

CURRICULUM VITAE FOR DR. LAURA M. WALLACE

Education

2002: Ph.D., Earth Sciences, University of California, Santa Cruz (Advisor: Eli Silver)
PhD thesis: Tectonics and arc-continent collision in Papua New Guinea: New insights from geodetic, geophysical and seismological data
1995: B.S. (with Honors and Distinction), Geology, University of North Carolina-Chapel Hill

Employment Record

2012-present: Research Scientist at University of Texas, Institute for Geophysics, Austin, TX
2016-present: Principal Scientist at GNS Science, New Zealand (note joint position with UTIG and GNS).
2007-2012: Senior research geophysicist (at Senior Scientist II level when departed in 2012), GNS Science, Lower Hutt, NZ
2002-2007: Research geophysicist, GNS Science, Lower Hutt, NZ
1996-2002: Graduate student researcher, Earth Sciences Dept. UC Santa Cruz
1993: Undergraduate teaching assistant, Dept. of Geology, Furman Univ.

Distinctions/Honours

2018-present: Fellow of the Royal Society of New Zealand
2018: McKay Hammer Award, Geoscience Society of New Zealand
2018: Co-chief scientist for IODP Expedition 375
2016: NZ Geophysics prize (for best NZ Geophysics paper published in 2015/2016). Awarded for our paper in Science on the HOBITSS experiment results
2015/2016: Distinguished lecturer for the NSF GeoPrisms Distinguished Lecturer Program
2014 & 2015: Kavli Foundation Frontiers of Science Fellow
2012: Editor's citation for excellence in refereeing, Geophysical Research Letters
2012: Editor's citation for excellence in refereeing, Journal of Geophysical Research-Solid Earth
2007: Editor's citation for excellence in refereeing, Journal of Geophysical Research-Solid Earth
2005: NZ Geophysics prize (for best NZ Geophysics paper published in 2004).
1997-2000: NASA Earth Systems Science Graduate Student Fellow

Published Articles

- Wallace, L.M.** (2020), Slow Slip Events in New Zealand, Annual Review of Earth and Planetary Sciences (invited review article), doi.org/10.1146/annurev-earth-0717190055104.
- Haines, A. J., & **Wallace, L. M.** (2020). New Zealand-wide geodetic strain rates using a physics-based approach. Geophysical Research Letters, 47, <https://doi.org/10.1029/2019GL084606>
- Zal, H.J., K. Jacobs, M.K. Savage, J. Yarce, S. Mroczek, K. Graham, E. K. Todd, J. Nakai, Y. Iwasaki, A. Sheehan, K. Mochizuki, **L. Wallace**, S. Schwartz, S. Webb, S. Henrys, 2020, Temporal and spatial variations in seismic anisotropy and Vp/Vs ratios in a region of slow slip, Earth and Planetary Science Letters, Volume 532, 15970, <https://doi.org/10.1016/j.epsl.2019.115970>.
- Wallace, L.M.**, M. Ikari, D. Saffer, H. Kitajima (2019), Slow motion earthquakes: Taking the pulse of slow slip events with Scientific Ocean Drilling, Oceanography, Invited Review paper, 32(1), 106-118.
- Wallace, L.M.**, Saffer, D.M., Barnes, P.M., Pecher, I.A., Petronotis, K.E., LeVay, L.J., and the Expedition 372/375 Scientists, 2019. *Hikurangi Subduction Margin Coring, Logging, and Observatories*. Proceedings of the International Ocean Discovery Program, 372B/375: College Station, TX (International Ocean Discovery Program). <https://doi.org/10.14379/iodp.proc.372B375.2019>
- Warren Smith, E., B. Fry, **L. Wallace**, E. Chon, S. Henrys, A. Sheehan, K. Mochizuki, S. Schwartz, S. Webb, and S. Lebedev (2019), Episodic stress and fluid pressure cycling in

- subducting oceanic crust during slow slip, *Nature Geoscience*, doi.org/10.1038/s41561-019-0367-x
7. Haines, J., **Wallace, L. M.**, & Dimitrova, L. (2019). Slow slip event detection in Cascadia using vertical derivatives of horizontal stress rates. *Journal of Geophysical Research: Solid Earth*, 124. <https://doi.org/10.1029/2018JB016898>
 8. Kaneko, Y., Ito, Y., Chow, B., **Wallace, L. M.**, Tape, C., Grapenthin, R., et al. (2019). Ultralong duration of seismic ground motion arising from a thick, low-velocity sedimentary wedge. *Journal of Geophysical Research: Solid Earth*, <https://doi.org/10.1029/2019JB017795>
 9. Shibazaki, B., **Wallace, L. M.**, Kaneko, Y., Hamling, I., Ito, Y., & Matsuzawa, T. (2019). Three-dimensional modeling of spontaneous and triggered slow-slip events at the Hikurangi subduction zone, New Zealand. *Journal of Geophysical Research: Solid Earth*, 124. <https://doi.org/10.1029/2019JB018190>
 10. Yohler, R., Bartlow, N., **Wallace, L. M.**; Williams, C. (2019). Time-dependent behavior of a near trench slow slip event at the Hikurangi Subduction Zone. *Geochemistry, Geophysics, Geosystems*, 20. <https://doi.org/10.1029/2019GC008229>
 11. Fagereng, A., H.M. Savage, J.K. Morgan, M. Wang, F. Meneghini, P.M. Barnes, R. Bell, H. Kitajima, D.D. McNamara, D.M. Saffer, **L.M. Wallace**, K. Petronotis, L. LeVay, and IODP Expedition 372/375 Scientists (2019), Mixed deformation styles observed on a shallow subduction thrust Hikurangi margin, New Zealand, *Geology*, doi.org/10.1130/G46367.1
 12. Barker, D.H.N., S. Henrys, F.C. Tontini, P.M. Barnes, D. Bassett, E. Todd, **L. Wallace**, 2018, Geophysical constraints on the relationship between seamount subduction, slow slip and tremor and the north Hikurangi subduction zone, New Zealand, *Geophys. Res. Lett.*, doi.org/10.1029/2018GL080259
 13. Todd, E. K., Schwartz, S. Y., Mochizuki, K., **Wallace, L. M.**, Sheehan, A. F., Webb, S.C., et al. (2018). Earthquakes and tremor linked to seamount subduction during shallow slow slip at the Hikurangi Margin, New Zealand. *Journal of Geophysical Research: Solid Earth*, 123, 6769–6783. <https://doi.org/10.1029/2018JB016136>.
 14. Yarce, J. A.F. Sheehan, J.S. Nakai, S.Y. Schwartz, K. Mochizuki, M.K. Savage, **L.M. Wallace**, S. A. Henrys, S.C. Webb, Y. Ito, R.E. Abercrombie, B. Fry, J. Shaddock, and E.K. Todd (2019), Seismicity at the northern Hikurangi margin, New Zealand, and investigation of the potential spatial and temporal relationships with a shallow slow slip event, *J. Geophys. Res.*, 124, doi.org/10.1029/2018JB017211.
 15. Barnes, J.D., J. Cullen, S. Barker, S. Agostini, S. Penniston-Dorland, J.C. Lassiter, A. Klugel, **L. Wallace** (2019), The role of the upper plate in controlling fluid-mobile element (Cl, Li, B) cycling through subduction zones: Hikurangi forearc, New Zealand, *Geosphere*, 15, doi.org/10.1130/GES02057.1.
 16. Biemiller, J., Ellis, S., Mizera, M., Little, T., **Wallace, L.**, & Lavier, L. (2019). Tectonic inheritance following failed continental subduction: A model for core complex formation in cold, strong lithosphere. *Tectonics*, 38, 1742–1763. <https://doi.org/10.1029/2018TC005383>
 17. Little, T.A., S.M. Webber, M. Mizera, C. Boulton, J. Oesterle, S. Ellis, A. Boles, B. van der Pluijm, K. Norton, D. Seward, J. Biemiller, and **L. Wallace** (2019). Evolution of a rapidly slipping, active low-angle normal fault, Suckling-Dayman metamorphic core complex, SE Papua New Guinea, *GSA Bulletin*, 131(7/8), 1333-1363.
 18. Muramoto, T., Y. Ito, D. Inazu, **L.M. Wallace**, R. Hino, S. Suzuki et al. (2019), Seafloor crustal deformation on ocean bottom pressure records with nontidal variability corrections: Application to Hikurangi margin, New Zealand, *Geophys. Res. Lett.*, 46, doi.org/10.1029/2018GL080830.
 19. **Wallace, L. M.**, Hreinsdóttir, S., Ellis, S., Hamling, I., D'Anastasio, E., & Denys, P. (2018). Triggered slow slip and afterslip on the southern Hikurangi subduction zone following the Kaikōura earthquake. *Geophysical Research Letters*, 45. <https://doi.org/10.1002/2018GL077385>

20. Williams, C. A., & **Wallace, L. M.** (2018). The impact of realistic elastic properties on inversions of shallow subduction interface slow slip events using seafloor geodetic data. *Geophysical Research Letters*, 45. <https://doi.org/10.1029/2018GL078042>
21. Saffer, D.M., **Wallace, L.M.**, Petronotis, K., and the Expedition 375 Scientists, 2018. Expedition 375 Preliminary Report: Hikurangi Subduction Margin Coring and Observatories. International Ocean Discovery Program. <https://doi.org/10.14379/iodp.pr.375.2018>
22. Webber, S., K.P. Norton, T.A. Little, **L.M. Wallace**, S. Ellis (2018) How fast can low-angle normal fault slip? Insights from cosmogenic exposure dating of the active Mai'iu fault, Papua New Guinea, *Geology*, 46(3), 227-230.
23. Kinoshita, C., D. Saffer, A. Kopf, A. Roesner, **L.M. Wallace**, E. Araki, T. Kimura et al., 2018, Changes in physical properties of the Nankai Trough megasplay fault induced by earthquakes, detected by continuous pressure monitoring, *J. Geophys. Res.*, 123(2), 1072-1088.
24. Todd, E. K., Schwartz, S. Y., Mochizuki, K., **Wallace, L. M.**, Sheehan, A. F., Webb, S.C., et al. (2018). Earthquakes and tremor linked to seamount subduction during shallow slow slip at the Hikurangi Margin, New Zealand. *Journal of Geophysical Research: Solid Earth*, 123, 6769–6783. <https://doi.org/10.1029/2018JB016136>
25. Kubota, T., Saito, T., Ito, Y., Kaneko, Y., **Wallace, L. M.**, Suzuki, S., et al. (2018). Using tsunami waves reflected at the coast to improve offshore earthquake source parameters: Application to the 2016 Mw 7.1 Te Araroa earthquake, New Zealand. *Journal of Geophysical Research: Solid Earth*, 123. <https://doi.org/10.1029/2018JB015832>
26. Kaneko, Y., **Wallace, L. M.**, Hamling, I. J., & Gerstenberger, M. C. (2018). Simple physical model for the probability of a subduction-zone earthquake following slow slip events and earthquakes: Application to the Hikurangi megathrust, New Zealand. *Geophysical Research Letters*, 45, 3932–3941. <https://doi.org/10.1029/2018GL077641>
27. Barker, D.H.N., S. Henrys, F.C. Tontini, P.M. Barnes, D. Bassett, E. Todd, **L. Wallace**, 2018, Geophysical constraints on the relationship between seamount subduction , slow slip and tremor and the north Hikurangi subduction zone, New Zealand, *Geophys. Res. Lett.*, doi.org/10.1029/2018GL080259
28. **Wallace, L.M.**, Y. Kaneko, S. Hreinsdottir, I. Hamling, Z. Peng, N. Bartlow, E. D'Anastasio, and B. Fry, 2017, Large-scale dynamic triggering of shallow slow slip enhanced by overlying sedimentary wedge, *Nature Geoscience*, 10, 765-770 doi: 10.1038/ngeo3021
29. Araki, E., D.M. Saffer, A. Kopf, **L.M. Wallace**, T. Kimura, Y. Machida, S. Ide (2017), Recurring and triggered slow slip events near the trench at the Nankai Trough subduction megathrust, *Science* 356, 1157-1160, doi: 10.1126/science.aan3120
30. Koulali, A., S. McClusky, **L. Wallace**, S. Allgeyer, P. Tregoning, E. D'Anastasio, and R. Benavente (2017), Slow slip events and the 2016 Te Araroa Mw 7.1 earthquake interaction: Northern Hikurangi subduction, New Zealand, *Geophys. Res. Lett.*, 44, doi:[10.1002/2017GL074776](https://doi.org/10.1002/2017GL074776).
31. Hamling, I.J., S. Hreinsdottir, K. Clark, J. Eliot, C. Liang, E. Fielding, N. Litchfield, P. Villamor, **L. Wallace**, and 22 other authors (2017), Complex multifault rupture during the 2016 M7.8 Kaikoura earthquake, new Zealand, *Science*, doi: 10.1126/science.aam7194.
32. Kaiser, A., N. Balfour, B. Fry, C. Holden, N. Litchfield, M. Gerstenberger, E. D'Anastasio, N. Horspool, G. McVerry, J. Ristau, S. Bannister, A. Christophersen, K. Clark, W. Power, D. Rhoades, C. Massey, I. Hamling, **L. Wallace**, J. Mountjoy, Y. Kaneko, R. Benites, C. Van Houtte, S. Dellow, L. Wotherspoon, K. Elwood, and K. Gledhill (2017), The 2016 Kaikoura earthquake, New Zealand, Preliminary seismological report, *Seismological Research Letters*, doi: 10.1785/0220170018
33. Power, W., X. Wang, **L. Wallace**, K. Clark, C. Mueller (2017), The New Zealand probabilistic tsunami hazard model: development and implementation of a methodology for

- estimating tsunami hazard nationwide, Geological Society, London, Special publications 456.
34. Villamor, P., K. Berryman, S. Ellis, G. Schreurs, **L.M. Wallace**, G. Leonard, R.M. Langridge, W. Ries, 2017, Rapid Evolution of subduction-related intraarc rifts: The Taupo Rift, New Zealand, *Tectonics*, 36(10), 2250-2272.
 35. Nicol, A., H. Seebeck, **L. Wallace**, 2017, Quaternary Tectonics of New Zealand, *in* Landscape and Quaternary Environmental Change in New Zealand, Atlantis Press, pp. 1-34
 36. **Wallace, L.M.**, S. C. Webb, Y. Ito, K. Mochizuki, R. Hino, S. Henrys, S. Schwartz, A. Sheehan, 2016, Slow slip near the trench at the Hikurangi subduction zone, *Science*, 352(6286), 701-704, doi: 10.1126/science.aaf2349.
 37. **Wallace, L.M.**, E. Araki, D. Saffer, X. Wang, A. Roesner, A. Kopf, A. Nakanishi, W. Power, R. Kobayashi, C. Kinoshita, S. Toczko, T. Kimura, Y. Machida, and S. Carr (2016), Near-field observations of an offshore Mw 6.0 earthquake from an integrated seafloor and subseafloor monitoring network at the Nankai Trough, southwest Japan, *J. Geophys. Res.*, 121, doi: 10.1002/2016JB013417.
 38. Mahony, S.H., Sparks, R.S.J., **Wallace, L.M.**, Engwell, S.L., Scourse, E.M., Barnard, N.H., Kandlbauer, J. and Brown, S.K. (2016), Increased rates of large magnitude explosive eruptions in Japan in the Late Neogene and Quaternary. *Geochem. Geophys. Geosyst.*. Accepted Author Manuscript. doi:10.1002/2016GC006362.
 39. Beavan, J., **L. Wallace**, N. Palmer, P. Denys, S. Ellis, N. Fournier, S. Hreinsdottir, C. Pearson, M. Denham, 2016, New Zealand GPS velocity field: 1995-2013, *New Zealand J. Geol. Geophys.*, doi: 10.1080/00288306.2015.1112817
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 41. Plaza-Faverola, A., S. Henrys, I. Pecher, **L. Wallace**, and D. Klaeschen (2016), Splay fault branching from the Hikurangi subduction shear zone: Implications for slow slip and fluid flow, *Geochem. Geophys. Geosyst.*, 17, doi:10.1002/2016GC006563.
 42. Hayward, B.W., H.R. Grenfell, A.T. Sabaa, U.A. Cochran, K.J. Clark, **L. Wallace**, and A.S. Palmer, 2016, Salt marsh foraminiferal record of 10 large Holocene (last 7500 yr) earthquakes on a subducting plate margin, Hawkes Bay, New Zealand, *Geol. Soc. Am. Bull.*, in press, doi:10.1130/B31295.1.
 43. Power, W., **L. Wallace**, C. Mueller, S. Henrys, K. Clark, B. Fry, X. Wang, C. Williams, 2016, Understanding the potential for tsunami generated by earthquakes on the southern Hikurangi subduction interface, *New Zealand J. Geol. Geophys.*, doi: 10.1080/00288306.2015.1127825
 44. Ellis, S., C. Williams, M. Reyners, D. Eberhart-Phillips, **L. Wallace**, 2016, Calculating regional stresses for northern Canterbury: the effect of the 2010 Darfield earthquake, *New Zealand J. Geol. Geophys.*, doi:10.1080/00288306.2015.1123740
 45. Saffer, D.M. and **L.M. Wallace**, 2015, The Frictional, Hydrologic, Metamorphic, and Thermal Habitat of Shallow Slow Earthquakes, *Nature Geoscience*, 8, 594-600, doi:10.1038/ngeo2490.
 46. Holden, L., **L.M. Wallace**, J. Beavan, N. Fournier, R. Cas, L. Ailleres, D. Silcock, 2015, Contemporary ground deformation at the Okataina Volcanic Centre from 1998 to 2011, measured using GPS, *Geophys. J. Int.*, 202(3), 2082-2105.
 47. Williams, C.A. and **L.M. Wallace**, 2015, Effects of material property variations on slip estimates for subduction interface slow slip events, *Geophysical Research Letters*, 42(4), 1113-1121.
 48. Hamling, I.J. and **L.M. Wallace**, 2015, Silent triggering: Aseismic crustal faulting induced by a subduction slow slip event, *Earth and Planetary Sci. Lett.*, 421, 13-19.
 49. Thirumalai, K., F.W. Taylor, C-C Shen, L.L. Lavie, C. Frohlich, **L.M. Wallace**, C-C Wu, H. Sun, and A.K. Papabatu, 2015, Variable Holocene deformation above a shallow

- subduction zone extremely close to the trench, *Nature Communications*, 6, doi:10.1038/ncomms8607.
50. Haines, A.J., L.L. Dimitrova, **L.M. Wallace**, C.A. Williams, 2015, Enhanced Surface Imaging of Crustal Deformation: Obtaining Tectonic Force Fields Using GPS Data, *Springer Briefs in Earth Sciences*, doi: 10.1007/978-3-319-21578-5.
 51. Clark, K., B.W. Hayward, U. Cochran, **L.M. Wallace**, W.L. Power, A. T. Sabaa, 2015, Evidence for past subduction earthquakes at a plate boundary with widespread upper plate faulting: southern Hikurangi margin, New Zealand, *Bulletin of the Seismological Society of America*, 10.1785/012014029.
 52. Cairns, E.A., T.A. Little, G.M. Turner, **L.M. Wallace**, S. Ellis, 2015, Paleomagnetic evidence for vertical-axis rotations of crustal blocks in the Woodlark Rift, SE Papua New Guinea: Miocene to present-day kinematics in one of the world's most rapidly extending plate boundary zones, *Geochem., Geophys., Geosystems*, in press.
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