

Annual Project Summary

Cooperative Central and Southeastern US Integrated Seismic Network-VPI&SU

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Martin C. Chapman, Virginia Tech, Department of Geological Sciences, Blacksburg, Virginia, 24061-0420, telephone (540) 231-5036, mcc@vt.edu

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INVESTIGATIONS UNDERTAKEN

The Virginia Tech seismic network operates in conjunction with other regional networks in mid-America region to collect high-quality seismic data in Virginia and adjacent parts of the Appalachian region. Research objectives include earthquake monitoring to maintain continuity of earthquake catalogs for seismic hazard assessment, studies of the seismotectonics of the region, earthquake source studies, wave propagation, and the temporal/spatial behavior of seismicity. Outreach objectives include development and maintenance of regional earthquake catalogs; and dissemination of information to federal/state/local governments, the engineering community and the general public.

RESULTS

Stations in operation during the report period are shown in Figure 1. The stations are 3 component, short-period with 24-bit digitization. Telemetry to the central recording facility on-campus is by duplex digital VHF radio. During the summer months of this report period, ANSS strong motion station CVVA was installed in Charlottesville, Virginia on the grounds of the Virginia Division of Mines and Minerals. That station became operational in late September, 2002, and is providing data for earthquake engineering applications, as well as helping to monitor the central Virginia area.

The digital network data are ported to an EARTHWORM system and are being exported to USGS NEIC in Golden, Co, CERl (University of Memphis), JIEE-TVA in Knoxville, TN and to the University of South Carolina in Columbia. Along with Virginia Tech, these institutions as well as others in the central and southeastern U.S. are presently developing improved data analysis and archiving procedures to take advantage of the greatly increased efficiency provided by the EARTHWORM systems now operational at the various institutions. Virginia Tech and other collaborative institutions are committed to efficient data acquisition, analysis and dissemination under the auspices of the mid-America region of the Advanced National Seismic System (see the ANSS-MA website at <http://www.anss-ma.org>).

In addition to the data dissemination via EARTHWORM, Va Tech maintains an anonymous ftp site containing waveform data from selected regional events. This is accessible via web browsers at <ftp://vtso.geol.vt.edu/events>. The worldwide web site <http://www.geol.vt.edu/outreach/vtso/> contains information on how to access the waveform data, as well as the other products of this project, which include a regional seismicity bulletin and historical earthquake catalog for the southeastern U.S. region. In addition, the website includes twelve hour digital Helicorder trace data from vertical components of the network.

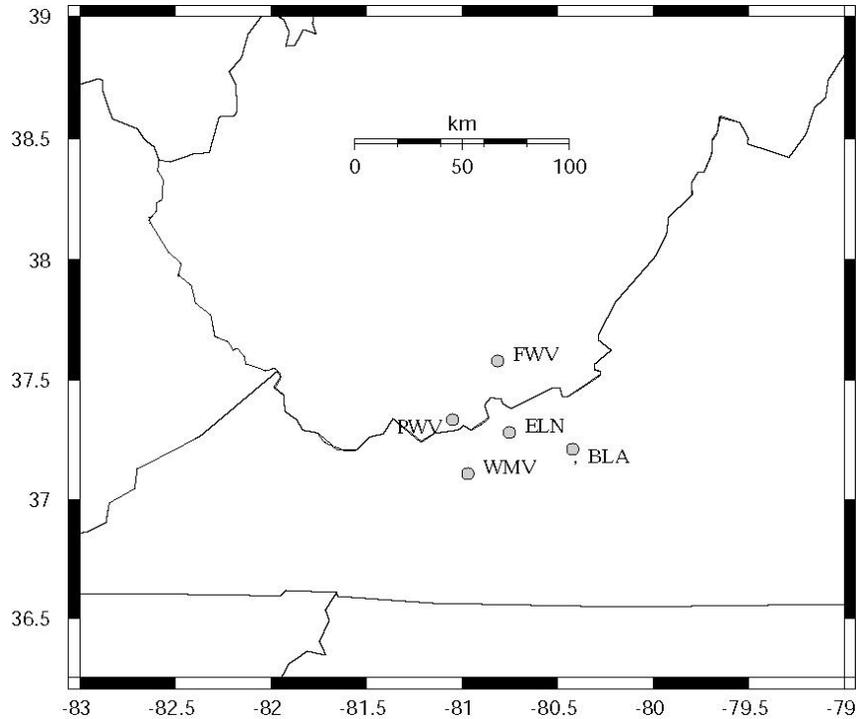


Figure 1. Circles show seismic stations operated by Virginia Tech.

Recent Seismicity in Virginia and the Southeast US

Figure 2 shows the epicenters of earthquakes in the Southeastern U.S. region reported in the 36th volume of the Southeastern United States Seismic Network Bulletin, for 2001, and earthquakes in the state of Virginia during the report period.

Virginia earthquakes during the report period include a magnitude 1.8 event on October 1, 2001 near Roanoke, Va that was not reported felt, a magnitude 1.8 shock 8 km northwest of Pulaski, Va on November 11, 2001, that was not felt, a magnitude 1.6 event near Blacksburg, Va on November 18, 2001 that was not felt, and a magnitude 3.1 Mblg event near Forrest Hill, West Virginia that should have been felt, but was not reported. This latter event was well recorded by the VA TECH network as well as by numerous regional stations. It occurred near our northernmost station FWV, in a very rural and sparsely populated area. The seismicity in western Virginia - southern West Virginia has been monitored by Virginia Tech since 1977 as is beginning to show a marked North-South alignment of epicenters. This latest event is one of the larger events to occur on this trend. The years 2000 and 2001

were relatively active years in terms of small shocks detected by the network. However, 2002 has to date been totally inactive.

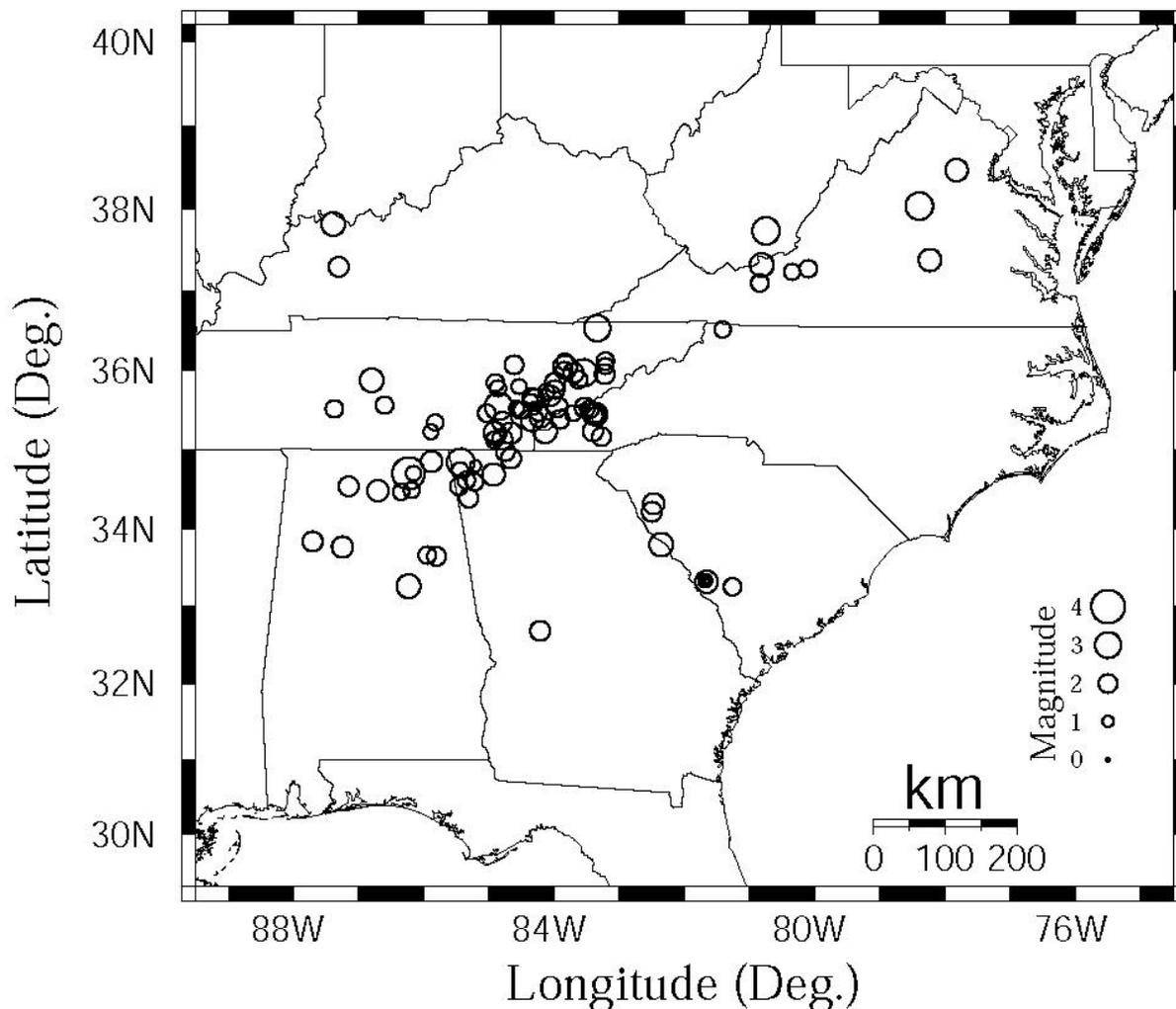


Figure 2. Epicenters of earthquakes occurring during 2001 and contained in the Southeastern U.S. Seismic Network Bulletin No. 36.

NONTECHNICAL SUMMARY

The Virginia Tech seismic network contributes to the earthquake monitoring of the southern Appalachian region of the southeastern United States. Data exchange with collaborating institutions is real-time, continuous. Data products generated by the project during the report period are available on-line, including waveform data for Virginia earthquakes, instrumental earthquake catalogs and a historical catalog of events in the southeastern region. On-line helicorder displays for the vertical component stations are also accessible at web site www.geol.vt.edu/outreach/vtso.

REPORTS PUBLISHED

The 35th volume of the Southeastern United States Seismic Network Bulletin for events occurring during the 2000 calendar year was finalized and distributed to over 200 institutions and individuals in December, 2001 of this report period. The bulletin contains complete phase arrival time data from all stations recording each tectonic earthquake, as well as much additional information on southeastern U.S. seismicity and network operation. Text versions of the Southeastern U.S. Seismicity Bulletins can be obtained electronically at the Va Tech website, or by anonymous ftp, at the address/URL cited above.

Volume 36 of the Southeastern United States Seismic Network Bulletin for calendar year 2001 has been finalized and will be mailed during November, 2001. Electronic versions of volume 36 in ASCII text and PDF format will be available soon (Early December, 2002) at our website and anonymous ftp address.

The CNSS Composite Catalog (<http://quake.geo.berkeley.edu/cnss/>) currently contains the listing of instrumentally located tectonic earthquake hypocenters and magnitude estimates for the southeastern US region, complete through 2001. Phase arrival time data for events are available on-line in the electronic versions of the SEUSSN bulletins, at the Virginia Tech anonymous ftp address (vtso.geol.vt.edu) or via the website <http://www.geol.vt.edu/outreach/vtso/>.

Bibliography of Published Reports during Report Period:

Southeastern U.S. Seismic Network Operators, (2001). *Southeastern U. S. Seismic Network Bulletin No. 35*, (compiled by M. C. Chapman, E. C. Mathena), Virginia Tech Seismological Observatory, Dept. Geological Sciences, Blacksburg, Va, 67 p.