

## **Regional Network Monitoring at Virginia Tech**

**Grant Award No. 99-HQ-AG-0172**

**Martin C. Chapman**

**Ph: (540) 231-5036, email [chapman@vtso.geol.vt.edu](mailto:chapman@vtso.geol.vt.edu)**

**J. Arthur Snoke**

**Ph: (540) 231-6028, email: [snoke@vt.edu](mailto:snoke@vt.edu)**

**Department of Geological Sciences  
Virginia Polytechnic Institute and State University  
Blacksburg, Virginia 24061-0420**

**<http://www.geol.vt.edu/outreach/vtso/>**

**Annual Project Summary  
November 1, 2000**

### **INVESTIGATIONS UNDERTAKEN**

The Virginia Tech seismic network operates with the objective of collecting high-quality seismic data in the southern Appalachians. 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.

A major transition in data acquisition occurred during the report period. The digital network data are now being ported to an EARTHWORM system, installed in June 2000. The data are currently 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 recently organized 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.

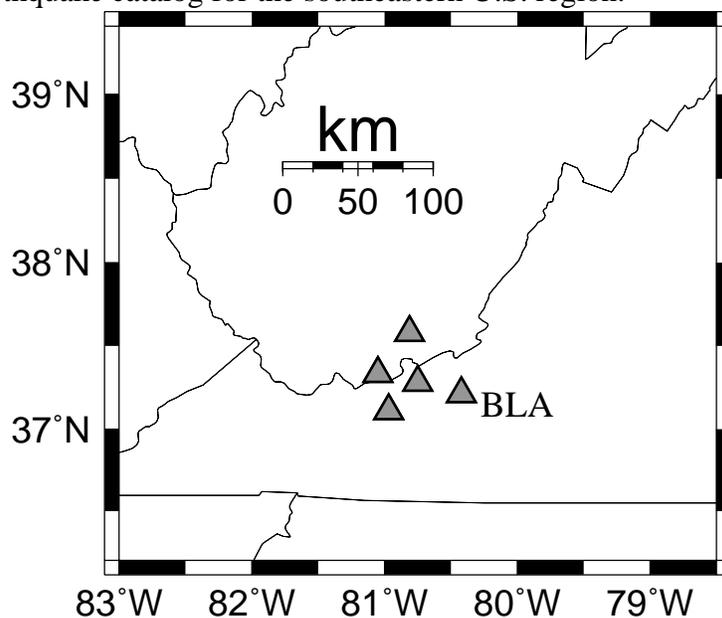


Figure 1. Triangles show seismic stations operated by Virginia Tech.

### **Recent Seismicity in Virginia and the Southeast US**

Figure 2 shows the epicenters of earthquakes in the Southeastern U.S. region reported in the 34th volume of the Southeastern United States Seismic Network Bulletin, for 1999. A more recent Virginia shock on August 18, 2000 was strongly felt in southwestern Roanoke County and the city of Roanoke. The epicenter was in the Blue Ridge Mountains, about 5 miles to the southwest of Roanoke, VA. Duration magnitude was 2.5. Waveform data for these events are accessible at the Va Tech anonymous ftp address.

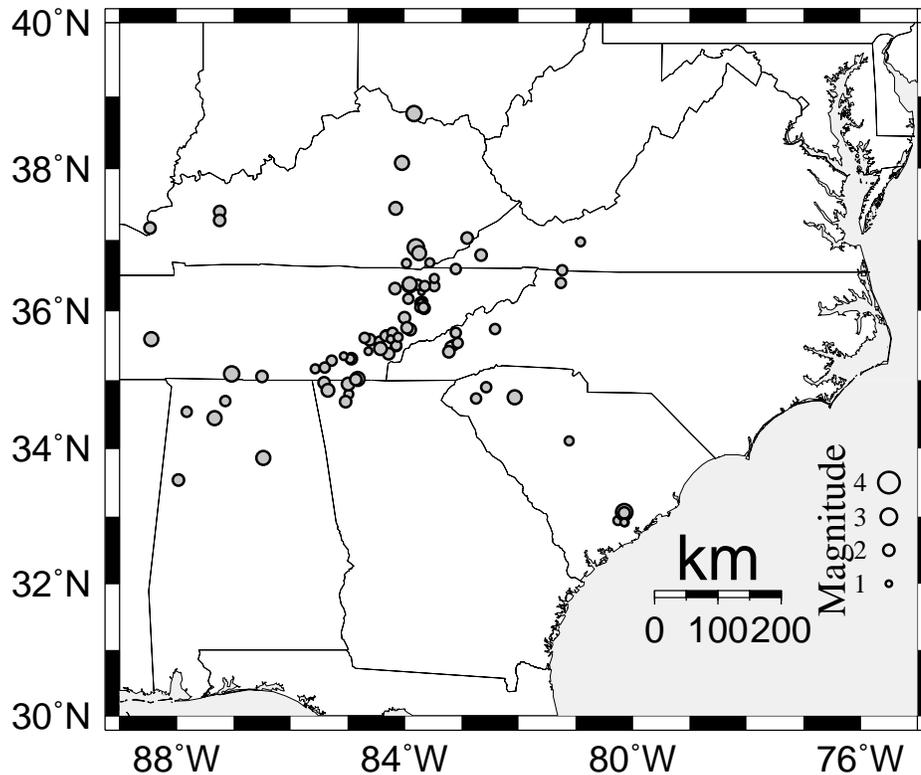


Figure 2. Epicenters of earthquakes occurring during 1999 and contained in the Southeastern U.S. Seismic Network Bulletin No. 34.

### **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 has been upgraded during the past year. Data products generated by the project during the report period are available on-line, including waveform data for two felt Virginia earthquakes, instrumental earthquake catalogs and a historical catalog of events in the southeastern region.

### **REPORTS PUBLISHED**

The 33rd volume of the Southeastern United States Seismic Network Bulletin for events occurring during the 1998 calendar year was finalized and distributed to over 200 institutions and individuals in December, 1999 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 34 of the Southeastern United States Seismic Network Bulletin for calendar year 1999 is now in the final stages of preparation and will be mailed during November, 2000.

Electronic versions of volume 34 in ASCII text and PDF format will be available soon (November, 2000) 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 1999. 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, (1999). *Southeastern U. S. Seismic Network Bulletin No. 33*, (compiled by M. C. Chapman, E. C. Mathena and J. A. Snoke), Virginia Tech Seismological Observatory, Dept. Geological Sciences, Blacksburg, Va, 63 p.