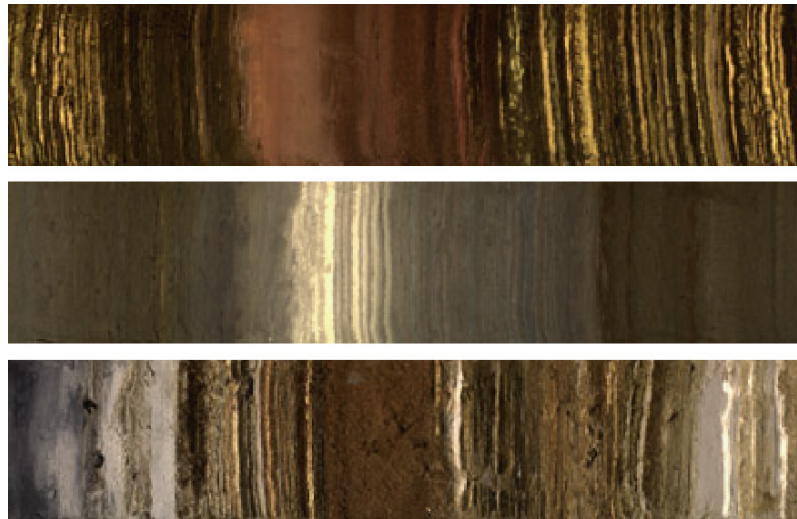


CoreWall at LacCore



Anders Noren



National Lacustrine Core Repository Limnological Research Center

University of Minnesota, Minneapolis

www.laccore.org

Anders Noren

LacCore Background

Services to Paleolimnological Community

- Planning
- Field
- Core processing / ICD
- Sample prep / Analysis
- Archiving

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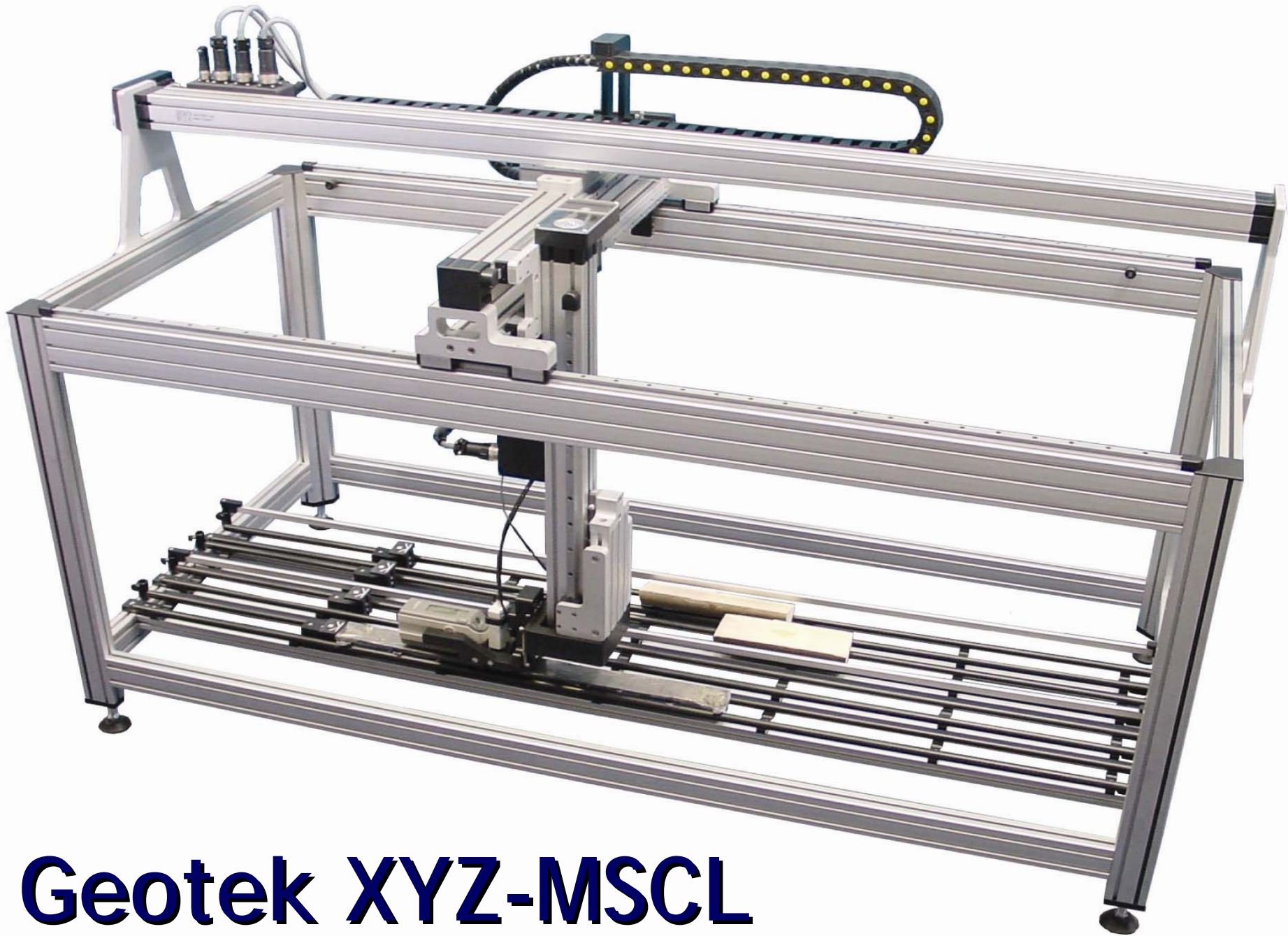
** All projects, large and small
m to km of core

Work Flow

- Planning
- Field
- Core processing / ICD
- Sample prep / Analysis
- Archiving

Geotek MSC1





Geotek XYZ-MSCL

Core Processing / ICD

1. Multisensor logging

- gamma density
- acoustic velocity
- electrical resistivity
- magnetic susceptibility (loop and high-resolution point sensors)
- color spectrophotometry
- natural gamma radiation

Core Processing / ICD

1. Multisensor logging

- gamma density
- acoustic velocity
- electrical resistivity
- magnetic susceptibility (loop and high-resolution point sensors)
- color spectrophotometry
- natural gamma radiation

Parse logger files, plot / email

Core Processing / ICD

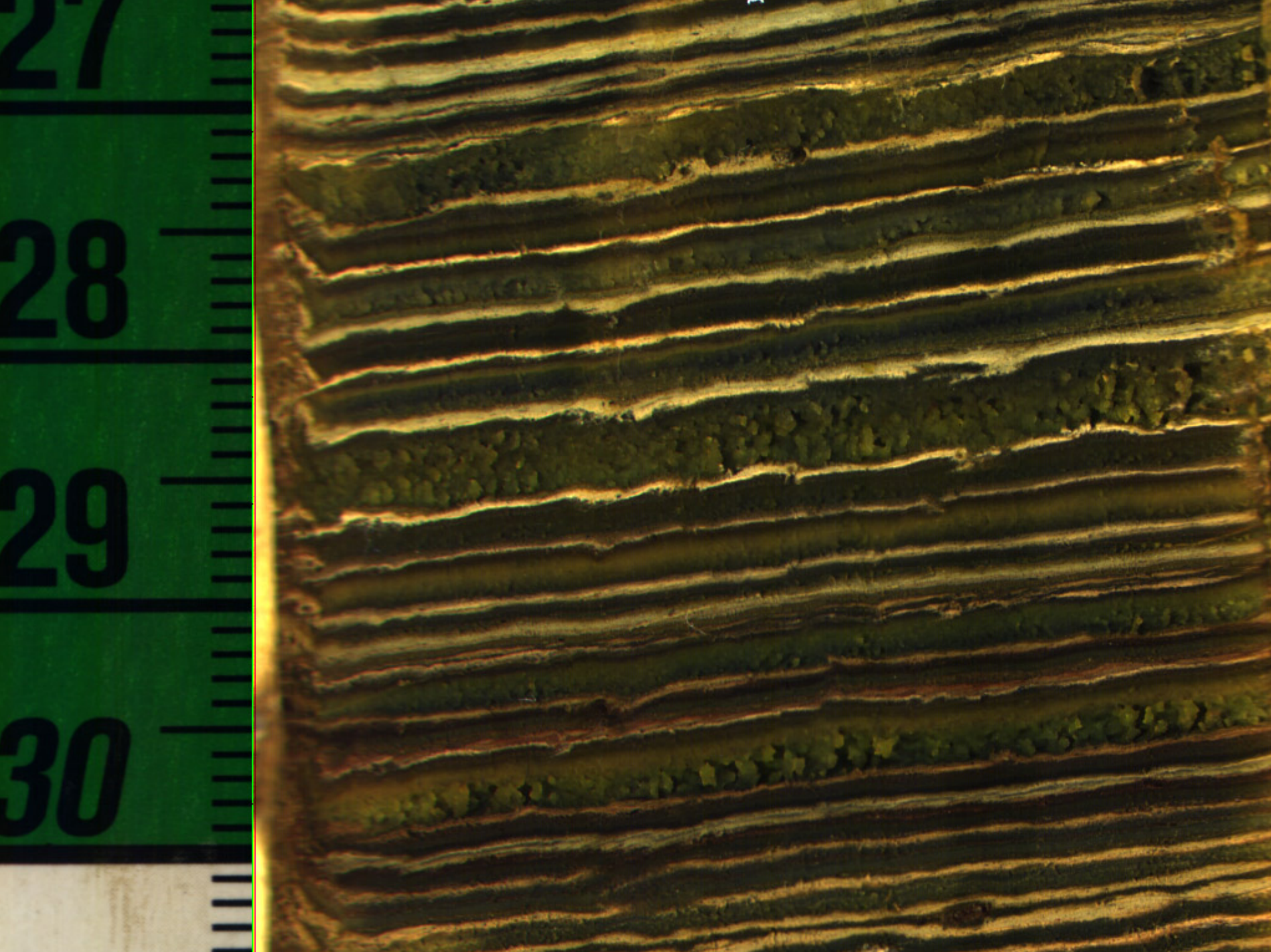
1. Multisensor logging


< split the cores >

2. High-res linescan digital imaging



DMT CoreScan
Geotek GeoScan III



- 
- The image shows a high-magnification micrograph of a biological tissue section, likely a cross-section of a plant stem or root. The tissue exhibits distinct, wavy, layered structures with varying shades of green and brown. On the left side, a green scale bar is visible, with markings for 27, 28, 29, and 30. A semi-transparent black box with red text is overlaid on the upper right portion of the image.
- 10-40 pixels/mm
 - whole-core
 - uniform lighting
 - glare-free: polarizing filters on light and lens



INITIAL CORE DESCRIPTION

Depth (cm)

STRUC.

UNIT

MS (SI)

Image

LAKE Nirvana

CORE ID QZVX-KER04-2B-27E-3

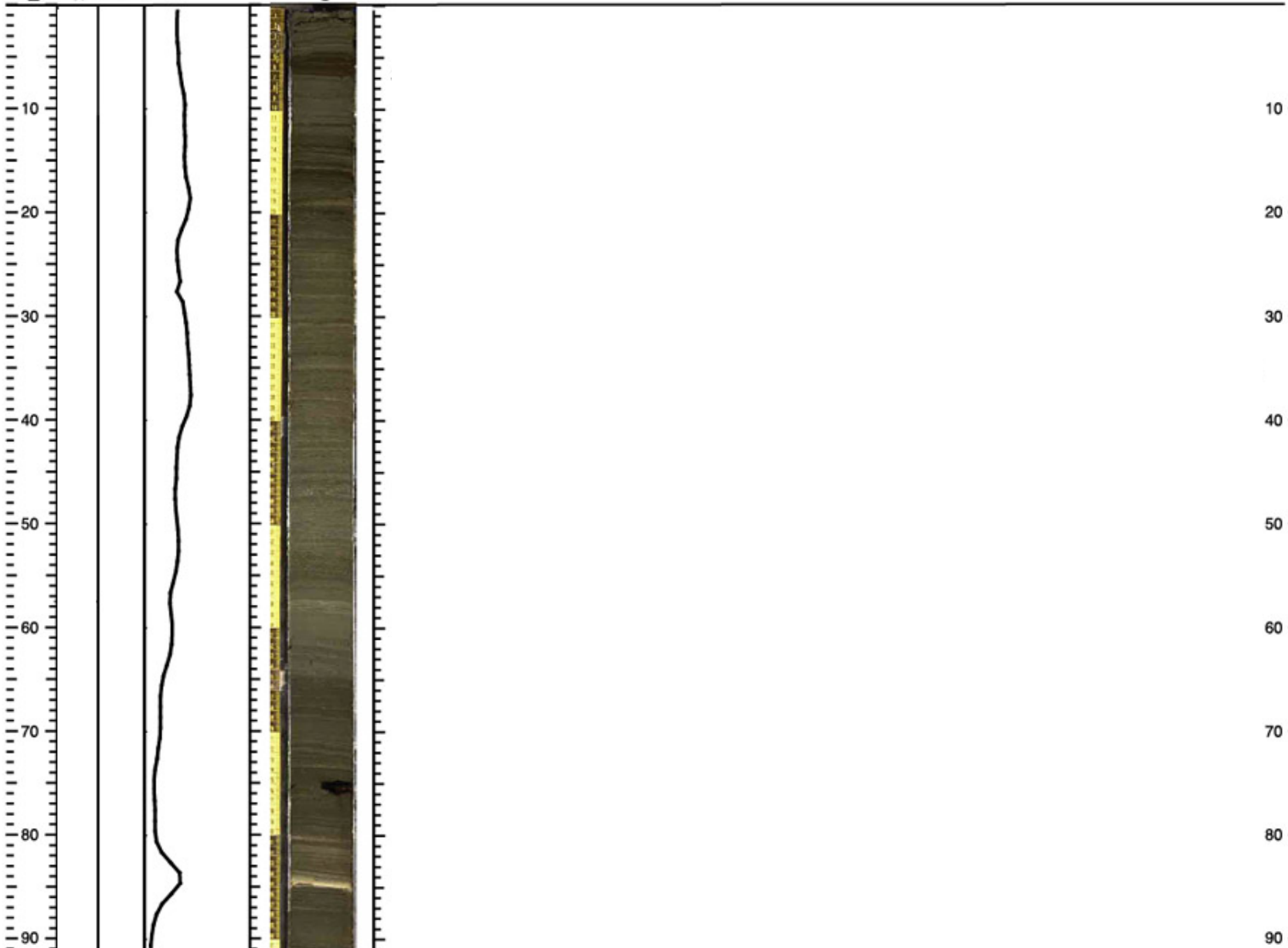
SECTION LENGTH (cm) 147.2 mbf top 125.30

SED. LENGTH (cm) 147.0 mbf bot 126.77

Describer Mark Shapley

Date 3/10/2006

LITHOLOGIC DESCRIPTION

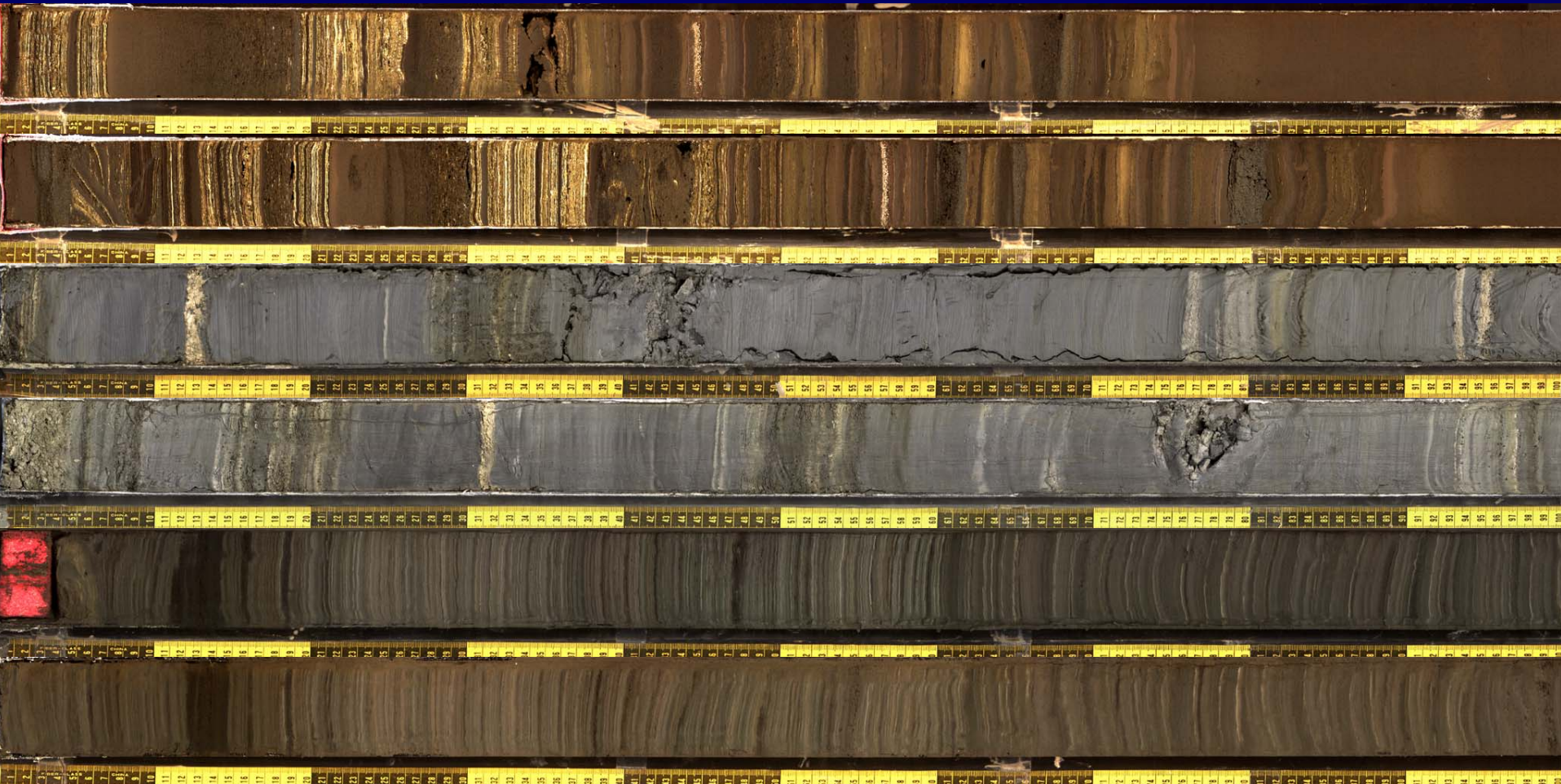


Initial Core Description

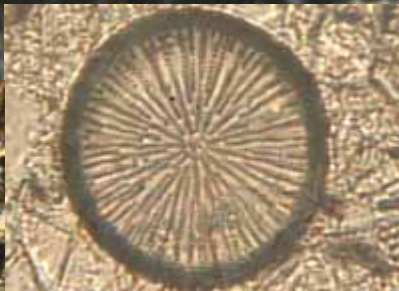
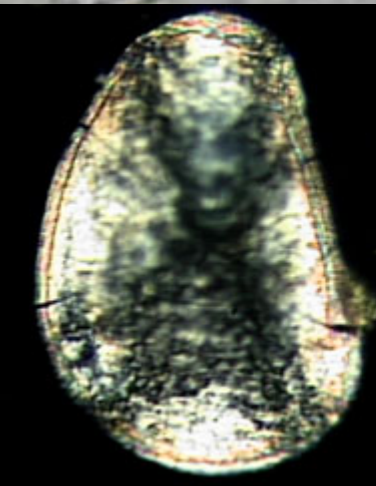


Core Processing / ICD

Core layout



Smear slides



Core Processing / ICD

1. Multisensor logging
2. High-res linescan digital imaging
3. Description
 - a. macro-scale
 - color
 - texture
 - structure

Core Processing / ICD

1. Multisensor logging
2. High-res linescan digital imaging
3. Description
 - a. macro-scale
 - color
 - texture
 - structure
 - b. micro-scale
 - mineral & biological components
 - detrital vs authigenic vs diagenetic



INITIAL CORE DESCRIPTION

LAKE Nirvana

SECTION LENGTH (cm) 147.2 mblf top 125.30

Describer Mark Shapley

CORE ID QZVX-KER04-2B-27E-3

SED. LENGTH (cm) 147.0 mblf bot 126.77

Date 3/10/2006

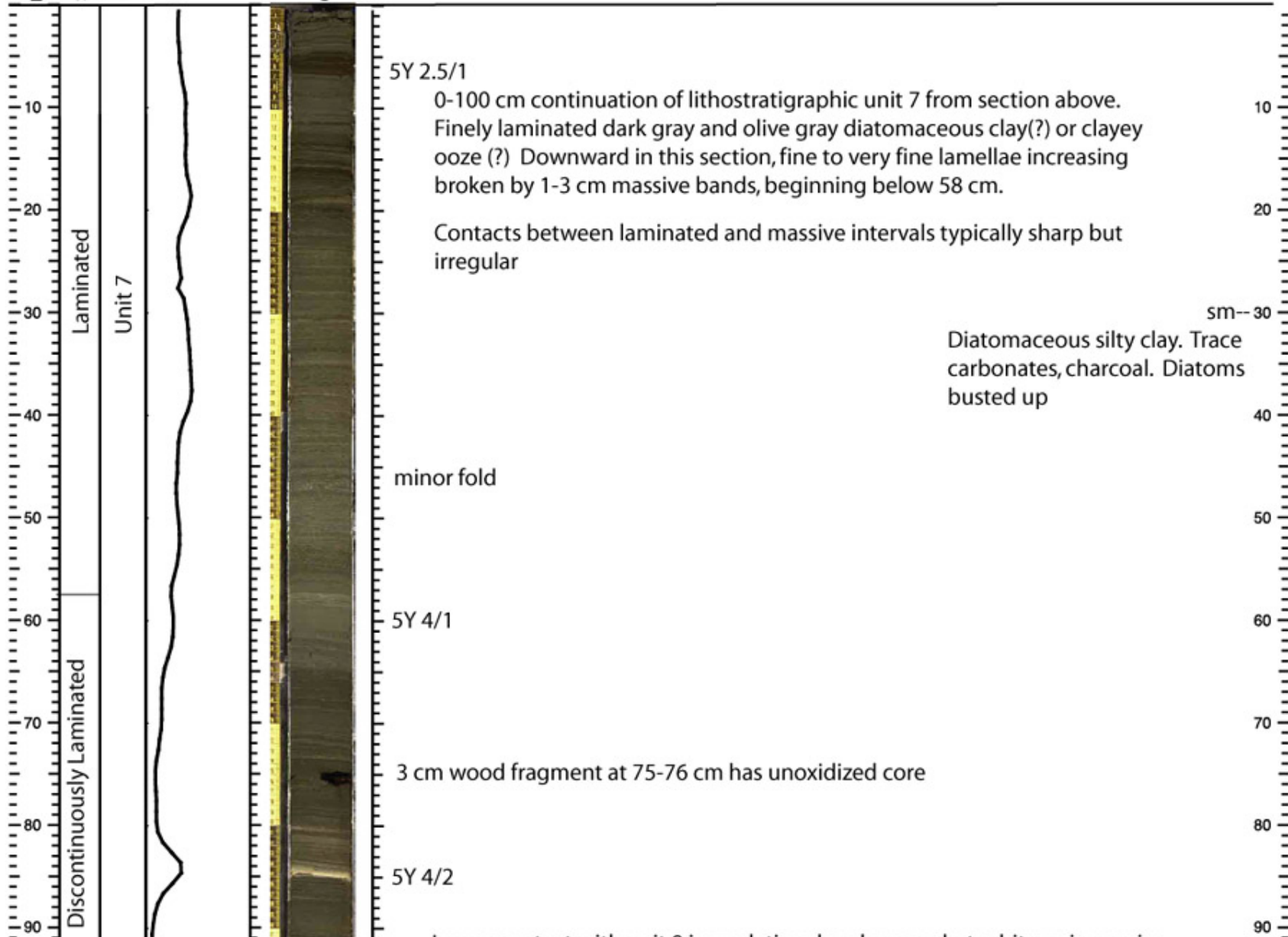
Depth (cm)

STRUC.

UNIT

MS (SI) Image

LITHOLOGIC DESCRIPTION



5Y 2.5/1

0-100 cm continuation of lithostratigraphic unit 7 from section above. Finely laminated dark gray and olive gray diatomaceous clay(?) or clayey ooze (?) Downward in this section, fine to very fine lamellae increasing broken by 1-3 cm massive bands, beginning below 58 cm.

Contacts between laminated and massive intervals typically sharp but irregular

sm--

Diatomaceous silty clay. Trace carbonates, charcoal. Diatoms busted up

minor fold

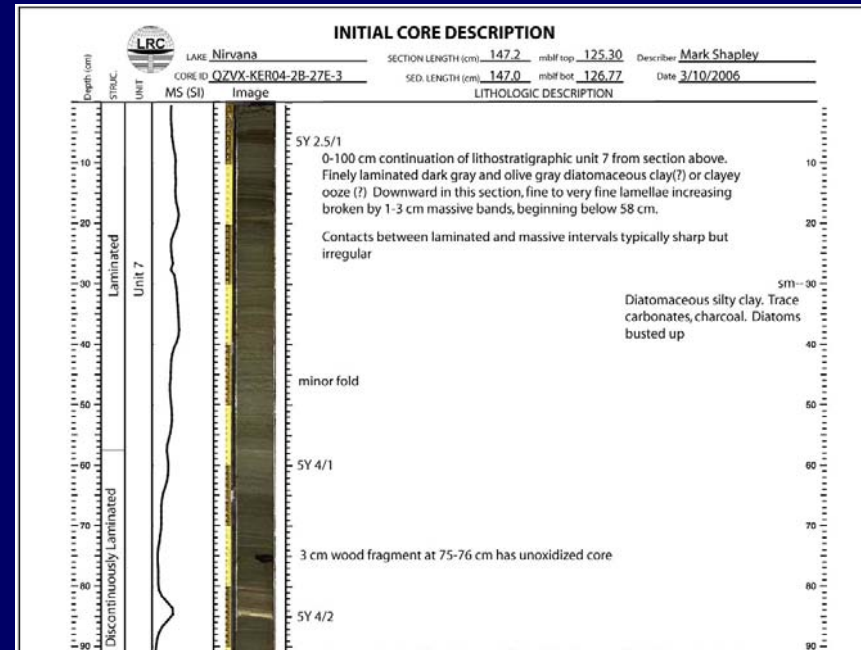
5Y 4/1

3 cm wood fragment at 75-76 cm has unoxidized core

5Y 4/2

ICD Sheets

Permanent descriptive record
Easily shared
Used for sample requests
Expedition report



ICD Sheets

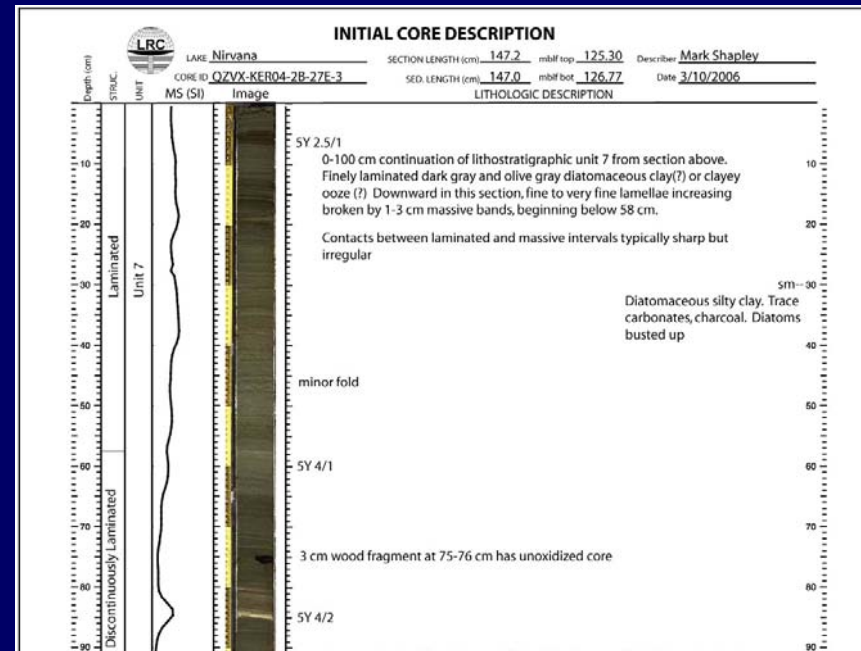
Complicated procedure

4 programs!

Excel, SigmaPlot, PhotoShop, Illustrator

Creation: 2-3 minutes/sheet

Digitizing: longer/later



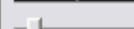


Browse



Layout:

Entry



Record:

101

Found:
830

Total:
7368

Unsorted



LacCore - National Lacustrine Core Repository - Section Database

Main Menu

EXPED HOLE CORE GAPS

Navigation buttons: New Duplicate Delete List View Sort Section Image Sample History Find

Identification

Expedition/Project: GLAD7 Lake Abbr: MAL
 Lake: Lake Malawi
 Year: 2005
 Site/Hole: 1B
 Core: 24 Coring Device Description:
 Coring Device: E
 Sec: 3
 Date: 3/12/2005 Core Diameter (cm): 6.62
 Sample Type: Sec CC Type:

Hole ID: GLAD7-MAL05-1B
 Core ID: GLAD7-MAL05-1B-24E
 Section ID: GLAD7-MAL05-1B-24E-3
 Field ID:
 IGSN:
 Accession Number: 4274

Section Comments

ICD MBLF

Sec Length (m): 1.038
 Sed Length (m): 0.938
 mblf top (m): 90.424
 mblf bot (m): 91.382
 Gaps: 9.800
 Core top mblf: 88.030

Corrected MBLF

Shrinkage Factor: 1.325
 Corr Sed Length (m): 0.71
 Corrected mblf top: 89.857
 Corrected mblf bot: 90.585

Hole Depth Shift

Hole Offset:
 DSmblf Top: 89.88
 DSmblf Base: 90.58

MCD

MCD Offset: -4.11
 MCD Top: 85.75
 MCD Base: 86.45

Archival

Shrinkage:
 Measured:
 Original:

Shipboard MBLF Calculation

Section L: 1.01
 Sec mblf T: 90.44 Sed Total:
 Sec mblf B: 91.45 624.05

Shipboard Core

Core mblf top: 88.11
 Core mblf base: 91.49
 Core recovery: 3.38

ICD Core

Core mblf top: 88.11
 Core mblf base: 91.42
 Core recovery: 3.31

Work Half

Archive Half

Comments

Permanent Location: COMO2C28

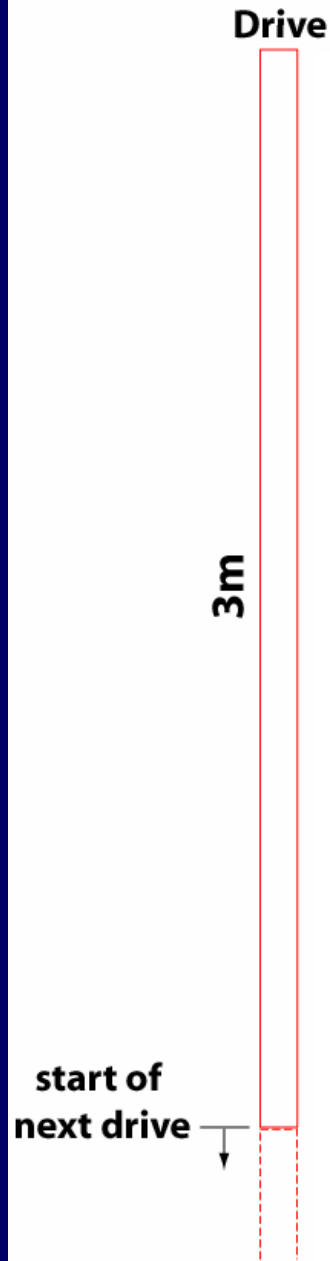
COMO2C28

Temporary Location:

	Top	Bottom	Span (cm)
Gap 1	0	.3	.3
Gap 2	7.5	7.7	.2
Gap 3	80	80.5	.5
Gap 4	86.5	86.9	.4
Gap 5	95.4	103.8	8.4
Gap 6			
Gap 7			

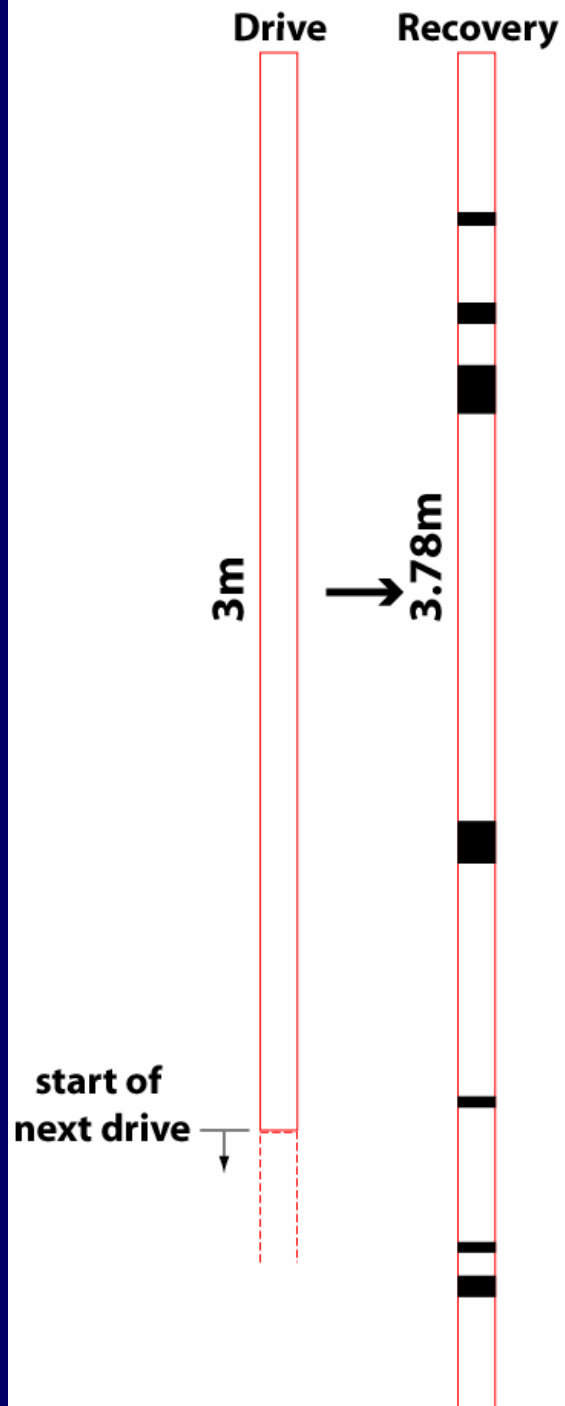
LacCore Database

- de-gapping



LacCore Database

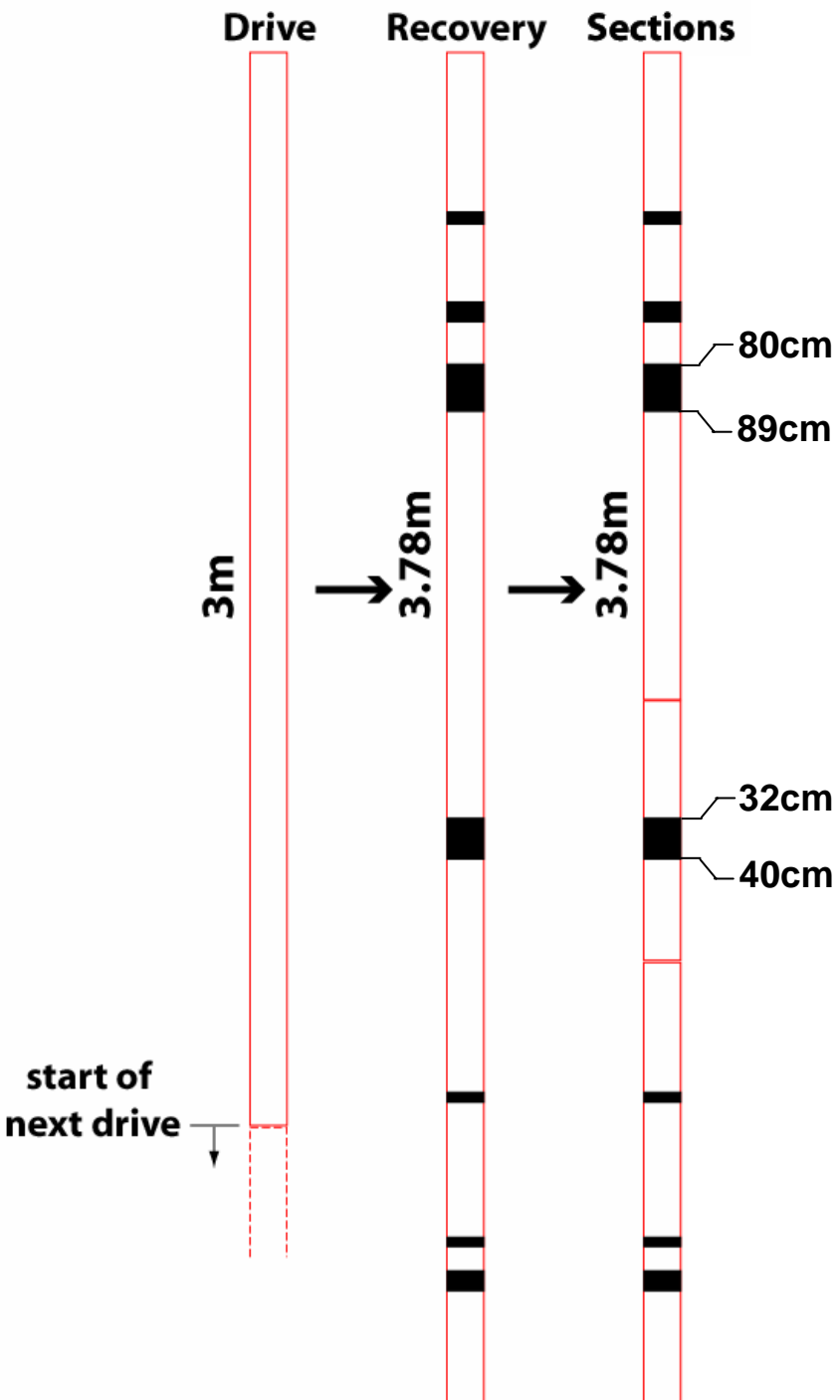
gas expansion



LacCore Database

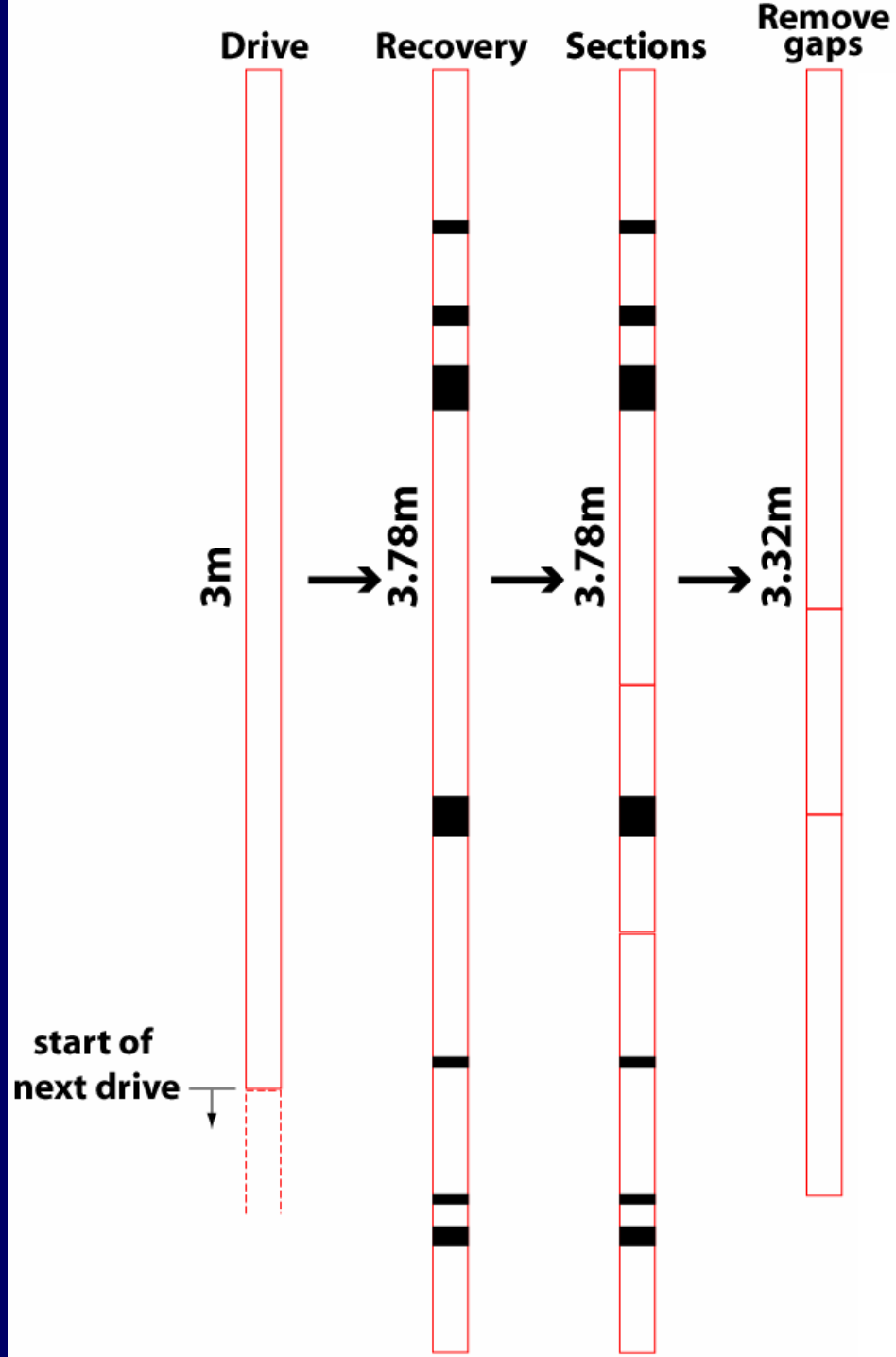
gap boundaries

	Top	Bottom	Span
Gap 1	0	.3	.3
Gap 2	7.5	7.7	.2
Gap 3	80	80.5	.5
Gap 4	86.5	86.9	.4
Gap 5	95.4	103.8	8.4
Gap 6			
Gap 7			



LacCore Database

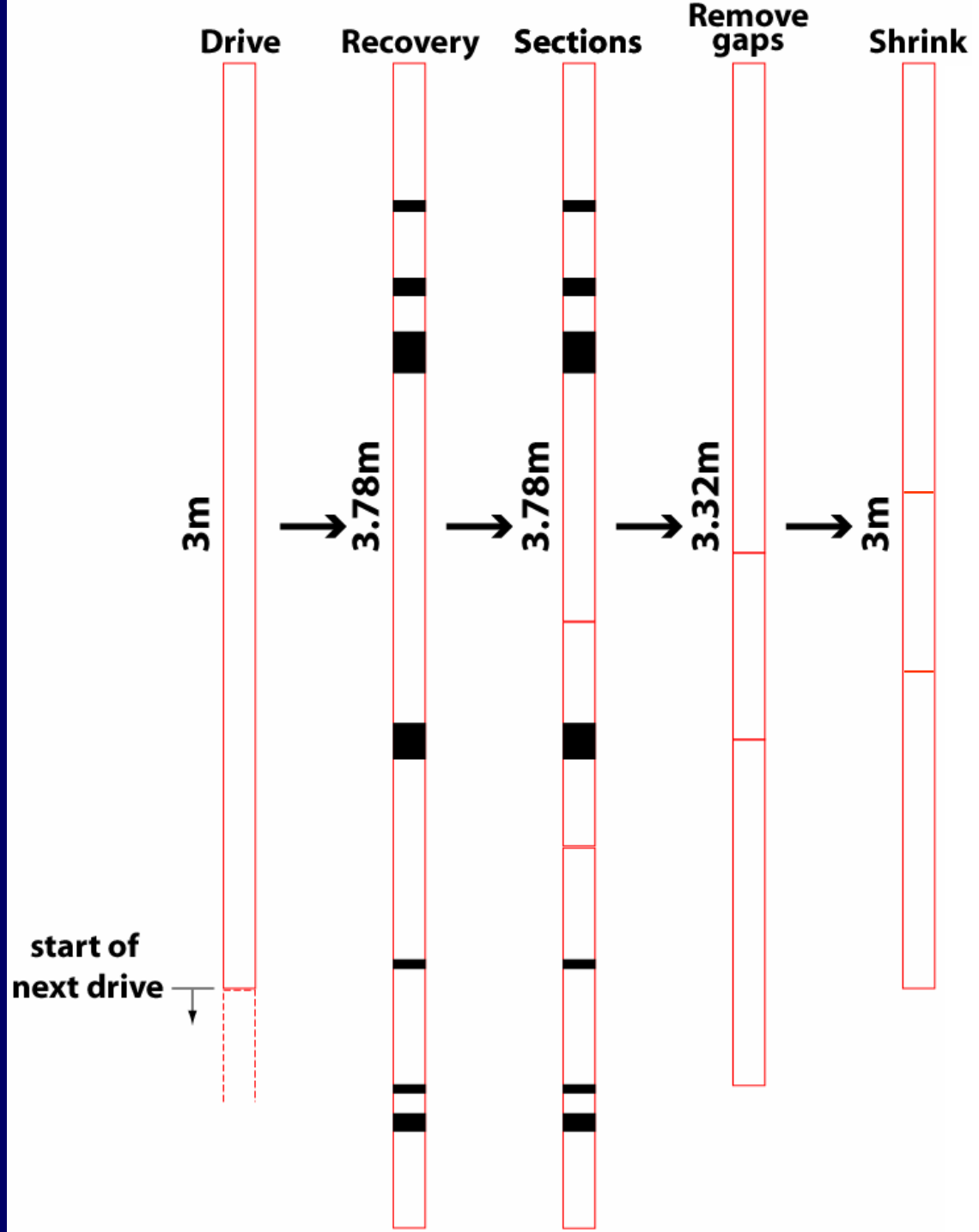
compress /
remove gaps



LacCore Database

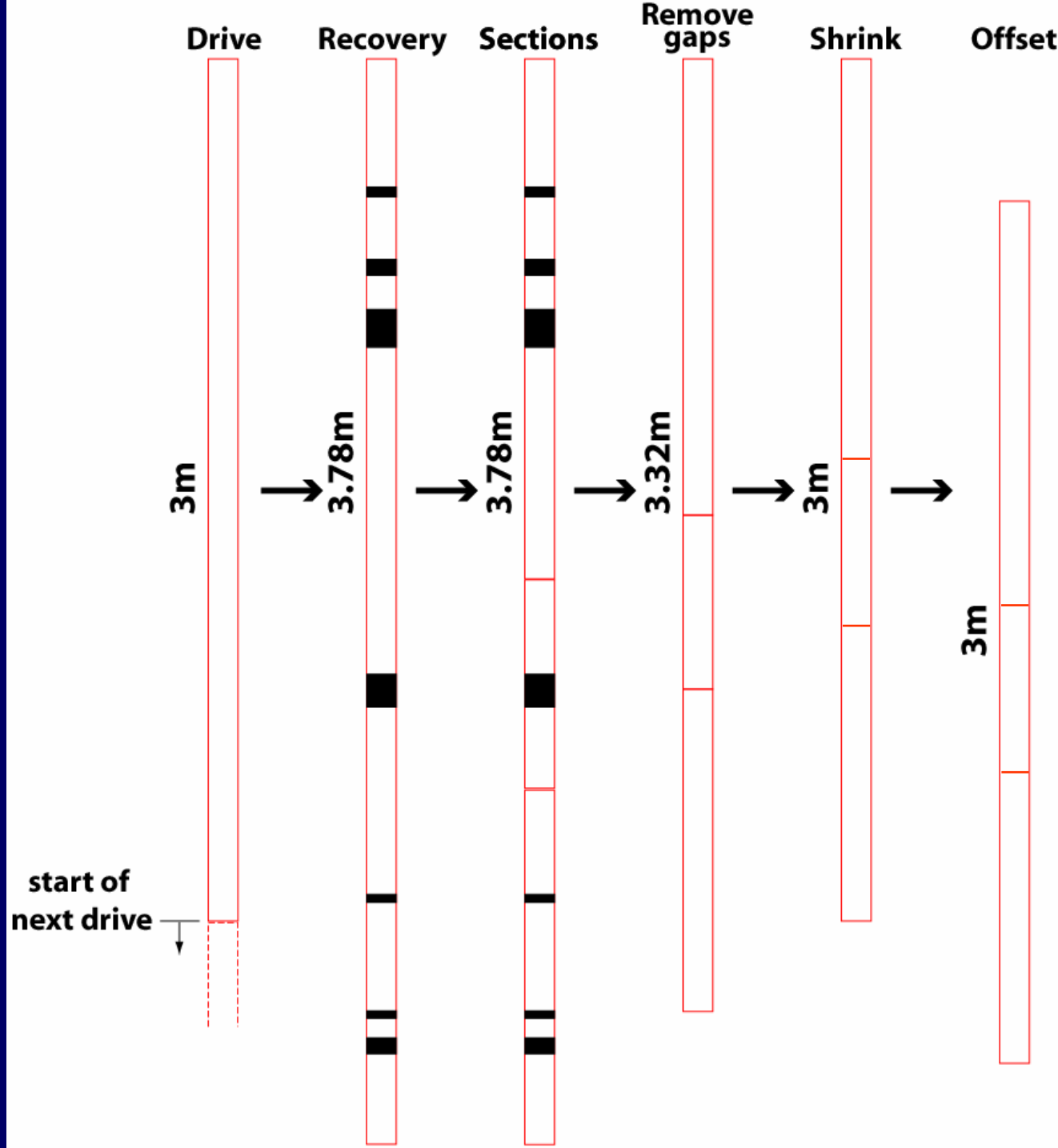
still too long!
shrinkage factor
(3.32/3.00)

Corrected MBLF	
Shrinkage Factor	1.325
Corr Sed Length (m)	0.71
Corrected mblf top	89.857
Corrected mblf bot	90.685



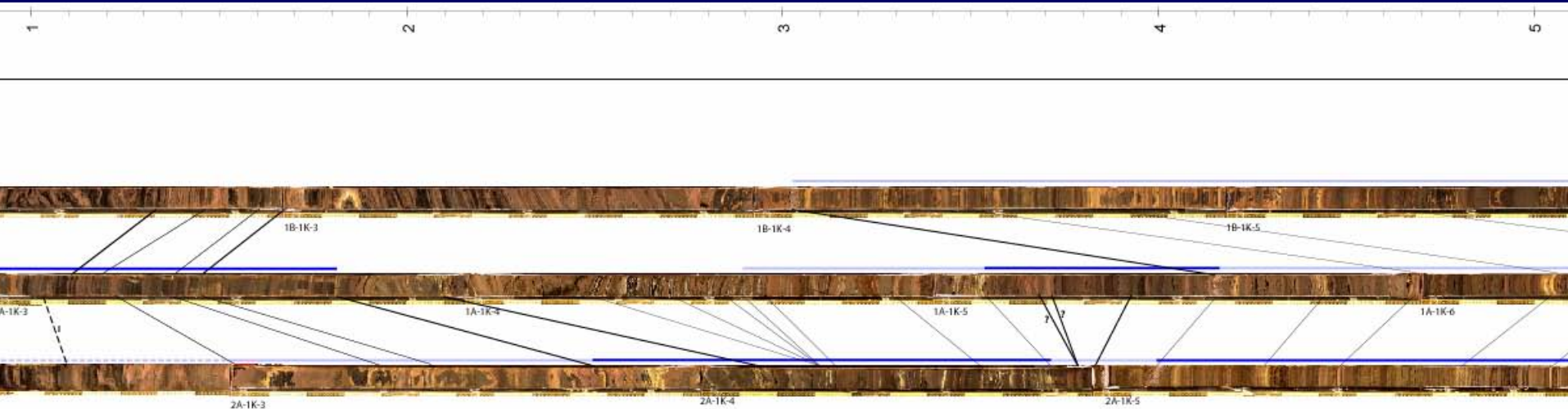
LacCore Database

offset if needed



Stratigraphic Correlation

- Visual
- Image-based
- Data-based
- Refine sampling strategy



Subsample Analyses

- Smear slides
- LOI
- TC/TIC coulometry
- Sulfur coulometry
- Biogenic silica
- Pollen
- XRD
- Thin sections
- Isotopes
- Grain size
- Diatoms
- Charcoal
- AMS carbon-14
- Lead-210
- Cesium-137

CoreWall

- Digital ICD
 - Eliminate handwriting step
 - Post/share data, images immediately

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- Subsample analyses' results juxtaposed with other datasets

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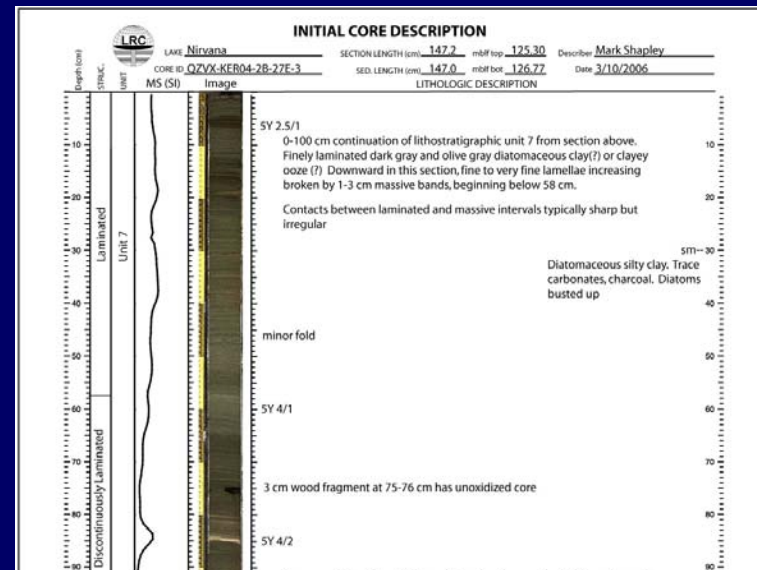
Particularly beneficial to paleolimnologists:

- Tradition of independence
- Funding structure

CoreWall

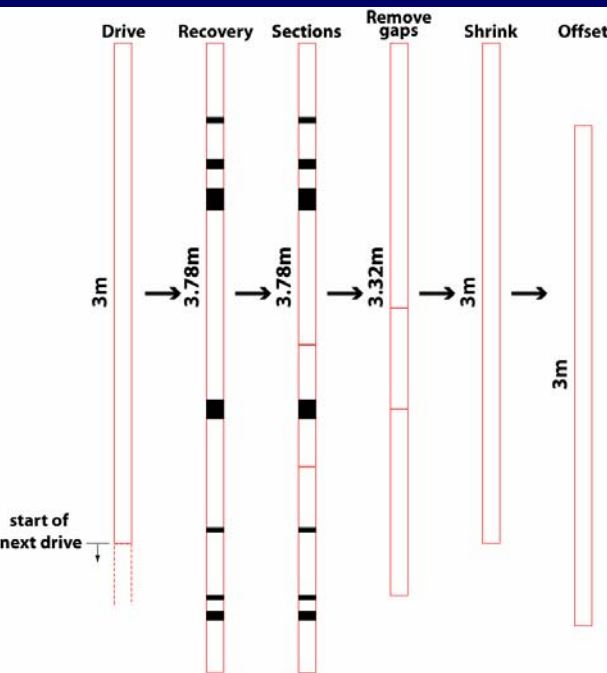
Generate printable ICD sheets/section summaries from data & annotations

- Choose data to juxtapose
- Trim bad data points



CoreWall

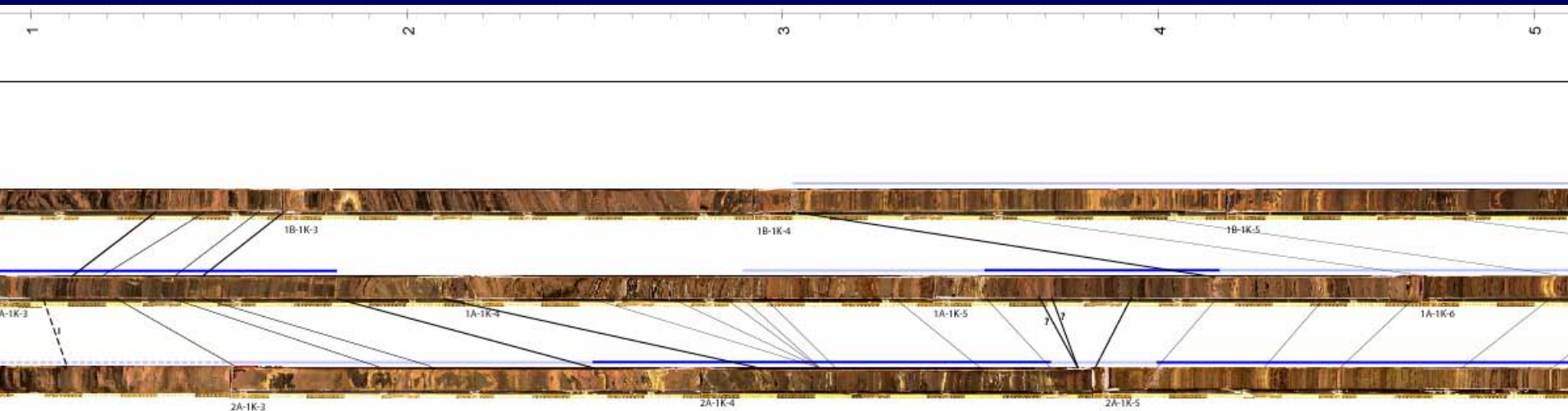
De-gapping: Compress regions of core and associated images and data to eliminate sediment gaps (squeezing/expanding within a section)



CoreWall

Perform stratigraphic correlation based on
logger data or images

Generate composite depth scales following
de-gapping and correlating

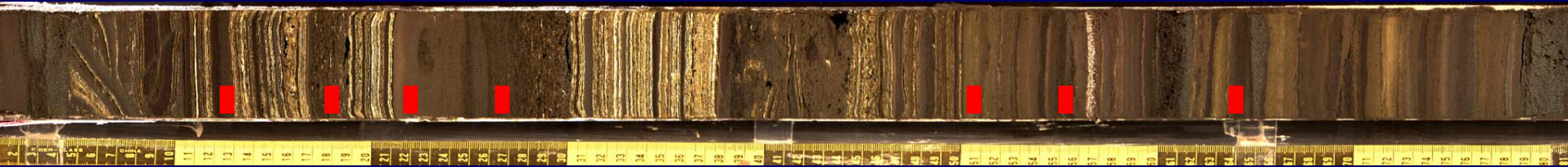


CoreWall

Show the locations of previously-taken samples

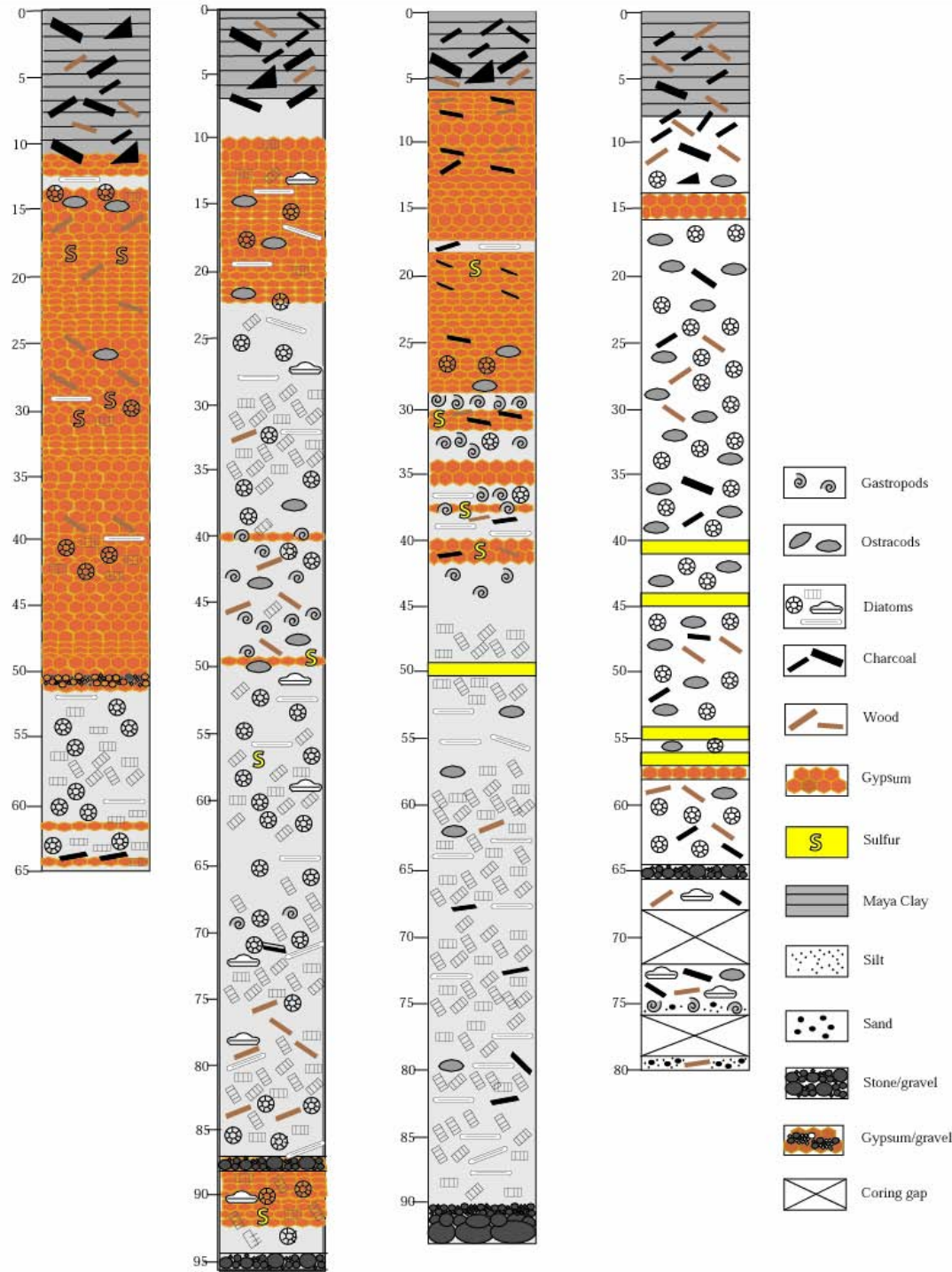
Generate sample lists/requests from user interactions with core images

- Consistent depth measurements



CoreWall

Generate stratigraphic figures and numeric exports for external plotting from description keywords



CoreWall

Perform depth scale adjustments and exports (and other numeric functionality) without loading core images

CoreWall

SUPPORT!



CoreWall

SUPPORT!

- Documentation
- User group
- A person, people, etc.



LAC CORE





