

Association of the State Geologists of the Central U.S. Earthquake Consortium
After Action Report for National Level Exercise 2011

Introduction

This is a report by the Association of the State Geologists of the Central U.S. Earthquake Consortium (CUSEC-SG) on their preparations and participation in the National Level Exercise of 2011 which was held on May 16-20, 2011 for the eight CUSEC states and four FEMA regional offices for that area. The report is presented by sections from the technical director for CUSEC-SG overall response and by the individual state geological surveys.

CUSEC-SG Technical Director (CUSEC-SG TD)

Preparations taken for earthquake response planning

CUSEC Technical Director set up procedures for daily situation conference calls between the State and Federal Geological Surveys during earthquake response. Pertinent information from State and National exercise development meetings were relayed to State Geologists for their preparation in response plans, such as development of plans to accommodate no power conditions and development and coordination of procedures to receive messages into the State Geologist in the SEOC. Several table top scenarios were exercised prior to the NLE-11 for further response plan development.

Any participation in National and State exercise development

CUSEC-SG TD participated in the National development meetings for the NLE-11 and in CUSEC working group meetings of communications, GIS, and exercise officers. CUSEC-SG TD participated with FEMA V along with EMAs of Illinois and Indiana for development of exercise play. Pertinent information from these meetings was relayed to State Geologists for their preparation of response plans.

Also the CUSEC State Geologists' soil site classification and liquefaction susceptibility maps were provided for additional analysis for the 4 northern states based on only having a M7.7 on the SW fault of New Madrid and a M6.0 in the Wabash Valley seismic zone.

Goals and objectives set out for the exercise

Goal was to exercise the CUSEC-SG and USGS daily situation awareness conference call during the NLE-11. Missouri Geological Survey had contact information wallet size cards produced for this and other communication purposes.

Overview and timeline of participation

During the exercise, email and smartphone notification for daily conference calls were made using list provided by USGS and CUSEC-SGs. USGS sent notification onto others such as their expert matter representatives located in the four FEMA Regions.

Analysis of outcomes/performance

Conference calls were very successful in relating problems that regions were encountering and how the other regions could overcome these such as requesting and coordinating imagery and fly overs that would span multiple states and FEMA Regions. These calls provided an overview of activities and locations in each state. Times for the conference calls sometimes were in conflict with some state's SEOC internal situational awareness briefings.

Summary

Procedures for a daily situational awareness call amongst CUSEC-SGs and USGS was developed and exercised during the NLE-11. Calls were successful in sharing information on location of activities in each state and solutions to problems that were developed that could be used in other regions.

Recommendations

Procedures for CUSEC-SG and USGS daily situational awareness conference calls for earthquake response seem to be adequate. No suggested changes had been received or discussed. Situation awareness call times should continue to be moved during the days to accommodate the largest number of participants. List for participant's notification should be reviewed yearly for any changes. There needs to be multiple states with this capability to set up a conference call so that if one cannot do it, others may cover the situation.

Geological Survey of Alabama

The Geological Survey of Alabama (GSA) did not participate in the NLE due to needed response to the April 27 tornado outbreak. Answers below are based on GSA's work in response to the April 27 tornado outbreak across the state. In this disaster, GSA played a Geographic Information Systems (GIS) support role to Alabama Emergency Management Agency (AEMA) as we would during an earthquake.

Problems and needs for improvement

1. Slowed use of AEMA's Emergency Management Tracking System (EMITS) response software. Data and file structure had been reorganized at AEMA since the last hurricane we worked, thus slowing down our capabilities in helping produce maps.
2. Contacting or forwarding calls to specific Emergency Support Functions (EMFs) at the Emergency Operations Center (EOC) was a challenge.
3. At GSA, it was unclear to staff the reimbursement procedures for time spent on response (reimbursement source? project number to charge to on time and attendance sheets?).
4. Coordination of GIS support in the Tuscaloosa office from the EOC during the response was a challenge.
5. Data sharing was often cumbersome. Sending/receiving large data from the EOC to the GSA via email/ftp/other created a big challenge.
6. There was uncertainty of length of continuity of response vs. returning to normal geology contract projects.
7. There was difficulty in finding needed imagery on U.S. Geological Survey (USGS) Hazards Data Distribution System (HDDS) and downloading data efficiently.

Proposed measures to counteract problems

1. Log in/out, server access/protocol, download/upload of real-time data for mapping purposes – these procedures could be typed out ahead of time and given to staff at the EOC so that there is no time required from EMA staff to explain it to those helping. An annual training session on EMITS at the EMA would also help.
2. A copy of a phone directory with phone numbers for each ESF for any staff working at the EOC would have been helpful. A stack of phone directories with ESF, names, agencies, and phone number was/is needed.
3. A Continuity Of Operations Plan (COOP) for the agency would be helpful for work procedures if the agency itself or its city is affected by the disaster. Having written guidelines such as a COOP for agency accounting staff (and others) to refer to during response situations would help.
4. Because GSA staff were directly impacted (e.g. homes were blown away/damaged; helping fire/rescue in Tuscaloosa with maps; etc.), different staff were available on different days, making it difficult to coordinate from a distance. Having one staff member at the GSA who coordinates staff at GSA would be helpful. This needs to be a clear responsibility ahead of time.
5. Slow connection speeds and firewalls at GSA – still unsure what the solution is due to the current economic situation. We have investigated cost of upgrading connection speed, but if/when this will happen is undetermined.
6. When to return to contract projects – having a coordinator at GSA would have helped; discussions with managers would also help to formulate a plan for future disasters.
7. USGS – is there a way to organize HDDS data by county and state within an ftp that will allow quick downloading? HDDS has potential to be incredibly helpful in saving lives and general response/relief. But if users cannot find the data needed or download it efficiently, it is equivalent to not having the data at all... We had the same problems with the tornado imagery and the oil spill imagery.

Lessons learned

- Phone numbers – you can never have too many of these – EMA, EOC, or Geo Survey.
- A major disaster affects all staff – not just geologists or GIS specialists.
- When your hometown is affected, staff availability and capability is reduced.
- Testing data access multiple times throughout the year across agencies is important. Carrying a laptop *and* data on an external drive was incredibly helpful.
- Organization is critical for imagery and should be organized specific to county and state.
- When directly impacted, digging out friends/family/neighbors from debris and making sure they have water, food, shelter, safety, to survive becomes priority for staff. This will affect response activities.
- For a major regional disaster – expect response to last over a year (Alabama is still cleaning up debris from the tornadoes a year later).

Preparations taken for earthquake response planning

1. Planning and discussions with staff ahead of time concerning data and data-sharing.
2. Collection and testing of phone and email contact information.
3. Identification of data-sharing platforms/services.

4. Collection of earthquake-related maps and geospatial data: historical isoseismic maps, historical seismicity maps, and structural/faults maps.
5. Review and collection of aftershock calculation and graphs.
6. Review of historical tsunami information for the Gulf and Caribbean and compiled information from this and recent Gulf tsunami research summaries.
7. Review of staff backgrounds, skills, and availability.
8. Compilation of pre-scripted press releases.
9. Compilation of county emergency management agency contact information.
10. Compilation of contact information for seismologists and geophysicists in Alabama.
11. Compilation of a quick reference city-to-city distance chart.
12. Search and compilation of earthquake-related web resources.
13. Compilation of a regional map showing location of seismic stations and information on and weblinks to the helicorders.
14. Compilation of a table showing the main different magnitudes used (ML, Mb, etc.) and what each is based on and their appropriate magnitude ranges.
15. Compilation of a table with MMI descriptions and roughly equivalent PGA.
16. Geospatial analysis and creation of amplification and liquefaction susceptibility maps.
17. Geospatial analysis and creation of a state landslide map susceptibility map.
18. Geospatial analysis and creation of a state karst map with historical sinkhole data.
19. Participation in state and regional earthquake exercises with our state and county EMAs.
20. Participation in CUSEC State Geologists meetings.
21. Completion of an earthquake response plan for GSA to include the above listed information and maps.

Any participation in state exercise development

1. Created liquefaction susceptibility, sinkhole location, and landslide susceptibility maps to AEMA for reference in exercises.
2. Compiled information on potential complicating geologic factors for reference use for AEMA in exercises.

Your Survey's goals and objectives set out for the exercise

1. Test phone communications with GSA, AEMA, and AEMA GIS staff.
2. Test email communications with GSA, AEMA, and AEMA GIS staff.
3. Test data-sharing capabilities and platforms with GSA, AEMA, and AEMA GIS staff.
4. Identify gaps in geologic map and data needed for response.
5. Review of responsibilities of staff in response.
6. Review of response procedures.
7. Review of all parts and indices of the GSA earthquake response plan.
8. Identification of gaps in contact info, data, maps, and other reference information for response.

Overview and timeline of participation

Alabama did not participate in the NLE due to the April 27 tornado outbreak response.

Illinois State Geological Survey

The State of Illinois did not fully participate in the NLE-11 exercise because of flooding. The Illinois State Geological Survey (ISGS) as the CUSEC State Geologists Technical Director coordinated the daily situation conference calls for the CUSEC State Geologists and U.S. Geological Survey. The State of Illinois held a three-day State Level Exercise in November 2011 (SLE-11) and only staffed the operations during the day and not 24 hours. This report covers that exercise.

Preparations taken for earthquake response planning

The ISGS continued to work on their response plan and clearinghouse plan with coordination with their state emergency managers. Part of that plan included establishing a Memorandum of Agreement with the Champaign County Amateur Radio Emergency Services group which is the county where the ISGS headquarters is located. The agreement is for the ARES group to provide communications at the ISGS headquarters during an emergency response. An area in the ISGS was set up for their use and ISGS coordinated with the state communications officer for call signs and procedures for submitting messages to specific individuals in the SEOC.

Any participation in state exercise development

The ISGS was involved with regional planning with FEMA Region V and meetings with the States of Indiana and Illinois emergency managers in setting up the NLE-11 exercise play.

Goals and objectives set out for the exercise

Our goals were to participate in the State's EOC for the full extent of the exercise and to test amateur radio communications between the ISGS Headquarters and the State EOC and test the setup for communications to southern states operations centers.

Overview and timeline of participation

ARES set up at the ISGS Headquarters on the morning of the first day of the exercise in November and communicated with the SEOC and state and county operations centers 150 miles south of ISGS Headquarters. These counties are within several counties of the southern border of Illinois.

ISGS's representative to the SEOC was notified by phone and email to staff the SEOC. The position was staffed within 2.5 hours (it is located about 2 hours from ISGS Headquarters). ISGS participated with message generation of aftershocks, assisting in writing press releases, and consultation with Federal and State Agencies for ISGS response coordination and effects that may be experienced. ISGS representative also participated in the verbal status reports in the SEOC which were held every several hours. Through state and FEMA coordinators, ISGS representative asked for imagery and that the imagery collection be coordinated by FEMA for multiple state requests in the area. ISGS participated in the full three-day exercise and provided recommendations for future exercises.

Analysis of outcomes/performance

ARES communications equipment set up was simple and communications was successful with the SEOC and for communications with the southern operations centers, it exceeded expectations.

The ISGS is fully integrated in the SEOC but had a limited role for this play since there were no external feeds of earthquake and aftershock information from USGS as would be during a real event or what was available during the NLE-11.

Summary

ISGS had set up an amateur radio emergency services agreement for earthquake response and successfully exercised it during the SLE-11. ISGS participated in the SEOC for the three-day exercise, but had limited role since this exercise was outside of the NLE-11 which had outside feeds of earthquake information. ISGS was asked to produce aftershock reports during the exercise and help write press releases.

Recommendations

Continue working on their response plans, train staff in the agency for response and for the next exercise expand staff involvement.

Mississippi Office of Geology

This is a summary of the Mississippi Office of Geology's participation (more correctly, non-participation) in the National Level Exercise 2011 (NLE 2011) of May 16-20, 2011, which tested responses to a magnitude 7.7 earthquake in the New Madrid Seismic Zone. Deadly tornadoes in late April and a record-breaking Mississippi River flood starting in early May caused MEMA to cancel their participation in NLE 2011. The Mississippi Office of Geology also cancelled its activities, except for participation in the Association of CUSEC State Geologists daily situation awareness conference calls during the exercise.

Preparations

In the months and weeks preceding the exercise, staff of the Mississippi Office of Geology met with the director and various staff of the Mississippi Emergency Management Agency (MEMA) to discuss geological aspects of the earthquake scenario. Discussion focused on statewide maps of soil class and amplification potential and liquefaction susceptibility. Other agencies and organizations participated in these meetings and discussions. The State Geologist presented the *Central US is Earthquake Country* PowerPoint to two groups of MEMA staff and associated organizations and companies (area coordinators and logistics).

Other preparation included reviewing pertinent literature, including Mid-America Earthquake Center report 09-03, and discussions at meetings of the Association of CUSEC State Geologists (plus by e-mail and telephone). The Association of CUSEC State Geologists held a communications exercise via conference call on November 17, 2010.

Plans for Participation

The Mississippi Office of Geology had planned for a limited participation in NLE 2011. The primary participation was to have been the State Geologist serving as a subject matter expert in the state EOC during the day shift for two or three days of the exercise.