

FRIEDMAN FAMILY VISITING PROFESIONALS PROGRAM

Visit to Oregon State University:
February 24, 2017



This report summarizes the visit of Ivan Wong from Lettis Consultants International that took place at Oregon State University on February 24, 2017,

ITINERARY OR AGENDA

Date/Time	Event
Friday, February 24 – 10:00 AM	Arrive at Oregon State University <i>*Park in CCE Reserved Spaces (located on south side of Kearney Hall); obtain parking pass to place on your dash from Tara Cooper in Kearney 111</i>
10 – 10:30 AM	Guest arrival and greeting EERI President, Maggie Exton
10:30 – 11 AM	Meeting with EERI Advisors
11 AM – 11:30 AM	Meeting with Ann Morey Ross, CEOAS
11:30 AM – 11:45 AM	Meeting with Andre Barbosa, Assistant Professor Structures
11:45 AM – Noon	Break
Noon – 1:30 PM	Lunch Ben Mason, Assistant Professor Geotechnical EERI Leaders, Sharoo Shrestha and Shafiq Alam, and Abbas Abdollahi, Geotechnical PhD Student

1:30 – 1:40 PM	Travel to O.H. Hinsdale Wave Research Lab <i>Shafiq to escort</i>
1:40 – 2:30 PM	Tour of O.H. Hinsdale Wave Research Lab and Structures Lab <i>Pedro Lomonaco, Director</i> <i>O.H. Hinsdale Wave Research Laboratory</i> <i>Sharoo Shrestha, EERI leader and Structures PhD student</i>
2:30 – 2:40 PM	Return the Kearney Hall <i>Shafiq to escort</i>
2:40 – 3:00 PM	Break/Lecture Preparation
3 – 4:00 PM	Lecture – <i>Predicting Earthquake Hazards and Developing Seismic Design Ground Motions in The Cascadia Subduction Zone: What We Know, Don't Know, and the Challenges Ahead</i>
4 – 5:00 PM	Meeting with Students
5:00 PM	Depart

STUDENT CHAPTER VISIT PLANNING COMMITTEE

LEAD ORGANIZER(S):

- Maggie Exton, President, extonm@oregonstate.edu
- Sharoo Shrestha, Treasurer, shrestsh@oregonstate.edu
- Mohammad Shafiqal Alam, Secretary, alammo@oregonstate.edu

Faculty advisors Ben Mason and Andre Barbosa also helped organize.

VISITING PROFESSIONAL LECTURE OVERVIEW

The presentation on the prediction of Earthquake Hazards in the Cascadia Subduction Zone and the impending disaster from one of the principal seismologists was an opportune one as the Pacific North-West is preparing for the "Big- One". The lecture attendees were vastly diverse stakeholders such as engineers from various disciplines, homeowners, emergency planners, city planners and engineering students.

Besides the presentation, graduate students had the opportunity to share their research and get invaluable advice from a professional with decades of experience on engineering seismology and seismic risk reduction.

Attached are some pictures from the event and the subsequent sections discuss more about specific events.



Ivan G. Wong presenting his Lecture



Audience at the Lecture



Ivan G. Wong with EERI advisors and leaders

Lecture Abstract

In only the past two to three decades has it become accepted that the Cascadia subduction zone is capable of generating giant earthquakes (moment magnitude [Mw] 8.5 and larger). Hence in this relatively short timeframe, the earthquake scientific and engineering communities have been playing catchup in terms of characterizing the hazards from such megaquakes and developing adequate seismic design criteria for ground shaking and tsunamis. The next Cascadia subduction zone megaquake will be the most severe natural hazard threat that the Pacific Northwest has ever seen. The Pacific Coast will be subjected to a devastating tsunami with wave heights in excess of 30 m in some locales and the areas from the coast inland up to 200 km will be hit by strong and sustained ground shaking. Two to three decades is a very short period of time to prepare the region for such formidable hazards and although significant progress has been made, there are significant holes in our knowledge and challenges in filling those holes. In this presentation, I will describe what we know and don't know in terms of the earthquake potential of the CSZ megathrust and its impacts, and how the available information is being used by the engineering community to not only develop seismic design criteria for new buildings, facilities, and structures but probably most challenging, assessing the seismic stability of our existing inventory.

Professional Bio

Principal Seismologist with Lettis Consultants International in Walnut Creek, California. Ivan has more than 40 years of experience in the fields of engineering seismology and seismic geology. A major focus in his career has been earthquake hazard reduction and awareness and public outreach. Ivan has directed the seismic hazard evaluations of more than 700 critical and important facilities worldwide, many for the Federal government. He has managed some of the largest seismic hazard evaluations performed in the U.S. including the Yucca Mountain Project. For FEMA, Ivan has been involved in the education and implementation of the seismic risk assessment software HAZUS in several areas in the U.S. He has been the recipient of numerous NEHRP external research grants from the USGS that have supported the development of urban probabilistic and scenario hazard maps and other earthquake hazard-related studies. Ivan is a past member of the EERI Board of Directors, past President of the EERI Northern California Chapter, past member of the Editorial Board for EERI's Earthquake Spectra, and currently serves as an Associate Editor for the Bulletin of the Seismological Society of America. He is a member of numerous scientific and engineering committees, panels, and working groups including Chair of the Working Group on Utah Earthquake Probabilities and a member of the CISN Advisory Panel, ANSS National Steering Committee, and the American Nuclear Society Working Groups on Probabilistic Seismic Hazard Analysis and Surface Fault Rupture and Deformation. Ivan has also been particularly active in serving the U.S. Geological Survey on several review and advisory panels including the review panel for the 1996 National Seismic Hazard Maps. Ivan has authored or coauthored more than 300 professional publications.

SUPPLEMENTAL ACTIVITIES

Lunch with students and EERI faculty advisor

Between 12:00 pm and 1:30 pm, Ivan was accompanied by one of the EERI faculty advisors, Dr. Ben Mason, two EERI leaders, Mohammad Shafiqul Alam and Sharoo Shrestha (both Structures PhD students) and a Geotechnical PhD student, Abbas Abdollahi for an informal lunch at McMenamins, Corvallis. Topics of discussion focused mostly on the current and past research works of Dr. Ben Mason and the students and Ivan's career as a seismologist and his experiences as an undergraduate student here at OSU. Ivan also talked about the desirable attributes an employer seeks on potential candidates during the recruitment process in the industry and stressed on the importance of networking to be successful in professional life.

O.H. Hinsdale Wave Research Laboratory tour

After the lunch, Ivan was escorted to O.H Hinsdale Wave Research Laboratory at OSU by Shafiq and Sharoo. Ivan was given a tour around the wave lab by the director of wave lab, Dr. Pedro Lomonaco who explained much of the ongoing research and the available facilities, including a demonstration of the Large Wave Flume which is the largest of its kind in North America and the Directional Wave Basin, also known as the Tsunami Wave Basin. Sharoo then gave Ivan a brief tour of the major structures facilities in the same building, i.e. the horizontal and vertical load actuators, the strong floor, the strong wall, the temperature controlled chamber, etc., and explained about some of the major ongoing and past research works.

Post-lecture student discussion

Following the lecture, students had an opportunity to speak with Ivan about his lecture, his work, and their own work in the field of earthquake engineering/seismology. As reported by a Geotechnical Engineering PhD student, Ivan helped her to better understand correlations between earthquake magnitudes and displacements of faults, to identify an appropriate magnitude range for her fault problem, and provided important reference suggestions for her work. She has since implemented those ideas to her Finite Element Model of a tunnel crossing a fault.

RESULTS, FEEDBACK AND LESSONS LEARNED

Brief description of challenges during the process, general reception of the program and Visiting Professional. Also a description of other topics or disciplines the Student Chapter would like to cover in future visits, and related goals.

- One challenge during the process was organizing transportation around campus due to parking restrictions and availability of vehicles.
- Another challenge was determining a time for the lecture—what is the time when most people can and will come?
- Another challenge arose with the fact that we at OSU-EERI did not appoint a lead organizer. This made it difficult to find out what had been done and what still necessary to accomplish. In the future, a shared document will be used so that everyone is aware of the task list and who is working on which task.

ACKNOWLEDGEMENTS

The Oregon State University EERI Student Chapter gratefully acknowledges the support of the Friedman Family for sponsoring the travel of Ivan Wong through their Friedman Family Visiting Professional Program endowment. Additionally, OSU-EERI would like to thank the ASCE student chapter at OSU for providing refreshments for the lecture, and Tara Cooper for her help reserving rooms and providing the itinerary template.

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:

- Item 1, Flier for event

Predicting Earthquake Hazards and Developing Seismic Design Ground Motions in the Cascadia Subduction Zone: What We Know, Don't Know, and the Challenges Ahead

Friedman Family Visiting Professional Lecture

Ivan G. Wong

Principal Seismologist

Lettis Consultants International

Walnut Creek, CA

In only the past two to three decades has it become accepted that the Cascadia subduction zone is capable of generating giant earthquakes (moment magnitude [Mw] 8.5 and larger). Hence in this relatively short timeframe, the earthquake scientific and engineering communities have been playing catchup in terms of characterizing the hazards from such megaquakes and developing adequate seismic design criteria for ground shaking and tsunamis. The next Cascadia subduction zone megaquake will be the most severe natural hazard threat that the Pacific Northwest has ever seen. The Pacific Coast will be subjected to a devastating tsunami with wave heights in excess of 30 m in some locales and the areas from the coast inland up to 200 km will be hit by strong and sustained ground shaking. Two to three decades is a very short period of time to prepare the region for such formidable hazards and although significant progress has been made, there are significant holes in our knowledge and challenges in filling those holes. In this presentation, I will describe what we know and don't know in terms of the earthquake potential of the CSZ megathrust and its impacts, and how the available information is being used by the engineering community to not only develop seismic design criteria for new buildings, facilities, and structures but probably most challenging, assessing the seismic stability of our existing inventory.



FRIDAY
FEB. 24
3 P.M.

Kearney 312
FREE

Food and drinks will be provided.

Ivan G. Wong is the principal seismologist with Lettis Consultants International in Walnut Creek, California. Ivan has more than 40 years of experience in the fields of engineering seismology and seismic geology. Ivan is a past member of the EERI Board of Directors, past President of the EERI Northern California Chapter, past member of the Editorial Board for EERI's Earthquake Spectra, and currently serves as an Associate Editor for the Bulletin of the Seismological Society of America. He is a member of numerous scientific and engineering committees, panels, and working groups including Chair of the Working Group on Utah Earthquake Probabilities and a member of the CISON Advisory Panel, ANSS National Steering Committee, and the American Nuclear Society Working Groups on Probabilistic Seismic Hazard Analysis and Surface Fault Rupture and Deformation.

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