



# StrataBugs v3.0

What have we done?  
Where are we now?  
Where are we going?

FORCE, March 2024  
*Paul Britton, StrataData Ltd.*

StrataBugs

# **StrataBugs v3.0**

**What have we done?**

**... And where are we now?**

# Versions and Releases

Help | About

# 3.0.26

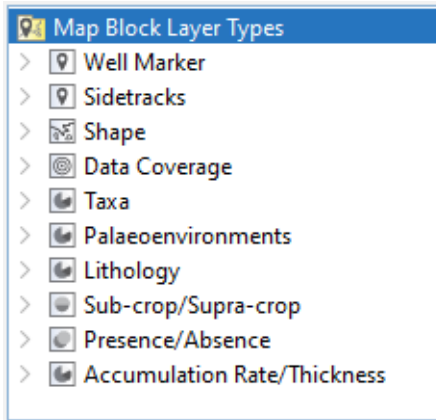
Application release number  
No database changes required

Major version number  
Change requires  
database reload into  
new structure

Minor version number  
Change requires in-  
place database  
update of existing  
structure



# Data Layers



- Well markers
- Data e.g. Palaeoenvs
- Shown as series of coloured circles



Samples & Interpretations - StrataBugs

File Samples Occurrences Picklist View Help

Well-1

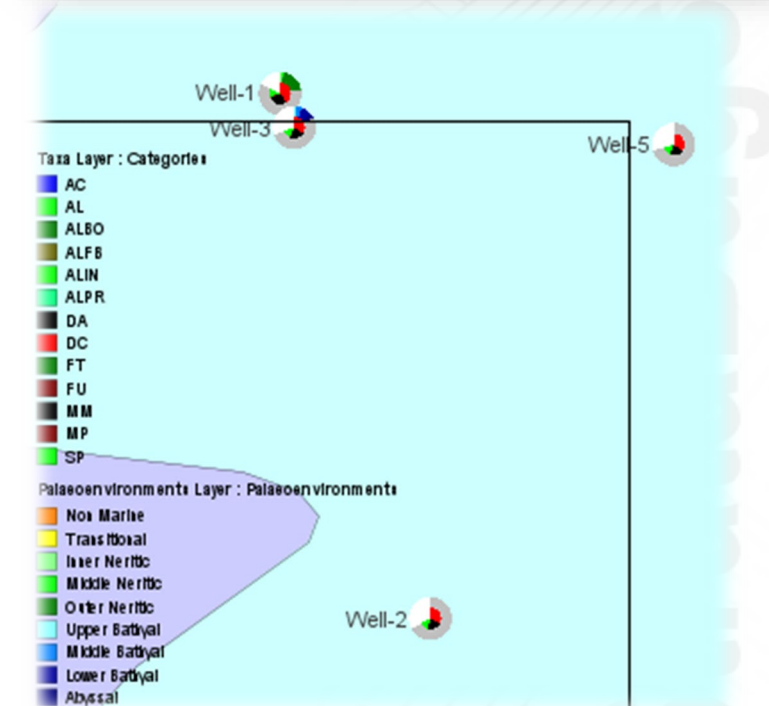
Samples Analyses Occurrences Interpretations Charts Documents

Version: Default Version ... Notes... Move data to...

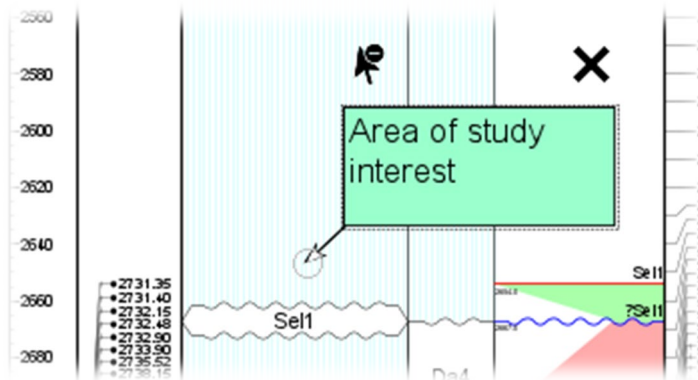
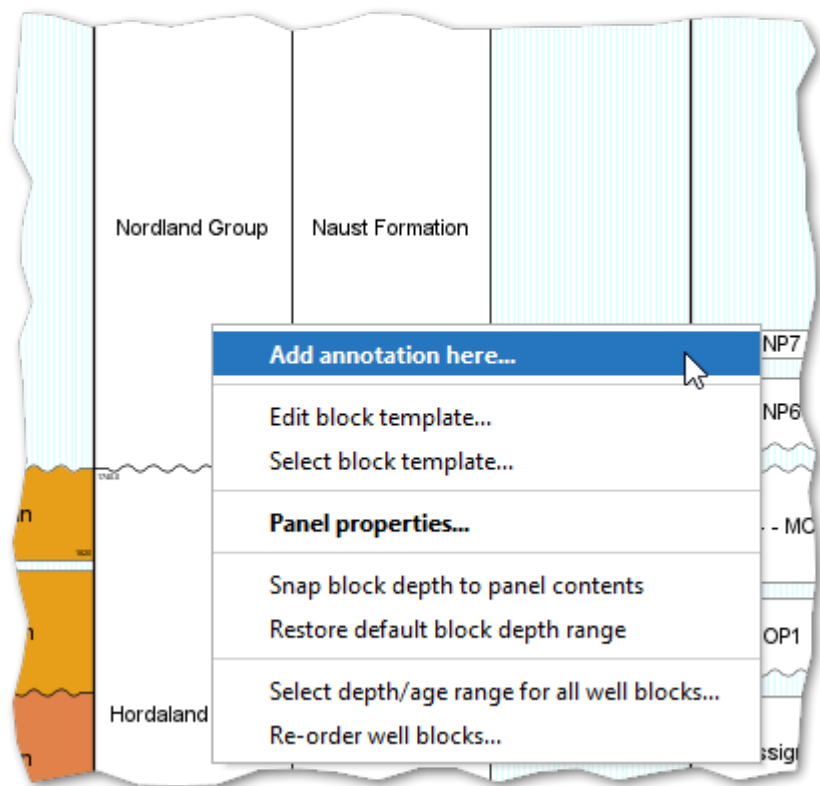
Chronostratigraphy Biozones Lithostratigraphy

Disconformities Palaeoenvironments Bio. Comments Interval Comments

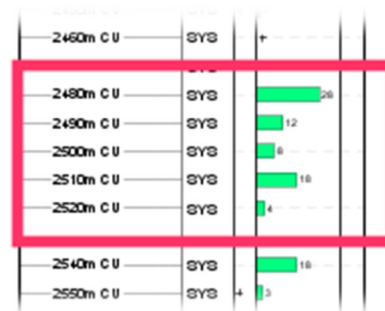
	Top Sample	Base Sample	Scheme	Palaeoenviron...	Proximal
Add...	1100.0 LOG	1518.5 LOG	Water depth	Inner Neritic	
Edit...	1518.5 LOG	1667.5 SC	Water depth	Middle Neritic	
Delete	1667.5 SC	1810 CU	Water depth	Outer Neritic	



# Chart Annotations



Annotation	
Text	Area of study i... [...]
Font size	XL [v]
Fill background	<input checked="" type="checkbox"/>
Fill colour	[Green] [... x]
Line colour	Inherited [...]
Line weight	0.3



Annotation	
Text	[Empty] [...]
Font size	XL [v]
Fill background	<input type="checkbox"/>
Line colour	[Red] [... x]
Line weight	2.0

Moves with linked point on block, so can be reordered, scaled etc.

# StrataBugs Server

StrataBugs Server

All Wells

## All wells

- [EXAMPLE-1 \(EXAMPLE-1\)](#)
- [EXAMPLE-2 \(EXAMPLE-2\)](#)
- [Lateral-1 \(LATERAL-1\)](#)
- [Lateral-2 \(LATERAL-2\)](#)
- [Lateral-3 \(LATERAL-3\)](#)
- [Motherbore \(MOTHERBORE\)](#)
- [Well-1 \(WELL-1\)](#)
- [Well-2 \(WELL-2\)](#)
- [Well-3 \(WELL-3\)](#)
- [Well-4 \(WELL-4\)](#)
- [Well-5 \(WELL-5\)](#)

## StrataBugs Server

### Well-1: Chronostratigraphy

863.0 - 1315.0
1620.0 - 1740.0
1740.0 - 1820.0
1740.0 - 1820.0
1830.0 - 1937.0
1830.0 - 1937.0
1937.0 - 2053.0
1937.0 - 2053.0
2060.0 - 2430.0
2060.0 - 2430.0
2432.0 - 2550.0
2432.0 - 2490.0
2500.0 - 2550.0

# Four stages of data processing

1. **Raw** Images from scanned slides (automated)
2. **Analytical** occurrence data from processing preparations (human → machine?)
3. **Events** picked from analytical data (human → machine)
4. Stratigraphic/environmental integrated **interpretation**  
(largely human, some automation)

# Occurrence Type Changes

emes Picklist

Add taxa to picklist:

Sort  
 Category  Abr. genus  
 Species  
 Genus

Qualifiers  
 None  aff.  
 spp.  cf.  
 grp.

Abundance  
Coarse:    
Counts:    
Fine:

Situation  
 In-situ  
 Reworked  
 Caved  
 Marker

Confidence  
 Confident  
 Questionable

<no sub-type>  ...

v2.1 and earlier

emes Picklist

Add taxa to picklist:

Sort  
 Category  Abr. genus  
 Species  
 Genus

Qualifiers  
 None  aff.  
 spp.  cf.  
 grp.

Abundance  
Coarse:    
Counts:    
Fine:

Situation  
 In-situ    
 Transported  
 Reworked  
 Caved  
 Contamination

Confidence  
 Confident    
 Questionable

<no sub-type>  ...

Marker

v3.0



# Events

## Taxon dictionary

- Category
- Genus
- Species

## Event dictionary – 'dictionary events'

- Implied chronostratigraphic age
- Link to taxon
- 'Use as top or base' flag for generating well events – one flag per taxon

## Well Events

- Dictionary event + Sample (= depth)
- Versions...
- Top, base or single

## Composite Standard

- Set of composite standard events = dictionary events + ages
- Stratigraphic occurrence of taxon
- Compare to well events...

# Events cont.

- Adding event as top/base of taxon range
- Adding event top/base Common

Event : Add

Taxon name: FOBA Glomospira gordialis

Event name: Glomospira gordialis

Abbreviation: (optional)

Permitted event types

Top  Base  Single

Prefix in wells: FDO LDO

Prefix in schemes: Top Base

Use to generate top or base well events

Description:

OK Help Cancel

Event : Add

Taxon name: FOBA Glomospira gordialis

Event name: Glomospira gordialis

Abbreviation: CMN Gl. go (optional)

Permitted event types

Top  Base  Single

Prefix in wells: FDCO LDCO

Prefix in schemes: LCO FCO

Use to generate top or base well events

Description:

OK Help Cancel

Events

Select all Clear selected Search... Load all

Type	Name	Abbr.	Taxon	Disc.	Use to gen. top/base?
FDCO/LDCO;LCO/FCO	Glomospira gordialis	CMN Gl. go	FOBA Glomospira gordialis	Micro.	<input type="checkbox"/>
FDO/LDO;Top/Base	Glomospira gordialis		FOBA Glomospira gordialis	Micro.	<input checked="" type="checkbox"/>

# Events in Composite Standards

Composite Standard : Edit

Name: Demo Composite Standard child

Top CSU:  Min age: 0.0 Ma  CSUs are ages

Base CSU:  Max age: 81.0 Ma  Ages are derived from CSUs

Timescale: GTS2012

Parent Composite Standard: Demo Composite Standard  Display inherited events

Name	Type	Error -	Age/CSU	Error +	Age	Confidence	Discipline	Taxon	Top/Base?	Comment	Modified	By
LAD Disphaerogena carposphaeropsis	LAD		61.0		61.0	Confide...	Paly	Disphaerogena carposph...	<input checked="" type="checkbox"/>		29-Jun-2011	SYS
FAD Palaeoperidinium pyrophorum [SA]	FAD		61.0		61.0	Confide...	Paly	Palaeoperidinium pyrop...	<input type="checkbox"/>		23-Nov-2022	SYS
LAD Spiniferites "magnifica"	LAD		60.9		60.9	Confide...	Paly	Spiniferites "magnifica"	<input checked="" type="checkbox"/>		29-Jun-2011	SYS
FAD Pollen Bisaccate [SA]	FAD		60.78		60.78	Confide...	Paly	Pollen bisaccate	<input type="checkbox"/>		01-Jul-2011	SYS
LAD Areoligera spp. [increase]	LAD		60.2		60.2	Confide...	Paly	Areoligera spp.	<input type="checkbox"/>		24-Oct-2014	SYS
LAD Palaeoperidinium pyrophorum [...]	LAD	2.5	59.92		59.92	Confide...	Paly	Palaeoperidinium pyrop...	<input type="checkbox"/>		09-Nov-2018	PDB
LAD Thalassiphora cf. delicata	LAD		59.82		59.82	Confide...	Paly	Thalassiphora cf. delicata	<input checked="" type="checkbox"/>		24-Oct-2014	SYS
LAD Areoligera spp. [SA]	LAD		59.23		59.23	Confide...	Paly	Areoligera spp.	<input type="checkbox"/>		01-Jul-2011	SYS
FAD Inaperturopollenites spp. [C]	FAD		58.82		58.82	Confide...	Paly	Inaperturopollenites spp.	<input type="checkbox"/>		01-Jul-2011	SYS
LAD Pollen Bisaccate [SA]	LAD		58.73		58.73	Confide...	Paly	Pollen bisaccate	<input type="checkbox"/>		01-Jul-2011	SYS
Single Glaphrocysta spp. [increase]	Single		58.68		58.68	Confide...	Paly	Glaphrocysta spp.	<input type="checkbox"/>			
LAD Palaeoperidinium pyrophorum [...]	LAD	4.5	58.55	2.1	58.55	Confide...	Paly	Palaeoperidinium pyrop...	<input type="checkbox"/>		09-Nov-2018	PDB
LAD Palaeocystodinium bulliforme [C]	LAD		57.72		57.72	Confide...	Paly	Palaeocystodinium bullif...	<input type="checkbox"/>		05-Mar-2019	PDB
LAD Palaeoperidinium pyrophorum [P]	LAD		57.0		57.0	Confide...	Paly	Palaeoperidinium pyrop...	<input type="checkbox"/>		09-Mar-2017	PDB

Created: SYS on 02-Dec-2004 Last modified: SYS on 12-Apr-2023

Buttons: Add event..., Edit event..., Delete, Prune, Modify..., Insert group..., Save as group..., Archived

- Event from event dictionary
- Age in section
- Based on time scale
- Age in Ma or Composite Standard Units (CSU)
- Prune to remove parent events from child CS
- Error bars for GC crossplot

Event : Edit

Age: 60.9 Confidence: Confident

Event name: FDO/LDO Spiniferites "magnifica"

Event Type:  LAD  FAD  Single event

Comment / reference:

Buttons: OK, Help, Cancel

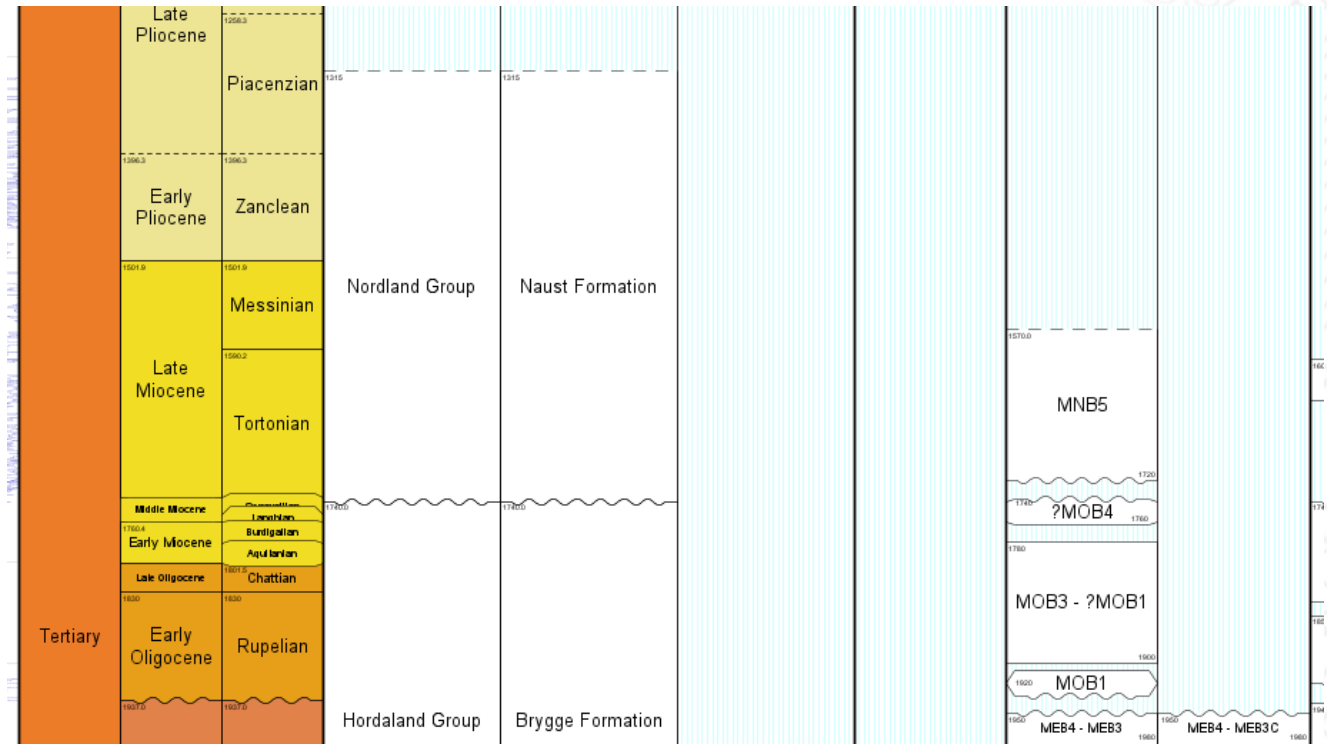
Composite Standard

This will remove 59 events. Continue?

Buttons: Yes, No

# What is an Interval?

- Pick top depth & name – top and base if range
- Base depth
- Sample types
- Scheme
- Analysis?
- Boundary types?



# **StrataBugs v3.0**

**Where are we going?**

## **Cira 1980s...**

To err is human...

... but to really f\*\*k things up, you need a computer!

## **2020s...**

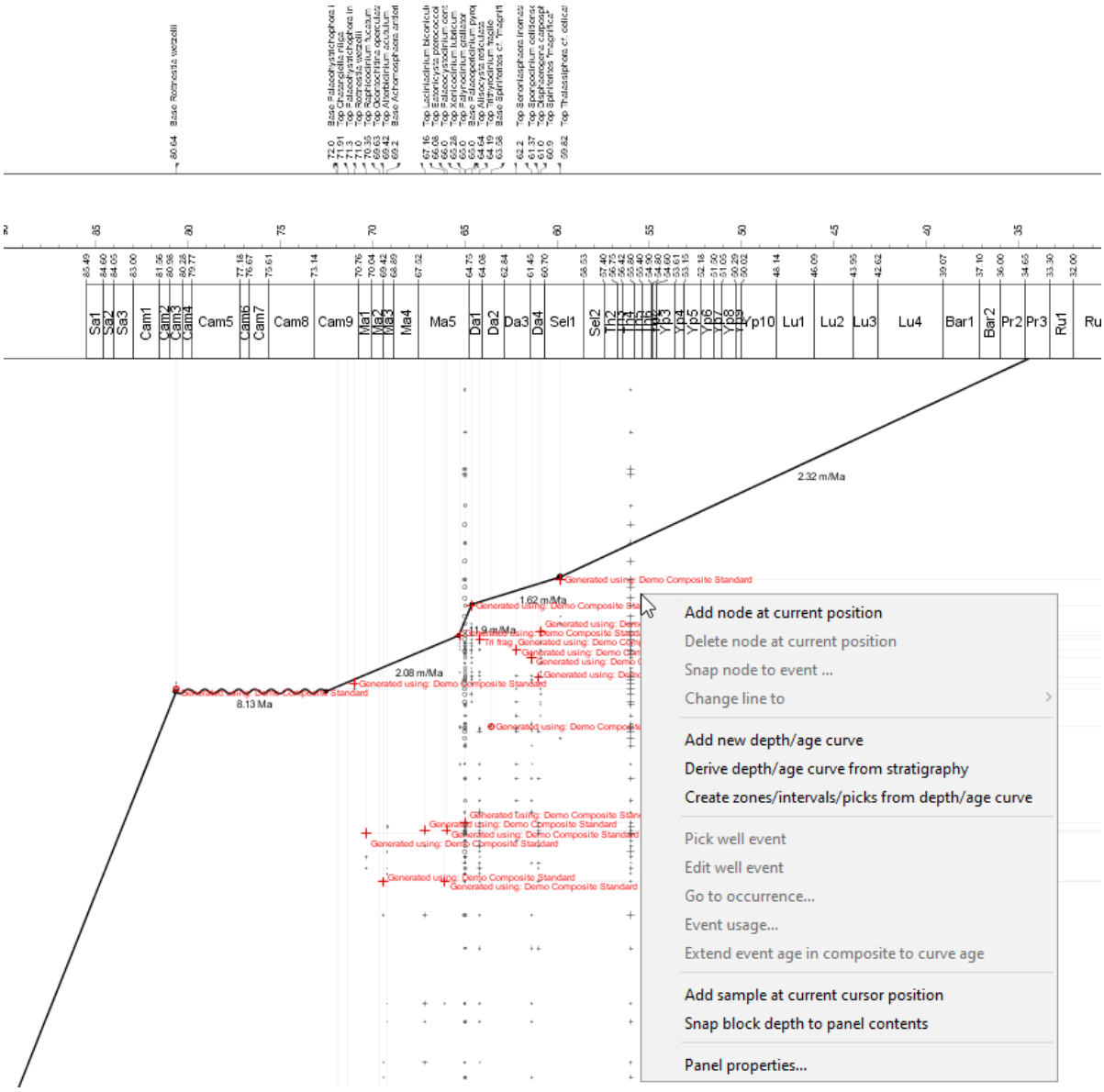
To err is computing...

... but to really f\*\*k things up, you need Machine Learning and AI!

# Image Processing

- Direct links to image processing systems
- Storage of individual specimen data?

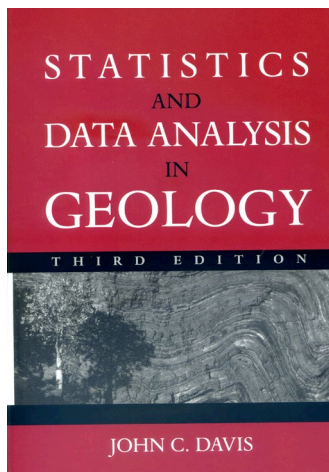
# Depth/age plot – the difficult bit





correlations. Distance matrices also seem to be less susceptible to drastic changes among different clustering methods. However, only limited statistical tests are available for hierarchical clustering, and little statistical theory has been developed or applied. [For some methods of clustering, a certain amount of theoretical justification has been developed. For examples, see Switzer (1970), Hartigan (1975), Everitt (1993), and Gordon (1999).] Most researchers who use clustering methods experiment with a variety of similarity measures and clustering techniques and choose the combination that yields the most satisfactory results with their data.

A pragmatic consideration may dictate the choice of a clustering procedure. Most hierarchical techniques may require creation and manipulation of an inordinately large matrix of similarities if the number of objects is large. (In the fields of ecology and archaeology, studies involving thousands of objects are not unusual.)



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