

CoreDNA Solution

CORE LOGGING technologies DISRUPTING your CORE ANALYSIS WORKFLOW...

**with a minor
core surgery!**



Mission

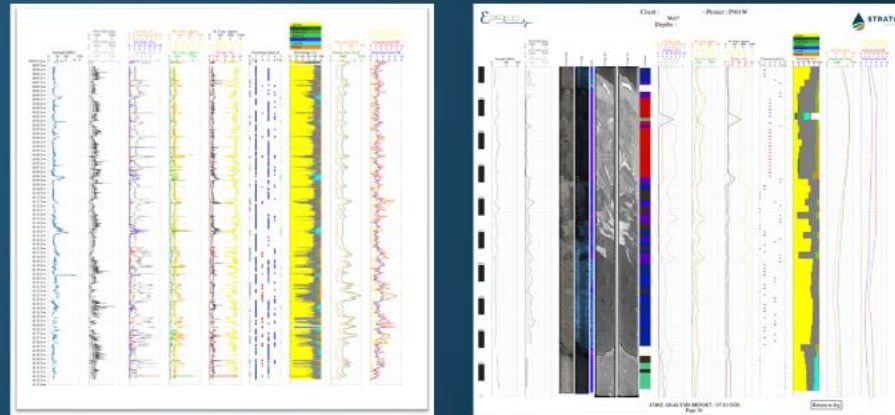
Why?

How?

When?

Where?

Quantitative Core Digitalization readily once barrel are opened



All data and analysis available prior plugging and slabbing:

A paradigm shift in core analysis...

Equip core specialists with critical core data to steer their core analysis workflow

Rock properties are complex and vary continuously with depth. A core analysis workflow designed to one lithofacies does not apply necessarily to another one. But those lithofacies are clearly identified after sampling selection and slabbing are made, two processes that cause irreparable damages to your cores...



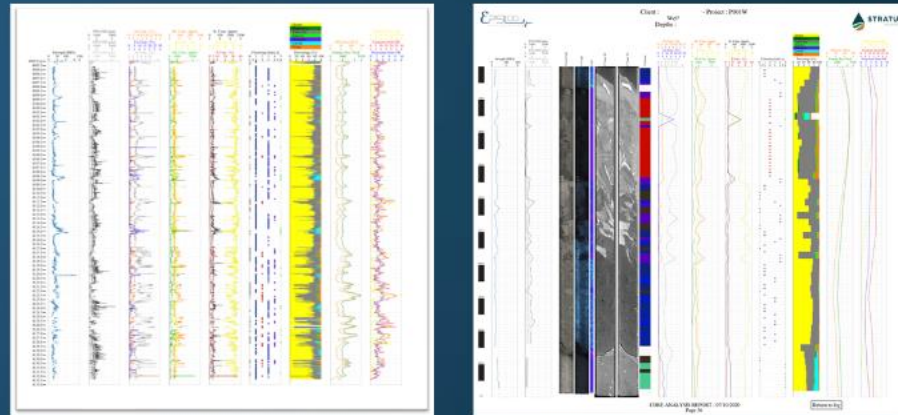
Resulting permanent damages due to standard sub-sampling

CoreDNA solution equips your core specialists with **trans-disciplinary quantitative high-resolution core logs** to grasp the complex nature of the cores prior causing any sub-sampling irreparable damages and starting costly core analysis campaigns.

MISSION



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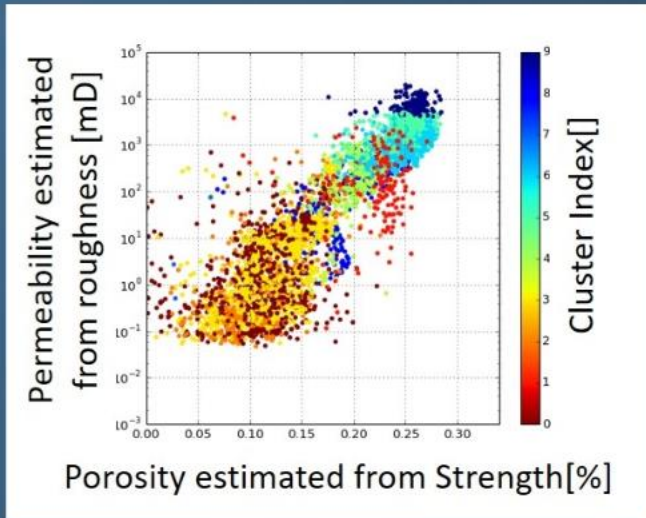
Where?



Detailed understanding of your cores before anything else...

Very little core's complexity is known before the processes of sampling and slabbing are causing irreparable damages to the cores.

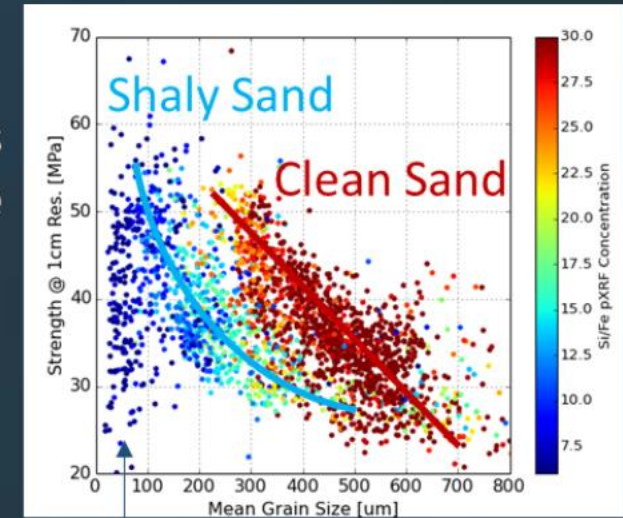
When **CoreDNA** solution is applied as barrels are opened, several quantitative high-resolution trans-disciplinary core logs are immediately generated.



The core logs are directly integrated to:

- Identify lithoFacies and transitions (Unsupervised/supervised machine learning);
- Predict reservoir quality indexes;
- Reveal Heterogeneity maps;

@ the centimetre scale.



This cost effective solution unravels reservoir complexities to reduce uncertainty by steering the rest of the core analysis workflow.

Early **CoreDNA** logs will be later integrated for (i) QCing plug results once these are ready and (ii) bridging the resolution gap between plug and well scales.

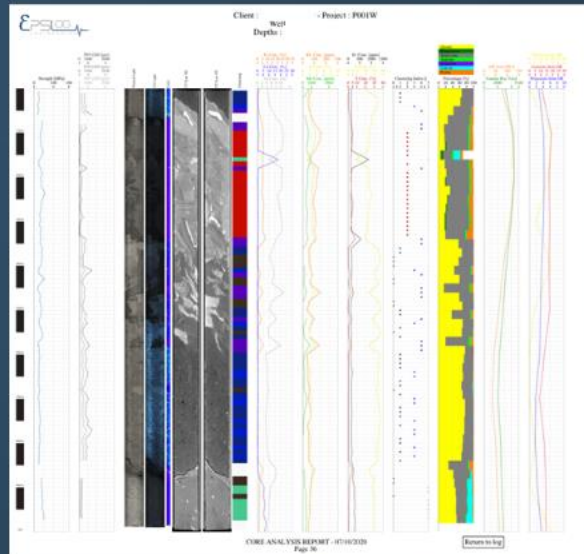
Early road map to guide the rest of core analysis

- **Unsupervised machine learning algorithms** applied to the large **CoreDNA** data set for facies identification and characterization;
- All results of **CoreDNA** are integrated with CT scan images, mineralogical interpretation, facies ID and statistics in a **smart PDF report**, which offer quick and easy navigation through data at multiple scales...
- This integrated data set becomes the **road map** for more complex and intensive **discipline-specific plug analysis**.

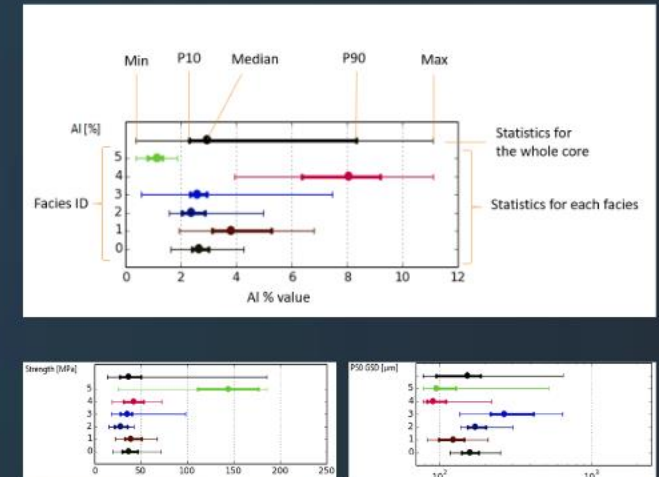
Core log overview



Detailed Core Log View
(1m section zoom)

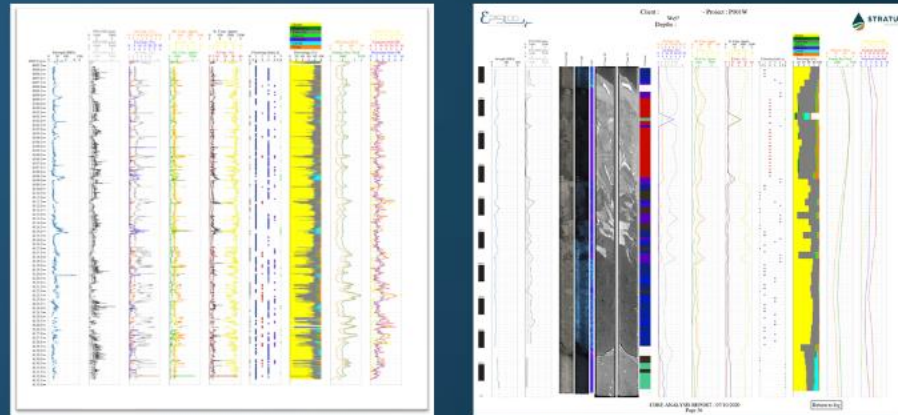


Facies Statistics Boxes





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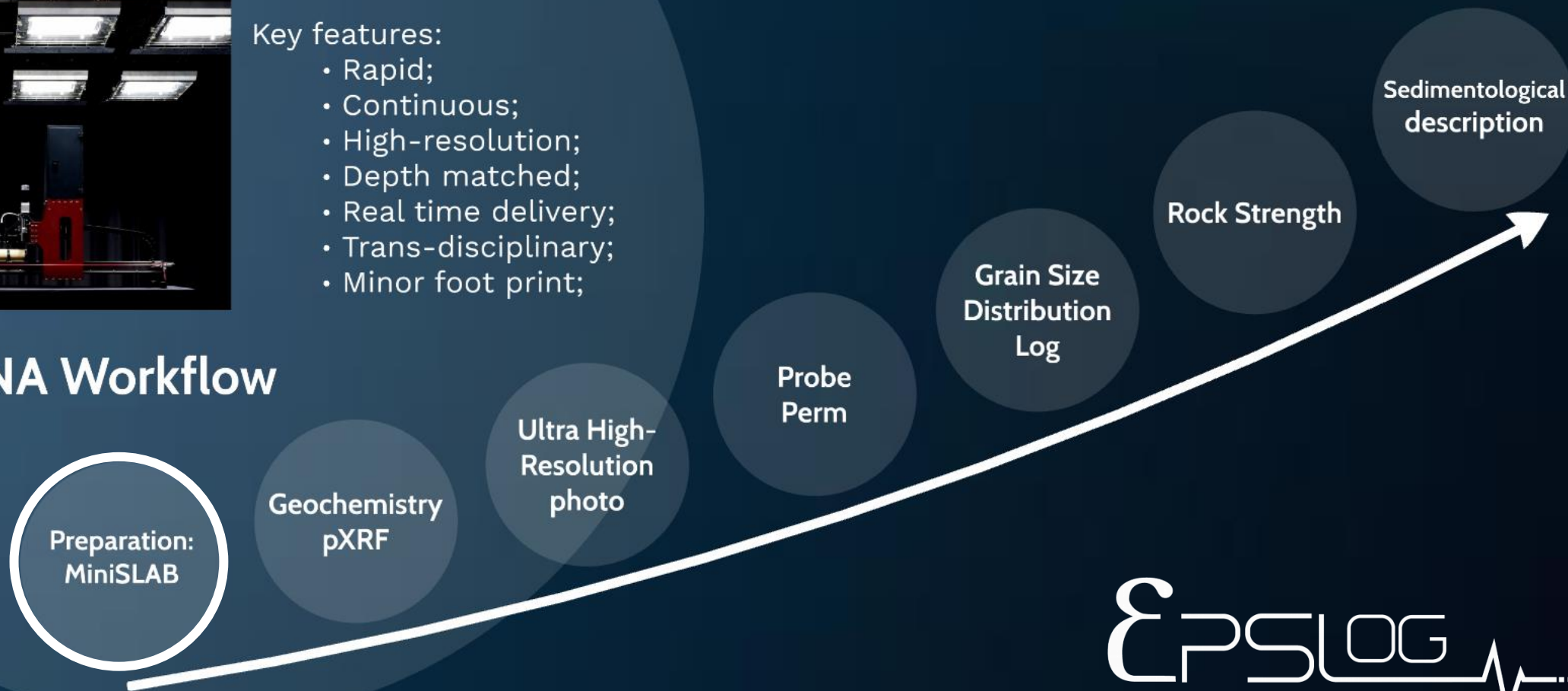
One unique equipment for all measurements.



Key features:

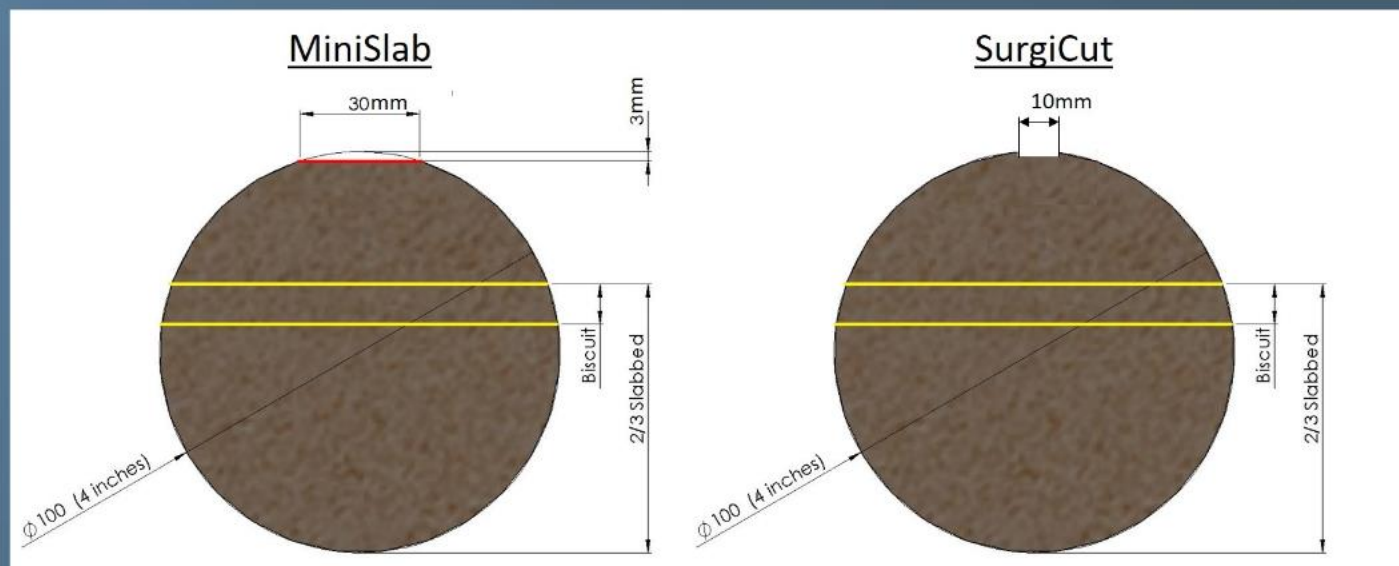
- Rapid;
- Continuous;
- High-resolution;
- Depth matched;
- Real time delivery;
- Trans-disciplinary;
- Minor foot print;

CoreDNA Workflow



MiniSlab & SurgiCut

MiniSLAB for Geochemistry, SurgiCUT only otherwise.



- Rapid surgical opening with PDC cutters (few minutes);
- Minimal footprint;
- Create a reference flat surface;
- Micrometer accuracy;
- Free of sawing marks;
- Dry cut, no fluid alteration.

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CoreDNA Workflow

Preparation:
MiniSLAB

Geochemistry
pXRF

Ultra High-
Resolution
photo

Probe
Perm

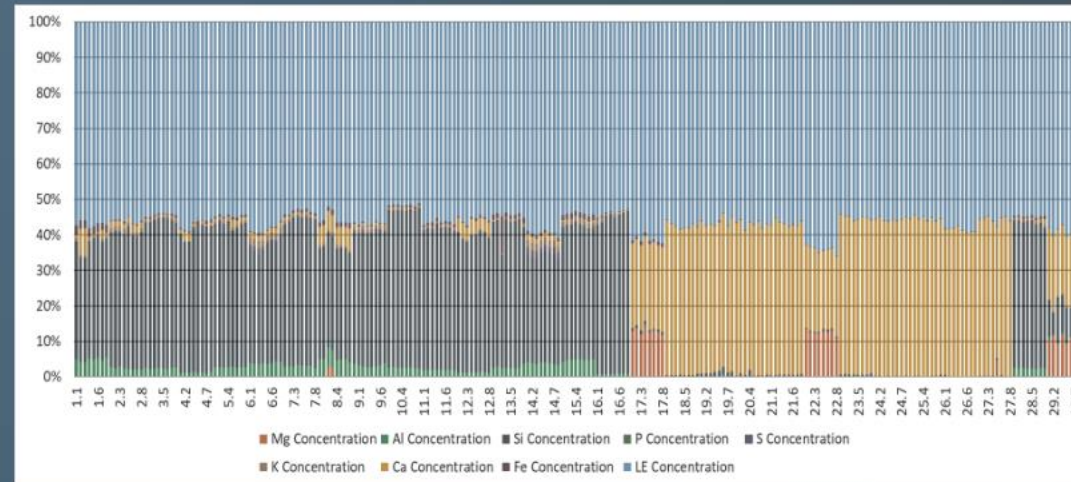
Grain Size
Distribution
Log

Rock Strength

Sedimentological
description

pXRF Logging

- Logs of 34 elemental composition;
- >Mg;
- 1cm spot size;
- Find major and traces of key **minerals**.



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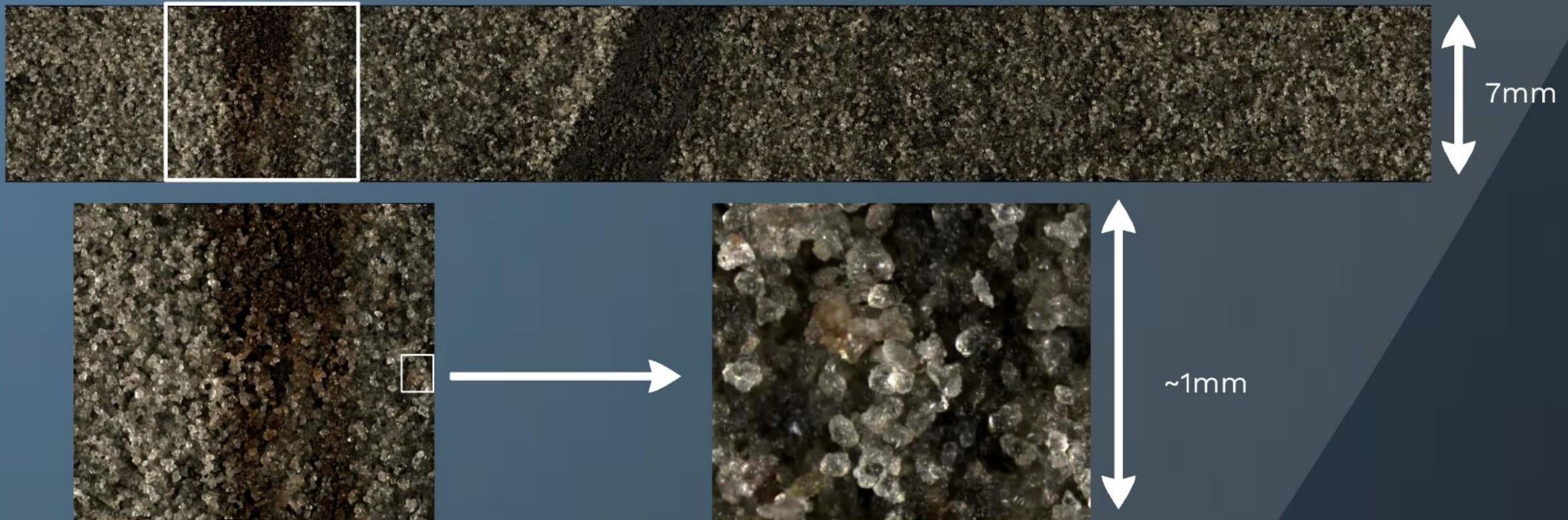
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Ultra High-Resolution Panoramic Photo

- Continuous "thin section" quality picture;
- Width: ~7mm, 4000 pixels, 1.8 μ m/px;
- Support sedimentological description and archive;
- Gateway to digital core analysis and AI;



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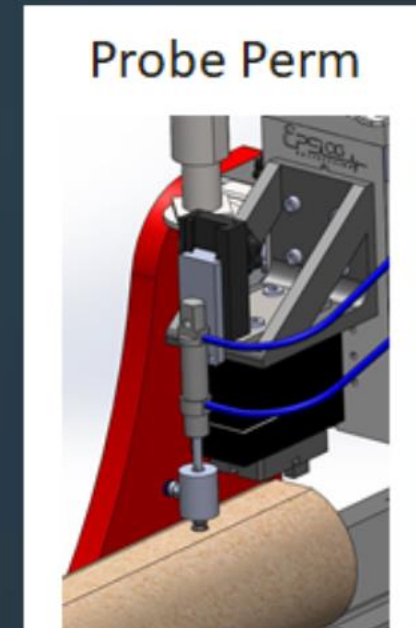
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Probe Permeability

Produce a log of permeability to air
before plugging and slabbing...

Steady and unsteady state experiment



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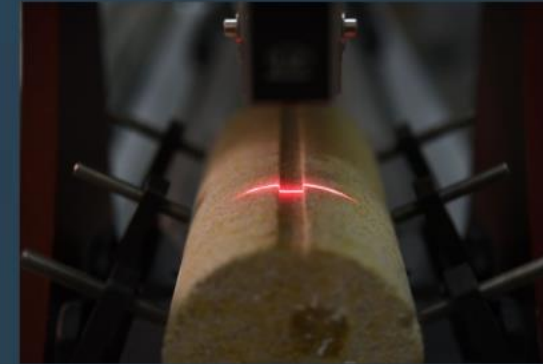
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Grain Size Distribution

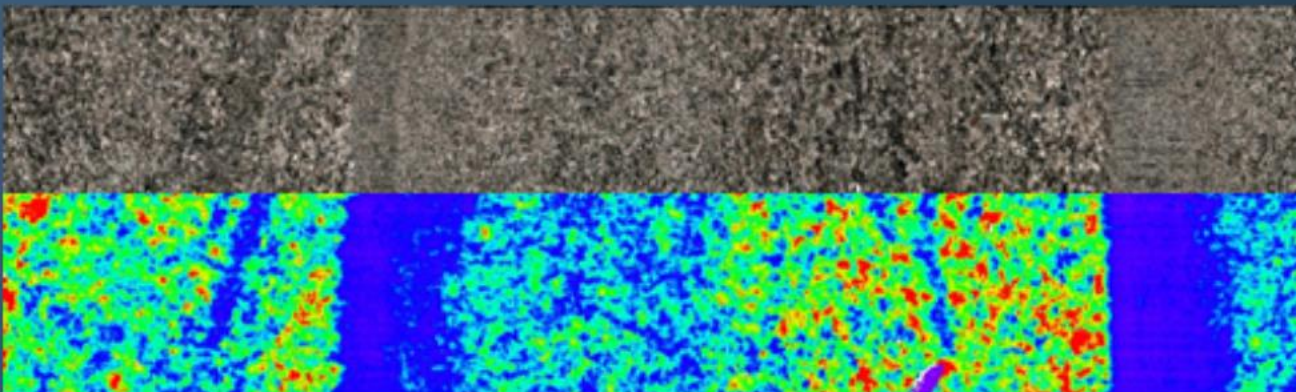
Analysis of combined:

- Laser profilometry
- Ultra high-resolution core photography

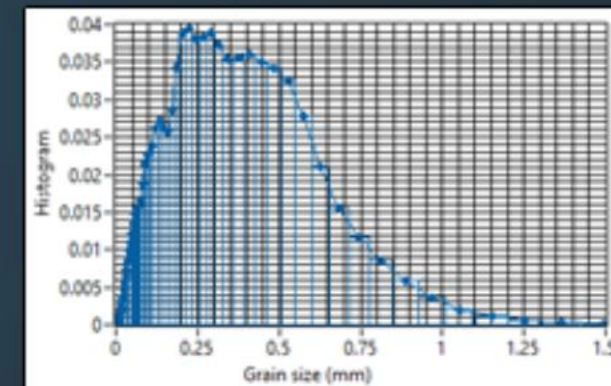
to produce estimated grain size distribution for every cm² of core.



- 15 μ m mesh
- Accuracy: 1 μ m



Estimated grain Size distribution every cm².



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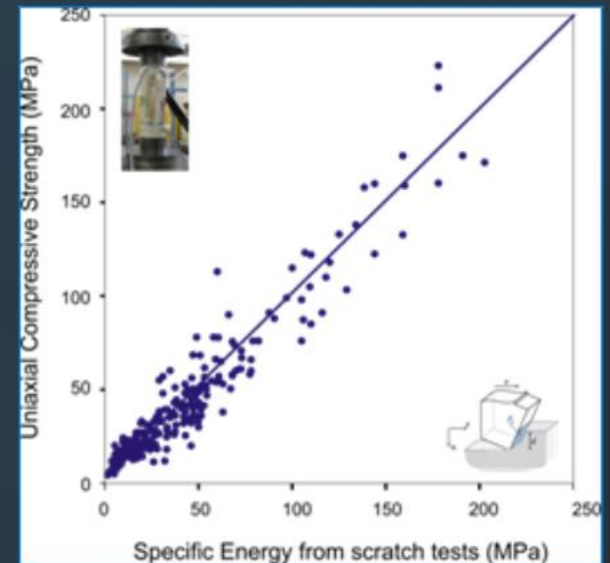
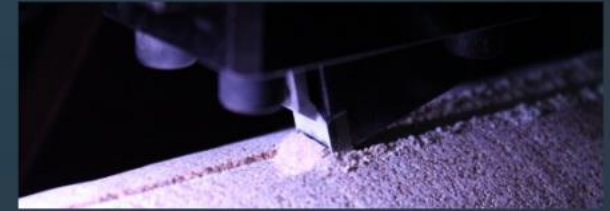
Rock Strength and Ultrasonic

Several submillimetric scratches are conducted;

- Mini controlled UCS ahead of PDC cutter (pressure at which rock fails constantly measured, cross section area imposed)
- Direct log of UCS (no calibration needed)

Vp and Vs measured along the SurgiCut;

- 50kHz;
- Resolution 4cm;



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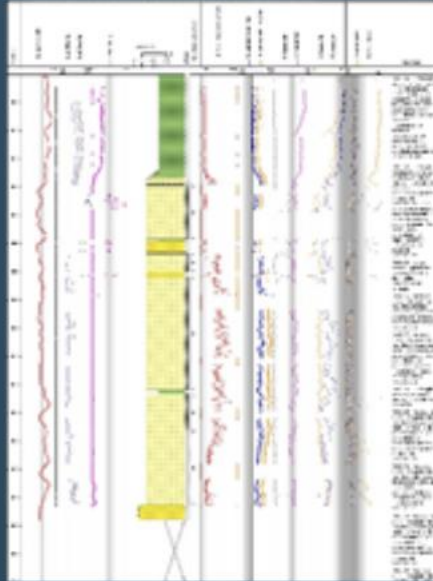
Grain Size
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Log

Rock Strength

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Sedimentological description

The MiniSLAB is a suitable surface to conduct core description before slabbing the cores...



Mission

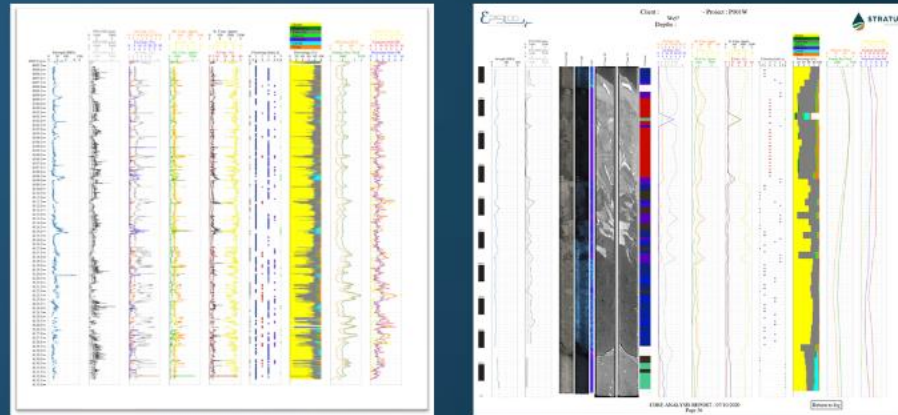
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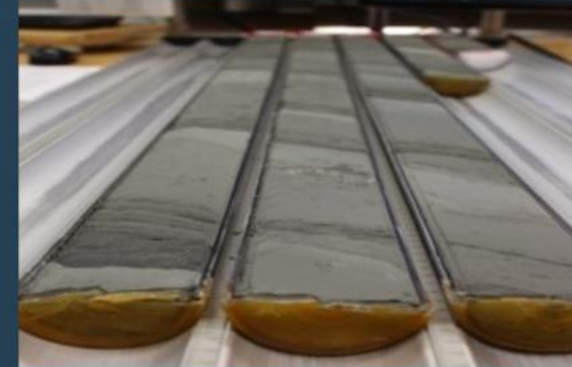
When using CoreDNA?



ON FRESH CORES:

- As early as possible once barrel are opened...
 - Limited footprint;
 - Minimal exposure to air guaranteed;
- Testing surface free of fluid invasion;
 - Data generated real-time;
- Rapid turnover and data integration.

Always...



ON LEGACY CORES:

- Digitize the remains of your core with the most complete core logging data set;
- Increase your data base & improve your machine learning models;
- Applicable on any core shape (even outer faces of 1/3rd slab).

~ 40 core logs @ 1cm resolution

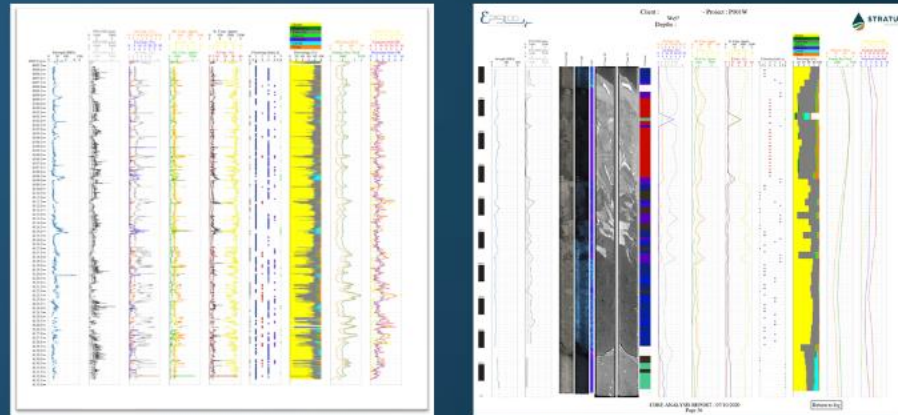
Delivered data formatted for machine learning applications

Facies identification / Petrophysical Estimators / Geochemical Interpretations

Heterogeneity maps / Ultra high-resolution core photos



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Partnerships & Portfolio

Benchtop units can be transported in any warehouse, laboratory, core storage, etc...

More than 50 000 ft of cores already tested worldwide.

Strategic partnerships with renown international laboratories:

- Stratum Reservoir;
- Metarock;
- Petricore;
- Core Specialist Services (CSS);
- Gopslab;

