

2014 ANNUAL REPORT

Utah Chapter

of the Earthquake Engineering Research Institute

Report Date: March 31, 2015

Utah
Chapter



This report summarizes the membership and activities conducted by the Utah Regional Chapter of the Earthquake Engineering Research Institute during 2014.

MISSION & GOALS

Chartered in 2012, the Utah Chapter is the 10th regional chapter of the Earthquake Engineering and Research Institute (EERI). We hope to advance EERI's goals of promoting the advancement of the science and practice of earthquake engineering, improving understanding of the impact of earthquakes, and advocating comprehensive and realistic measures for reducing the harmful effects of earthquakes by:

- Being a source of collective expertise on seismic hazards and risk reduction
- Partnering with other organizations and agencies involved with seismic-risk issues
- Being an advocate for seismic safety at the State and local government levels
- Increasing awareness through education and lecture opportunities
- Promoting student chapters and activities

Involving members through participation in committee work.

MEMBERSHIP SUMMARY

The Utah Regional Chapter had a total of about members at the end of 2014.

OFFICERS

The Board consisted of the following members:

| Role | Name | Affiliation | Email |
|---------------------|-----------------|---|--|
| President | Les Youd | Retired, Brigham Young University | Youd1132@comcast.net |
| Secretary-Treasurer | Kevin Franke | Brigham Young University | Kevin_franke@byu.edu |
| President Elect | Brent Maxfield | The Church of Jesus Christ of Latter-day Saints | maxfieldba@ldschurch.org |
| Past President | Pete McDonough | Questar | Pete.McDonough@questar.com |
| Board Member | Kristine Pankow | University of Utah Seismograph Stations | pankow@seis.utah.edu |
| Board Member | Rob Snow | AECOM | Robert.w.snow@aecom.com |
| Board Member | Jerod Johnson | Reaveley Engineers & Associates | jjohnson@reaveley.com |

Board meetings were held monthly during 2014, usually during the first week of the month, and via telephone conference call.

BUDGET & FINANCIALS

Briefly describe the chapter budget and financials, with text description or any tables and charts as needed.

CHAPTER ACTIVITIES

Regular Chapter Meetings

The Utah Chapter did not hold regular meeting during the year. Special activities are listed below.

Short Course on Liquefaction

The Utah Chapter organized and sponsored a one-day short course on April 9, 2014 on liquefaction. The featured lecturer was W. D. Liam Finn, University of British Columbia.

Other speakers were Loren Anderson, Steve Bartlett, Mathew Francis, Jerod Johnson, and Les Youd. Topics covered included:

- Fundamentals of liquefaction hazard evaluation
- Procedures using SPT, CPT, and Vs
- Consequences of liquefaction
- Methods for estimating lateral ground displacement
- Methods for estimating settlements
- IBC requirements
- Mitigation of liquefaction hazard
- Structural mitigation
- Site mitigation

About 70 engineers attended the course. Fees paid by participants covered the cost of the event plus about \$3,000 in revenue, which supported chapter activities throughout the year. Because of the success, both financially and by fulfilling chapter goals, the Utah Chapter plans to develop and sponsor an annual short course.

Seminar on 2010-2011 Christchurch, New Zealand Earthquakes

The Utah Chapter of EERI and the Structural Engineers Association of Utah (SEAU) jointly sponsored a free seminar at the University of Utah on October 16, 2014 entitled: *Structural and Geotechnical Lessons Learned from the Christchurch Earthquake*. Invited instructors were Dan Bech, S.E., Principal at Holmes Culley in San Francisco, and Russell A. Green, PhD, Professor of Civil and Environmental Engineering at Virginia Tech. About 105 people from various disciplines attend the event, including some remotely in distant parts of the state. The seminar was well received by attendees, and the chapter and SEAU plan to jointly sponsor similar seminars of general interest in the future to accomplish the goals of the two societies.

Earthquake Scenario

With financial assistance from FEMA through EERI, the Utah Chapter was asked to develop a scenario earthquake hazard assessment for the Utah State Seismic Safety Commission. During the fourth quarter of the year, a committee was formed to develop the scenario. The committee consisted of Kristine Pankow, chair, Brent Maxfield, Peter McDonough, Les Youd, Barry Welliver, and Bob Cary. The committee decided that the scenario would be based on a simulated magnitude 7 earthquake on the Salt Lake segment of the Wasatch

fault. Preliminary work on the scenario during 2014 including preparation of draft write-ups for the major hazards, including fault rupture, ground shaking, liquefaction, and damage estimates for structures and facilities, including residential and commercial unreinforced masonry buildings and lifelines. Final scenario development and reporting will occur during the first few months of 2015.

2015 Short Course on Seismic Ground Motions

A committee to develop a 2015 short course on Design Ground Motions was formed with Brent Maxfield, chair, and Chris Pankow, Jared Johnson, and Rob Snow as members.

Nomination for EERI Alfred E. Alquist Special Recognition award

A nomination for chapter member Walter Arabasz for the EERI Alfred E. Alquist Special Recognition Award was completed and submitted to EERI.

Organization of Committees

The following committees to foster chapter goals were setup during the year:

- Web Site and Publicity Committee with Rob Snow as chair with Brent Maxfield as board contact member for the committee. The purpose is to maintain the chapter website and update it with pertinent new information monthly, and to assist with publicity for all chapter events, such as the spring short course, upcoming lectures, etc.
- Student Outreach Committee with Kevin Franke as chair and Les Youd as board contact. The is to involve students with an interest in earthquake engineering in chapter and national EERI activities
- Chapter Newsletter Committee with Brent Maxfield as chair. The purpose is to compile and distribute a monthly newsletter informing members and professionals in other societies interested in earthquake issues of chapter and national activities, initiatives, earthquake reconnaissance reports, and other news on earthquake issues.
- Chapter Governance Committee with Brent Maxfield as chair with past presidents Les Youd, Peter McDonough, and Barry Welliver as members. The purpose is to correct and update the chapter bylaws as needed.
- Membership Committee with Ron Dunn as chair. The purpose is to assist in recruiting new chapter members with interests in earthquake engineering.
- Spring Short Course Organizing Committee with Brent Maxfield as chair. The purpose is to develop and organize a short course for earthquake professionals in Utah on ground motion assessment for engineering design.
- Earthquake Scenario Committee with Kristine Pankow as chair and Brent Maxfield, Peter McDonough, Les Youd, Barry Welliver, Steve Bowman, and Bob Cary as members. The purpose is to prepare a scenario earthquake report for the Salt Lake City segment of the Wasatch fault.

COMMUNICATIONS

The Utah Chapter began publishing a Newsletter in October 2014. It is meant to grow into a monthly letter. Only 1 issue was made in 2014.

STUDENT CHAPTER COORDINATION

The Student Chapter at Brigham Young University is an active chapter. We have begun discussions with the University of Utah to try and generate interest in a student chapter. The support from the Civil & Environmental Engineering Department has been at best luke-warm. We will strive to develop interest from the student level.

ELECTION & ELECTION RESULTS

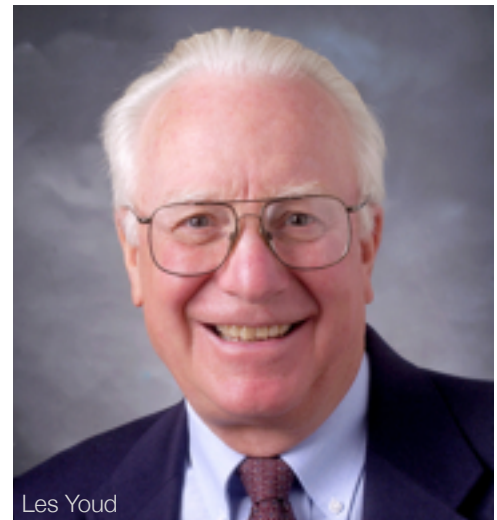
An election for officers was held in November 2014. The table below shows the new officers elected to the Chapter board who will take office on January 2015.

| Role | Name | Affiliation | Email |
|---------------------|----------------|---|--|
| President | Brent Maxfield | The Church of Jesus Christ of Latter-day Saints | maxfieldba@ldschurch.org |
| Secretary-Treasurer | Kevin Franke | Brigham Young University | Kevin_franke@byu.edu |
| Past President | Les Youd | Retired, Brigham Young University | Youd1132@comcast.net |
| President Elect | Ron Dunn | Dunn & Associates | RDunn@Dunn-SE.com |
| Board Member | Jerod Johnson | Reaveley Engineers & Associates | jjohnson@reaveley.com |
| Board Member | Bob Carey | Utah Division of Emergency Management | bcarey@utah.gov |
| Board Member | Bill Lund | Utah Geological Survey | BillLund@utah.gov |

LIST OF ATTACHMENTS

Included at the end of this report are various attachments to supplement the information included above. A list of the attachments is included below:

- Short Course Flyer
- October 2014 Newsletter



EVALUATION AND MITIGATION OF LIQUEFACTION HAZARD FOR ENGINEERING PRACTICE

Focus Topics:

- Liquefaction Effects
- Site Characterization
- Liquefaction Analysis
- Triggering Debate
- Liquefied Shear Strength
- Soil Improvement vs Structural Mitigation
- Structural Engineering
- Lessons Learned
- Risk Considerations
- Foundation Design
- Prob. Assessment

Invited instructor: W.D. Liam Finn, Professor Emeritus of Civil Engineering, University of British Columbia

Bio: W. D. Liam Finn (National University of Ireland, 1954; M.Sc, PhD University of Washington 1957, 1960). Liam is an expert in geotechnical earthquake engineering with particular interest in liquefaction, seismic response of sites and earth structures, seismic safety evaluation of dams, seismic response of pile foundations and seismic risk.

He pioneered the use of dynamic effective stress analysis in practice and the use of large strain deformation analysis for the analysis of post liquefaction deformation of dams. Liam initiated the first program of geotechnical earthquake engineering in Canada at UBC in 1966 and pioneered the development of effective stress dynamic analysis in 1975.

Who Should Attend:

- Geotechnical and structural engineers, building and transportation officials, and risk managers.

Purpose:

- Improve engineering practice in Utah through thorough review and discussion of state-of-the-art procedures applied by engineers to evaluate and mitigate liquefaction hazard including structural methods. Emphasis will be on urban infrastructure, including bridges, buildings and planned development.

Utah Chapter of EERI Short Course on Liquefaction

He currently sits on the Technical Review Board for the Seismic Retrofit of British Columbia Schools where he was a major contributor to a recently developed risk management plan for this \$2 billion project that includes both structural and geotechnical mitigation methods. For this work, Liam received the Consulting Engineers of Canada award for his contribution to the seismic retrofit program for BC Schools. He was Editor of the International Journal of Soil Dynamics and Earthquake Engineering from 2000-2008 and is on editorial boards for other journals. He is a former Chairman of ISSMGE/TC-4 the Earthquake Geotechnical Engineering.

Course Syllabus:

- Deterministic Evaluation of Liquefaction Triggering - Methods and Controversial Issues
- Probabilistic Procedures for Estimating Ground Motions for Liquefaction Hazard Evaluation
- Consequences of Liquefaction - Settlement and Lateral Spread
- Geotechnical and Structural Mitigation of Liquefaction Hazard
- General Treatment of Geotechnical Ground Modification Procedures
- Detailed treatment of Structural Mitigation Measures Based on Ongoing Retrofit of Vancouver, BC schools

Speakers on selected topics:

- Loren Anderson (USU) - Liquefaction Risk Assessment
- Steve Bartlett (UofU) - Mapping of Liquefaction Risk
- Kevin Franke (BYU) - Performance Based Evaluation of Liquefaction Hazard
- Les Youd (BYU) - Damage to Shallow and Deep Foundations
- Kyle Rollins (BYU) - Design of Deep Foundations to Resist Liquefaction Effects
- Jerod Johnson (Reaveley Engineers) - Comments on Structural Mitigation

Course schedule:

| | |
|----------|---|
| 7:30 am | Registration opens, continental breakfast |
| 8:00 am | Greetings and introductions |
| 8:15 am | Instruction by Dr. Liam Finn |
| 10:15 am | 15 minute break |
| 12:30 pm | Lunch |
| 1:15 pm | Presentations by selected speakers |
| 2:45 pm | break |
| 3:00 pm | Questions from attendees to panel of speakers |
| 5:00 pm | Concluding remarks and closure |

CoSponsoring Groups:

Utah Chapter of the GeolInstitute, Utah Seismic Safety Commission (USSC), Utah Geological Society (UGA).

Registration fees:

Online on or before April 1, 2014:

- Nonmember \$250.00
- Members of Utah Chapter EERI \$210.00
Join Utah Chapter of EERI (\$25.00 see utah.eeri.org to register) and then register for the short course at the member price
- Member of cosponsoring society \$240.00
- Student \$25.00
- Corporate or Government Group \$210.00

If 3 or more individuals from a corporation become members of the Utah Chapter of EERI (\$25.00 see utah.eeri.org to register), then each member of the corporation or government agency may register at the member price.

Online after April 1, 2014, or at the door: (registration will be capped at 150 persons. Please register early to ensure a seat.)

- Nonmember, EERI Member, CoSponsoring, and Corporate/Government Rates increase by \$50.00
- Student rates increase by \$5.00

You can register for the short course at the following website.

<http://www.brownpapertickets.com/event/597499>





Earthquake Engineering Research Institute Utah Chapter

October 2014 Newsletter



President's Message Les Youd

The Utah Chapter of EERI is pleased to add a newsletter to our regular chapter activities and hope to make it available to a wide audience as well as chapter members. The Utah Chapter was organized in 2011 with the objectives of fostering professional educational and societal activities aimed at better understanding of earthquake hazards and reducing risk in Utah, advancing the science and practice of earthquake engineering to improve understanding of the impact of earthquakes on the physical, social, economic, political and cultural environments, and to advocate for comprehensive and realistic measures for reducing the harmful effects of earthquakes.

Last year the chapter sponsored several activities to meet these objectives, including a presentation of the 2012 Joyner Lecture by Jon Bray, UC Berkeley, a "Meet Mentors" evening in which Walt Arabasz and Les Youd made short presentations outlining their successful careers and answering questions from attendees, and a one-day short course on liquefaction to discuss methods for predicting its occurrence and mitigating its effects. W.D. Liam Finn, University of British Columbia, an experienced expert, was the primary lecturer. We are planning additional activities for the coming year and invite all to attend.

On October 16, the Utah chapter will join with SEAU in sponsoring the SEAU Fall Seminar on the topic of Structural and Geotechnical Lessons Learned from the 2010 and 2011 Christchurch, New Zealand earthquakes. Speakers will be Dan

Bech, S.E., Principal at Holmes Culley in San Francisco and Russell A. Green, PhD, Professor of Civil and Environmental Engineering at Virginia Tech. Both speakers spent considerable time in Christchurch conducting investigations after the earthquakes. (See announcement in this newsletter for further details.)

The chapter is also planning a spring short course on assessing ground motions for engineering design. Further information on this course will be published in future newsletters. We have also invited David Wald from the USGS to come to Salt Lake and discuss the latest tools that the USGS has to assist engineers and building owners to understand the expected damage following a significant earthquake. Once this event is scheduled, we will provide you with the information. We look forward to having the opportunity to mingle with each of you and learn together at these future activities.

Les Youd, President, Utah Chapter EERI

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Together We Can Reduce the Risk of Earthquakes in Utah

Brent Maxfield, President Elect

This article reaches out to those who are in a position to help us reduce the risk of earthquakes in Utah. You may be an architect, a public official, a building code regulator, a structural engineer, a civil engineer, a planner, a social scientist, a geologist, a seismologist, an emergency planner, a first responder, a building owner, or just someone who is interested in earthquake information. We all have something in common – earthquakes.

The Earthquake Engineering Research Institute (EERI) is unique in that it can bring together a diverse group of people who each have unique expertise and experience. Each member brings something valuable to the table. The EERI Utah Chapter shares the same goals as the national organization, and we encourage you to visit the www.eeri.org website. The benefit of belonging to the EERI Utah Chapter is that we can focus on issues unique to Utah. We also live and work near each other and will all be affected when the Wasatch Fault decides to slip.

We view reducing risk in three areas: Prepare, respond, and recover. If you fit into any of these three categories, we need you. The preparation involves ensuring that the latest codes and standards are enforced for new buildings, mitigating the hazards in existing buildings, understanding the nature of the hazards, and preparing to respond and recover. The response will happen in the days and weeks following an event, and the

recovery will occur in the months, years, and even decades following a major seismic event. The best way to reduce the impact of the response and the recovery will be to prepare. That is where you come in. Let's work together to be better prepared.

This is the inaugural issue of the EERI Utah Chapter Newsletter. We feel that it is an excellent way to unite our efforts. We view the newsletter as a means of collecting and disseminating information related to reducing seismic risk in Utah. If you or your organization has published an article relating to seismic issues, we seek your help and permission to reprint it in this newsletter. We want to be the clearinghouse for disseminating seismic information to as many people as possible. Articles that would benefit many people are only being published in local society newsletters. If these same articles can be reprinted in the EERI Utah Chapter Newsletter, they will be able to benefit many more people.

We are seeking your help in providing us articles for the newsletter. Please forward articles, announcements, or information to our newsletter Chair, Chris Garris. His email is: garrisct@pbworld.com. Please provide a permission statement with the email.

In this newsletter, our president Les Youd describes some of the past and future activities of the Chapter. We would love the opportunity to cosponsor some of these activities with you, or maybe you have activities that you would like our assistance to cosponsor. Please let us know.

Lastly, we invite you to join the EERI Utah Chapter. You do not need to belong to the



national chapter to join. The cost is only \$25.00 per year. By joining the EERI Utah Chapter, you can assist us in reducing the

seismic risk in Utah. For more information, please visit the EERI Utah Chapter website at: <http://utah.eeri.org>.

Upcoming Events:

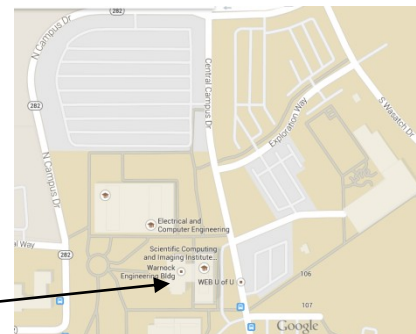
EERI/SEAU Fall Seminar: October 16, 2014, 5:30p Refreshments, Presentation at 6:00p

STRUCTURAL AND GEOTECHNICAL LESSONS LEARNED FROM THE CHRISTCHURCH EARTHQUAKE

Invited instructors: Dan Bech, S.E., Principal at Holmes Culley in San Francisco and Russell A. Green, PhD. Professor of Civil and Environmental Engineering at Virginia Tech.

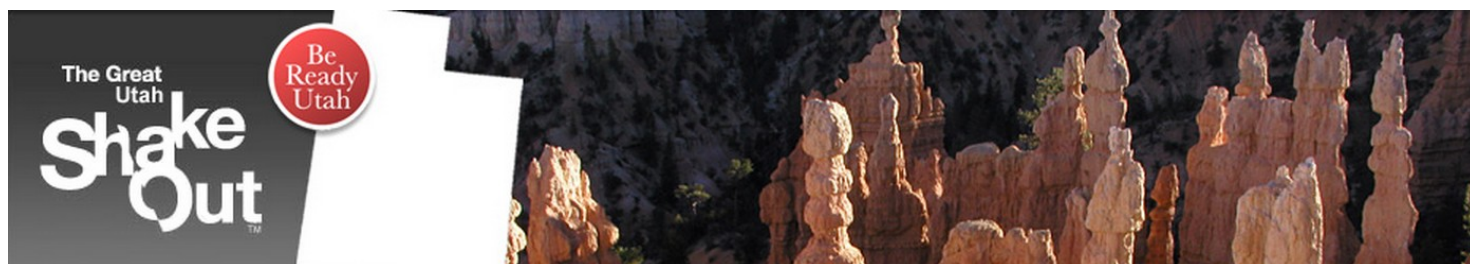
Who Should Attend? Geotechnical/Structural Engineers, Geologists, Emergency Preparedness Managers/Planners, and non-technical folks who may be interested in learning about earthquakes.

- Warnock Engineering Building, Room L104, University of Utah
- Refreshments at 5:30pm, Presentation at 6:00pm
- More information at: <http://utah.eeri.org/wp-content/uploads/2014/08/EERI-Fall-Seminar-2014.pdf>



Partial funding of this training program has been provided by the Utah Division of Occupational & Professional Licensing from the Professional Engineer and Professional Land Surveyor Education and Enforcement Fund.

The Great Utah ShakeOut Event: April 16, 2015



Millions of people worldwide practice how to [Drop, Cover, and Hold On](#) each year during [Great ShakeOut Earthquake Drills!](#)

Utahns can join them by [registering](#) today for the **Great Utah ShakeOut**. The next Utah ShakeOut Day of Action will be April 16, 2015, though you can register to hold your ShakeOut drill on any day of the year (including Fall, 2014). Participating is a great way for [your family or organization](#) to be prepared to survive and recover quickly from big earthquakes— wherever you live, work, or travel.

Click to see the YouTube video '160 Fires' depicting the potential effects of an earthquake along the Wasatch Front: <https://www.youtube.com/watch?v=OXIM4Nf3gZk>



2014 EERI Utah Chapter Leadership

| | | | |
|----------------------------|-----------------|--|----------------|
| President | Les Youd | Youd1132@comcast.net | (801) 226-2667 |
| President Elect | Brent Maxfield | maxfieldba@ldschurch.org | (801) 240-1529 |
| Vice President | Jerod Johnson | jjohnson@reaveley.com | (801) 505-4016 |
| Secretary/Treasurer | Kevin Franke | kevin_franke@byu.edu | (801) 422-1349 |
| Past President | Pete McDonough | pete.McDonough@questar.com | (801) 324-3136 |
| Board Member | Kristine Pankow | pankow@seis.utah.edu | (801) 585-6484 |
| Board Member | Rob Snow | robert.w.snow@urs.com | (801) 904-4048 |

Helpful Earthquake Engineering Links:

| | |
|---|--|
| Earthquake Engineering Research Institute (EERI) - Utah | http://utah.eeri.org |
| National EERI | http://www.eeri.org |
| Structural Engineering Association of Utah (SEAU) | http://www.seau.org |
| American Society of Civil Engineers (ASCE) – Utah | http://www.sections.asce.org/utah/ |
| ASCE GEO-Institute | http://www.asce.org/geo/ |
| American Council of Engineering Companies (ACEC) - Utah | http://www.acecutah.org |
| Seismological Society of America (SSA) | http://www.seismosoc.org |
| Southern California Earthquake Center (SCEC) | http://www.scec.org |
| Utah Seismic Safety Commission (USSC) | http://ussc.utah.gov |
| Utah Geological Survey (UGS) | www.geology.utah.gov/utahgeo/hazards/index.htm |
| University of Utah Seismology and Active Tectonics Research Group | http://www.uusatrg.utah.edu |
| Utah Division of Occupational and Professional Licensure (DOPL) | http://www.dopl.utah.gov |
| United States Geological Society (USGS) | http://earthquake.usgs.gov/ |
| Be Ready Utah | http://www.utah.gov/beready/ |
| Utah ShakeOut Website: | http://www.shakeout.org/utah/ |
| Homebuyer's Guide to Earthquake Hazards in Utah | http://geology.utah.gov/online/pdf/pi-38.pdf |

EERI Utah Chapter is seeking articles and announcements for upcoming newsletter editions. Please forward submissions to be considered by the Utah Chapter leadership to Chris Garriss at garrisct@pbworld.com.