

The European Arctic Seismic Bulletin for the years 1990 – 2013

J. SCHWEITZER (johannes@norsar.no) (1), B. PAULSEN (1), G. N. ANTONOVSKAYA (2), A. V. FEDOROV (3), Y. V. KONECHNAYA (2), V. E. ASMING (3), M. PIRLI (4)

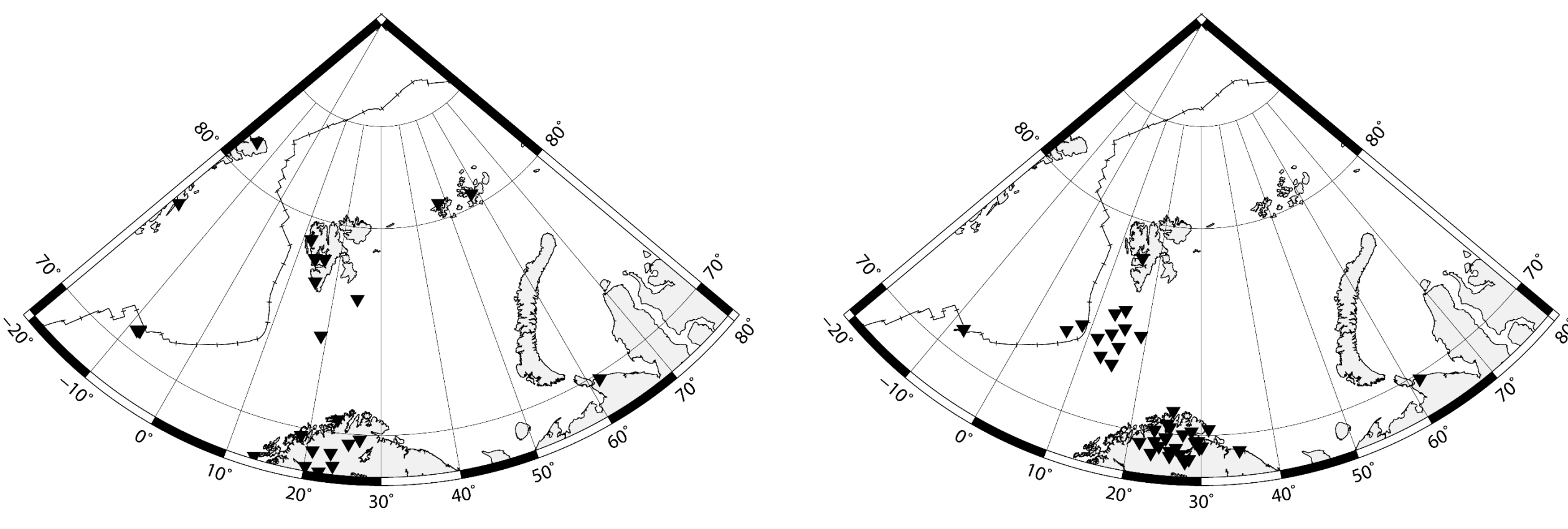
(1) NORSAR, Kjeller, Norway, (2) N. Laverov Federal Center for Integrated Arctic Research of the Ural Branch of the Russian Academy of Sciences, Arkhangelsk, Russian Federation, (3) Kola Branch, Geophysical Survey of Russian Academy of Sciences, Apatity, Russian Federation, (4) Independent Researcher, Skjetten, Norway

Recent years have shown an increased interest in Polar research and in particular in understanding tectonics and seismic hazard in the Arctic. To understand the seismic activity in the European Arctic, the seismic bulletins should be as complete as possible. We present a new seismic event bulletin for the European Arctic (70° – 90° N, -15° – 75° E), for the 24-year long period 1990 – 2013. The poster will show in detail the merging of the different sources taken in account for the compilation, the homogenization of the data and the relocation of the seismic events. With respect to the ISC bulletin for this region, the new bulletin contains 5,932 new seismic events and 54,630 new seismic onset readings from stations mostly located at regional distances. The gains are distributed over the entire study region, with the most significant contributions across the Svalbard Archipelago, along the Knipovich and northern Mohns Ridges, as well as northern Fennoscandia.

A detailed description of the process to compile the bulletin and to relocate the seismic events has been recently published (Schweitzer et al., 2021; Schweitzer et al., 2022).

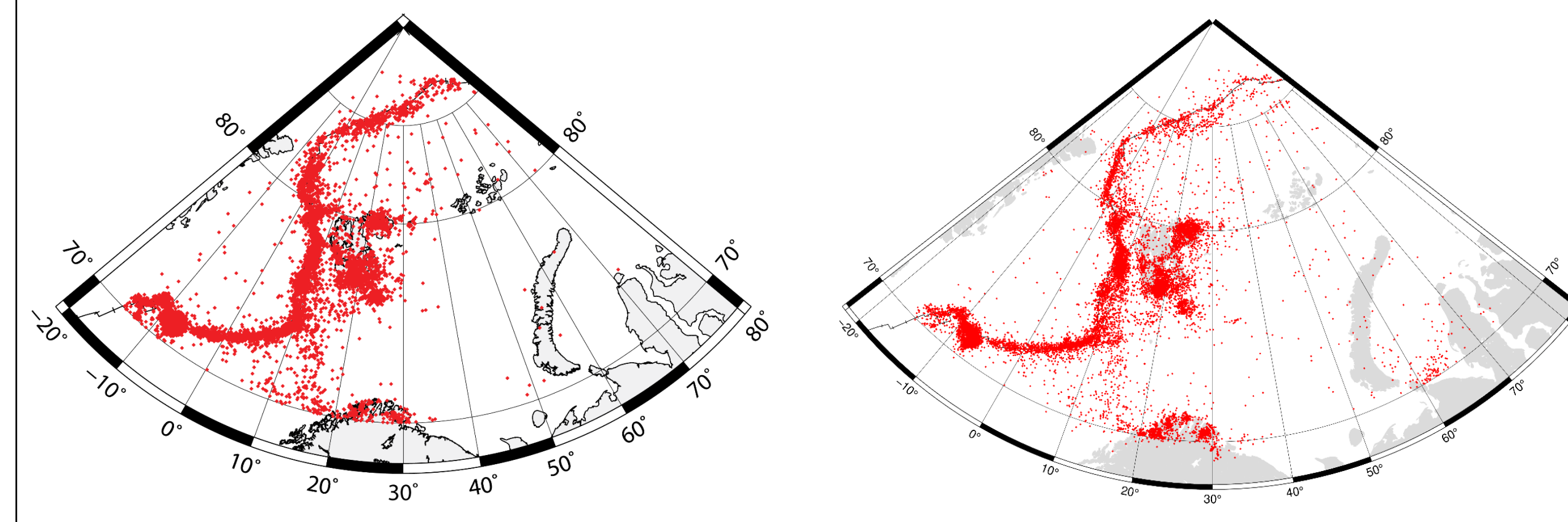
Seismic Stations with Observations

In ISC Bulletins Newly Added



Seismic Event Locations 1990 – 2013

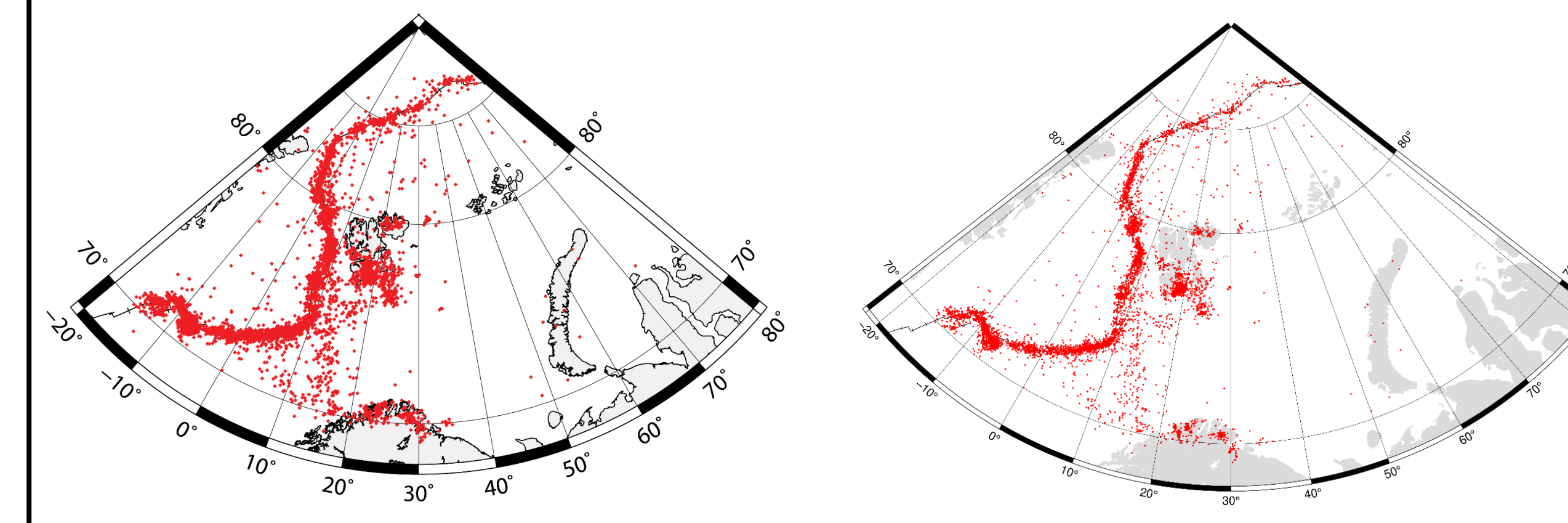
All 14 808 ISC rebuild events All 20 731 EURARC events



Seismic Event Locations 1990 – 2013

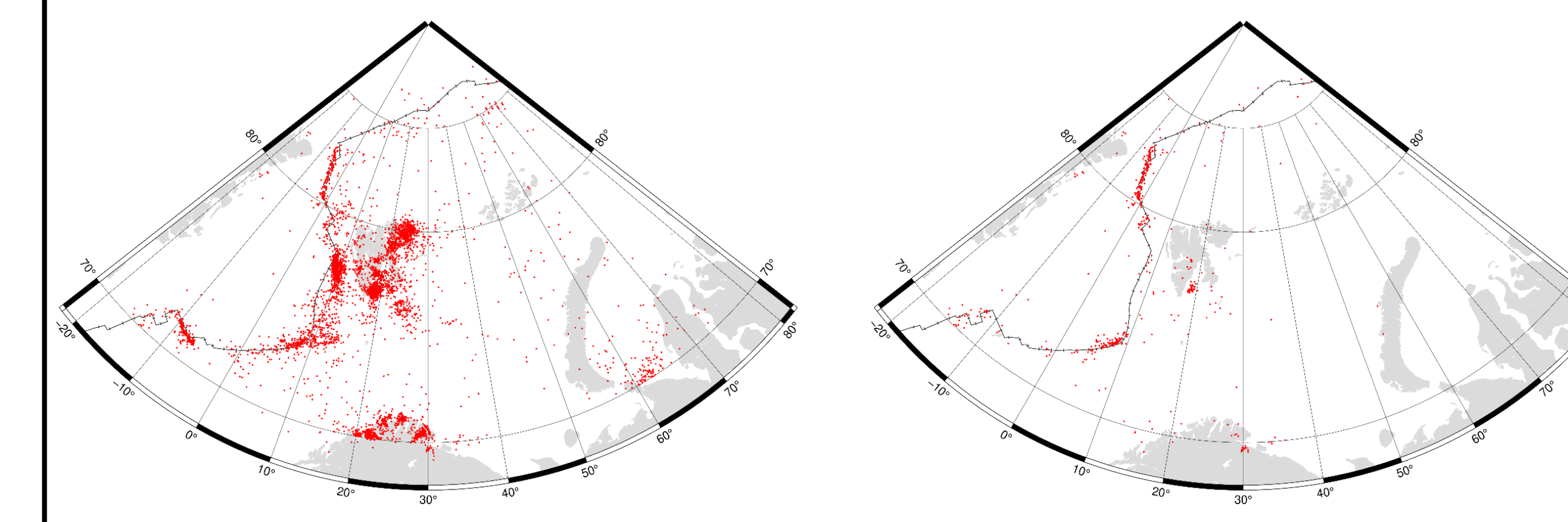
minimum 4 observing stations

7 094 ISC rebuild events 7 933 EURARC events

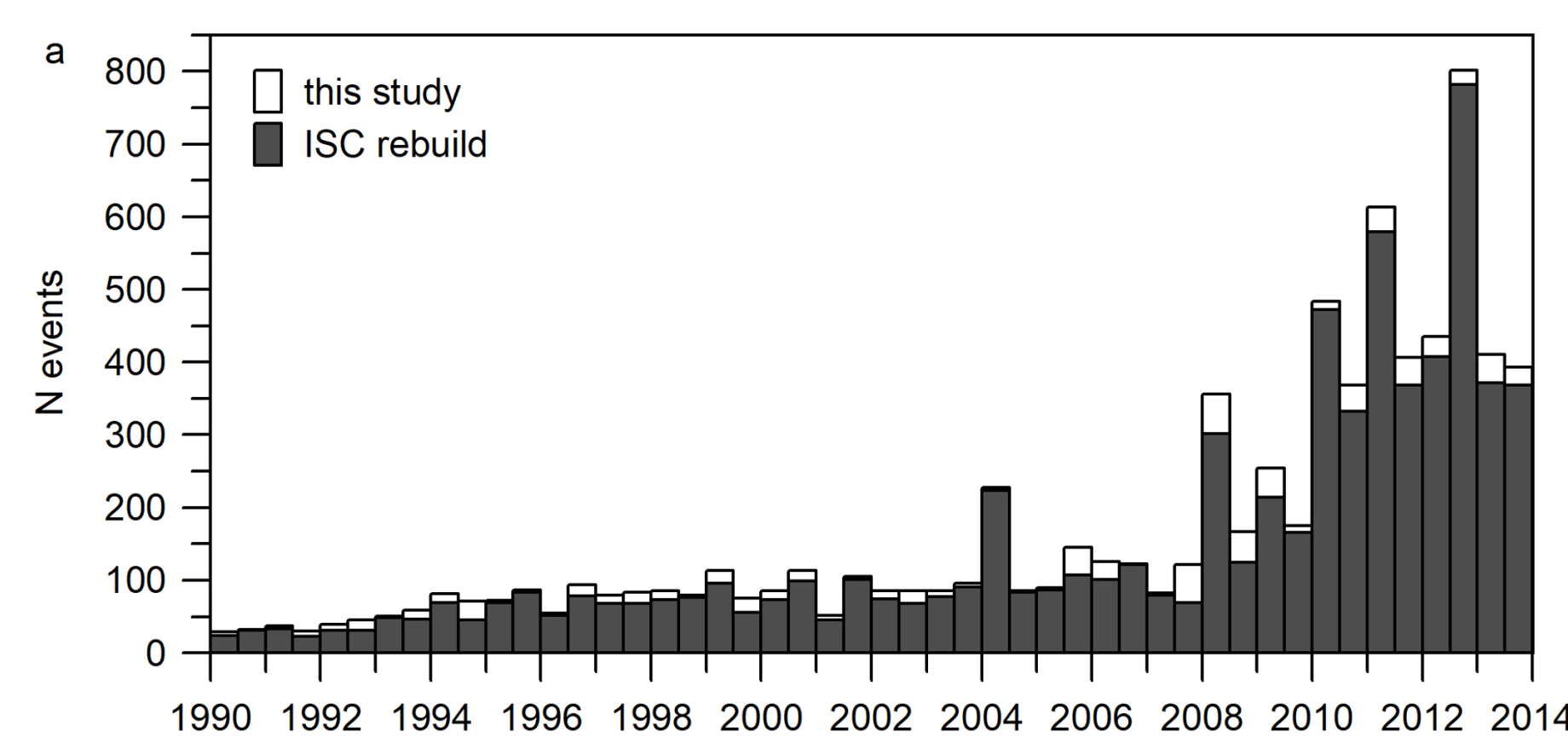


Seismic Event Locations 1990 – 2013

All 5 932 new events 505 new events with min 4 stations

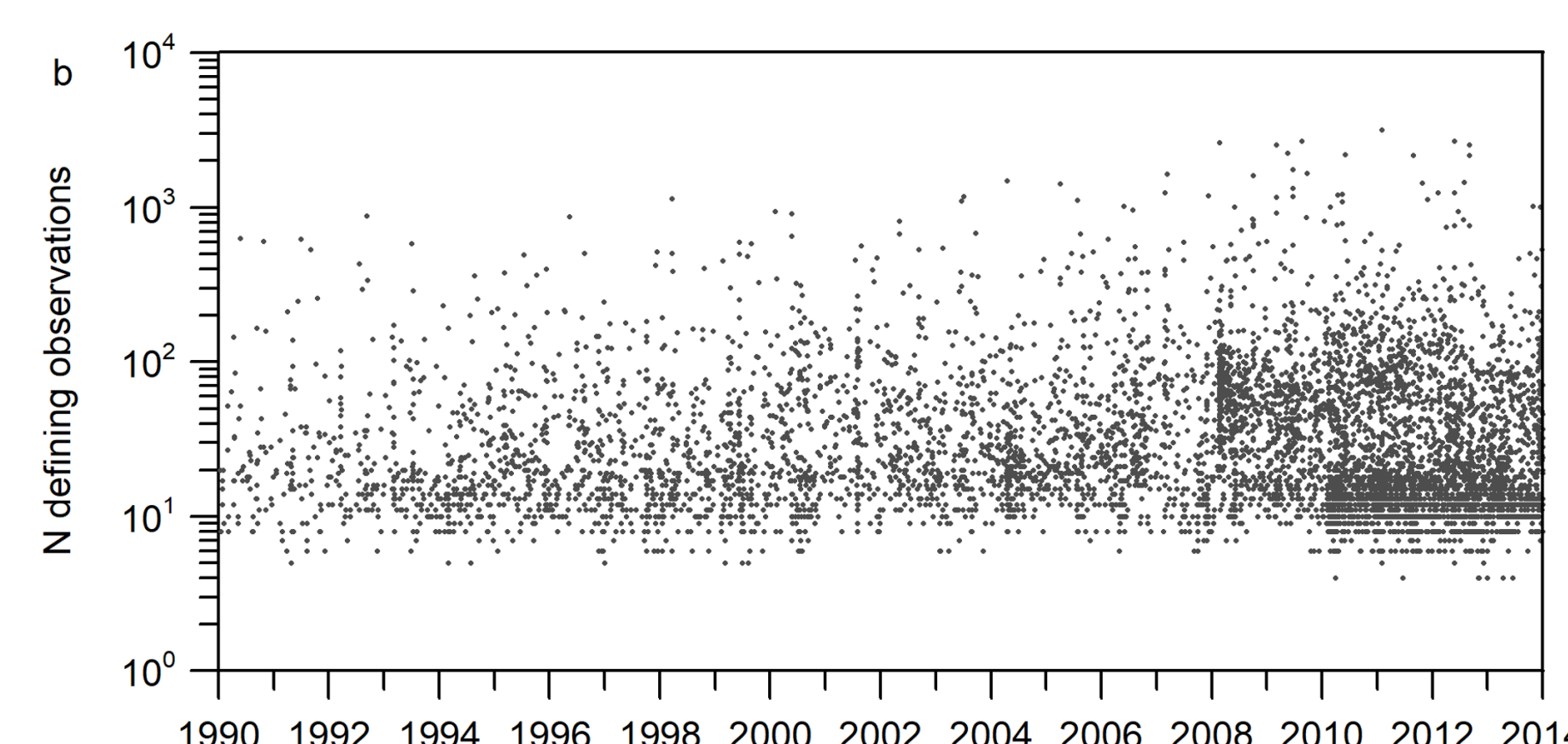


Timeline

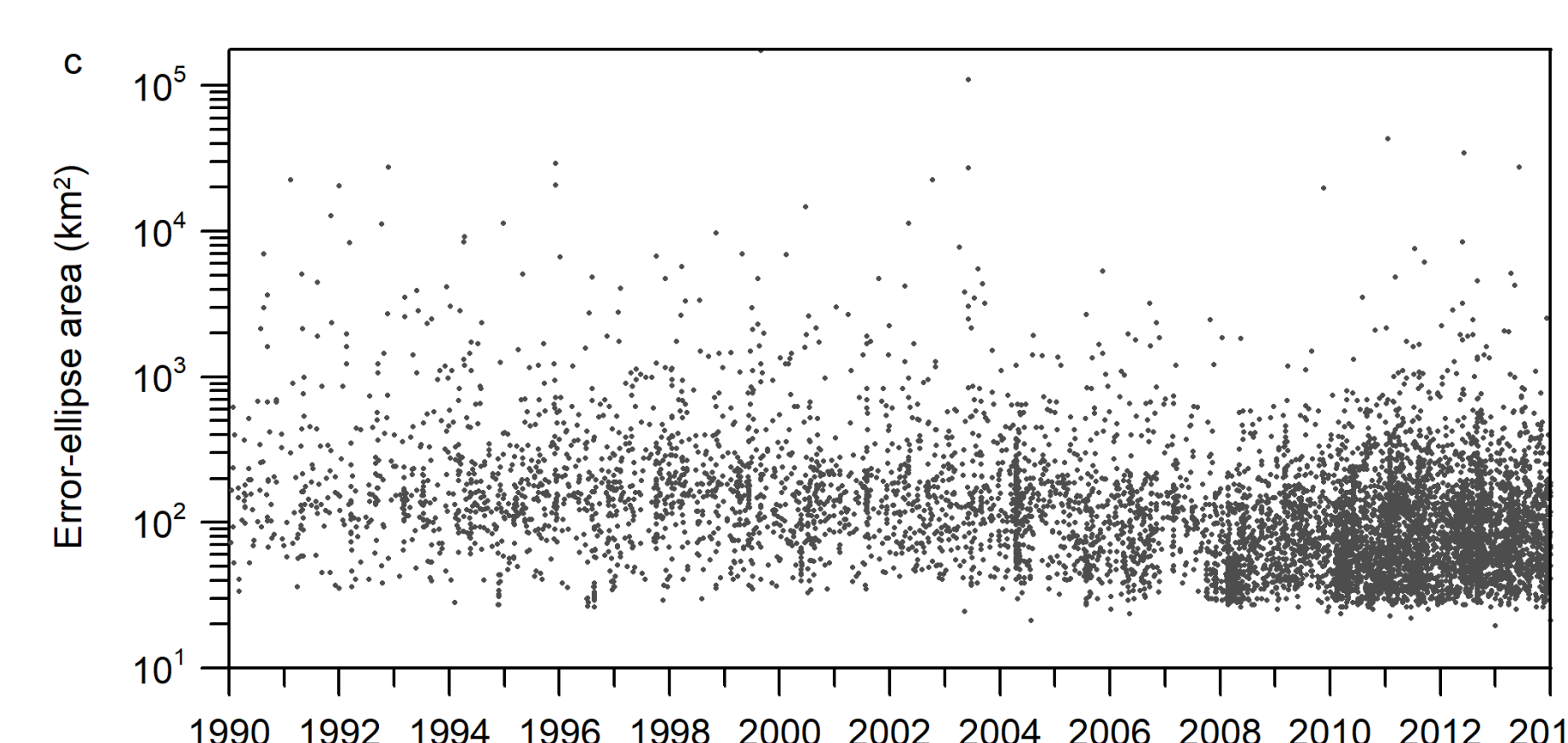


a) Histogram of the number of seismic events observed and located by at least 4 seismic stations or arrays per 6 months. Gray bars represent the ISC rebuild Bulletin events and white bars the events of the new bulletin. b) Number of defining observations during hypocenter inversion for each event against time. c) Area of 95% confidence-level uncertainty ellipse for the best location estimate against time.

Number of Defining Data



Uncertainty-Ellipse Area



Acknowledgements

This research has been partly funded within the Russian-Norwegian cooperative project «Seismological research related to geophysical processes in the European Arctic» funded by grants from the Russian Foundation for Basic Research (14-05-93080) and the Norwegian Research Council (233973/H30). G.N.A. and Y.V.K. have been also partly funded by the Russian Foundation for Basic Research grant no. 18-05-70018. We thank James Harris (ISC), for preparing and providing several copies of the ISC database during the work on this paper. We thank Steven Gibbons for providing us with his collection of readings from events on the mid-Atlantic ridge. We thank Marja Uski and Kati Oinonen for helping with the download of the Nordic Bulletin and Peter Voss for providing us with the Danish Earthquake bulletin.

Published as:

Schweitzer, J., B. Paulsen, G. N. Antonovskaya, A. V. Fedorov, Y. V. Konechnaya, V. E. Asming, and M. Pirl (2021). A 24-Yr-Long Seismic Bulletin for the European Arctic, *Seismol. Res. Lett.* **92**, 2758–2767, doi: 10.1785/0220210018.

Schweitzer, J., B. Paulsen, G. N. Antonovskaya, A. V. Fedorov, Y. V. Konechnaya, V. E. Asming, and M. Pirl (2022). EURARC – a bulletin for the European Arctic 1990 – 2013. *ISC Seismological Dataset Repository*, 2022, doi: 10.31905/TYLLQY8T