## Research Highlight

SW4: Investigating Basin Amplification Factors for Shaking in the Reno, Nevada, Region

The Fall 2017 CIG-LLNL Computational Seismology Workshop was key in getting new users up and running quickly on seismic wave-propagation codes. The lead author of Dunn et al. (2018), a workshop participant, presented results from investigations of basin amplification effects due to local and regional earthquakes around the Reno-area basin at the annual SSA meeting the following Spring 2018. The study generated 3D SW4 synthetic seismograms for frequencies up to 3 Hz and 1 Hz from two events, the local 2008 Mogul sequence and the regional 2016 Nine Mile Ranch event.
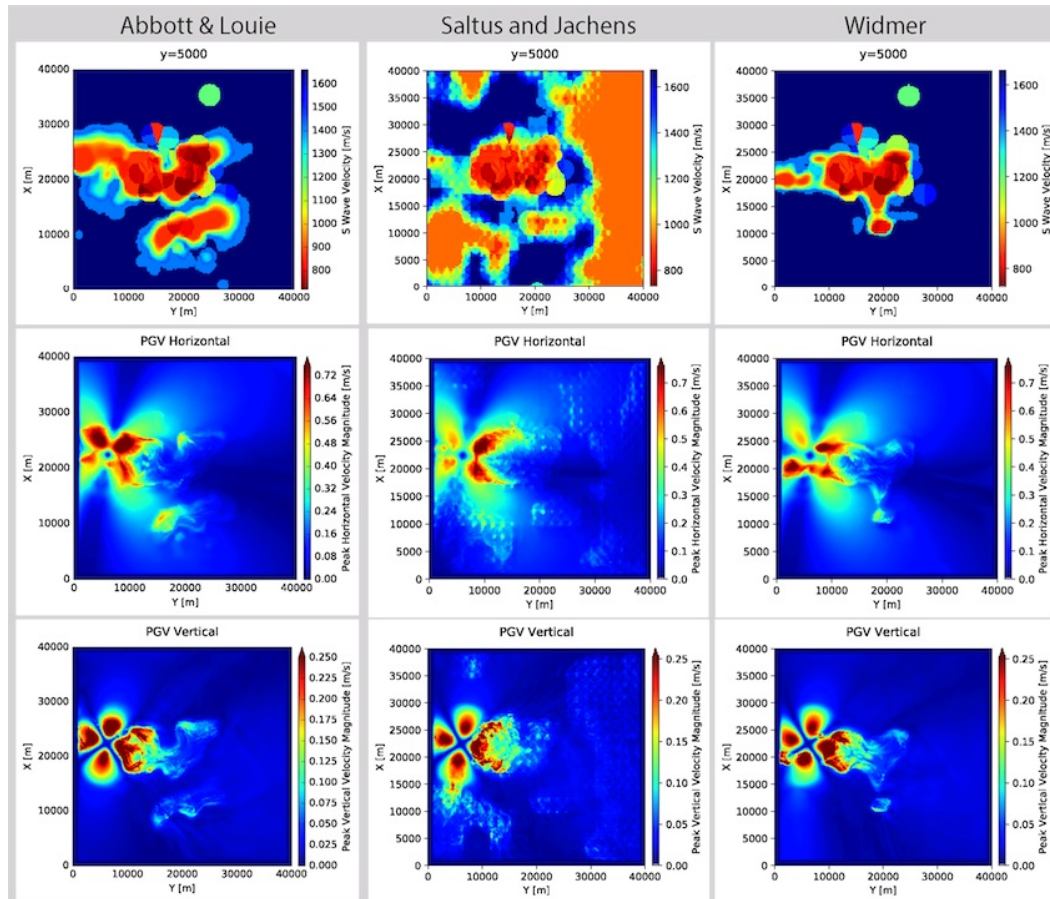
[caption]

Several alternative basin models were investigated (Figure). Simulations showed higher than observed peak amplitudes for the Mogul sequence, which may be due to inaccuracies in the source or geological model and/or the lack of topography. Nine Mile Ranch simulations indicate that basin amplification is sensitive to the global minimum shear velocity. While computing higher frequencies becomes computationally expensive at lower velocities, basin effects are not modeled correctly when shallow low velocities are excluded. Lastly, the study observed no clear correlations between PGV, and Vs30 or basin thickness.

Mogul simulations were computed on Amazon Web Services on a 40 km x 40 km x 30 km grid with two mesh refinement layers and 25 meter grid spacing at the surface for a total of 310 million grid points. Minimum velocity was about 600 m/s.

[highlight]

Meeting Summaries

2018 CGU CIG Joint Mantle Convection and Lithospheric Dynamics Workshop, June 10-14, 2018 in Niagara Falls, Canada. This second joint meeting with the Canadian Geophysical Union (CGU) brought together a group of international researchers predominantly from the U.S. and Canada who study the dynamics of the Earth's mantle and lithosphere through numerical modeling. Participants contributed 39 abstracts to CIG sponsored sessions. Discussions included the need for adjoint and error estimation workshops for mantle and lithosphere dynamics, access to mesoscale computing, online public code reviews to include and train remote users helping software projects to better their practices, and shorter satellite hack events. A tutorial on ASPECT was also offered over three days, emphasizing lithospheric deformation and two-phase flow. [website]

2018 PyLtih Hackathon. The 1st PyLith Hackathon was held jointly with the ASPECT Hackathon to facilitate community development of PyLith. The three main developers worked with 6 early career scientists to begin growing the user-developer community. During this period, the group worked on: (1) implementing poroelasticity (including unit and full-scale testing and documentation), (2) coupling PyLith with an elasticity boundary integral formulation for reduction of the finite-element domain, and (3) development of a new example suite for 3D strike-slip faulting. The group discussed other topics that may lead to continued collaboration on implementation of additional features. [website][summary]

2018 ASPECT Hackathon. The 5th ASPECT Hackathon was held jointly with the PyLith Hackathon. Participants (25) worked over an 8-day period both continuing to work on existing projects as well as initiating new projects and collaborations. The group included 9 new user-

developers. Over 40 projects were initiated with many new collaborative efforts to add new material models, benchmarks, improved performance and other features driven by research interests. [website][summary]

Announcements

Elections: Nominations Open

Nominations are now open for this year's elections - 2 seats are open on the Executive Committee and 3 on the Science Steering Committee. Many thanks to EC members Louis Moresi and Magali Billen, and SSC members Katie Cooper, Boris Kaus, and Sabine Stanley for their contributions to the community. Email the Nominations Committee your nominations for these key governance positions [email].

Bylaws Revisions Approved. Updated CIG Bylaws was unanimously approved by the electorate 30 June 2018. Thanks to all CIG Institutional Member Representatives for participating in CIG governance. The revised bylaws can be found on the Governance page of our website.

Call for Focused Working Groups - Fall 2018. CIG seeks to encourage new ideas from the community by forming Focused Working Groups (FWG). FWG's should address a specific topic and have a clearly defined scope e.g. workshop, white paper, benchmark, etc. They should define concrete outcome(s) achievable within a short time frame, < 2 years. Anyone can propose one! We look forward to your ideas in continuing the CIG community's dynamic leadership in the earth sciences. Look for more details this Fall.

2018 CIG Annual Report. [pdf]

Congratulations to ...

Congratulations to newly elected GSA Fellows Scott D. King (Virginia Tech), and Adrian Lenardic (Rice University).

Student presenter, Xiaowen Liu of University of Alberta (left), won the Best Student Paper Award in the CGU Solid Earth Section for her presentation in a CIG sponsored session. Also pictured, Claire Currie, *CIG EC* (middle); and Rich Perone, *President CGU* (right). Photo credits: Nicholas Kinar

WEBINARS

2018
October 11 - Luc Lavier
November 8 - Louis Moresi
2019
February 31 - Eunseo Choi
March 14 - Mark Ghiorso
April 11 - Cian Wilson
May 9 - Carolina Lithgow-Bertelloni

More info
Connect to webinar

MEETINGS

September 15-19: Rayleigh Tutorial and Developers Workshop

NEW RELEASES

ASPECT 2.0.1

click the icon for citation info

ALLOCATIONS

Stampede2: 912/85,608 SUs
Comet: 0/500,000 SUs
Comet GPU: 0/15,000 SUs
Oasis: 0/10,000 SUs
Ranch: 10,000 GB

QUICK LINKS

Submit Publications
Software

CONTACT US

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