

GCCC New Projects

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Austin, Texas



**BUREAU OF
ECONOMIC
GEOLOGY**

ACT – Accelerating Carbon Technologies

Q3 2019 - Q2 2022

PI- **Meckel**

FRISK – Quantification of fault-related leakage risk

Focus for the collaboration will be on the **geological understanding of fault seal systems** and defining suitable **fault outcrop analogues**.

Meckel will attend FRISK meetings provide insight into learning from research in the Gulf of Mexico, and will host visiting scholar Johnathon Osmond, a current PhD student at the University of Oslo.

- Quantification of fault complexity
- Fault permeability and dynamic changes
- Reservoir simulations and quantification of leakage rates
- Integration for improved risk workflow

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SENSE – Assuring integrity of CO₂ storage sites through ground surface monitoring

Demonstrate reliable, cost efficient CO₂ storage monitoring using ground surface deformation detection combined with geomechanical modelling and inversion to provide information on pressure distribution and hydraulic behaviour of storage sites.

Meckel will attend SENSE meetings and provide earth models and recommendations for evaluating prospective storage sites in the U.S. offshore region of the Gulf of Mexico.



Country	National Coordinator	Participating partner
Australia	CSIRO - Commonwealth Scientific and Industrial Research Organisation	
France	IFP Energies Nouvelle	GEOGREEN
Germany	GEOMAR Helmholtz Centre for Ocean Research Kiel	
Japan	Research Institute of Innovative Technology for the Earth (RITE)	
Norway	Norwegian Geotechnical Institute	University of Oslo, EQUINOR ENERGY AS, QUAD GEOMETRICS NORWAY AS
Spain	Fundación Ciudad de la Energía (CIUDEN)	Spanish Geological Survey (IGME)
Switzerland	Swiss Federal Institute of Technology, EPFL	
UK	British Geological Survey (BGS)	
USA	Lawrence Livermore National Laboratory	The University of Texas at Austin

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ACTOM – Act on Offshore Monitoring

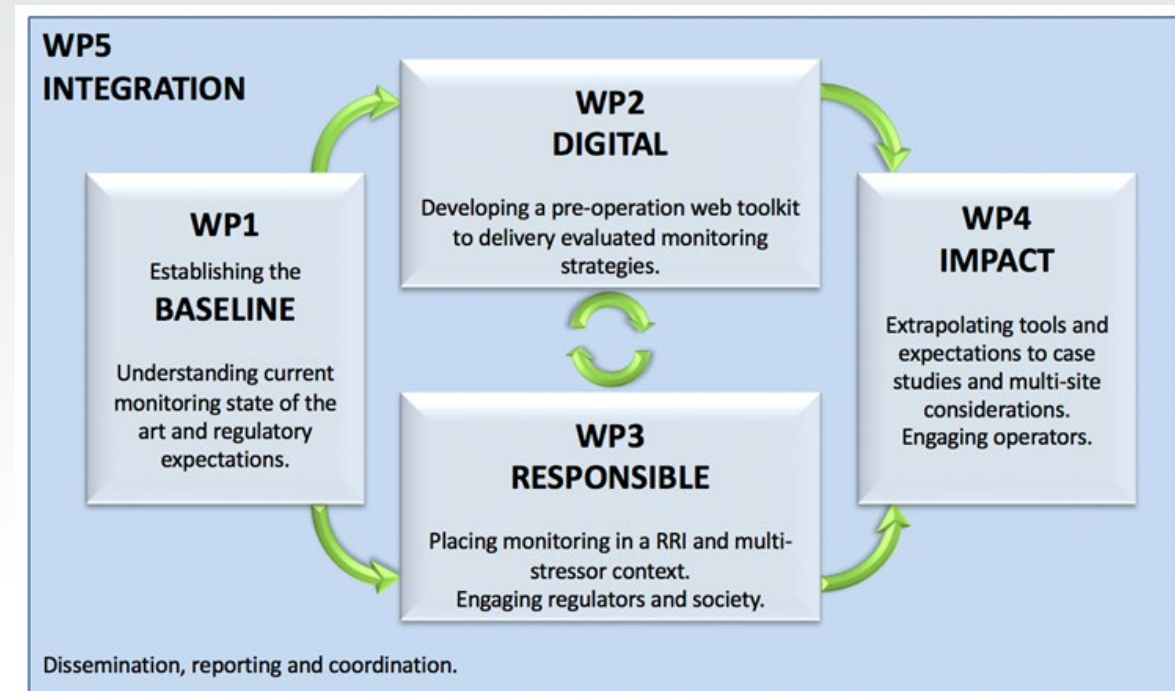
PI- **Romanak**

Objective- Develop internationally applicable capabilities to design and execute appropriate, rigorous and cost-effective **monitoring of offshore carbon storage**, aligning **industrial, societal and legislative expectations** with technological capabilities and limitations.

Outcome: A **web-based toolkit** that will collect algorithms for designing optimal monitoring programs for offshore geological storage sites.

BEG activities - **input marine monitoring techniques**, including stoichiometric methods, and build metrics for the case study site in the Gulf of Mexico (others are: Northern lights, P18 gas field)

Partner	Country
NORCE	NORWAY
Plymouth Marine Laboratory	UK
University of Dundee	UK
Los Alamos National Laboratory The Bureau of Economic Geology	USA
OCTIO AS	Norway
TNO	Netherlands

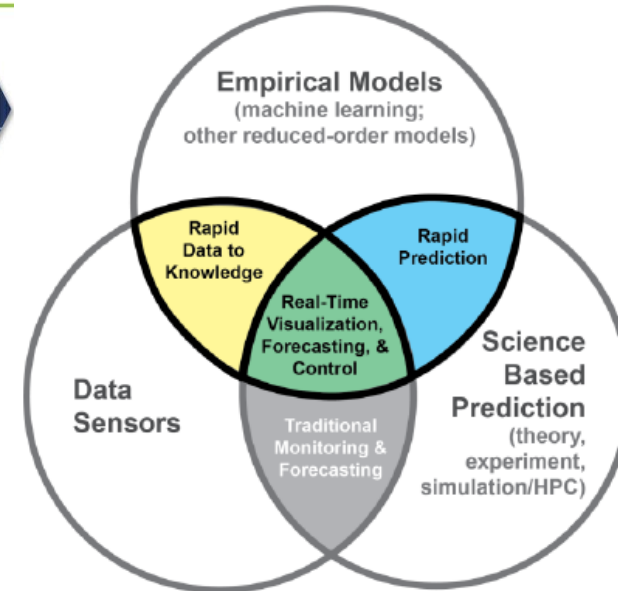
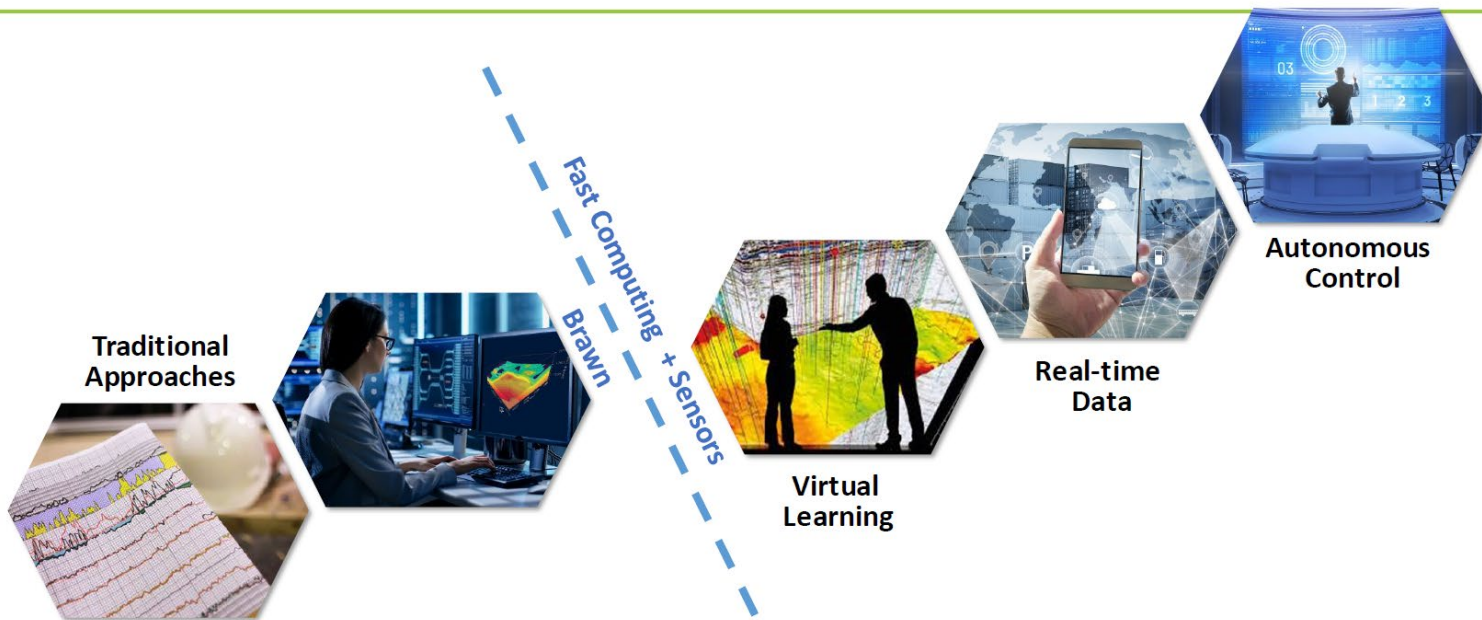


Science-informed Machine Learning for Accelerating Real Time Decisions in Subsurface Applications (SMART) Initiative

PI- Hosseini

The **three main goals** of this initiative will be to employ creative approaches to enable:

- **Real Time Visualization** of key subsurface features and flows
- **Virtual Learning** for rapid prediction of reservoir behavior
- **Real Time Forecasting** of actively-managed carbon storage



IEAGHG – State of Induced Seismicity

PI- Hosseini

The **primary** objective of this study is to summarize

- The levels of induced seismicity observed in CCS projects
- The consequences of the induced seismicity in terms of:
 - Health and safety of people
 - The environment
 - Assets

A **second** purpose is to gain

- An understanding on processes that industry and authorities employ to manage the risk of induced seismicity.

A **third** purpose is to

- Present notable case studies where outreach measures have supported operators and regulators in managing concerns of stakeholders in connection with induced seismicity.
- Sketch out current research and innovation trends to better manage the risk of induced seismicity.

Site	citation	experience
Cogdell	Gan & Frohlich, 2013; Aiken et al, 2016	Induced seismicity related to EOR, still in operation
Decatur (IBDP)	Kaven et al, 2015	Microseismic in and just above basement induced by moderate-volume CO ₂ injection into the lower part of the Mt Simon Fm
Decatur (next project)	Templeton et al, 2018	Injection at higher volumes into the middle-upper part of Mt Simon Fm, response from basement
Anneth	Zhou et al, 2010	Response to Water injection as part of EOR flood measured by SWP
Cranfield	Takagishi et al, 2017	No response to high volume, high pressure injection
In Salah	Stork et al, 2015	Fractures opening in overburden
QUEST	Bacci, et al, 2018	Minimal detection
Ketzin	Paap et al, 2014	Minimal detection
Otway	Siggins & Daley, 2010	Minimal microseismicity detection

SBIR & Pore Scale Lab

PI- Sun

- Institution: Paulsson, Inc., Van Nuys, CA
- **Proposal Title:** Development of Big-Data Edge-Computing Analytic Framework for Distributed Fiber Optic Sensors
- Solicitation: DE-FOA-0002145, FY 2020 SBIR/STTR Phase I Release 1

Pore scale fluid flow modeling lab equipped with microscope, pumps, etc.

