

## **Dynamic elastic parameters of Jurassic deposits in the Marianowo Anticline (Poland) gas storage site with a CO<sub>2</sub> cushion**

*Paulina Krakowska-Madejska*<sup>1\*</sup>, *Edyta Puskarczyk*<sup>1</sup>, *Grzegorz Machowski*<sup>1</sup>, *Gabriel Ząbek*<sup>1</sup>, *Bartosz Papiernik*<sup>1</sup> and *Michał Michna*<sup>1</sup>

<sup>1</sup>AGH University of Krakow, Faculty of Geology, Geophysics and Environmental Protection, Krakow, Poland

\*Corresponding author : [krakow@agh.edu.pl](mailto:krakow@agh.edu.pl)

**Abstract.** The Marianowo Anticline, which is located on the NW part of Poland, was recognized by seismic survey and classified as a potential storage structure for CO<sub>2</sub> in the aquifer. Initial geomechanical model of the formations of the Lower and Middle Jurassic was built up based on the laboratory measurements on core samples and well logging carried out in several wells in situ. Laboratory tests covered P- and S-wave velocity measurements under axial compression test with different axial load. Next, dynamic elastic moduli were estimated by applying different models. Well logging delivered P-wave velocity and bulk density parameters. Moreover, petrophysical analysis allowed calculating porosity and mineral content, which were also applied for determining dynamic elastic moduli. All results were connected and specific optimal models were chosen for the construction of geomechanical model of Marianowo Anticline. The goal of the project was to estimate reliable and effective dynamic elastic parameters based on lab measurements, well logs and appropriate models, as well as combination of the results from two different sources (measurements on cores and directly on formation in the wells). The results are promising and indicate that the AM meets the capacity and safety conditions for a CO<sub>2</sub> cushion gas storage. However, the optimal development of storage requires high-resolution 3D seismic and new wells with well logging and reservoir test. The project was supported by Norwegian Funds as part of the Polish Norwegian Research Cooperation program, POLNOR CCS 2019, implemented by the National Centre for Research and Development (Contract NOR/POLNORCCS/AGaStor/0008/2019).