DESCINFO:
A Descriptive and Interpretative Information System for the IODP Riserless Drilling Vessel

Peter Blum

Zenon Mateo

Paul Foster

USIO Analytical Services

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DESCINFO Project Goal and Context

- Replace multiple inadequate description and interpretation capture, database, and data access/visualization solutions from the ODP/IODP Phase 1.
- Provide a system for IODP Phase 2 that meets user expectations formulated over the past decade and more.
- DESCINFO products will be delivered as part of the Analytical Systems deliverables defined in the United States Scientific Ocean Drilling Vessel (SODV) project work breakdown structure

SODV Analytical Systems Projects

- Analytical and Operational Information Management
  - 11 projects
- Descriptive and Interpretative Information and Data Analysis
  - 9 projects
    - Descriptive and interpretative information capture
    - Data visualization
    - Age-depth modeling
    - Integrated stratigraphic correlation
    - Temperature and pressure data analysis
    - Microscopy

DESCINFO

- Chemistry and Microbiology
  - 17 projects
- Petrophysics and Geophysics
  - 14 projects

DESCINFO Issues

Distinction and capture of the following information:

- Detailed descriptions
  - Based on descriptive elements (component, texture, color, morphology, etc.)
- Taxonomic concept-based descriptions
  - Based on lithologic names, fossil taxonomies
- Interpretations
  - Stratigraphic units; natural processes and environments; models; etc.

INTEGRATED OCEAN DRILLING PROGRAM
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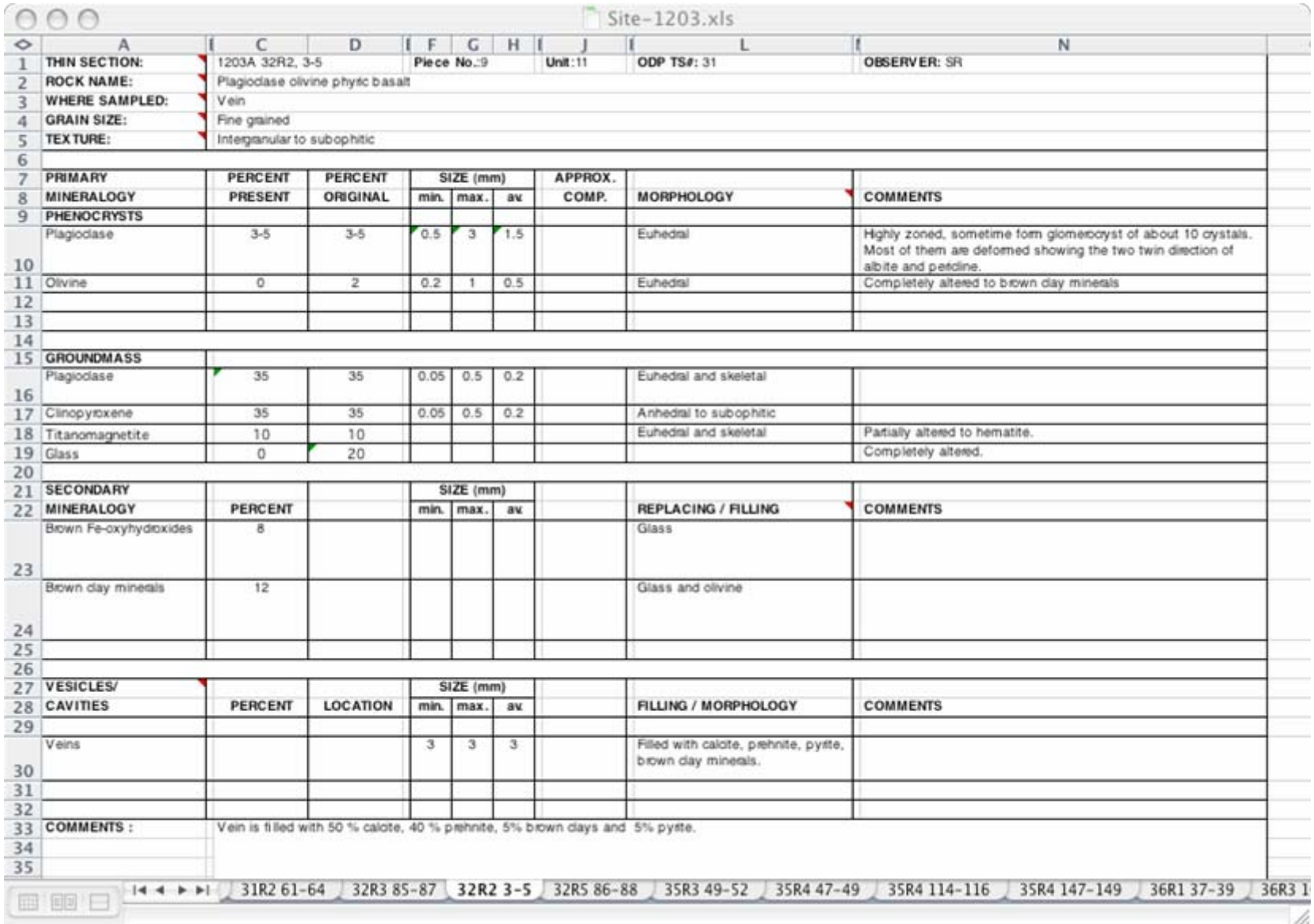
DESCINFO Issues



Site-1203.xls

	A	C	D	F	G	H	J	L	N
1	**THIN SECTION:**	1203A 32R2, 3-5		**Piece No.:**9			**Unit:**11	**ODP TS#:** 31	**OBSERVER:** SR
2	**ROCK NAME:**	Plagioclase olivine phyric basalt							
3	**WHERE SAMPLED:**	Vein							
4	**GRAIN SIZE:**	Fine grained							
5	**TEXTURE:**	Intergranular to subophitic							
6									
7	**PRIMARY**	**PERCENT**	**PERCENT**	**SIZE (mm)**			**APPROX.**		
8	**MINERALOGY**	**PRESENT**	**ORIGINAL**	**min.**	**max.**	**av.**	**COMP.**	**MORPHOLOGY**	**COMMENTS**
9	**PHENOCRYSTS**								
10	Plagioclase	3-5	3-5	0.5	3	1.5		Euhedral	Highly zoned, sometime form glomerocyst of about 10 crystals. Most of them are deformed showing the two twin direction of albite and pericline.
11	Olivine	0	2	0.2	1	0.5		Euhedral	Completely altered to brown clay minerals
12									
13									
14									
15	**GROUNDMASS**								
16	Plagioclase	35	35	0.05	0.5	0.2		Euhedral and skeletal	
17	Clinopyroxene	35	35	0.05	0.5	0.2		Anhedral to subophitic	
18	Titanomagnetite	10	10					Euhedral and skeletal	Partially altered to hematite.
19	Glass	0	20						Completely altered.
20									
21	**SECONDARY**			**SIZE (mm)**					
22	**MINERALOGY**	**PERCENT**		**min.**	**max.**	**av.**		**REPLACING / FILLING**	**COMMENTS**
23	Brown Fe-oxyhydroxides	8						Glass	
24	Brown clay minerals	12						Glass and olivine	
25									
26									
27	**VESICLES/**			**SIZE (mm)**					
28	**CAVITIES**	**PERCENT**	**LOCATION**	**min.**	**max.**	**av.**		**FILLING / MORPHOLOGY**	**COMMENTS**
29									
30	Veins			3	3	3		Filled with calcite, prehnite, pyrite, brown clay minerals.	
31									
32									
33	**COMMENTS :**	Vein is filled with 50 % calcite, 40 % prehnite, 5% brown clays and 5% pyrite.							
34									
35									

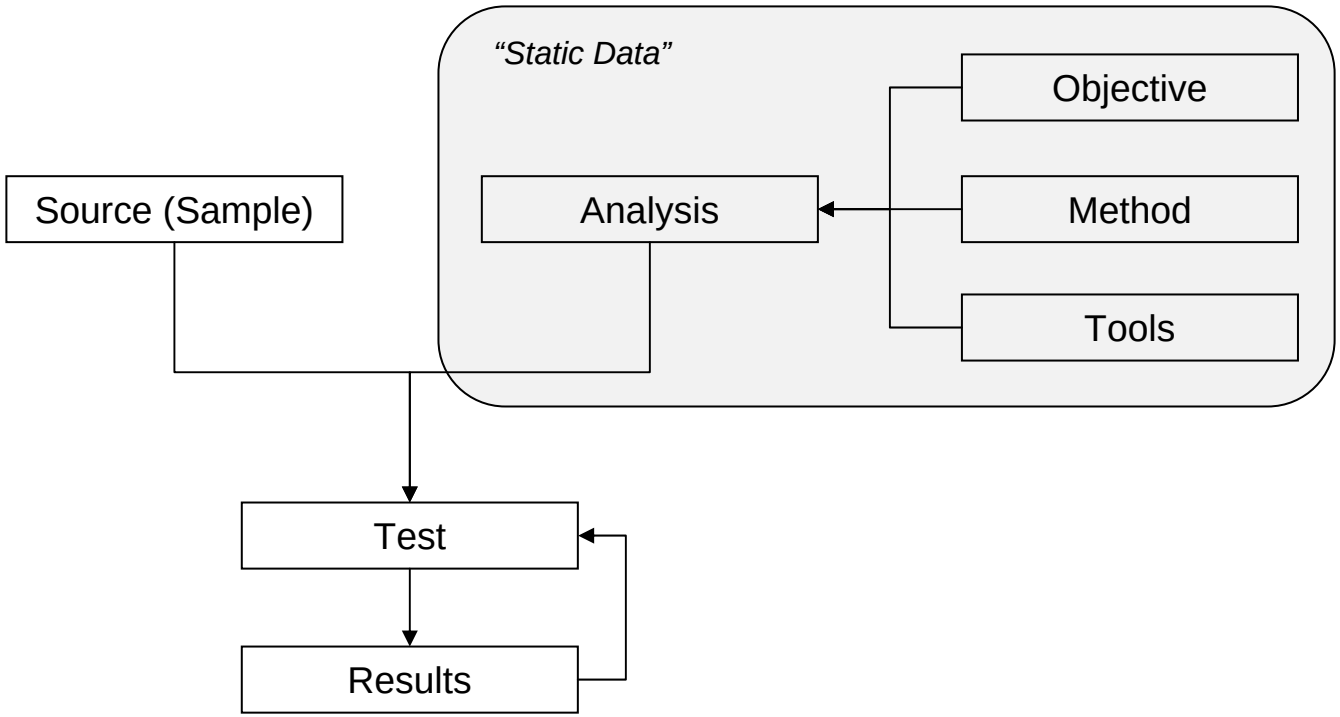
31R2 61-64 | 32R3 85-87 | 32R2 3-5 | 32R5 86-88 | 35R3 49-52 | 35R4 47-49 | 35R4 114-116 | 35R4 147-149 | 36R1 37-39 | 36R3 1

DESCINFO Issues

- Address all descriptive information capture requirements with one integrated solution
  - Avoid treating “hard rocks”, sediments, and paleontological description needs separate from each other
  - Avoid classification by method of analysis (macroscopic/microscopic) and instead add that information as metadata
- Generic approach: describe, classify, and name *a material*
  - Make tools and data more widely applicable

Description Analysis

- Description is a special case of analytical test, supplementing instrumental analysis for chemical, physical, and biological information
- Linked to physical sample and/or the results of another analysis, such as an image.



DESCINFO Issues

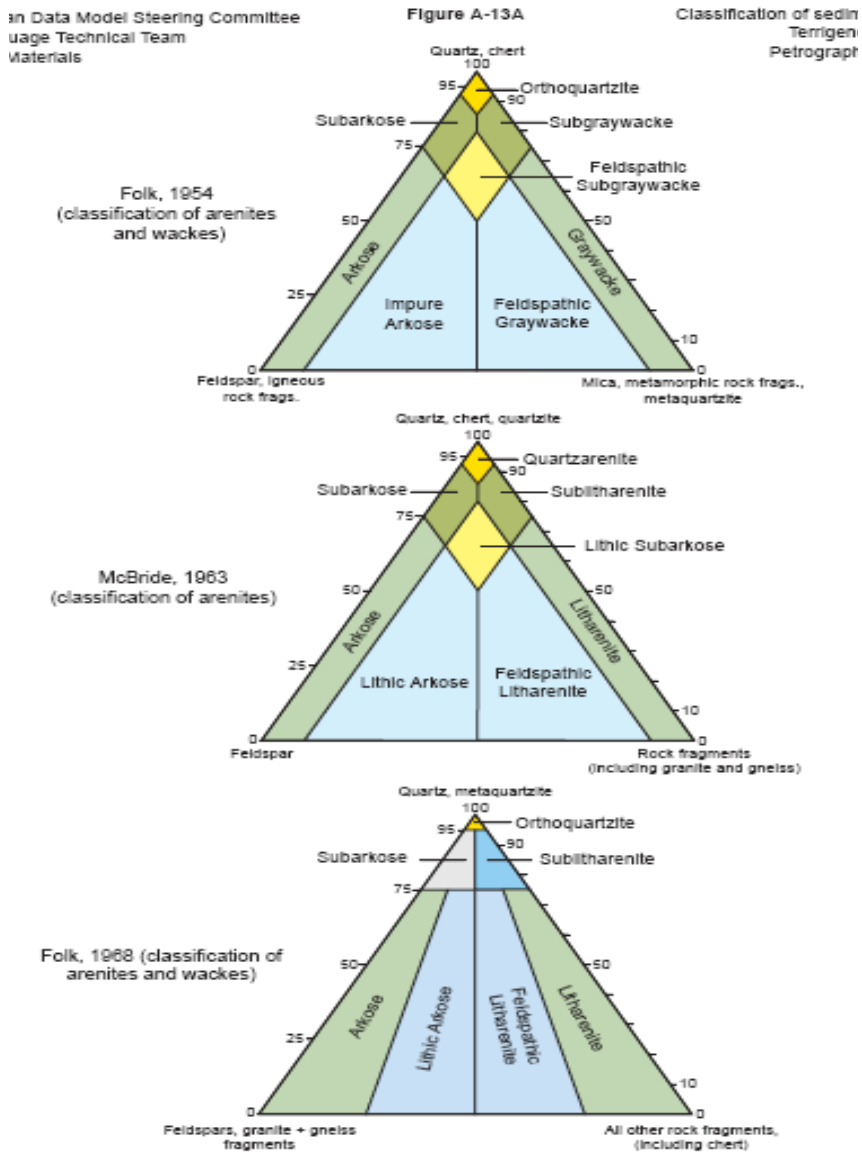
- Allow describer to use different workflow patterns
  - Describe at the elemental (common denominator) level or describe using taxonomic concepts (that are immediately parsed into the elements)
  - Describe all features within an interval or describe individual features across multiple intervals
  - One person describes all features or multiple users share the description of configurable groups of features by expertise

DESCINFO Issues

- Accommodate use of different classifications, combinations of classifications, and modified classifications
  - Multiple schemes are in use today and we need to allow their applications until they are replaced by better, more universal classifications
  - In the foreseeable future no single classification scheme will be suitable for all scientific applications or accepted by all the scientists we serve

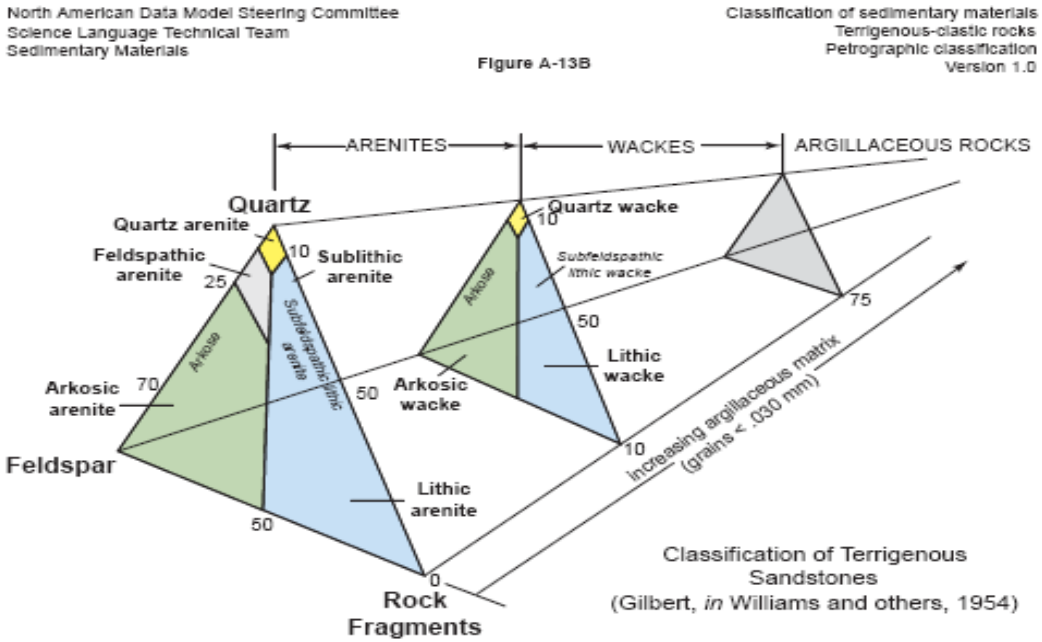
Ternary Mania

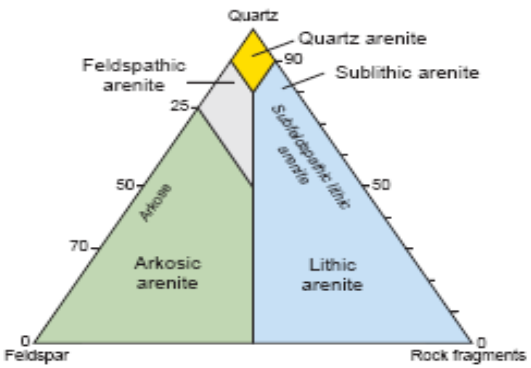
- In the 1950s - 1070s, creation of classifications based on ternary diagrams became a fashion
- The diagrams depicted here all propose a nomenclature for materials composed of quartz grains, feldspar grains, and rock (composite mineral) fragments



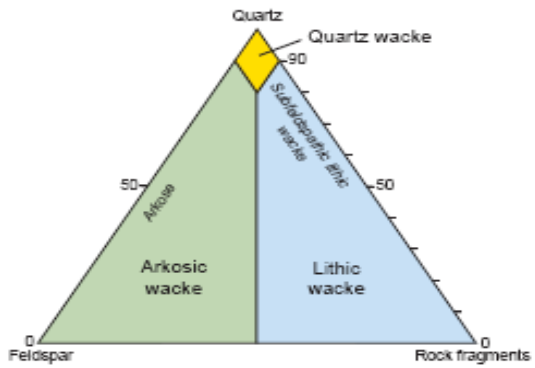
Ternary Mania

- Matrix composition added as a forth dimension (but only for clay matrix)





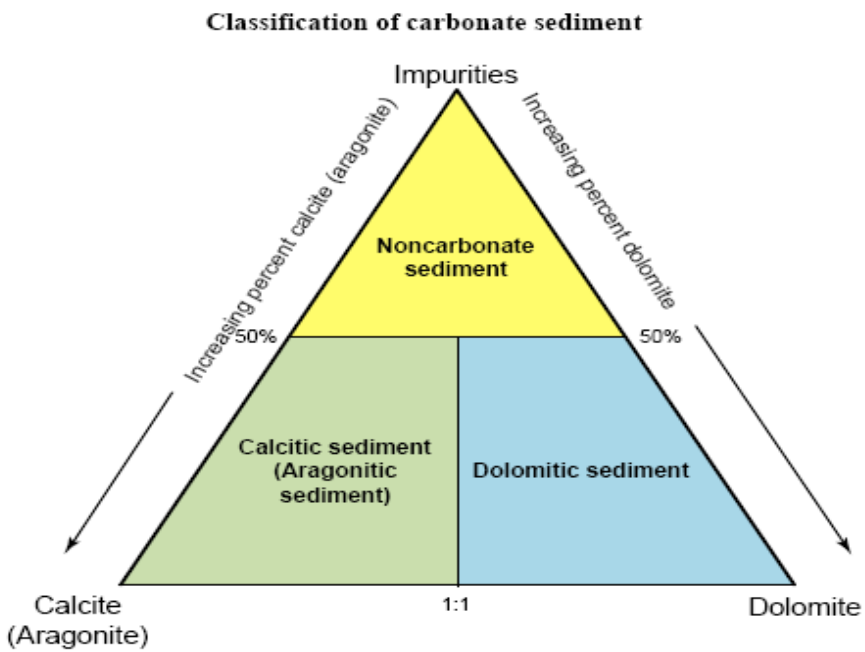
Classification of terrigenous arenites
(Gilbert, *in* Williams and others, 1954)



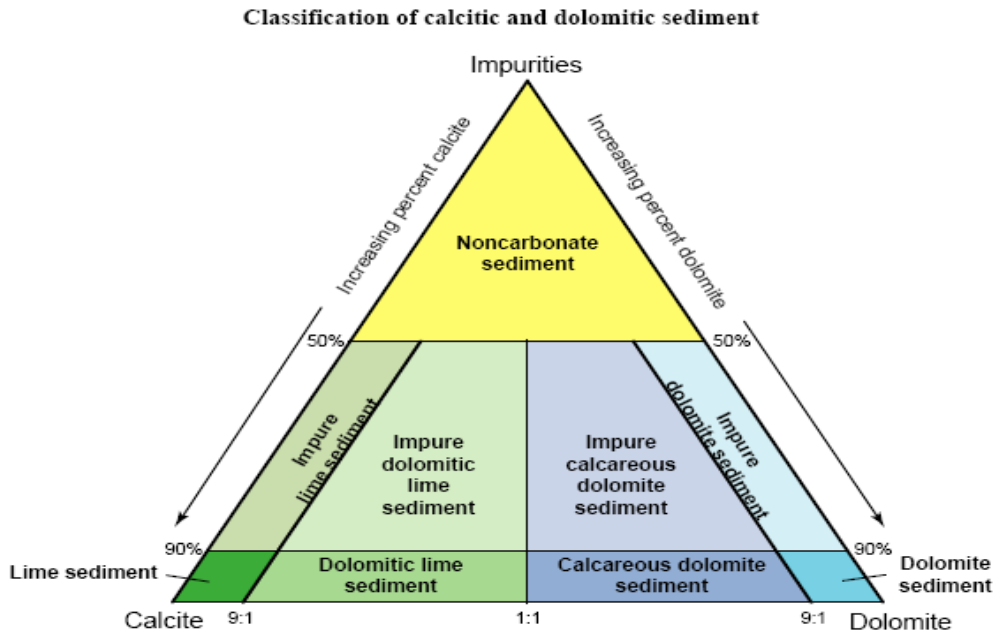
Classification of terrigenous wackes
(Gilbert, *in* Williams and others, 1954)

Ternary Mania

- ...therefore, another set of ternary diagrams are needed for carbonates.



Based on the scheme of Leighton and Pendexter (1962, Figure 2). NOTE: Where aragonite:calcite >1:1, insert "aragonitic" in place of "calcitic".



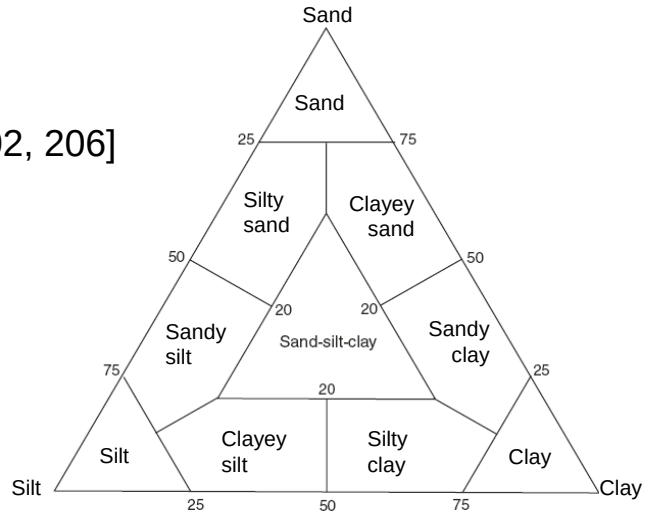
Based on the scheme of Leighton and Pendexter (1962, Figure 2). NOTE: where aragonite:calcite >1:1, use "aragonite" in place of "lime" and "aragonitic" in place of "calcareous".

Ternary Mania

- The ultimate twist: a gravel size distribution (a histogram) represented by a rhomboid to define nomenclature based on spectral signature

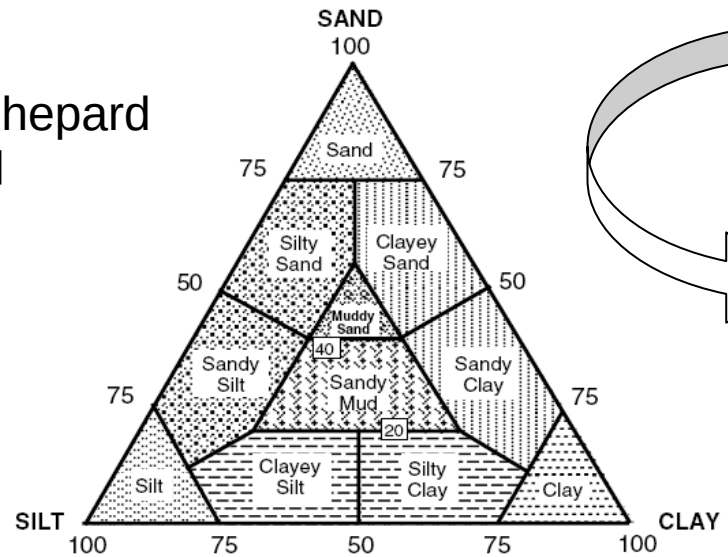
Ternary Mania

Shepard (1954)
[166, 170, 190, 194, 195, 202, 206]

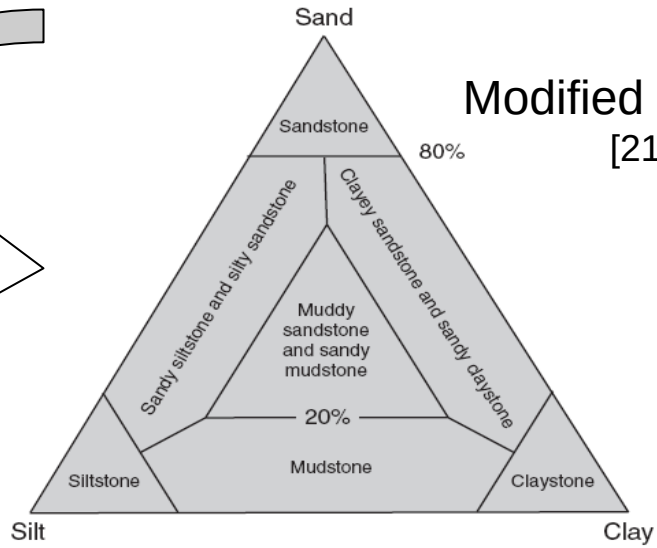


Usage in the IODP

Modified Shepard
[183]

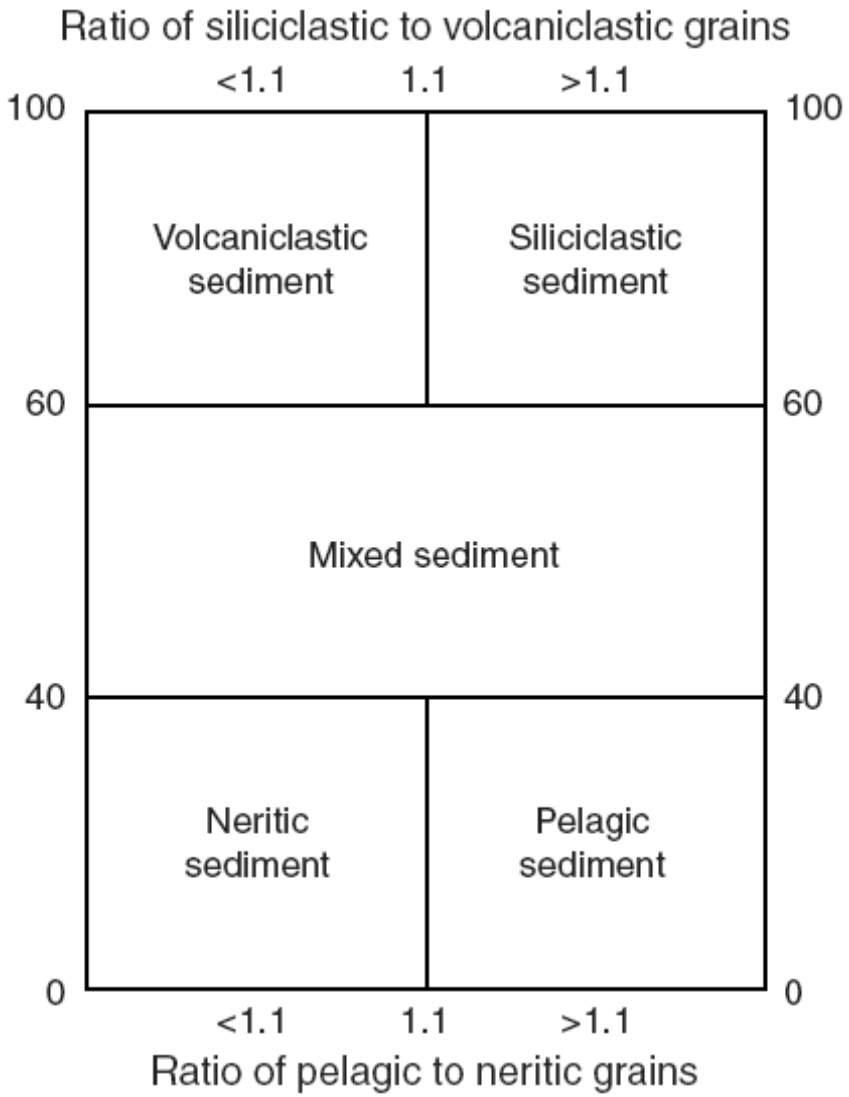


Modified Shepard
[210]



From Ternary to Rectangular

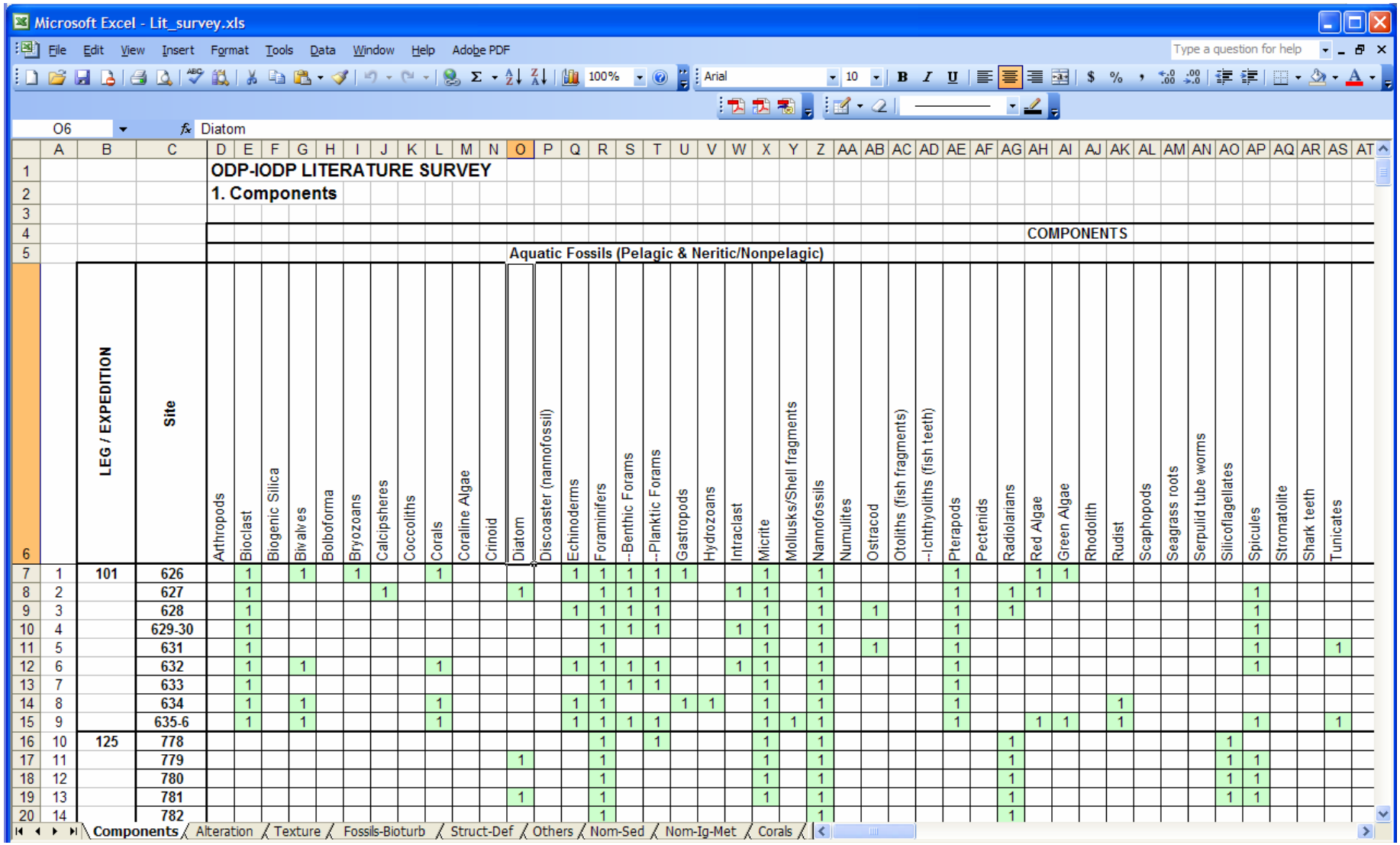
- Mazullo et al., 1988
- Designed for “deep sea sediments”
- Used as a starting point on most ODP/IODP sediment expeditions
- Based on interpretative concepts and therefore always problematical
- Has been modified on many expeditions



DESCINFO Research

- Two research goals:
  - Define the DESCINFO data structure
  - Define value lists
- Research tasks:
  - Analyze ODP/IODP Phase 1 legacy
    - Initial Results Explanatory Notes to analyze methodology and workflow issues
    - Initial Results volume site chapters to analyze information not captured in the database
    - Visual core descriptions (including barrel sheets) to analyze popular information recorded more regularly
  - Analyze classification schemes used within and without the ODP/IODP
    - Including modifications made to published classifications to accommodate users' needs

DESCINFO Research



Microsoft Excel - Lit_survey.xls

ODP-IODP LITERATURE SURVEY

1. Components

COMPONENTS

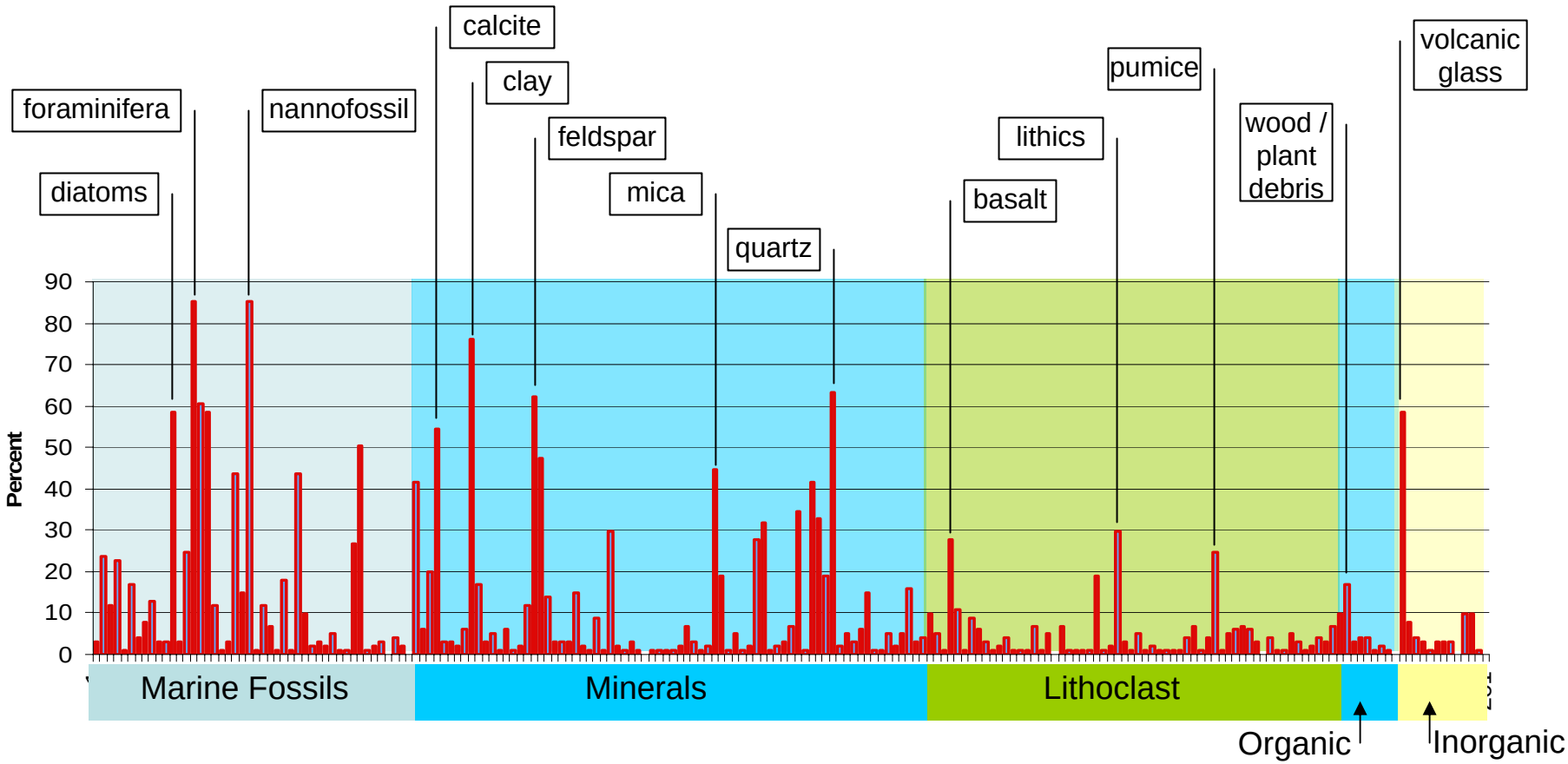
Aquatic Fossils (Pelagic & Neritic/Nonpelagic)

		LEG / EXPEDITION	Site	Arthropods	Bioclast	Biogenic Silica	Bivalves	Bolboforma	Bryozoans	Calcispheres	Coccoliths	Corals	Coraline Algae	Crinoid	Diatom	Discoaster (nannofossil)	Echinoderms	Foraminifers	--Benthic Forams	--Planktic Forams	Gastropods	Hydrozoans	Intraclast	Micrite	Mollusks/Shell fragments	Nannofossils	Numulites	Ostracod	Otoliths (fish fragments)	--Ichthyoliths (fish teeth)	Pterapods	Pectenids	Radiolarians	Red Algae	Green Algae	Rhodolith	Rudist	Scaphopods	Seagrass roots	Serpulid tube worms	Silicoflagellates	Spicules	Stromatolite	Shark teeth	Tunicates
7	1	101	626		1		1		1			1					1	1	1	1	1			1		1					1			1	1										
8	2		627		1					1					1			1	1	1			1	1		1					1		1	1								1			
9	3		628		1												1	1	1	1				1		1		1			1		1								1			
10	4		629-30		1													1	1	1			1	1		1					1											1			
11	5		631		1													1						1		1		1			1											1		1	
12	6		632		1		1					1					1	1	1	1			1	1		1					1											1			
13	7		633		1													1	1	1				1		1					1											1			
14	8		634		1		1					1					1	1			1	1		1		1					1					1									
15	9		635-6		1		1					1					1	1	1	1				1	1	1					1			1	1		1					1			1
16	10	125	778															1		1				1		1							1									1			
17	11		779												1			1						1		1							1									1	1		
18	12		780															1						1		1							1									1	1		
19	13		781												1			1						1		1							1									1	1		
20	14		782															1								1							1												

Components | Alteration | Texture | Fossils-Bioturb | Struct-Def | Others | Nom-Sed | Nom-Ig-Met | Corals

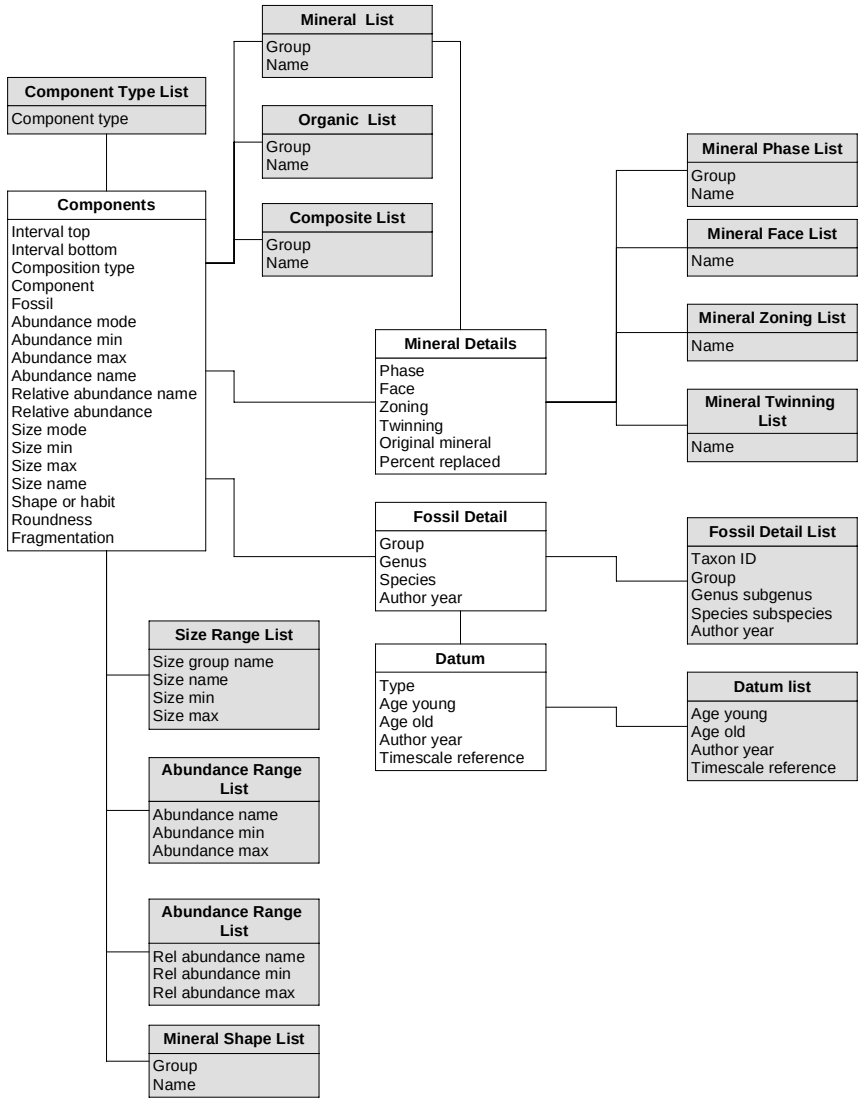
DESCINFO Research

- Component freqency:
  - Usage frequency of values from 111 sites
  - Helps define attributes and value lists for detailed descriptions

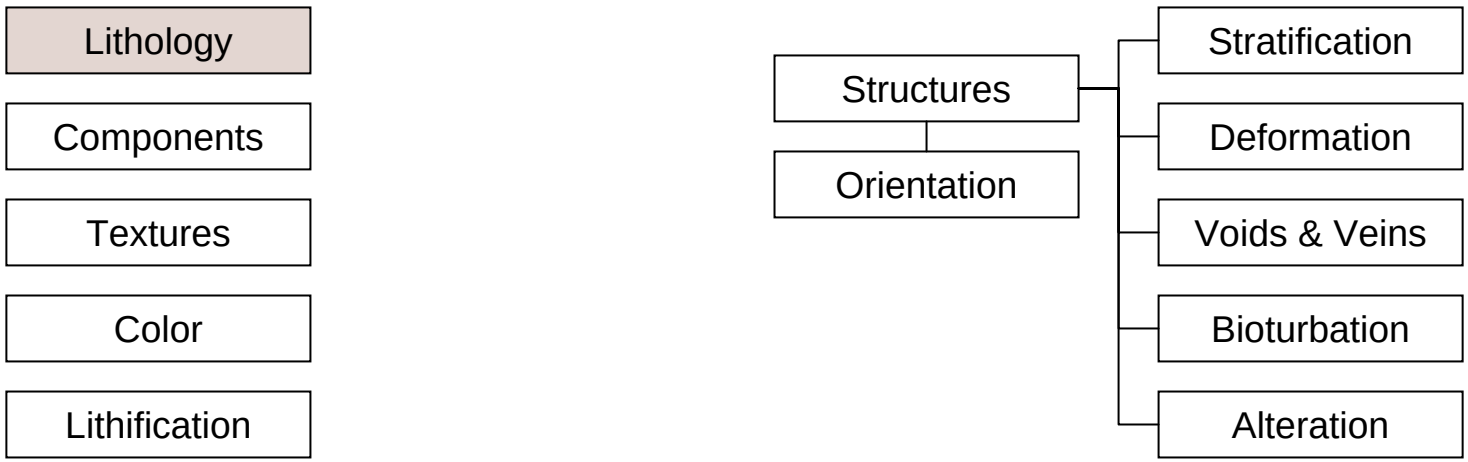


DESCINFO Research

- "Common denominator" information elements and associated value lists



Information Classes



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DESCINFO Research

Microsoft Excel - descinfo_structure_20060412.xls

D25

	A	B
1	DEFORMATION LIST	
2		
3	Group	Name
4	Fracture / Joint	fracture / joint
5	Fracture / Joint	cleavage
6	Fracture / Joint	conjugate fracture / joint
7	Fracture / Joint	extension fracture / joint
8	Fracture / Joint	shear fracture / joint
9	Fracture / Joint	normal shear fracture / joint
10	Fracture / Joint	reversed shear fracture / joint
11	Fracture / Joint	strike-slip shear fracture / joint
12	Fracture / Joint	conj. strike-slip shear fracture / joint
13	Fracture / Joint	riedel fracture / joint
14	Fracture / Joint	horse-tailing
15	Fault / Shear	(micro)fault / shear, general
16	Fault / Shear	antithetic fault / shear
17	Fault / Shear	conjugate fault / shear
18	Fault / Shear	healed fault
19	Fault / Shear	normal fault / shear
20	Fault / Shear	reverse fault / shear
21	Fault / Shear	strike-slip fault / shear
22	Fault / Shear	syn-sedimentary fault
23	Fault / Shear	thrust fault
24	Fault / Shear	riedel fault / shear
25	Fault / Shear	decollement zone
26	Fault / Shear	ductile shearing
27	Fault / Shear	fault breccia
28	Fault / Shear	fault gouge
29	Fault / Shear	phacoid (shear lens)
30	Fault / Shear	slickenside / slickenline
31	Fault / Shear	tension gash
32	Fault / Shear	plastic strain (crystal; Leg 304)
33	Folds	(micro)fold, general
34	Folds	asymmetrical
35	Folds	symmetrical
36	Folds	inclined
37	Folds	recumbent
38	Folds	slump fold
39	Miscellaneous	bands, deformation
40	Miscellaneous	bands, flow
41	Miscellaneous	boudinage
42	Miscellaneous	collapse/dissolution breccia
43	Miscellaneous	cracks, dessication
44	Miscellaneous	cracks, syneresis
45	Miscellaneous	crystal plastic fabric
46	Miscellaneous	dike

Stratification | Deformation | Veins and Voids | Orientation | Bioturbation | Alteration

62 values

Microsoft Excel - descinfo_values_minerals_20060411.xls

E1046 Plagioclase*

	A	B	C	D	E
1			New Dana Classification of Minerals		
2					
3	*Old Dana Class*	*Class*	*Sub-Class*	*Group*	*Name*
1035	VIII - Silicates (Tektosilicates)	75	Tectosilicate Si Tetrahedral Frameworks with silica derivative structures	75.3.1	Tektosilicates
1036	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	K (Na,Ba) feldspars	Orthoclase
1037	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	K (Na,Ba) feldspars	Sanidine
1038	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	K (Na,Ba) feldspars	Hyalophane
1039	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	K (Na,Ba) feldspars	Celsian
1040	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	K (Na,Ba) feldspars	Microcline
1041	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	K (Na,Ba) feldspars	Anorthoclase
1042	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	K (Na,Ba) feldspars	IMA2004-011
1043	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	K (Na,Ba) feldspars	Rubicline!
1044	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	K (Na,Ba) feldspars	Filatovite!
1045	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	76.1.2	Buddingtonite
1046	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	Plagioclase series	Plagioclase*
1047	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	Plagioclase series	Albite
1048	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	Plagioclase series	Oligoclase
1049	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	Plagioclase series	Andesine*
1050	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	Plagioclase series	Labradorite*
1051	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	Plagioclase series	Bytownite*
1052	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	Plagioclase series	Anorthite
1053	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	75.1.4	Reedmergnerite
1054	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	Paracelsian	Paracelsian
1055	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	Paracelsian	Slawsonite
1056	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	Banalsite	Banalsite
1057	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	Banalsite	Stronalsite
1058	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	Banalsite	Lisetite
1059	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	Banalsite	Svyatoslavite
1060	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	75.1.7	Dmisteinbergite
1061	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	75.1.8	Kokchetavite!
1062	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework with Al-Si frameworks	75.1.9	IMA2004-054
1063	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework Feldspathoids and related species	Nepheline	Kalsilite
1064	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework Feldspathoids and related species	Nepheline	Nepheline
1065	VIII - Silicates (Tektosilicates)	76	Tectosilicate Al-Si Framework Feldspathoids and related species	Nepheline	Trikalsilite

Native Elements | Sulfides | Oxides | Halides | CO3-NO3-B | SO4-Cr-Mo | PO4-As-Va | Organic Minerals | Silicates | Approved-Unclass | Unapproved

4,530 minerals as of 3/16/2006 (IMA approved, not approved and discredited minerals)

DESCINFO Research

Type	Classification	Material Type	ODP/IODP Use
Formal/ published	Mazullo et al. (1988): Shepard (1954), Fisher and Schminke (1984), Wentworth (1922)	Sediment & igneous	☑
	Dunham (1962), Embry and Klovan (1972)	Carbonates	☑
	Moncrief (1989)	Poorly sorted sediments	☑
	Streckeisen (1974)	Igneous	☑
	Int'l. Union of Geological Sciences (IUGS)	Igneous	☑
	USGS-North American Geologic Map Data Model	Ig, Sed & Met	
	British Geological Survey (BGS)	Ig, Sed & Met	
	Shell Exploration and Production	Ig, Sed & Met	
Tool-Specific	AppleCore	Sediment (igneous)	☑
	J-CORES	Sediment & igneous	☑

What's in a Name?

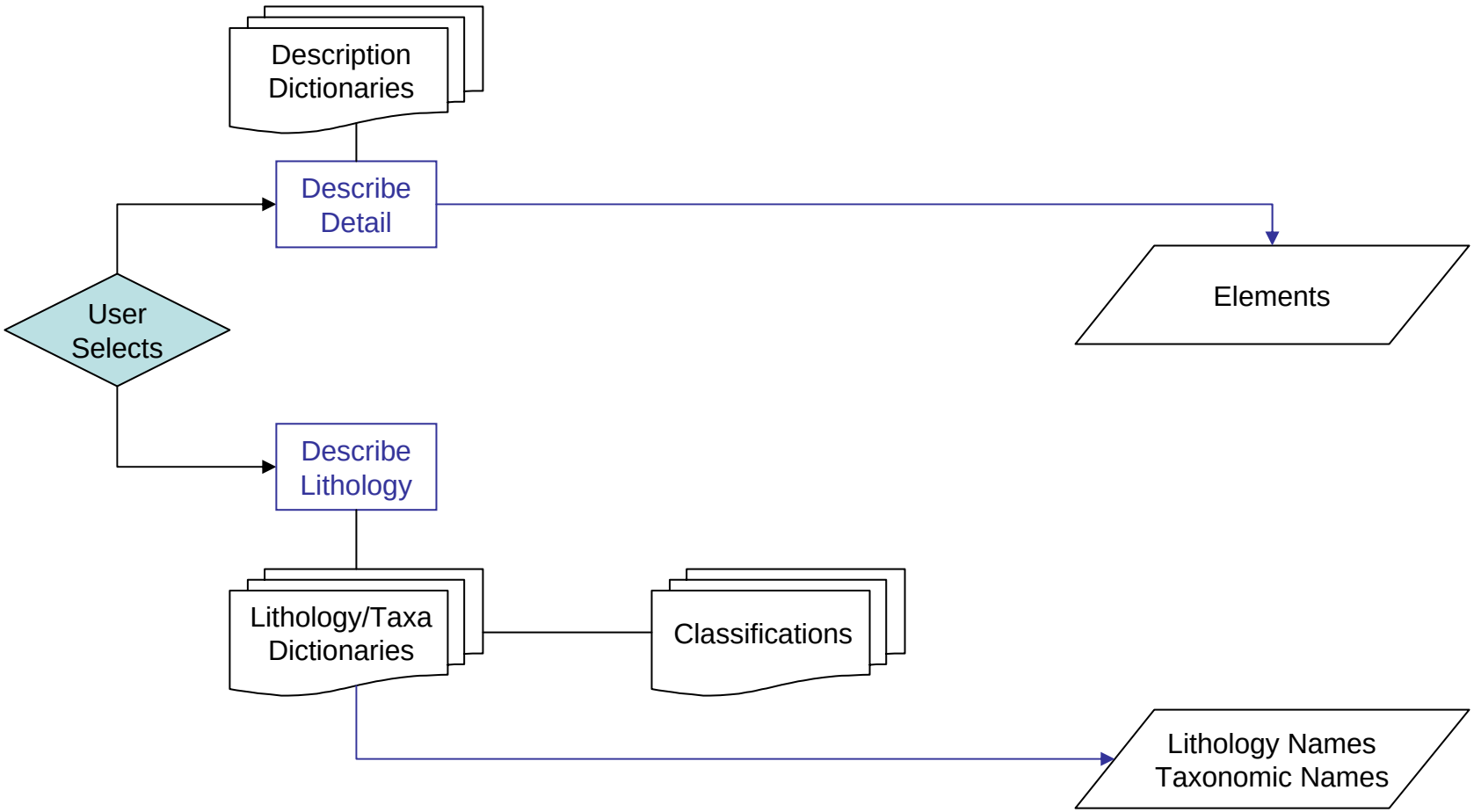
Detailed Description	Mazullo et al. 1988	USGS	BGS
Quartz, 25%; silt, 0.004-0.62 Quartz, 15%; sand, 0.06-2 Feldspar, 15%; silt, 0.004-0.62 Feldspar, 10%; sand, 0.06-2 Composite, 20%; gravel, 2-30 Mafics, 15%; silt, 0.004-0.62 Clay, 5%, clay, <0.004	Sandy silt with gravel	L3: Muddy sediment L4: Gravelly mud L5-a: Feldspatic graywacke L5-b: Feldspatic litharenite L5-c: Lithic arkose L5-d: lithic wacke L5-e: feldspatic wacke L5-f: lithic arenite L5-g: lithic wacke	L6: Silici-granule pebble lithic arenite
Clay, 60%, <0.004 Lithoclast, 35%, silt, 0.004-0.62 Quartz, 3%, fine sand, 0.13-0.25 Calcite, molluscs, 2%, slight fragmentation	Silty clay	L3: muddy sediment L4-a: mud L4-b: clayey silt L5: [insufficient information]	L6: Silicate clay

DESCINFO Solution

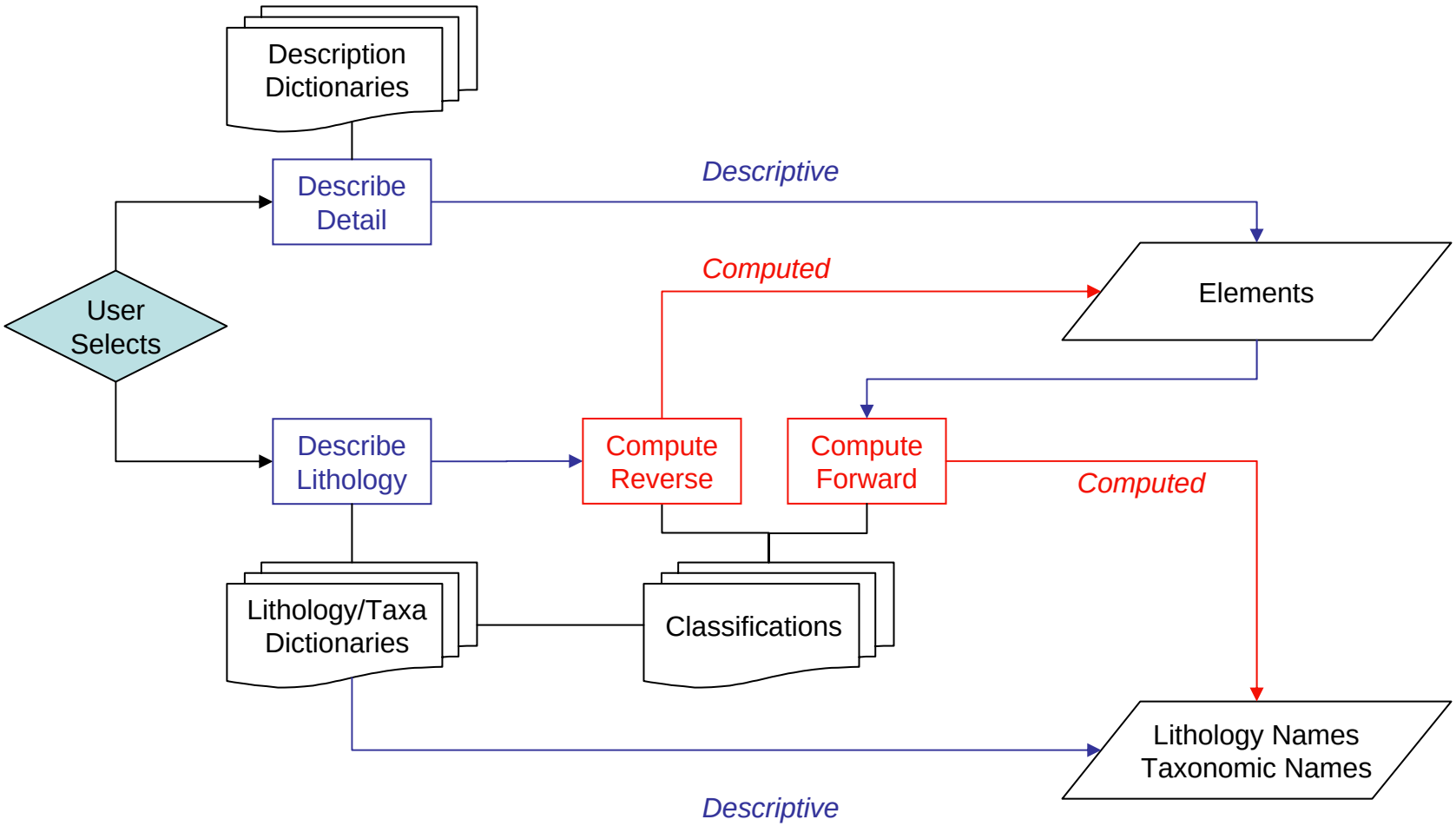
- Normalize and atomize information into generally accepted “common denominator concepts” or “information elements”.
  - Use general material description concepts such as mineral name, abundance, size, shape, etc.
  - Avoid interpretative concepts related to the formation process or environment
- Use value lists or dictionaries to maintain search capabilities of database
- Provide for global searches that are independent of the taxonomic concepts used
  - I.e, search for the abundance of a mineral, a type of a fossil, components of a certain size, etc.

Lithologic Concepts

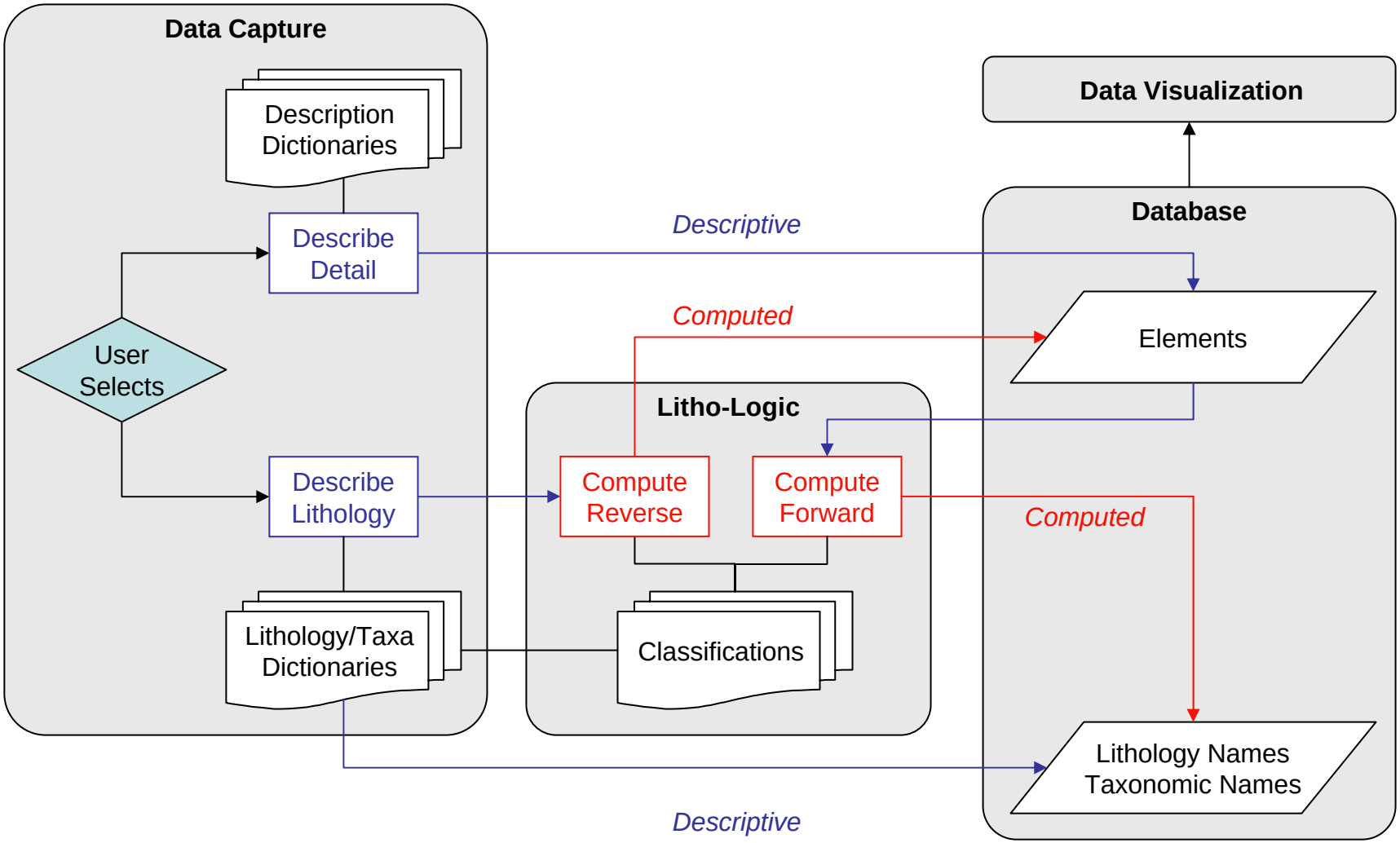
Lithologic Concepts



Lithologic Concepts



Lithologic Concepts



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Capture

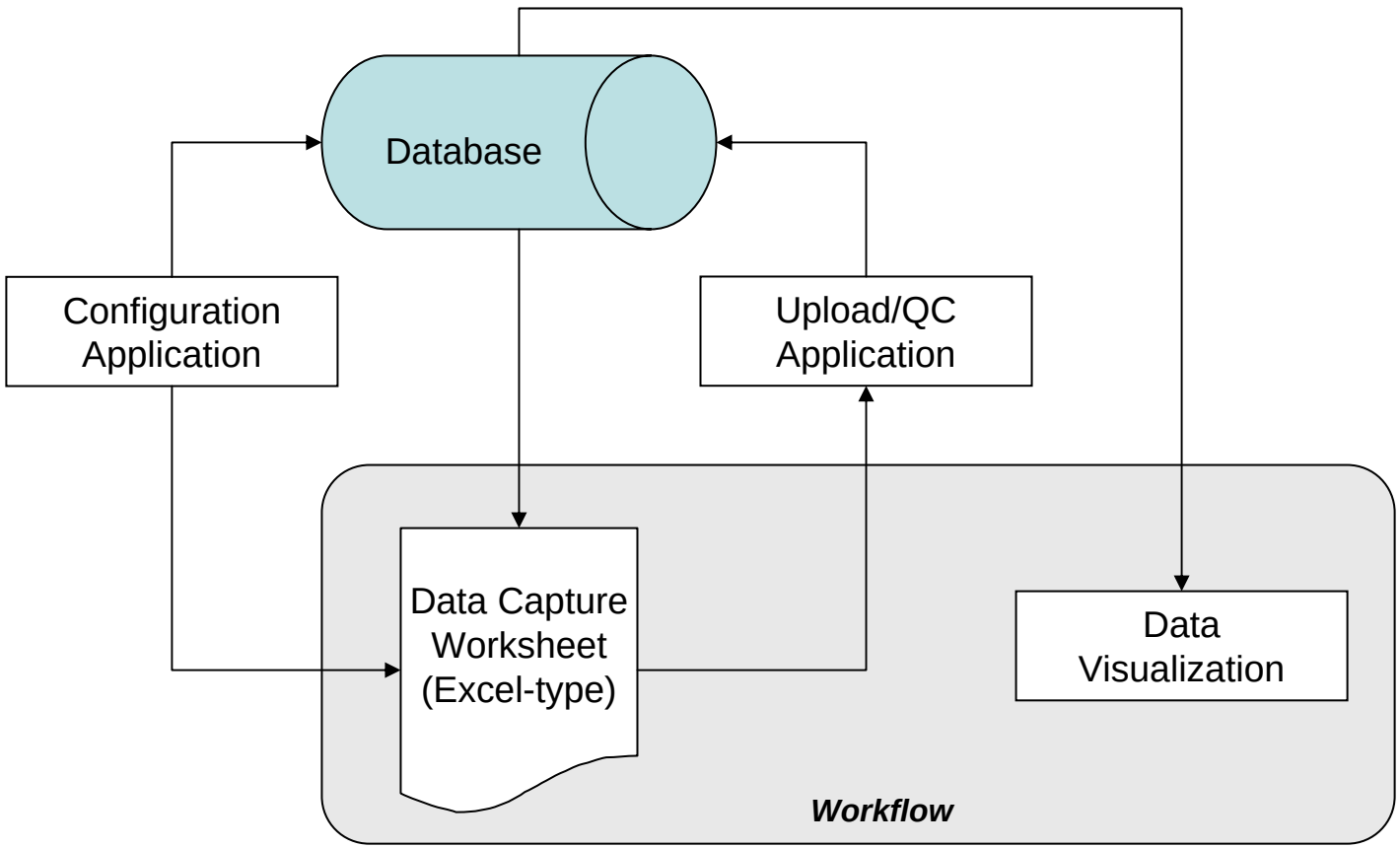
Alteration_Log.xls

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
1									ROCK TYPE		ALTERATION OF PIECE					OLIVINE ALTERA			
2	Hole	Core	Section	Piece	Curated Depth	Dist top of the piece	Dist bottom piece	Depth below seafloor	Primary Rock	Altered Rock Name	Color of Piece	Background	Patches	Halo Alteration	Vein Alteration? Y or N	Serpentinite	Amphibole	Chl & Smectites	Magnetite
3	H	C	SEC	P	CD	DT	DB	D	PR	AR	CO	BA	PA	HA	FV	SE	AM	CS	MT
4	1268A	1R	1	1		0	6	0.03		Serpentinite breccia	grn to brown	100			Y	90		10	
5	1268A	1R	1	2		6	13	0.10		Completely serpentinized Harzburgite	brown	100			Y	10		90	
6	1268A	1R	1	3		13	18	0.16		Soapstone	grnish	100			Y	10			
7	1268A	1R	1	4		18	26	0.22		Diabase	grey	100							
8	1268A	1R	1	5		26	30	0.28		Completely altered Harzburgite	grnish to brown	100				14		85	1
9	1268A	1R	1	6		30	41	0.36		Pebbles									
10	1268A	1R	1	7		41	45	0.43		Soapstone	beige to grey	100				10			
11	1268A	1R	1	8		45	50	0.48		Soapstone	grey + wh	100				10			
12	1268A	1R	1	9		50	57	0.54		Completely serpentinized Harzburgite	grn	40		60	Y	90			
13	1268A	1R	1	10		57	60	0.59		Completely serpentinized Harzburgite	grn	40		60	Y	90			
14	1268A	2R	1	1		0	3	14.02		Serpentinite	grn to brown	100			Y	90		10	
										Completely									

Sheet1 Sheet2 Sheet3

Capture

- The current “default” implementation model



Visualization

- Requirements:
  - Visualize all data types
    - Numerical
    - Images
    - Descriptive and interpretative
  - User-interactive configuration of displays
  - Standard graphic reports
    - Have cost scientists too much time to prepare in the past
  - Meet publication requirements
    - To be defined

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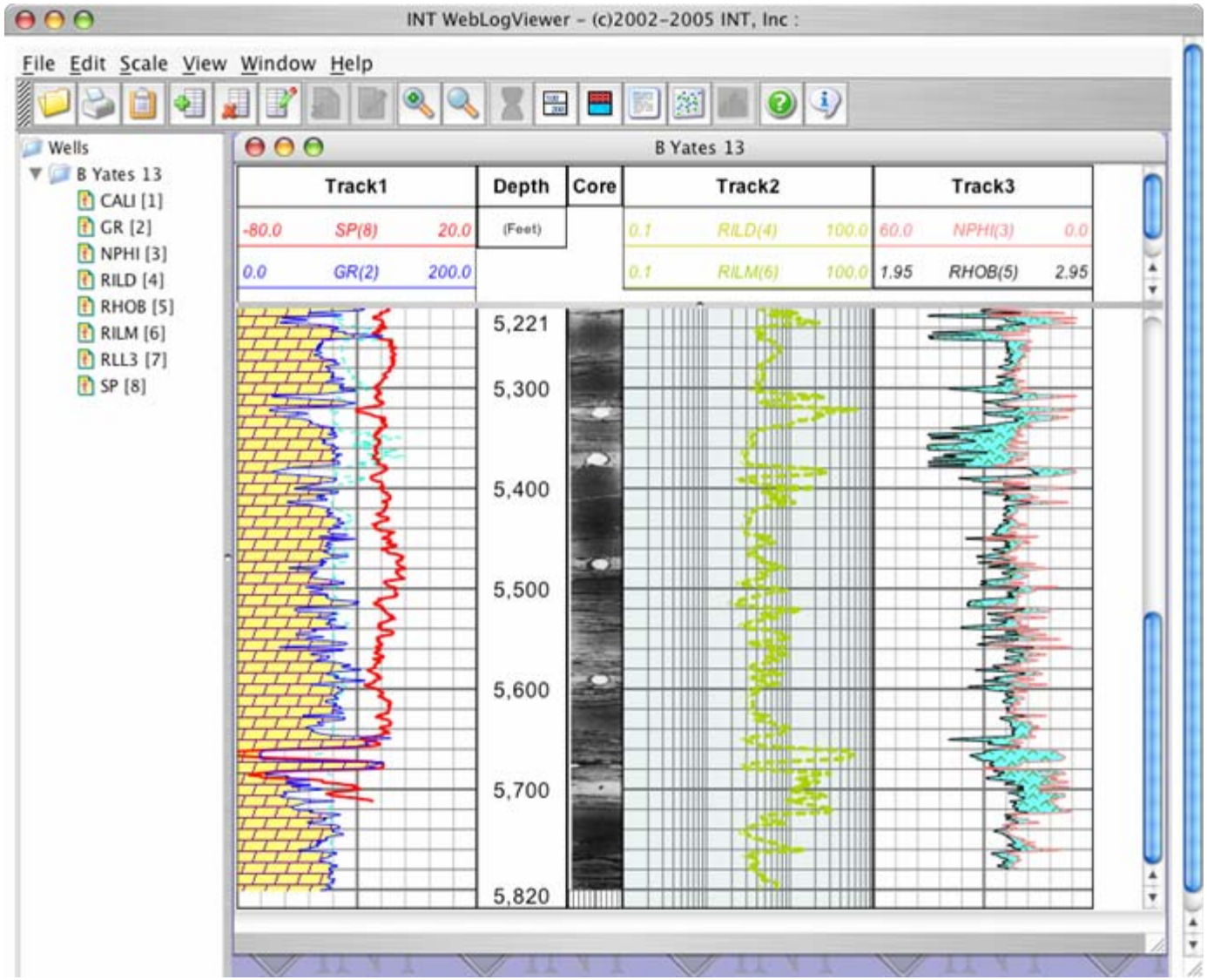
Visualization



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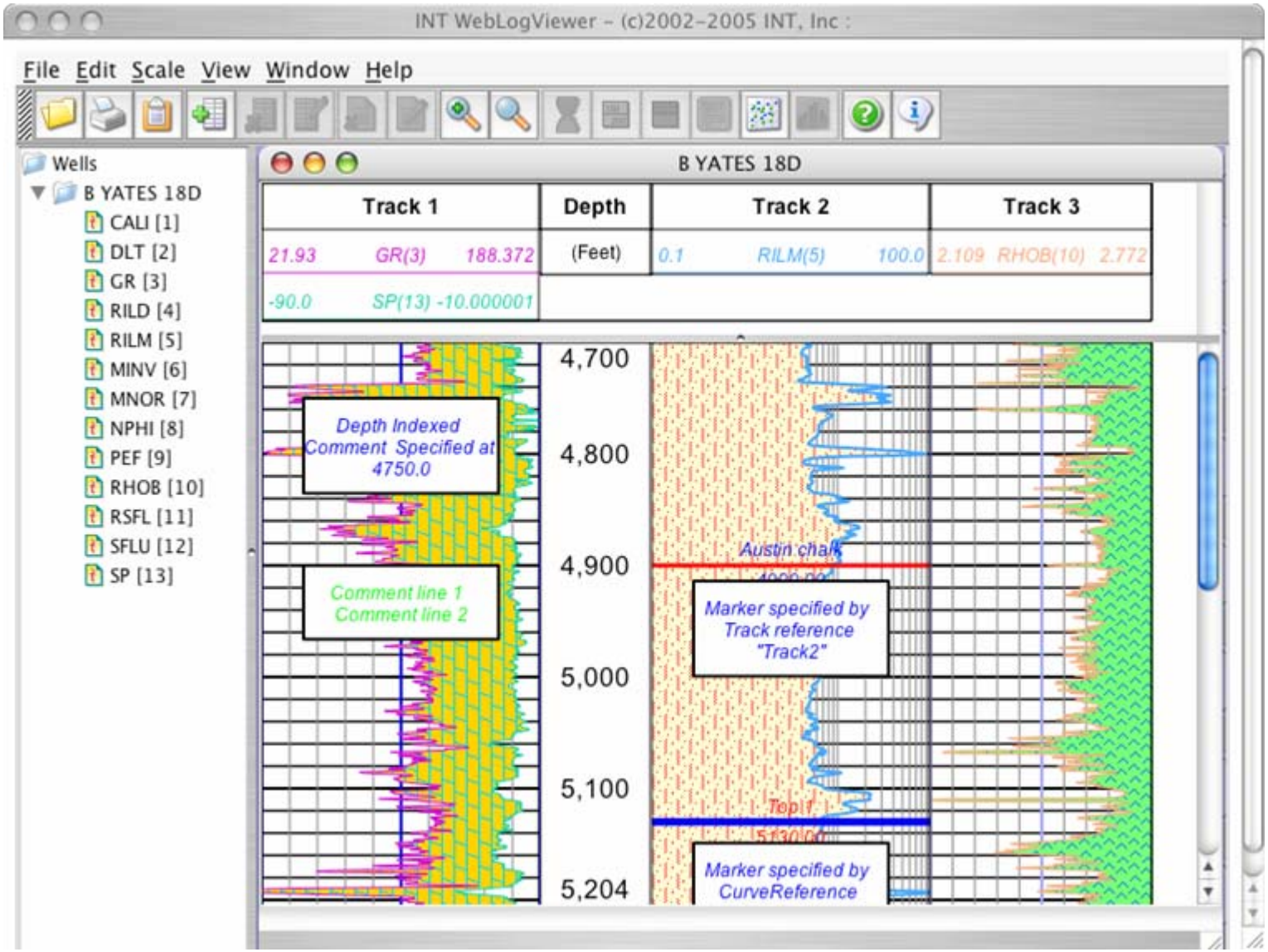
Visualization



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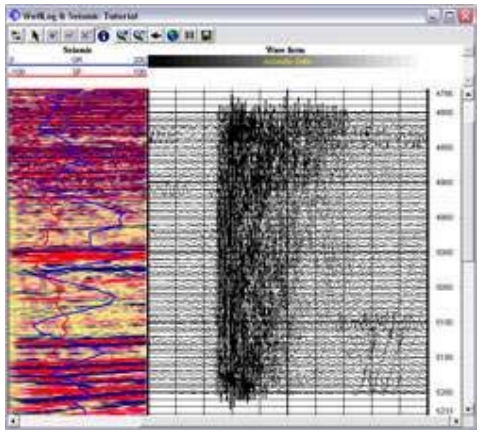
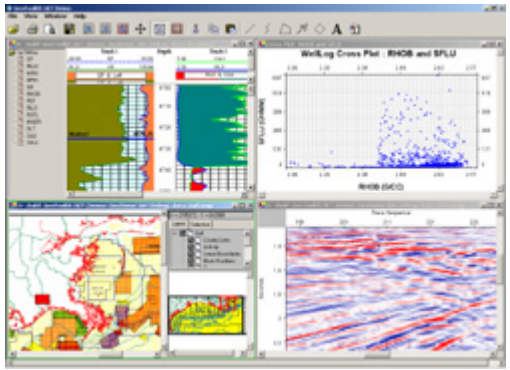
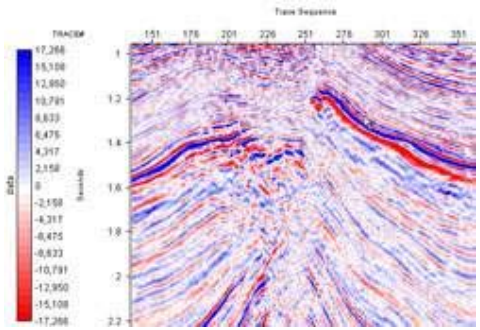
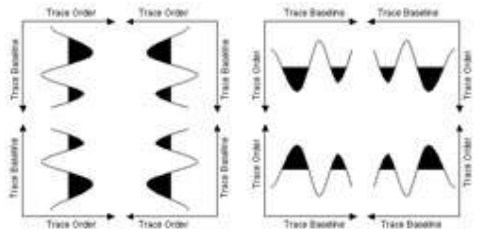
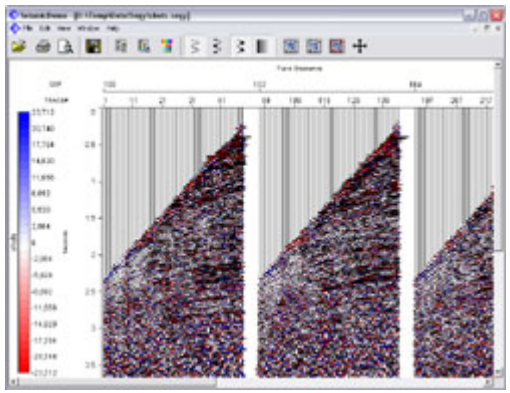
Visualizations

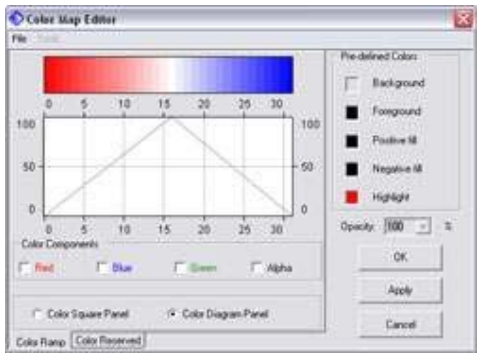


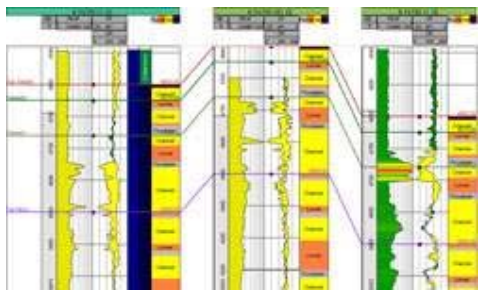


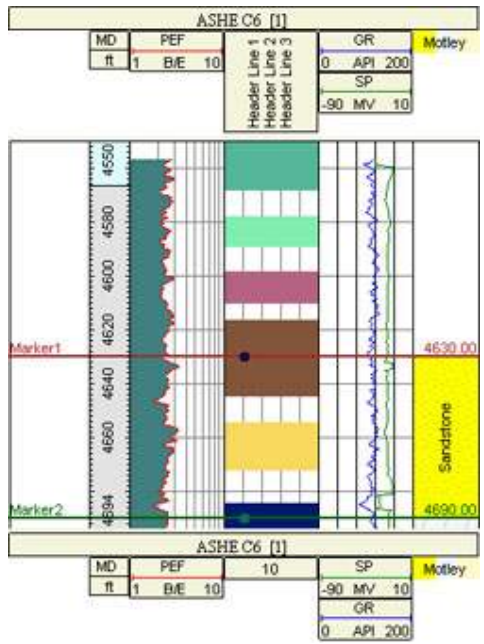












DESCINFO Project Schedule

Time Frame	Tasks
January 2006	Begin DESCINFO research and project planning
April 3, 2006	Draft project scope distributed within USIO and to IODP DMCG
May 2006	Distribute project scope document to broader stakeholder group for input and/or validation
May-July 2006	Evaluate existing software tools, including complete solutions and “tool kits” for implementing data capture and visualization. Prepare DESCINFO specifications
July 2006	Complete analysis of ODP/IODP Phase I DESCINFO issues
August-September 2006	Procure software, if so determined
October 2006 – May 2007	Implement (configure, code), organize user tests, complete changes
June 2007	Deployment.

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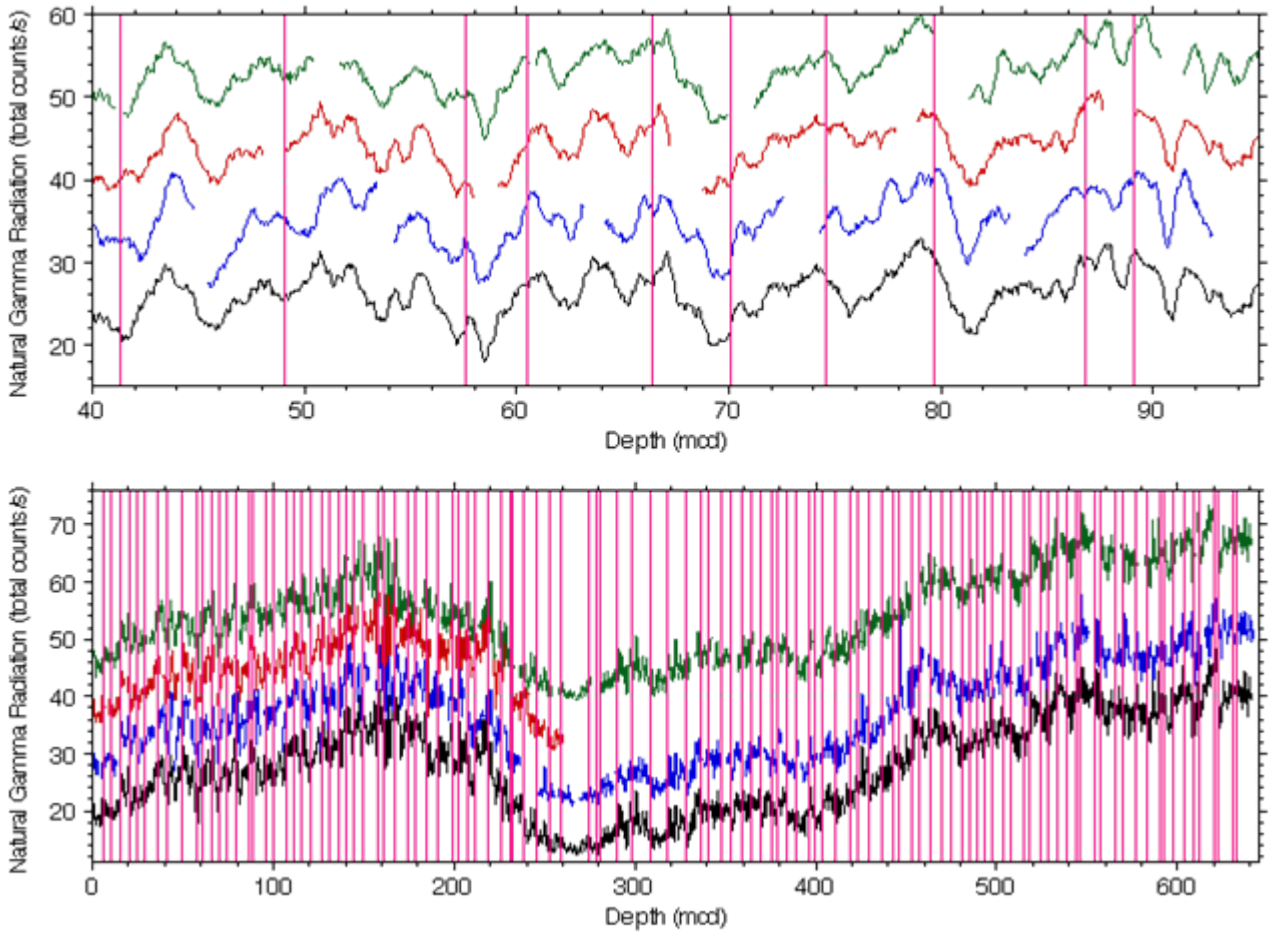
Related Projects

Stratigraphic Correlation Integration

- Build on relatively well-established correlation procedures
- Includes correlation and splicing of data from samples
- Assume an upgraded “Splicer-Sagan” application to be delivered by the CoreWall group
- Integrate input/output content and data



Depth Scales

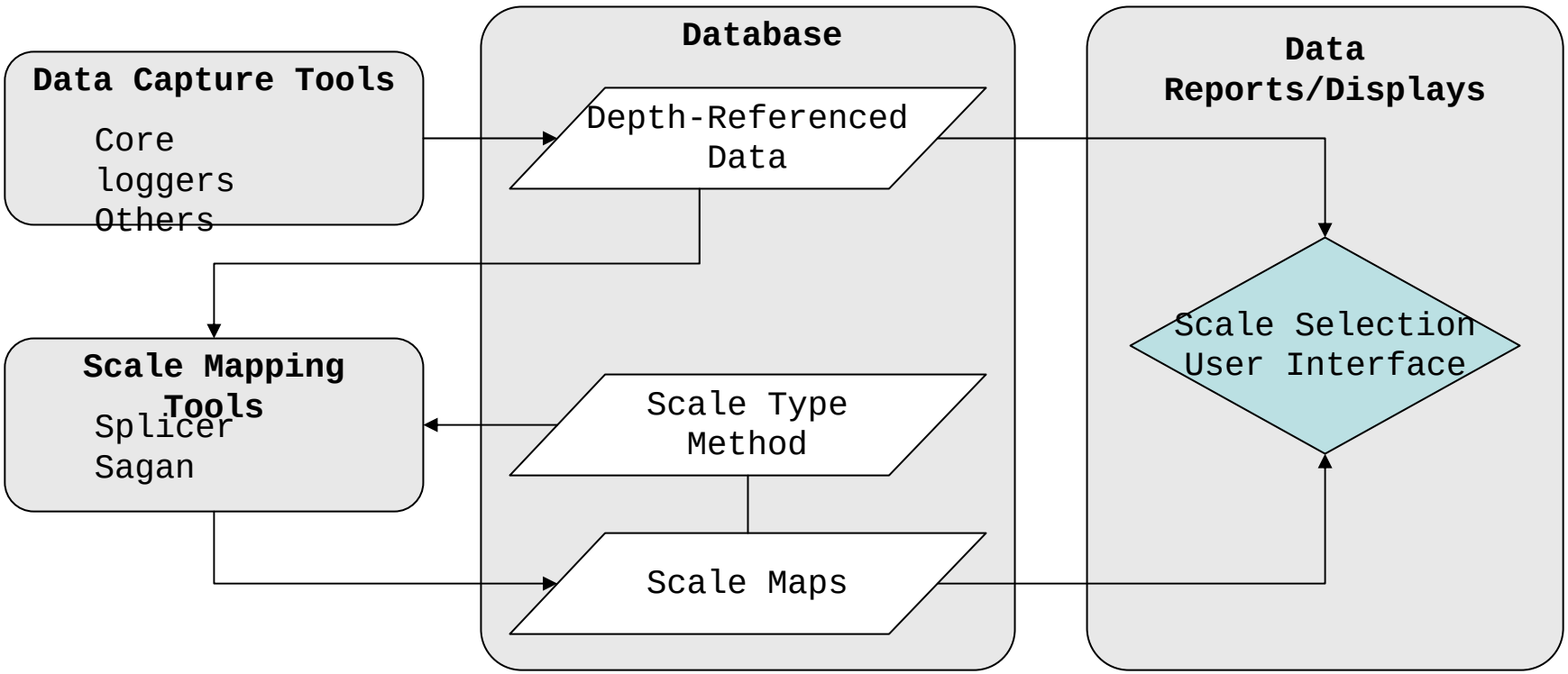
Measurement scales	Core	Core Referenced	Wireline Logging	LWD	MWD	Seismic Surveys
Core	(Within core)					
Core Referenced		Core composite depth				
Wireline Logging			Log composite depth			
LWD				LWD composite depth		
MWD					MWD composite depth	
Seismic Surveys						

Interval scales

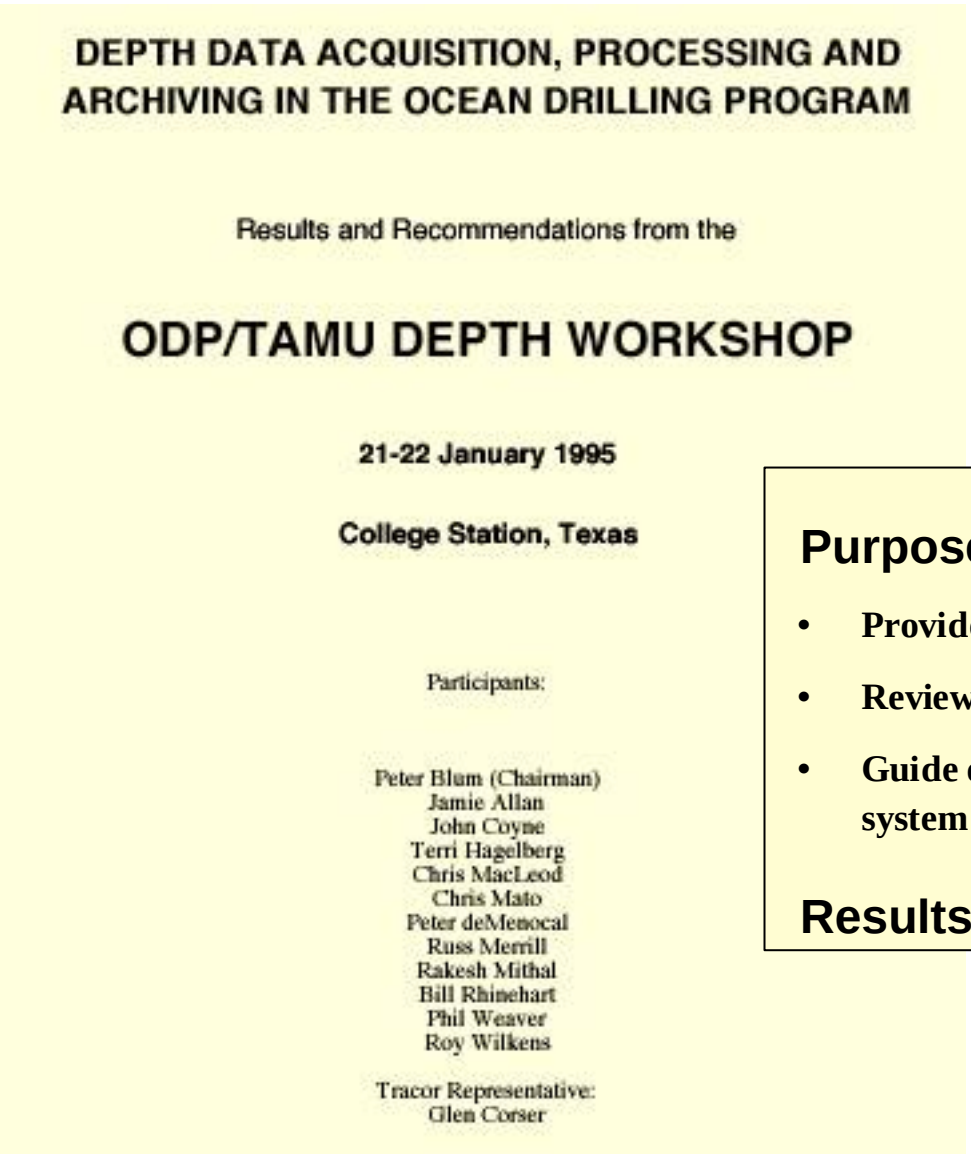
Continuous scales

Depth Scales

- Establish a depth scale framework that allows mapping of any data sets against another



1995 Depth Workshop



DEPTH DATA ACQUISITION, PROCESSING AND ARCHIVING IN THE OCEAN DRILLING PROGRAM

Results and Recommendations from the

ODP/TAMU DEPTH WORKSHOP

21-22 January 1995

College Station, Texas

Participants:

Peter Blum (Chairman)
Jamie Allan
John Coyne
Terri Hagelberg
Chris MacLeod
Chris Mato
Peter deMenocal
Russ Merrill
Rakesh Mithal
Bill Rhinehart
Phil Weaver
Roy Wilkens

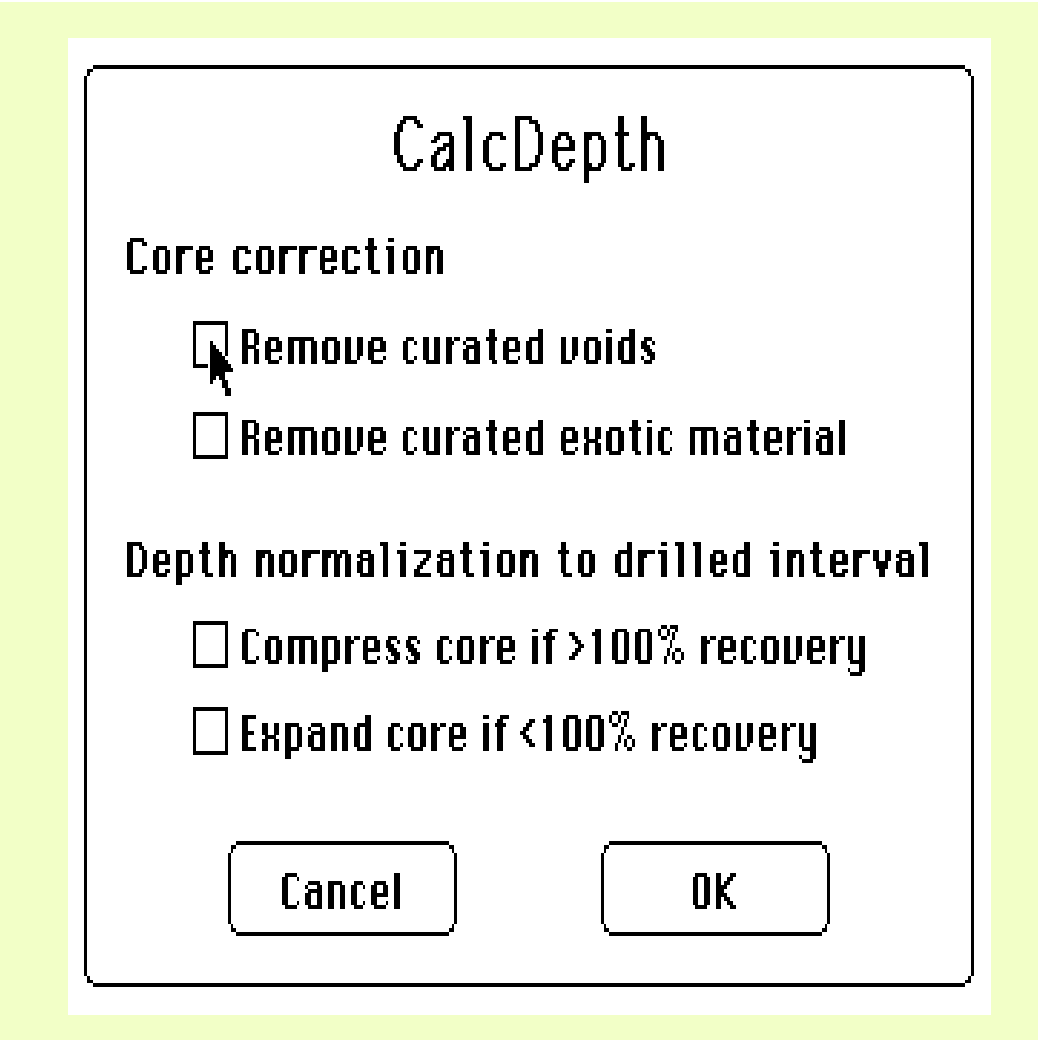
Tracor Representative:
Glen Corser

Purpose:

- **Provide in-depth review as a stepping stone for data integration**
- **Review a proposal to correct for >100% core recovery**
- **Guide depth-related design for new ODP data management system**

Results:

1995 Depth Workshop (cont.)



Age-Depth Modeling

- Define standard methods for creating shipboard age-depth models
- Provide a tool to create age-depth map based on age control points and methods
- Archive models and metadata in LIMS
- Provide age as an independent variable based on user-selected age-depth model

Age-Depth Modeling

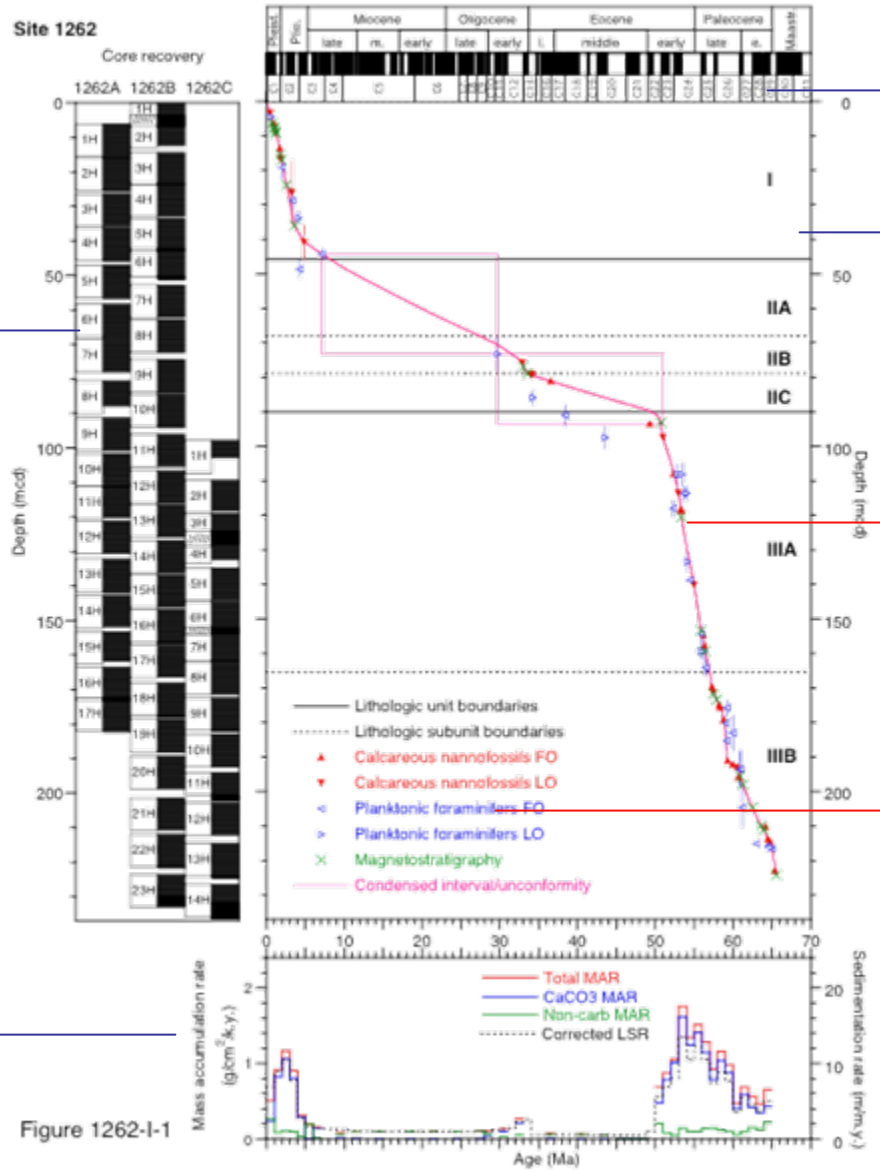


Figure 1262-I-1

Age scales

Age-depth model panel

Nominal core recovery

Age-depth model:
Locally weighed
least squares curve fit
based on interactively
selected and added
control points
(ODP Leg 208 example)

Types of age-control points

Linear sedimentation rate
&
Component mass
accumulation rates