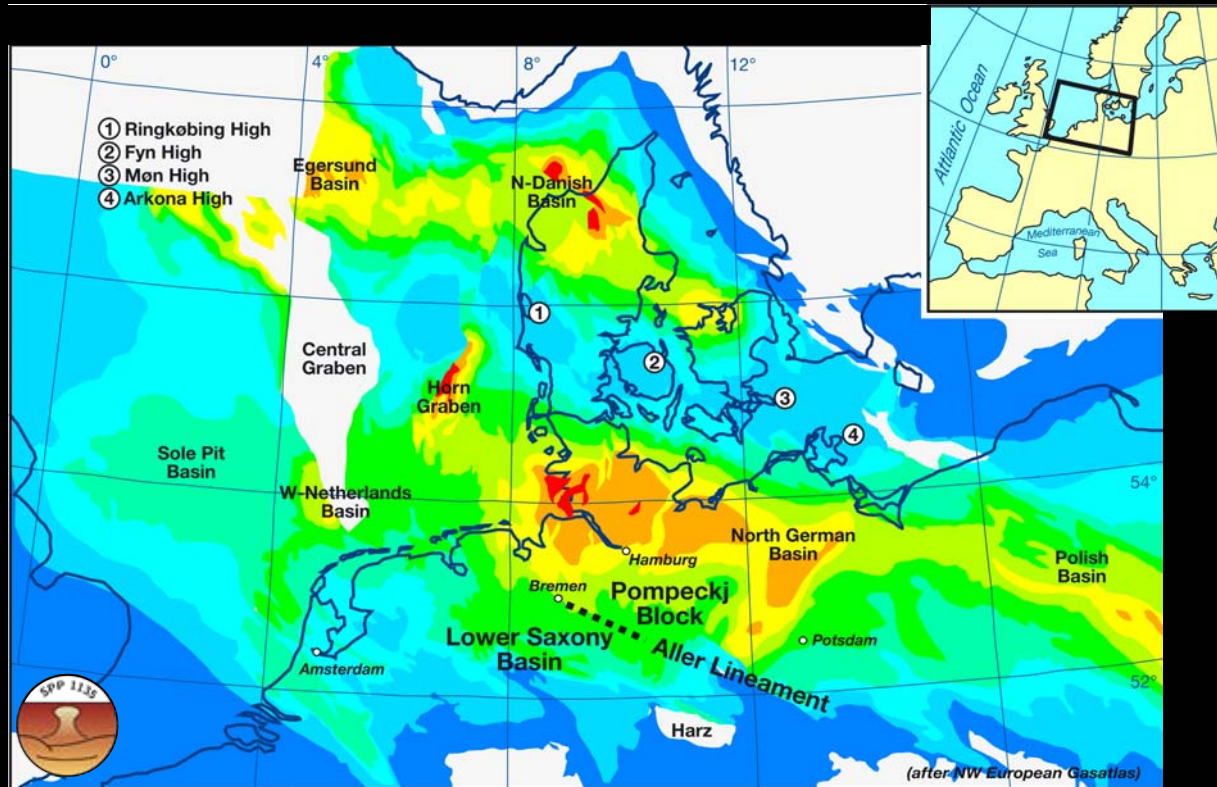


# Sub-/Seismic Structure and Deformation Quantification on different scales from 3-D reflection seismics in the North German Basin



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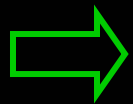
(4) TEEC Isernhagen



# Basin evolution depends on

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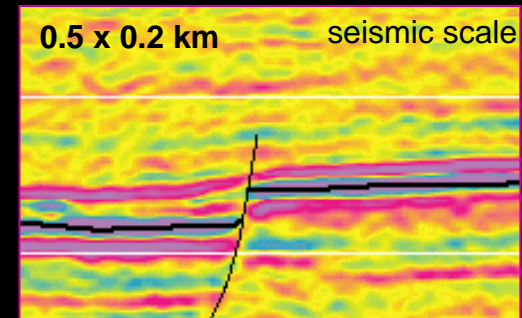
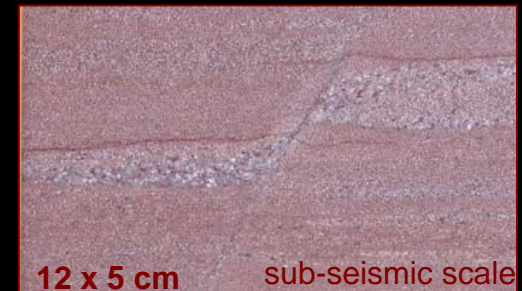
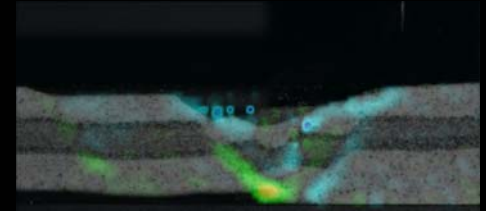
- (a) magnitude of deformation,
- (b) strain accumulation in space and time,
- (c) processes controlling (a) and (b) under varying kinematic constraints.



study seismic and sub-seismic deformation in 3-D



quantify distribution, magnitude and accumulation of strain over variety of scales



# Workflow *'sub-/seismic deformation analysis'*

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**(1) Seismic interpretation**  
structural architecture and tectonic evolution

**(2) Kinematic 3-D retro-deformation**  
quantify strain magnitude and distribution

**(3) Geostatistic tools**  
quantitative fracture prediction

**(4) Analogue deformation experiments**  
evolution of strain over time

**(5) Validation of results**

**predict hydrocarbon pathways and storage**

# Strain distribution and quantification

Seismic data, processing results and modelling examples cannot be shown here for confidentially reasons of industry data.

Results to date are:

- hanging-wall deformation is strongly controlled by 3-D fault morphology
- areas of high and low deformation are imaged
- deformation affects area up to 1.3 km away from fault
- $e_1$  magnitude: 15% after 100 m displacement, 25-30% after 200 m displacement
- location of strain concentration does not change
- deformation evolves from localized zones to areas of more distributed strain

