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7.3 Current status of development of the regional network associated with the NORSAR Data Processing Center

The purpose of this contribution is to summarize the status of development and future plans for the regional network in northern Europe that contributes seismic data in real time to the NORSAR Data Processing Center. The network is shown in Fig. 7.3.1 and currently comprises the NORESS and ARCESS arrays in Norway, the FINESA array in Finland, the GERESS array in Germany, and the two 3-component stations at Ksiaz and Stary Folwark in Poland. Also summarized in this contribution is the current status of development of the Intelligent Monitoring System (IMS) and plans for the near future.

The new 3-component stations in Poland

A description of the two 3-component stations at Ksiaz and Stary Folwark in Poland is given by Mykkeltveit and Paulsen (1990). The current system, comprising field installations in Poland and associated telecommunications arrangements for real time transmission of data to NORSAR, is shown schematically in Fig. 7.3.2. The system is fully operational as of April 1991, and will enable Poland to take an active part in the GSETT-2 (Group of Scientific Experts' Technical Test number 2) experiment during 22 April – 2 June 1991.

During the fall of 1991, the telecommunication links will be rearranged to include also a satellite ground station in Warsaw for real time reception of data from the two stations in Poland. A Sun Sparcstation-based data acquisition and processing system is also planned for installation at the Institute of Geophysics in Warsaw. It is expected that this will effectively contribute to the broadening of the scientific cooperation between NORSAR and the Institute of Geophysics in Warsaw. Such cooperation is needed in order to acquire relevant information on, e.g., seismicity and wave propagation characteristics in Poland and surrounding areas, for integration into the IMS knowledge base.

The NORESS, ARCESS, FINESA and GERESS arrays

A comprehensive description of NORESS and ARCESS is given in Mykkeltveit *et al* (1990). These array have been in stable and continuous operation since they were installed in 1984 and 1987, respectively. The uptime statistics provided in the present and past issues of the NORSAR Semiannual Technical Summaries testify to this. There are no plans for any significant modifications to these arrays.

The performance of the somewhat smaller, technically less sophisticated, yet very powerful FINESA array in Finland has recently been described by Uski (1990). Considering the simplicity of the FINESA field installation, its operational stability since the upgrade of the data acquisition system in December 1989 has been remarkable. There are no immediate plans for modifying the FINESA system.

The GERESS array in German Bavaria has been described by Harjes (1990). Results from the processing of GERESS data at NORSAR have been presented by Fyen (1990). Although the quality of data received at NORSAR is not yet entirely satisfactory, the data are being processed continuously and also used experimentally by IMS (see below). The GERESS field system developer is currently concentrating on solving remaining technical problems. Cooperative efforts between NORSAR personnel and scientists from the Ruhr University in Bochum, Germany, currently focus on optimizing the GERESS beam deployment. Again, active cooperation is needed for the purpose of supplementing the IMS knowledge base.

Data from all four arrays will be contributed to the GSETT-2 experiment, along with data from about 50 other single stations and arrays worldwide. This will provide another excellent opportunity to assess the capability of NORESS-type arrays for detection of weak seismic events at both regional and teleseismic distances.

The Intelligent Monitoring System

IMS is a system for joint processing of data from a regional network of arrays and single 3-component stations. IMS has been described in detail by Bache *et al* (1990), and initial results from operating the system are given by Bratt *et al* (1990). IMS is distributed between NORSAR and the Center for Seismic Studies (CSS) in Arlington, Virginia, as indicated in Fig. 7.3.2.

The first version of IMS provides for joint processing of data from NORESS and ARCESS. This version has been in operation at NORSAR since January 1990, and event statistics are reported in the Semiannual Technical Summaries. The analysis at NORSAR of regional events for the GSETT-2 experiment is carried out using IMS in its current version.

The IMS system developer SAIC is currently operating an upgraded version of IMS at CSS. This new version allows processing of data from an arbitrary number of arrays and single 3-component stations. Since March 1991, data from NORESS, ARCESS, FINESA and GERESS are jointly and experimentally processed at CSS. According to current plans, this new version of IMS will be installed at NORSAR during the summer of 1991.

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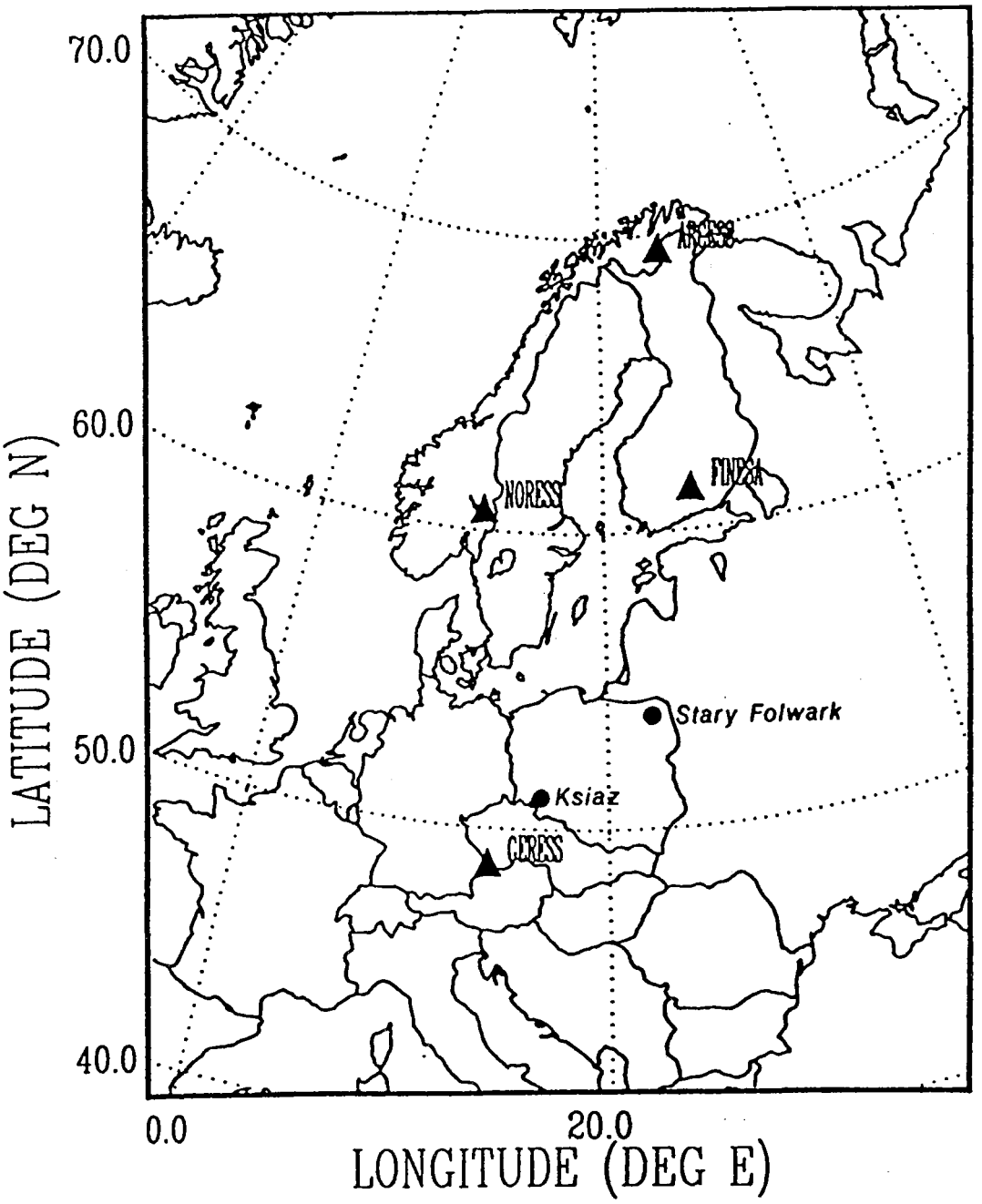

Fig. 7.3.1. The figure shows the network of regional arrays and single 3-component stations in northern Europe contributing real time data to NORSAR.

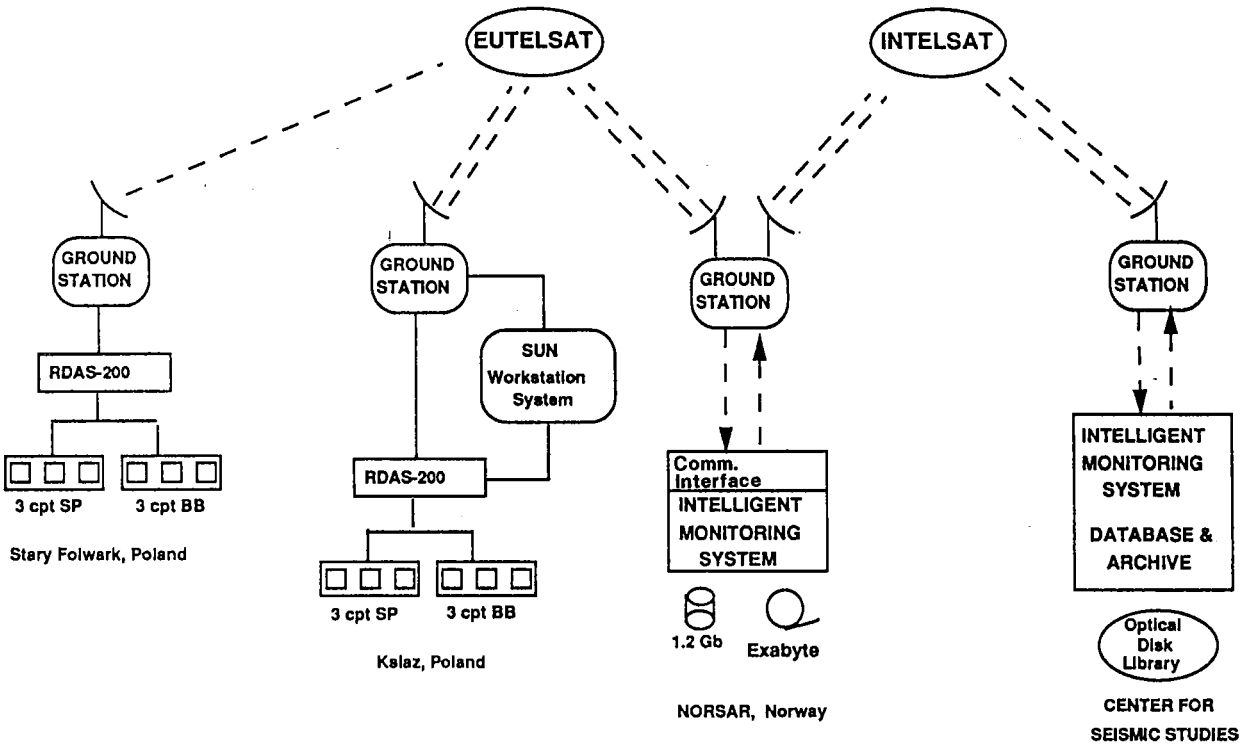

Fig. 7.3.2. The diagram shows the two stations in Poland with associated data communications arrangements. The diagram also shows how data from these stations are made available to the Intelligent Monitoring System, both in Norway and the U.S.