

## RICHARD M ALLEN

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Seismological Laboratory  
Dept. of Earth and Planetary Science  
University of California Berkeley  
307 McCone Hall  
Berkeley, CA 94720-4767

Tel: (510) 642-1275  
Fax: (510) 643-5811  
Email: rallen@berkeley.edu  
Web: <http://seismo.berkeley.edu/~rallen>

### PROFESSIONAL PREPARATION AND EMPLOYMENT

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#### *University of California, Berkeley*

Director, Berkeley Seismological Laboratory	2011-present
Professor, Dept. of Earth and Planetary Science	2012-present
Associate Professor, Dept. of Earth and Planetary Science	2008-2012
Assistant Professor, Dept. of Earth and Planetary Science	2005-2008

#### *ETH Zürich, Institut für Geophysik, Switzerland*

Visiting Professor	2011
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#### *Institut de Physique du Globe de Paris, France*

Visiting Professor	2010
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#### *University of Wisconsin-Madison, Dept. of Geology and Geophysics*

Assistant Professor of Geology and Geophysics	2002-2004
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#### *California Institute of Technology, Seismological Laboratory*

Texaco Prize Postdoctoral Research Fellow in Geophysics	2001
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#### *Princeton University, Dept. of Geosciences*

Ph.D.	2001
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#### *University of Durham, UK, Dept. of Geological and Geophysical Sciences*

M.Sc.	1995
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#### *Cambridge University, UK*

B.A.	1994
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### RESEARCH INTERESTS

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More information available at: <http://earthquakes.berkeley.edu/~rallen/research/>

- **Mantle convection:** integrating seismological techniques to better constrain structure in an effort to determine the physical processes responsible for upwelling and downwelling in the mantle, including the role of plumes, subduction zones and drips.
- **Crust-mantle and lithosphere-asthenosphere interaction:** high-resolution seismic imaging of 3D crustal, lithospheric, and uppermost mantle structure to constrain melt pathways from the mantle and through the crust, deformation and tearing of subducting slabs, and delamination of the lithosphere.
- **Seismic source processes:** detection and characterization of low amplitude seismic tremor and slow slip events; investigation of the kinematics and dynamics of the rupture process; study of the possible linkages between these processes.
- **Earthquake hazard mitigation:** development of real-time seismological and geodetic techniques for implementation in earthquake early warning systems around the world.
- **Observational systems:** design, development and implementation of new geophysical observational systems in response to scientific and societal needs including instrumentation, processing software and communications.

## PROFESSIONAL ADVISORY ACTIVITIES

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Testimony and briefings for legislatures, legislators and senior government officials:

- Testimony, U.S. House of Representatives, Committee on Natural Resources, Subcommittee on Energy and Mineral Resources.
- Testimony, California State Senate, Government Organization and Natural Resources Committees.
- Michelle Bachelet, Former President of Chile.
- Suzette Kimball, Acting Director; David Applegate, Associate Director, USGS.
- Floyd Kvamme, Co-Chair of President Bush's Council of Advisors on Science and Technology.
- James Lee Witt, Director of the Federal Emergency Management Agency.
- Jack Gibbons, Science Advisor to President Clinton.

Advising on the use of current realtime earthquake information:

- Private organizations, including: Boeing, Chevron, Genentech, Google, Hewlett Packard, Lam Research, Life Technologies, Intel, Microsoft, PG&E, Red Cross, So. Cal Edison.
- Government agencies, including: Bay Area Rapid Transit (BART), California Dept. of Water Resources, CalEMA, CalTrans, California Seismic Safety Commission, City of San Francisco.

## RECENT PROFESSIONAL SERVICE AND SYNERGISTIC ACTIVITIES

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Principle Organizer, 3<sup>rd</sup> International Conference on Earthquake Early Warning: Implementing Earthquake Alerts. Berkeley, California, Sep 3-5, 2014.

Chair, U.S. Earthquake Early Warning Coordination Committee, February 2013 – present.

Member, Cascadia Initiative Expedition Team. Responsible for deploying ocean-bottom instrumentation for the community-designed Cascadia Initiative. 2011-present.

Member, Scientific Advisory Board, European Union Framework 6 Project: Strategies and tools for Real Time EArthquake RiSk ReducTion (REAKT). 2011-present.

Chair, International Earthquake Early Warning Advisory Committee, Geological Institute of Israel. 2012-2013.

Chair, Amphibious Array Steering Committee for the NSF Cascadia Initiative. Charged with providing guidance to NSF on the onshore-offshore community seismic experiment. 2009-2012.

Chair, IRIS PASSCAL Standing Committee. 2009-2011. Member 2008-2011.

Popular dissemination of science: Participated in many press interviews for print, radio and TV science news resulting in stories in the *New York Times*, *Los Angeles Times*, *London Times*, *San Francisco Chronicle*, *National Geographic*, *Time*, *Scientific American*, *Science*, *GeoTimes*, *New Scientist* and appearances on the BBC, NBC, CBS, ABC, FOX, and NPR. Organized and participated in scientific press conferences.

## HONORS AND AWARDS

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- NSF GeoPRISMS Distinguished Lecturer, 2014-2015.
- Yuval Ne'eman Distinguished Lecturer in Geophysics, Atmosphere and Space Sciences, awarded by Tel Aviv University, Israel. March/April 2014.
- Donald Sterling Noyce Prize for Excellence in Undergraduate Teaching, May 2008. Awarded annually to a faculty member in the physical sciences at UC Berkeley.
- Hellman Family Faculty Research Award, July 2006. Awarded by the University of California, Berkeley to junior faculty who show capacity for distinction in their research.

**SELECTED PUBLICATIONS**

Complete list and reprints available at: <http://earthquakes.berkeley.edu/~rallen/pub/>

- Kuyuk, H.S., R.M. Allen, Designing a Network-Based Earthquake Early Warning Algorithm for California: ElarmS-2, *Bull. Seismo. Soc. Am.*, **104**, 162-173, doi:10.1785/0120130146, 2014.
- Allen, R.M. Seconds count. *Nature* **502**, 29-31, doi:10.1038/502029a, 2013.
- Kuyuk, H.S., R.M. Allen, A global approach to provide magnitude estimates for earthquake early warning alerts, *Geophys. Res. Lett.*, **40**, 6329-6333 doi:10.1002/2013GL058580, 2013.
- Colombelli, S., R.M. Allen, A. Zollo, Application of real-time GPS to earthquake early warning in subduction and strike-slip environments, *J. Geophys. Res.*, **118**, 3448-3461, doi:10.1002/jgrb.50242, 2013.
- Allen, R.M., Transforming Earthquake Detection? *Science* **335**, 297-298, doi:10.1126/science.1214650, 2012.
- Obrebski, O., R.M. Allen, F. Zhang, J. Pan, Q. Wu, S.-H. Hung, Shear wave tomography of China using joint inversion of body and surface wave constraints *J. Geophys. Res.*, **117** B01311, doi:10.1029/2011JB008349, 2012.
- Allen, R.M. and A. Ziv, Application of real-time GPS to earthquake early warning, *Geophys. Res. Lett.*, **38**, L16310, doi:10.1029/2011GL047947, 2011.
- Porritt, R.W., R.M. Allen, D.C. Boyarko, M.R. Brudzinski, Investigation of Cascadia Segmentation with Ambient Noise Tomography, *Earth Planet. Sci. Lett.* **185**, 67-76, doi:10.1016/j.epsl.2011.06.026, 2011.
- Obrebski, M., R.M. Allen, F. Pollitz, S.-H. Hung, Lithosphere-asthenosphere interaction beneath the western United States from the joint inversion of body-wave traveltimes and surface-wave phase velocities, *Geophys. J. Int.* **185**, 1003-1021, doi:10.1111/j.1365-246X.2011.04990.x, 2011.
- Allen, R.M., Seconds before the big one, *Scientific American*, 74-79, April 2011.
- Allen, R.M., P. Gasparini and O. Kamigaichi (eds), Earthquake Early Warning, Special Issue, *Seismo. Res. Lett.*, **80**, (5) p682-782, 2009.
- Olson, E.L., and R.M. Allen. The deterministic nature of earthquake rupture. *Nature*, **438**, 212-215, doi:10.1038/nature04214, 2005.
- Allen, R.M., H. Kanamori. The potential for earthquake early warning in southern California. *Science* **300** (5620) 786-798, 2003.

**SELECTED GEOPHYSICAL DEPLOYMENTS**

- ElarmS/ShakeAlert, July 2006-present: Real-time development and testing of earthquake early warning. Realtime testing using 400 geophysical stations across California contributed by the CISEN ([CISEN.org](http://CISEN.org)) and streamed to the Berkeley Seismological Laboratory for processing. See [ElarmS.org](http://ElarmS.org).
- Cascadia Initiative Offshore Deployment, January 2011-present: Member of the expedition team responsible for multiple deployments of 60 NSF ocean-bottom seismometers along the Pacific Northwest at a total of 240 sites over 4 years (2011-2015). Data will be immediately available to all researchers in this NSF-funded community experiment.
- Flexible Array Cascadia Experiment for Segmentation (FACES), October 2007-October 2009: 25 broadband velocity instruments along the length of Cascadia.
- Mendocino Experiment, June 2007-September 2009: 80 broadband seismic stations centered around the Mendocino Triple Junction.