DYNAMIS questions for today:

1. What is your project/initiative about ?

What is the project plan in terms of desicion gates and required funding?

Where, who and when?

Answer: see next folios

CO_2SINK

CO_2 Storage by Injection into a Saline Aquifer at Ketzin

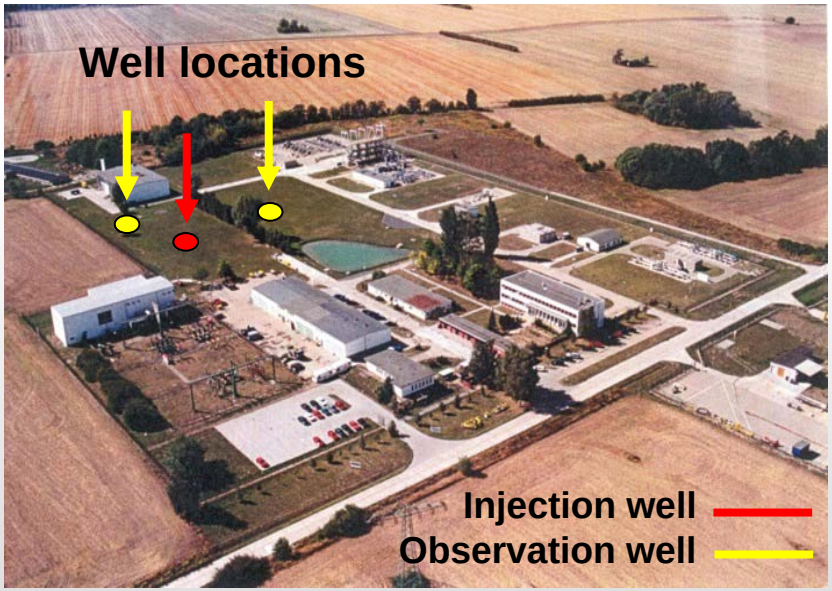
Objectives

Set up a full-scale CO_2 storage test site on land to:

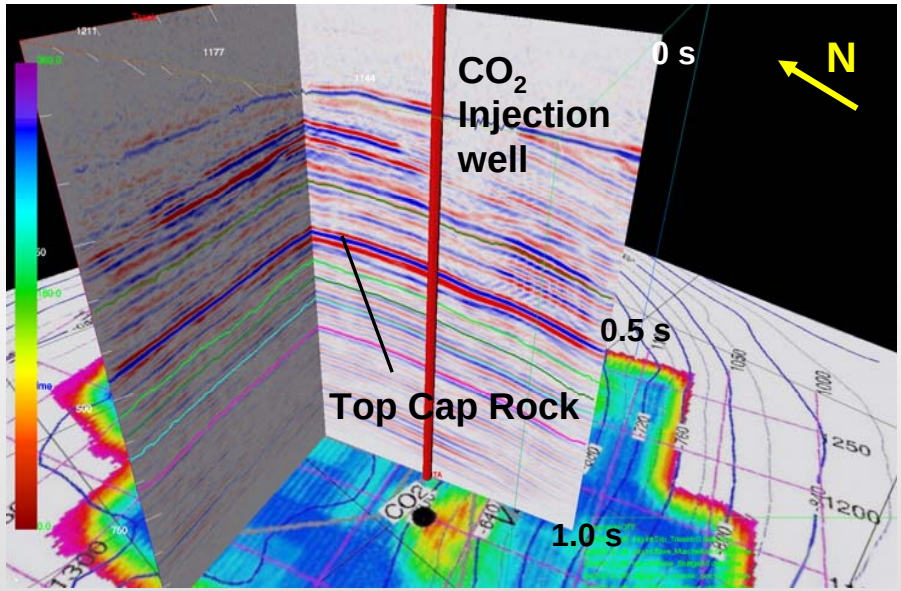
- advance understanding of science and processes in underground storage of CO_2
- provide real case experience
- develop best practice guidelines for geological storage of CO_2

Budget: 19.000.000 € (EC 8.700.000 €)

Runtime: 04/2004 – 03/2009



Injection Site



e.g. Seismic 3D-Baseline Survey

CO_2 Recovery, Transportation, Intermediate Storage and Injection Conditioning

coordinated by

GeoForschungsZentrum Potsdam

funded by

Bundesministerium für Wirtschaft und Technologie BMWi

and

E.ON Energie AG

RWE Power

Shell Deutschland Holding

Siemens AG Power Generation

Vattenfall Europe

CHEMKIN Real-time observation of the chemical and kinetic behavior of carbon dioxide during geological storage

GeoForschungsZentrum Potsdam

Umwelt- und Ingenieurtechnik GmbH Dresden

Universität Potsdam

Technische Universität Clausthal

Optimare GmbH Bremerhaven

COSMOS

CO_2 Storage, Monitoring and Safety Technology
COSMOS

SP 1
Wellbore Integrity
GFZ Potsdam
dbi-gti Freiberg
Vattenfall Europe
Schlumberger

SP 2
Reservoir Monitoring
GFZ Potsdam
Schlumberger
Lawrence Livermore

SP 3
Cap Rock Integrity
IBF & IMG
Karlsruhe University
RWE Power, Essen

DBI-GTI

GFZ POTSDAM

Universität Karlsruhe (TH)

VATTENFALL

Schlumberger

Schlumberger

RWE Power

COSMOS in BMBF/DFG Programme GEOTECHNOLOGIES

EUROGIA PROPOSAL

COSMOS

CO_2 Storage, Monitoring and Safety Technology

Coordinator:

1- GeoForschungsZentrum Potsdam (GFZ) – Germany

Partners:

2- Vattenfall Europe Mining AG, Cottbus (VE) – Germany – (Observer)

3- Deutsches Brennstoff Institut - Gastechnologisches Institut GmbH, (dbi-gti) – Germany

4- Schlumberger SRPC – France

5- ENS/CNRS – France

6- Eni S.p.A – Italy

September 2004

Eurogia 3rd Call

HUMAN RESOURCES AND MOBILITY (HRM) ACTIVITY

MARIE CURIE ACTIONS
Marie Curie Research Training Networks
(RTN)

Call: FP6-2005-Mobility-1

STAGE 2 – FULL PROPOSAL

GRASP
Greenhouse-gas Removal Apprenticeship and Student Program

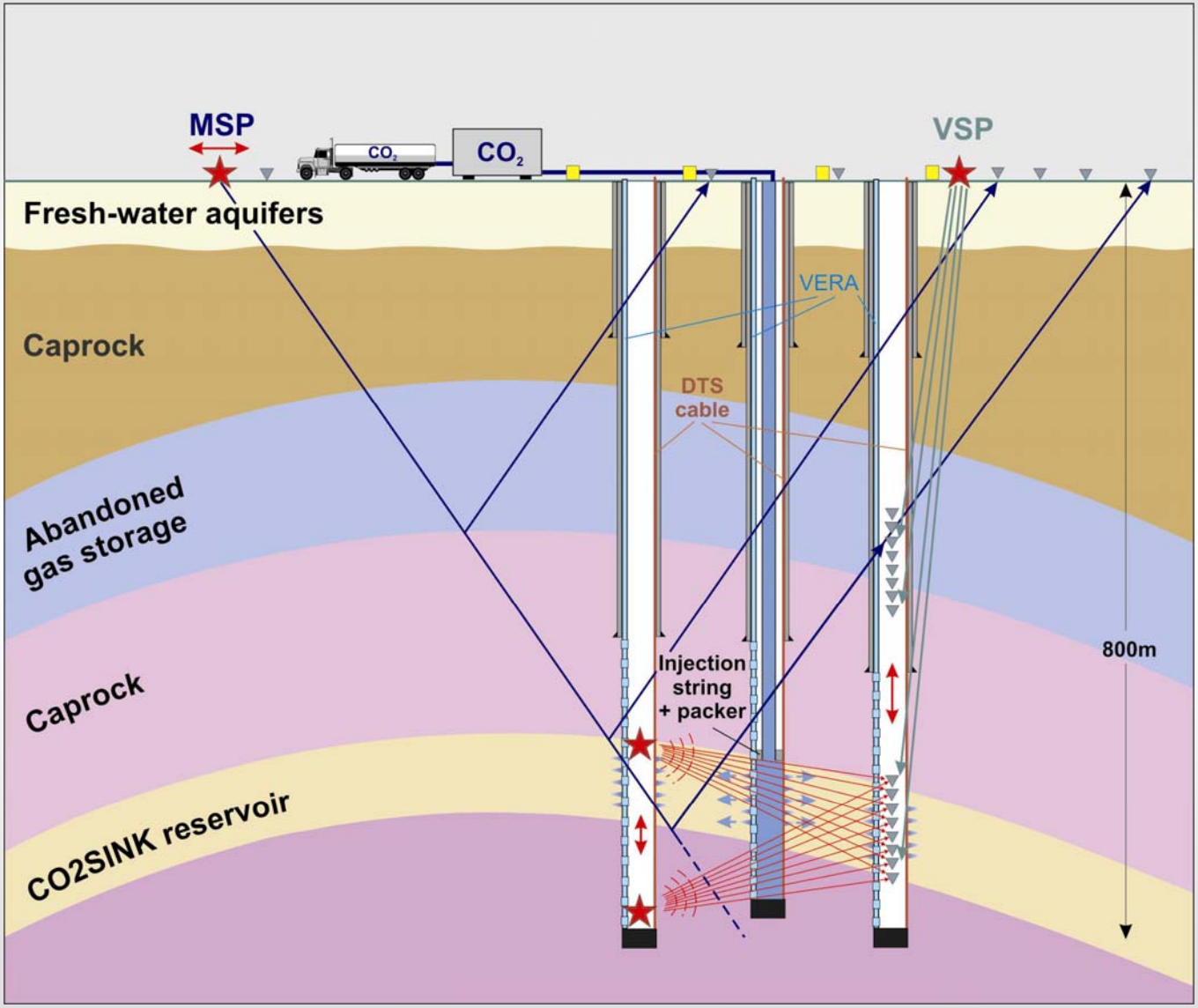
IP CO_2ReMoVe - Monitoring tool deployment (provisional)

	Subsurface monitoring													
	Seismic methods						non-seismic methods							
	3D seismic baseline	4D surface seismic repeats	4D/3D-9C seismic	well seismic VSP	well seismic crosswell	microseismicity	downhole EM, ERT	P/T monitoring	gravity	EM, electrical	Ground SP	Observation well shallow	Observation well deep	Tracers
InSalah														
Sleipner														
Snøhvit														
Ketzin														
K12b														
Tarnov														
Kaniov (ECBM)														
Qatar														
Weyburn	CO2GeoNet Proposal													

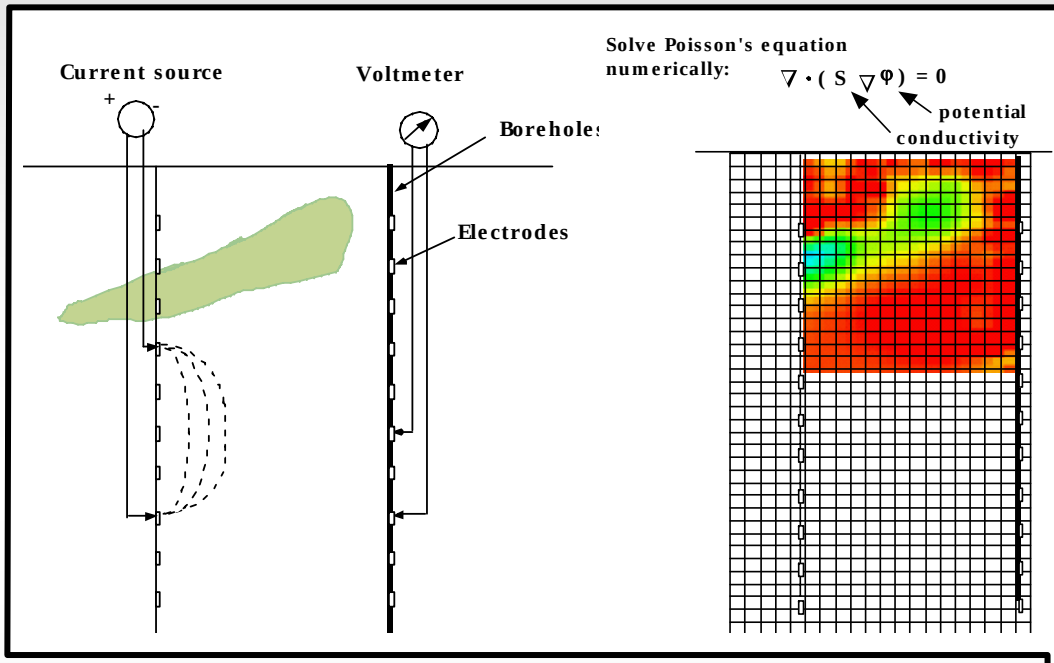
	Already carried out/paid from other sources
	To be carried out in CO2ReMoVe
	Proposed for CO2ReMoVe, not yet evaluated

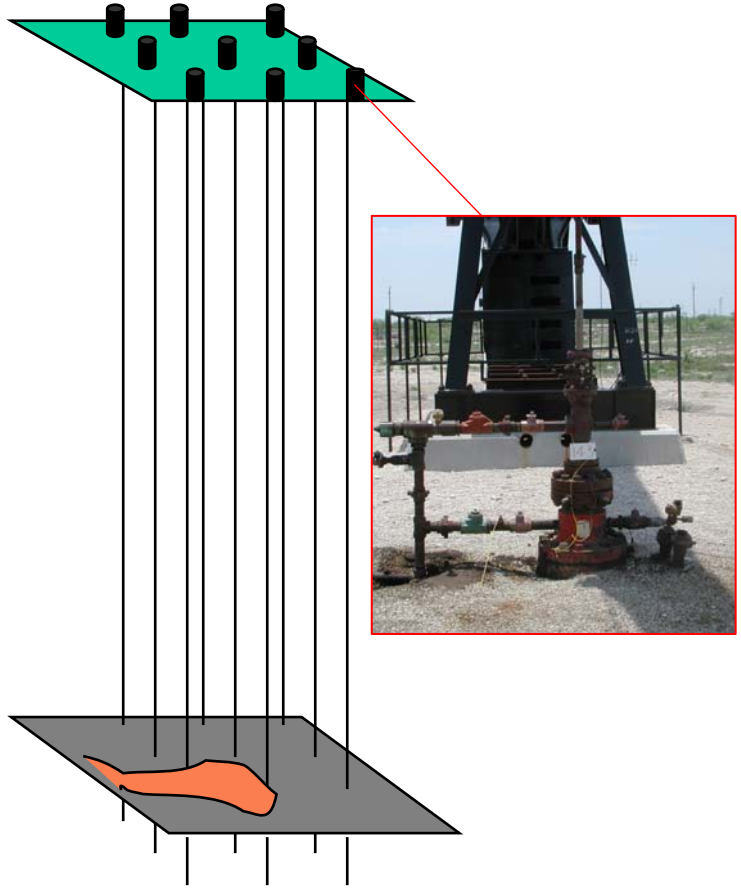
Surface / near-surface monitoring												
onshore											offshore	
soil gas	microbiology	tilt meter	airborne remote sensing	satellite remote sensing (e.g. INSAR)	surface monitoring (Eddy current etc)	Meteorology [BP??]	Ground geophysical EM, SP	surface fluids, geochem.	CO2 in houses/depressions	Open path laser	seabed gas	seabed high resolution survey
CO2GeoNet Proposal												

e.g., seismic crosshole survey

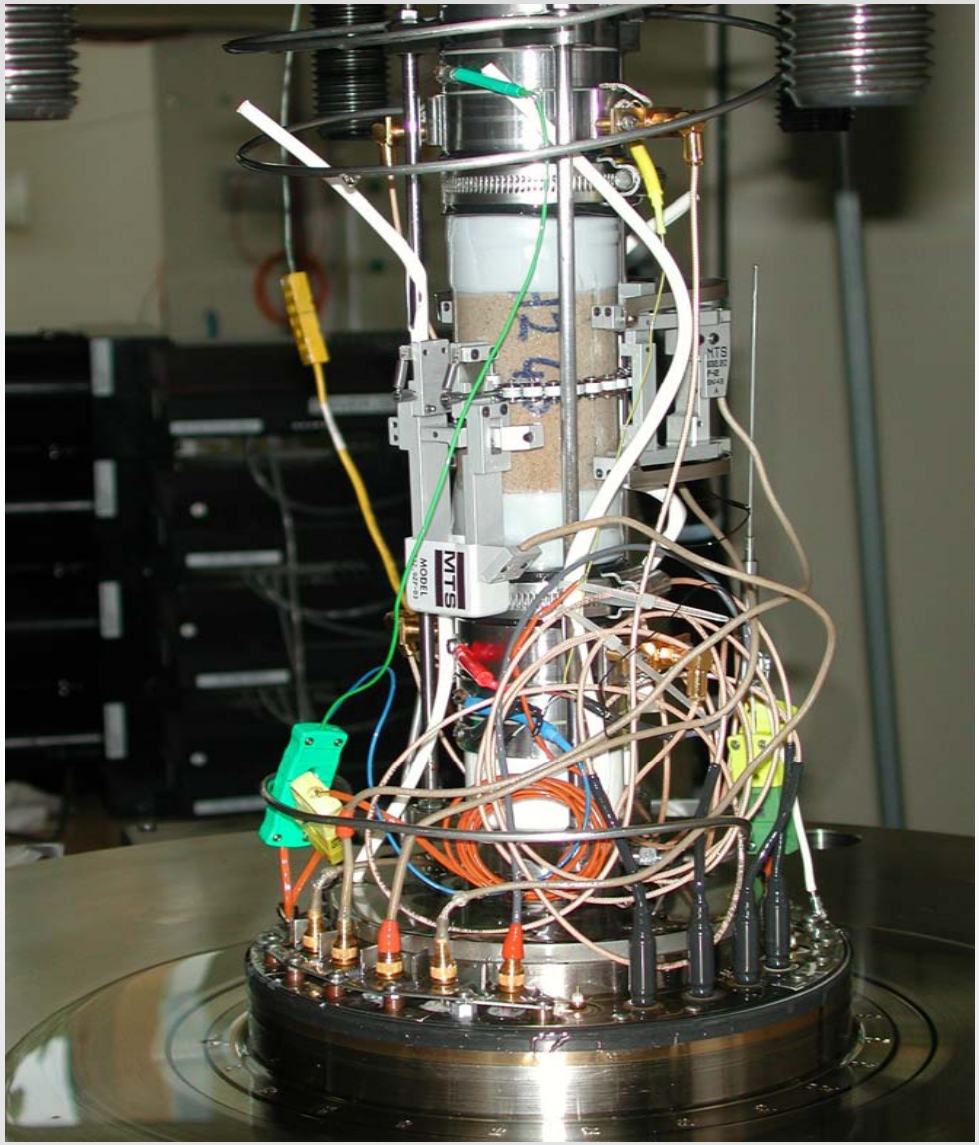


e.g., Vertical Electrical Resistivity Array: VERA



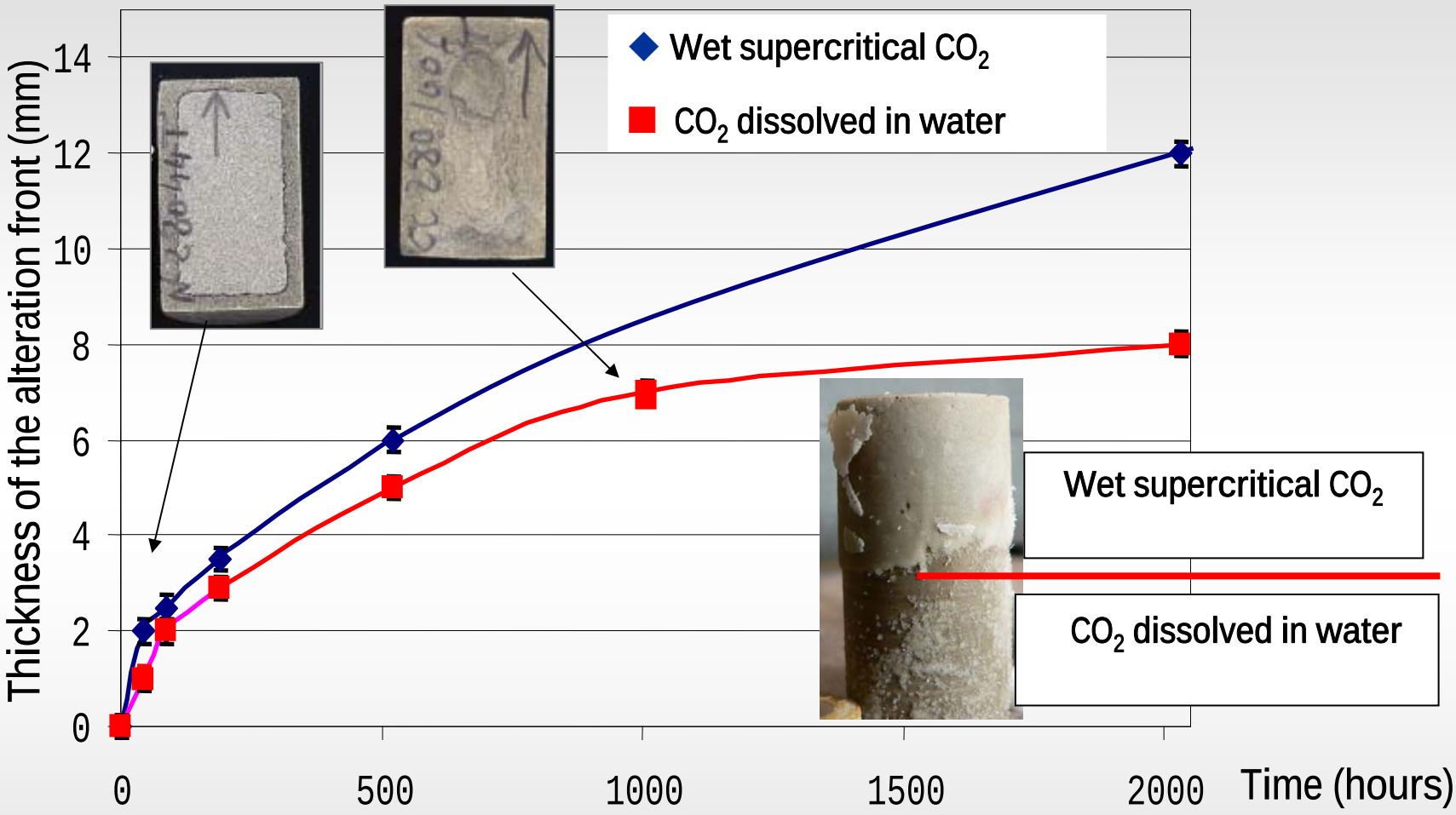


- measures resistance between electrodes (passive)
- spaced or long electrodes
- fast, cheap, easy
- *signal to noise issues*
- *resolution issues*



e.g., triaxial high-compression rock testing with CO_2-flow under simulated in-situ conditions

e.g., cement testing and cementation technology

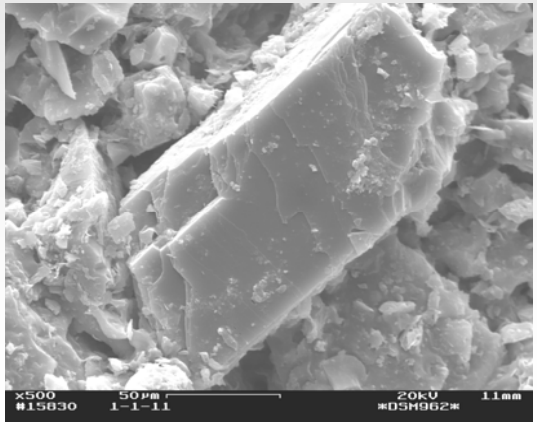


Kinetic Study at 90°C, 280 Mpa

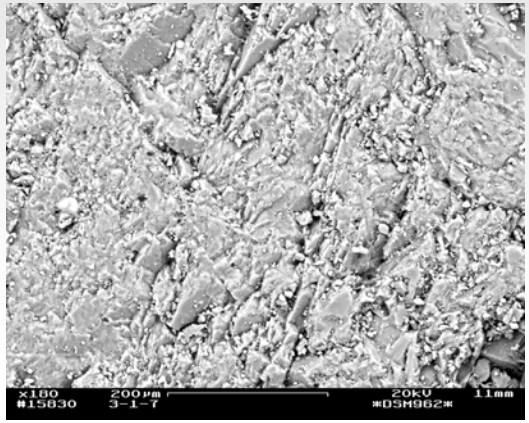
e.g Geochemistry: Alteration of Minerals

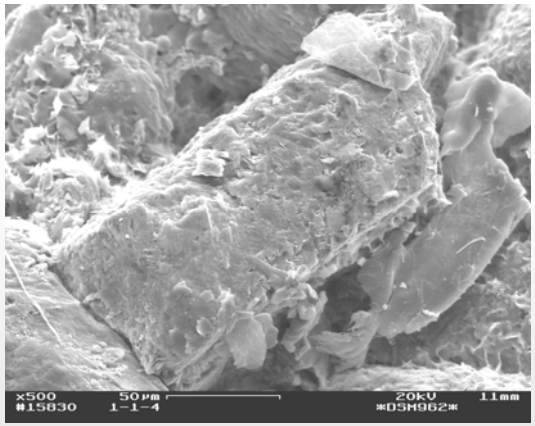
K-Feldspar

Dolomite cement

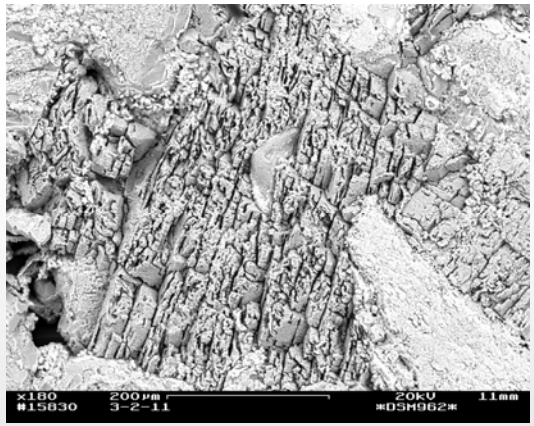


before

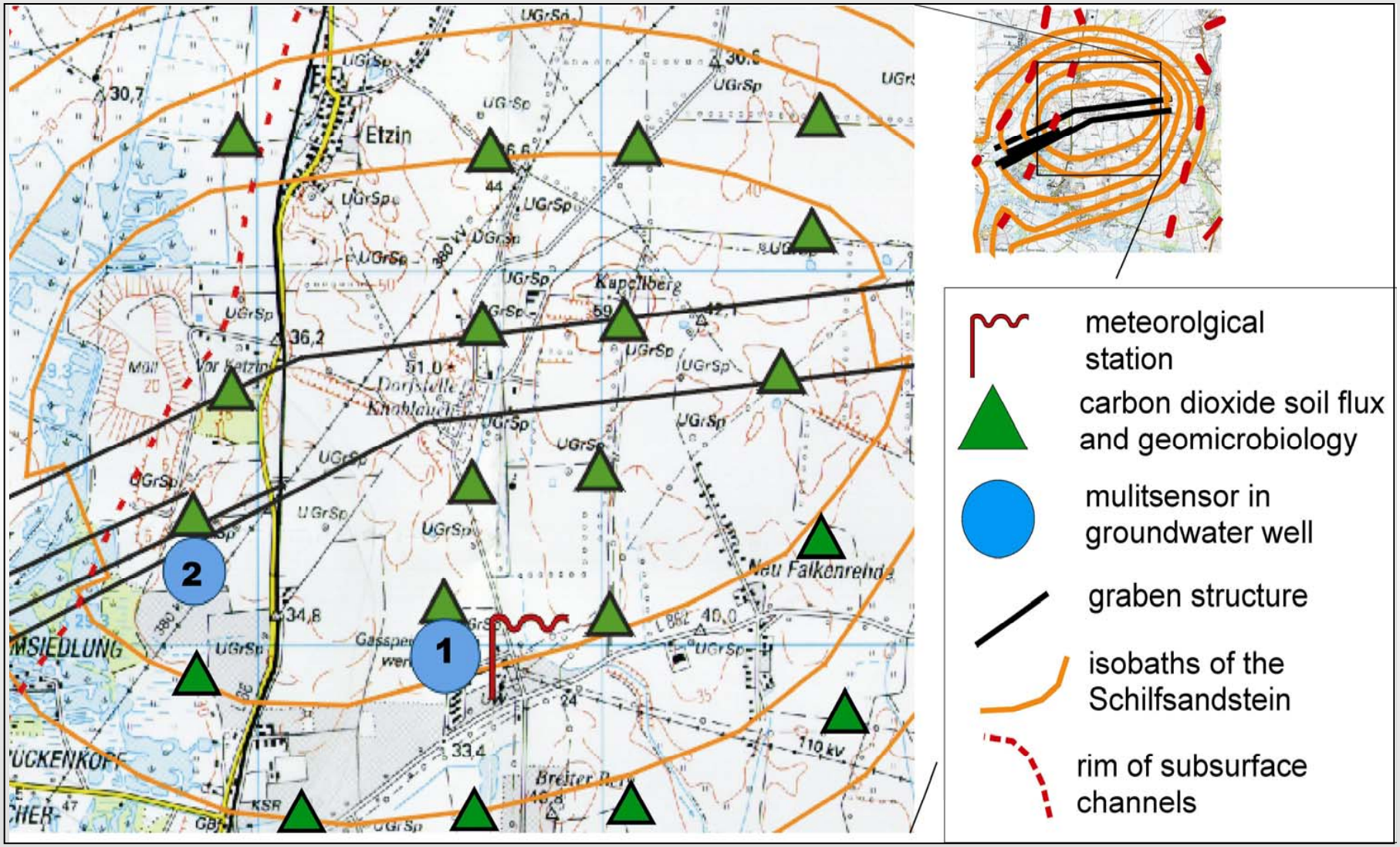




after exposure to CO_2-solution in brine (T=60°C, p=150 bar,8 weeks)



e.g., geochemical & microbiological field monitoring



DYNAMIS questions for today:

2. **What needs to be in place to make your initiative happen?**

   Answer: Nearly everything already in place

DYNAMIS questions for today:

3. **How can DYNAMIS help your initiative or vice versa to promote a concerted action in Europe towards CCS deployment?**
    1. Realising Hypogen via pilots or full scale demo
    2. Timescales versus DYNAMIS
    3. Hydrogen – key or pacing in a CCS context
    4. Structure of DYNAMIS outcome to ensure commercial up-take in your project

Answer: Possibly, in its role for gaining political and public acceptance of CCS