

## RICHARD M ALLEN

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### PROFESSIONAL PREPARATION AND EMPLOYMENT

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<i>University of California, Berkeley</i>	
Chair, Dept. of Earth and Planetary Science	2015-present
Professor, Dept. of Earth and Planetary Science	2012-present
Director, Berkeley Seismological Laboratory	2011-present
Associate Professor, Dept. of Earth and Planetary Science	2008-2012
Assistant Professor, Dept. of Earth and Planetary Science	2005-2008
<i>ETH Zürich, Institut für Geophysik, Switzerland</i>	
Visiting Professor	2011
<i>Institut de Physique du Globe de Paris, France</i>	
Visiting Professor	2010
<i>University of Wisconsin-Madison, Dept. of Geology and Geophysics</i>	
Assistant Professor of Geology and Geophysics	2002-2004
<i>California Institute of Technology, Seismological Laboratory</i>	2001
Texaco Prize Postdoctoral Research Fellow in Geophysics	
<i>Princeton University, Dept. of Geosciences</i>	Ph.D. 2001
<i>University of Durham, UK, Dept. of Geological and Geophysical Sciences</i>	M.Sc. 1995
<i>Cambridge University, UK</i>	B.A. 1994

### RESEARCH INTERESTS

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More information available at: <http://rallen.berkeley.edu/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 Transportation and Infrastructure, Subcommittee on Economic Development, Public Buildings, and Emergency Management; 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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Chair, National Academy of Science, Committee on Seismology and Geodynamics, 2015–present.

Chair, Earthquake Early Warning, US Science Research & Development Committee, 2006–2016.

Chair, Ocean Bottom Seismometer Instrumentation Pool, IRIS Oversight Committee, 2015.

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

Member, Cascadia Initiative Expedition Team deploying seafloor instruments, 2011-2015.

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

Chair, National Science Foundation, Amphibious Array Steering Committee, 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://rallen.berkeley.edu/pub>

- Hawley, W.B., R.M. Allen, M.A. Richards, Tomography reveals buoyant asthenosphere accumulating beneath the Juan de Fuca plate, *Science*, **353**, 1406-1408, doi: [10.1126/science.aad8104](https://doi.org/10.1126/science.aad8104), 2016.
- Kong, Q., R.M. Allen, L. Schreier, Y.-W. Kwon, MyShake: A smartphone seismic network for earthquake early warning and beyond, *Sci. Adv.*, **2**, e1501055, doi: [10.1126/sciadv.1501055](https://doi.org/10.1126/sciadv.1501055), 2016.
- Martin-Short, R., R.M. Allen, I.D. Bastow, E. Totten and M.A. Richards, Mantle flow geometry from ridge to trench beneath the Gorda–Juan de Fuca plate system, *Nature Geoscience*, **8**, 965-968, [10.1038/NGEO2569](https://doi.org/10.1038/NGEO2569), 2015.
- Grapenthin, R., I. Johanson, and R.M. Allen, The 2014 Mw 6.0 Napa earthquake, California: Observations from real-time GPS-enhanced earthquake early warning, *Geophys. Res. Lett.*, **41**, [10.1002/2014GL061923](https://doi.org/10.1002/2014GL061923), 2014.
- Allen, R.M. Seconds count. *Nature* **502**, 29-31, [10.1038/502029a](https://doi.org/10.1038/502029a), 2013.
- Allen, R.M., Transforming Earthquake Detection? *Science* **335**, 297-298, [10.1126/science.1214650](https://doi.org/10.1126/science.1214650), 2012.
- 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, [10.1111/j.1365-246X.2011.04990.x](https://doi.org/10.1111/j.1365-246X.2011.04990.x), 2011.
- Allen, R.M. and A. Ziv, Application of real-time GPS to earthquake early warning, *Geophys. Res. Lett.*, **38**, L16310, [10.1029/2011GL047947](https://doi.org/10.1029/2011GL047947), 2011.
- Allen, R.M., Seconds before the big one, *Scientific American*, 74-79, April 2011.
- Allen, R.M., P. Gasparini, O. Kamigaichi, M. Bose (2009) The Status of Earthquake Early Warning around the World: An Introductory Overview, *Seismo. Res. Lett.*, **80**, (5) p682-693, [10.1785/gssrl.80.5.682](https://doi.org/10.1785/gssrl.80.5.682), 2009.
- Brudzinski, M. and R.M. Allen, Segmentation in Episodic Tremor and Slip All Along Cascadia, *Geology*, **35** (10) 907-910, [10.1130/G23740A.1](https://doi.org/10.1130/G23740A.1), 2007.
- Olson, E.L., and R.M. Allen. The deterministic nature of earthquake rupture. *Nature*, **438**, 212-215, [10.1038/nature04214](https://doi.org/10.1038/nature04214), 2005.
- Allen, R.M., H. Kanamori. The potential for earthquake early warning in southern California. *Science*, **300** (5620) 786-798, [10.1126/science.1080912](https://doi.org/10.1126/science.1080912), 2003.
- Ritsema, J., R.M. Allen, The elusive mantle plume, *Earth Planet. Sci. Lett.*, **207**, 1-12, 2003.
- Allen, R.M., G. Nolet, W.J. Morgan, K. Vogfjord, B.H. Bergsson, P. Erlendsson, G.R. Foulger, S. Jakobsdottir, B.R. Julian, M. Pritchard, S. Ragnarsson, and R. Stefansson, Imaging the mantle beneath Iceland using integrated seismological techniques, *J. Geophys. Res.*, **107**, 2325, [10.1019/2001JB000595](https://doi.org/10.1019/2001JB000595), 2002.

**SELECTED GEOPHYSICAL DEPLOYMENTS**

- MyShake, 2014-present: Harnessing personal/private smartphones to record earthquake ground shaking for research into earthquake sources process and hazard reduction including earthquake early warning. See <http://myshake.berkeley.edu/>
- ShakeAlert (E-larmS, G-larmS & T-larmS), 2006-present: Development of earthquake early warning and tsunami warning. Realtime testing using 400 geophysical stations across California. Collaborative testing in Israel, Chile, Korea and U.S. Pacific Northwest. See <http://rallen.berkeley.edu/eew>
- Cascadia Initiative Offshore Deployment, 2011-2015: Chief Scientist on 2 cruises recovering ocean-bottom seismometers deployed across Juan de Fuca.