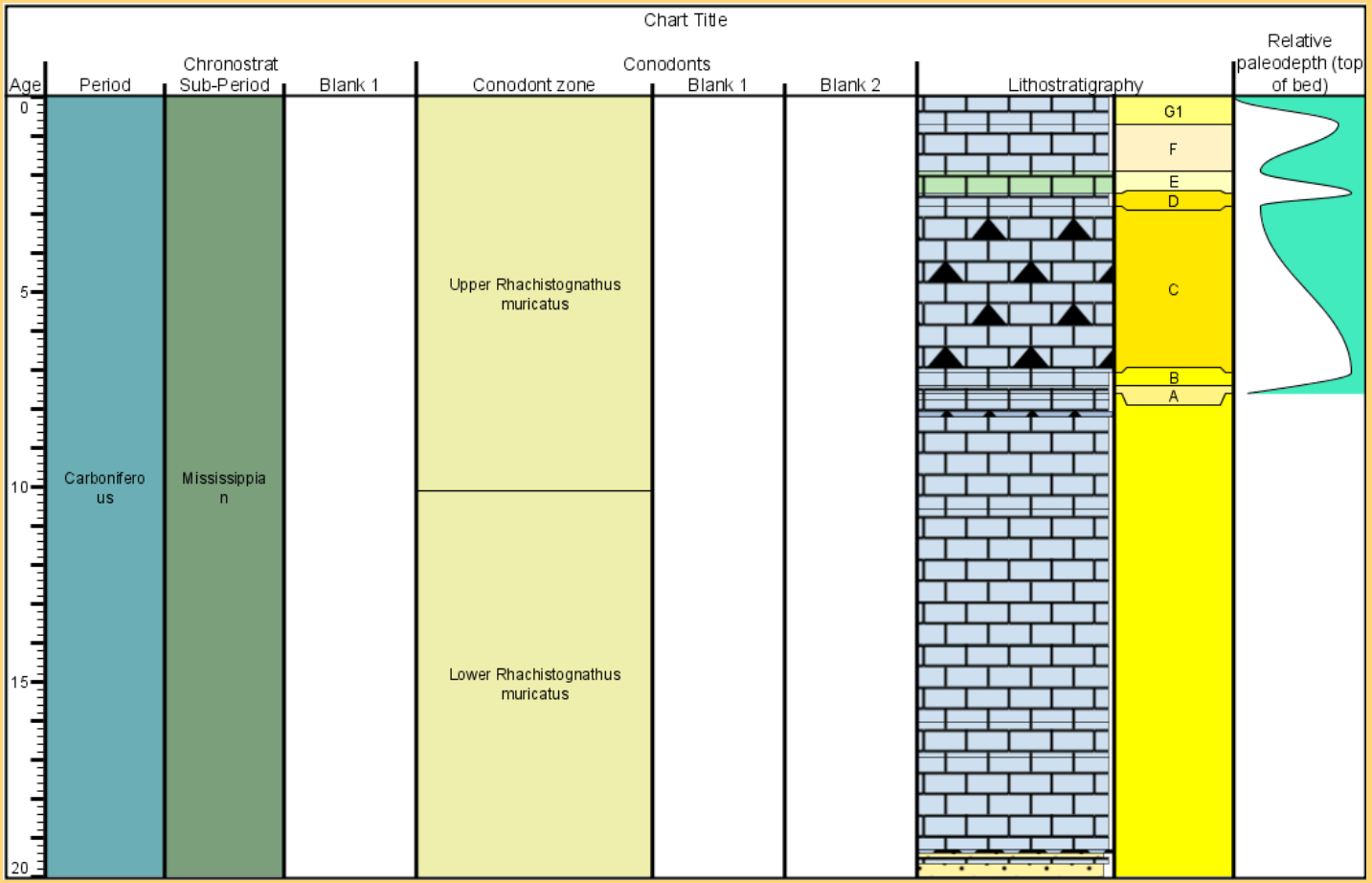
Quaternary Regional Stages	:	Italian marine stage	Italian marine substage
Italian marine stage	block	100	211/217/206
	TOP	0.018	
	Tarantian	0.126	solid
	Ionian	0.96	solid
	Calabrian	1.81	solid
	Gelasian	2.588	solid
Italian marine substage	block	80	211/217/206
	TOP	0.09	
	Tyrrhenian	0.126	solid
	TOP	0.96	
	Sicilian	1.24	solid
	Emilian	1.5	solid
	Santernian	1.81	solid

Inside TS Creator Pro Settings:



Blank Column: leaves space which can be filled in with custom drafting

The Blank Column can be inserted multiple times, in any location.



Format:

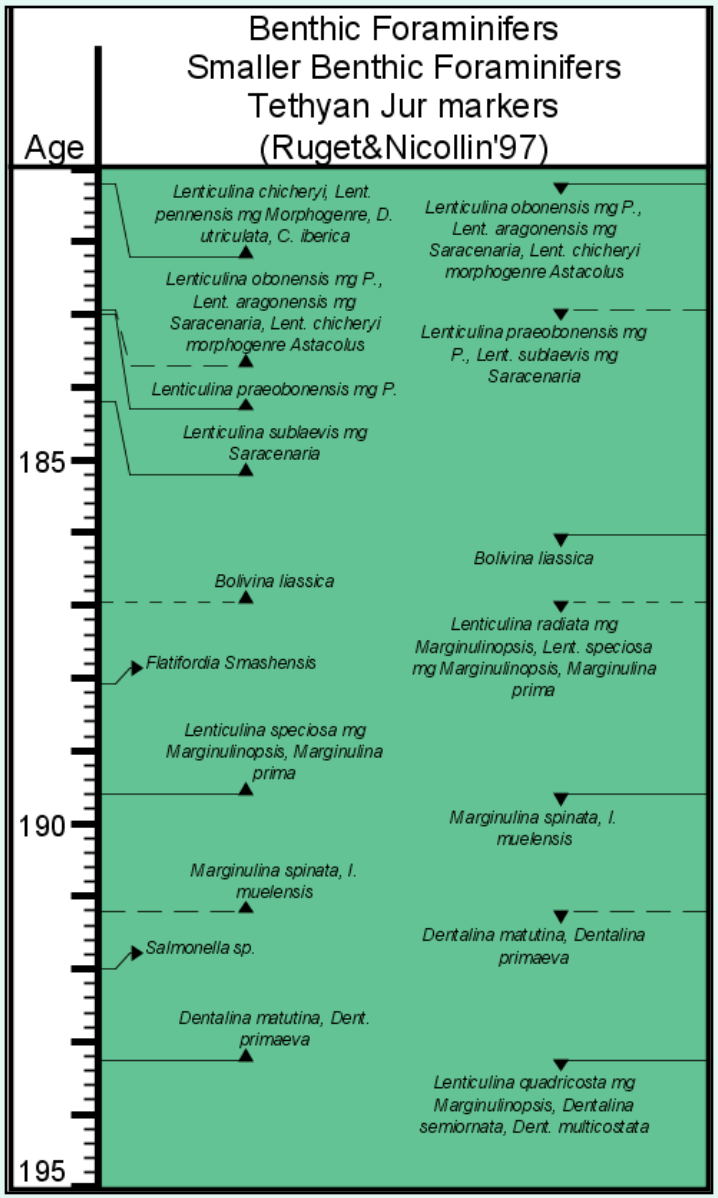
<Title>	**blank**	<width>

Required fields:
- A **Title**
- the word '**blank**' in the second cell
- width is optional

Note: blank columns can be added in Settings and in the Editor, but cannot be saved to the datapack. They can be saved to a settings file which will recreate them upon loading. The only way to add a blank column to a datapack is to manually insert this format line.

Event Column: shows first appearance date (FAD), last appearance date (LAD), or an event

Event column with Event Display



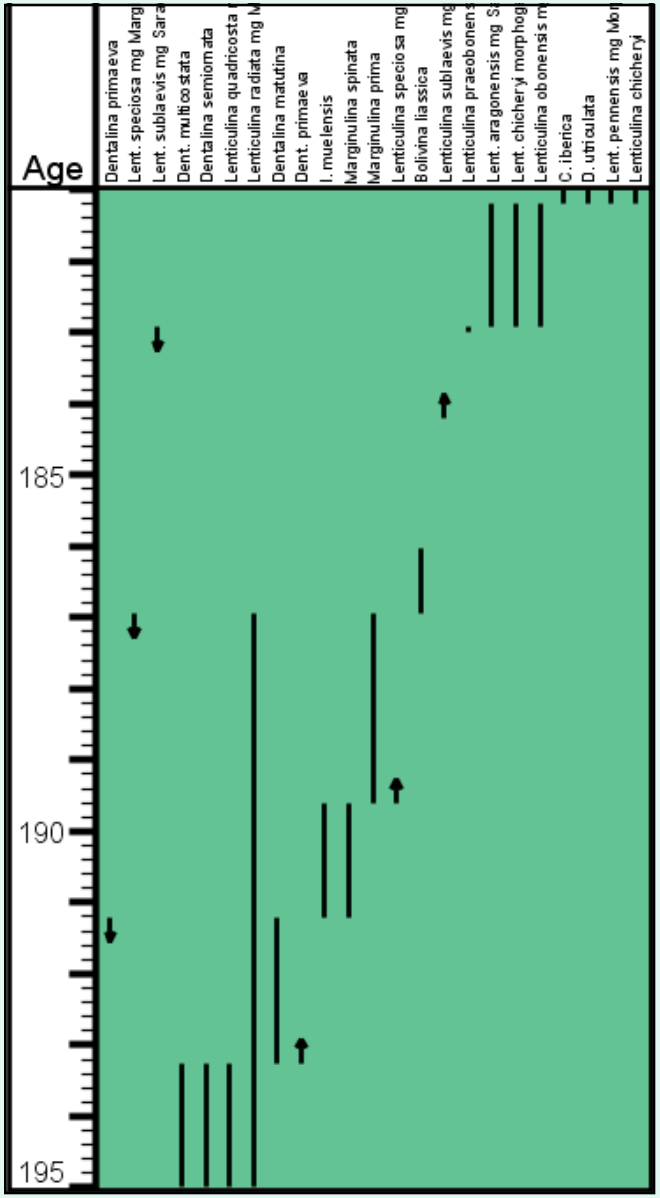
Up arrows show FAD.

Down arrows show LAD.

Side arrows show an EVENT.

Vertical bars (in Range display) show extent of one fossil from FAD to LAD.

Event column with Range Display

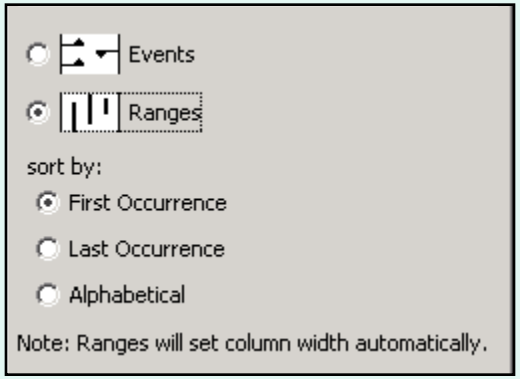


Event Column Display Types:

Inside TS Creator Pro Settings there are two display types for an Event column: **Event display** or **Range display**. (these display types cannot be set inside the datapack)

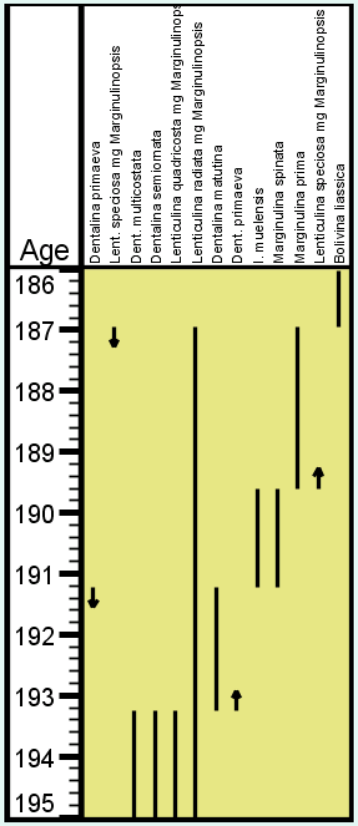
For Range display, you can sort by First or Last Occurrence or Alphabetical display.

Settings:

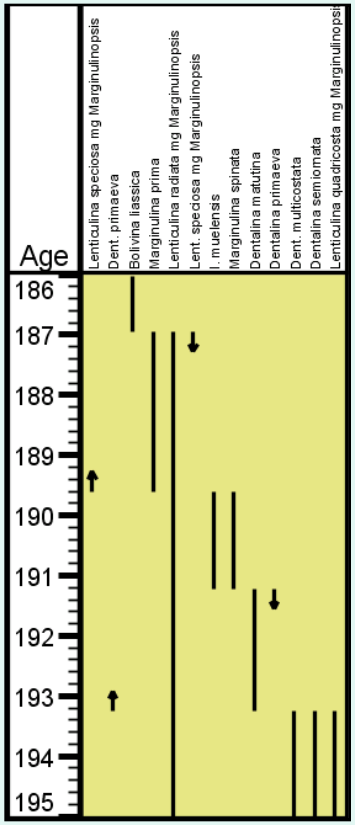


Range display sort options:

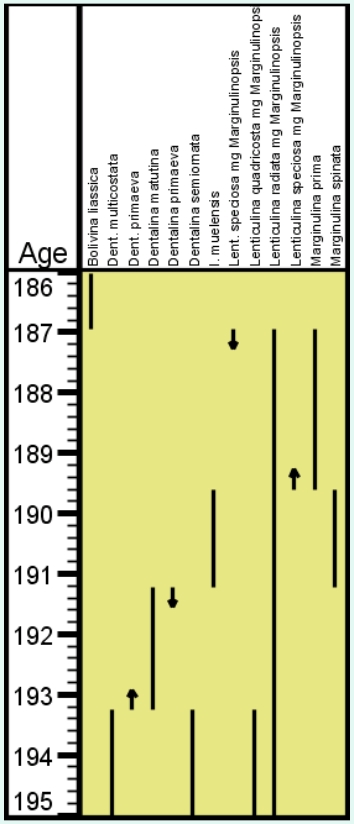
First Occurrence



Last Occurrence



Alphabetical



Range displays only: will connect a line between FAD and LAD of same name. Cannot vary line type – use Range column for more detailed display.

Range displays only: do not show EVENT Type data.

Event displays only: can show solid, dashed or dotted line type.

Event displays only: show EVENT Type data: a single event with arrow pointing to the side.

Event Column Format:

Header Row:

<Title>	event	<width>	<color>

Required cells are:

- **Title** (example: Diatom Datums)
- the word '**event**'.
- width (default is 150) is optional.
- color (R/G/B values) is optional.

Type row:

<Type>

Required cell is **Type.** Type is either the word 'LAD', 'FAD' or 'EVENT'.

Data rows:

<blank>	<label>	<age>	<linestyle>

Required cells are:

- an **empty cell** at the beginning of each data row,
- the **label** (example: Globegerina),
- the **age**.
- Linestyle is optional and can be solid, dashed or dotted.

Datapack:

Foram Zone Marker	event	250	241/244/181	← Header Row
FAD				← Type Row
	Truncorotalia (Globorotalia) truncatuli	2	solid	← Data Rows
	Menardella (Globorotalila) miocenica	3.77	solid	
	Globoconella (Globorotalia) punctic	4.52	solid	
	Globorotalia tumida	5.72	solid	
	Globigerinoides extremus	8.93	dashed	
	Neogloboquadrina acostaensis s.s. -	10.57	solid	
	Globoturborotalia nepenthes	11.63	solid	
LAD				← Type Row
	Globorotalia tosaensis	0.61	solid	
	Globigerinoides fistulosus	1.77	solid	
	Menardella (Globorotalia) miocenica	2.39	solid	
	Dentoglobigerina altispira	3.13	dotted	
	Sphaeroidinellopsis seminulina	3.14	solid	
	Globoquadrina dehiscens	5.91	solid	
	Globorotalia lenguaensis (Atl. only)	8.97	solid	
	Neogloboquadrina mayeri	11.47	solid	
EVENT				← Type Row
	Barbarella Fondaensis	4.93	solid	
	Elementiasis Fiftharea	9.86	dashed	

Note: you can have multiple Type Rows per Header Row.

Special Event Column: Standard Chronostratigraphy - GSSP Column

GSSP stands for Global Stratotype Section and Points and marks type section for Chronostratigraphic Stages. The base of each unit of the geologic time scale is defined at these specific locations and points (described in the popup text).

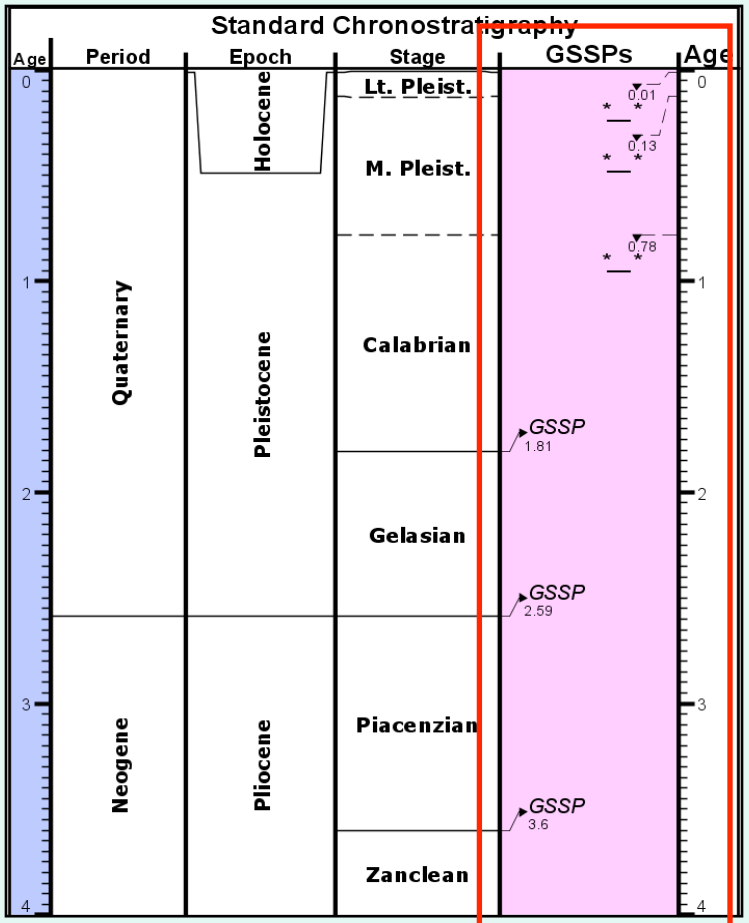
There are two event **types** in the GSSPs column:

- ***Ratified*** events (type: **EVENT**)
- Events that ***have not been Ratified*** (type: **LAD**) Note that the popup uses the word 'Potential..' to describe non-ratified events.

Datapack:

GSSPs	event	80	USGS		off	The base of each unit
LAD						
	* — *	0.0117	dashed	Potential	Holocene GSSP may coincide with	
	* — *	0.126	dashed	Potential	Upper Pleistocene subseries GSS	
	* — *	0.781	dashed	Potential	Middle Pleistocene subseries GSS	
	* — *	15.97	dashed	Potential	Langhian GSSP may coincide with	
	* — *	20.43	dashed	Potential	Burdigalian GSSP may coincide w	
	* — *	28.4	dashed	Potential	Chattian GSSP may coincide with	
	* — *	37.2	dashed	Potential	Priabonian GSSP may coincide wi	
	* — *	40.4	dashed	Potential	Bartonian GSSP may coincide with	
	* — *	48.6	dashed	Potential	Lutetian GSSP may coincide with	
	* — *	58.7	dashed	Potential	Thanetian GSSP may coincide wit	

EVENT				
	GSSP	1.806	solid	The base of the Calabrian Stage of Pleistocene Series [
	GSSP	2.588	solid	The base of the Gelasian Stage, base of the Quaternary
	GSSP	3.6	solid	The base of the Piacenzian Stage [click <a href="http:/
	GSSP	5.333	solid	The base of the Pliocene Series and the Zanclean Stag
	GSSP	7.248	solid	The base of the Messinian stage [click <a href="http://"
	GSSP	11.608	solid	The base of the Tortonian Stage [click <a href="http://w
	GSSP	13.82	solid	Serravallian GSSP (submitted Fall 2006) coincides with
	GSSP	23.03	solid	The base of the Neogene System, Miocene Series and
	GSSP	33.9	solid	The base of the Oligocene Series and Rupelian Stage [
	GSSP	55.8	solid	The base of the Eocene Series and Ypresian Stage [cli
	GSSP	65.5	solid	The base of the Cenozoic Era, Paleogene System, Pale
	GSSP	70.6	solid	The base of the Maastrichtian Stage [click <a href="htt



Ratified events are labelled **GSSP** and display on the left side of the column.

Not yet ratified events are marked with ***---*** and display on the right side of the column.

How to Display Multiple Items Per Age Date

In Block and Event columns, when two or more data items occur at the same time, they can be written in the same Excel cell separated by ' **–** ' (a dash), a **comma** or any separator.
Chart display will show the line exactly as written in the datapack.

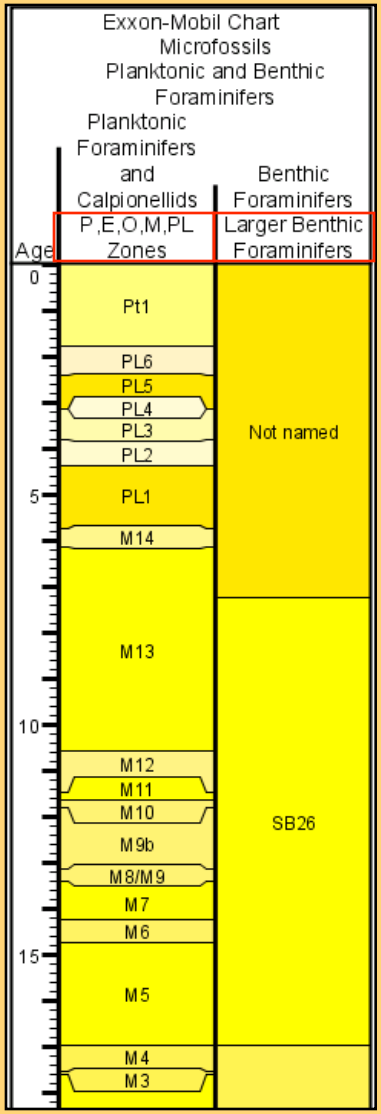
	B. bulloides	28.45	solid
	Nummulites retiatus, Discocyclina spp., Orbitoclypeus spp., Asterocyclina spp.	33.88	solid

Nummulites retiatus, Discocyclina spp., Orbitoclypeus spp., Asterocyclina spp.

	B. bulloides	28.45	solid
	Nummulites retiatus - Discocyclina spp. - Orbitoclypeus spp. - Asterocyclina spp.	33.88	solid

Nummulites retiatus - Discocyclina spp. - Orbitoclypeus spp. - Asterocyclina spp.

Block Column: displays data over an interval



Block columns display data in blocks over an interval. The top of the interval is the base of the previous interval. The top of the topmost interval begins with the name TOP followed by an age value.

P,E,O,M,PL Zones	block	50	247/249/153
	TOP	0	
	Pt1	1.77	solid
	PL6	2.39	solid
	PL5	3.13	solid
	PL4	3.14	solid
	PL3	3.81	solid
	PL2	4.37	solid
	PL1	5.72	solid
	M14	6.14	solid
	M13	10.57	solid
	M12	11.47	solid
	M11	11.63	solid

Larger Benthic Foraminifers	:	Larger Benthic Foram Zone	Larger Benthic Foram M
Larger Benthic Foram Zone	block	100	204/204/82
	TOP	0	
	Not named	7.25	solid
	SB26	16.97	solid
	SB25	20.43	solid
	SB24	23.03	solid
	SB23	26.83	solid
	SB22b	28.45	solid
	SB22a	30.42	solid
	SB21	33.88	solid
	SB20	35.04	solid
	SB19	37.24	solid
	SB18	37.98	solid

Block Column Format:

Header row:

<Title>	**block**	<width>

Required fields:

- a **Title** (Example: Italian marine stage)
- the word '**block**'

Data rows:

<blank>	**<label>**	**<age>**	<linestyle>

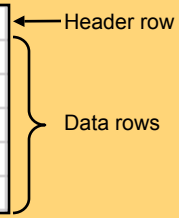
Required fields:

- a **blank** first cell
- the name **label** (Example: Ionian)
- the **age**.
- Linestyle can be solid, dashed or dotted. (optional)

The first data row in a block column should specify the TOP of the first block.

Datapack:

Italian marine stage	block	100	211/217/206
	TOP	0.018	
	Tarantian	0.126	solid
	Ionian	0.96	solid
	Calabrian	1.81	solid
	Gelasian	2.588	solid

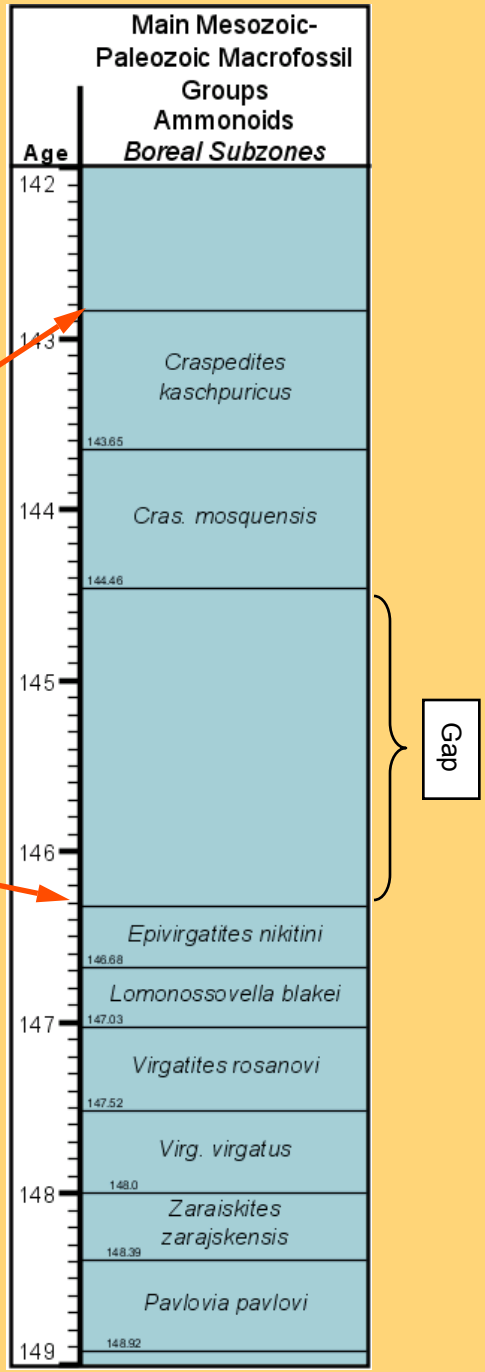


Defining TOPS

Block, Chron, Facies and Range columns display data that represent intervals. TS Creator Pro defines each data point as a **base** of interval. **The top of any interval is defined as the base of the previous interval.** To start a data column, use the word '**TOP**' in the **label** cell of the data row, which will specify the first top of the first interval. Additional TOPs can be placed anywhere in the data to illustrate gaps in the column.

Boreal Subzones	block	150	162/204/21
	TOP	142.84	
	Craspedites kaschpuricus	143.65	solid
	Cras. mosquensis	144.46	solid
	TOP	146.32	
	Epivirgatites nikitini	146.68	solid
	Lomonossovella blakei	147.03	solid
	Virgatites rosanovi	147.52	solid
	Virg. virgatus	148	solid
	Zaraiskites zarajskensis	148.39	solid
	Pavlovia pavlovi	148.92	solid

Gap



Sequence and Trend Columns: show T-R sea level cycle curves

Sequence and Trend columns both show transgressive/regressive sea level cycles and are represented by a horizontal set of peaks.

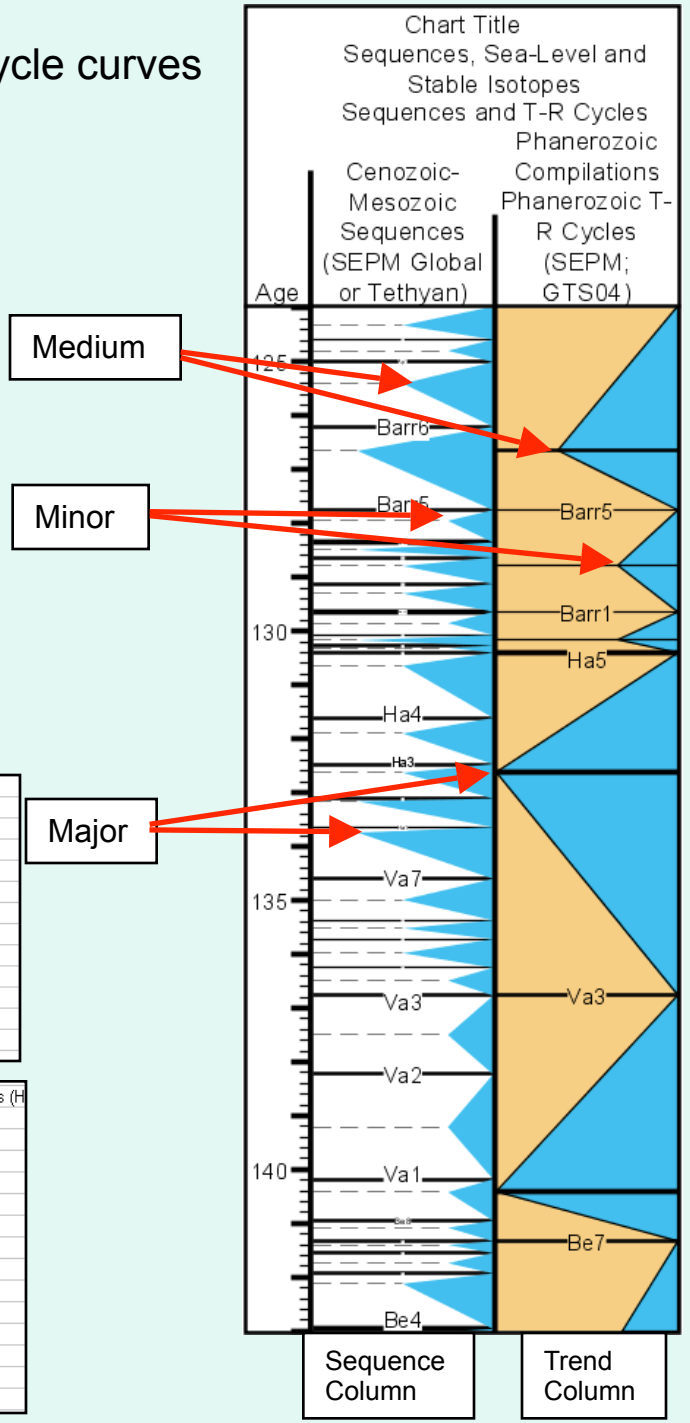
They differ by:

- Sequence columns show **high frequency** events. Trend columns show **low frequency** events (broader scope).
- default **background color** (Background color of a Sequence column is white, and a Trend column is orange. Background colors are editable.).
- peak **severities** (major, medium, and minor peaks.) Example: a major peak in a Sequence column is only 75% of the width of the column while in a Trend column, major is 100% of the width.
- the Trend column's peaks are **outlined in black** while the Sequence column's peaks are not outlined.

Datapacks:

Cenozoic-Mesozoic	:	Sequences (SEPM Global or Tethyan)	Boreal Jurassic Sequence:	Boreal T-R Cycles
Sequences (SEPM Global or Tethyan)	sequence	100	255/255/255	
		MFS	0	Major
	LGM	SB	0.02	Major
		MSF	0.13	Major
	MIS 6	SB	0.14	Major
		MFS	0.24	Medium
	MIS 8	SB	0.27	Medium
		MFS	0.42	Medium
	MIS 12	SB	0.44	Major
		MFS	0.62	Medium
	MIS 16	SB	0.64	Major

Phanerozoic Compilations	:	Phanerozoic T-R Cycles (SEPM; GTS04)	Major Mesozoic-Cenozoic	Major Paleozoic Sequences (H
Phanerozoic T-R Cycles (SEPM; GTS04)	trend	100	245/204/131	
		MSF	0	Major
	LGM	SB	0.02	Major
		MFS	2.92	Medium
	Me 2	SB	5.77	Medium
		MFS	10.51	Major
	Ser 4/Tor 1	SB	11.8	Major
		MSF	15.71	Medium
	Ch 4/Aq 1	SB	23.03	Medium
		MSF	27.97	Major
	Ch 1/Ru 4	SB	28.45	Major
		MSF	30.72	Medium
	Lu 4	SB	41.67	Medium



Sequence and Trend Column Format:

Header Row:

<Title>	**sequence or trend**	<width>

Required fields are:
- the **Title** (Example: Boreal T-R Cycles)
- the word '**sequence**' or '**trend**' in the second cell.
- width is optional

Data Rows:

<blank>	<label>	**SB or MFS**	**age**	**severity**

Required fields are:

- a **blank** in the first cell
- the letters '**SB**' (Sequence Boundary) or '**MFS**' (maximum flooding surface)
- **age**
- **severity** (Options are Major, Medium or Minor)
- The label field is optional.

Datapack:

Cenozoic-Mesozoic	:	Sequences (SEPM Global or Tethyan)	Boreal Jurassic Sequence:	Boreal T-R Cycles
Sequences (SEPM Global or Tethyan)	sequence	100	255/255/255	
		MFS	0	Major
	LGM	SB	0.02	Major
		MSF	0.13	Major
	MIS 6	SB	0.14	Major
		MFS	0.24	Medium
	MIS 8	SB	0.27	Medium
		MFS	0.42	Medium
	MIS 12	SB	0.44	Major
		MFS	0.62	Medium
	MIS 16	SB	0.64	Major

Header row

Data rows

Range Column: shows variation in abundance of a lifeform over time

Abundance line thicknesses:

rare

common

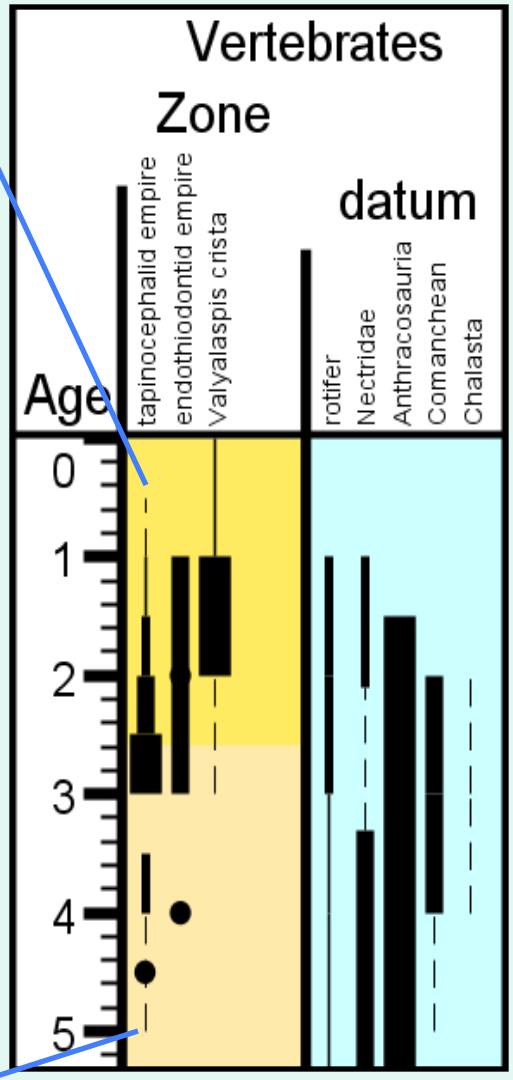
frequent

abundant

flood

missing

sample



Datapack:

Vertebrates	:	Zone	datum
Zone	range	1000	USGS
	tapinocephalid empire	0.5	TOP
	tapinocephalid empire	1	rare
	tapinocephalid empire	1.5	common
	tapinocephalid empire	2	frequent
	tapinocephalid empire	2.5	abundant
	tapinocephalid empire	3	flood
	tapinocephalid empire	3.5	missing
	tapinocephalid empire	4	frequent
	tapinocephalid empire	4.5	sample
	tapinocephalid empire	5	rare

Abundance column

Range columns can be sorted for display by First Occurrence, Last Occurrence or Alphabetically.

Range Column Format:

Header Row:

<Title>	range	<width>

Required fields are:
- the **Title** (Example: Zone)
- the word '**range**'.
- width is optional

Data rows:

<blank>	<label>	<age>	<abundance>

Required fields are:
- a **blank** first cell
- a **label** (Example: tapinocephalid empire)
- **age**. (base age or age of a sample)
- abundance is optional. (Abundance specifies the **thickness of the line** that will be used to draw the range.)

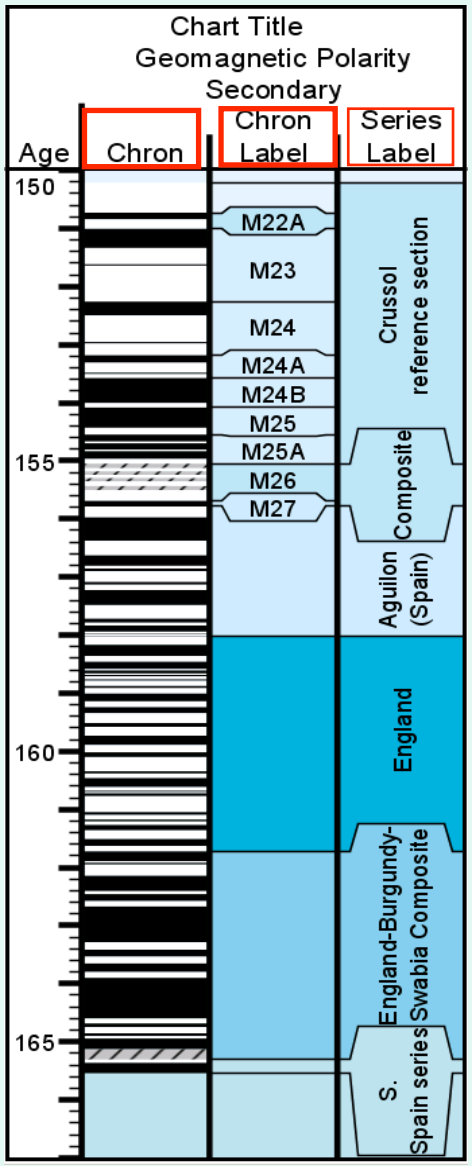
Ranges are intervals of time. The age of each data row specifies the base of the range, so a Top must be specified first. This can be done using the word TOP in the abundance cell. If no TOP exists, then the topmost range point is used as a TOP.

Abundance options:

- **TOP** - specifies the top of a range..default. Can also use LAD (last appearance date)
- **missing** - no line will be drawn
- **rare** - thinnest line: dashed
- **common** - thicker than rare
- **frequent** - thicker than common
- **abundant** - thicker than frequent
- **flood** - thickest line (warning: will hide sample symbol)
- **sample** - a filled circle is drawn at the age date; sample does not contribute to a range.

Chron Column: shows Polarity

Chron columns contain three component columns: **Chron (polarity), Chron Label and Series Label.**



Polarity choices include:

- **N** (Normal)
- **R** (Reverse)
- **U** (Unknown) or **No Data**
- **TOP**.

Datapack

Column Type

Series Label

Geomagnetic Polarity	:	Primary	Secondary
Secondary	chron	100	nocolor
Crussol reference section			
	TOP		150.21
	R		150.729
	N	M22A	150.844
	R	M22A	151.006
	N	M23	151.336
	R	M23	151.616
	N	M23	151.642
	R	M23	152.261
	N	M24	152.498
	R	M24	152.956
	N	M24	152.981
	R	M24	153.185
	N	M24A	153.312
	R	M24A	153.483
	N	M24A	153.509
	R	M24A	153.575
	N	M24B	154.007
	R	M24B	154.084
	N	M25	154.432
	R	M25	154.55
	N	M25A	154.669
	R	M25A	154.698
	N	M25A	154.805
	R	M25A	154.834
	N	M25A	154.969
	R	M25A	155.049
Composite			
	U	M26	155.128
	R	M26	155.185

polarity

Chron Label

Chron Column Format:

Header Row:

<Title>	chron	<width>

Required fields are:

- **Title** (Example: Primary)
- the word '**chron**' in the second cell.
- width is optional

Series Row:

<Series name>	<blank>	<width>

Required field is:

- **Series name**. (Example: Austrian series)
- If width is to be specified, a **blank cell** is required in the second cell.

Data Rows:

<blank>	<polarity>	<label>	< age>

Required fields are:

- a **blank** first cell
- **polarity** (Examples: N, R)
- label is optional (cell can remain blank). Label will display in the Chron Label sub-column.
- **age** (the base age)

Polarity values:

TOP

N (normal)	black
R (reverse)	white
No Data	grey
U (unknown)	grey

Datapack:

Primary	chron	124	nocolor
Austrian series			
	TOP		190
	N	Basalt	192
	R	E4	194
	No Data	No Data	196
	N	E2	198
	U	Gap?	200

Header Row

Series Row

Data Rows

Polarity column

Label column

Age column

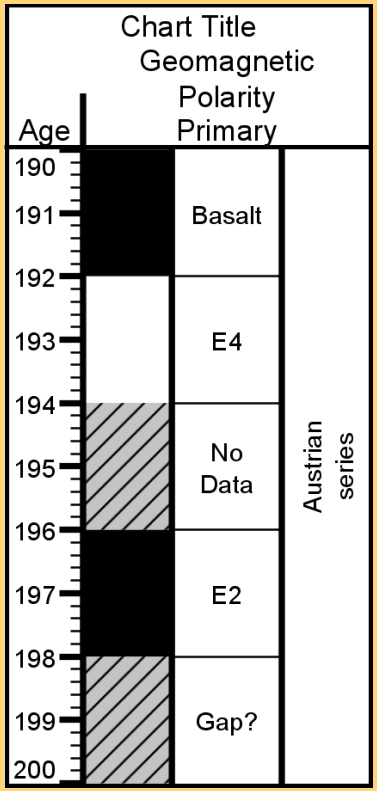
N

R

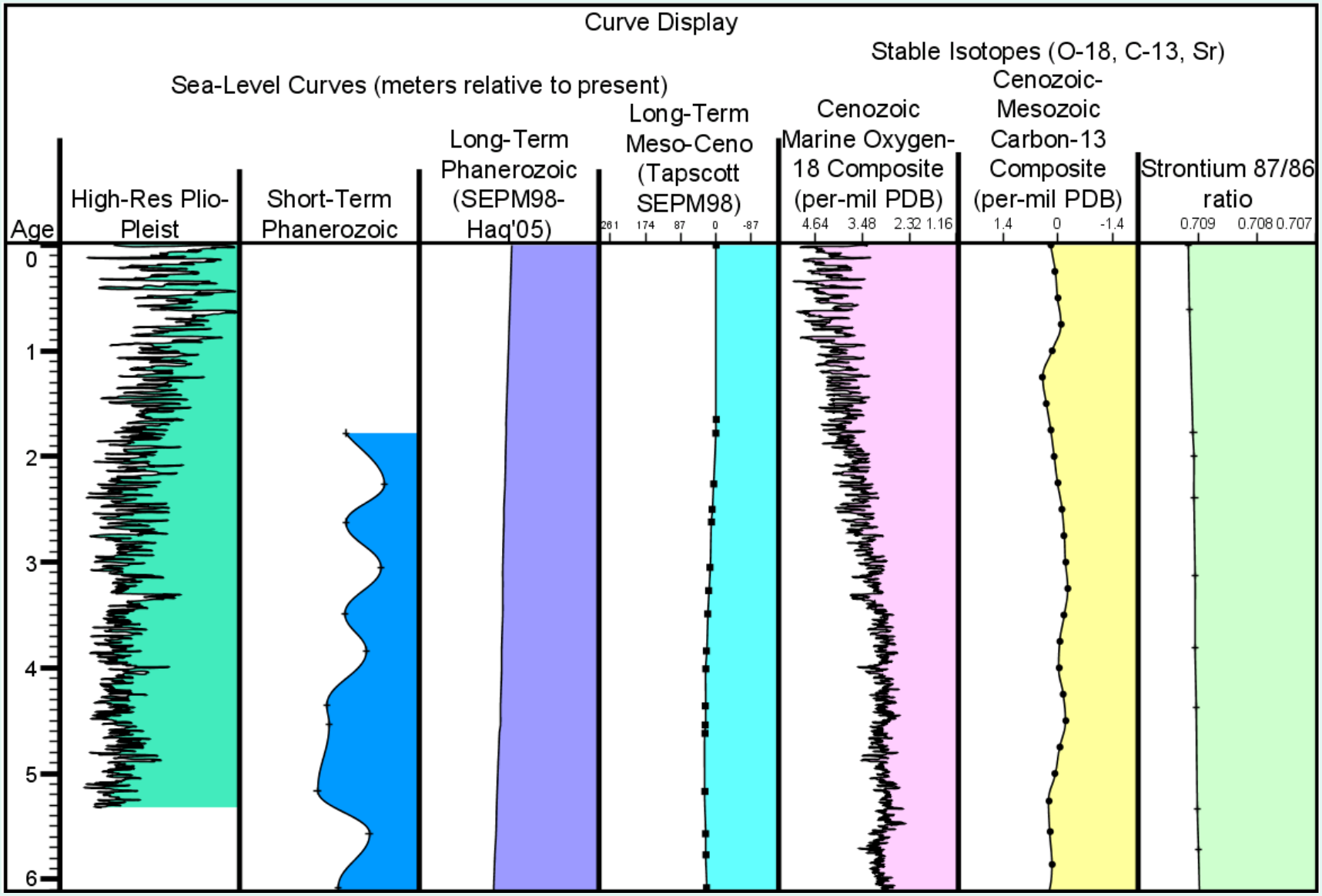
No Data

N

U



Point Column: draws an X vs Age plot curve.



Point Column Format:

Header row:

<Title>	**point**	<width>	<color>

Required fields are:

- **Title**
- the word **'point'**
- width and color are optional. (Color is the background color.)

Style row (optional):

<Point type>	line or no line	< fill color>	<range low>	<range high>	smoothed

Style row is **optional**. If used, **Point type** is required.

Optional fields include:

- the word 'line' will connect points. 'no line' will eliminate the line.
- *fill color* is specified in R/G/B format or as 'nofill'. Fill puts color under the curve.
- *range low* and *range high* specify the range of the curve in the X dimension. If omitted, TS Creator will fit all points inside the column.
- the word 'smoothed' determines whether or not to smooth the line connecting points. The smoothed curve (Bezier) passes through every point.

Point type choices:

- **nopoints** - points will not be drawn on the curve
- **rect** - each point is a square
- **circle** - each point is a filled circle
- **cross** - each point is a '**+**'

Data rows:

<blank>	**<age>**	**<X value>**

Required fields are:

- an **empty first cell**
- **age** (age is the Y coordinate of the line – vertical position)
- **X value**. (horizontal position of the line)

Point Column Datapack

Color under curve

Background color

Short-Term Phanerozoic	point	100	224/225/255		off
circle	line	64/233/191	-150	285	smoothed
	1.779	27.38			
	2.26	-67.91			
	2.621	27.38			
	3.053	-58.94			
	3.492	28.32			
	3.837	-23.57			
	4.357	74.55			
	4.535	68.42			
	5.168	97.13			
	5.566	-30.64			

Header row

Style row

Data rows

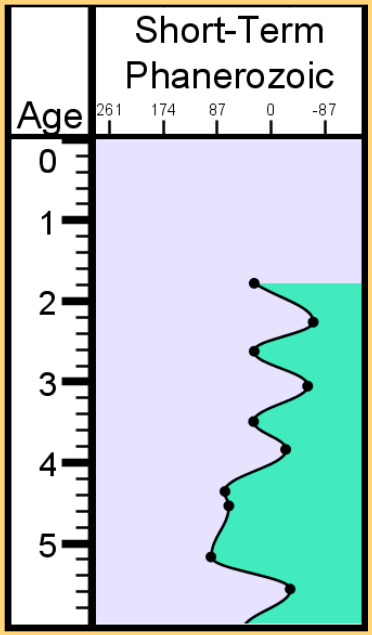
Use circle for Point Type

Range low and high

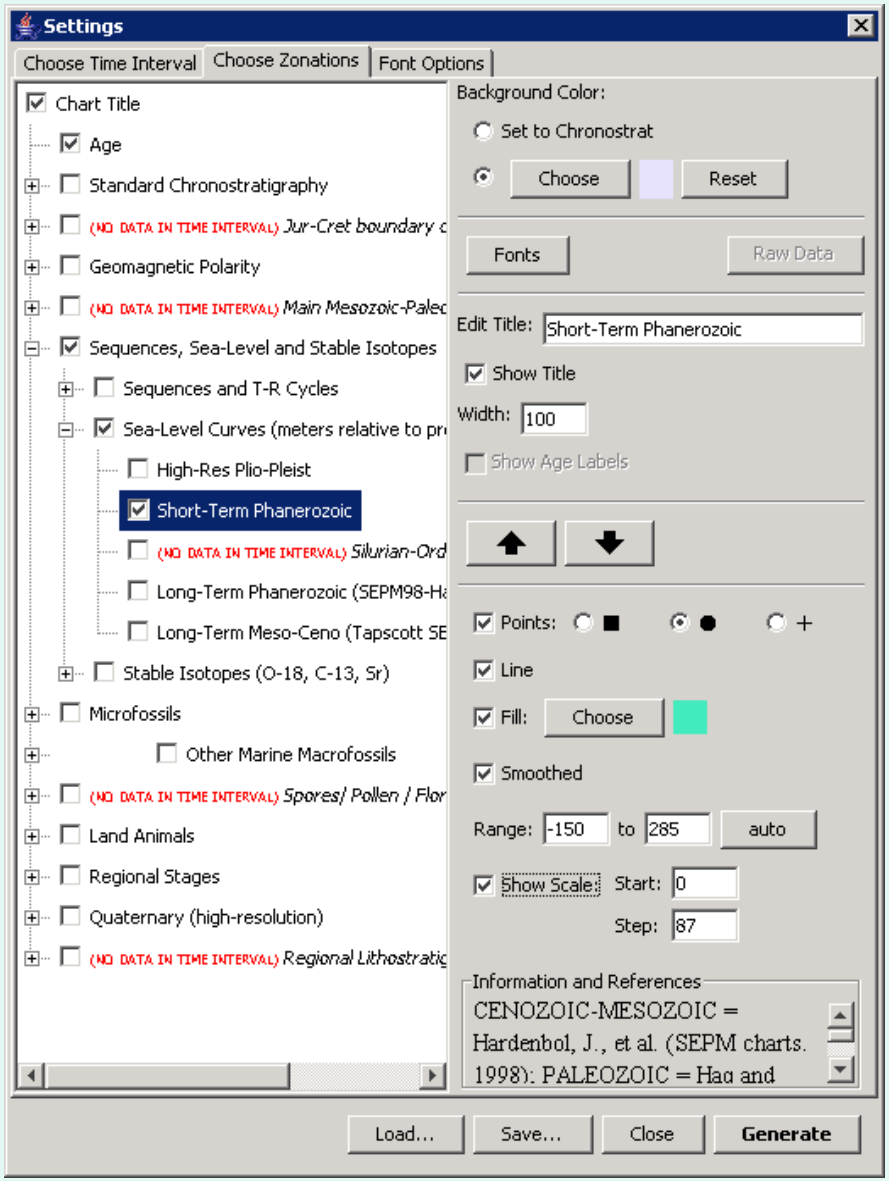
Age column

X-value column

Result:



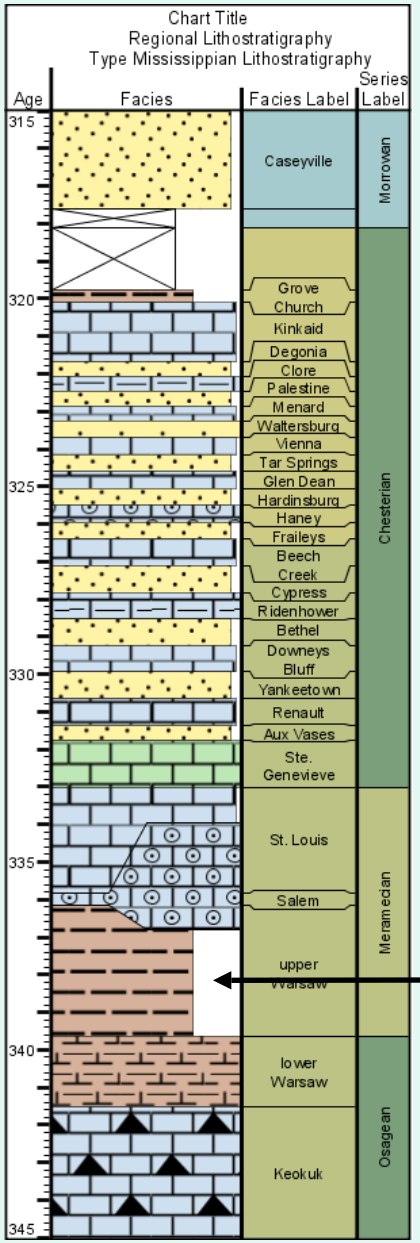
Point Column Display Options



In Settings/Choose Zonations, you can select the following options for a Point Column:

- set **background color** to match the Chronostrat column or choose a color.
- edit **font**
- edit **title**
- turn title on or off
- set **width** of column
- move the column up and down relative to other columns at the same level
- turn points on the line on or off
- choose **point type**: square, circle or +
- turn line on or off
- turn fill under curve on or off.
- choose **color** of fill under the curve
- turn line **smoothing** on or off
- set horizontal range automatically or set range manually
- turn display of horizontal scale on or off
- set **start point** for horizontal range labels and set **step increment** for the labels.

Facies Column: draws lithofacies units



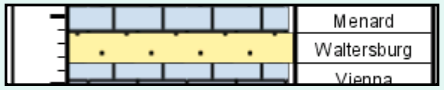
The Facies Column draws lithostratigraphic facies patterns and names.

There are **3 component columns** in a Facies column format (similar to the Chron column format):

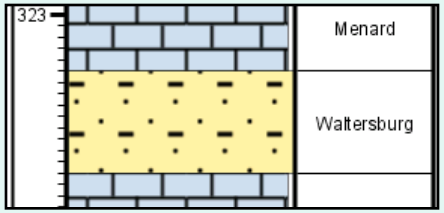
- **Facies** - shows facies patterns. These patterns are editable using Adobe Illustrator. 50 patterns are included in TS Creator Pro. New ones can be created and added to the standard set.
- **Facies Label** – shows facies names next to facies patterns.
- **Series Label** – shows Chronostratigraphic Stage.

Automatic indentation mimics the look of strat column charts by making rock types with smaller grain sizes horizontally smaller, as they tend to erode faster. Indentations can be controlled using the **patternwidth** format.

Hint: If a unit is not thick enough to reproduce the entire pattern, increase the vertical scale in Settings.

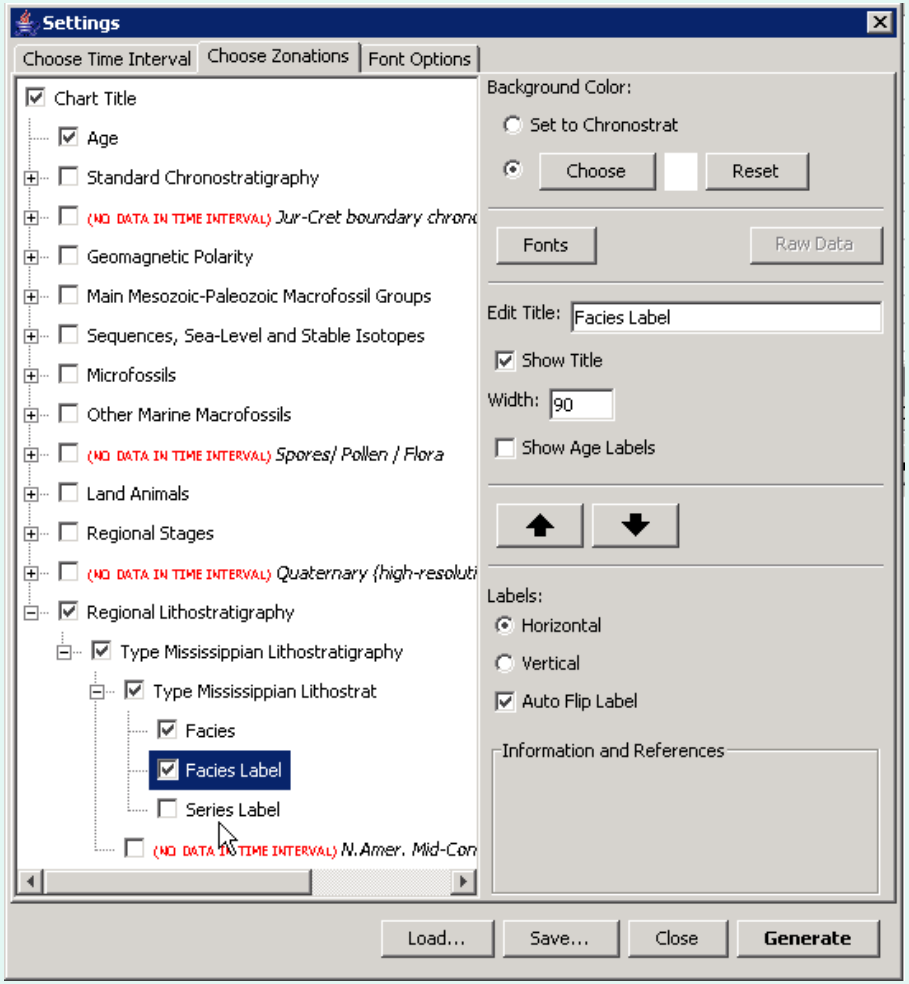


Scale: 1.5



Scale: 5.0

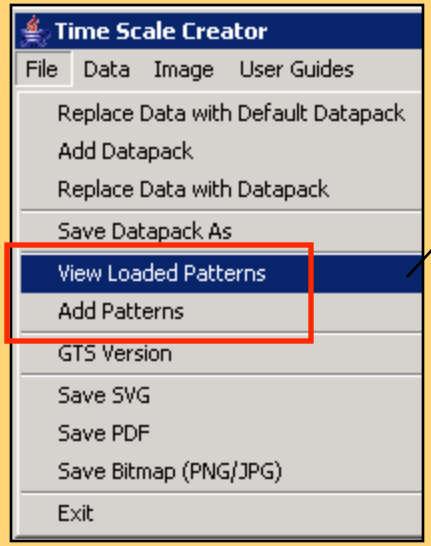
Facies Column Options Inside TS Creator Pro

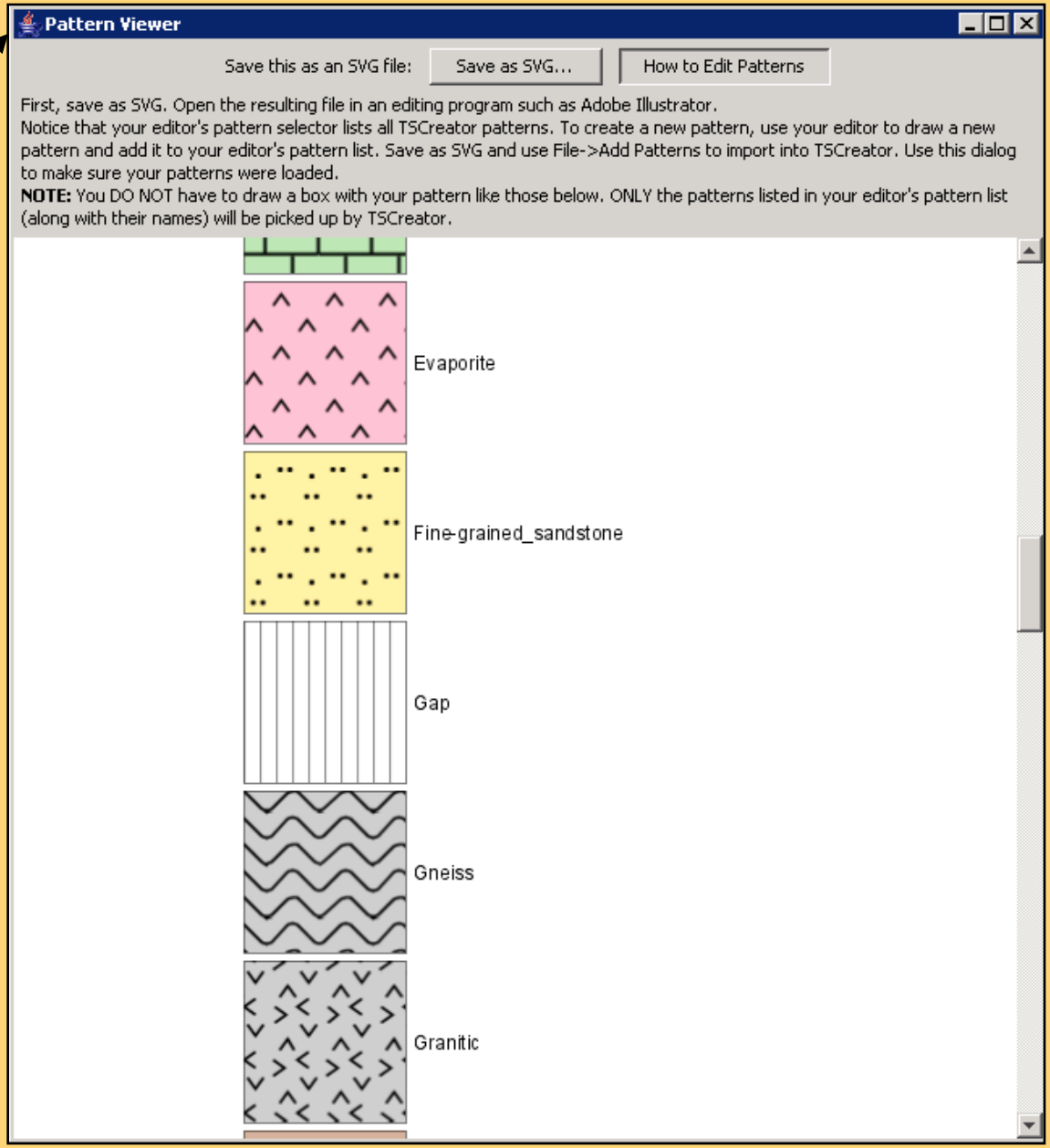


In Settings/Choose Zonations, you can select the following for the three component facies columns:

- Background color.
- Fonts
- Title
- Turn title on or off
- Width of column. **(Column width is not editable inside the datapack for Facies Columns).**
- Turn age labels on or off
- Display labels horizontally or vertically with the ability to ‘auto flip’ the label to fit the column width if necessary.

Viewing, Creating or Editing Lithology Patterns





To see the 50 default lithology patterns, click on *File/View Loaded Patterns* to bring up the Pattern Viewer.

To add new patterns, click on *Save as SVG* button to save the 50 default patterns. Bring the file into **Adobe Illustrator** and add new patterns as desired. Then click on File→*Add Patterns* to import the new file into TS Creator Pro.

Facies Column Format:

Header row:

<Title>	**facies**	<width>

Required fields:

- **Title** (Example: Type Mississippian Lithostrat)
- the word '**facies**'
- width is inactive (can be set inside TS Creator Pro)

Series row:

<Series label>	**<blank>**	<width>

Required fields:

- **Series label** (Example: Morrowan)
- a **blank** second cell
- width is optional

Data rows:

<blank>	**<facies>**	<label>	**<age>**

The 'facies' field value in a data row is either 'TOP' or a facies pattern.

Required fields:

- a **blank** first cell
- **facies** (a pattern, Example: Sandstone)
- label (name of facies, Example: Caseyville) –optional. Label will display in the Facies Label sub-column.
- **age**

Facies Pattern Width Format: pattern indentations

Facies columns show grain size by **varying the width** of the box containing the pattern. The patterns built into the software already have widths associated with them. These widths can be altered by specifying them inside the datapack using the **patternwidths format.**

Important: **The patternwidths parameters are independent of the Facies column (do not include within the Facies column data in the datapack).**

Header row:

patternwidths	**patternwidths**

Required fields:

- the word **'patternwidths'** in the first and second cells.

Data rows:

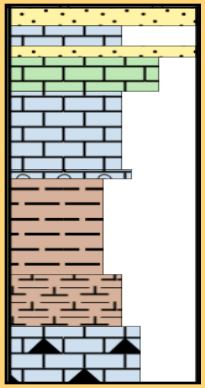
<blank>	**<pattern name>**	**<pattern width>**

Required fields:

- a **blank** first cell
- **pattern name** (a pattern, Example: Sandstone)
- **pattern width** – width of column block in percent. (low percentages may make the pattern unreadable: suggest using 50 to 100% range for readability)

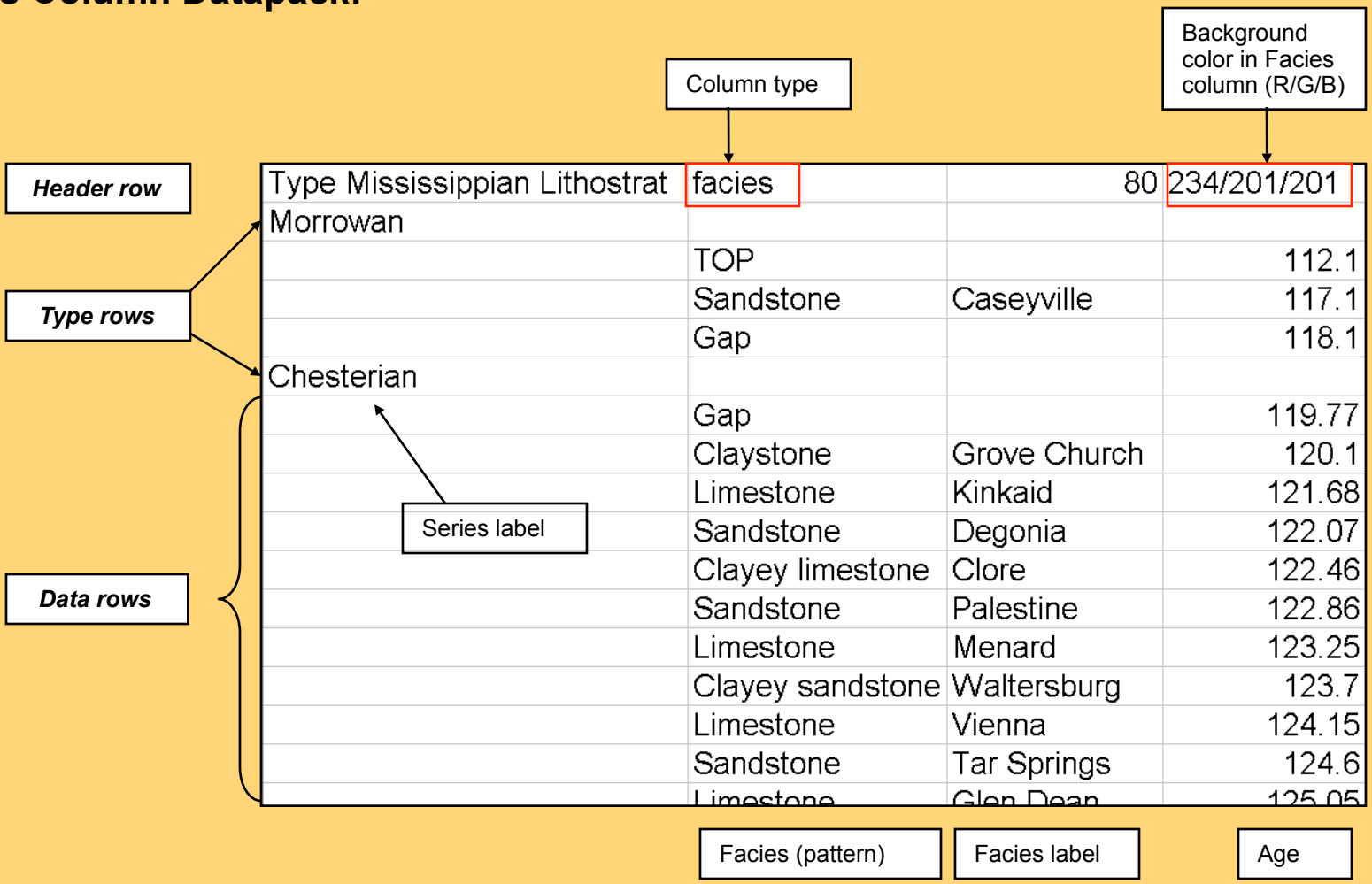
Datapack

patternwidths	patternwidths	
	Limestone	60
	Claystone	50
	Siliceous limestone	70
	Continental marl	60
	Oolitic limestone	65
	Sandstone	100
	Dolomitic limestone	80
	Clayey limestone	75



Note: pattern widths are global: changing them inside the Editor for one set of facies columns will change them for all sets of facies columns loaded.

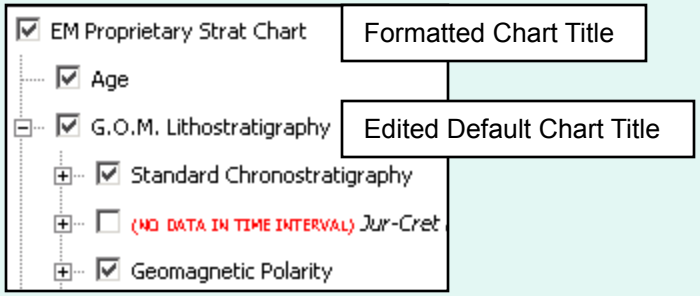
Facies Column Datapack:



Type Mississippian Lithostrat	facies		80	234/201/201
Morrowan				
	TOP			112.1
	Sandstone	Caseyville		117.1
	Gap			118.1
Chesterian				
	Gap			119.77
	Claystone	Grove Church		120.1
	Limestone	Kinkaid		121.68
	Sandstone	Degonia		122.07
	Clayey limestone	Clore		122.46
	Sandstone	Palestine		122.86
	Limestone	Menard		123.25
	Clayey sandstone	Waltersburg		123.7
	Limestone	Vienna		124.15
	Sandstone	Tar Springs		124.6
	Limestone	Glen Dean		125.05

Chart Title

Inside Settings:



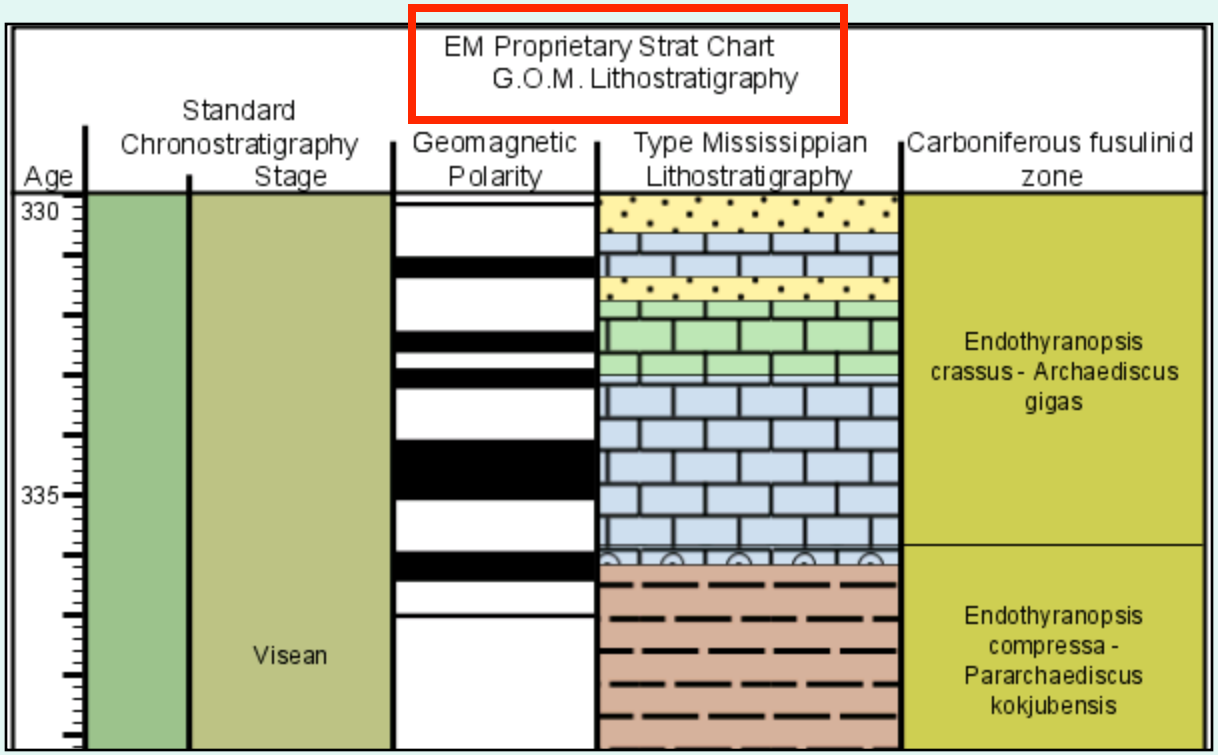


Chart Title Format:

The datapack contains a **default Chart Title** in the first cell of the first group column. And additional chart title can be added above this one by using the following **format.**

Chart Title:	**<name>**

Required fields:

- the words **'Chart Title:'** (with a colon)
- the **title** of the chart or any text desired (Example: ExxonMobil Proprietary Strat Chart)

The formatted Chart Title must be placed after **format version:** and **date:** lines. Only one **Chart Title format line** can exist in the datapack.

Datapack:

format version:	1.2				
date:	1/1/2007				
Chart Title:	EM Proprietary Strat Chart				
age units:	Ma				
Chart Title	:	Age	Standard Chrono	Jur-Cret boundary	Geoma

← Chart Title format line

← First group column

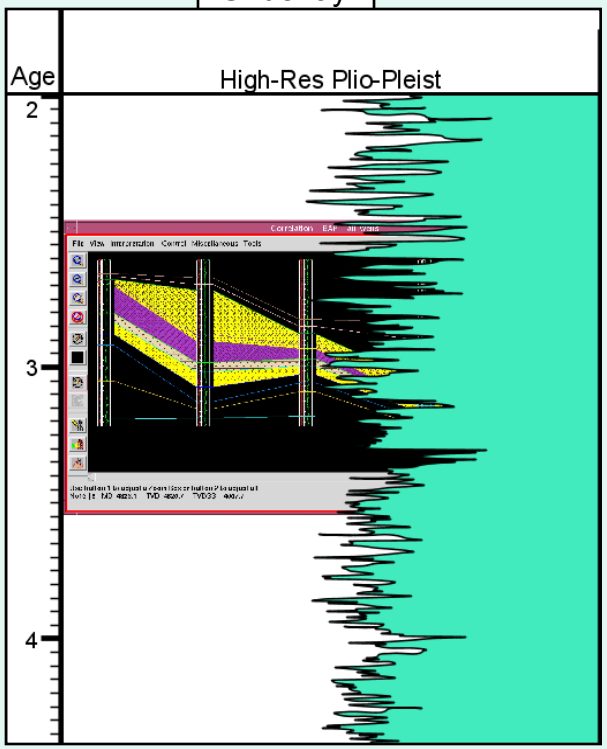
To change the name of the default Chart Title (in the Group column), replace 'Chart Title' with the desired words. (Example: G.O.M. Lithostratigraphy)

format version:	1.2				
date:	1/1/2007				
Chart Title:	EM Proprietary Strat Chart				
age units:	Ma				
G.O.M. Lithostratigraphy	:	Age	Standard Chrono	Jur-Cret boundary	Geor

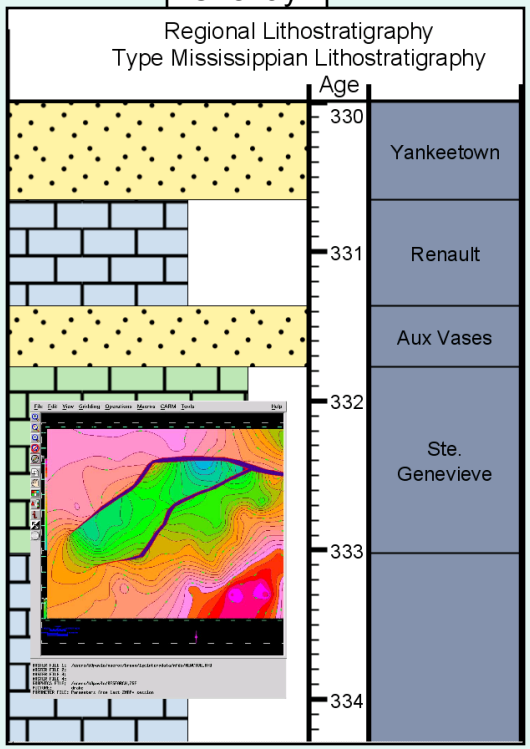
Freehand Column

Freehand columns allow import of image files to be displayed on top of (overlay) or underneath (underlay) the column listed above in the datapack. It can also be displayed as a separate, free-standing column.

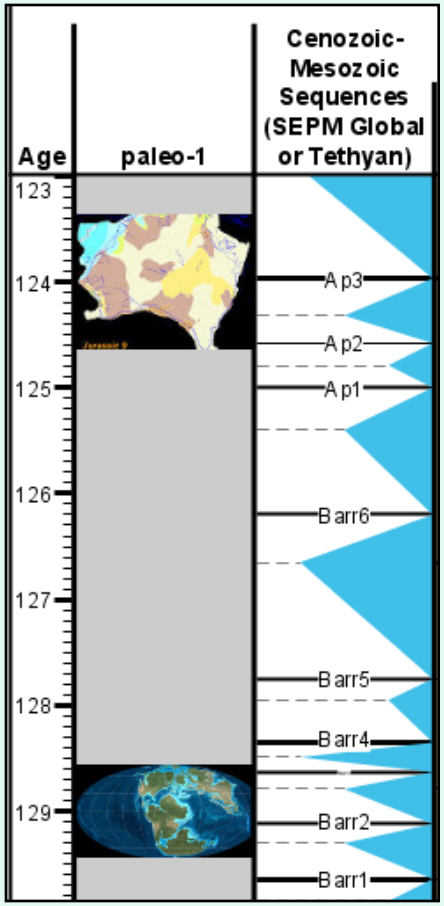
Underlay



Overlay



Free-standing Column



The Freehand column can be used to display data such as oil/gas levels (tied to lithostratigraphy) or paleo reconstructions (polygons).

The data format is an image file (jpg, png or svg).

Freehand Column: allows loading of image files

<Title>	**<coltype>**	< width>	<color>

Freehand columns can be drawn as a separate column, or overlaid or underlaid on the column listed above it in the datapack. Note: Under or overlay will not work on Block, Range or Event columns. Chron overlay will work but not underlay.

Required fields:

- **Title** (Example: Scotese Paleomap)
- **<coltype>** is the word '**freehand**' (creates a separate column), **'freehand-overlay**' or **'freehand-underlay'** (image appears in column listed above it in datapack**)**
- width and color are not required. 'Color' is background color.

image	**<filename>**	< top age>	<base age>

Required fields:

- the word **image**
- the **filename** (including path) of the image file. Supported formats are **JPG, PNG** or **SVG**.
- 'top age' and 'base age' are not required, but if specified, the image will be placed centered both horizontally and vertically between them, maintaining the aspect ratio.

For **additional control** of image placement use the following (optional) format lines:

agetype	**<type>**	< top age>	<base age>
xtype	**<type>**		

<type> choices:

- **Fit** – stretch image to fit disregarding original aspect ratio.
- **Center** – center image
- **Start** – place image toward the top age for agetype or the left for xtype.
- **End** – place image toward the base age for agetype or the right for xtype.

Note: the xtype row is optional: center is the default horizontal placement choice.

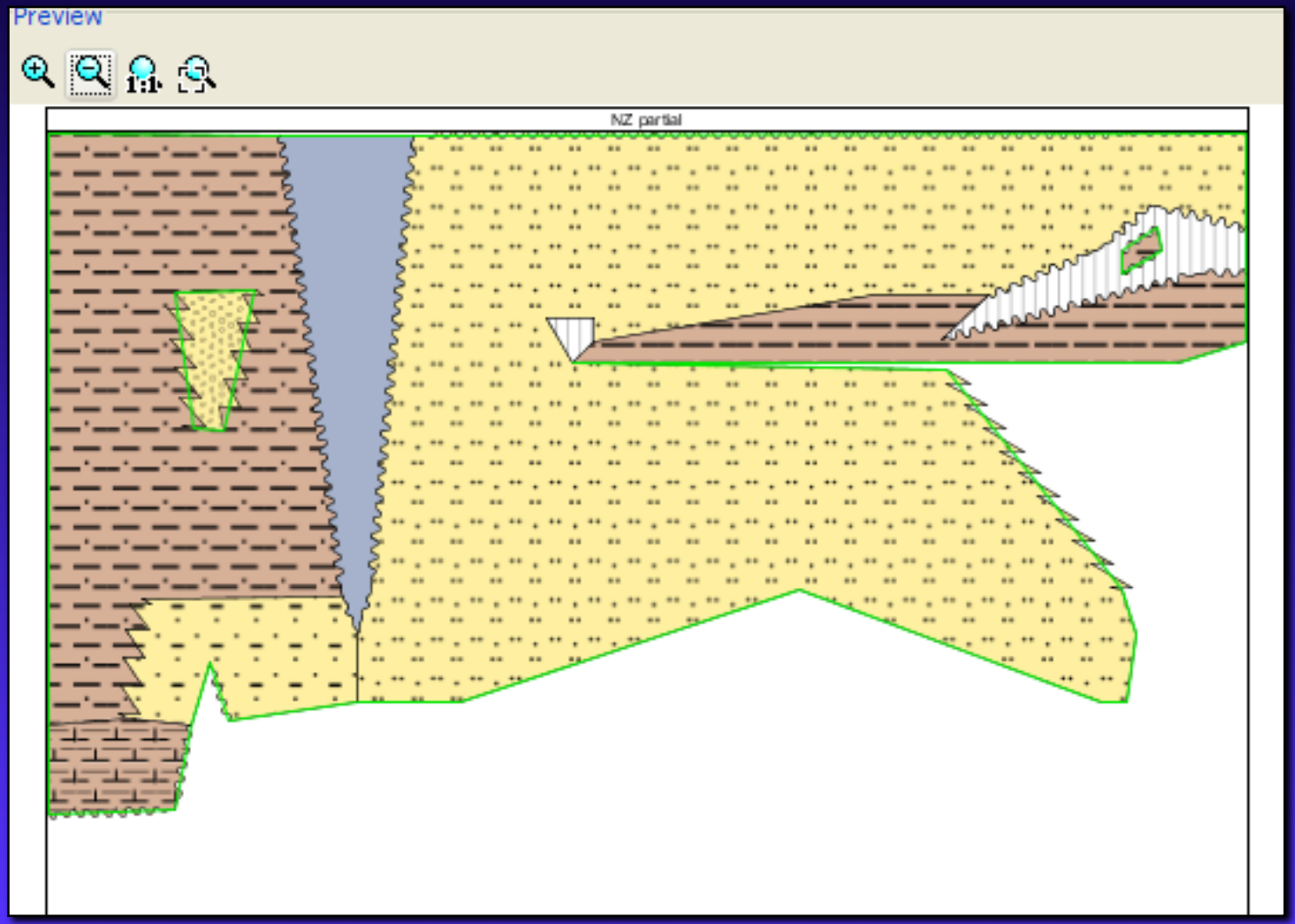
Required fields:

- the word '**agetype**' in the first row, first cell
- **type:** where to place the image **vertically**
- 'top age' and 'base age' are not required fields

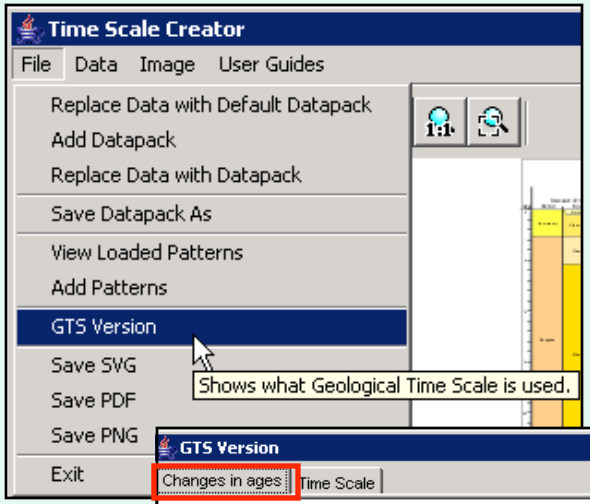
- the word '**xtype**' in the second row, first cell
- **type:** where to place the image **horizontally**

Other Features

Column types -- Transect *(with jagged/wavy contacts)*

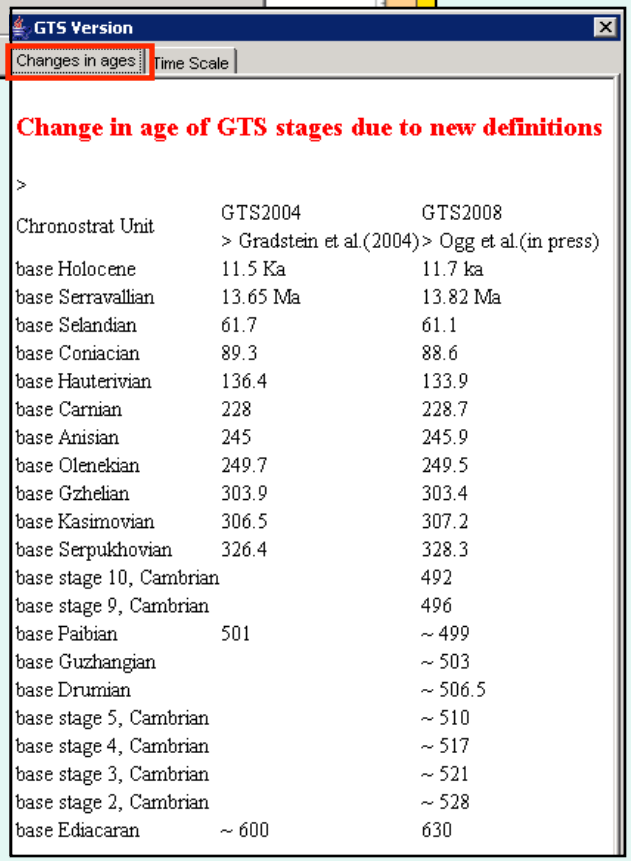


Geological Time Scale Version Comparison: GTS 2008 vs GTS 2004

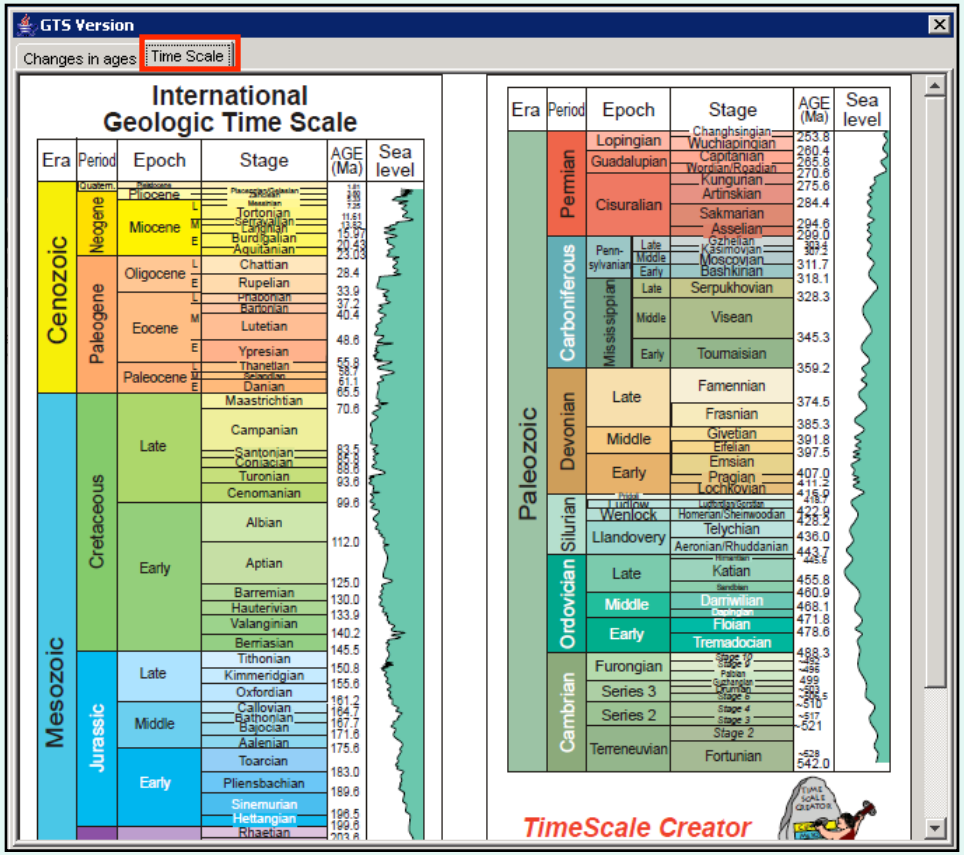


Click on **File/GTS Version** to bring up a version comparison. It shows the difference between the time scale used by TS Creator's data, Concise GTS (2008), and the published GTS 2004. These are the changes that have been ratified by IUGS since GTS 2004 came out.

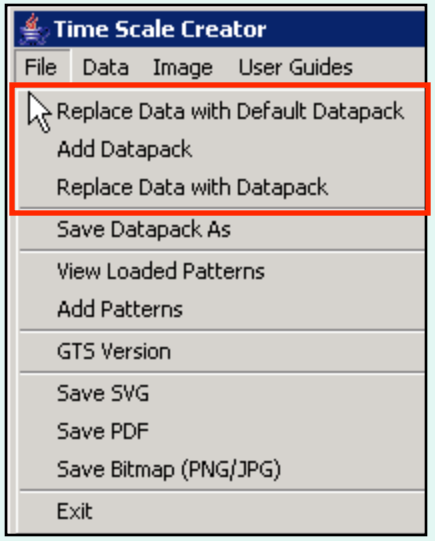
The Changes in Ages tab shows a text comparison. The Time Scale tab shows a graphical comparison.



Chronostrat Unit	GTS2004 > Gradstein et al.(2004)	GTS2008 > Ogg et al.(in press)
base Holocene	11.5 Ka	11.7 ka
base Serravallian	13.65 Ma	13.82 Ma
base Selandian	61.7	61.1
base Coniacian	89.3	88.6
base Hauterivian	136.4	133.9
base Carnian	228	228.7
base Anisian	245	245.9
base Olenekian	249.7	249.5
base Gzhelian	303.9	303.4
base Kasimovian	306.5	307.2
base Serpukhovian	326.4	328.3
base stage 10, Cambrian		492
base stage 9, Cambrian		496
base Paibian	501	~ 499
base Guzhangian		~ 503
base Drumian		~ 506.5
base stage 5, Cambrian		~ 510
base stage 4, Cambrian		~ 517
base stage 3, Cambrian		~ 521
base stage 2, Cambrian		~ 528
base Ediacaran	~ 600	630



Loading Datapacks



Loading Options for Datapacks:

- **Replace Data with Default Datapack:** The default datapack is loaded automatically when the program starts. If the data has been modified in the Editor or another datapack loaded and the default datapack is needed, use this option. It will discard all current data and reset all settings to default.
- **Add Datapack:** Load another datapack, appending its columns into the currently loaded datapack. Use this for custom or updated data.
- **Replace Data with Datapack:** Load another datapack while discarding all current data and settings. If the new datapack does not have a Standard Chronostratigraphy/Stage column, the Top and Base of Interval settings inside Settings will be blank. TS Creator Pro does not read the range of ages in any other column in a datapack.

Public-provided datapacks are located on our website for downloading; and more are with the PRO set. They include:

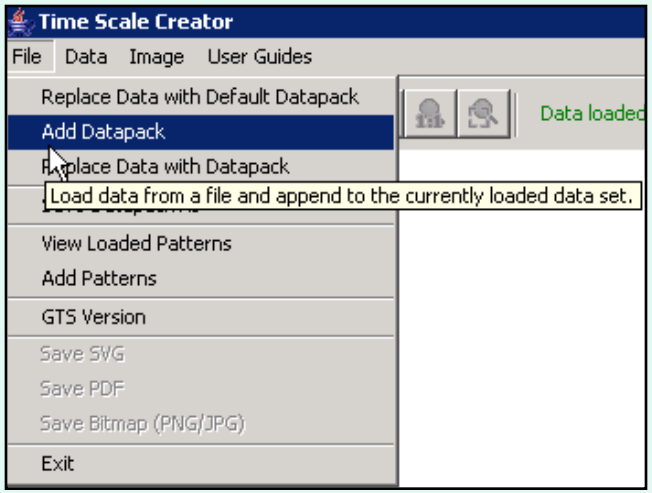
Australia_events, Russian zones, New Zealand time scale, Penns_outcrop_negative

See the DATAPACK page on our website.

Add Datapack:

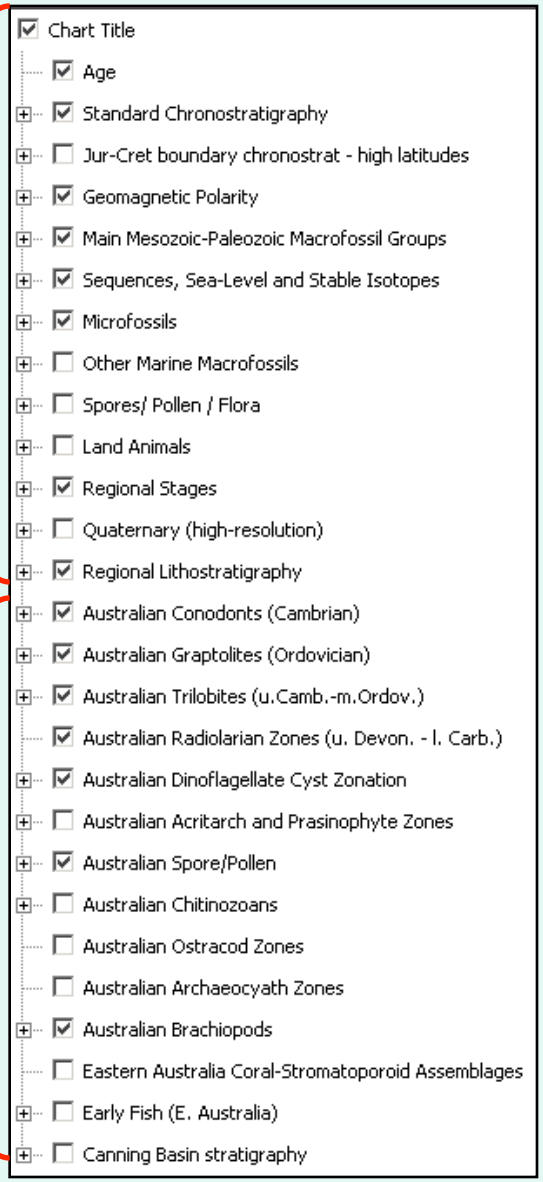
How does data get appended to the already loaded datapack?

The datapack added is appended to the bottom of the already loaded datapack.



Default datapack columns

Added datapack columns



Saving the Output Chart to a File

Charts can be saved as **SVG, PDF, or Bitmap (PNG/JPG) files.**

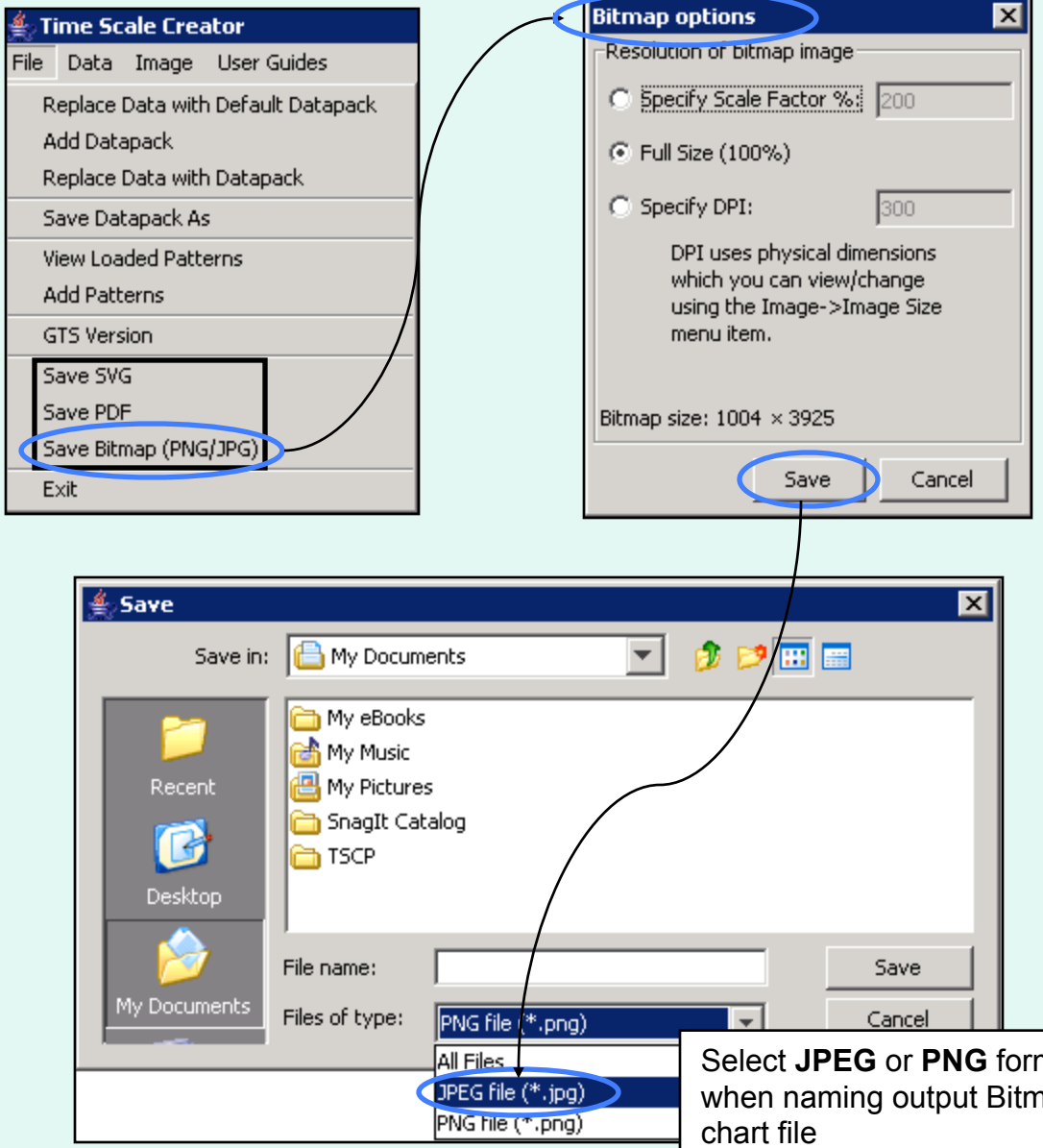
.SVG is a scalable vector graphics file which can be directly imported into most graphics software for plotting. (ex. Adobe Illustrator) Individual elements (color, text, line, etc.) of this format can be edited. Columns can be merged. High quality PDFs and JPGs can be created in Adobe Illustrator from the .SVG file.

.PDF is a universal format that is easy to email. Image quality is very good. Downside is that **PDF files take a long time to build** in TS Creator Pro.

.JPG is a raster image file that can be read into PowerPoint, ArcGIS and Easycopy (for montaging). JPG files can be loaded directly into **Petrel**.

.PNG (portable network graphics) is also a raster image file, but is a newer Bitmap format that produces better quality files compared to JPGs. Petrel 2007 will have a .PNG import format.

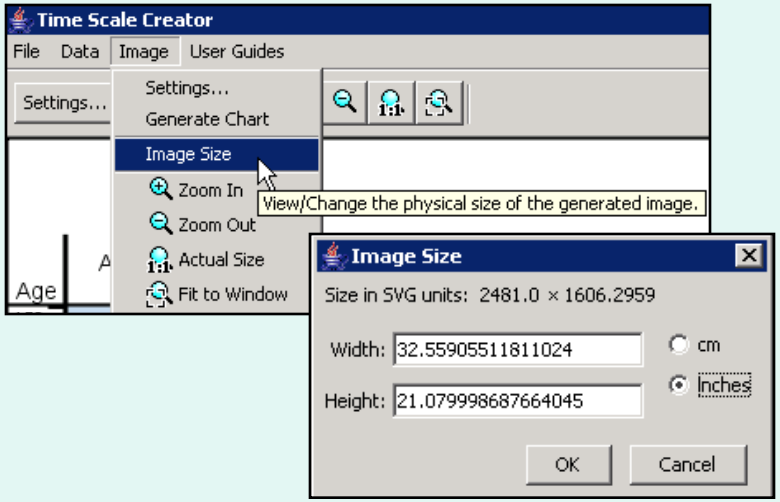
Bitmap options include ability to specify a scale factor or specify DPI.



Select **JPEG** or **PNG** format when naming output Bitmap chart file

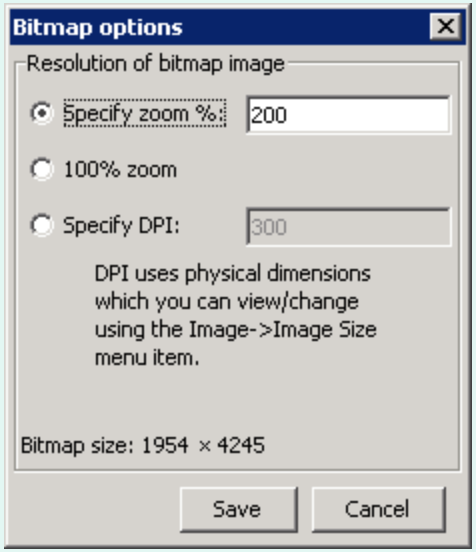
Output Dimensions and Resolution

To obtain **output size** of the chart: click on **Image / Image Size**. Size of chart in inches or centimeters can be set here or changed with Bitmap zoom options. (ratio of height to width remains constant)



Hint: (for JPGs)

- **300 DPI** JPG produces **high resolution** charts suitable for import into PowerPoint (and printing from there). Drawback is a **large file size**.
- **100% zoom** JPG is **lower resolution** but smaller file size.

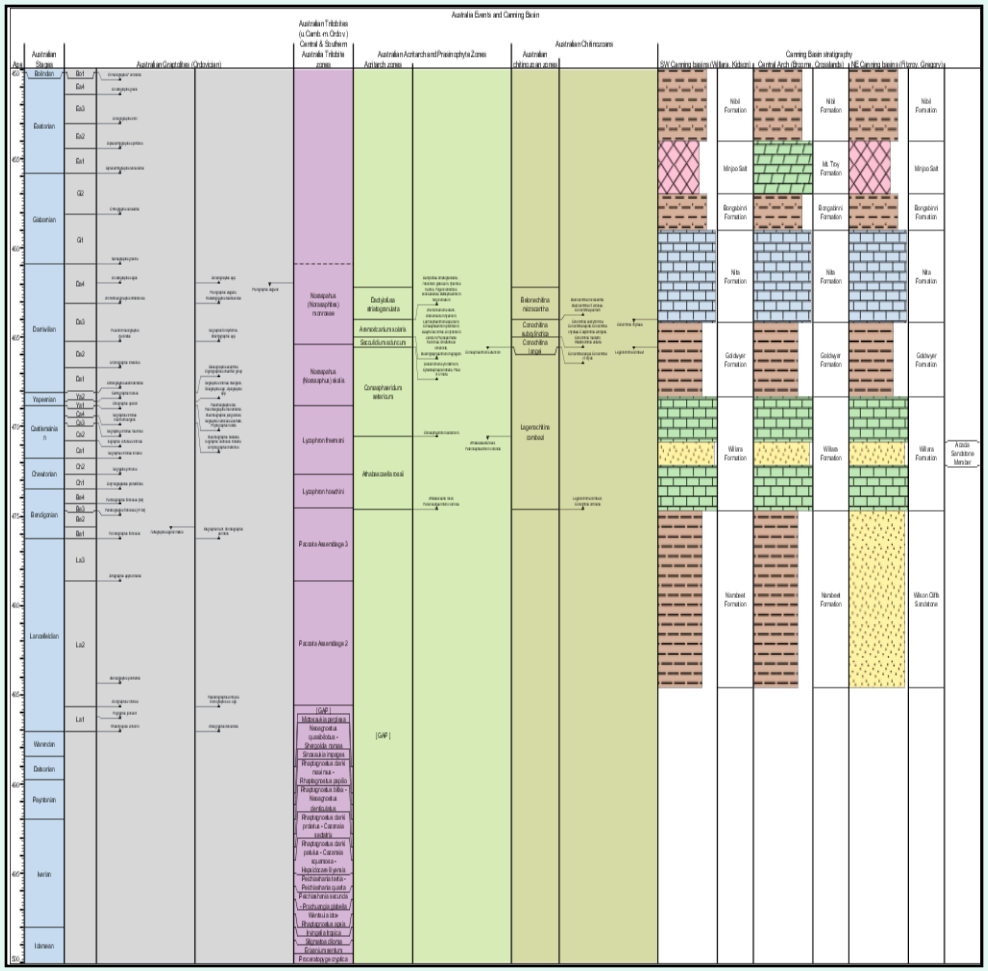


Resolution of bitmap image:

- **Specify zoom %** means apply a scale factor to output
- **100% zoom** means plot at full size
- **Specify DPI** allows increasing resolution (and size) of output graphic. DPI (dots per inch) is the number of pixels divided by the size of the image in inches. (**warning:** setting DPI above 300 may yield a memory error)

Sample Datapacks: Australia

Range of datapack: 579.8 my



Datapack Columns

- [x] Chart Title
  - [x] Age
  - [x] Australian Stages
  - [x] Australian Conodonts (Cambrian)
    - [x] Australian Conodont zones
    - [x] Australian conodont datums
  - [x] Australian Graptolites (Ordovician)
    - [x] Australian Graptolite zones
    - [x] Australian graptolite subzones
    - [x] Australian graptolite zonal markers
    - [x] Other Australian graptolite datums
  - [x] Australian Trilobites (u.Camb.-m.Ordov.)
    - [x] Central & Southern Australia Trilobite zones
    - [x] Central & Southern Australia trilobite subzones
    - [x] Central & Southern Australia trilobite markers
    - [x] Canning Basin Trilobite zones
  - [x] Australian Radiolarian Zones (u. Devon. - l. Carb.)
  - [x] Australian Dinoflagellate Cyst Zonation
    - [x] Australian dinocysts zones
    - [x] Australian dinocycst subzones
    - [x] Australian dinocyst datums
  - [x] Australian Acritarch and Prasinophyte Zones
    - [x] Acritarch zones
    - [x] Acritarch datums
  - [x] Australian Spore/Pollen
    - [x] Spore/Pollen Zones (Price et al. 1985, 1993)
    - [x] Price subzones
    - [x] Southeast Standard zones
    - [x] Southeast Standard subzones
    - [x] Southeast spore/pollen zonal markers
  - [x] Australian Chitinozoans
    - [x] Australian chitinozoan zones
    - [x] Australian chitinozoan datums
  - [x] Australian Ostracod Zones
  - [x] Australian Archaeocyath Zones
  - [x] Australian Brachiopods
    - [x] Tasmanian Brachiopod Zones
    - [x] Tasmanian Brachiopod datums
    - [x] Eastern Australia Brachiopod Zones
    - [x] Eastern Australia Brachiopod subzones
    - [x] Western Australia Brachiopod Zones
    - [x] Western Australia Brachiopod subzones
  - [x] Eastern Australia Coral-Stromatoporoid Assemblages
  - [x] Early Fish (E. Australia)
    - [x] Phoebodont Shark assemblages
    - [x] Turiniid Thelodont assemblages
  - [x] Canning Basin stratigraphy
    - [x] SW Canning basins (Willara, Kidson)
    - [x] Central Arch (Broome, Crosslands)
    - [x] NE Canning basins (Fitzroy, Gregory)
    - [x] NE Canning basin members
    - [x] NE Canning marginal slope
    - [x] NE Canning shelf (Lennard, Balgo)
    - [x] Devonian conglomerates
    - [x] Main tectonic events

Some common user-problems (and JAVA defect):

A word of advice during exploring - there are numerous close-spaced Foram and Nanno events in the Neogene in the current database (and an abundance of Sequences in the glacial-pulsed Pleistocene), so the auto-adjust software sometimes has problems to display these details unless a vertical scale of at least 4 cm to 1 million years. A similar high-density of detail occurs with the brie North American ammonite zones in the Campanian-Turonian interval and ammonite subzones within much of the Jurassic-Cretaceous. Therefore, we have placed some of this dense-detail into "additional" columns with the lesser-used secondary events, plus shorten the genera names for the ammonites and other taxa.

A problem that may occur -- The default Java installation on some operating systems limits the amout of memory a program can use. This Java default may cause large or information-heavy displays may run out of memory. If this happens, a message will appear on the screen -- you can still save the Settings file to regenerate the on-screen display, and usually can save the non-displayed SVG graphic file to be opened in another graphics program or Firefox-type browser. If "Out of Memory" appears, then the TimeScale Creator will also explain how to increase the Java memory allocation. Unfortunately that means you have to restart TSCreator, but you can save your current settings and not loose much time.

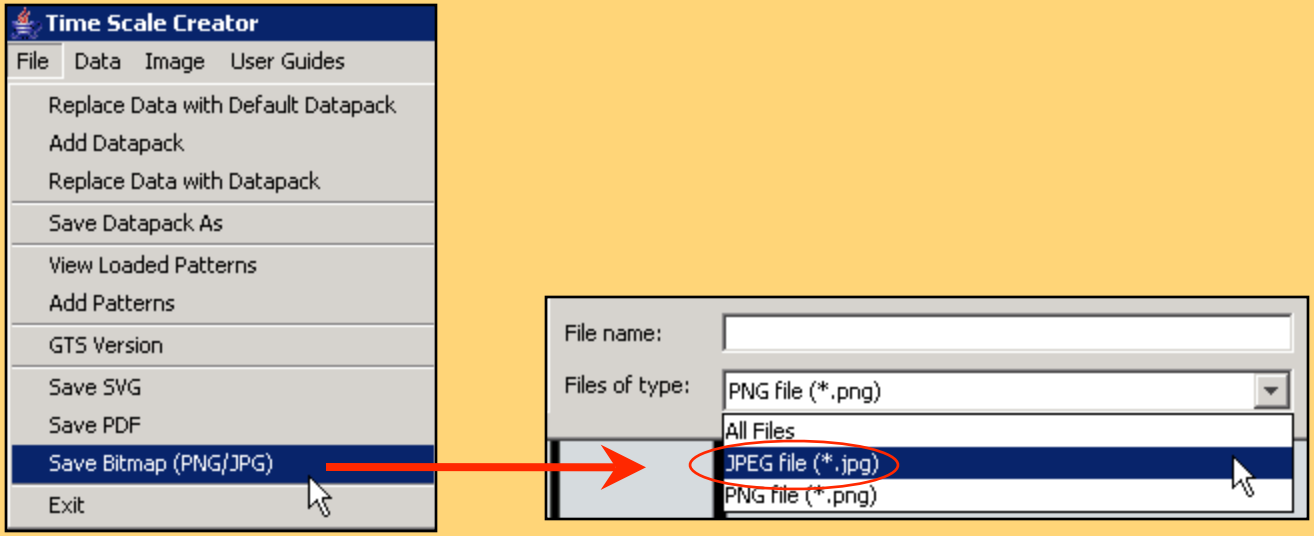
Future Plans

Future plans include:

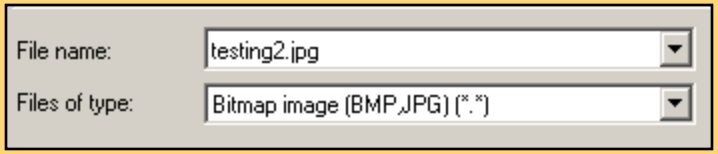
- Optional **Stratabugs** lithology suite.
- New Column types -- entering and displaying Basin transects, Evolutionary trees, Symbol columns

Using TS Creator Pro Images in Petrel

1. Export final display as a Bitmap. (File/Save Bitmap). Select file type JPEG.

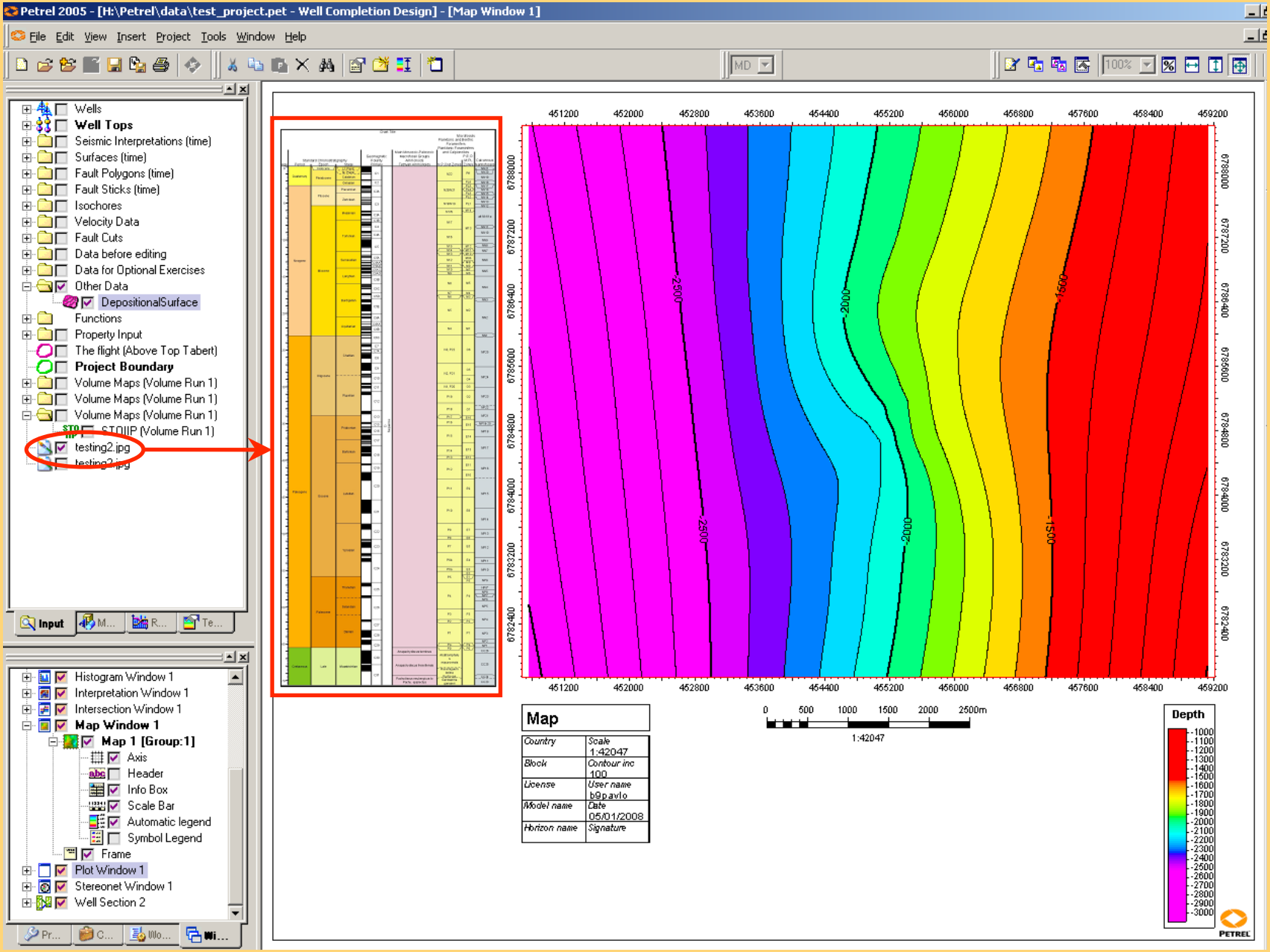


2. Import the JPEG into Petrel. (File/Import) Use file type 'Bitmap image (BMP, JPG)'.



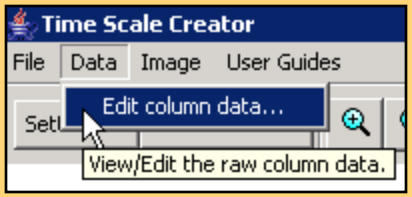
3. Open a compatible window (Function, Histogram, Interpretation, Intersection, Map, Plot, or Stereonet) Add plot to window.

TS Creator Pro JPEG Imported into Petrel Map Window



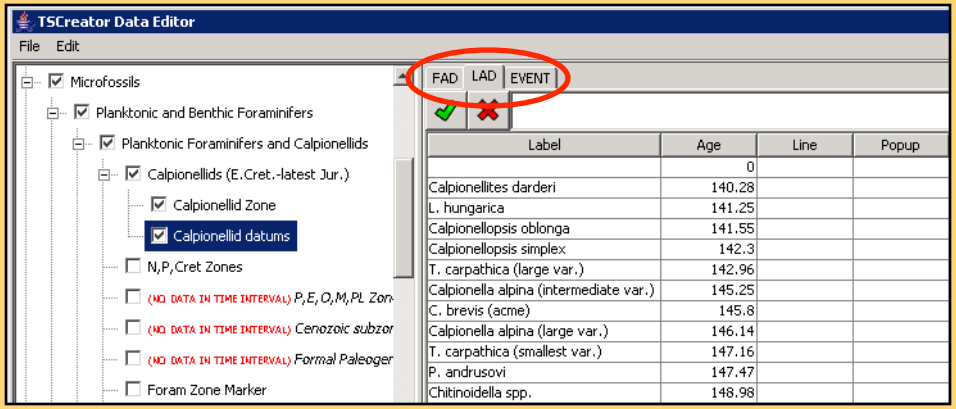
Using the Editor in TS Creator Pro

Click on **Data/'Edit column data…'** to bring up the Editor. All columns in the datapack are editable.



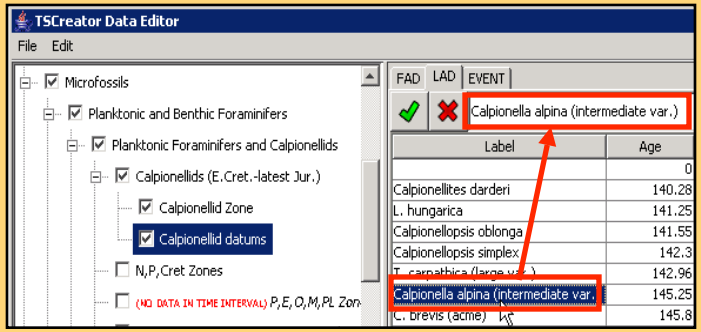
There are **three format types** in the editor, depending on the column type being edited.

Event Column



The first format type:

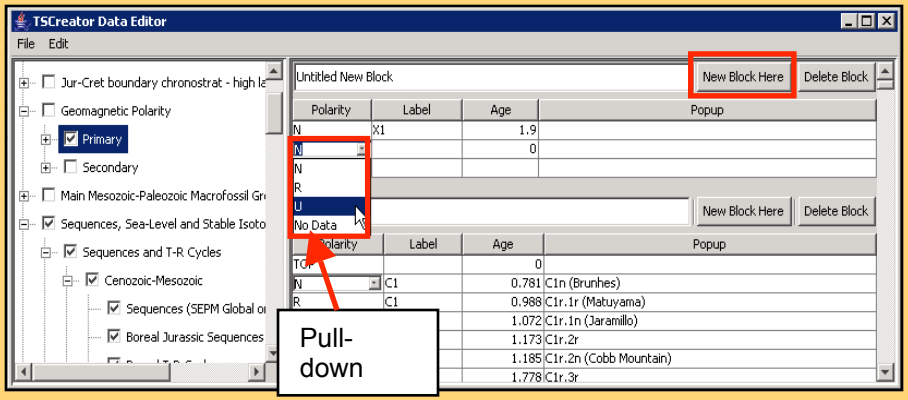
- edits are done in an **edit box** at the top of the data.
- does not allow creation of new blocks of data
- contains tabs for **FAD, LAD and EVENT** data
- only column type with this format : **Event**



To edit a cell, highlight the cell then type the new value in the edit space at the top of the window.

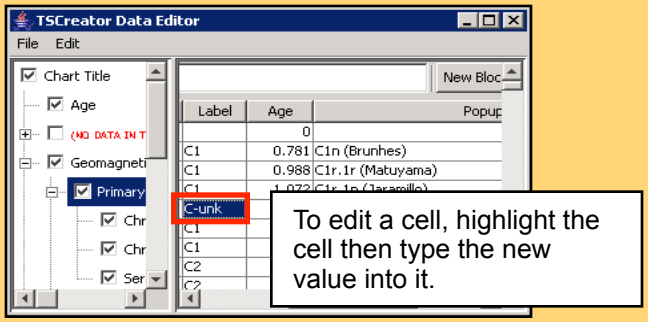
Using the Editor

Chron Column



The second format type:

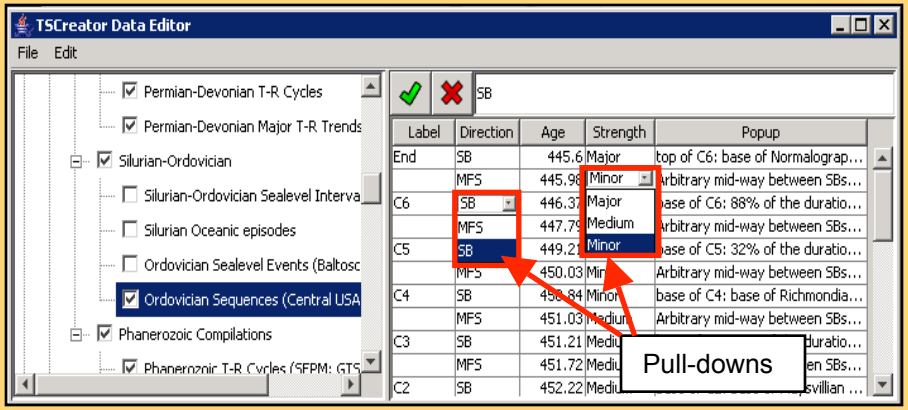
- can **add/delete blocks** of data
- edits are done **'in place'**
- contains **pull-downs** for data selection in some columns
- column types with this format: **Chron, Facies**

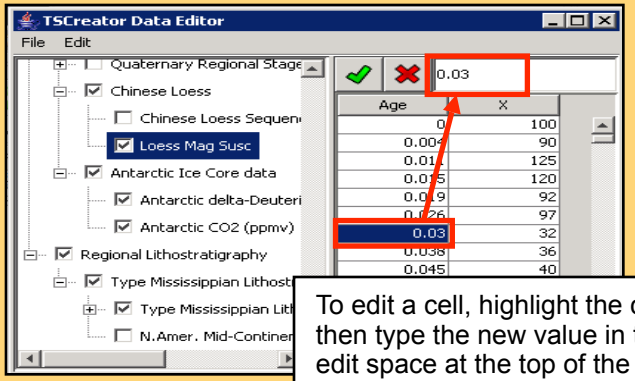


The third format type:

- edits are done in an **edit box** at the top of the data.
- does not allow creation of new blocks of data
- contains **pull-downs** for data selection in some cells
- column types with this format : **Point, Sequence, Trend and Range**

Sequence Column





Using the Editor: edit functions

To add data from an Excel spreadsheet:

1. arrange the data in the spreadsheet in the same column order as seen in the Editor,

2. **copy** the same columns in the spreadsheet as appear in the editor (note: there are ***no blank columns*** in the editor); copy the desired number of rows,

3. **insert** the same number of blank rows into the editor at the place you want to add the data.

4. **right click** and select **paste**, overwriting the blank rows.

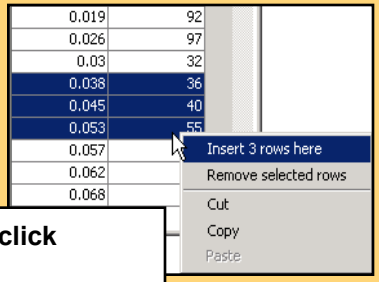
• **To insert new blank rows of data**, highlight the number of rows you want to insert at the place you want to insert them, **right click** and select 'insert # rows here'. The blank rows will be added above the highlighted rows.

• **To delete data** inside a cell, an entire row or multiple rows, highlight the data, **right click** and select '**Cut**'. This leaves empty rows or cells.

• **To remove rows of data**, highlight them, **right click** and select '**Remove selected rows**'. Rows are deleted.

• The **red X** and **green check** work the same as Excel. The X replaces the new value with the previous one.

• **Warning:** '**Paste**' will overwrite data if empty rows are not created or available.



Right click menu:

Using the right mouse button menu, you can insert rows, remove rows, cut, paste and copy rows.

Hint: To **check edits**, click on **Generate Chart** to see changes. Changes are not final until the datapack is saved.

TimeScale Creator

Selected Datapacks

TS-Creator -- *GA version*

Australian Government
Geoscience Australia

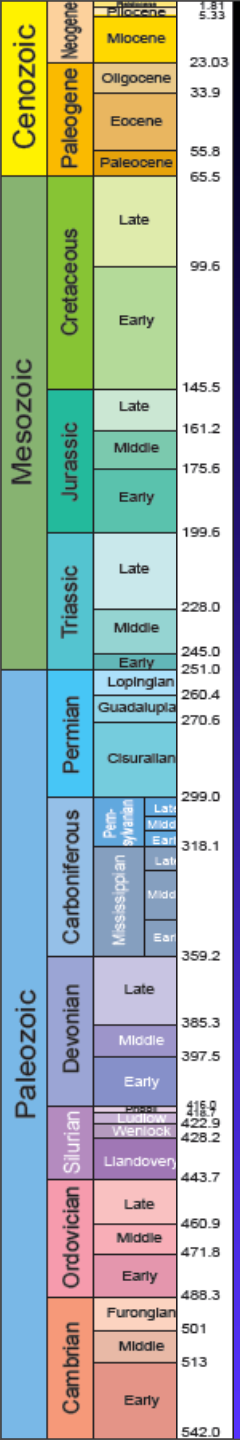
Basic Lithostrat of all onshore and offshore basins

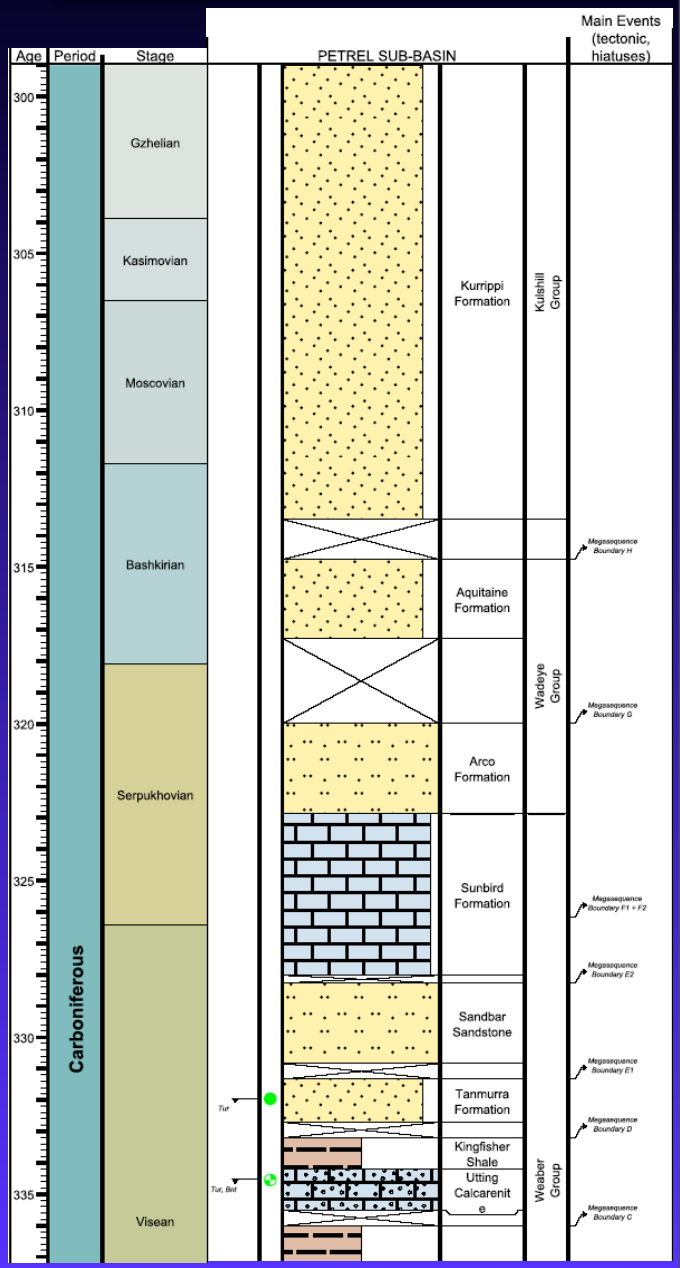
+ Precambrian basins

Hot-Links to LEXICON

Calls to Oracle database

- *Basin summary reports*
  (includes PDFs of transects)
- *All formations, members*
- *All Oil-Gas reference wells*





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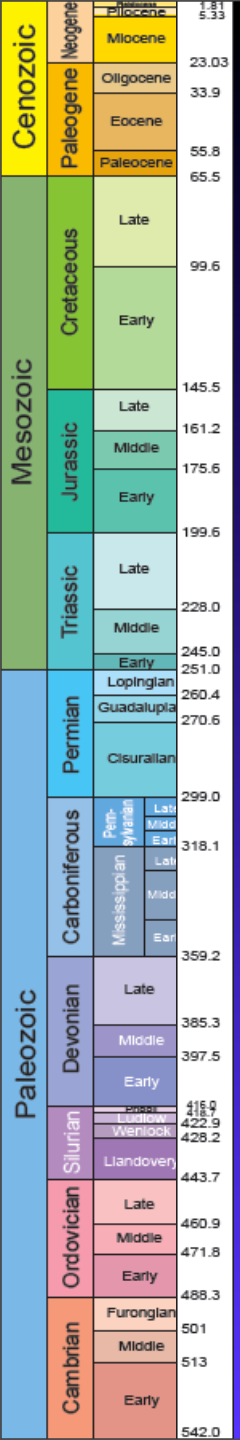
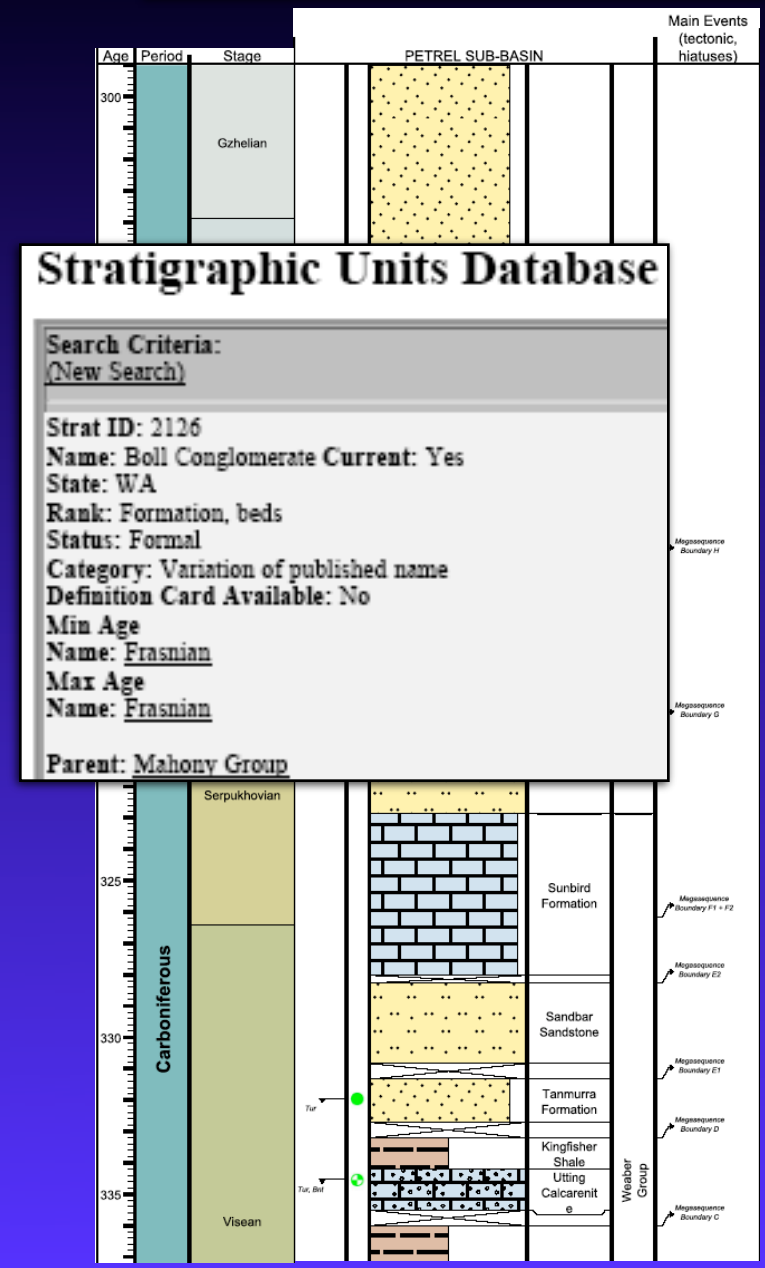
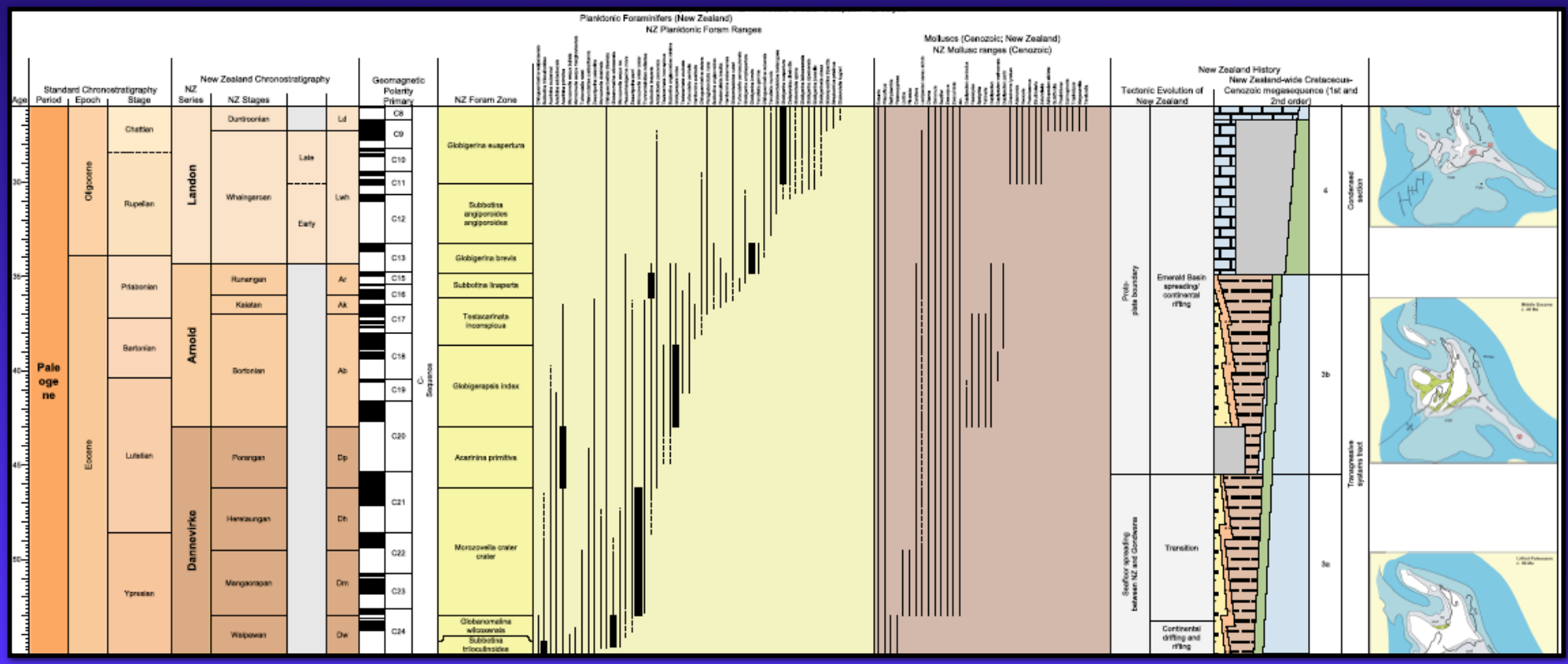




Regional Datapack examples

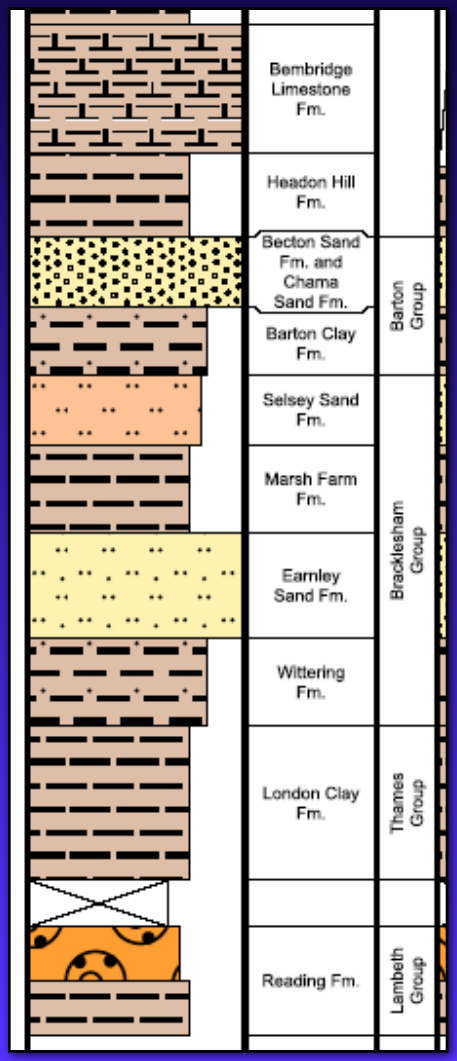
Biostratigraphy -- *North Sea; Agglutin. foram catalog; ExxonMobil "in house"*

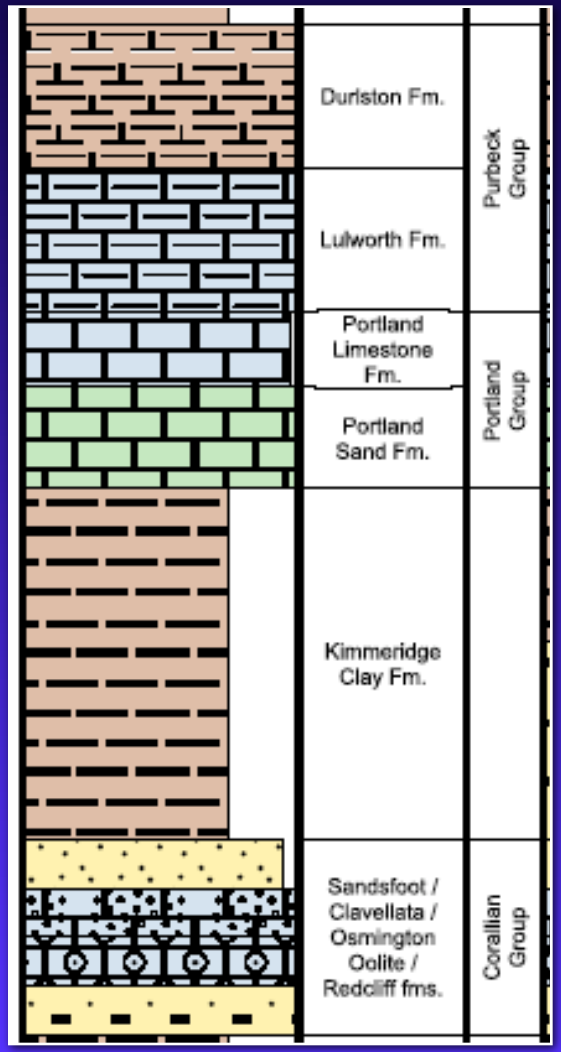
New Zealand -- all the ranges and zones from NZ timescale book; plus reconstructions; soon to add litho-stratigraphy for each basin



Regional Datapack examples

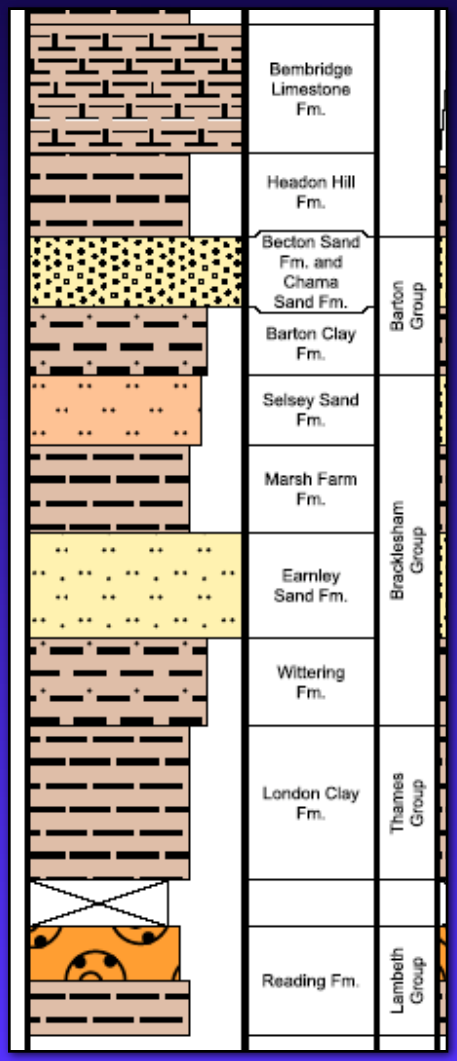
Lithostratigraphy -- *British Isles = ~50 columns. Joint project with British Geological Survey. All formations hot-linked to BGS Lexicon.*

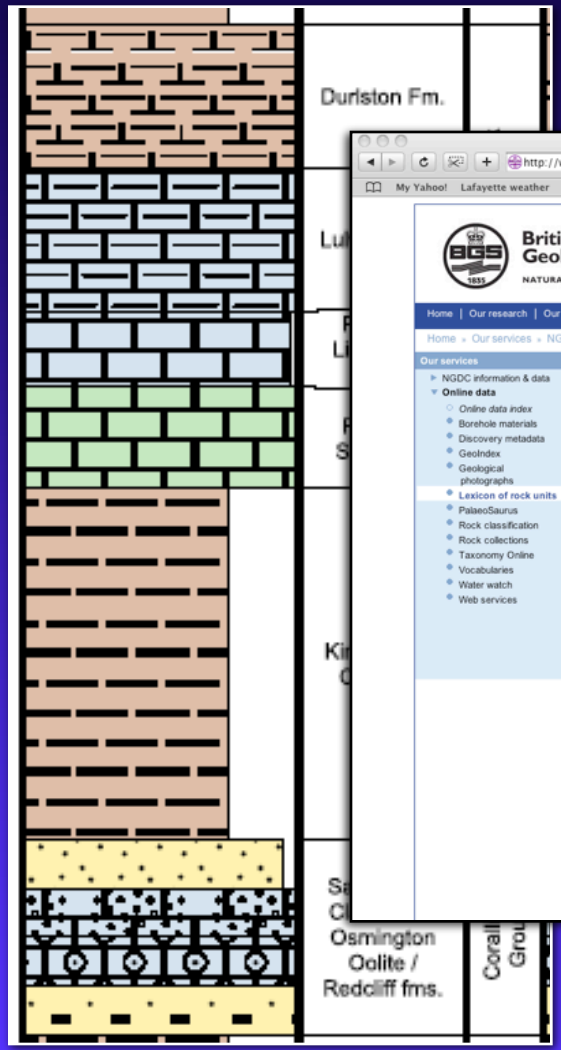


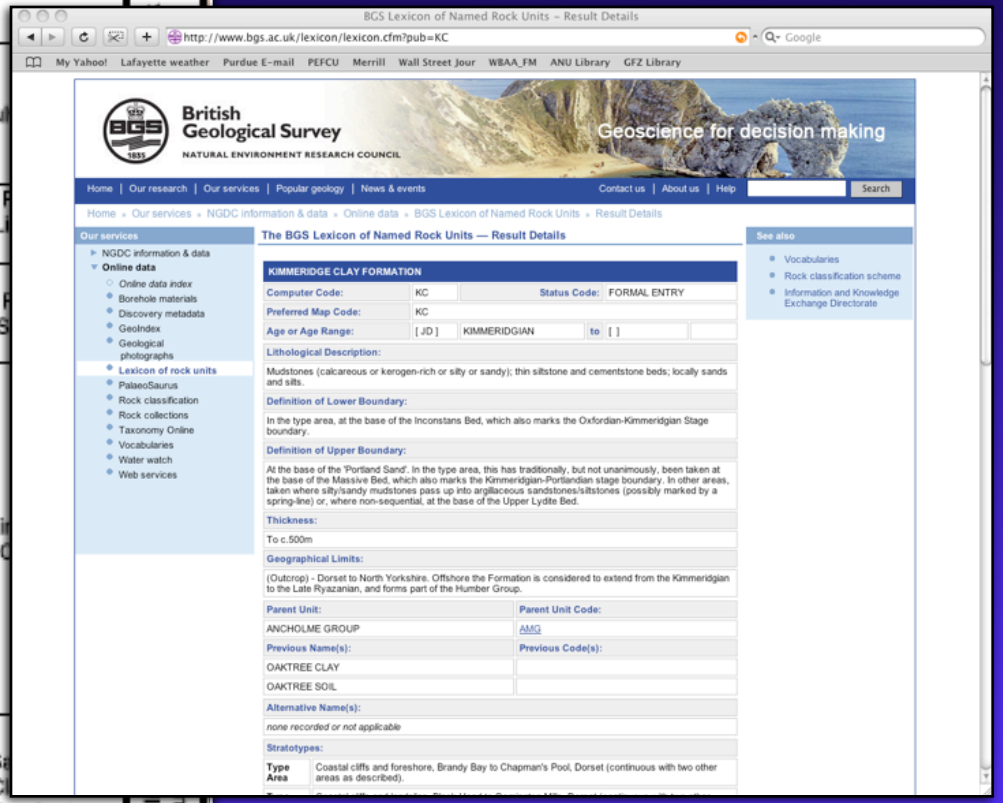


Regional Datapack examples

Lithostratigraphy -- ***British Isles = ~50 columns. Joint project with British Geological Survey. All formations hot-linked to BGS Lexicon.***







Regional Datapack examples

Regional Lithostratigraphy -- *North Sea-Barents Sea.*

Interactive stratigraphic lexicon

http://www.nhm.uio.no/norlex/

My Yahoo! Lafayette weather Purdue E-mail PEFCU Merrill Wall Street Jour WBAA_FM ANU Library

NORLEX

Norwegian Interactive Offshore Stratigraphic lexicon

Open access area

- Norlex report
- Formations and Members descriptions
- Geologic Time Scale

Password protected area

Lithostratigraphy

- Offshore formation tops
- Wells by map
- Formation and members descriptions
- Lithostratigraphic charts
- Preliminary sequence stratigraphy

Biostratigraphy

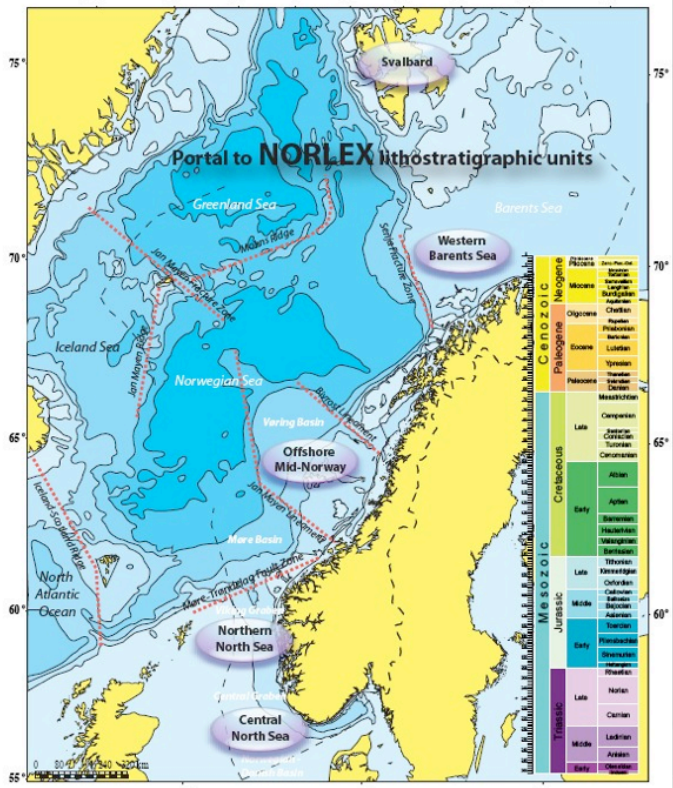
NORLEX project

- Staff, contributors and sponsors
- NORLEX goals and focus paper
- Lithostratigraphic template

Regional literature

Links - organisations

Links - other



Network of Offshore Records of Geology and Stratigraphy

http://www.nhm.uio.no/norges/litho/northsea_meso.php

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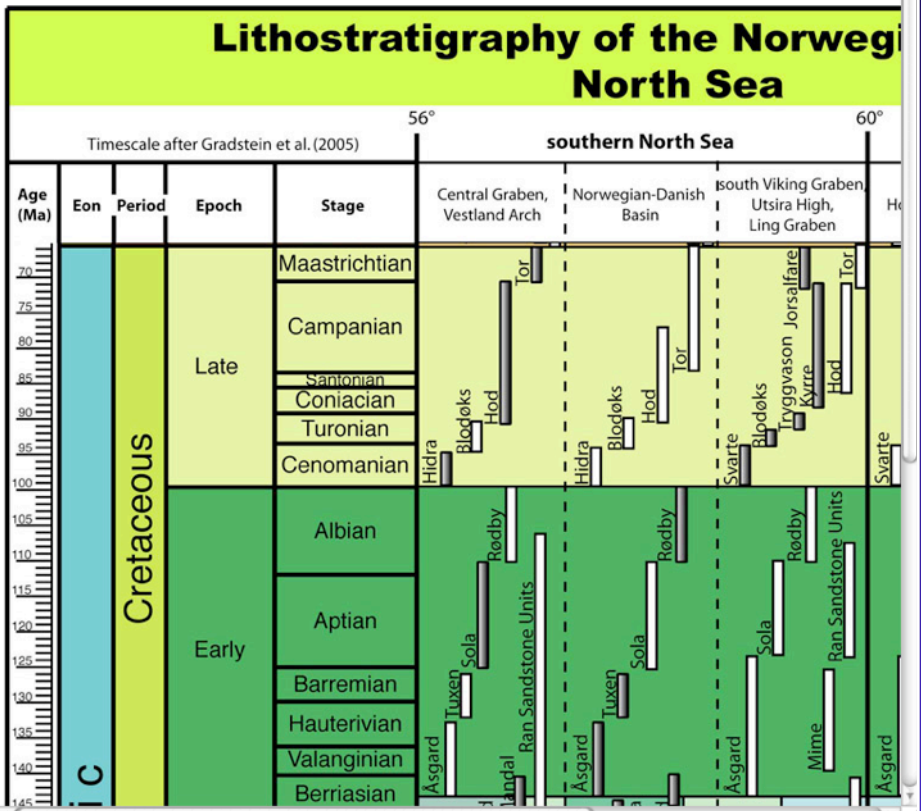
Norlex

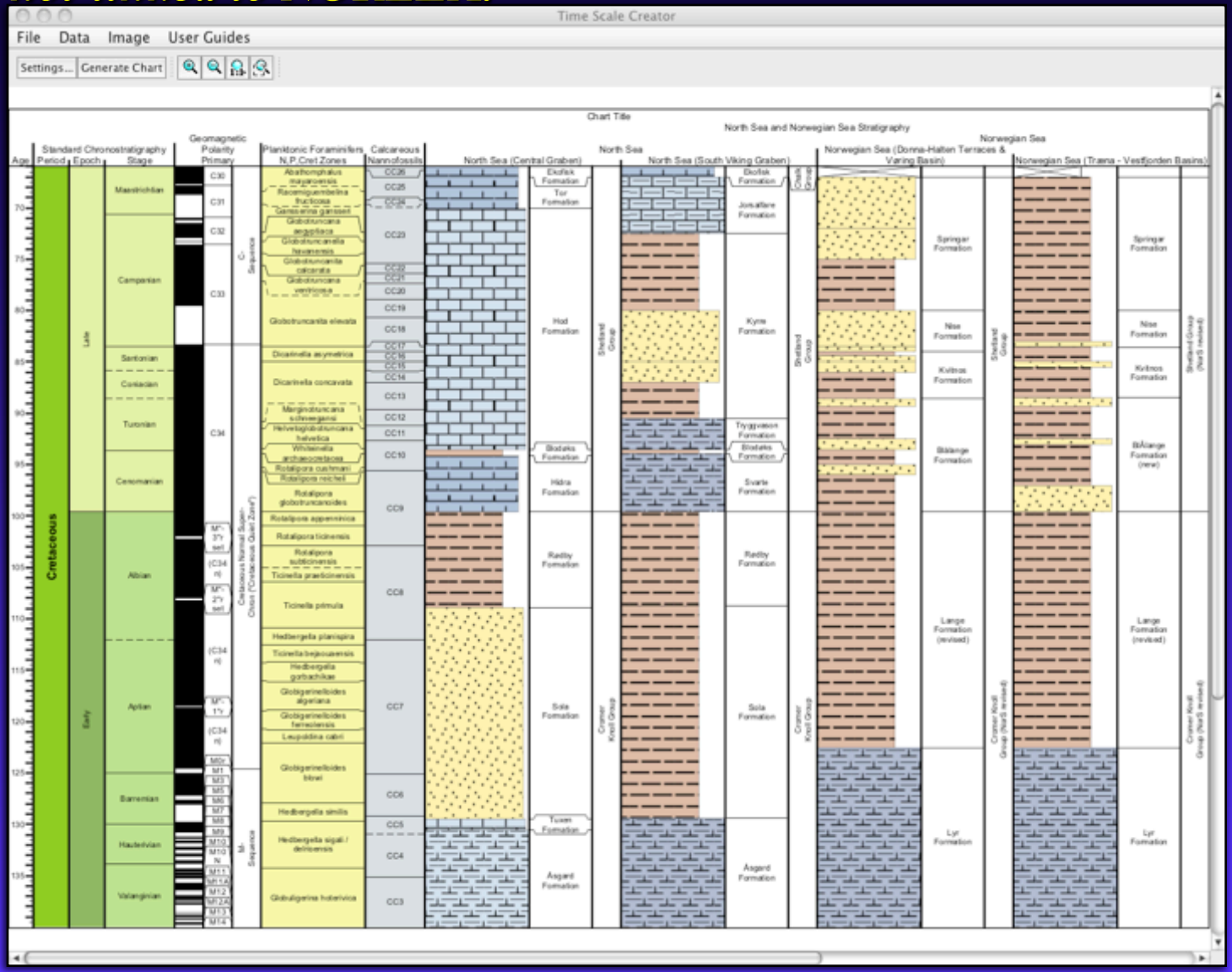
home previous page

Formation and group names are clickable



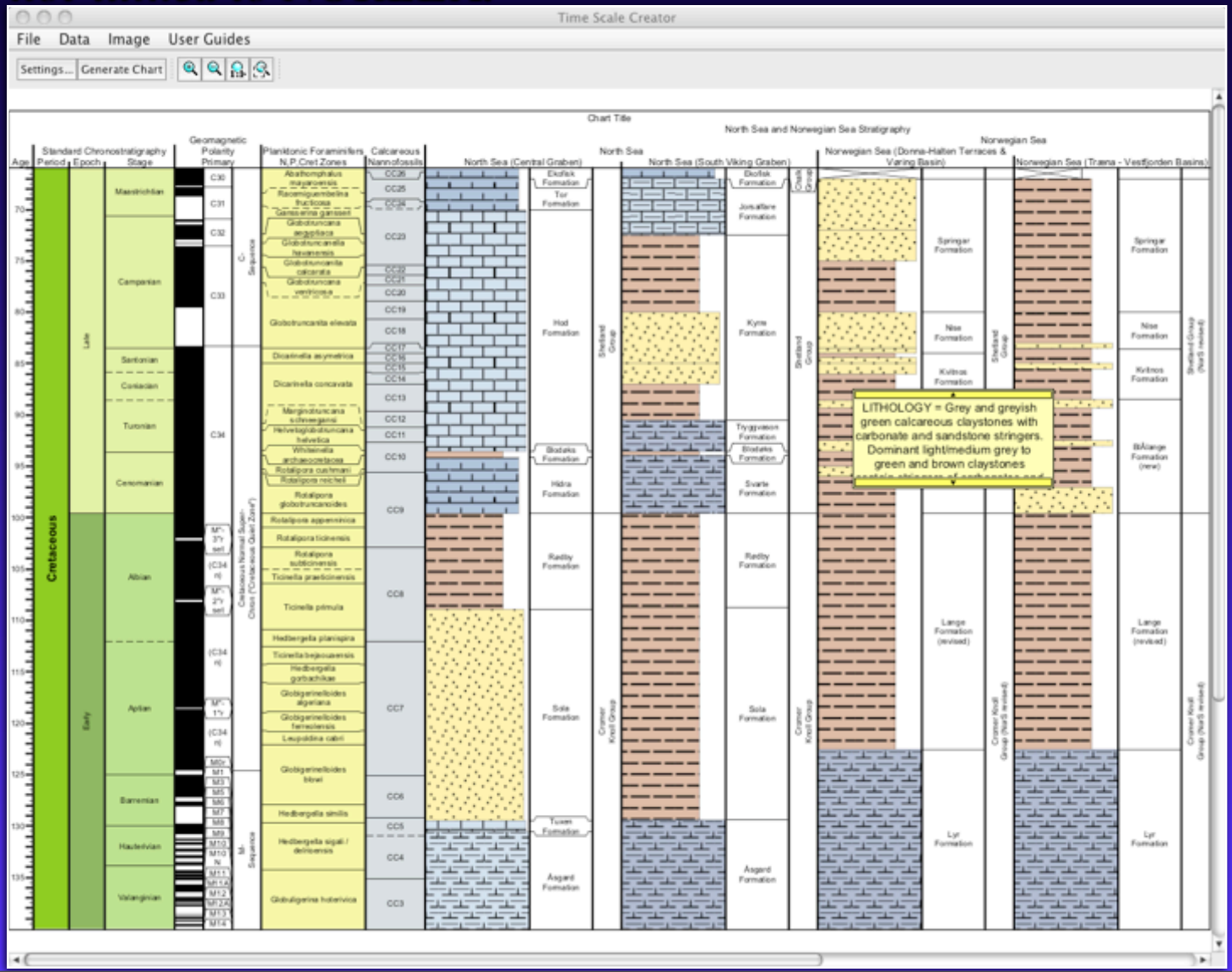
Regional Datapack examples

Regional Lithostratigraphy -- ***North Sea-Barents Sea. All formations hot-linked to NORLEX.***



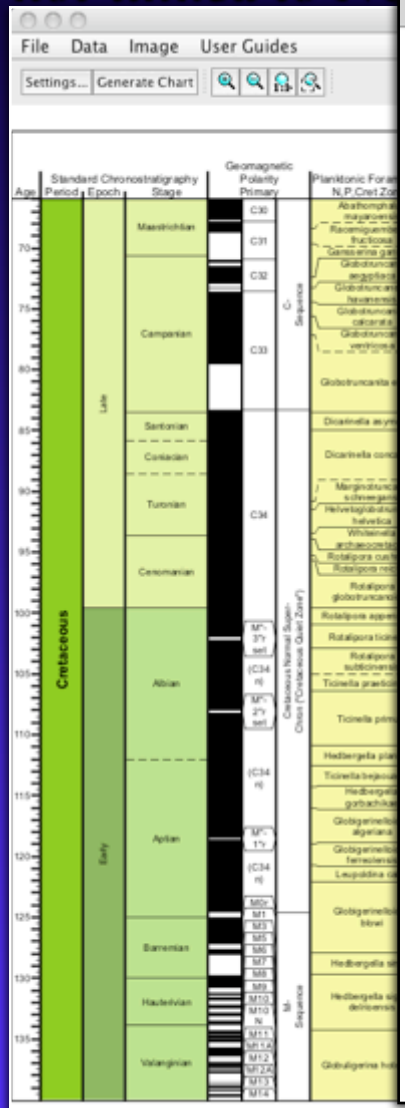
Regional Datapack examples

Regional lithostratigraphy -- *North Sea-Barents Sea. All formations hot-linked to NORLEX.*



Regional Datapack examples

Regional lithost
hot-linked to NC



Network of Offshore Records of Geology and Stratigraphy

http://www.nhm.uio.no/norges/litho/kvitnos.php

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Norlex

home previous page

Kvitnos Formation

Shetland Group

Introduction

The Kvitnos Formation was originally introduced by Dalland *et al.* (1988) for a widespread unit of calcareous mudstones developed below the Nise Formation. Two new sandstone members are defined within this formation: the Tumler Member, an interval of Santonian sandstones in the Vøring Basin, and the Kvitskjæving Member, a unit with a similar stratigraphic age developed in the Vestfjorden Basin.

Name

English/ Norwegian and any previous names: No previous formal or published informal names.

Derivatio nominis: Kvitnos is the Norwegian name for the white-beaked dolphin or *Lagenorynchus albirostris*. This small (up to 3m long) 'springar-type' species is found in flocks up to 30 individuals over large parts of the north Atlantic, around the British Isles and the Norwegian and Barents Seas, primarily in shallow coastal areas, in contrast to the closely related Kvitskjæving, which is found in deeper waters.

Lithology

The Kvitnos Formation consists predominantly of calcareous mudstones with subordinate carbonate and sandstone stringers (Dalland et al., 1988). The mudstones light-medium grey, green-grey, occasional medium-dark grey, soft, plastic, amorphous, occasional firm to blocky, subfissile, slightly to moderately calcareous and slightly silty. The limestones stringers are grey-white, occasionally light brown, soft to moderately hard, occasionally argillaceous and micritic. The

Sample Datapacks: North Sea and Offshore Norway Microfossil Zones and Events

Range of datapack: 136.4 my

Datapack Columns

- Chart Title
  - Age
  - North Sea and Offshore Norway Microfossil Zones and Events
    - Dinoflagellate cysts (North Sea)
      - N-Sea Dinocyst Zone
      - Dinocyst events
    - Offshore Norway (North Sea) Zone
    - Offshore Norway Events

TS-Creator
Image datapacks

Reconstructions

Global (Scotese, Blakey)

Regional facies -- Australia, New Zealand

Oil-Gas levels

Tied to lithostrat diagram