

How to utilize fundamental knowledge to predict EOR potential at the Norwegian Continental Shelf

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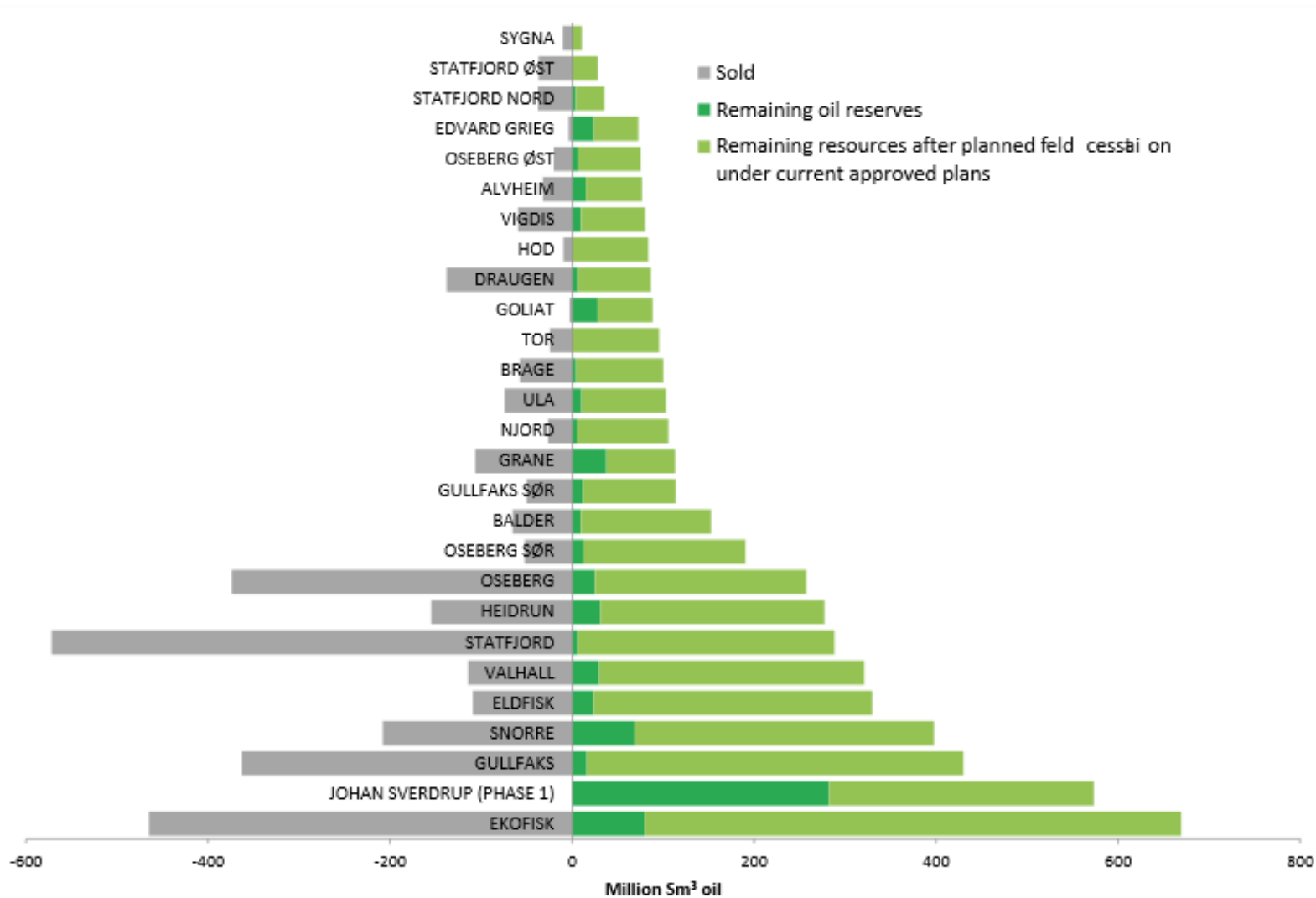
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Do we need EOR?



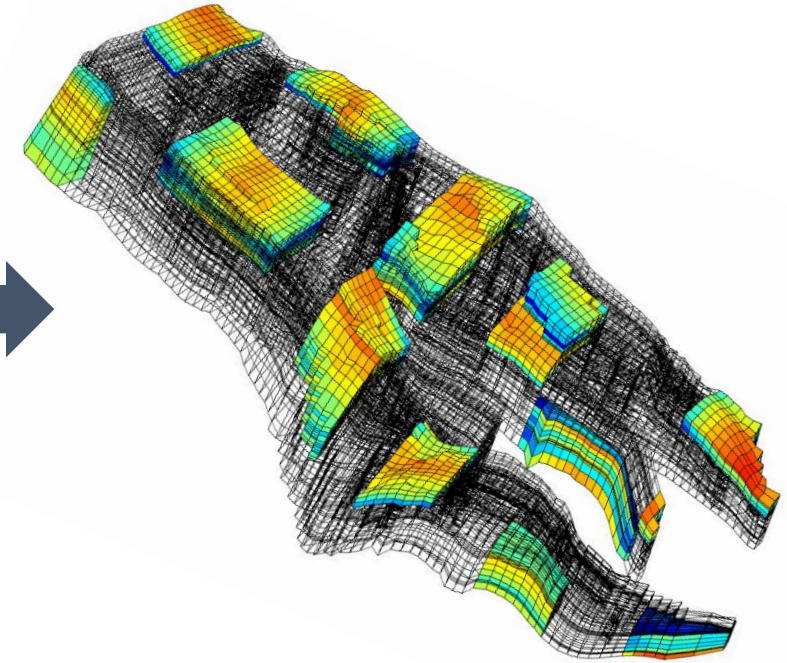
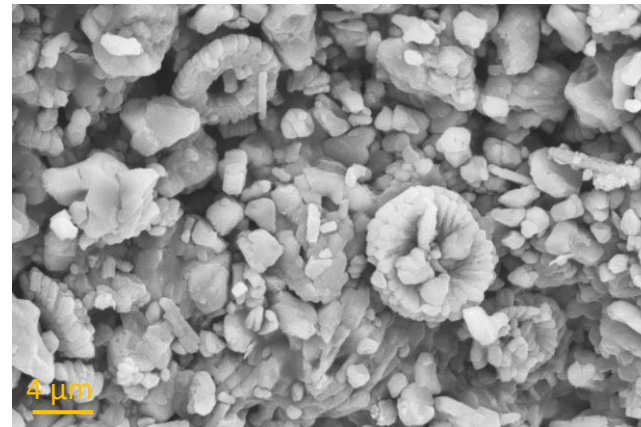
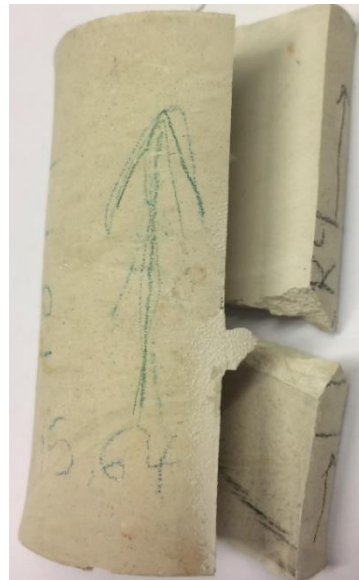
Fundamental knowledge

- *Results from laboratory experiments*
- *Algorithms, mathematical and conceptual models, tools to include uncertainties, optimization and decision making tools, SCAL procedures, development of new techniques or tools*

EOR simulation

- Evaluate the EOR potential for a given method within a given field
- Several scales
 - Pore-, core- and field-scale
- Understand the mechanisms and effects of EOR methods
- Optimize production

Integrated workflow



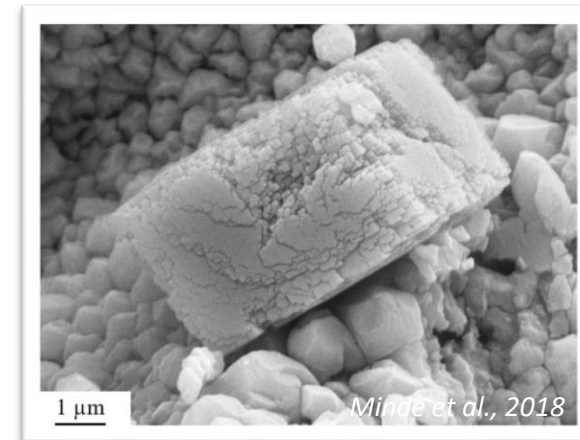
- From core- to pore- to field-scale
- Multi-disciplinary work

Input from the laboratory

- Understanding EOR mechanisms
- Basic properties of:
 - Rocks and mineralogy
 - Rock – fluid interactions
 - Polymers, surfactants and silicates
 - Microbes
- Environmental impact



Minde et al., 2018



Minde et al., 2018

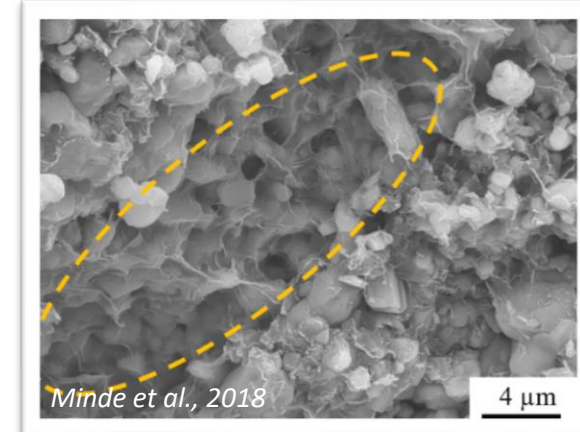


Stavland et al., 2011

The National IOR Centre of Norway

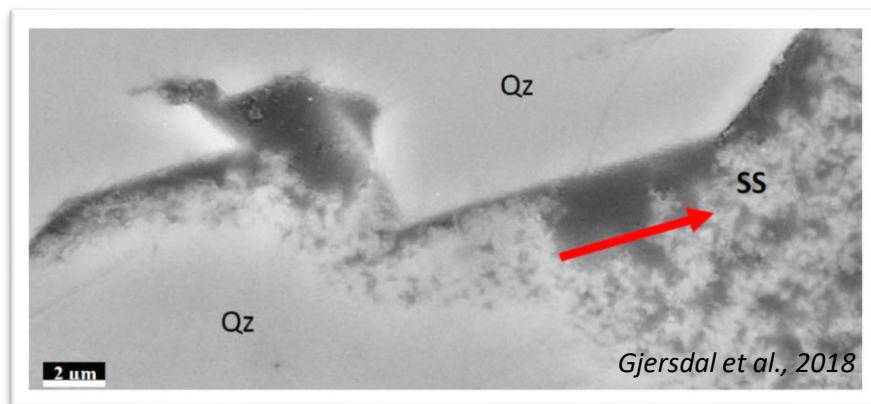


Photo: Mari Løvås



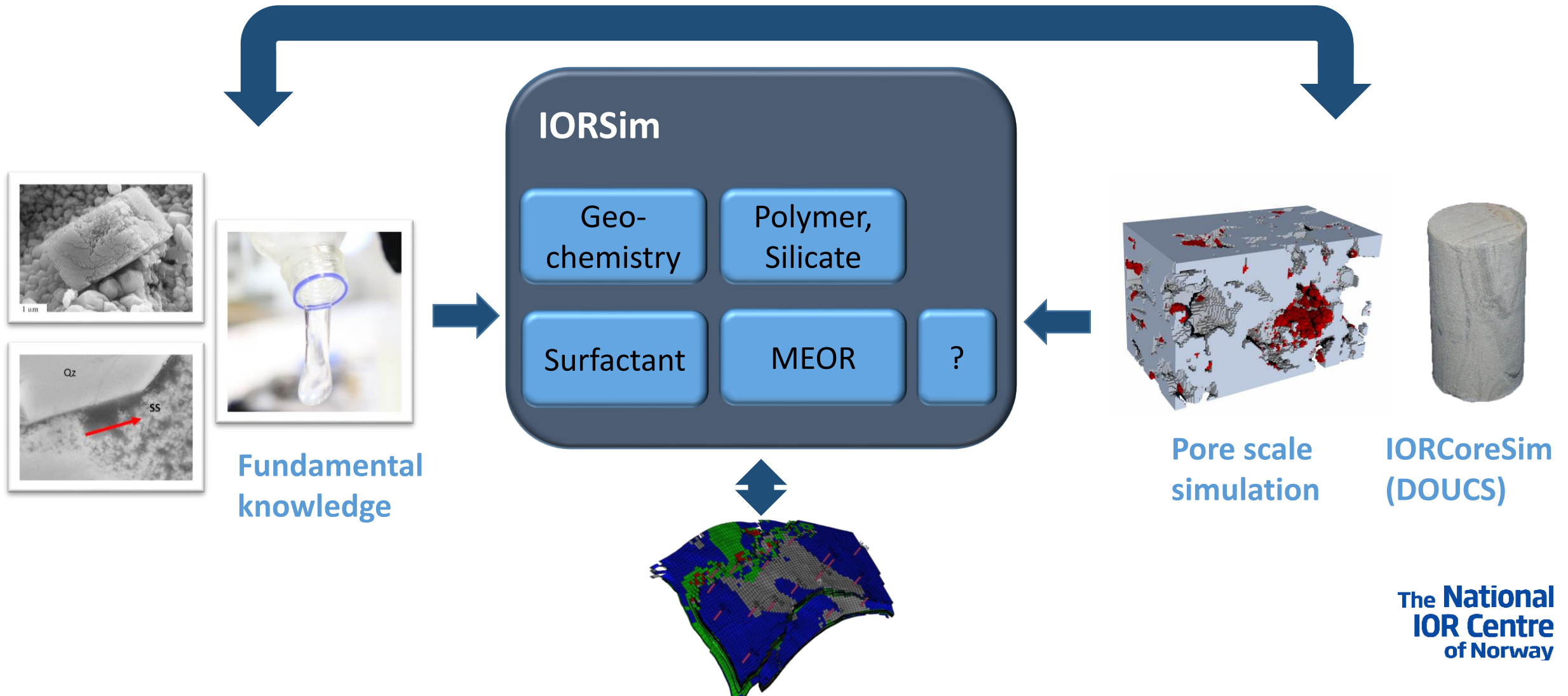
Minde et al., 2018

4 μm



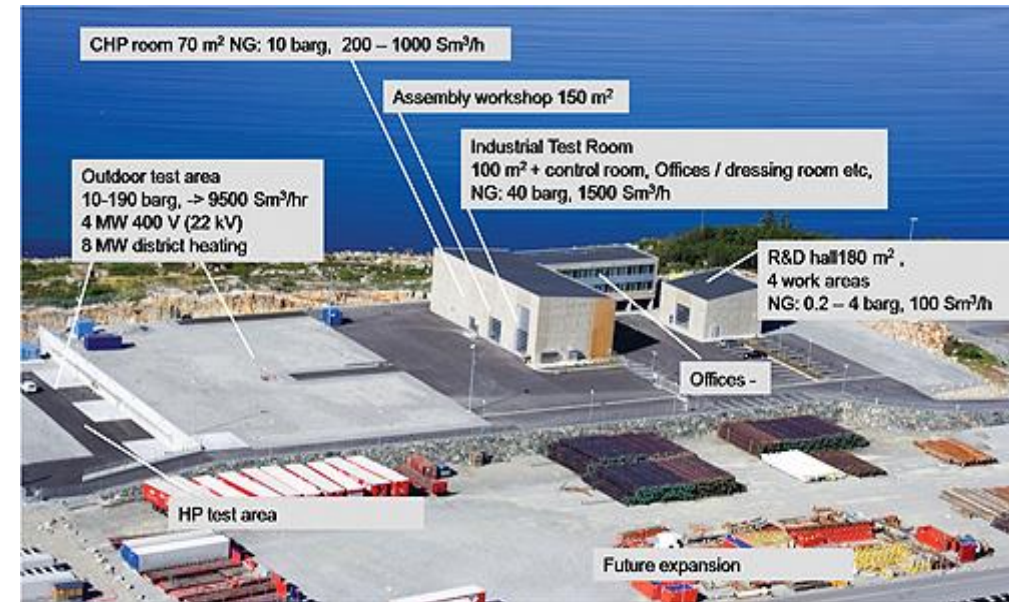
Gjersdal et al., 2018

EOR simulation



Challenges

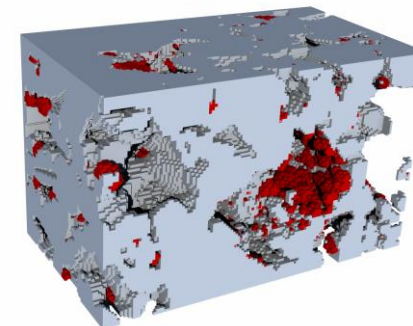
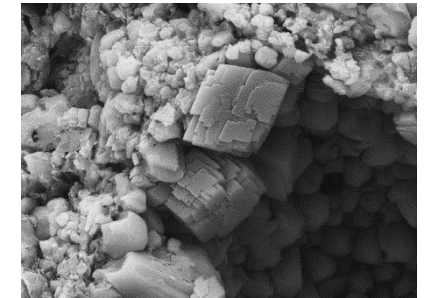
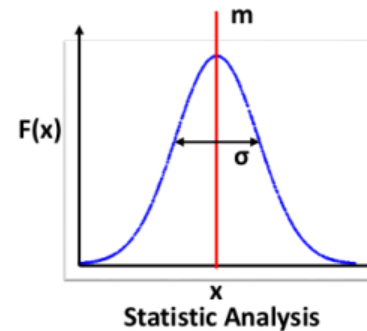
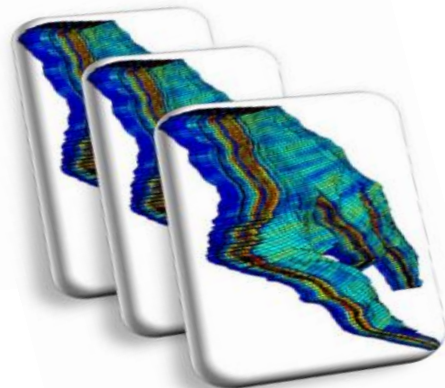
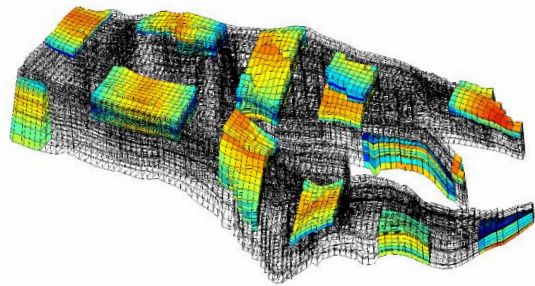
- Upscaling
- Large-scale testing - the missing link?
- Minimizing risk – improved algorithms
- Interactions between industry, academia and authorities



IOR FIELD LAB

Conclusions

- Fundamental knowledge is a prerequisite for EOR simulation
- Recognizing the up-side
- The Centres add-on to Eclipse: IORSim
- Tool to predict full-field EOR potential



The 2018 user partners and observers:



IOR NORWAY 2019

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