GeoPRISMS-Alaska Living Bibliography

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Created July, 2020 (to be updated periodically)
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Description of the Living Bibliography

This bibliography was prepared as a synthesis product following the GeoPRISMS Alaska workshop at Lamont Doherty Earth Observatory in August 5-6, 2019 on Subduction Cycles and Deformation at the Alaska-Aleutian margin.
The link to workshop web page, including agenda and participant list, is here: [https://sites.google.com/view/alaska-workshop/home?authuser=0].

With a total of 45 participants (51% early career faculty, postdocs or students), there were representatives from all ~19 GeoPRISMS-AK funded projects (FY12-18). A post-conference survey in December 2019 requested information from attendees as to their relevant publications and proposals, including those in preparation and planned. This document is based on that input as well as some 2020 updates. The products listed here include formal GeoPRISMS project outputs, as well as those laterally related to PI group projects. Terry Plank (the workshop organizer and PI) initiated this project and did the initial document curation. She would be happy to pass the project onto another curator in the future.

Publications are annotated so as to provide a short synopsis of the research scope, results and context within Alaska Subduction research. Four research themes, which are similar to those developed at the workshop, provide structure to the paper groupings within the Bibliography:

1) The Alaska-Aleutian Megathrust
2) Magmatic Volatiles at Arcs
3) Arc Formation and Continental Growth
4) Arc Volcano Systems

Papers and proposals in press, in revision, in preparation and planned are also included to keep the community informed of upcoming and ongoing work. The intent is to update this document periodically and disseminate it publicly and broadly as a living GeoPRISMS legacy product.

- **GeoPRISMS-Alaska Publications: 31**
- **Papers in press, in preparation, or planned: 23**
- **Proposals funded, in preparation or planned – last 2 years: 8**
- **Proposals funded FY12-18: 19**

GeoPRISMS-Alaska Publications

The Alaska-Aleutian Megathrust

GeoPRISMS focused effort on shoreline-crossing science across the Alaska megathrust, from the incoming plate to underthrust structures, seismicity and deformation. What controls great earthquake locations, slow slip, locking fractions and seismic gaps along strike?

Elliott, J., & Freymueller, J. T. (**2020**). A block model of present‐day kinematics of Alaska and western Canada. *Journal of Geophysical Research*: Solid Earth, 125, e2019JB018378.

An updated GPS velocity field is used to develop the first regionally comprehensive geodetic tectonic block model for Alaska and western Canada. In addition to providing new geodetic slip rates on faults, the model gives a cohesive picture of the large-scale tectonic motions in this corner of the northeastern Pacific.

Abers, G. A., Adams, A. N., Haeussler, P. J., Roland, E., Shore, P. J., Wiens, D. A., Schwartz, S.Y., Sheehan, A.F., Shillington, D.J., Webb S., and L.L. Worthington (**2019**). Understanding Alaska's Earthquakes. *Eos*, 100 (10), 30–35.

This EOS article describes the design and roll-out of the Alaska Amphibious Community Seismic Experiment (AACSE), including 75 ocean floor broadband seismometers, 30 on-land seismometers, accelerometers, seafloor pressure gauges and temperature sensors deployed in 2018-2019 along the Alaska Peninsula and Kodiak Island. All data are open and the data analysis is on-going. Field campaigns engaged and trained early career scientists and high school science educators.

Li, Jiyao, Donna J. Shillington, Demian M. Saffer, Anne Bécel, Mladen R. Nedimovic, Harold Kuehn, Spahr C. Webb, Katie M. Keranen, and Geoffrey A. Abers **(2018)** Connections between subducted sediment, pore-fluid pressure, and earthquake behavior along the Alaska megathrust. *Geology* 64 (4), 299-302.

This study uses results from the ALEUT multichannel seismic experiment to show along-strike contrasts between the Semidi and Shumagin segments along the AK Peninsula, favoring a model whereby greater underthrust sediment leads to greater pore fluid pressure and a larger coherent asperity that together are responsible for larger earthquakes along the Semidi segment.

Li, S., and Freymueller, J. T. (**2018**). Spatial variation of slip behavior beneath the Alaska Peninsula along Alaska-Aleutian subduction zone. *Geophysical Research Letters*, 45.

Preexisting campaign GPS sites were resurveyed to estimate a precise velocity field for the Alaska Peninsula. Four segments were identified that mark significant along-strike changes in the locking distribution: Kodiak (strongly locked), Semidi (intermediate), Shumagin (weakly locked), and Sanak (dominantly creeping). The authors suggest that the orientation of seafloor fabric on the downgoing plate has an important control on segmentation.

Ruppert, N. A., Rollins, C., Zhang, A., Meng, L., Holtkamp, S. G., West, M. E., & Freymueller, J. T. (**2018**). Complex faulting and triggered rupture during the 2018 MW7.9 offshore Kodiak, Alaska, earthquake. *Geophysical Research Letters*, 45.

The 2018 magnitude 7.9 earthquake occurred 300 miles off-shore of Kodiak island in the outer rise region of the incoming plate. Aftershock relocations, source mechanisms, teleseismic P wave backprojection, and GPS data inversion indicate complex rupturing, involving 5 segments, some of which correlate with plate bending faults.

Bécel, Anne, Donna J. Shillington, Matthias Delescluse, Mladen R. Nedimović, Geoffrey A. Abers, Demian M. Saffer, Spahr C. Webb, Katie M. Keranen, Pierre-Henri Roche, Jiyao Li and Harold Kuehn (**2017**) Tsunamigenic structures in a creeping section of the Alaska subduction zone, *Nature Geoscience*, doi:10.1038/ngeo2990.

Multi-channel reflection/refraction and bathymetric data collected as part of the ALEUT project identify structures within the creeping Shumagin Segment that may promote tsunamigenesis, including an active normal fault, deep-water thrust splay faults, and a small frontal prism. Mechanisms are proposed for the 1788 tsunamigenic earthquake in the Shumagins that involve lateral propagation from the neighboring locked Semidi segment.

Kogan, M. G., D. I. Frolov, N. F. Vasilenko, J. T. Freymueller, G. M. Steblov, G. Ekström, N. N. Titkov, and A. S. Prytkov (**2017**), Plate coupling and strain in the far western Aleutian arc modeled from GPS data, *Geophys. Res. Lett.*, 44, 3176–3183, doi:10.1002/2017GL072735.

GPS observations from the westernmost Aleutian (Komandorsky) Islands and Kamchatka are inverted for the fault locking depth and block motion in this northwestern corner of the Pacific. The best fit model involves a rigid, westwardly moving Komandorsky sliver bounded by the Aleutian and back-arc faults.

Lay, T., Ye, L., Bai, Y., Cheung, K. F., Kanamori, H., Freymueller, J., Steblov, G. M., and Kogan, M. G. (**2017**). Rupture along 400 km of the Bering fracture zone in the Komandorsky Islands earthquake (MW 7.8) of 17 July 2017. *Geophysical Research Letters*, 44.

The 17 July 2017 Komandorsky Islands MW 7.8 earthquake involved arc-parallel right-lateral strike-slip faulting along the Bering Fracture Zone (BFZ) in the westernmost Aleutian Islands back arc. The slip distribution determined from seismic, tsunami, and geodetic observations indicates that the BFZ serves as the primary plate boundary, and not Pacific-North America. The fore-arc Komandorsky Sliver translates rapidly parallel to the Aleutian Trench at a rate of 53 mm/yr relative to the Bering Plate.

Li, S., J. Freymueller, and R. McCaffrey (**2016**), Slow slip events and time-dependent variations in locking beneath Lower Cook Inlet of the Alaska-Aleutian subduction zone, *J. Geophys. Res. Solid Earth*, 121, doi:10.1002/2015JB012491.

A series of abrupt changes in GPS site velocities occurred in Lower Cook Inlet, Alaska in late 2004, early 2010, and late 2011 that are interpreted as slow-slip events. The earlier slip event is unusual in that it lasted almost a decade. The Lower Cook Inlet events are notable in that slip rates are linear, and events start and stop abruptly.

Li, J., D. J. Shillington, A. Bécel, M. R. Nedimović, S. C. Webb, D. M. Saffer, K. M. Keranen, and H. Kuehn (**2015**), Downdip variations in seismic reflection character: Implications for fault structure and seismogenic behavior in the Alaska subduction zone, *J Geophys Res-Solid Earth*, *120*(11), 7883-7904, doi:10.1002/2015JB012338.

Unusually deep features are imaged in multi-channel seismic data from the ALEUT project at the western end of the Semidi segment offshore of the AK Peninsula. The plate interface transitions from a thin reflection (100-250 m low velocity zone) to a thick reflection band (3-5 km layered zone) that marks the transition from stick-slip sliding to slow slip and tremor at 25-55 km depth.

Magmatic Volatiles at Arcs

Volatile elements and species (e.g., H_2O, CO_2, S, O_2) are essential to arc magma origin, evolution, ascent and eruption, but they are notably difficult measure. The GeoPRISMS program has led substantial developments in the techniques to measure volatiles in magmas, crystals and gases in the Alaska-Aleutian arc, and how they relate to subduction and volcanic processes.

Werner, C., Rasmussen, D.J., Plank, T., Kelly, P.J., Kern, C., Lopez, T., Gliss, J., Power, J.A., Roman, D.C., Izbekov, P. and Lyons, J., (**2020**) Linking Subsurface to Surface using Gas Emission and Melt Inclusion data at Mount Cleveland volcano, Alaska. *Geochemistry, Geophysics, Geosystems*, p.e2019GC008882.

Novel samples were collected from the Cleveland volcano gas plume using a MultiGAS instrument mounted to a helicopter as part of the GeoPRISMS Maritime Maid platform. The power of this study is the complementary information obtained from melt inclusions (from the 2016 eruption) that track the degassing magma at depth. The unusually high H_2O/SO_2 ratios measured in the gas are matched by magma degassing at shallow depths, 0.5 to 3 km, largely within the edifice.

Rasmussen, D. J., T. A. Plank, P. J. Wallace, M. E. Newcombe, J. B. Lowenstern (**2020**). Vapor bubble growth in olivine-hosted melt inclusions. *American Mineralogist*.

Melt inclusions from Seguam volcano are homogenized in the laboratory in order to restore initial CO_2 concentrations (up to 1500 ppm), which when combined with H_2O concentrations, place the magma storage region at 8 +/- 2 km depth. A new computational program, MIMiC, is developed to restore CO_2 concentrations in untreated melt inclusions from other arc volcanoes.

Bucholz, C.E. and P.B. Kelemen (**2019**) Oxygen fugacity at the base of the Talkeetna arc, Alaska, *Contrib. Mineral. Petrol*. 174, 79.

Cumulates from the base of the Talkeetna arc complex record high oxygen fugacity (FMQ +0.4 to +2.3) in their olivine-spinel compositions, providing strong evidence that primary arc magmas are oxidized.

Fischer, T.P. and Lopez, T.M. (**2016**) First airborne samples of a volcanic plume for $\delta^{13}C$ of CO_2 determinations. *Geophysical Research Letters*, *43*(7), pp.3272-3279.

The GeoPRISMS-Maritime Maid platform enabled the first carbon isotope measurements of a volcanic plume made by helicopter and analyzed in near real time using a Thermo Fisher Delta Ray IRIS mass spectrometer onboard the vessel. Although CO_2 concentrations were low in the gas plume from the remote volcano, Kanaga, and jet exhaust is a potential contaminant, the airborne sampling and shipboard measurements extrapolated to magmatic $\delta^{13}C$ consistent with ground-based measurements.

Arc Formation and Continental Growth

Geological, petrological and seismic studies combine to explore the Aleutians as a type locality for both arc volcanism and continental growth. What are the magmatic additions and subtractions that create continental crust at arcs?

Kay, S.M., Jicha, B.R., Citron, G.L., Kay, R.W., Tibbetts, A.K. and Rivera, T.A. (**2019**) The calc-alkaline Hidden Bay and Kagalaska plutons and the construction of the central Aleutian oceanic arc crust. *Journal of Petrology*, 60(2), pp.393-439.

This study summarizes over 40 years of work on 35-14 Ma plutons on Adak and Kagaslaska islands in the central Aleutians, focusing on their mineralogy and geochemistry, as type examples of calc-

alkaline ("continental") plutons found in an oceanic setting. As such, their origin bears on the generation of continental crust. A key condition may be thick enough crust (> 37 km) and high enough H_2O (> 3.5 wt%) to stabilize pargasitic amphibole during closed system crystallization.

Rasmussen, D.J. Plank, T and Roman D.C. (**2019**) The Aleutian arc through and through: How subduction dynamics influence the generation, storage, and eruption of volatile- bearing magmas. *GeoPRISMS Newsletter* 42: 10-13.

This Newsletter article discusses new insights derived from volcanic rock sampling campaigns carried out on the GeoPRISMS/Maritime Maid platform between Cleveland to Shishaldin volcanoes in 2015-2016. New melt inclusion volatiles data, whole rock geochemistry, and chemical diffusion chronometry illuminate processes that relate to varying slab depths, crustal magma storage depths, and storage-to-eruption timescales.

Jicha, B.R. and Kay, S.M. (**2018**) Quantifying arc migration and the role of forearc subduction erosion in the central Aleutians. *Journal of Volcanology and Geothermal Research*, *360*, pp.84-99.

This Invited Review article presents new $^{40}Ar/^{39}Ar$ ages of volcanic rocks from Adak, Kanaga and Great Sitkin islands, and combines with existing data to document the northward migration of the Central Aleutian volcanic arc over the past 38 Ma. This arc sector experienced limited growth and episodic erosion for most of its history, prior to development of an accretionary prism in the last few Ma. The paper links arc migration, tectonic events, subduction erosion and arc geochemistry.

Sisson, T.W. and P.B. Kelemen (**2018**) Near-solidus melts of MORB + 4 wt% H2O at 0.8 - 2.8 GPa applied to issues of subduction magmatism and continent formation, *Contrib. Mineral. Petrol.* 173, 23 pp.

This paper reports new major and trace element analyses of the melts and minerals from legacy laboratory experiments (by Jun Liu) that simulated the conditions of subducting oceanic crust. Results are applied to western Aleutian magmas that preserve positive Sr anomalies, consistent with partial melts of subducted eclogite. In order to create continental crust with no Sr anomaly, arc cumulates would need to be lost from the lower arc crust in roughly equal volume to preserved crust.

Yogodzinski, G.M., P.B. Kelemen, K. Hoernle, S.T. Brown, I. Bindeman, J.D. Vervoort, K.W.W. Sims, M. Portnyagin, R. Werner (**2017**) Sr and O isotopes in western Aleutian seafloor lavas: Implications for the source of fluids and trace element character of arc volcanic rocks, *Earth Planet. Sci. Lett*. 475, 169–180.

This study concludes that the unradiogenic Sr isotopes and mantle-like O isotopes of volcanic rocks across the Aleutian arc require melting of the minimally altered basalt of the subducting plate, at depths > 2 km below the paleo-seafloor. Such melting exceeds that currently predicted by slab thermal models. Key samples for this study came from research cruises SO201-1b and SO249-1 on the R/V SONNE.

Nielsen, S.G.; Gene Yogodzinski; Julie Prytulak; Terry Plank; Suzanne Kay; Robert Kay; Jerzy Blusztajn; Jeremy Owens; Maureen Auro; Tristan Kading (**2016**) Tracking along-arc sediment inputs to the Aleutian arc using thallium isotopes. *Geochem. Cosmochem. Acta.,* 181: 217-237.

This study develops thallium isotopes as a new tool for tracing sediment recycling at subduction zones, and applies it to the Aleutian arc. A new geochemical reference site, ODP 886C, is also established in the thin pelagic sediments that are subducting at the central-to-western Aleutians trench. The shift from predominantly terrigenous to more pelagic sediments from east to west is reflected in a shift to heavier Tl isotopes in both the incoming sediments and arc volcanics.

Kelemen, P.B. and M.D. Behn (**2016**) Formation of lower continental crust by relamination of buoyant arc lavas and plutons (Review Article), *Nature Geoscience* 9, 197-205.

Relamination is a process implicated here in continental growth models, where arc crust is subducted via subduction erosion or imbrication, and then density sorted such that buoyant material returns to the upper plate to form arc lower crust. The trace element composition of Aleutian plutons and lavas are used to develop a relamination model that can explain the composition of Talkeetna lower crust.

Cai, Y, M.E. Rioux, P.B. Kelemen, S.L. Goldstein, L. Bolge and A.R.C. Kylander-Clark (**2015**) Distinctly different parental magmas for calc-alkaline plutons and tholeiitic lavas in the central and eastern Aleutian arc: New isotope, trace element and geochronological data, *Earth Planet. Sci. Lett.* 431, 119-126.

This study finds an isotopic contrast between Eocene-to-Miocene plutons that have formed the Aleutian mid crust and Holocene volcanics of the active Aleutian arc. The contrast could reflect either a temporal shift in Aleutian primary magma compositions, or a difference in origin and transport of magmas that preferentially stall and form plutons. The mid-crustal plutons resemble bulk continental crust, and so their origin may have broad implications for continental formation.

Yogodzinski, G.M., P.B. Kelemen, J. D. Vervoort, M. Portnyagin, K. Sims, K. Hoernle, B. Jicha, F. Hauff and R. Werner (**2015**) The role of subducted basalt in the source of island arc magmas: Evidence from seafloor lavas of the western Aleutians, *J. Petrol*., 56, 441–492, 2015.

The topic of this comprehensive geochemical study is the newly discovered submarine volcanism beyond Buldir, the westernmost volcanic island. Multiple trace element and isotopic systems point to substantial melting of subducting oceanic crust eclogite as the major slab component in western Aleutian magmas. These slab melts also appear along the rest Aleutian arc, but are diluted by more extensive melting in the hotter mantle wedge. This project was collaborative between NSF-funded US scientists and German Ministry funded GEOMAR, with samples collected on the R/V SONNE.

Shillington, D.J., H.J.A. Van Avendonk, M.D. Behn, P.B. Kelemen, and O. Jagoutz (**2013**) Constraints on the composition of the Aleutian arc lower crust from Vp/Vs, *Geophys. Res. Lett*., 40, 2579–2584.

Converted S-waves from along-arc refraction profiles reveal an unusual seismic character for the eastern Aleutian arc lower crust, with both high Vp (7.3-7.6 km/s) and low Vp/Vs (1.7-1.75). Petrological modeling and study of lower crustal xenoliths demonstrates that these seismic characteristics are consistent with a mixture of ultramafic cumulates and alpha quartz.

Arc Volcano Systems

Multi-disciplinary, volcano-scale experiments reveal the magmatic and fluid drivers to eruption. How does crustal structure, magma flux, crustal rheology, and fluid migration affect the onset and style of volcanic eruptions?

Newcombe, M., T. Plank, A. Barth, P. Asimow, E. Hauri (**2020**). Water-in-olivine magma ascent chronometry: Every crystal is a clock. *Journal of Volcanology and Geothermal Research*, 398, 106872.

This paper develops a new chronometer, based on the diffusion of water from olivine crystals in the minutes-to-hours of syneruptive ascent. A combination of olivine and melt embayment zonation

profiles indicates acceleration of magma during the 1977 eruption of Pyre Peak on Seguam. Newcombe was supported as a GeoPRISMS postdoc.

Xue, X., J. Freymueller, and Z. Lu (**2020**). Modeling the post-eruptive deformation at Okmok based on the GPS and InSAR timeseries: changes in the shallow magma storage system, *Journal of Geophysical Research*, https://doi.org/10.1029/2019JB017801.

The authors develop a time-dependent inversion filter that combines GPS and InSAR time series observations to model deformation at Okmok volcano since its last eruption in 2008. There have been five inflation episodes from 2008 to 2019, each of which decayed exponentially in time. The total volume change has been 50-60% of the volume decrease during the 2008 eruption.

Janiszewski, H.A., Wagner, L.S. and Roman, D.C. (**2020**) Aseismic mid-crustal magma reservoir at Cleveland Volcano imaged through novel receiver function analyses. *Scientific Reports*, *10*(1), pp.1-9.

A novel receiver function approach finds evidence for mid-crustal magma storage (~10-20 km) located beneath the observed seismicity (< 7.5 km) at Cleveland volcano, using a campaign array of seismometers deployed during the GeoPRISMS program, Maritime Maid platform in 2015-2016. This technique can be used even with sparse seismic arrays.

Miller, D., Bennington, N., Haney, M., Bedrosian, P., Key, K., Thurber, C., Hart, L. and Ohlendorf, S. (**2020**) Linking magma storage and ascent to eruption volume and composition at an arc caldera. *Geophysical Research Letters*, p.e2020GL088122.

Ambient noise tomography and radial anisotropy locate structures beneath Okmok volcano, based on 13 temporary seismic stations deployed during 2015-2016, augmented by 12 permanent instruments of the Alaska Volcano Observatory. A region of positive anisotropy ($V_{SH} > V_{SH}$) beneath Okmok caldera is interpreted as a body of stacked sills, while the region surrounding it, with negative anisotropy, as dike-dominated. These structures appear to affect seismicity, and possibly magma paths, that lead to eruptions of different size and style.

Albright, J. A., Gregg, P. M., Lu, Z., & Freymueller, J. T. (**2019**). Hindcasting magma reservoir stability preceding the 2008 eruption of Okmok, Alaska. *Geophysical Research Letters*, 46.

Geodetic data are assimilated into the Ensemble Kalman Filter to develop a successful hindcast of the 2008 Okmok eruption. This is one of the first times a physics-based model (with a simple failure criterion and crustal rheology) was used to demonstrate that a magma chamber was trending towards tensile failure weeks before eruption. This method shows great promise for eruption forecasting, especially for eruptions without obvious precursors like Okmok 2008.

Rasmussen, D.J., Plank, T., Roman, D.C., Power, J.A., Bodnar, R.J. and Hauri, E.H. (**2018**) When does eruption run-up begin? Multidisciplinary insight from the 1999 eruption of Shishaldin volcano. *Earth and Planetary Science Letters*, 486: 1–14.

This multi-disciplinary study examines events in the year preceding the 1999 eruption of Shishaldin volcano, combining timeseries of earthquake depths, seismic anisotropy, and magma mixing events with depths as recorded in olivine crystals and their melt inclusions. The seismic precursors clearly relate to magmatic events, leading to a new concept of petrological run-up.

Degrandpre, K., T. Wang, Z. Lu, and J. T. Freymueller (**2017**), Episodic inflation and complex surface deformation of Akutan volcano, Alaska revealed from GPS time-series, *Journal of Volcanology and Geothermal Research*, 347, 337-359.

GPS, InSAR and seismic data are used to constrain the inflation history and source of Akutan volcano from 2006-2017. Model inversions place an inflating oblate spheroid at 7-8 km depth, intermediate between zones of active seismicity in the shallow volcanic system (< 7 km) and lower crust (15-25 km). A total of 0.2 km^3 of magma has migrated episodically into this region in 10 years.

GeoPRISMS-AK Papers in press, in revision, or in review

Barcheck, G., G. A. Abers, A. N. Adams, A. Bécel, J. Collins, J. B. Gaherty, P. J. Haeussler, Z. Li, G. Moore, E. Onyango, E. C. Roland, D. E. Sampson, S. Y. Schwartz, A. F. Sheehan, D. J. Shillington, P. J. Shore, S. C. Webb, D. A. Wiens and L. L. Worthington, The Alaska Amphibious Community Seismic Experiment. *Seismol. Res. Lett.,* **in press**

Suleimani, E., and J. T. Freymueller. Near-field modeling of the 1964 Alaska tsunami: the role of splay faults and horizontal displacements. *Journal of Geophysical Research*., **in press**.

Miller, P.K., D. M. Saffer, G. A. Abers, D.J. Shillington, K. M. Keranen, A. Bécel, J. Li and C. Bate Subducted sediments and shear foliation cause low velocity zones along the plate interface, *Nature Geoscience*, **in review**

Waters, L. E., E. Cottrell, M. L. Coombs, and K. A. Kelley. Generation of Calc-Alkaline Magmas During Crystallization at High Oxygen Fugacity: An Experimental and Petrologic Study of Tephras from Buldir Volcano, Western Aleutian Arc, Alaska, USA, *Journal of Petrology,* **in revision**

Coombs, M.L., Jicha, B.R.. The magmatic evolution, eruptive history, and effects of glacial ice on long-lived Akutan volcano, eastern Aleutian Islands, *GSA Bulletin*, **in press**.

Newcombe, M., T. Plank, Y. Zhang, M. Holycross, A. Barth, A. S. Lloyd, D. J. Ferguson, E. Hauri (2020) Magma Pressure-Temperature-time paths during mafic explosive eruptions. *Frontiers in Earth Science*, **in revision**.

GeoPRISMS Papers Planned or in Preparation

Kuehn, *H., M. R.* Nedimović, D. J. Shillington, A. Becel, J. Li. Segmentation of the eastern Alaska-Aleutian subduction zone by subjected seamounts, **in preparation**

Kitajima, Hiroko and Jeppson, Tamara. Physical properties of incoming sediments at different subduction zones including the Alaska subduction zone, **in preparation.**

Naif, Samer, Kerry Key, et al., Electromagnetic imaging results from survey of the Shumagin Gap and Semidi segments, **planned.**

Rasmussen, D. J., T. A. Plank, D. C. Roman. Magmatic water content controls magma storage depth, **in preparation.**

Andrys, J., K. A. Kelley, E. Cottrell, and M. L. Coombs. Roles of oxygen fugacity and volatile content on calc-alkaline trends in Aleutian arc magmas, **in preparation.**

Andrys, J., E. Cottrell, and K. A. Kelley (planned), Experimental investigation of oxidized, water-rich arc magmatic differentiation at high pressure, **planned.**

Lopez, T., Fischer, T.P., Plank, T., Malinverno, A., Rizzo, A.L., Rasmussen, D.J., Cottrell, E., Werner, C., Kern, C., Bergfeld, D., Ilanko, T., Andrys, J.L., Cameron, C., Kelley, K.A., Tracking carbon from subduction to outgassing across the Aleutian Subduction Zone, **in preparation.**

Behn, Kelemen, Hacker. Origin and evolution of continental lower crust: Underthrusting and density sorting in the Tadpole Zone at the arc Moho, **planned**

Hoernle et al. The onset of Aleutian Subduction, **planned.**

Bezard et al. Geochemical Evolution of Aleutian Volcanism, **planned.**

SM Kay et al. Significance of Attu Island, **planned.**

Walden-Yogodzinski et al. Geochemistry of N. Pacific AOC, **planned.**

Rasmussen, D. J., T. A. Plank, D. C. Roman, E. H. Hauri, H. A. Janiszewski, E. Lev, K. E. Nicolaysen, P. E. Izbekov. How slab depth is reflected in Aleutian arc magmas. Invited to Journal of Volcanology and Geothermal Research, **in preparation.**

Höfig, T.W., Portnyagin M., Hoernle K., Hauff, F., Jicha, B.R., Wartho, J.-A., Van den Bogaard, P., Garbe-Schönberg, D., More than 40 million years of oblique subduction recorded in the magmatism of the westernmost Aleutian arc, **planned.**

Kay, S.M., Jicha, B.R., Yogodzinski, G.M., Tibbetts, A.K., Magmatic Clues to the Distinctive Tertiary Evolution of the Attu Region of the Western Aleutian Arc, **planned.**

Andrys, J., K. A. Kelley, E. Cottrell, M. Jackson, and M. L. Coombs, Along-strike variations in magmatic volatiles, thermal structure, and slab contributions to arc magmas in the western Aleutians, **planned.**

Power, J.A., Roman, D.C., Lyons, J.J., Haney, M.M., Rasmussen, D.J., Plank, T., Nicolaysen, K.P., Izbekov, P., Werner, C., Kaufman, A.M. Seismic Investigations of Volcanic Vents on Chuginadak Island, Alaska and Implications for Magmatism in the Islands of Four Mountains and Forecasting Eruptions at Mount Cleveland Volcano, **in preparation**

AK-Aleutian Subduction Proposals planned, pending or funded in the last 2 years

COLLABORATIVE RESEARCH: MEASURING STRAIN ALONG THE ALEUTIAN SUBDUCTION ZONE TRENCH TO BETTER CONSTRAIN SEISMIC AND TSUNAMI HAZARD, Spahr Webb – NSF OCE 16-56413 **continuing grant**.

Supplement to *Alaska Amphibious Community Seismic Experiment* PI: A. Bécel, LDEO. NSF – **started in 2019**

AVERT: Anticipating Volcanic Eruptions in Real Time, Terry Plank, Einat Lev and 6 other LDEO PI's – Gordon and Betty Moore Foundation, **started 11/2019** for 5 years.

Collaborative Research: Incoming plate and forearc structure of the Semidi and SW Kodiak Segments offshore Alaska Peninsula from 3-D active-source and local earthquake tomography, lead PI: A. Bécel (with Pablo Canales, WHOI). NSF OCE-1947758, **started 04/01/2020**.

Collaborative Research: A Seismic Study of Oceanic-Arc Crustal Construction Processes at the Archetypal Andreanof Segment of the Aleutian Arc. PI: Shillington. (Collaborative with Dan Lizarralde, WHOI) NSF-MGG-1753676, **started 4/15/2020**

Collaborative Research: Behavior and structure on and around the megathrust revealed by the Alaska Amphibious Community Seismic Experiment – Geoff Abers, w/ Emily Roland/UW, Susan Schwartz/UCSC. – NSF, **started 7/1/2020**

Collaborative Research: Variation of Incoming Plate Hydration and Faulting Along the Alaska Subduction Zone. PI: Shillington, co-PI: Gaherty. (Collaborative with Wiens, Wash U). NSF-MGG-2026676, **starting 9/01/2020**

Constraining the Ongoing Volcano Deformation and Magma Source Geometry at Okmok Volcano, Aleutian Arc. Jeff Freymueller –NSF, **submitted**

For a list of nineteen (19) GeoPRISMS NSF Projects Funded on Alaska Subduction Science in FY12-FY18, follow this link:
https://sites.google.com/view/alaska-workshop/geoprisms-ak-projects?authuser=0