

iGeos Conditions of Use

Sedimentary Structure Identification Tool & Bioturbation Intensity Identification Tool Integrated within EasyCore

1. Introduction

The AI modules are Sedimentary Structure Identification and Bioturbation Intensity Identification tools that are advanced AI-driven modules designed to automatically detect, classify, and visualize key sedimentological features in siliciclastic settings. These tools are embedded within EasyCore to enable geoscientists to learn, explore, and validate geological interpretations more efficiently.

Important Note:

These tools are intended for learning, exploration, and validation only.

They are not designed for final decision-making parameters, nor should they replace geological judgment, reservoir characterization workflows, or operational decisions.

2. Overview of Tools

2.1 Sedimentary Structure Identification Tool

This tool uses deep learning models trained on a large dataset of siliciclastic core images to automatically identify and annotate sedimentary structures, including but not limited to:

Mud drapes, Massive sandstone, Bioturbated muddy media, Massive mudstone, Bioturbated sandy media, Parallel lamination, Low-angle lamination, Massive conglomerate, Cross stratification, Current ripples, Fissile shale, Rip-up clasts, Scattered pebble, Concretions, Soft-sediment deformation, Wavy bedding, Broken pieces, Empty intervals, Non-core intervals.

The tool provides spatial bounding boxes, confidence scores, and classification labels.

2.2 Bioturbation Intensity Identification Tool

This tool uses advanced convolutional neural networks to detect, quantify, and classify bioturbation intensity in siliciclastic rocks following established ichnological scales (sparse–moderate–intense classes). The data set is predominantly composed of siliciclastic core images, and to a lesser extent outcrop images. It works best when square rock images roughly in 6-7 cm diameter are used.

3. Getting Started: Please follow EasyCore user manual.

- Review and Validate
- Accept or reject detections
- Adjust classification labels manually
- Compare AI output with expert's interpretation

Reminder: These outputs are not to be used as final decision-making parameters, but for educational insight and interpretation support only.

4. Best Practices

4.1 For Optimal Performance

Use siliciclastic sedimentary rocks

Use high-resolution, properly oriented images that are in their original depositional orientation.

Avoid glare, shadows, or uneven lighting

4.2 Geological Best Practices

Always cross-check AI predictions manually

Validate features with sedimentologic and ichnologic context

Maintain a record of manual overrides for quality assurance

5. Limitations

Models are trained on siliciclastic systems and may behave differently in carbonates, evaporites, or volcanoclastic cores

Some sedimentary structures with subtle expression may be misclassified

Bioturbation intensity can be influenced by image quality, wet/dry surface contrast, and presence of drilling artifacts

The tools do not replace geological judgment

The outputs are provided on an “as is” and “as available” basis solely for research and informational purposes and are not intended or validated for operational, commercial, or decision-making use. Any reliance on or use of the outputs is entirely at the end user’s sole risk.

6. Recommended Use Cases

- Education & Training
- Geology students learning sedimentary structures
- TAs or instructors preparing examples
- Virtual core workshops
- Research & Validation
- Quick-look interpretation
- Comparison against manual observations
- Enhancing reproducibility in academic studies
- Quality Assurance
- Cross-checking sedimentary logs
- Supporting inter-interpreter calibration
- Building annotation datasets

7. Troubleshooting

Issue: Model fails to detect structures

Solution:

Check image quality

Adjust brightness or resolution

Ensure correct orientation

Issue: Incorrect bioturbation classification

Solution:

Adjust lighting or image clarity

Issue: Slow processing

Solution:

Reduce image file size without losing clarity

Training sessions are available upon request.