

South African National Seismograph Network (SANSN) FDSN Report 2007

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Seismic Monitoring by the Council for Geoscience

The South African National Seismograph Network (SANSN) is operated by the Council for Geoscience (CGS) and consists of 22 seismograph stations distributed throughout South Africa (See Figure 1). Table 1 lists the geographical coordinates as well as details of the equipment installed at the stations. Data from three stations of the International Monitoring System (IMS) is routinely used for earthquake locations in southern Africa, viz., Boshof, Lobatse and Sutherland.

The SANSN functions as a regional network recording both continuous waveform data at 20 samples per second (sps) and triggered waveform data at 100 sps, except for the Kloof (KLOF) station situated in the Far West Rand goldmining area which records triggered waveform data at 750 sps.

Waveform data transmission to the Data Analysis Center (DAC) in Silverton is facilitated through General Packet Radio System (GPRS) which provides near-realtime communication with the remote stations. The CGS employs the SeisComp data acquisition software developed by the GeoForschung Zentrum in Potsdam, Germany, while data analysis is undertaken with the SEISAN earthquake analysis software developed by the University of Bergen, Norway.

Results of phase data analysis is reported routinely in quarterly seismological bulletins published by the CGS and are also routinely made available to the International Data Center (IDC) in the United Kingdom and the National Earthquake Information Center (NEIC) in the United States. Daily assessments of large earthquakes in South Africa is reported on the CGS website (<http://www.geoscience.org.za>) while phase data for large earthquakes in southern Africa is also provided to the European Mediterranean Seismological Center (EMSC).

The CGS is actively involved with the Indian Ocean Tsunami Warning System (IOTWS) and provide continuous waveform data from 5 broadband stations located at Calvinia, Ceres, Grahamstown, Mussina and Pongola to the International Data Center (IDC).

The SANSN also provides waveform data from 11 stations to the AfricaArray project, an initiative between Penn State University, University of the Witwatersrand and the CGS, to uplift Geoscience training on the African Continent.

Future Plans for SANSN

Implementation of the AUTOLOC software is envisaged during the 2007 financial year to distribute alerts of large earthquakes to employees of the CGS. Maintenance issues of damp vaults at selected stations, security for stations and the relocation and upgrade of the Newcastle station will be addressed during the next year.

It is envisaged to expand the SANSN with additional stations in the gold/platinum mining areas within the next 2 years as well as equipping backup stations for the IOTWS with broadband equipment.

Table 1: Stations of the South African National Seismograph Network.

LOCALITY AND STATION CODE	LATITUDE (DEG MIN)	LONGITUDE (DEG MIN)	ELEVATION ABOVE SEA LEVEL (METERS)	INSTRUMENTS
Belfast (BFT)	25°41.20'S	30°02.60'E	1868	EARS Micro 24 bit Digital recorder with a Guralp CMG-40T extended short-period seismometer.
Calvinia (CVN)	31°27.00'S	19°45.70'E	1050	EARS Omega 24 bit Digital recorder with a Geotech Instruments KS2000 broadband seismometer.
Ceres (CER)	33°21.70'S	19°17.60'E	472	EARS Omega 24 bit Digital recorder with a Geotech Instruments KS2000 broadband seismometer.
Elim (ELIM)	34°35.80'S	19°44.70'E	472	EARS Micro 24 bit Digital recorder with a Guralp CMG-40T extended short-period seismometer.
East Rand Property Mines (ERPM)	26°14.60'S	28°14.51'E	1611	EARS Micro 24 bit Digital recorder with a Mark Products L4-3D three-component short-period seismometer.
Grahamstown (GRM)	33°18.80'S	26°30.50'E	610	EARS Omega 24 bit Digital recorder with a Geotech Instruments KS2000 broadband seismometer.
Gariiep Dam (HVD)	30°36.30'S	25°29.80'E	1433	EARS Micro 24 bit Digital recorder with a Guralp CMG-40T extended short-period seismometer.
Kloof (KLOF)	26°20.99'S	27°36.60'E	1631	EARS Micro 24 bit Digital recorder with a Mark Products L4-3D three-component short-period seismometer.
Komaggas (KOMG)	24°47.94'S	17°29.02'E	299	EARS Omega 24 bit Digital recorder with a Guralp CMG-40T extended short-period seismometer.
Kokstad (KSD)	30°32.46'S	29°25.00'E	1350	EARS Micro 24 bit Digital recorder with a Geotech Instruments KS2000 broadband seismometer.
Koster (KSR)	25°51.10'S	26°53.83'E	1623	EARS Omega 24 bit Digital recorder with a Guralp CMG-40T extended short-period seismometer.
Lephalale (LEP)	23°38.98'S	27°44.81'E	840	Stand Alone Quake Seismometer with a Guralp CMG-40T extended short-period seismometer.
Mopani (MOPA)	23°31.04'S	31°23.86'E	362	EARS Micro 24 bit Digital recorder with a Guralp CMG-40T extended short-period seismometer.
Mussina (MSNA)	22°20.71'S	30°01.39'E	600	EARS Micro 24 bit Digital recorder with a Geotech Instruments KS2000 broadband seismometer.
Newcastle (NWL)	27°43.24'S	29°57.19'E	1332	EARS Omega 18 bit Digital dial-up event recorder with a short-period Mark Products L4-C seismometer.
Pongola (POGA)	27°22.19'S	31°36.70'E	290	EARS Micro 24 bit Digital recorder with a Geotech Instruments KS2000 broadband seismometer.
Prieska (PKA)	29°40.20'S	22°45.40'E	960	EARS Omega 24 bit Digital recorder with a Guralp CMG-40T extended short-period seismometer.
Silverton (SLR)	25°44.10'S	28°16.90'E	1348	Nanometrics Calisto Europa with a Streckeisen STS-2 broadband seismometer.
Senekal (SEK)	28°19.40'S	27°37.50'E	1486	EARS Omega 24 bit Digital recorder with a Guralp CMG-40T extended short-period seismometer.
Schweizer-Reneke (SWZ)	27°10.94'S	25°19.90'E	1342	EARS Omega 24 bit Digital recorder with a Guralp CMG-40T extended short-period seismometer.

Table 1: Stations of the South African National Seismograph Network (Contd).

LOCALITY AND STATION CODE	LATITUDE (DEG MIN)	LONGITUDE (DEG MIN)	ELEVATION (METERS)	INSTRUMENT
Somerset-East (SOE)	32°42.70'S	25°33.70'E	820	EARS Omega 18 bit Digital dial-up event recorder with a Mark Products L4-3D three-component short-period seismometer.
Jpington (UPI)	28°21.72'S	21°15.16'E	845	EARS Omega 24 bit Digital recorder with a Geotech Instruments KS2000 broadband seismometer.

Figure 1: Geographical distribution of stations comprising the South African National Seismograph

