

Publications related to the CCS2022-2024 project

Project data: [CCS-data 2022-2024](#)

Reports (acquisition & processing, and interpretation):

Abramovitz, T., Vosgerau, H., Gregersen, U., Smit, F. W. H., Bjerager, M., Jusri, T. A., Mathiesen, A., Mørk, F., Schovsbo, N. H., Petersen, H. I., Nielsen, L. H., Laghari, S., Rasmussen, L. M., and Keiding, M. 2024. CCS2022-2024 WP1: The Rødby structure. Seismic data and interpretation to mature potential geological storage of CO₂. GEUS. Danmarks og Grønlands Geologiske Undersøgelse Rapport 2024/18. GEUS. 143 pp. <https://doi.org/10.22008/gpub/34739>.

Fyhn, M.B.W., Mathiesen, A., Nørmark, E., Mørk, F., Smit, F., Vosgerau, H., Laghari, S., Funck, T., Jusri, T., and Gregersen, U., 2024. CCS2022-2024 WP1: The Jammerbugt structure. Seismic data and interpretation to mature potential geological storage of CO₂. GEUS. Danmarks og Grønlands Geologiske Undersøgelse Rapport 2024/11. GEUS. 82 pp. <https://doi.org/10.22008/gpub/34732>

Funck, T. and Nørmark, E. 2023. CCS2022-2024 WP1: The Havnsø structure – Marine acquisition report. Offshore seismic acquisition Havnsø-Nekselø 2022, with seismic source from the onshore acquisition. Danmarks og Grønlands Geologiske Undersøgelse Rapport 2023/22. GEUS. 48 pp. <https://doi.org/10.22008/gpub/34689>

Funck, T. Ehrhardt, A. Andreasen, N.R. Behrens, T. Christensen, N. Demir, Ü. Ebert, T. Nielsen, T.B. Nørmark, E. Pedersen, H. Schramm, B. Smith, L. Steinborn, P. and Trinhammer, P. 2023. Acquisition of marine seismic data in Jammerbugt in 2023. CCS2022-2024 WP1: Seismic data acquisition across the Jammerbugt structure on research vessel Jákup Sverri, Danmarks og Grønlands Geologiske Undersøgelse Rapport 2023/39. GEUS. 120 pp. <https://doi.org/10.22008/gpub/34706>

Gregersen, U., Hjelm, L., Vosgerau, H., Smit, F.W.H., Nielsen, C.M., Rasmussen, R., Bredesen, K., Lorentzen, M., Mørk, F., Lauridsen, B.W., Pedersen, G.K., Nielsen, L.H., Mathiesen, A., Laghari, S., Kristensen, L., Sheldon, E., Dahl-Jensen, T., Dybkjær, K., Hidalgo, C.A., and Rasmussen, L.M., 2023. CCS2022-2024 WP1: The Stenlille structure - Seismic data and interpretation to mature potential geological storage of CO₂. Danmarks og Grønlands Geologiske Undersøgelse Rapport 2022/26. GEUS. 164 pp. <https://doi.org/10.22008/gpub/34661>

Gregersen, U., Vosgerau, H., Smit, F.W.H., Lauridsen, B.W., Mathiesen, A., Mørk, F., Nielsen, L.H., Rasmussen, R., Funck, T., Dybkjær, K., Sheldon, E., Pedersen, G.K., Nielsen, C.M., Bredesen, K., Laghari, S., Olsen, M.L., and Rasmussen, L.M., 2023. CCS2022-2024 WP1: The Havnsø structure - Seismic data and interpretation to mature potential geological storage of CO₂. Danmarks og Grønlands Geologiske Undersøgelse Rapport 2023/38. GEUS. 200 pp. <https://doi.org/10.22008/gpub/34705>.

Malehmir, A. and Markovic, M. 2024. GEUS2023-ROEDBY seismic survey: Acquisition, processing and results, Final Report (April 2024), 22 pp. Data and report available via GEUS: [CCS-data 2022-2024](#).

Malehmir, A. and Papadopoulou, M. 2022. Innovative land seismic data acquisition for geological CO₂ storage in Stenlille, Denmark. Final Acquisition and Processing Report of the GEUS2022-STENLILLE survey. Uppsala University, July 2022, 42 pp. Data and report available via GEUS: [CCS-data 2022-2024](#).

Malehmir, A. and Papadopoulou, M. 2023. GEUS2022-HAVNSOE seismic survey: Acquisition and processing report. Uppsala University. Final report (June 2023). 45 pp. Data and report available via GEUS: [CCS-data 2022-2024](#).

Malehmir, A. and Westgate, M. 2023. GEUS2023-GASSUM seismic survey: Acquisition, processing and results, Final Report (December 2023), 25 pp. Data and report available via GEUS: [CCS-data 2022-2024](#).

Putnaite, J. and Malehmir, A., 2024. GEUS2023-THORNING seismic survey: Acquisition, processing and results, Final Report (June 2024), 18 pp. Data and report available via GEUS: [CCS-data 2022-2024](#).

Realtime Seismic, 2023. Final report - GEUS2023-GASSUM-RE2023. Reprocessing [PSTM] of the GEUS2023-GASSUM 2D Seismic Survey. Reprocessing report for the Geological Survey of Denmark and Greenland. Realtime Seismic Pty. Ltd., France. 63 pp. Data and report available via GEUS: [CCS-data 2022-2024](#).

Realtime Seismic, 2023. Final report - Reprocessing [PSTM] of the GEUS2023-JAMMERBUGT 2D Seismic Survey. Reprocessing report for the Geological Survey of Denmark and Greenland. Realtime Seismic Pty. Ltd., France. 93 pp. Data and report available via GEUS: [CCS-data 2022-2024](#).

Realtime Seismic, 2023. GEUS2022-HAVNSOE-RE2023. Reprocessing of the GEUS2022-HAVNSOE 2D Seismic Survey for the Geological Survey of Denmark and Greenland. Realtime Seismic Pty. Ltd., France. 57 pp. Data and report available via GEUS: [CCS-data 2022-2024](#).

Realtime Seismic, 2023. Stenlille Data processing [STENLILLE-97-GEUS-RE2023 reprocessing PSTM & PSDM] report. Reprocessing report for the Geological Survey of Denmark and Greenland. Realtime Seismic Pty. Ltd., France. 69 pp. Data and report available via GEUS: [CCS-data 2022-2024](#).

Realtime Seismic, 2024. Final report - Reprocessing [GEUS2023-ROEDBY-RE2023, PSTM] of the GEUS2023-ROEDBY 2D Seismic Survey. Reprocessing report for the Geological Survey of Denmark and Greenland. Realtime Seismic Pty. Ltd., France. 68 pp. Data and report available via GEUS: [CCS-data 2022-2024](#).

Realtime Seismic, 2024. Final report - Reprocessing [GEUS2023-THORNING-RE2024, PSTM] of the GEUS2023-THORNING 2D Seismic Survey. Reprocessing report for the Geological Survey of Denmark and Greenland. Realtime Seismic Pty. Ltd., France. Data and report available via GEUS: [CCS-data 2022-2024](#).

Papers and extended abstracts

Bredesen, K., Smit, F.W.H., Lorentzen, M. and Gregersen, U. 2023. Improved delineation of the Gassum Formation reservoir zones using seismic impedance inversions: implications for exploiting the Stenlille aquifer gas storage facility as a CO₂ storage demonstration site, onshore Denmark. Geological Society of London. *Geoenery*, vol. 1. <https://doi.org/10.6084/m9.figshare.c.6662413>

Bredesen, K., Lorentzen, M., Smit, F.W.H. and Gregersen, U. 2022. Quantitative seismic interpretation of the Gassum Formation at the Stenlille aquifer gas storage. GHGT-16 Conference Proceedings (2022); SSRN Electronic Journal, November, 2022, 12 pp. <https://doi.org/10.2139/ssrn.4276697>

Gregersen, U., Smit, F.W.H., Lorentzen, M., Vosgerau, H., Bredesen, K., Hjelm, L., Mathiesen, A. and Laghari, S. 2022. Tectonostratigraphy and Structural Evolution of the Stenlille Structure in Zealand, Denmark – a Site for Natural Gas and CO₂ Storage. GHGT-16 Conference Proceedings (2022); SSRN Electronic Journal Nov. 2022 & Geophysics eJournal 4 (85) Dec. 2022, 12 pp. SSRN: <http://dx.doi.org/10.2139/ssrn.4275875>

Konstantinidis, E., Kucinskaite, K., Malehmir, A., Westgate, M., Gregersen, U. and Keiding, M., 2023. Velocity model building and seismic imaging of the Gassum structure for potential CO₂ storage in Denmark. 4th EAGE Global Energy Transition Conference & Exhibition; GET2023, Paris, 5 pp. <https://doi.org/10.3997/2214-4609.202321050>

Kucinskaite, K., Papadopoulou, M., Zappalà, S., Malehmir, A., Westgate, M., Gregersen, U., and Funck, T., 2023. Near- surface effect on geological CO₂ storage site characterization in Denmark. Conference paper. 4th EAGE Global Energy Transition Conference & Exhibition; GET2023, Paris, 5 pp. <https://doi.org/10.3997/2214-4609.202321026>

Lorentzen, M., Bredesen, K., Gregersen, U., Smit, F.W.H. and Laghari, S. 2022. Fault Mapping of the Gassum Formation Reservoir and the Fjerritslev Formation Caprock Interval at the Stenlille Gas Storage Site Using a Pre-Trained Convolutional Neural Network. GHGT-16 Conference Proceedings (2022); Geophysics eJournal, 4(86), December, 2022, 12 pp. SSRN: <http://dx.doi.org/10.2139/ssrn.4277405>

Malehmir, A., Markovic, M., and Abramovitz, T., 2024. Unravelling Detailed Geological Structures for CCS Applications in Rødby-Denmark. EAGE Annual Meeting, Oslo, Norway (EarthDoc). 85th EAGE Annual Conference & Exhibition; Oslo, 4 pp. <https://doi.org/10.3997/2214-4609.202410758>

Papadopoulou, M., Malehmir, A., Zappalà, S., Gregersen, U., Nielsen, L. and Hjelm, L. 2022. Innovative land seismic data acquisitions for CO₂ and energy storage applications. EAGE – Near Surface Geoscience '22 conference, Belgrade, Serbia. Extended abstract. Vol. 2022, p. 1–5. <https://doi.org/10.3997/2214-4609.202220098>

Papadopoulou, M., Zappalà, S., Malehmir, A., Gregersen, U., Hjelm, L., Nielsen, L., and Haspang, M. P. 2023. Innovative land seismic investigations for CO₂ geological storage in Denmark. *Geophysics*, 88(5), B251–B266. <https://doi.org/10.1190/geo2022-0693.1>

Papadopoulou, M., Zappalà, S., Malehmir, A., Kucinskaite, K., Westgate, M., Gregersen, U., Hjelm, L., Funck, T. and Nielsen, L. 2023. Upscaling Innovative Land Seismic Acquisitions for Geological Storage of CO₂ in Denmark. 84th EAGE Annual Conference & Exhibition, Vienna. European Association of Geoscientists & Engineers, Conference paper. Conference Proceedings Volume 2023, 1–5. <https://doi.org/10.3997/2214-4609.202310385>

Papadopoulou, M., Zappalà, S., Malehmir, A., Kucinskaite, K., Westgate, M., Gregersen, U., Funck, T., Smit, F. and Vosgerau, H., 2024. Advancements in seismic imaging for geological carbon storage: Study of the Havnsø structure, Denmark. *International Journal of Greenhouse Gas Control*, 137, 10204. <https://doi.org/10.1016/j.ijggc.2024.104204>.

Smit, F.W.H., Gregersen, U., Lorentzen, M., Bredesen, K., Pedersen, G.K., Hovikoski, J. and Vosgerau, H. 2022. Seismic Geomorphology of the Upper Triassic – Lower Jurassic Gassum Formation – Improved Reservoir Characterization in the Stenlille (Denmark) CCS Demonstration Site. GHGT-16 Conference Proceedings (2022); *Geophysics eJournal*, 4 (83), December 2022, 11 pp. SSRN: <https://papers.ssrn.com/abstract=4277360>

Westgate, M., Malehmir, A., Konstantinidis, E., Kucinskaite, K., Keiding, M., Gregersen, U., and Bjerager, M., 2024. High-resolution, large-scale seismic imaging of halokinetic-induced structures for geological carbon storage: results from East Jutland, Denmark. NSG2024 30th European Meeting of Environmental and Engineering Geophysics, Sep 2024, Volume 2024, 5 pp.

Westgate, M., Malehmir, A., Konstantinidis, E., Kucinskaite, K., Hjelm, L., Gregersen, U., Keiding, M. and Bjerager, M., 2023. Seismic imaging of the Gassum Formation in Denmark for CO₂ storage potential using a dual-recording method. NSG2023 29th European Meeting of Environmental and Engineering Geophysics, Sept. 2023, Volume 2023, 5 pp. <https://doi.org/10.3997/2214-4609.202320051>

Zappalà, S., Malehmir, A., Papadopoulou, M., Gregersen, U., Funck, T., Clausen, O.R., and Nørmark, E., 2024. Combined onshore and offshore wide-scale seismic data acquisition and imaging for carbon capture and storage exploration in Havnsø, Denmark. *Geophysics*, 89(4), B257–B272. <https://doi.org/10.1190/geo2023-0503.1>

Zappalà, S., Malehmir, A., Papadopoulou, M., Gregersen, U., Hjelm, L., Funck, T., Nørmark, E., Trinhammer, P. and Nielsen, L. 2024. Innovative reflection seismic acquisition for CCS applications at a transition zone in Havnsø area – Denmark. 85th EAGE Annual Conference & Exhibition; Oslo, 4 pp. <https://doi.org/10.3997/2214-4609.2024101380>

Abstracts (short, 1 p., with conference presentation):

Abramovitz, T., Jusri, T., Mathiesen, A., Gregersen, U., Keiding, M., Bjerager, M., Malehmir, A., Kucinskaite, K., Putnaite, J., Pertuz, T. and Juhlin, M., 2024. De-risking potential onshore CO₂ storage sites in Denmark – insights from new public data. Abstract. SEISMIX 2024 conference, June 2024, Uppsala, Sweden. Oral presentation. Abstract, 1p.

Bredesen, K., Lorentzen, M., Smit, F., and Gregersen, U. 2022: Quantitative seismic interpretation of the Gassum Formation at the Stenlille aquifer gas storage. 16th Greenhouse Gas Control Technologies Conference - GHGT-16, <https://ghgt.info/>, Lyon, France. Oral presentation. Abstract, 1p.

Funck, T., Fyhn, M.B.W., Jusri, T., Ehrhardt, A., Nørmark, E., Mathiesen, A., Mørk, F., Smit, F., Vosgerau, H., Laghari, S., and Gregersen, U., 2024. Seismic imaging and assessment of a potential CO₂ storage site in the Danish North Sea: The Jammerbugt structure. Abstract. SEISMIX 2024 conference, June 2024, Uppsala, Sweden. Oral presentation. Abstract, 1p.

Gregersen, U., 2024. Undersøgelser af en række danske muligheder for dyb lagring af CO₂ i onshore, nearshore og offshore områder. Grønne Gasdage 2024 conference, Fredericia, 5. sept. 2024. Dansk Industri. Invited presentation (DI). Oral presentation. Abstract, 1 p.

Gregersen, U., Smit, F.W.H, Lorentzen, M., Bredesen, K., Vosgerau, H., Hjelm, L. and Mathiesen, A. 2022: Tectonostratigraphy and structural evolution of the Stenlille structure in western Zealand of Denmark – A site for natural gas storage and potential Carbon Capture Storage (CCS). Abstract oral presentation. 16th Greenhouse Gas Control Technologies Conference - GHGT-16, <https://ghgt.info/>, Lyon, France. Oral presentation. Abstract, 1p.

Gregersen, U., Smit, F.W.H. and Vosgerau, H., 2024. Maturation for potential CO₂ storage in Denmark – The Stenlille and Havnsø structures. [36th Nordic Geological Winter meeting 2024](#), Gothenburg, Sweden. Oral presentation. [Abstract](#), 1p.

Kucinskaite, K., Papadopoulou, M., Zappalà, S., Malehmir, A., Westgate, M., Gregersen, U., Hjelm, L., Funck, T. and Nielsen, L., 2023. Novel land seismic studies for geological storage of CO₂ in Denmark. Abstract. 81st International Scientific Conference of the UL, University of Latvia. Oral presentation. Abstract, 1p.

Lorentzen, M., Bredesen, K., Gregersen, U. and Smit, F.W.H. 2022: Fault mapping of the Gassum Formation reservoir and the Fjerritslev Formation cap-rock interval at the Stenlille gas storage site using a pre-trained convolutional neural network. 16th Greenhouse Gas Control Technologies Conference - GHGT-16, <https://ghgt.info/>, Lyon, France. Poster presentation. Abstract, 1p.

Smit, F.W.H., Gregersen, U., Lorentzen, M., Bredesen, K. and Vosgerau, H. 2022: Seismic Geomorphology of the Upper Triassic–Lower Jurassic Gassum Formation – Improved Reservoir Characterization in the Stenlille (Denmark) CCS Demonstration Site. 16th Greenhouse Gas Control Technologies Conference - GHGT-16, <https://ghgt.info/>, Lyon, France. Oral presentation. Abstract, 1p.

Papadopoulou, M., Kucinskaite, K., Zappalà, S., Malehmir, A., Westgate, M., Gregersen, U. and Funck, T., 2024. Seismic characterization of geologic carbon storage sites in Denmark: Near-surface aspects. SEISMIX 2024 conference, June 2024, Uppsala. Oral presentation. Abstract, 1p.

Putnaite, J., Malehmir, A., Bjerager, M., Abramovitz, T., and Keiding, M. 2024. Dual-purpose seismic imaging for geological carbon storage and near-surface characterization. SEISMIX 2024 conference, June 2024, Uppsala. Oral presentation. Abstract, 1p.

Theses (PhD and Master Theses related to the acquisition & data of the CCS2022-2024 project)

Ahmed, S. M., 2024. Reflection seismic imaging and interpretation of 2D lines at Rødby (Denmark) potential geological CO₂ storage site. Uppsala University.

Greve, B.A., 2023. Onshore seismic data acquisition – Practical considerations, source coupling and data quality. University of Copenhagen. Master Thesis, 66 pp.

Khan, H., 2024 August, Subsurface site characterization using seismic imaging technique for CO₂ storage in Denmark. Uppsala University.

Stender, V.L., 2023. Tomographic inversion of first arrivals for 2-D seismic velocity modelling onshore western Zealand, Denmark. University of Copenhagen. Master Thesis, 69 pp.

Zeru, M.H., 2024 January. 2D Reflection Seismic Imaging of Rødby Structures, Denmark: Geological Conditions for CO₂ Sequestration. Uppsala University.