



International Workshop on Offshore Geologic CO₂ Storage

5th International Workshop

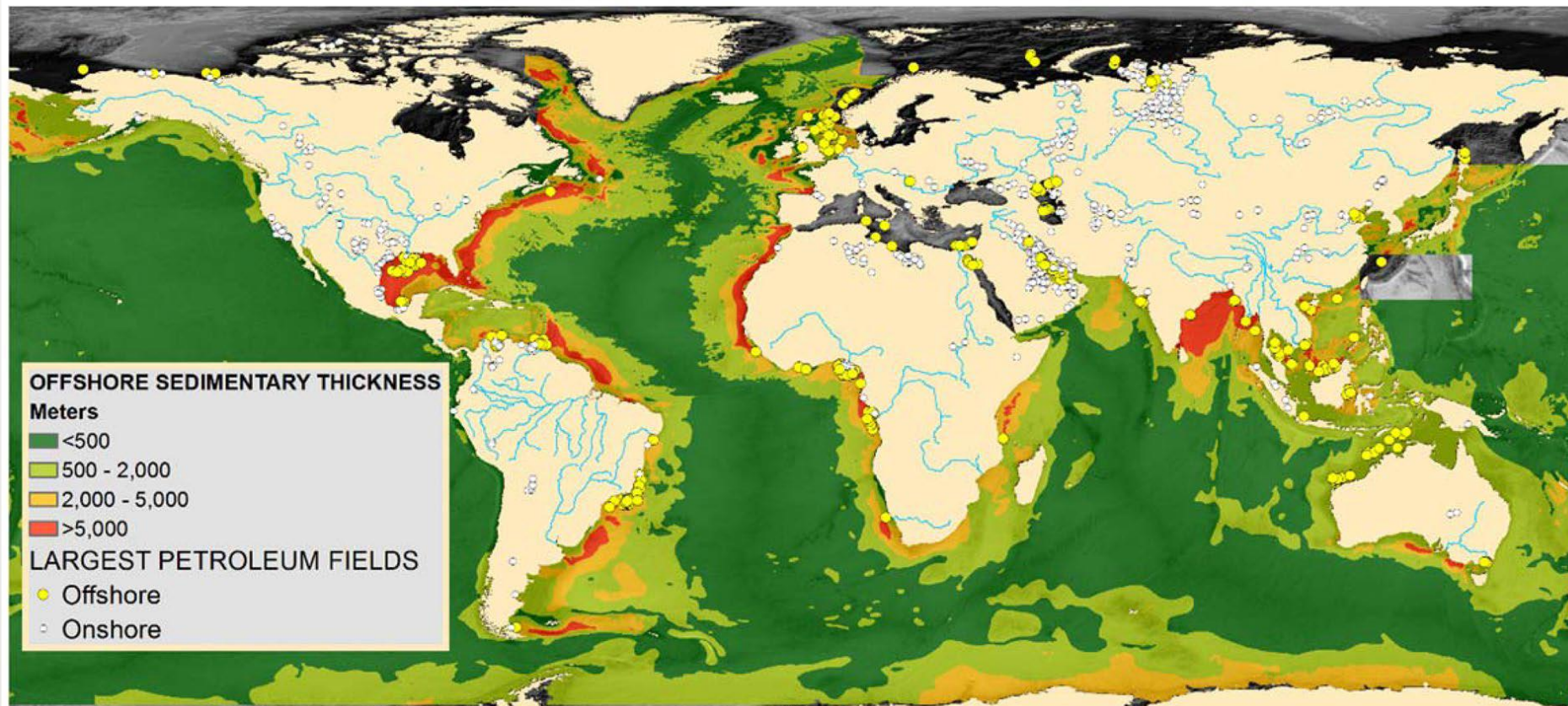
19-20 May 2022

New Orleans

Katherine Romanak
The University of Texas at Austin
Bureau of Economic Geology



The global offshore continental shelves represent the largest near-term storage for gigaton-scale CCS



Ringrose and Meckel, Nature 2019

CSLF Report on Offshore Geologic CO₂ Storage

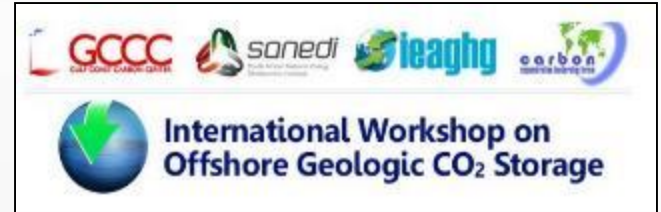


“There is a growing wealth of research, development and practical experiences that are relevant to CO₂ storage offshore, but this expertise is familiar only to a few specific countries around the world. However there is also significant global potential for offshore CO₂ storage, and countries who are not yet active but may become interested in offshore storage, would benefit from knowledge sharing from these existing experiences and expertise. Such international knowledge sharing would be facilitated by international workshops and by international collaborative projects.”

(CSLF Ministerial Nov 2015: CSLF-T-2015-06)



Workshop Series



- **1st Workshop, 19-21 April 2016, at the BEG, University of Texas, Austin.** 50+ attendees from 13 countries.
 - Organized by the Bureau of Economic Geology (BEG) at the University of Texas at Austin in collaboration with the South African Center for CCS at SANEDI, IEAGHG, and with support from CSLF and UNFCCC's CTCN.
 - To facilitate sharing of knowledge and experiences among those who are doing offshore storage and those who may be interested.
 - **Northern Lights was announced!**
 - **IEAGHG Report 2016-TR2**
- **2nd Workshop 19-20 June 2017, at Lamar University Beaumont, Texas.** 50+ attendees from 9 countries
 - To address and build on the recommendations and topics raised at the first workshop offshore storage forward. Continuing the theme of 'how to do'
 - **IEAGHG Report 2017-TR12**

Workshop Series



- **3rd Workshop, Research Council of Norway, Oslo, 3-4 May 2018, 50+ attendees** from 13 countries.
 - Organized by the **Research Council of Norway** in collaboration with The University of Texas at Austin and IEAGHG, and with support from CSLF.
 - To address and build-on the recommendations and topics raised at the first two workshops to take offshore storage forward. Continuing theme of ‘how to do’.
 - **IEAGHG Report 2018-TR02**
- **4th Workshop 19-20 February 2020, University of Bergen, Norway, 150 attendees**
 - Organized in collaboration with the STEMM-CCS Project meeting, University of Bergen, The University of Texas at Austin and IEAGHG
 - To address and build-on the recommendations and topics raised at the first three workshops to take offshore storage forward. Continuing theme of ‘how to do’. 150 attendees.
 - **IEAGHG Report 2020-TR02**

5th Offshore Workshop

New Orleans, Louisiana

May 19-20

50 in person, >120 Online



Mix of Industry, Academia, Regulators



5th Offshore Workshop



**SECARB Offshore – GoMCarb Gulf Regulator Workshop
Agenda (CDT)
May 16, 2022
Bourbon Orleans Hotel – Orleans Ballroom
New Orleans, Louisiana**



**SECARB Offshore & GoMCarb Joint
CCS Conference | International Workshop
on Offshore Geologic CO₂ Storage
May 16 - 20 | New Orleans**



**International Workshop on
Offshore Geologic CO₂ Storage**

5th International Workshop on Offshore Geologic CO₂ Storage
Organised by GCCC, BEG at the University of Texas, with IEAGHG
New Orleans, Louisiana
Thursday 19th – Friday 20th May 2022

5th Workshop, New Orleans

19-20 May, Hosted by BEG UT and SSEB

Agenda

- Welcome & Scene Setting
- International Project Roundup (16 projects)
- Technical Aspects of Depleted Fields
- Containment & Pressure Management
- Regulations and Offshore CCS
- Technical Aspects of Saline Formations
- Monitoring Offshore CCS
- Shipping & Shore Infrastructure
- Summary & Recommendations

Project Roundup

1. Cascadia project -basalt storage, USA
2. Gulf of Mexico, USA
3. Project Greensand, Denmark
4. Petrobras Pre-Salt CCS project, Brazil
5. Deep C Store, Australia
6. Pelican project, Australia
7. Project developments –Taiwan
8. Endurance field, East Coast Cluster, UK
9. Liverpool Bay CCS, UK
10. Ravenna CCUS project, Italy
11. Aramis, The Netherlands
12. Porthos, The Netherlands
13. Northern Lights, Norway
14. Polaris project, Norway
15. Ebro Offshore project, Spain

5- minute presentations due to the sheer numbers!

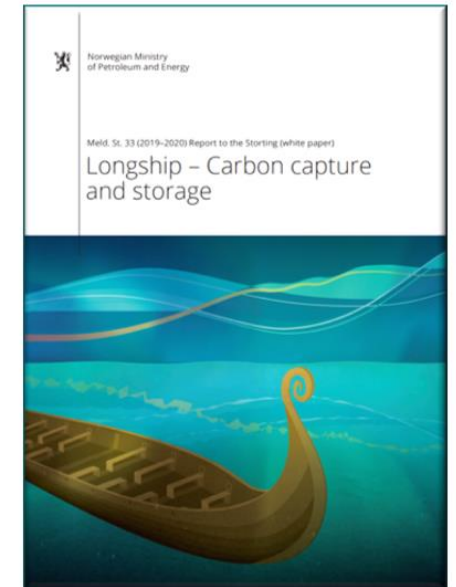
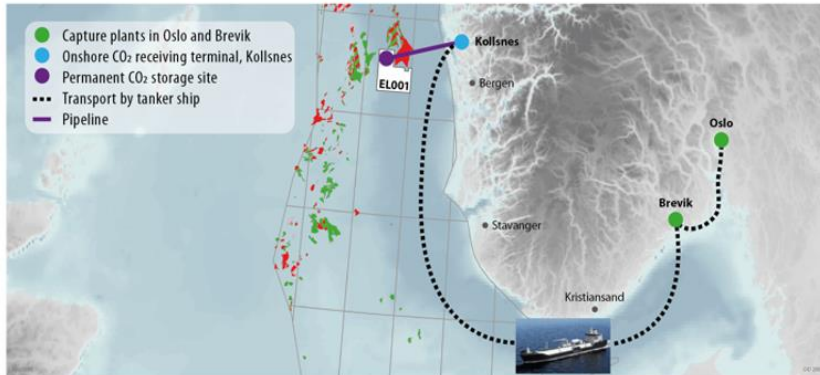
Northern Lights- Leading the Way

First proposal of:

- Hub model
- Ship transport model
- International CO₂ trade (provisional LC application)

A CCS activity has started:

Longship- a full scale CCS demonstration project on the way to large-scale deployment



- Contribute to developing technology for capture, transport and permanent storage of CO₂
- Develop a full-scale CCS value chain in Norway by 2024
- Demonstrate that CO₂ management are safe and possible

Learning- cost reductions – business development

Eva Halland

Main Technical Outcomes

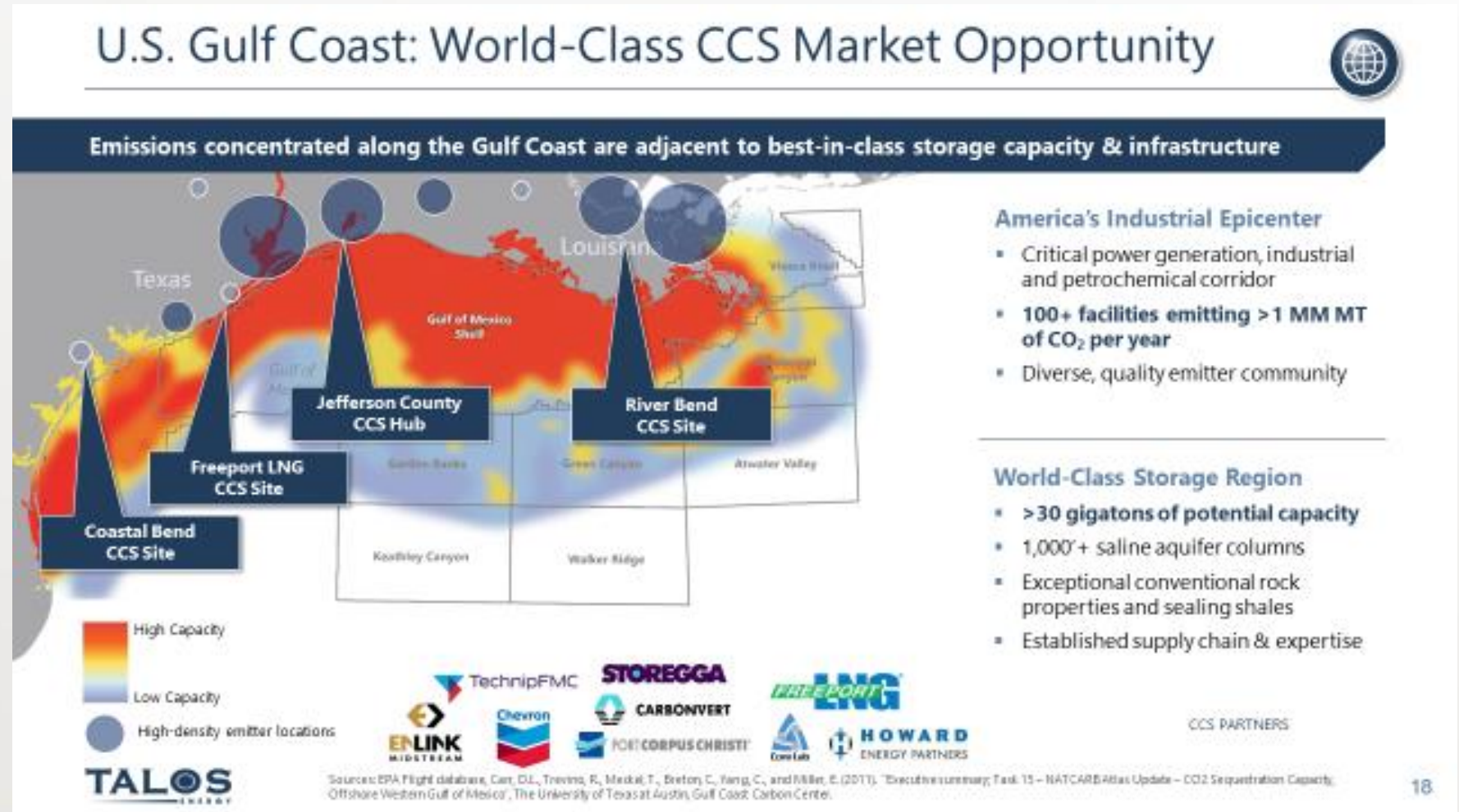
- Many industry sectors are involved (ammonia, fertilizer, power generation, waste incineration)
- Ship-based handling and injection is being developed, not just transport (similar to Lula Project, Brazil)
- Infrastructure reuse is still in question- site specific, REX-CO2 is developing a well screening tool
- Depleted fields - proven containment, infrastructure reuse, thermal affects,
- Saline – pressure management and brine management issues
- Environmental monitoring – informed by controlled releases, avoidance of false positives, fit for purpose.

Regulations in the USA

- Biden's Infrastructure Act - Nov 15, 2021
 - Authorizes leases for CO₂ storage on the Outer Continental Shelf
 - Permitting framework needed by Nov 15, 2022
- Regulators are drinking from a firehose- very interested in this information
- 45Q-growing numbers of class VI applications and bids for primacy

Gulf of Mexico

- Talos Energy has the first offshore lease
- Regional hubs and point source projects
- Cox and Exxon also planning projects



Conclusions

- The growing number of projects since last workshop! Momentum!
- The range of projects, good for others to learn from
- Some projects planning to use shipping for transport and/or injection
- Good participation by regulators
- New industry players coming in
- Re-use of infrastructure is complex, technically and legally. Good examples of the details needed from some projects
- Can we co-locate activities? Maybe, maybe not
- Pleased to see use of environmental monitoring research outputs for real projects (STEMM-CCS and ECO₂ to N. Lights, Greensand, Northern Endurance Partnership)
- N. Lights Env Mon plan 'fit for purpose'

Recommendations

- Continue this outreach – to new industry players and sectors, and to new countries
- Reach towards investors?
- Capacity estimations need consistency – use SRMS
- Need work on environmental impacts in GoM?
- Make needs and perspectives known to regulators ASAP
- Each site is different-need to let regulators know one size does not fit all.
- Need EPA engagement

Overall Summary

- The CSLF Taskforce and Report on Offshore storage which made recommendations for knowledge sharing has been successful in stimulating international cooperation, knowledge transfer and project development in the offshore.
- The USA and Norway have been leaders in advancing the International Workshop on Offshore Storage through their hosting and collaborative support of the meetings.

Further Information

- Presentations are posted on GCCC Website
<https://www.beg.utexas.edu/gccc/research/goi>
- Report will be produced by IEAGHG
- Drafted by Carlos Uroza, BEG



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Global Offshore Initiative



**International Workshop on
Offshore Geologic CO₂ Storage**

Program Overview

GCCC is pursuing various aspects of offshore carbon sequestration, including a global needs assessment and identify an international community of parties interested in offshore storage.

Explore the links below for presentations, posters, and publications.

AGENDA

DAY 1 – Thursday 19th May

SESSION 1: Welcome & Scene Setting

09:00 – 09:10 Welcome Tim Dixon, IEAGHG, & Katherine Romanak, GCCC

09:10 - 09:20 Scene setting - COP26 outcomes in relation to offshore CCS Tim Dixon, IEAGHG

SESSION 2: International Project Roundup - CHAIR: Sue Hovorka & Katherine Romanak

09:20 – 09:25 Offshore basalt storage / Cascadia project David Goldberg, Columbia University

09:25 – 09:30 Project Greensand, Denmark Søren Reinhold Poulsen, EBN

09:30 – 09:35 Porthos, The Netherlands [video] Bram Herfkens, Porthos

09:35 – 09:40 Petrobras' Pre-Salt CCS project update Leonardo Ribeiro & Ana Paula Mussi, Petrobras

09:40 – 09:45 Deep C Store, Australia Daein Cha, deepC Store Ltd

09:45 – 09:50 Pelican project, Australia [video] Nick Hoffman, CarbonNet Australia

09:50 – 09:55 Taiwan Cheryl Yang, ITRI

09:55 – 10:00 Endurance field, East Coast Cluster (ECC), UK Nicolas Bouffin, BP

10:10 – 10:05 Northern Lights, Norway Cristel Lambton, Northern Lights

10:20 – 10:25 Liverpool Bay CCS, UK & Ravenna CCUS project, Italy Alessandro Aleandri, ENI

10:25 – 10:30 Aramis, The Netherlands Owain Tucker, Shell

10:30 – 10:35 Polaris project, Norway Morten Sola, Horizont Energy

10:35 – 10:40 Ebro Offshore project, Spain [video] Francisco Pángaro, Repsol

10:40 – 10:45 Gulf of Mexico, USA Ryan Jones, Talos

10:45 – 10:50 CCS in the GoM Ganesh Dasari, ExxonMobil

10:50 – 10:55 GoM (LA) Depleted Field CCS Development Michael Hopkinson, Cox Oil

10:55 – 11:05 Discussion / Questions

Thank you for your attention

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