

high-energy layers detected in the field. The results of this study show how a combined approach between geological evidence and tsunami modelling could be a suitable tool for the attribution of tsunami deposits connected to specific tsunamogenic sources.

Keyword: tsunami; earthquake; faults; flooding; sea-level

**How to cite:** Scardino, G., Rizzo, A., De Santis, V., Kyriakoudi, D., Rovere, A., Vacchi, M., and Scicchitano, G.: On the origin of multiple tsunami inundation of the archaeological site of Ognina (Sicily): Numerical models and field geological data, EGU General Assembly 2021, online, 19–30 Apr 2021, EGU21-8591, <https://doi.org/10.5194/egusphere-egu21-8591>, 2021.

---

#### Conference details:

QRA Postgraduate Symposium 2022  
Sheffield Hallam University  
2 and 9 September 2022

**Title: In search of seismic and sedimentary evidence for proglacial North Sea lakes: insights into their distribution and role during the Elsterian, Saalian and Weichselian glaciations**

D. Kyriakoudi<sup>1,2\*</sup>, M. Vervoort<sup>2</sup>

<sup>1</sup>*Flanders Marine Institute (VLIZ), Wandelaarkaai 7, Ostend, Belgium, 8400*

<sup>2</sup>*Renard Centre of Marine Geology (RCMG) - Department of Geology, Ghent University, Krijgslaan 281, Ghent, Belgium, 9000*

During the Middle and Late Pleistocene, ice sheets occupied parts of the North Sea during three major glaciations, the Elsterian (MIS 12), the Saalian (MIS 10-6) and the Weichselian (MIS 4-2). Since there is no ample offshore evidence, the limits, dynamics and chronology of the ice sheets that occupied the southern North Sea are less precisely defined. Nevertheless, offshore studies often support the idea of the presence of proglacial North Sea lakes in front of the ice sheets, despite the lack of solid geomorphological and sedimentological evidence [1,2,3,4]. The existence of a proglacial lake is also used in the argument that glacial outburst floods created the erosional features preserved in the Dover Strait [5]. As part of the WALDO project ("Where are All the (proglacial) Lake seDiments in the NOrth Sea Basin?"), this study aims to test the hypothesis that proglacial lakes were important landscape features in the southern North Sea during the Elsterian, Saalian and Weichselian glaciations, based on the analysis and interpretation of marine geophysical and sedimentological data. In the framework of this study, three field surveys with the *RV Belgica* have been planned. During these surveys, high-resolution geophysical data (bathymetry, backscatter, acoustic and seismic data) and sediment cores from different areas in the southern North Sea will be acquired. By looking for geomorphological and sedimentological evidence of proglacial landforms and other associated sediment deposits, we aim to determine the location, distribution, and extent of the proglacial lakes during the last three glacial maxima. If such evidence is found, it will lead to a better understanding of the Pleistocene glacial landscape evolution and lithostratigraphic framework of the southern North Sea basin, ultimately resulting in updated regional palaeo-geographic and palaeo-

environmental reconstructions. If insufficient evidence is found, then the proglacial lake hypothesis needs to be reassessed.

## References

- [1] Gibbard, P.L., 1988. The history of the great northwest European rivers during the past three million years. *Philos. Trans. R. Soc. London. B, Biol. Sci.* 318, 559–602.
- [2] Cohen, K.M., Busschers, F.S., Gibbard, P.L., 2005. Stratigraphical implications of an Elsterian pro-glacial “North Sea” lake. In SEQS Subcommission European Quaternary Stratigraphy 2005 annual meeting.
- [3] Murton, D.K., Murton, J.B., 2012. Middle and Late Pleistocene glacial lakes of lowland Britain and the southern North Sea Basin. *Quat. Int.* 260, 115–142.
- [4] Cotterill, C.J., Phillips, E., James, L., Forsberg, C.F., Tjelta, T.I., Carter, G., Dove, D., 2017. The evolution of the Dogger Bank, North Sea: A complex history of terrestrial, glacial and marine environmental change. *Quat. Sci. Rev.* 171, 136–153.
- [5] Gupta, S., Collier, J.S., Palmer-Felgate, A., Potter, G., 2007. Catastrophic flooding origin of shelf valley systems in the English Channel. *Nature* 448, 342–5.

---

*\*Corresponding author. Email address: [despina.kyriakoudi@vliz.be](mailto:despina.kyriakoudi@vliz.be) (D. Kyriakoudi).*

This study is part of the WALDO project (Where are All the (proglacial) Lake seDiments in the NOrth Sea Basin?), a 4-year BELSPO-funded research project, which supports two PhD programs (more information: <https://waldo.ugent.be/>).

---

## Conference details:

QRA Postgraduate Symposium 2023  
Durham University  
7 and 8 September 2023

**Title: Proglacial lakes in the southern North Sea: In search of reflection-seismic and sedimentary evidence during the Middle- and Late-Pleistocene glaciations**

**Presenter: Despina Kyriakoudi**

During the Middle and Late Pleistocene, parts of the North Sea were covered by ice sheets in three different phases, known as the Elsterian (MIS 12), the Saalian (MIS 10-6), and the Weichselian (MIS 4-2) glaciations. It has been proposed by various studies that large proglacial lakes developed in front of these ice sheets during each of these glacial periods, due to glacial meltwater and drainage of numerous great northern European rivers. However, no widespread, convincing geomorphological and sedimentological evidence about the existence or exact location of these lakes has yet been found. The goal of the WALDO\* project is to assess the hypothesis that these proglacial lakes existed and were significant features in the southern North Sea during the three ice ages. In 2022, two offshore surveys were conducted with RV Belgica, during which datasets of high-resolution seismic reflection data and vibrocores were acquired in various areas across the southern North Sea. This newly gathered data, together with available datasets from various British and Dutch offshore wind farms, are currently being analyzed. During this presentation, we will show the current state of the project and some preliminary results. An additional dedicated research survey is planned to take place in October 2023 to acquire more geophysical and ground-truthing data. Over the coming years, we hope that this data will bring us