KOLA

Seismic sounding of the Barents Sea shelf-mainland junction zone

June-September 1995

Submitted By

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Data for the 1995 Kola Seismic Experiment

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This experiment was carried out in the transition zone between the Baltic Shield and the Barents Sea Plate and is considered to fill up ~ 100 km gap in seismic observations along the previously conducted geotraverse EU-3. Marine airgun shots were recorded on-land at four sites: Liinahamary, Kola Superdeep Borehole (SD-3), Prirechny, and Apatity (Fig. 1). At the SD-3 location seismic signals were recorded at the well head and at 5050 m below the surface. Besides the major marine shots, a far-offset (4920 m) VSP in the SD-3 (200 - 5050 m depth range) was acquired using seismic vibrators as a source.

Ten 3-component IRIS/PASSCAL RefTeks were used in this experiment during June-September 1995. However, due to our need to continuously record for several days and instrument's memory limitations, we only recorded vertical component data from the marine sources. Vertical seismic profiling (VSP) was conducted using a 4-component ('120° geometry') Russian tool and all 4 components are presented. Each source and recording site was equipped with GPS-receivers affording accurate timing and locations.

Data reduction and archival

The data recorded are corrected for timing problems that occurred due to occasional loss of GPS lock. Once timing is corrected, the shots are identified and the associated data removed from tape, binned into receiver gather, and recorded to file in SEG-Y (IBM floating point) format with proper header information. Each receiver gather corresponds to a single SEG-Y file. The source-receiver offset information is stored in standard SEG-Y locations and timing information is stored in PASSCAL SEG-Y locations. The VSP records

have depth values stored in OFFSET trace-headers locations that are also duplicated in FFID numbers. VSP component numbers are stored in CHAN trace headers. Each SEG-Y file from a recording site is stored separately in the directory with the name corresponding to this recording site (Fig. 1). Each binary SEG-Y file is supplied by a READ.ME text file created in UNIX. These text files contain information about instrument number, start/stop times, coordinates and offset range. The time-table of the marine shots with precise ship positioning (latitude-longitude and UTM coordinates) is stored in the SHIP_COORD directory as a UNIX text-file. All the data files (binary and text) in corresponding directories are saved on the tape using UNIX 'tar' command. Use 'tar xvf ...' to extract these files from the archive tape.

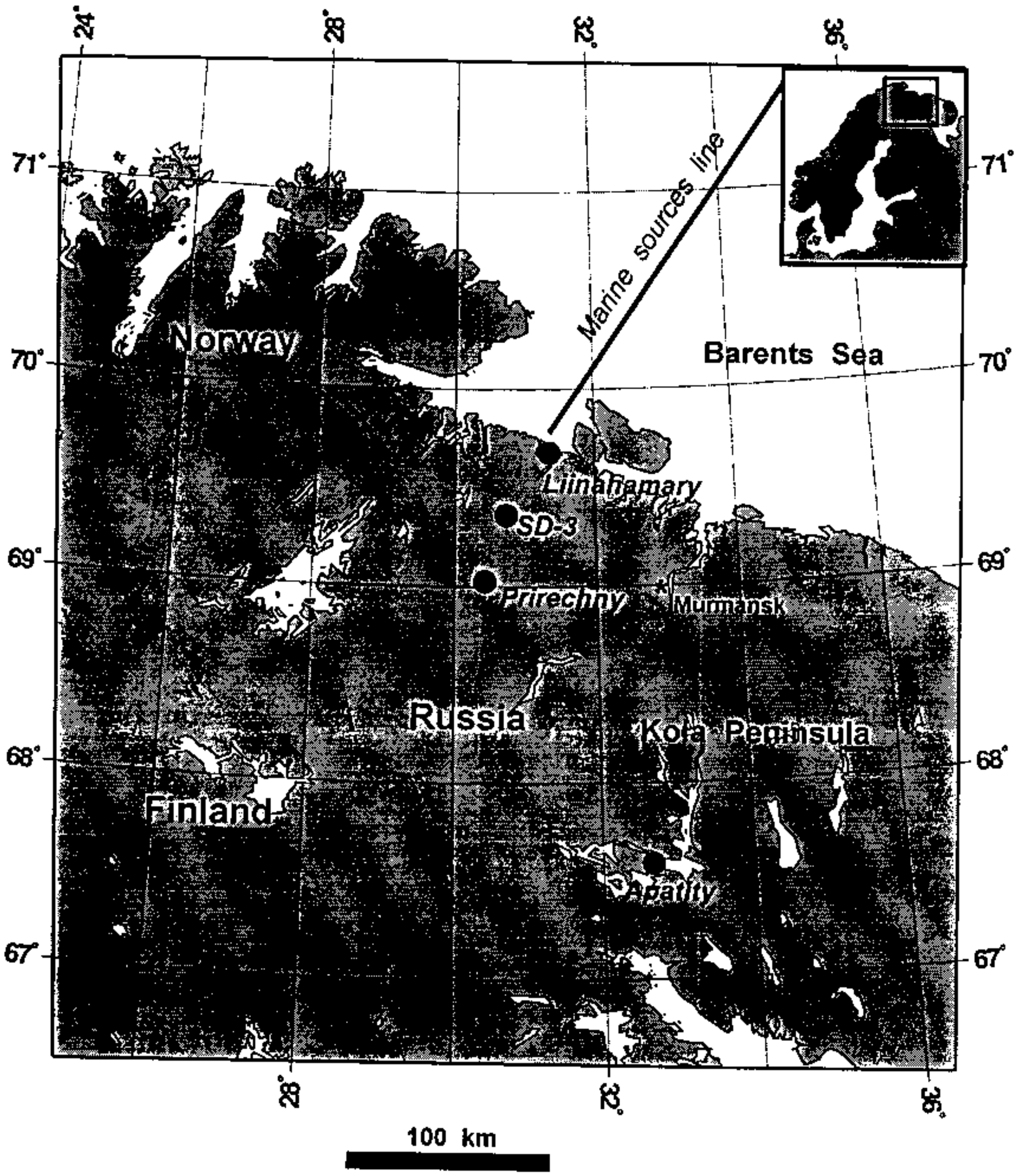

Fig. 1 Location of ship track with airgun shots (solid line) and recording stations (solid circles) during 1995 year experiment in the vicinity of the Kola Superdeep Borehole (SD-3).