

Final Technical Report

ARRA Upgrade of some ANSS Seismic Stations in the Central U.S.

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1. Executive Summary

All upgrades funded under this award are complete. Upgrades were made to nine existing broadband seismograph stations, one analog station and the data center. The upgrades to the nine existing broadband stations brought the stations to ANSS standards by modernizing the data acquisition system and adding accelerometers.

2. Detailed Summary

Station upgrades were made at nine existing broadband sites and one analog recording site of the Saint Louis University portion of the New Madrid (NM) seismic network. The station upgrades were quickly accomplished immediately after the award. USIN, SIUC and OLIL only required a Baler14 storage unit. Other stations had the digitizers upgraded and an accelerometer added. The upgrade at PLAL occurred during year 2 of the funding since this was a remote site that required a site visit by USGS personnel because of the satellite telemetry; the PLAL site is the only site whose sensor orientation was verified by USGS field procedures. The SIUC station was quickly upgraded in equipment; in August 2011, all equipment was moved to a new, quieter site. The CGM3 site is unique since it consists of two accelerometers with $\pm 2g$ and $\pm 1/8g$ sensitivities, with the latter serving as a sensitive seismometer.

Table 1 shows the major equipment installed under the ARRA funding (indicated by normal font and background color) as well as other equipment at the broadband stations. Equipment serial numbers are provided. Except for the serial numbers of the Baler14 storage unit, the digitizer and sensor serial numbers are in the required dataless SEED that has been submitted to the USGS.

All data streams of the SLU network have current, annotated dataless SEED deposited in the NEIC metadata server and at the IRIS Data Management Center. All digital data streams are archived at the IRIS DMC, and all broadband BH data streams are available on the internal NEIC Continuous Wave Buffer.

The locations of all digital stations operated by Saint Louis University are shown in Figure 1. As a result of the ARRA upgrade all previous existing broadband stations now meet ANSS standards by having an accelerometer. In addition these systems have new digitizers.

Table 1. SLU ANSS Broadband Stations

Station	Digitizer	Accelerometer	Storage	Broadband	Note
BLO	Q330 3079	Episensor ES-T 4083	Baler14 6905	CMG3-ESP 3926	
CGM3	Q330HR 2635	Episensor ES-T 2719/1335	Baler14 6699		Site moved
FVM	<i>Q330HR 2175</i>	<i>Episensor ES-T 4081</i>	<i>Baler14 6500</i>	<i>Trillium120 485</i>	
MGMO	<i>Q330HR 2631</i>	<i>Episensor ES-T 3303</i>	<i>Baler14 6678</i>	<i>Trillium40 0577</i>	
MPH	Q330SR 3155	Episensor ES-T 3308	Baler14 6906	CMG3-ESP 3794	
OLIL	Q330 393	Episensor ES-TBH 199	Baler14 6908	CMG3-ESP 3828	
PBMO	Q330 3132	EpisensorES-T 3304	Baler14 6912	CMG3-ESP 3663	
PLAL	Q330 3156	Episensor ES-T 3305	Baler14 6763	CMG3-ESP 3733	
PVMO	Q330 3078	Episensor ES-T 3310	Baler14 6764	CMG3-ESP 3814	
SIUC	Q330 395	Episensor ES-T 1337	Baler14 6904	CMG3-ESP 3934	Site moved
SLM	Q330 3131	Episensor ES-T 3307	Baler14 6907	Trillium 120 768(2)	
UALR	Q330 1855	Episensor ES-T 1336	Baler14 6632	CMG3-ESP 3A38	
USIN	Q330SR 394	Episensor ES-TNH 200	Baler14 6904	CMG3-ESP T3A44	
UTMT	Q330SR 2480	Episensor ES-T 2916	Baler14 6202	Trillium40 0036	
Data Center	IBM X3650M2 rack mounted computers for data ingest, Earthworm, Earthquake Center Web services: Serial numbers 7947AC1-KQWRPDC, 7947AC1-KQWRPDF, 7947AC1-KQWRPDH, 7947AC1-KQWRPDD , 7947AC1-KQWRPDK and 7947AC1-KQWRPDG.				

Note: *Italics indicate a component that was not part of the ARRA upgrade which are indicated by color shading.*

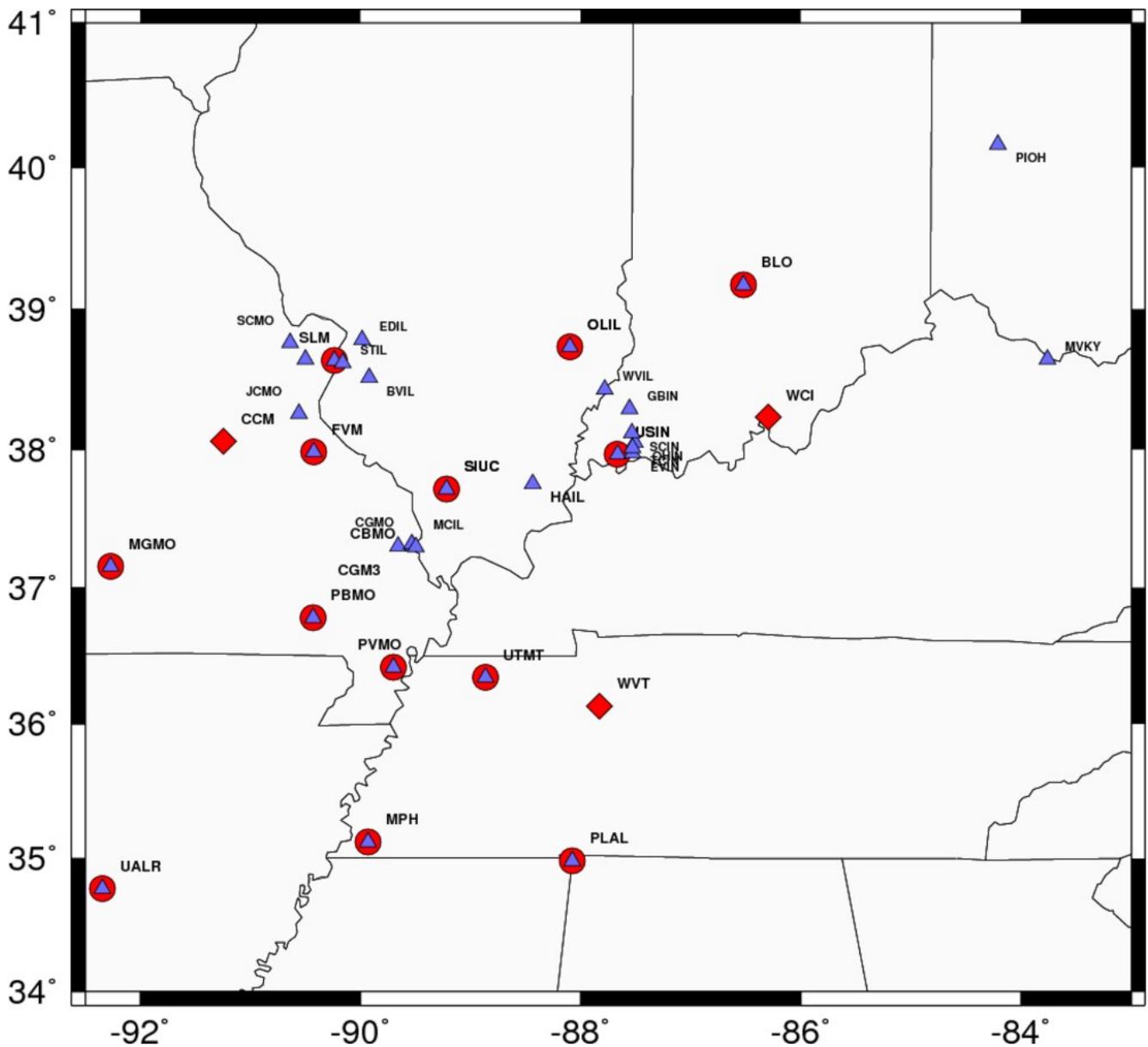


Figure 1. Map of Seismic Stations: Map of stations operated by Saint Louis University. Symbols: red circles – broadband sensor; blue triangle – accelerometer; Note the IRIS IU stations, red diamonds, CCM, WCI and WVT were originally established by Saint Louis University, but are part of the IRIS IU network and receive support from Albuquerque; however SLU provides local assistance. None of the stations shown are ANSS backbone stations, except for the IU stations.