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Education: B.A.Sc. (Engineering Physics), University of British Columbia, 1970. Ph.D. (Geophysics), Princeton University, 1978,

Employment 7/89-Pres. Professor, University of Hawaii at Manoa (UHM); 7/83-6/89 Associate Professor, UHM; 1/82-6/83 Assistant Professor, UHM; 9/79-12/81 Assistant Seismologist, Hawaii Institute of Geophysics; 1/78-9/79 Research Associate, Princeton University; 9/75-12/77 NRC Postgraduate Scholar, Princeton University; 9/74-8/75 Research Assistant, Princeton University; 9/73-8/74 Teaching Assistant, Princeton University; 1/72-7/73 Geophysicist, Gulf Oil Canada Ltd., Calgary, Alberta.

Current teaching Literate Programming with R & RStudio (ERTH 615), Bayesian Data Analysis (ERTH 695).

Graduate students (*principal advisor, otherwise committee member)

Hazel Hotchandani (comps 2019, diss, Econ), Michael Tucker (entered 2019, Astronomy), Taylor Viti (MS 2019 Geophysics), John Avery (MS 2019 Geophysics), Alexandra Pleus (MS 2018 Geophysics), Charu Lata (MS 2019 Geophysics), Andrew Foerder (MS 2020 Geochem.), Andrew Chase (entered 2019 Geophysics), Emily Costello (PhD 2020, Planetary) Rob Walker* (MGeo Coastal), Dave Waller (MGeo Geothermal), Bianca Mintz (MGeo GG), Alyssa Anderson (PhD 2020, Geophysics), Svetlana Natarov (PhD candidate, entered 2014, GT), Brian Shiro (PhD candidate, HIGP, entered January 2013), Haunani Kane, (MSc, Coastal), Tiffany Anderson* (PhD, Coastal), Brad Romine (PhD, Coastal), Malin Klawonn (PhD candidate, Volcanology), Dana Brodie (MS, geophysics), Christine Pequignet (PhD, 2012 Oceanography), Michael Chandler (MSc 2010, Geophysics), Eva-Marie Nosal* (PhD, Geophysics 2009), Seung-Sep Kim (PhD, 2009, Geophysics), Matt Patrick (PhD, 2006 Volcanology), Shung-Sheng Fu (PhD, 2006 Geophysics), Xinhua Sun* (PhD, 2001, Geophysics), Eduardo Mercado (PhD, Psychology, 2001), Peter Bromirski* (PhD, geophysics, 1995), Bertram Nolte* (PhD, 1994, geophysics), Subhashis Mallick* (PhD, Geophysics, 1990), Mrinal Sen* (PhD, Geophysics, 1991), Atanu Basu* (PhD, Geophysics, 1990), Charles McCreery (PhD, Geophysics), Gerald Carter (PhD, Geophysics, 1983), Patricia Cooper* (PhD, Geophysics 1983), John B. Sinton* (PhD, Geophysics 1982), Brian Iwatake (MSc, Geophysics 1981).

Recent research support

N. Lautze, D. Thomas and others (co-PIs), U. S. Department of Energy, Evaluation of Geothermal Resources in Hawaii, \$500K in 2015, \$750K in 2016-17, \$500K in 2018-2019.

Publications

Arranged by subject, and chronologically within subject. For non-technical publications, scroll to bottom. ‘*’ indicates a graduate student. Work in last five years is highlighted.

Ecology

Shea*, D., and others including L.N. Frazer (2020). Environmental DNA (eDNA) from multiple pathogens is elevated near active Atlantic salmon farms, *Proceedings of the Royal Society B*. DOI: <http://dx.doi.org/10.1098/rspb.2020.2010>

- Veazey*, L., Franklin, E.C., Kelley, C., Rooney, J. and Frazer, L.N., (2016) The implementation of rare events logistic regression to predict the distribution of mesophotic hard corals across the main Hawaiian Islands, *PeerJ*, DOI: 10.7717/peerj.2189.
- Groner, M.L., Rogers, L.A., Bateman, A.W., Connors, B.M., Frazer, L.N., Godwin*, S.C., Krkošek, M., Lewis, M.A., Peacock*, S.J., Rees, E.E., Revie, C.W., and Schlägel, U.E. (2016) Review Article: Lessons from sea louse and salmon epidemiology, *Phil. Trans. Roy. Soc. B*, **371**(1689), DOI: 10.1098/rstb.2015.0203.
- Krkosek, M., Ashander, J., Frazer, L.N., and Lewis, M.A. (2013) Allee effect from parasite spill-back, *American Naturalist*, **182**(5), 640–652.
- Frazer, L.N., Krkosek, M. and Morton, A. (2012) Critical thresholds in sea lice epidemics: evidence, sensitivity and subcritical estimation, *Proceedings of the Royal Society, B*, Published online Jan 4, 2012. DOI: 10.1098/rspb.2011.2210
- Frazer, L.N. (2009) Sea-cage aquaculture, sea lice and declines of wild fish, *Conservation Biology*, **23**(3), 599–607.
- Frazer, L.N. (2008). Sea lice infection models for fishes, *Journal of Mathematical Biology*, **57**, 595–611.
- Frazer, L.N. (2007) Comment on "Sea lice on adult Pacific salmon in the coastal waters of British Columbia, Canada" by R.J. Beamish et al., *Fisheries Research*, **85**, 328–331.
- Krkosek, M., Lewis, M.A., Morton, A., Frazer, L.N. and Volpe, J. (2006) Epizootics of wild fish induced by farm fish, *Proceedings of the National Academy of Sciences*, **103**(42), 15506–15510.
- Frazer, L.N., (2006) Reliability of reported sea lice levels on salmon farms in British Columbia, *Fishbytes*, **12**(1), 3.

Coastal Processes

- Vitousek, S., Barnard, P.L., Fletcher, C.H., Frazer, N., Erikson, L., and Storlazzi, C. (2020) Sea-level rise exponentially increases coastal flood frequency, *Nature Scientific Reports*, 10:6466, doi: 10.1038/s41598-020-62188-4
- Vitousek, S., Barnard, P.L., Fletcher, C.H., Frazer, N., Erikson, L., and Storlazzi, C. (2017) Doubling of coastal flooding frequency within decades due to sea level rise, *Nature Scientific Reports*, **7**(1399), doi:10.1038/s41598-017-01362-7
- Romine, B.M., Fletcher, C.H., Frazer, L.N., and Anderson, T.R. (2016) Beach erosion under rising sea level modulated by coastal geomorphology and sediment availability on carbonate reef-fringed coasts, *Sedimentology*, DOI: 10.1111/sed.12264.
- Kane*, H.H., Fletcher, C.H., Romine*, B.M., Frazer, L.N., Anderson*, T.R., and Barbee, M.M. (2015) Modeling sea-level rise of vulnerability of coastal environments using ranked management concerns, *Climatic Change*, DOI: 10.1007/s10584-015-1377-3, published online March 19, 2015.
- Anderson*, T.R., Fletcher, C.H., Barbee, M.M., Frazer, L.N., and Romine, B.M. (2015) Doubling of coastal erosion under rising sea level by mid-century in Hawaii. *Natural Hazards*, DOI 10.1007/s11069-015-1698-6, published online March 18, 2015.
- Kane*, H.H., Fletcher, C.H., Frazer, L.N., and Barbee, M.M. (2015) Critical elevation levels for flooding due to sea level rise in Hawaii. *Regional Environmental Change*, **15**(8), 1679–1687. DOI: 10.1007/s10113-014-0725-6.
- Anderson*, T.R., Frazer, L.N. and Fletcher, C.H. (2014) Long-term shoreline change at Kailua, Hawaii using regularized single transect. *Journal of Coastal Research*, DOI: 10.2112/JCOASTRES-D-13-00202.1, published online October 16, 2014.
- Anderson*, T.R. and Frazer, L.N. (2014) Toward parsimony in shoreline change prediction (III): B-splines and noise handling, *Journal of Coastal Research*, **30**(4): 729–742.
- Romine*, B.M., Fletcher, C.H., Barbee, M.M., Anderson*, T.R. and Frazer, L.N. (2013) Are beach erosion rates and sea level rise related in Hawaii? *Global and Planetary Change*, **108**, 149–157.

- Kane*, H.H., Fletcher, C.H., Romine*, B.M., Anderson*, T.R., Frazer, L.N., and Barbee, M.M. (2012) Vulnerability assessment of Hawai'i's cultural assets attributable to erosion using shoreline trend analysis techniques, *Journal of Coastal Research*, **28**(3): 533–539.
- Anderson*, T.R., Frazer, L.N. and Fletcher, C.H. (2010) Transient and persistent shoreline change from a storm. *Geophys. Res. Lett.*, **37**, L08401, DOI: 10.1029/2009GL042252
- Conger*, C.L., Fletcher, C.H., Hochberg, E., Frazer, L.N. and Rooney*, J. (2009) Remote sensing of sand distribution patterns across an insular shelf: Oahu, Hawaii, *Marine Geology*, **267**, 175–190.
- Romine*, B.M., Fletcher, C.H., Frazer, L.N., Genz*, A.S., Barbee, M.M. & Lim*, S.C. (2009) Historical shoreline change, southeast Oahu, Hawaii: Applying polynomial models to calculate shoreline change rates, *Journal of Coastal Research*, **25**(6), 1236–1253.
- Frazer, L.N., Anderson*, T.R., and Fletcher, C.H. (2009) Correction to: "Modeling storms improves estimates of shoreline change", *Geophys. Res. Lett.*, **37**, L20401, doi:10.1029/2009GL041993.
- Frazer, L.N., Anderson*, T.R. and Fletcher, C.H. (2009) Modeling storms improves estimates of shoreline change, *Geophys. Res. Lett.*, **36**, L20404, doi:10.1029/2009GL040061.
- Frazer, L.N., Genz*, A.S. & Fletcher, C.H. (2009) Toward parsimony in shoreline change prediction (I): basis function methods. *Journal of Coastal Research*, **25**(2), 366–379.
- Genz*, A.S., Frazer, L.N. & Fletcher, C.H. (2009) Toward parsimony in shoreline change prediction (II): applying basis function methods to real and synthetic data, *Journal of Coastal Research*, **25**(2), 380–392.
- Fletcher, C.H., and sixteen others (2008) Geology of Hawaii Reefs, Chapter 11 of *Coral Reefs of the USA, Coral Reefs of the World*, **1**: 435–487.
- Genz*, A. S., Fletcher, C. H., Dunn, R. A., Frazer, L. N. and Rooney, J. J., (2007). The Predictive Accuracy of Shoreline Change Rate Methods and Alongshore Beach Variation on Maui, Hawaii, *Journal of Coastal Res.*, **23**(1), 87–105.

Geothermal Exploration

- Lautze, N., G. Ito, D. Thomas, N. Frazer, S. J. Martel, N. Hinz, D. Tachera, G. Hill, H.A. Pierce, P.E. Wannamaker, T. Martin (2020) Play Fairway analysis of geothermal resources across the state of Hawai'i: 4. Updates with new groundwater chemistry, subsurface stress analysis, and focused geophysical surveys. *Geothermics* (Vol. 86, July 2020, 10798), <https://doi.org/10.1016/j.geothermics.2019.101798>
- Lautze, N., D. Thomas, N. Hinz, G. Ito, N. Frazer, D. Waller (2017) Play fairway analysis of geothermal resources across the state of Hawaii: 1. Geological, geophysical, and geochemical datasets, *Geothermics*, (70) 376–392, <https://doi.org/10.1016/j.geothermics.2017.02.001>
- Ito, G., N. Frazer, N. Lautze, D. Thomas, N. Hinz, D. Waller, R. Whittier, E. Wallin (2016), Play fairway analysis of geothermal resources across the state of Hawaii: 2. Resource probability mapping, *Geothermics*, doi:10.1016/j.geothermics.2016.11.004
- Lautze, N., D. Thomas, N. Hinz, D. Waller, N. Frazer, G. Ito (2017), Play fairway analysis of geothermal resources across the state of Hawaii: 3. Use of development viability criterion to prioritize future exploration targets, *Geothermics*, (70) 406–413, <https://doi.org/10.1016/j.geothermics.2017.07.005>

Geophysics

- Anderson, A.N., Foster, J. H. and Frazer, L.N. (2020) Implications of deflation-inflation event models on Kilauea volcano Hawaii, *Journal of Volcanology and Geothermal Research*, v397, 15 May 2020, <https://doi.org/10.1016/j.jvolgeores.2020.106832>

- Pleus, A. Ito, G. and Frazer, L.N. (2020) Rheology and thermal structure of the lithosphere beneath the Hawaiian Ridge inferred from gravity data and models of plate flexure, *Geophysical Journal International*, **207**:207–224, <https://doi.org/10.1093/gji/ggaa155>.
- Butler, R., Frazer, L.N. and Templeton, W. (2016) Bayesian probabilities for Mw 9.0 earthquake in the Aleutian Islands from a regionally scaled global rate, *Journal of Geophysical Research B Solid Earth*, doi:10.1002/2016JB012861.
- Howell, S., Smith-Konter, Frazer, N., B. Tong, X., and Sandwell, D. (2016) Vertical fingerprint of earthquake cycle-induced loading of the San Andreas fault, *Nature Geoscience* (in press).
- Klawonn*, M., C. J. Wolfe, L. N. Frazer, and B. F. Houghton (2014), Constraining particle size dependent plume sedimentation from the 17 June 1996 eruption of Ruapehu volcano, New Zealand using geophysical inversions, *J. Geophys. Res.* **119**:1749–1763, doi:10.1002/2013JB010387.
- Klawonn*, M., C. J. Wolfe, L. N. Frazer, and B. F. Houghton (2012), Novel inversion approach to constrain plume sedimentation from tephra deposit data: Application to the 17 June 1996 eruption of Ruapehu volcano, New Zealand, *J. Geophys. Res.*, **117**, B05205, doi:10.1029/2011JB008767.
- Nosal*, E.-M. and Frazer, L.N. (2008). Pair-wise spectrogram processing used to track a sperm whale, *Canadian Acoustics*, **36**(1), 132–138.
- Nosal*, E.-M. and Frazer, L.N. (2007). Sperm whale three-dimensional track, swim orientation, beam pattern, and click levels observed on bottom-mounted hydrophones, *J. Acoust. Soc. Am.*, **122**(4), 1969–1978.
- Nosal*, E.-M. and Frazer, L.N. (2007). Modified pair-wise spectrogram processing for localization of unknown broadband sources, *IEEE J. Oceanic Eng.*, **32**(3), 721–728.
- Øyvind Engen, Ø., Frazer, L.N., Wessel, P. and Faleide, J.I. (2007), Prediction of sediment thickness in the Norwegian-Greenland sea from gravity inversion, *JGR-Solid Earth*, **111**, B11403, doi:10.1029/2005JB003924
- Patrick*, M., Frazer, L.N. and Brooks, B. (2006). Probabilistic modeling of eruptive activity at Etna volcano 1996–2000 using surface deformation and radiant heat flux, *Geophys. Res. Lett.*, **33**, L18312, doi:10.1029/2006GL026983
- Nosal*, E.-M., and Frazer, L. N., 2006. Track of a sperm whale from delays between direct and surface-reflected clicks, *Applied Acoustics*, **67**, 1187–1201.
- Brooks, B.A., Foster, J.H., Bevis, M., Frazer, L.N., Wolfe, C., and Behn, M., 2006. Periodic slow earthquakes on the flank of Kilauea volcano, Hawai'i, *Earth Plan. Sci. Lett.*, **246**, 207–216.
- Nosal*, E.-M., and Frazer, L.N., 2006. Pair-wise processing of spectrograms for localization of multiple broadband CW sources, *IEEE OES Newsletter*, **41**, 8–13.
- Brooks, B.F. and Frazer, L.N., 2005. Importance reweighting reduces dependence on temperature in Gibbs samplers: an application to the inverse coseismic geodetic problem, *Geophys. J. Int.*, **161**, 12–20.
- Fu*, Shung-Sheng, Tao, C., Prasad, M., Wilkens, R. H., and L. N. Frazer, 2004. Acoustic properties of coral sands, Waikiki, Hawaii, *J. Acoust. Soc. Am.*, **115**, 2013–2020.
- Tiemann, C.O., Porter, M.B., and Frazer, L.N., (2004) Localization of marine mammals near Hawaii using an acoustic propagation model, *J. Acoust. Soc. Am.*, **115**, 2834–2843.
- Isoun*, E., Fletcher, C., Frazer, L.N. and Gradie, J., (2003) Multi-spectral mapping of reef bathymetry and coral cover; Kailua Bay, Hawaii, *Coral Reefs*, **22**, 68–82.
- Gorgas*, Thomas J., Wilkens, R. H., Fu*, Shung-Sheng, Frazer, L. N., Richardson, M. D., Briggs, K. B., and Lee, H. J., 2002. In situ acoustic and laboratory ultrasonic soundspeed and attenuation measured in heterogeneous soft seabed sediments: Eel River shelf, California, *Marine Geology*, **182**, 103-119.
- Mercado*, E. and Frazer, L.N., (2001) Humpback whale song or humpback whale sonar: a reply to Au et al., *IEEE. J. Ocean Eng.*, **26**, 406–415.
- Sun*, X. H. and Frazer, L. N., 2000. Shear wave attenuation profile from sonic dipole well-log data, *Geophys. Res. Lett.*, **27**, 285–288.
- Sun*, X. H., Tang, X. M., Cheng, C. H., and Frazer, L. N., 2000. P- and Swave attenuation logs from monopole sonic data, *Geophysics*, **65**, 755-765.

- Frazer, L. N. and Mercado*, E., 2000. A sonar model for humpback whale song, *IEEE. J. Ocean Eng.*, **25**, 160–182.
- Frazer, L. N., Fu*, Shung-Sheng, and Wilkens, R. H., 1999. Seabed sediment attenuation profiles from a movable subbottom acoustic vertical array, *J. Acoust. Soc. Am.*, **106**, 120–130.
- Mercado*, E., & Frazer, N., 1999. Environmental constraints on sound transmission by humpback whales. *J. Acoust. Soc. Am.*, **106**, 3004–3016.
- Fu*, S.S., Wilkens, R.H., and Frazer, L.N., 1999. New instrument for in situ velocity and attenuation profiles., In: Zang, R. and J. Zhou (eds.), *Shallow-Water Acoustics*, China Ocean Press, Beijing, 597–603.
- Frazer, L. N., & Sun*, Xinhua, 1998. New objective functions for waveform inversion, *Geophysics*, **63**(1), 1-10.
- Frazer, L. N., Sun*, Xinhua, & Wilkens, R. H., 1997. Changes in attenuation with depth in an ocean carbonate section: ODP sites 806 and 807, Ontong Java Plateau, *J. Geophys. Res.*, **102**, 2983-2998.
- Frazer, L. N., Sun*, Xinhua, & Wilkens, R. H., 1997. Inversion of sonic waveforms with unknown source and receiver functions, *Geophys. J. Int.*, **129**, 579-586.
- Fu*, S. S., Wilkens, R. H., & Frazer, L. N., 1996. In situ velocity profiles in gassy sediments: Eckernfoerde Bay, *Geo-Marine Lett.*, **16**, 249-253.
- Fu*, S. S., Wilkens, R. H., and Frazer, L. N., 1996. Acoustic Lance: New in situ seafloor velocity profiles, *J. Acoust. Soc. Am.*, **99**, 234-242.
- Frazer, L.N., 1995. SH propagation in rocks with planar fractures-I. Excess slowness, *Geophys. J. Int.*, **122**, 33-62.
- Bromirski*, P. B., Frazer, L. N., and Duennebie, F. K., 1995. The Q-gram method: Q from instantaneous phase, *Geophys. J. Int.*, **120**, 73-86.
- Frazer, L. N., 1994. A pulse in a binary sediment, *Geophys. J. Int.*, **118**, 75-93.
- Nolte*, B. and Frazer, L. N., 1994. Vertical seismic profile inversion with genetic algorithms, *Geophys. J. Int.*, **117**, 162-178.
- Tolstoy, A. and Frazer, L. N., 1993. Maximizing matched field processing output used in a new approach to ocean acoustic tomography, in: *Computational Acoustics-Volume 2*, pp. 79-84, edited by D.Lee, A.R.Robinson and R.Vichnevetsky, North-Holland, Amsterdam.
- Rudman, A. J., Mallick*, S., Frazer, L. N., and Bromirski*, P. B., 1993. Workstation computation of synthetic seismograms for vertical and horizontal profiles: a full wavefield response for a 2D layered halfspace, *Computers & Geosciences*, **19**, 447-474.
- Nolte*, B., Frazer, L. N., and Mallick*, S., 1992. Seismogram synthesis for azimuthally anisotropic media with a single slowness integration, *Geophys. J. Int.*, **111**, 127-140.
- Bromirski*, P., Frazer, L. N., and Duennebie, F., 1992. Shear Q of sediments from spectral ratios of converted basement reflections, *Geophys. J. Int.*, **110**, 465-485.
- Sen*, M.K. and Frazer, L. N., 1991. Multifold phase space path integral synthetic seismograms, *Geophys. J. Int.*, **104**, 479-487.
- Mallick*, S. and Frazer, L. N., 1991. Reflection/transmission coefficients and azimuthal anisotropy in marine seismic studies, *Geophys. J. Int.*, **105**, 241-252.
- Tolstoy, A., Diachok, O., and Frazer, L. N., 1991. Acoustic Tomography via matched field processing, *J. Acoust. Soc. Am.*, **89**, 1119-1127.
- Bromirski*, P., Frazer, L. N., and Duennebie, F. K., 1991. Sediment Qbeta from spectral ratios of converted basement reflections, in: *Shear Waves in Marine Sediments*, edited by T. J. Hovem, M. D. Richardson, and R. D. Stoll, pp. 361-368. Kluwer Academic, The Netherlands.
- Mallick*, S., and Frazer, L. N., 1990. Computation of synthetic seismograms for stratified azimuthally anisotropic media, *J. Geophys. Res.*, **95**, 8513-8526.
- Mallick*, S. and Frazer, L. N., 1990. Synthesis of Po/So for a variety of oceanic models and their implications for the structure of the oceanic upper mantle, *Geophys. J. Int.*, **100**, 235-253.
- Frazer, L. N., 1990. Dynamic elasticity of microbedded and fractured rocks, *J. Geophys. Res.*, **95**, 4821-4831.
- Frazer, L. N. and Pecholcs*, P. I., 1990. Single-Hydrophone Localization, *J. Acoust. Soc. Am.*, **88**, 995-1002.

- Basu*, A., and Frazer, L. N., 1990. Rapid determination of critical temperature in simulated annealing inversion, *Science*, **249**, 1409-1412.
- Frazer, L. N., 1989. Review of "Migration of Seismic Data", G.H. Gardner (ed.), *EOS*, **70**, 116.
- Frazer, L. N. and Fryer, G. J., 1989. Useful properties of the system matrix for a homogeneous anisotropic elastic solid, *Geophys. J. R. Astr. Soc.*, **97**, 173-177.
- Frazer, L. N., 1988. Quadrature of wavenumber integrals, pp. 279-290 in: *Handbook of Seismological Algorithms*, edited by D. J. Doornbos, Academic Press.
- Mallick*, S. and Frazer, L. N., 1988. Rapid computation of multi-offset VSP synthetic seismograms in a stratified medium, *GEOPHYSICS*, **53**, 479-491.
- Sen*, M. K., Frazer, L. N., Chapman, N. R. and Mallick*, S., 1988. Analysis of multipath sound propagation in the ocean near 50°N, 128°W, *J. Acoust. Soc. Am.*, **83**, 588-597.
- Frazer, L. N., and Rudman, A. J., 1988. Seismic modeling in the (τ, ρ) domain, *Indiana Geological Survey Occasional Paper 54*.
- Schoenberg, M., Mallick*, S., and Frazer, L. N., 1988. Synthetic shear VSP's in azimuthally anisotropic media, *Exploration Geophysics (Australia)*, **19**, 151-157.
- Frazer, L. N., 1987. Review of "Seismic Wave Propagation in Stratified Media" by B. L. N. Kennett, *EOS*, **68**, 79.
- Butler, R., McCreery*, C. S., Frazer, L. N., and, Walker, D. A., 1987. High frequency seismic attenuation of Oceanic P- and S-waves in the Western Pacific, *J. Geophys. Res.*, **92**, 1383-1396.
- McCoy, J. J. and Frazer, L. N., 1987. Pseudodifferential operators, operator orderings, marching algorithms and path integrals for one-way wave equations, *Wave Motion*, **9**, 413-427.
- Frazer, L. N., 1987. Synthetic seismograms using multi-fold path integrals, Part I: Theory, *Geophys. J. R. astr. Soc.*, **88**, 621-646.
- Brocher, T. M. and Frazer, L. N., 1987. A comparison of two algorithms for the calculation of synthetic seismograms in two-dimensional media, *Geophys. Res. Lett.*, **14**, 801-803.
- Sen*, M. K. and Frazer, L. N., 1987. Synthetic seismograms using multifold path integrals, Part II: Computations, *Geophys. J. R. astr. Soc.*, **88**, 647-671.
- Mallick*, S. and Frazer, L. N., 1987. Practical aspects of reflectivity modeling, *GEOPHYSICS*, **52**, 1355-1364.
- Fryer, G. J. and Frazer, L. N., 1987. Seismic waves in stratified anisotropic media-II. Elastodynamic eigensolutions for some anisotropic systems, *Geophys. J. R. astr. Soc.*, **91**, 73-101.
- Frazer, L. N. and McCoy, J. J., 1986. An acoustic reflectivity method for laterally varying media, in: *Ocean Seismo-Acoustics*, T. Akal and J.M. Berkson (eds.), pp. 47-56, Plenum Press, New York.
- McCoy, J. J., Fishman, L. and Frazer, L. N., 1986. Propagation modeling based on wavefield factorization and invariant embedding, in: *Ocean Seismo-Acoustics*, T. Akal and J. M. Berkson (eds.), pp. 39-46, Plenum Press, New York.
- Lienert, B.R. and Frazer, L. N., 1986. Evaluation of seismometer arrays for earthquake location, *Geological Survey of Indiana, occasional paper series.*, paper No. 52.
- Frazer, L. N., 1986. Applications of multi-fold Kirchhoff-Helmholtz integrals to sound propagation in the ocean, Part I: theory, *J. Acoust. Soc. Am.*, **79**, 1748-1759.
- McCoy, J. J., Fishman, L. and Frazer, L. N., 1986. Reflection and transmission at an interface separating transversely inhomogeneous acoustic half spaces, *Geophys. J. R. astr. Soc.*, **85**, 543-562.
- Lienert, B. R., Berg, E. and Frazer, L. N., 1986. HYPOCENTER: An earthquake location method using centered, scaled and adaptively damped least squares, *Bull. Seism. Soc. Am.*, **76**, 771-783.
- McCoy, J. J. and Frazer, L. N., 1986. A propagation model for range dependent transversely inhomogeneous media, *Geophys. J. R. astr. Soc.*, **86**, 703-717.
- Frazer, L. N. and Sen*, M. K., 1985. Kirchhoff-Helmholtz reflection seismograms in a laterally inhomogeneous multi-layered elastic medium, part I: theory, *Geophys. J. R. astr. Soc.*, **80**, 121-147.
- Frazer, L. N., Bates*, D. L. and Rudman, A. J., 1985. Generation of vertically incident seismograms, *Indiana Geological Survey, occasional paper No. 49*.

- Sen*, M. K. and Frazer, L. N. 1985. Kirchhoff-Helmholtz reflection seismograms in a laterally inhomogeneous multi-layered medium, Part II: Computations, *Geophys. J. R. astr. Soc.*, **82**, 415-437.
- Carter*, J. A. and Frazer, L. N., 1984. Accommodating lateral velocity changes in Kirchhoff migration by means of Fermat's principle, *GEOPHYSICS*, **49**, 46-53.
- Frazer, L. N. and Gettrust, J. G., 1984. On a generalization of Filon's method and the computation of the oscillatory integrals of seismology, *Geophys. J. R. astr. Soc.*, **76**, 461-481.
- Frazer, L. N., 1984. Frequency Domain AGC, *GEOPHYSICS*, **49**, 492.
- Frazer, L. N. and Sinton*, J. B., 1984. A Kirchhoff method for the computation of finite-frequency body wave synthetic seismograms in a laterally inhomogeneous medium, *Geophys. J. R. astr. Soc.*, **78**, 413-429.
- Fryer, G. J. and Frazer, L. N., 1984. Seismic waves in stratified anisotropic media, *Geophys. J. R. astr. Soc.*, **78**, 691-710.
- Spudich, P. and Frazer, L. N., 1984. Use of ray theory to calculate high frequency radiation from earthquake sources having spatially variable rupture velocity and stress drop, *Bull. Seism. Soc. Am.*, **74**, 2061-2082.
- Frazer, L. N., 1983. Two problems in spectral WKB theory: the interpolation of sampled velocity profiles and the use of frequency dependent, complex velocities, *Geophys. J. astr. Soc.*, **72**, 193-211.
- Carter*, J. A. and Frazer, L. N., 1983. A method of modeling reflection data from media with lateral velocity changes, *J. Geophys. Res.*, **88**, 6469-6476.
- Frazer, L. N. and Bates*, D. L., 1983. Unconditionally stable reflectivity calculations, in: *Acoustics and the Sea-Bed*, N. G. Pace (ed.), Bath University Press, Claverton Down, England, pp. 139-145, 1983.
- Frazer, L. N., 1982. Invariant expressions for radiation from a fault with prescribed slip, *Geophys. J. R. astr. Soc.*, **70**, 529-533.
- Sinton*, J. B. and Frazer, L. N., 1982. A method for the computation of finite frequency body wave synthetic seismograms in laterally varying media: numerical examples, *Geophys. J. R. astr. Soc.*, **71**, 37-55.
- Carter*, J. and Frazer, L. N., 1982. Rapid F-K migration of zero-offset seismic reflection data, *J. Geophys. Res.*, **87**, 9365-9373.
- Brocher, T. M., Iwatake*, B. T., Gettrust, J. F., Sutton, G. H., and Frazer L. N., 1981. Comparison of the signal to noise ratios of low frequency hydrophones and geophones as a function of ocean depth, *Bull. Seism. Soc. Am.*, **71**, 1649-1659.
- Gettrust, J. F. and Frazer, L. N., 1981. A computer model study of the propagation of the long range Pn phase, *Geophys. Res. Lett.*, **8**, 749-752.
- Frazer, L. N. and Rudman, A. J., 1981. Generation of synthetic seismograms for an acoustic layer over an acoustic half space, *Indiana Geological Survey, Occasional Paper Series*, No. **35**, Bloomington, Indiana 47405.
- Phinney, R. A., Chowdhury, K. R. and Frazer, L. N., 1980. Transformation and analysis of record sections, *J. Geophys. Res.*, **86**, 359-377. This paper was also reprinted in the book *Slant Stack Processing*, G. H. F. Gardner & L. Lu (eds.) Soc. Expl. Geophys., Tulsa, OK, 1991.
- Frazer, L. N. and Phinney, R. A., 1980. A theory for the computation of finite frequency synthetic seismograms in an inhomogeneous medium, *Geophys. J. R. astr. Soc.*, **63**, 691-717.
- Jordan, T. H. and Frazer, L. N., 1980. Reply to "Comments on 'Crustal and Upper Mantle Structure' by T. H. Jordan and L. N. Frazer" by N. K. Bulin, *J. Geophys. Res.*, **85**, 381-382.
- Frazer, L. N., 1979. A new derivation of the displacement potentials for motion in a homogeneous isotropic elastic medium, *Geophys. J. R. astr. Soc.*, **59**, 389-397.
- Frazer, L. N., 1978. Synthesis of Shear-coupled PL, *Ph.D. thesis*, Princeton University.
- Frazer, L. N., 1977. Use of the spherical layer matrix in inhomogeneous media, *Geophys. J. R. astr. Soc.*, **50**, 743-749.
- Jordan, T. H., and Frazer, L. N., 1975. Crustal and Upper mantle structure from Sp phases, *J. Geophys. Res.*, **80**, 1504-1518.

Non-technical publications

- Frazer, Neil, 2010. Testimony to NOAA regarding Ocean Aquaculture.
- Frazer, Neil, 2010. *Boat Camping Haida Gwaii, 2nd edition*, 176pp, ISBN 13: 978-1-55017-487-8, Harbour Publishing, Madeira Park, Canada.
- Frazer, Neil, 2010. A visit to Norway – and the sea lice follies of BC (feature article). *Sustainable Coast*, Thursday, June 17.
- Frazer, Neil, 2010. Open ocean aquaculture can be destructive (editorial). *Star Advertiser*, Tuesday Jan 24, Honolulu, Hawaii.
- Frazer, Neil 2009. Letter to Senators. *Food and Water Watch*, 28 July, 2009.
- Frazer, Neil, 2008. A Canadian tragedy. *SalmonAreSacred.org*
- Frazer, Neil, 2007. Sea lice physics without the math. *Gulf Trollers News*.
- Frazer, Neil, 2006. College of Science needs new core curriculum, *Ka Leo O Hawai'i*, **100**(132), 5.
- Frazer, Neil, n.d. Questions and answers with Dr. Neil Frazer on infectious salmon anaemia. *Georgia Strait Alliance*.
- Frazer, Neil, 2005. "Looking for Kayak Bill," *Sea Kayaker*, **108**, 18.
- Frazer, Neil, 2004. "Sea lice and scientists: Notes for Rafe Mair," Notes for a radio interview, October 14, 2004, *Canadian Sablefish Association*.
- Frazer, Neil, 2004. "Clotheslining: Lining-out your small boat," *Pacific Yachting*, (July, August and September issues), Vancouver, Canada.
- Frazer, Neil, 2003. A scientist looks at BC salmon aquaculture (article). *Saltspring News* Sunday March 23. Saltspring Island, Canada.
- Frazer, Neil, 2002. Debate continues over 2001 sea lice investigation. *Fisherman Life*, August 2002, vol. 2, issue 7, pp 5–9. Anchor Publishing, Port Moody, Canada.
- Frazer, Neil, 2002. DFO sea lice response questioned. *Fisherman Life*, February 2002, vol. 2, issue 1, p. 6. Anchor Publishing, Port Moody, Canada.