**Student Research**

.

General philosophy: I try to work with students to craft a project that best suits the student's goals and what they like to do, within the limitations of my expertise and funding. All of my masters projects and many of my undergraduate projects have a field mapping component because I believe that geologic mapping is fundamental to good geologic research and (perhaps most importantly) because I believe students do not get enough geologic mapping experience today. Accordingly, I believe that giving students additional advanced geologic mapping experience will serve them well, regardless of whether they go directly into the professional ranks (where field experience is the no.1 most valued skill along with writing and critical thinking skills) or whether they go on to do PhD studies in another department. I also try to design masters projects so that my students have a good chance to publish at least one first authored peer-reviewed paper from their thesis research. Senior projects are designed with the potential for a student to present their findings at a GSA and AGU meeting. My general interest areas in “basement geology” include the relationship between metamorphic P-T-t paths and tectonic process, processes of subduction and accretion (including mélange generation), the rock record of subduction initiation and termination, the paths of material movement along and near the subduction interface (including localization of subduction megathrust slip and exhumation-related faulting) ophiolite generation and emplacement, and orogenic belt assembly. Specific areas of interest are the Franciscan Complex of coastal California and various metamorphic and ophiolitic units of the central and northern Sierra Nevada. In the neotectonics and tectonic-geomorphology realm, I have a general interest in strike-slip fault system evolution on scales from meters to hundreds of km, with particular interest in step-over evolution as well as a specific interest in the long time-scale and length-scale landscape evolution of the Sierra Nevada and California Coast Ranges.

**List of Ongoing and Past Masters Projects**.

Sean Spencer (ongoing). Long time and length scale landscape evolution forced by rapid volcanic deposition, northern Sierra Nevada and southern Cascades, California.

Azael Salinas (ongoing). Structural-metamorphic relationships of greenschist & blueschis facies rocks of the Nacimiento Belt, Limekiln Creek area, central California coast.

Yvan Mendoza (M.S. 2016). High-grade burial metamorphism of sedimentary mélange, Shoo Fly Complex, central Sierra Nevada, California.

Dennis Eck (M.S. 2014). The Devils Gate ophiolite, northern Sierra Nevada, California: Not an ophiolite or metamorphic sole?

Nobuaki Masutsubo (M.S. 2013) Diverse metamorphic trajectories, imbricated ocean plate stratigraphy, and fault rocks, Feather River ultramafic belt, Yuba Rivers area, California.

Jennifer Jackson (M.S. 2012) Southern extension of the Feather River ultramafic belt, central Sierra Nevada, California: Evidence for along-strike variation of basement units in an orogenic belt.

Chris Kemp. (M.S. 2012) Tectonic and geomorphic evolution of the northern Sierra Nevada, California.

Emily Fisher (Davis). (M.S. 2010) Tectonic inversion related to paired migrating bends and step-overs: A structural and geomorphologic analysis of the Fish Lake Valley Area, California-Nevada.

Chris Smart (M.S. 2008). Structural and metamorphic evolution of a metamorphic sole, western border Feather River ultramafic belt, North Fork Feather River Canyon, CA. Winner of Best Thesis Award, California State Fresno for academic year 2008-2009.

Selected Ongoing and Past Undergraduate Research Projects

Steffany Aguilar-Loeb (ongoing).

Great Valley Group or Franciscan mélanges, eastern San Jose, California

Kevin Loeb (ongoing). Investigation of fault zones in Coast Range ophiolite gabbro, Hayward Hills, California.

John Tanner (2013). Field relationships of inset late Cenozoic volcanic rocks, South Fork Kings Canyon, California.

Yvan Mendoza (2010). PT conditions of metamorphism, Shoo Fly Complex, northern Mokelumne River area, CA.

Rachel Prohoroff (2010). Structural relationships of mélanges and intra- Franciscan serpentinite, western Marin County, CA.

Brian Hitz (2009) Mélanges involving Franciscan, Great Valley Group, and Coast Range ophiolite, Hayward Hills, CA.

Joey Luce (2009): Eclogites of the Sierra Nevada?

Jared Long (2009). High-grade Franciscan rocks west of the Salinian block, CA

Chad Carlson (2009). Field relations and age of late Cenozoic volcanic unit, mid-upper San Joaquin River drainage, CA

Barbara "Bo" Jessup (2009). Geology and metamorphism of part of the Franciscan core of Mt. Diablo, California.

**Student Publications and Abstracts**

Publications and Abstracts of student advisees (one asterisk denotes masters student as Fresno State, two asterisks denoted undergraduate at Fresno State at time of research, three asterisks denotes PhD student at UC Berkeley, four asterisks, co-advised Ph.D. student with Chinese Academy of Sciences, Beijing). Student author or authors are underlined.

**Publications**

Luo. J.\*\*\*\*, Xiao, W., Wakabayashi, J., Han, C., Zhang, J., Wan, B., Ao, S., Zhang, Z., Tian, Z., Song, D., and Chen, Y., in press, The Zhaheba ophiolite complex in Eastern Junggar (NW China): Long lived supra-subduction zone ocean crust formation and its implications for the tectonic evolution of the southern Altaids. Gondwana Research. doi.10.1016/j. gr. 2015.04.004

Shimabukuro, D.H.\*\*\*, Wakabayashi, J., Alvarez, W., and Chang, S.-c., 2012, Cold and old: The rock record of subduction initiation beneath a continental margin, Calabria, southern Italy. Lithosphere, v. 4, p. 524-532. doi: 10.1130/L222.1

Prohoroff, R.E.\*\*, Wakabayashi, J., and Dumitru, T.A., 2012, Sandstone-matrix olistostrome deposited on intra-subduction complex serpentinite, Franciscan Complex, western Marin County, California: Tectonophysics v. 568-569, p. 296-305. doi: 10.1016/j.tecto.2012.05.018

Hitz, B.\*\*, and Wakabayashi, J., 2012, Unmetamorphosed sedimentary mélange with high-pressure metamorphic blocks in a nascent forearc basin setting: Tectonophysics. v. 568-569, p. 124-134. doi: 10.1016/j.tecto.2011.12.006

Smart, C.M.\*, and Wakabayashi, J., 2009, Hot and deep: Rock record of subduction initiation and exhumation of high-temperature, high-pressure metamorphic rocks, Feather River ultramafic belt, California: Lithos, v. 113, p. 292-305, doi:10.1016/j.lithos.2009.06.012

Abstracts

Mendoza, Y.\*, and Wakabayashi, J., 2013, High-grade burial metamorphism of sedimentary mélange, Shoo Fly Complex, central Sierra Nevada, California. EOS Fall Meeting Supplement, abstract T11A-2407

Carlson, C.W.\*\*, and Wakabayashi, J., 2013, One versus two late Cenozoic uplift events, Sierra Nevada, California, recorded in drainage geomorphology: Geological Society of America Abstracts with Programs, v. 45, no. 6, p.17

Luo, J.\*\*\*\*, and Wakabayashi, J., 2013, An upper crustal ophiolite remnant within the Feather River ultramafic belt, northern Sierra Nevada California: Unsubducted, but affected by ridge subduction? Geological Society of America Abstracts with Programs, v. 45, no. 6, p. 72

Masutsubo, N.\*, and Wakabayashi, J., 2013, Diverse metamorphic trajectories, imbricated ocean plate stratigraphy, and fault rocks, Yuba River area, Feather River ultramafic belt, California: Geological Society of America Abstracts with Programs, v. 45, no. 6, p. 72

Eck, D.S.\*, and Wakabayashi, J., 2013, The Devils Gate ophiolite, northern Sierra Nevada: Not an ophiolite or metamorphic sole? Geological Society of America Abstracts with Programs, v. 45, no. 6, p.72

Shimabukuro, D.H.\*\*\*, Alvarez, W., Wakabayashi, J., and Moores, E.M., 2013, An oceanic core complex preserved in ophiolitic fragments in Calabria, southern Italy: Geological Society of America Abstracts with Programs, v. 45, no. 6, p.55

Masutsubo, N.\*, and Wakabayashi, J., 2011, Complex temporal-spatial relationships, Feather River ultramafic belt, northern Sierra Nevada. EOS Fall Meeting Supplement Abstracts

Jackson, J.L.,\* Wakabayashi, J., and Jackson, B.A., 2011, Southern continuation of high-grade metamorphic rocks of the Feather River ultramafic belt, California: Preliminary reconnaissance. EOS Fall Meeting Supplement Abstracts

Prohoroff, R.E.\*\*, Wakabayashi, J., and Dumitru, T., 2011, Sandstone matrix olistostrome depoisted on intra-subduction complex serpentinite, trench slope basin deposits, and nappe and fold architecture and chronology, Franciscan Complex, Marin County, California. EOS Fall Meeting Supplement Abstracts

Masutsubo, N.\*, and Wakabayashi, J. 2010, Amphibolite and blueschist facies metamorphism, Feather River ultramafic belt, Yuba River drainage: A record of subduction initiation, ridge subduction, and continued subduction? Geological Society of America Abstracts with Programs,v. 42, no. 5, p. 479

Mendoza, Y.\*\*, and Wakabayashi, J., 2010, Collisional metamorphic signature in the Sierra Nevada, California? High-grade metamorphism of the Shoo Fly Complex: Geological Society of America Abstracts with Programs,v. 42, no. 5, p. 479

Shimabukuro, D.H.\*\*\*, Wakabayashi, J., Alvarez, W., and Chang, S.-c., 2010, Possible cold subduction initiation beneath a continental margin in Calabria, southern Italy: Geological Society of America Abstracts with Programs,v. 42, no. 5, p. 678.

Prohoroff, R.E.\*\*, and Wakabayashi, J., 2010, Order within the chaotic: Franciscan Complex field relations show km-scale overturnede folds, an olistostrome deposited on intra-Franciscan serpentinite, and more: Geological Society of America Abstracts with Programs,v. 42, no. 5, p. 35

Kemp, C.\*, and Wakabayashi, J., 2009, Late Cenozoic uplift and associated landscape evolution of the Sierra Nevada, California: Geological Society of America Abstracts with Programs,v. 41, no.7 p. 180

Carlson, C.\*\*, Wakabayashi, J., and Pluhar, C., 2009, Field relations and age of late Cenozoic volcanic units inset within the mid-upper San Joaquin River drainage, CA: Geological Society of America Abstracts with Programs,v. 41, no.7, p . 293

Shriver, A.\*, and Wakabayashi, J., 2009, Landscape evolution of the northern Sierra Nevada, USA: Insights from the American River drainage: Geological Society of America Abstracts with Programs,v. 41, no.7, p .293

Luce, J.\*\*, and Wakabayashi, J., Revisiting the lone Sierra Nevada eclogite locality: What IS it?: Geological Society of America Abstracts with Programs,v. 41, no. 7, p.404

Long. J.\*\*, and Wakabayashi, J., 2009, High-P amphibolite blocks from mélange, Nacimiento belt, coastal California: A first report: Geological Society of America Abstracts with Programs,v. 41, no.7, p. 403

Masutsubo, N.\*, and Wakabayashi, J., 2009, Beyond simple models of orogenic metamorphism: HP/HT, LP/HT, and HP/LT metamorphism, Feather River ultramafic belt, North Yuba River canyon, California: Geological Society of America Abstracts with Programs,v. 41, no.7, p .519

Annis, D.\*\*, and Wakabayashi, J., 2009, HP/HT metamorphism of the Devil's Gate ophiolite, Sierra Nevada, California: Where is the upper plate?: Geological Society of America Abstracts with Programs,v. 41, no.7, p. 404

Hitz, B.\*\*, and Wakabayashi, J., 2009, Franciscan shear zones between Coast Range ophiolite and Great Valley Group rocks: Evidence of mélange diapirism? Geological Society of America Abstracts with Programs,v. 41, no.7, p.404

Shimabukuro, D\*\*\*, Wakabayashi, J., Libera, F., Piluso, E., and Alvarez, W., 2009, Applying the Franciscan model to a non-collisional Alpine segment in the Calabrian orogen of southern Italy: Geological Society of America Abstracts with Programs,v. 41, no.7, p. 403

Kemp, C.\*, and Wakabayashi, J., 2009, Sierra Nevada frontal fault system: Kinematics and associated landscape evolution: Geological Society of America Abstracts with Programs, v. 41, no.5, p.31.

Kemp, C.\*, and Wakabayashi, J., 2008, Temporal slip variation of the Sierra Nevada frontal fault system and effects on landscape evolution: EOS (2008 AGU Fall Meeting abstracts)

Smart, C.\*, and Wakabayashi, J., 2008, Hot and deep: Rock record of subduction initiation, Feather River ultramafic belt, California: Geological Society of America Abstracts with programs, v. 40, no.6, p. 514-515

Wakabayashi, J., and Smart, C.\*, 2008, The rate of SW Pacific Cenozoic tectonic transitions compared to models of North American Cordilleran tectonics: Are the latter too simplistic? Geological Society of America Abstracts with programs, v. 40, no.6, p.514.