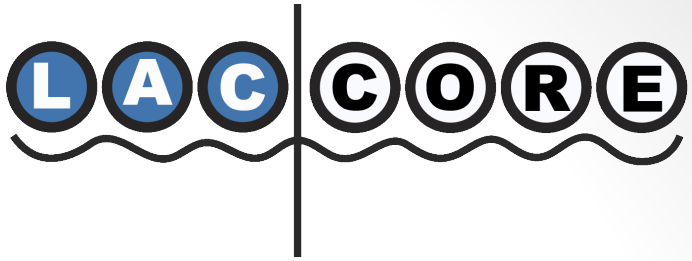

Continental Scientific Drilling Cyberinfrastructure

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UNIVERSITY OF MINNESOTA
Driven to Discover℠

Tools

Data Management

- LacCore Drilling DB—drill site metadata capture
- ICDP DIS—all drilling data/metadata
- *DESC—Digital Environment for Sample Curation—collections management*
- *SCODDEX—drilling/coring data repository*

Registration

- IGSN—International Geo Sample Number—globally unique identifiers

Visualization

- CoreWall / Corelyzer—core/data visualization
- Correlator—stratigraphic correlation
- PSICAT—lithologic description
- CoreRef—web application for rapid display of fundamental datasets
- GeoMapApp—integrates IMLGS and other data

Reference/Interpretation

- TMI—Tool for Microscopic Identification—sediment component ID

Archives

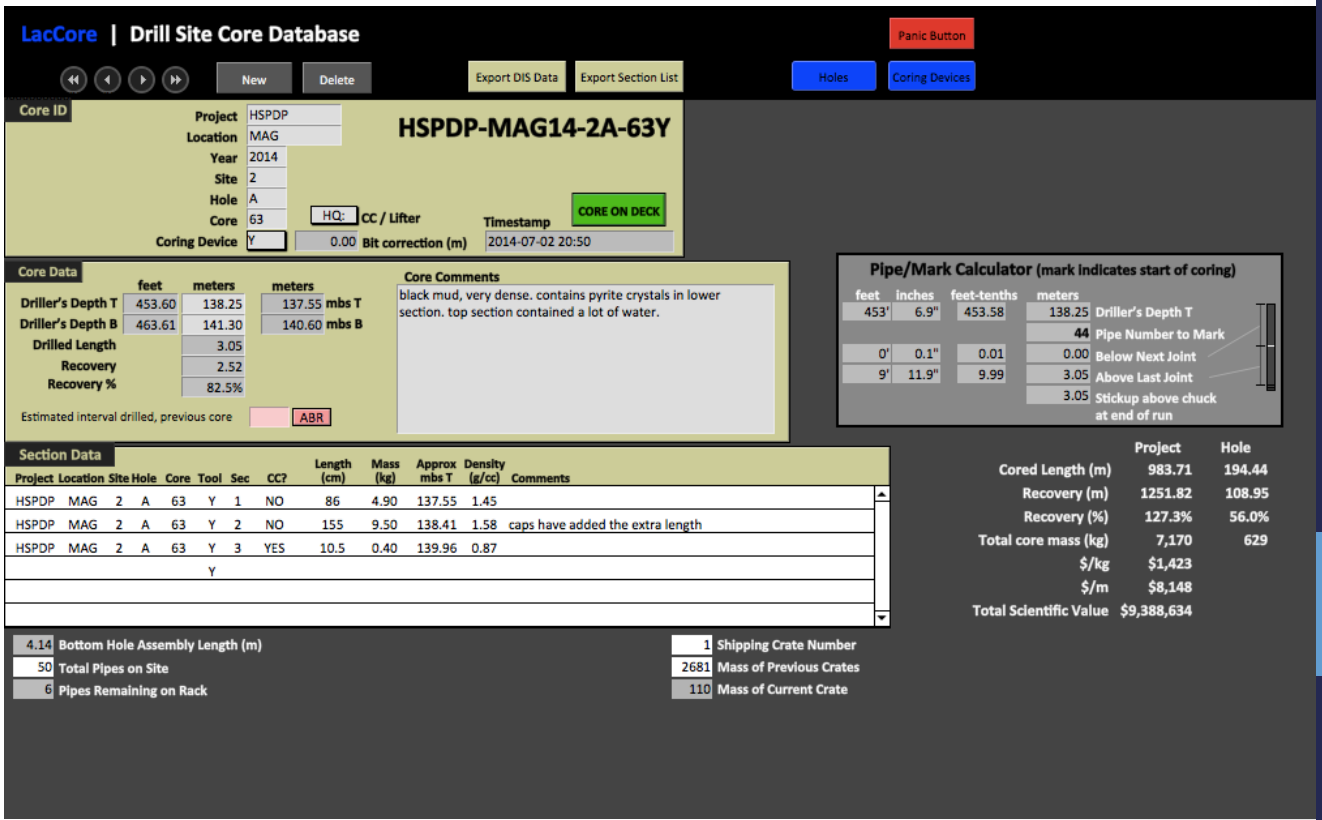
- IMLGS—Index to Marine and Lacustrine Geological Samples
- IEDA—Integrated Earth Data Applications

LacCore Drilling DB

Integrate rig, pipe, tool measurements

Rapid drilling data capture and feedback

Readily modifiable based on situation



ICDP DIS

Full integration of all drilling data

Supports ICD

IGSN

International Geo Sample Number

- Globally unique sample identifiers
- Does not replace other identifiers
- Allows linkage from sample to data to publication to archive and back
- Distributed allocating agents
- Governance by membership in implementing organization

DESC

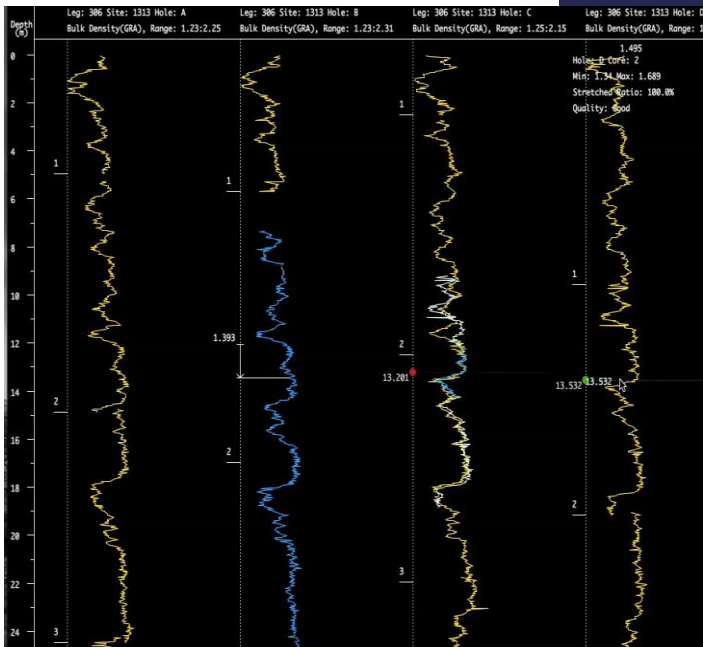
Digital Environment for Sample Curation

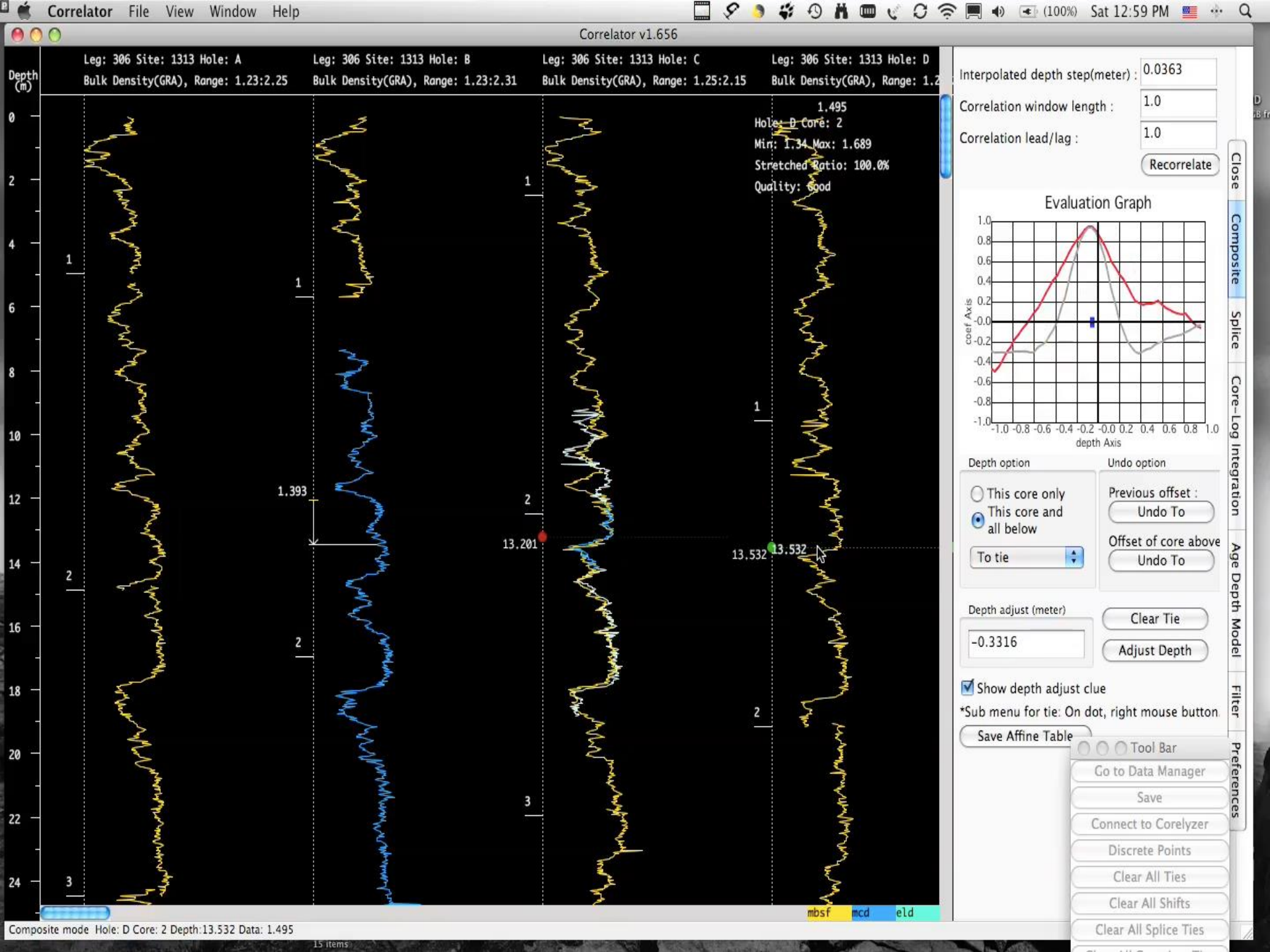
- Shared Cyberinfrastructure for Earth Science Sample Collections
- Hosted at IEDA
- Using core repositories as initial community

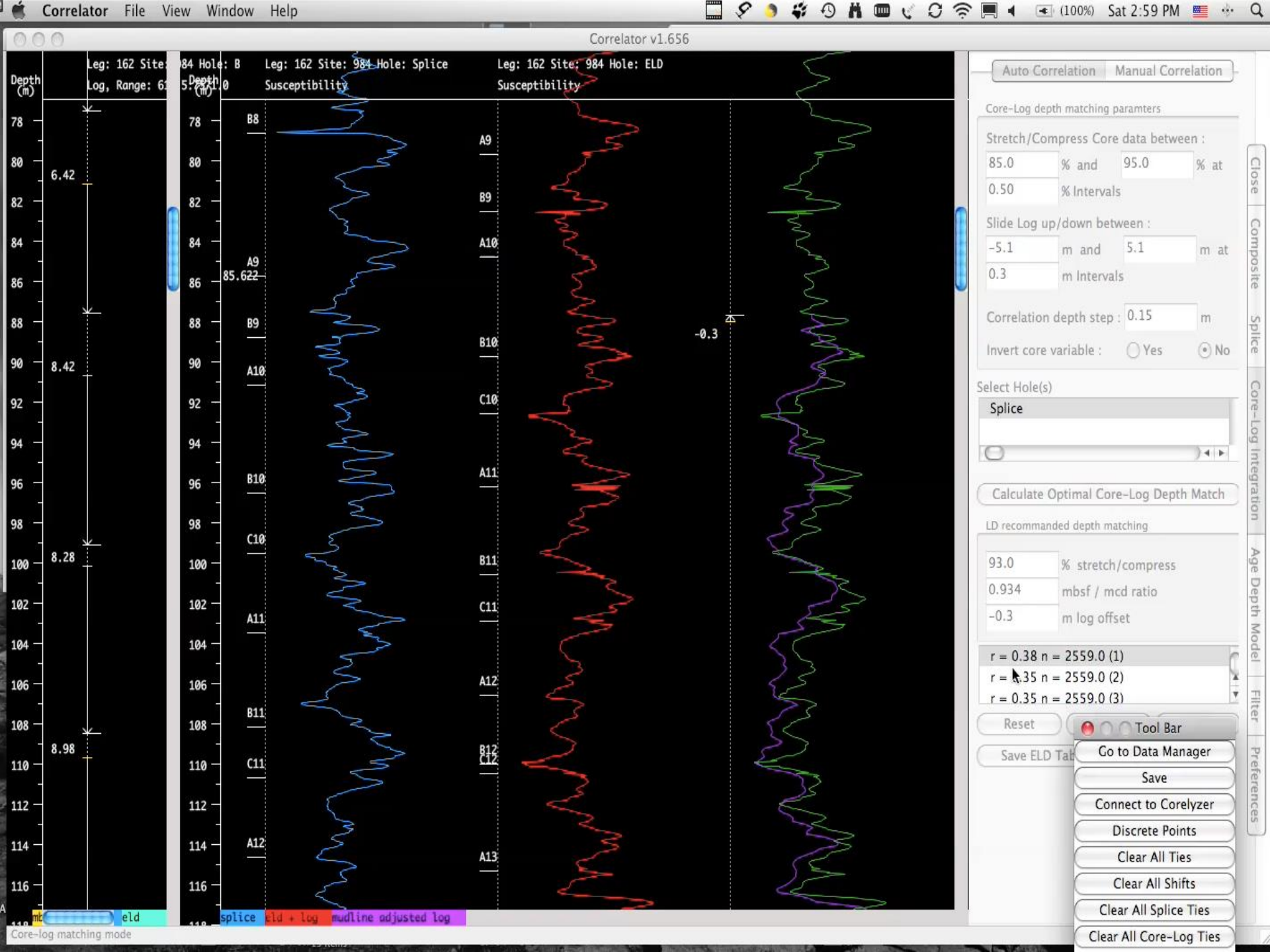
Correlator

Stratigraphic correlation of cores from multiple drilled holes

- Rewrite of Splicer and Sagan programs
- Sediment core samples
  - Incomplete recovery during drilling
  - Define composite/reference section
  - Splice together best material from each hole
  - Integrate cores with downhole logs



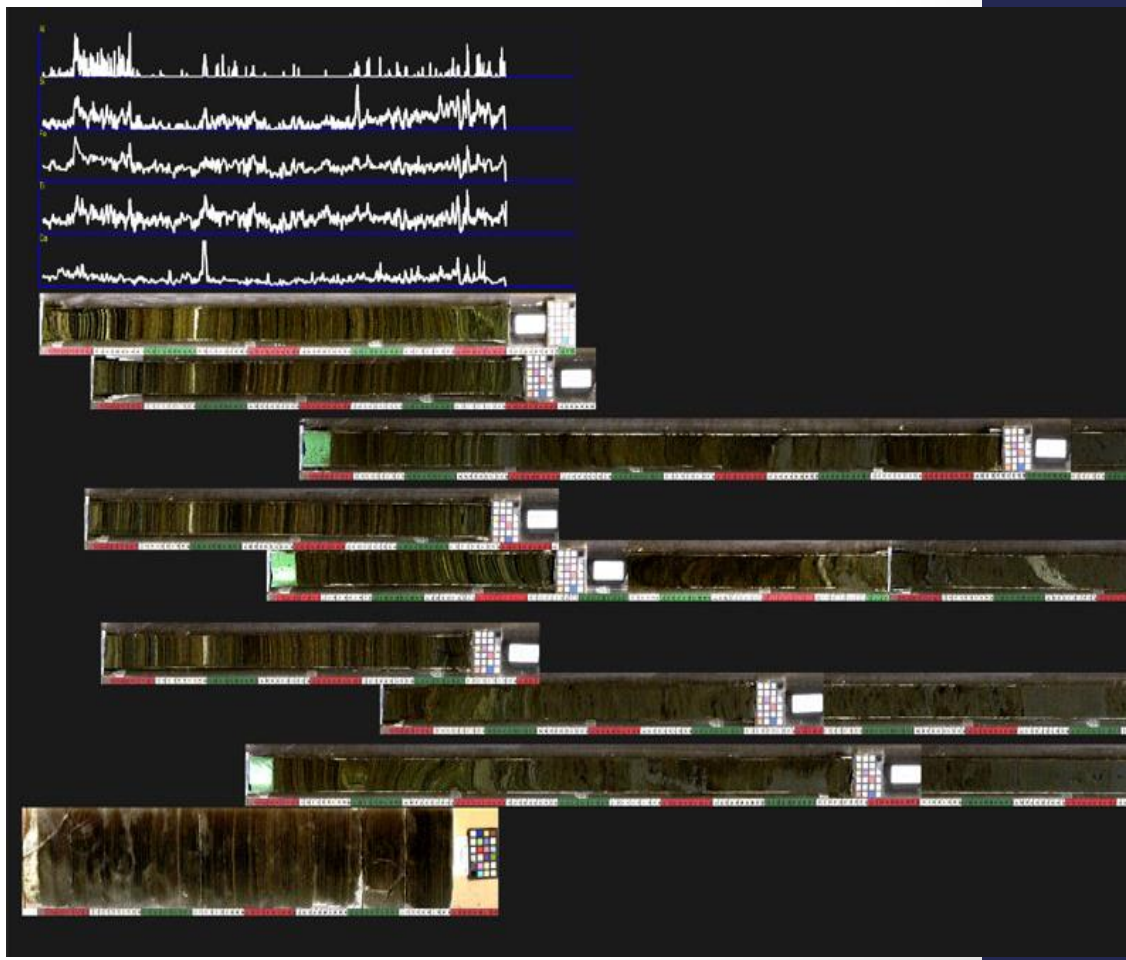

Correlator File View Window Help
Correlator v1.656
Leg: 306 Site: 1313 Hole: A
Bulk Density(GRA), Range: 1.23:2.25
Leg: 306 Site: 1313 Hole: B
Bulk Density(GRA), Range: 1.23:2.31
Leg: 306 Site: 1313 Hole: C
Bulk Density(GRA), Range: 1.25:2.15
Leg: 306 Site: 1313 Hole: D
Bulk Density(GRA), Range: 1.2
Depth (m)
1.495
Hole: D Core: 2
Min: 1.34 Max: 1.689
Stretched Ratio: 100.0%
Quality: good
1.393
13.201
13.532
13.532
mbsf
mcd
eld
Interpolated depth step(meter) :
0.0363
Correlation window length :
1.0
Correlation lead/lag :
1.0
Recorrelate
Evaluation Graph
coef Axis
depth Axis
Depth option
This core only
This core and all below
To tie
Undo option
Previous offset :
Undo To
Offset of core above
Undo To
Depth adjust (meter)
-0.3316
Clear Tie
Adjust Depth
Show depth adjust clue
*Sub menu for tie: On dot, right mouse button
Save Affine Table
Close
Composite
Splice
Core-Log Integration
Age Depth Model
Filter
Preferences
Tool Bar
Go to Data Manager
Save
Connect to Corelyzer
Discrete Points
Clear All Ties
Clear All Shifts
Clear All Splice Ties
Composite mode Hole: D Core: 2 Depth:13.532 Data: 1.495


Correlator File View Window Help
Correlator v1.656
Leg: 162 Site: 984 Hole: B
Log, Range: 6
Depth (m)
Leg: 162 Site: 984 Hole: Splice
Susceptibility
Leg: 162 Site: 984 Hole: ELD
Susceptibility
6.42
8.42
8.28
8.98
B8
A9
85.622
B9
A10
B10
C10
A11
B11
C11
A12
A13
-0.3
Auto Correlation
Manual Correlation
Core-Log depth matching paramters
Stretch/Compress Core data between :
85.0 % and 95.0 % at
0.50 % Intervals
Slide Log up/down between :
-5.1 m and 5.1 m at
0.3 m Intervals
Correlation depth step : 0.15 m
Invert core variable : Yes No
Select Hole(s)
Splice
Calculate Optimal Core-Log Depth Match
LD recommanded depth matching
93.0 % stretch/compress
0.934 mbsf / mcd ratio
-0.3 m log offset
r = 0.38 n = 2559.0 (1)
r = 0.35 n = 2559.0 (2)
r = 0.35 n = 2559.0 (3)
Reset
Save ELD Tab
Tool Bar
Go to Data Manager
Save
Connect to Corelyzer
Discrete Points
Clear All Ties
Clear All Shifts
Clear All Splice Ties
Clear All Core-Log Ties
Close
Composite
Splice
Core-Log Integration
Age Depth Model
Filter
Preferences
eld
splice
eld + log
mudline adjusted log
Core-log matching mode

Corelyzer

Visualization platform for high-resolution core images and data

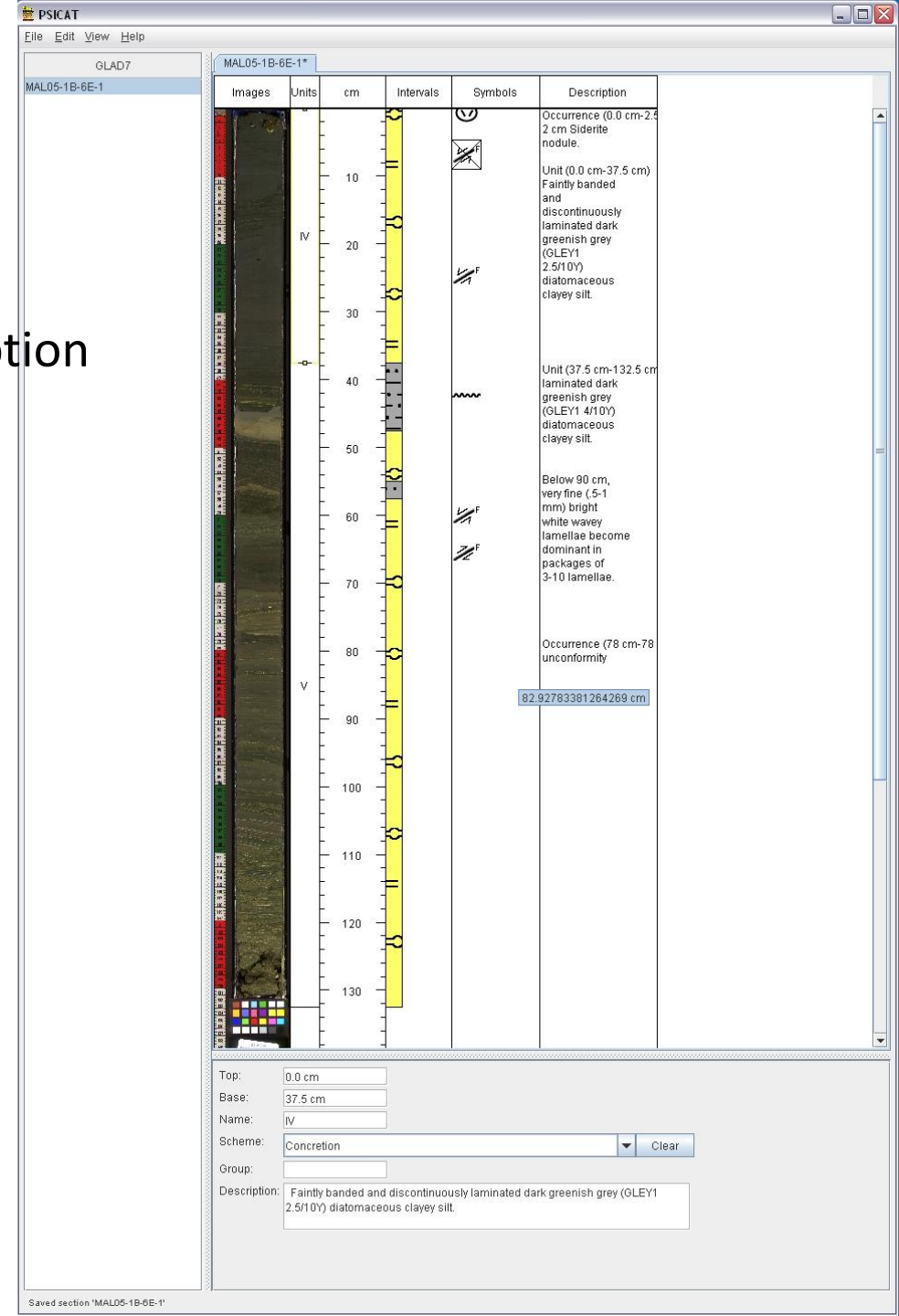
- Visual correlation
- Core-data comparison



PSICAT

Application for visual core description

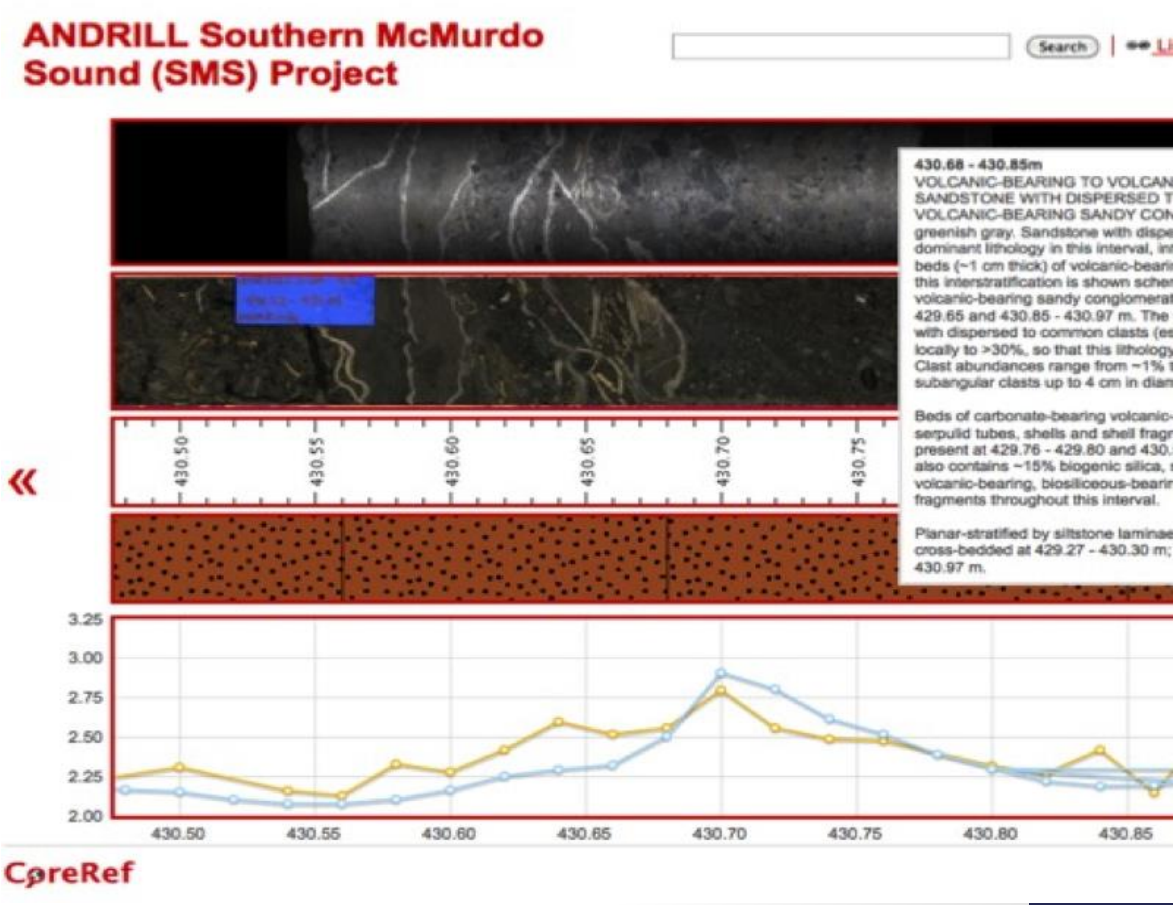
- lithology
- color
- texture
- structure
- features of interest



CoreRef

Web application for core-data visualization and reference

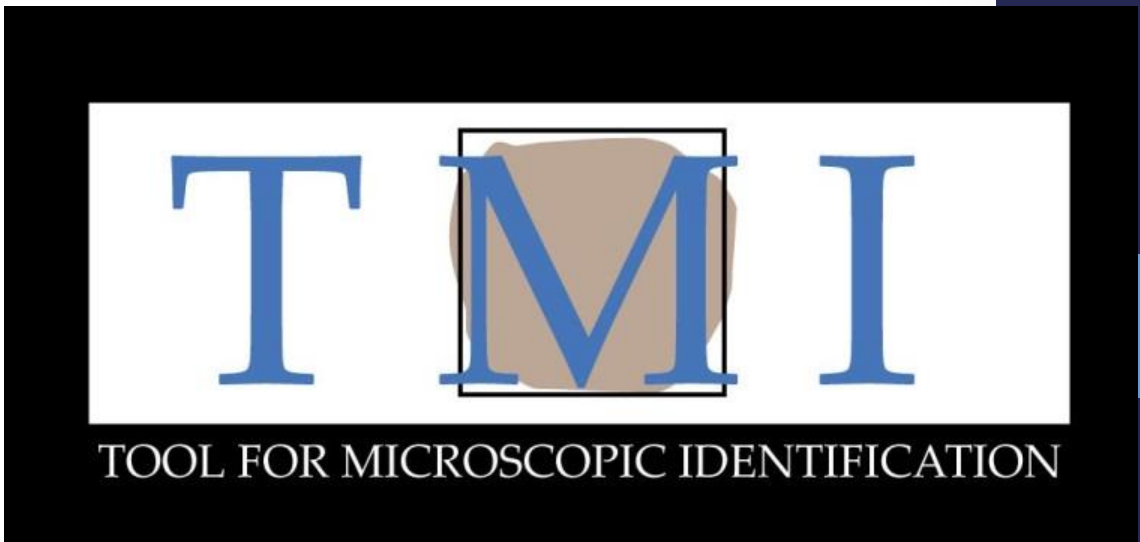
- Quickly access fundamental core datasets



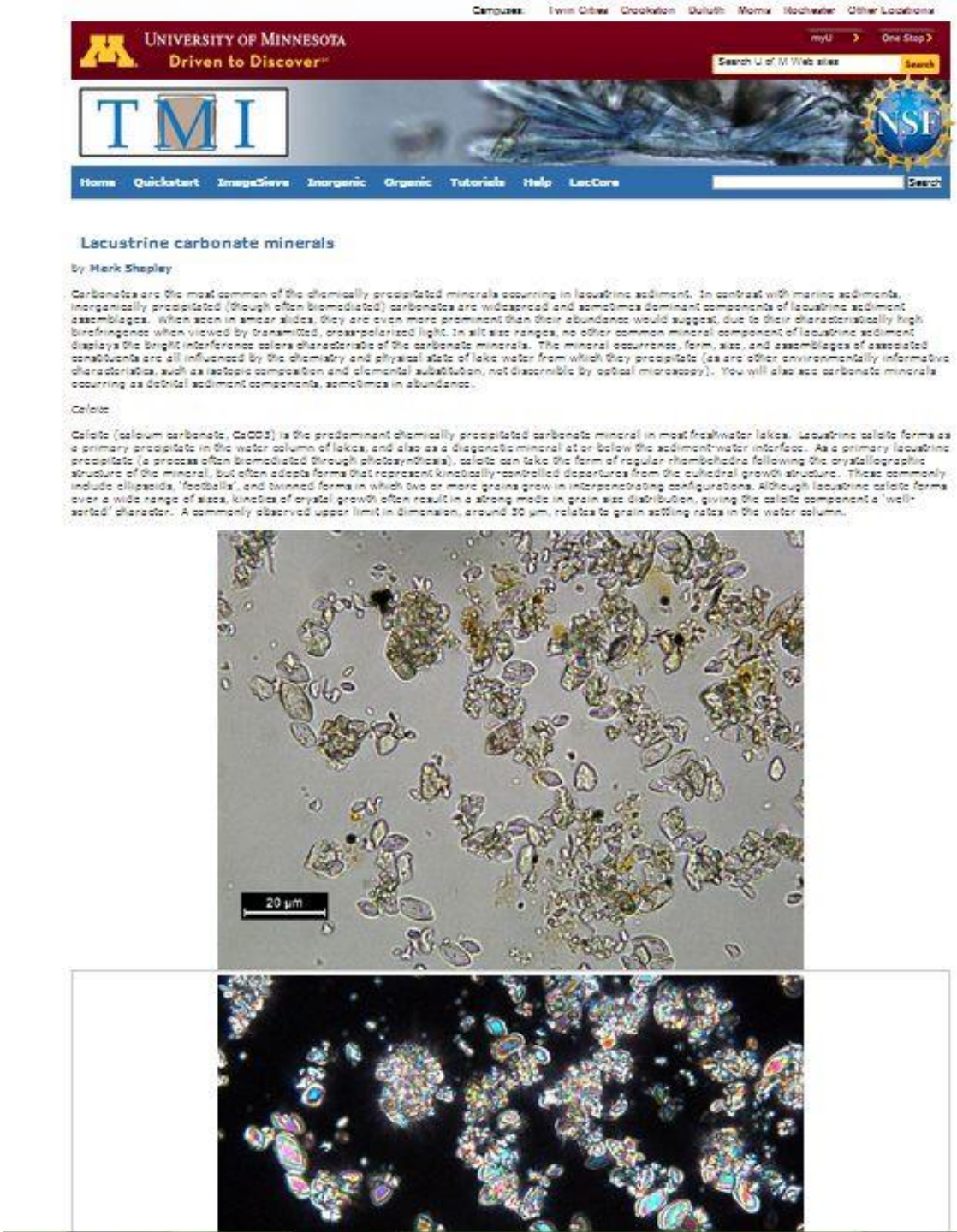
TMI

Microscopic description using petrographic smear slides

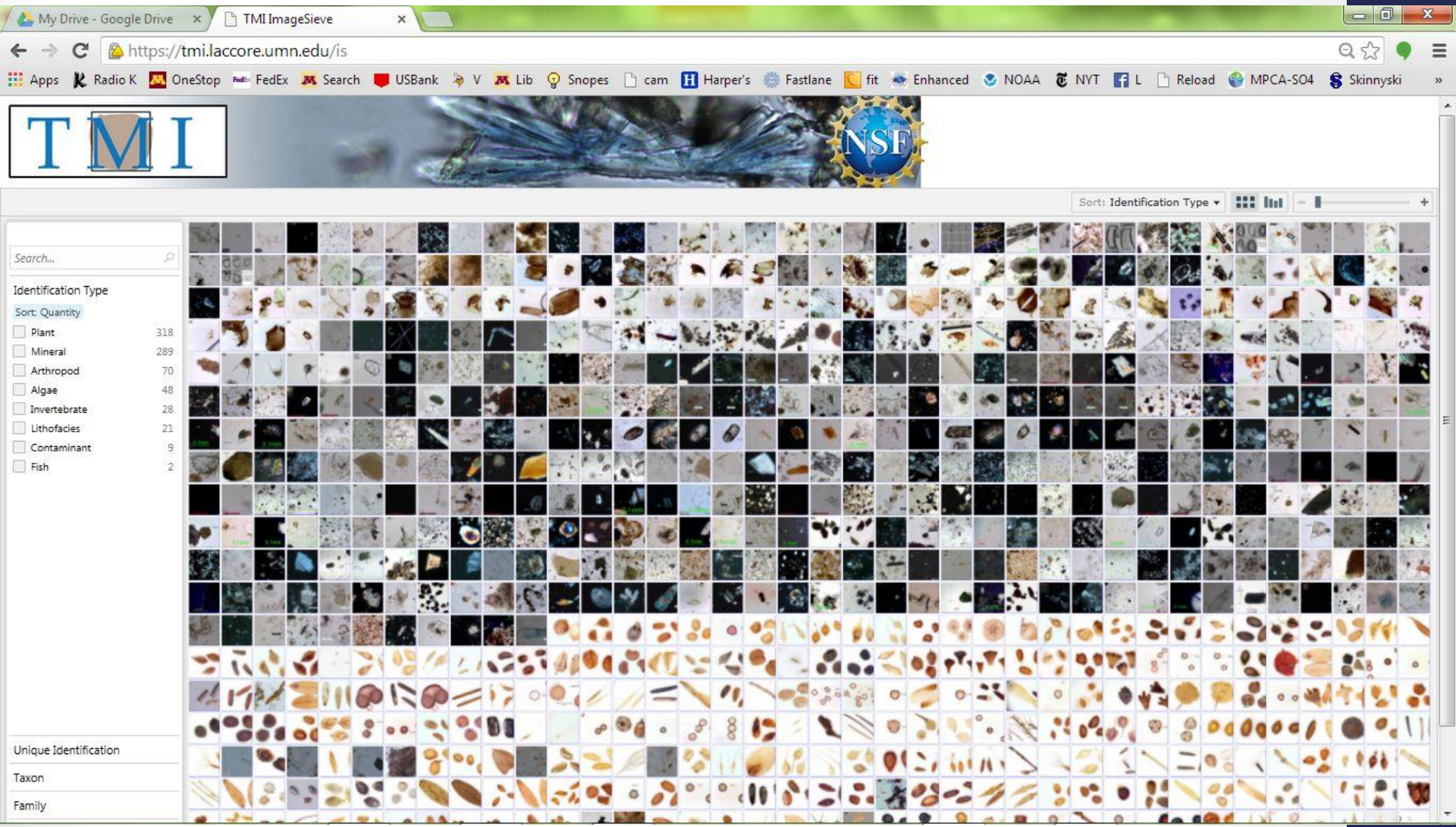
- Detrital mineralogy and texture
- Endogenic mineralogy
- Diagenetic mineralogy and alteration
- Flora and fauna and their preservation
- Organic matter source and condition



Tutorials


Campuses: Twin Cities Crookston Duluth Morris Rochester Other Locations
UNIVERSITY OF MINNESOTA
Driven to Discover℠
myU
One Stop
Search U of M Web sites
Search
TMI
NSF
Home Quickstart ImageSieve Inorganic Organic Tutorials Help LacCore
Search
Lacustrine carbonate minerals
by Mark Shapley
Carbonates are the most common of the chemically precipitated minerals occurring in lacustrine sediment. In contrast with marine sediments, inorganically precipitated (though often biomediated) carbonates are widespread and sometimes dominant components of lacustrine sediment assemblages. When seen in smear slides, they are even more prominent than their abundance would suggest, due to their characteristically high birefringence when viewed by transmitted, crosspolarized light. In all size ranges, no other common mineral component of lacustrine sediment displays the bright interference colors characteristic of the carbonate minerals. The mineral occurrence, form, size, and assemblages of associated constituents are all influenced by the chemistry and physical state of lake water from which they precipitate (as are other environmentally informative characteristics, such as isotopic composition and elemental substitution, not discernible by optical microscopy). You will also see carbonate minerals occurring as detrital sediment components, sometimes in abundance.
Calcite
Calcite (calcium carbonate, CaCO3) is the predominant chemically precipitated carbonate mineral in most freshwater lakes. Lacustrine calcite forms as a primary precipitate in the water column of lakes, and also as a diagenetic mineral at or below the sediment-water interface. As a primary lacustrine precipitate (a process often biomediated through photosynthesis), calcite can take the form of regular rhombohedra following the crystallographic structure of the mineral, but often adopts forms that represent kinetically-controlled departures from the euhedral growth structure. These commonly include ellipsoids, 'footballs', and twinned forms in which two or more grains grow in interpenetrating configurations. Although lacustrine calcite forms over a wide range of sizes, kinetics of crystal growth often result in a strong mode in grain size distribution, giving the calcite component a 'well-sorted' character. A commonly observed upper limit in dimension, around 30 µm, relates to grain settling rates in the water column.
20 µm

ImageSieve


My Drive - Google Drive
TMI ImageSieve
https://tmi.laccore.umn.edu/is
Apps
Radio K
OneStop
FedEx
Search
USBank
V
Lib
Snopes
cam
Harper's
Fastlane
fit
Enhanced
NOAA
NYT
L
Reload
MPCA-SO4
Skinnyski
TMI
NSF
Sort: Identification Type
Search...
Identification Type
Sort: Quantity
Plant 318
Mineral 289
Arthropod 70
Algae 48
Invertebrate 28
Lithofacies 21
Contaminant 9
Fish 2
Unique Identification
Taxon
Family

Future

Goals

- Refinement and further development of existing tools
- Integration of functionality
- Linkages between tools
- Data repository

Challenges

- Funding
  - Developer turnover / code base knowledge
  - Evolving OS and systems

Links

www.corewall.org
www.coreref.org
tmi.laccore.umn.edu
www.seabedsamples.org
www.iedadata.org
www.igsn.org
www.geosamples.org/desc