

SHORT REFERENCES

Figure 1—Bedrock ages

- (A) Alldrick et al. (2001); Andronicos et al. (2003); Butler et al. (2002, 2006); Crawford et al. (1999, 2009); Diakow (2006); Friedman and Mortensen (2002); Friedman et al. (2001); Gareau (1991a,b); Gareau et al. (1997); Gehrels (2000, 2001); Gehrels and Boghossian (2000); Gehrels et al. (1991, 2006, 2009); Haggart et al. (2006a,b); Klepeis et al. (1998); Klepeis and Crawford (1999); Mahoney et al. (2007a,b,c,d,e, 2009); Ray et al. (1998); Rusmore et al. (2000, 2001, 2005); Saleeby (2000); van der Heyden (1989, 2004)
- (B) Paterson (unpublished)
- (C) A. Iriondo (pers. comm., 2011, in Arvizu, 2012); A. Velázquez-Santelis (pers. comm., 2011, in Arvizu, 2012); Anderson and Silver (1979); Anderson et al. (1980, 2005); Arvizu (2012); Arvizu et al. (2009); Barth and Wooden (2006); Barth et al. (1990); Castineiras (pers. comm. in Izaguirre, 2009); Damon et al. (1983); Fackler-Adams et al. (1997); Gilbert (2012); González-León et al. (2008); Haxel et al. (2005); Henry et al. (2003); Iriondo (2001); Iriondo and McDowell (2011); Iriondo et al. (2005); Izaguirre (2009); Johnson et al. (1999a,b, 2003); Kimbrough and Moore (2003); Kimbrough et al. (2001); Lawton et al. (2012); Leggett (2008); M. Enríquez (pers. comm., 2011, in Arvizu, 2012); Mael et al. (2011); McDowell et al. (2001); Miller et al. (1995); Ortega-Rivera et al. (1997); Peña-Alonso et al. (2012); Pérez-Segura et al. (2009, 2013); Peryam et al. (2011); Poole et al. (1991); Premo and Morton (2014); Premo et al. (2014a,b); Ramos-Velázquez et al. (2008); Riggs et al. (1993); Schmidt and Paterson (2002); Snow et al. (1991); Spencer et al. (2011); Valencia et al. (2006); Vega-Granillo et al. (2008, 2011, 2012, 2013)
- (D) Alaniz-Álvarez et al. (1996); Barboza-Gudiño et al. (2004, 2008); Bissig et al. (2008); Campa Uranga et al. (2004, 2012); Campa-Uranga and Iriondo (2004); Centeno-García et al. (2011); Ducea et al. (2004); Elías-Herrera and Ortega-Gutiérrez (2002); Elías-Herrera et al. (2000, 2005, 2007, 2011); Fastowsky et al. (2005); Ferrari et al. (2014); Garza-Gonzales (2007); Godinez-Urban et al. (2011); Hernández-Pineda et al. (2011); Jones et al. (1995); Keppie et al. (2004); Kirsch et al. (2012, 2014); Lawton and Molina-Garza (2014); Martens et al. (2012); Martini et al. (2009, 2011); Martiny et al. (2000); Mortensen et al. (2008); Murillo-Muñeton (1994); Ortega-Obregón et al. (2009, 2012, 2014); Ramos-Arias and Keppie (2011); Ratschbacher et al. (2009); Solari et al. (2001, 2007, 2010, 2011); Torres de León et al. (2012); Valencia et al. (2009, 2013); Weber et al. (2005, 2007); Yañez et al. (1991); Zavala-Monsivais et al. (2009, 2012)
- (E) Aspden et al. (1995); Bustamante et al. (2010); Cardona et al. (2010a,b); Chew et al. (2008); Chiariadis et al. (2009); Cochrane (2013); Cochrane et al. (2014); Litherland et al. (1994); Mantilla Figueroa et al. (2013); Martínez (2007); Montes et al. (2010); Restrepo et al. (2011); Riel et al. (2013); Schütte et al. (2010); Vallejo et al. (2006); van der Lelij (2013); Villagomez et al. (2011); Vinasco et al. (2006); Viscarret et al. (2009); Weber et

al. (2010); Winter (2008)

(F) Boekhout et al. (2012, 2013); Cardona (2006); Cardona et al. (2009); Chew et al. (2007); Dalmayrac et al. (1980); de Haller et al. (2006); Demouy et al. (2012); Lancelot (1978); Lipa (2005); Marocco (1978); Mišković et al. (2009, in press); Mukasa (1984, 1986a,b); Mukasa & Tilton (1985a,b); Polliand et al. (2005); Romero et al. (2013); Schaltegger et al. (2008); Sillitoe & Mortensen (2010); Vidal et al. (1995); Witt et al. (2013)

(G) Aguirre-Urreta et al. (2008); Alasino et al. (2012); Alessandretti et al. (2013); Álvarez et al. (2011); Barredo et al. (2012); Coloma et al. (2012); Dahlquist and Alasino (2012); Dahlquist et al. (2006, 2013); Damm et al. (1986); Deckart et al. (2014); Grosse et al. (2009); Gulbranson et al. (2010); Hervé et al. (2013, 2014); Jara and Charrier (2014); Maksaev (1990); Maksaev et al. (2006, 2009, 2010, 2014); Mancuso et al. (2010); Martin et al. (1999); Martina et al. (2011); Masterman (2003); Munizaga et al. (2008); Pankhurst et al. (1996, 2006); Parada et al. (2005); Pineda and Calderón (2008); Poma et al. (2014); Rocha-Campos et al. (2011); Rossel et al. (2013); Salazar et al. (2009); Schiuma and Llambías (2008); Söllner et al. (2007); Tornos et al. (2010); Vásquez Illanes (2008); Vennari et al. (2014); Willner et al. (2008)

(H) Aragón et al. (2011); Barbeau et al. (2009a,b); Benedini and Gregori (2013); Bruce et al. (1991); Calderón et al. (2007); Castro et al. (2011); Césari et al. (2011); Chernicoff et al. (2013); Cúneo et al. (2013); Deckart et al. (2014); Hervé et al. (2007, 2013); Kohn et al. (1995); Martin et al. (2001); Pankhurst et al. (1999, 2006); Parada et al. (1997); Rapela et al. (2005); Rolando et al. (2004); Suárez et al. (2009, 2010, 2014); Varela et al. (2005, 2012)

Figure 1—Detrital zircon ages

(A) Dumitru et al. (2013); Fuentes et al. (2011); Laskowski et al. (2013); Leier and Gehrels (2011); Paterson (unpublished); Raines et al. (2013); Surpless and Beverly (2013)

(B) Barbeau et al. (2005); Dickinson and Gehrels (2008); Dumitru et al. (2013); Gehrels and Pecha (2014); Grove (pers. comm. to Paterson); Laskowski et al. (2013); Lawton and Bradford (2011); Lawton et al. (2010); Morgan et al. (2005); Paterson (unpublished); Riggs et al. (2012, 2013); Sharman et al. (2013, 2014)

(C) Alsleben et al. (2012); Fletcher et al. (2007); Gehrels (pers. comm. to Paterson); Gehrels and Pecha (2014); Gehrels and Stewart (1998); González-León et al. (2005, 2009, 2011); Jacobson et al. (2011); Kimbrough et al. (2001); Mael et al. (2011); Peryam et al. (2011); Pompa-Mera et al. (2013); Premo and Morton (2014); Sharman et al. (2014); Spencer et al. (2011)

(D) Barboza-Gudiño (2012); Barboza-Gudiño et al. (2010, 2012); Campos-Madrigal et al. (2013); Centeno-García et al. (2011); Escalona-Alcázar et al. (2009); Gillis et al. (2005); Godínez-Urban et al. (2011); Grodzicki et al. (2008); Helbig et al. (2012); Hinojosa-Prieto et al. (2008); Keppie et al. (2008); Kirsch et al. (2012); Lawton and Molina-Garza

(2014); Lawton et al. (2009); Martini et al. (2009, 2011); Mendoza-Rosales et al. (2010); Morales-Gámez et al. (2008); Ocampo-Díaz et al. (2014); Ortega-Flores et al. (2014); Ortega-Obregón et al. (2009); Palacios-García and Martini (2014); Pérez-Gutiérrez et al. (2009); Ramos-Arias and Keppie (2011); Rubio-Cisneros and Lawton (2011); Silva-Romo et al. (2015); Solari et al. (2010); Talavera-Mendoza et al. (2007, 2013); Torres de León et al. (2012); Valencia et al. (2013); Venegas-Rodríguez et al. (2009); Witt et al. (2012)

(E) Ayala et al. (2009, 2012); Bande et al. (2012); Cardona et al. (2010a,b, 2012); Chew et al. (2007); Cochrane (2013); Horton et al. (2010a,b); Mantilla Figueiroa et al. (2013); Nie et al. (2010, 2012); Saylor et al. (2011, 2012); Weber et al. (2010); Xie et al. (2010); Zapata et al. (2009)

(F) Boekhout et al. (2013); Cardona et al. (2009); Decou et al. (2013); Leier et al. (2010); Michalak (2013); Reimann et al. (2010); Reitsma (2012)

(G) Álvarez et al. (2011); Augustsson (2015); Bahlburg et al. (2009); Di Giulio et al. (2012); Encinas et al. (2014); Hervé et al. (2013); Naipauer et al. (2012, 2014); Oliveros et al. (2012); Sagripanti et al. (2011); Tunik et al. (2010); Willner et al. (2008)

(H) Augustsson et al. (2006); Barbeau et al. (2009a,b); Calderón et al. (2007); Chernicoff et al. (2013); Fildani et al. (2003); Hervé et al. (2003); Sepúlveda et al. (2010)

Figure 3—Geochemistry

(B) Barth et al. (2011); Bateman and Chappell (1979); Bateman et al. (1988); Burgess (2006); Chen and Moore (1982); Chen and Tilton (1991); Coleman et al. (2012); Economos et al. (2008, 2010); Frost (1988); Frost et al. (1988); Gray (2008); Kistler et al. (1986); Kistler and Ross (1990); Kylander-Clark et al. (2005); Loetterle (2008); Memeti (2009); Peck et al. (1983); Ratajeski et al. (2001); Reid et al. (1983); Saleeby et al. (1988, 1990, 2007); Solgadi and Sawyer (2008); Stern et al. (1982); Zak et al. (2009)

(C) Allen, C.M. (1989); Allen, E.F. (2007); Anderson and Rowley (1982); B. John, T. Cameron, and J. Lawford Anderson (unpublished); Barth (1989, 1990); Barth et al. (1990); Beckerman et al. (1982); Beckerman (1982); Brand (1985); Davis and Wooden (1989); DePaolo (1981); Farber (thesis); Fox et al. (1989); Fox and Miller (1990); Frizzell et al. (1986); Glazner et al. (2008); Hayes (1992); Herzig (1991); Hill (1986); Ianno (unpublished); Ianno and Hartman (unpublished); Ianno and Paterson (unpublished); J. Brand and Lawford Anderson (unpublished); J. Morrison and D. Miller (unpublished); Kistler (1983, 2014); Kistler and Lee (1989); J.L. Anderson (unpublished); Lee (1984); Mayo (dissertation); Miller (1977); Miller and Glazner (1995); Miller and Young; Miller et al. (1990, 1995); Morton (2014); Ramo et al. (2002); Wooden and Barth (unpublished data); Young (1990); Young et al. (1992)

(D) Centeno-García (1994); Centeno-García and Silva-Romo (1997); Centeno-García et al. (1993); Elías-Herrera (2003); Elías-Herrera et al. (2005); Freydier et al. (1996a,b); Galaz et al. (2013); Garza-González (2007); Grajales-Nishimura et al. (1999); Helbig et

al. (2012); Helbig, unpublished; Kirsch et al. (2012, 2014); Lapierre et al. (1992); Martiny (2008); Ortega-Obregón et al. (2010); Rosales-Lagarde et al. (2005); Schaaf et al. (2002); Solari et al. (2010); Talavera-Mendoza (2000); Tardy et al. (1994); Torres et al. (1999); Valencia-Moreno et al. (2001); Yañez et al. (1991)

FULL REFERENCES

Figure 1—Bedrock ages

- Aguirre-Urreta, M.B., Pazos, P.J., Lazo, D.G., Fanning, C.M., Litvak, V.D., 2008. First U-Pb SHRIMP age of the Hauterivian stage, Neuquén Basin, Argentina: *Journal of South American Earth Sciences*, v. 26, p. 91–99.
- Alaniz-Álvarez, S.A., van der Heyden, P., Samaniego, A.F.N., and Ortega-Gutiérrez, F., 1996, Radiometric and kinematic evidence for Middle Jurassic strike-slip faulting in southern Mexico related to the opening of the Gulf of Mexico: *Geology*, v. 24, p. 443–446, doi: 10.1130/0091-7613(1996)024<0443.
- Alasino, P.H., Dahlquist, J.A., Pankhurst, R.J., Galindo, C., Casquet, C., Rapela, C.W., Larrovere, M.A., and Fanning, C.M., 2012, Early Carboniferous sub- to mid-alkaline magmatism in the Eastern Sierras Pampeanas, NW Argentina: A record of crustal growth by the incorporation of mantle-derived material in an extensional setting: *Gondwana Research*, v. 22, p. 992–1008, doi: 10.1016/j.gr.2011.12.011.
- Alessandretti, L., Philipp, R.P., Chemale, F., Jr, Brückmann, M.P., Zvirtes, G., Matté, V., and Ramos, V.A., 2013, Provenance, volcanic record, and tectonic setting of the Paleozoic Ventania Fold Belt and the Claromecó Foreland Basin: Implications on sedimentation and volcanism along the southwestern Gondwana margin: *Journal of South American Earth Sciences*, v. 47, p. 12–31, doi: 10.1016/j.jsames.2013.05.006.
- Alldrick, D.J., 2001, Geology and mineral deposits of the Ecostall belt, northwest British Columbia, in *Geological Fieldwork 1999*, Paper 2000-1, B.C. Ministry of Energy and Mines, p. 279–306.
- Álvarez, J., Mpodozis, C., Arriagada, C., Astini, R., Morata, D., Salazar, E., Valencia, V.A., and Vervoort, J.D., 2011, Detrital zircons from late Paleozoic accretionary complexes in north-central Chile (28°–32°S): Possible fingerprints of the Chilenia terrane: *Journal of South American Earth Sciences*, v. 32, p. 460–476, doi: 10.1016/j.jsames.2011.06.002.
- Anderson, T. H., and Silver, L. T., 1979, The role of the Mojave-Sonora megashear in the tectonic evolution of northern Sonora, in Anderson, T. H., and Roldan-Quintana, J., eds., *Geology of Northern Sonora: Field Trip Guidebook for the 1979 Annual Meeting in San Diego*, Geological Society of America, Boulder, Colorado, p. 59–68.
- Anderson, T. H., L. T. Silver, and G. A. Salas, 1980, Distribution and U-Pb isotope ages of some lineated plutons, northwestern Mexico, in Crittenden, Sr., Coney, P.J., and Davis, G.H., eds., *Cordilleran metamorphic core complexes*: Geological Society of America Memoir, v. 153, p. 269–283.

- Anderson, T.H., Rodríguez-Castañeda, J.L., and Silver, L.T., 2005, Jurassic rocks in Sonora, Mexico: Relations to the Mojave-Sonora megashear and its inferred northwestward extension, in Anderson, T.H., Nourse, J.A., McKee, J.W., and Steiner, M.B., eds., *The Mojave-Sonora Megashare Hypothesis: Development, Assessment, and Alternatives*: Geological Society of America Special Papers, v. 393, p. 51–95.
- Andronicos, C.L., Chardon, D.H., Hollister, L.S., Gehrels, G.E., and Woodsworth, G.J., 2003, Strain partitioning in an obliquely convergent orogen, plutonism, and synorogenic collapse: Coast Mountains Batholith, British Columbia, Canada: *Tectonics*, v. 22, p. 1012, doi: 10.1029/2001TC001312.
- Aragón, E., Castro, A., Díaz-Alvarado, J., and Liu, D.Y., 2011, The North Patagonian batholith at Paso Puyehue (Argentina-Chile). SHRIMP ages and compositional features: *Journal of South American Earth Sciences*, v. 32, p. 547–554, doi: 10.1016/j.jsames.2011.02.005.
- Arvizu, H.E., 2012, Magmatismo permo-triásico en el NW de Sonora, México: Inicio de la subducción y maduración de un margen continental activo [M.Sc. thesis]: Universidad Nacional Autónoma de México, Centro de Geociencias, Querétaro, Mexico, 250 p.
- Arvizu, H.E., Iriondo, A., Izaguirre, A., Chávez-Cabello, G., Kamenov, G.D., Solís-Pichardo, G., Foster, D.A., and Cruz, R.L.-S., 2009, Rocas graníticas pérmicas en la Sierra Pinta, NW de Sonora, México: Magmatismo de subducción asociado al inicio del margen continental activo del SW de Norteamérica: *Revista Mexicana de Ciencias Geológicas*, v. 26, p. 709–728.
- Aspden, J. A., Bonilla, W., and Duque, P., 1995, The El Oro metamorphic complex Ecuador: Geology and economic mineral deposits: *Overseas Geology and Mineral Resources*, v. 67, 63 p.
- Barbeau, D.L., Jr., Gombosi, D.J., Zahid, K.M., Bizimis, M., Swanson-Hysell, N., Valencia, V., and Gehrels, G.E., 2009, U-Pb zircon constraints on the age and provenance of the Rocas Verdes basin fill, Tierra del Fuego, Argentina: *Geochemistry, Geophysics, Geosystems*, v. 10, Q12001, doi:10.1029/2009GC002749.
- Barbeau, D.L., Jr., Olivero, E.B., Swanson-Hysell, N.L., Zahid, K.M., Murray, K.E., and Gehrels, G.E., 2009, Detrital-zircon geochronology of the eastern Magallanes foreland basin: Implications for Eocene kinematics of the northern Scotia Arc and Drake Passage: *Earth and Planetary Science Letters*, v. 284, p. 489–503, doi: 10.1016/j.epsl.2009.05.014.
- Barboza-Gudiño, J.R., Hoppe, M., Gómez-Anguiano, M., and Martínez-Macías, P.R., 2004, Aportaciones para la interpretación estratigráfica y estructural de la porción noroccidental de la Sierra de Catorce, San Luis Potosí, México: *Revista Mexicana de Ciencias Geológicas*, v. 21, p. 299–319.
- Barboza-Gudiño, J.R., Orozco-Esquivel, M.T., Gómez-Anguiano, M., and Zavala-Monsiváis, A., 2008, The Early Mesozoic volcanic arc of western North America in northeastern Mexico: *Journal of South American Earth Sciences*, v. 25, p. 49–63.
- Barredo, S., Chemale, F., Marsicano, C., Ávila, J.N., Ottone, E.G., and Ramos, V.A.,

- 2012, Tectono-sequence stratigraphy and U–Pb zircon ages of the Rincón Blanco Depocenter, northern Cuyo Rift, Argentina: *Gondwana Research*, v. 21, p. 624–636, doi: 10.1016/j.gr.2011.05.016.
- Barth, A.P., and Wooden, J.L., 2006, Timing of magmatism following initial convergence at a passive margin, southwestern U.S. Cordillera, and ages of lower crustal magma sources: *Journal of Geology*, v. 114, p. 231–245.
- Barth, A.P., Tosdal, R.M., and Wooden, J.L., 1990, A petrologic comparison of Triassic plutonism in the San Gabriel and Mule Mountains, Southern California: *Journal of Geophysical Research*, v. 95, p. 20075–20096.
- Benedini, L., and Gregori, D., 2013, Significance of the Early Jurassic Garamilla formation in the western Nordpatagonian Massif: *Journal of South American Earth Sciences*, v. 45, p. 259–277, doi: 10.1016/j.jsames.2013.03.016.
- Bissig, T., Mortensen, J.K., Tosdal, R.M., and Hall, B.V., 2008, The rhyolite-hosted volcanogenic massive sulfide District of Cuale, Guerrero terrane, West-Central Mexico: silver-rich, base metal mineralization emplaced in a shallow marine continental margin setting: *Economic Geology*, v. 103, p. 141–159.
- Boekhout, F., Spikings, R., Sempere, T., Chiaradia, M., Ulianov, A., and Schaltegger, U., 2012, Mesozoic arc magmatism along the southern Peruvian margin during Gondwana breakup and dispersal: *Lithos*, v. 146-147, p. 48–64, doi: 10.1016/j.lithos.2012.04.015.
- Boekhout, F., Sempere, T., Spikings, R., and Schaltegger, U., 2013, Late Paleozoic to Jurassic chronostratigraphy of coastal southern Peru: Temporal evolution of sedimentation along an active margin: *Journal of South American Earth Sciences*, v. 47, p. 179–200, doi: 10.1016/j.jsames.2013.07.003.
- Bruce, R.M., Nelson, E.P., Weaver, S.G., and Lux, D.R., 1991, Temporal and spatial variations in the southern Patagonian batholith; Constraints on magmatic arc development: *Geological Society of America Special Papers*, v. 265, p. 1–12.
- Bustamante, C., Cardona, A., Bayona, G., Mora, A., Valencia, V., Gehrels, G., and Vervoort, J., 2010, U-Pb LA-ICP-MS geochronology and regional correlation of Middle Jurassic intrusive rocks from the Garzón Massif, Upper Magdalena Valley and Central Cordillera, southern Colombia: *Boletín de Geología*, v. 32, p. 1–17.
- Butler, R.F., Gehrels, G.E., Baldwin, S.L., and Davidson, C., 2002, Paleomagnetism and geochronology of the Ecstall pluton in the Coast Mountains of British Columbia: Evidence for local deformation rather than large-scale transport: *Journal of Geophysical Research: Solid Earth*, v. 107, p. EPM 3–1–EPM 3–13, doi: 10.1029/2001JB000270.
- Butler, R.F., Gehrels, G.E., Hart, W., Davidson, C., and Crawford, M.L., 2006, Paleomagnetism of Late Jurassic to mid-Cretaceous plutons near Prince Rupert, British Columbia, in Haggart, J.W., Enkin, R.J., and Monger, J.W.H., eds., *Paleogeography of the North American Cordillera: Evidence For and Against Large- Scale Displacements*: Geological Association of Canada Special Paper 46, p. 171–200.
- Calderón, M., Fildani, A., Hervé, F., Fanning, C.M., Weislogel, A., and Cordani, U.,

- 2007, Late Jurassic bimodal magmatism in the northern sea-floor remnant of the Rocas Verdes basin, southern Patagonian Andes: *Journal of the Geological Society*, London, v. 164, p. 1011–1022.
- Campa-Uranga, M.F., and Iriondo, A., 2004, Significado de dataciones Cretácicas de los arcos volcánicos de Taxco, Taxco Viejo y Chapolapa, en la evolución de la plataforma Guerrero-Morelos: GEOS Unión Geofísica Mexicana, v. 24, p. 173.
- Campa-Uranga, M.F., García Díaz, J.L., and Iriondo, A., 2004, El arco sedimentario del Jurásico Medio (Grupo Tecocoyunca y Las Lluvias) de Olinalá: GEOS Unión Geofísica Mexicana, v. 24, p. 174.
- Campa-Uranga, M.F., Torres de León, R., Iriondo, A., and Premo, W.R., 2012, Caracterización geológica de los ensambles metamórficos de Taxco y Taxco el Viejo, Guerrero, México: *Boletín de la Sociedad Geológica Mexicana*, v. 64, p. 369–385.
- Cardona, A., Cordani, U.G., and MacDonald, W.D., 2006, Tectonic correlations of pre-Mesozoic crust from the northern termination of the Colombian Andes, Caribbean region: *Journal of South American Earth Sciences*, v. 21, p. 337–354.
- Cardona, A., Cordani, U.G., Ruiz, J., Valencia, V.A., Armstrong, R., CHEW, D., Nutman, A., and Sánchez, A.W., 2009, U-Pb Zircon Geochronology and Nd Isotopic Signatures of the Pre-Mesozoic Metamorphic Basement of the Eastern Peruvian Andes: Growth and Provenance of a Late Neoproterozoic to Carboniferous Accretionary Orogen on the Northwest Margin of Gondwana: *The Journal of Geology*, v. 117, p. 285–305, doi: 10.1086/597472.
- Cardona, A., Valencia, V.A., Bayona, G., Duque, J., Ducea, M., Gehrels, G., Jaramillo, C., Montes, C., Ojeda, G., and Ruiz, J., 2010, Early-subduction-related orogeny in the northern Andes: Turonian to Eocene magmatic and provenance record in the Santa Marta Massif and Rancheria Basin, northern Colombia: *Terra Nova*, v. 23, p. 26–34, doi: 10.1111/j.1365-3121.2010.00979.x.
- Cardona, A., Valencia, V., Garzón, A., Montes, C., Ojeda, G., Ruiz, J., Weber, M., 2010. Permian to Triassic I to S-type magmatic switch in the northeast Sierra Nevada de Santa Marta and adjacent regions, Colombian Caribbean: tectonic setting and implications within Pangea paleogeography. *Journal of South American Earth Sciences*, v. 29, p. 772–783.
- Castro, A., Moreno-Ventas, I., Fernández, C., Vujovich, G., Gallastegui, G., Heredia, N., Martino, R.D., Becchio, R., Corretgé, L.G., Díaz-Alvarado, J., Such, P., García-Arias, M., and Liu, D.Y., 2011, Petrology and SHRIMP U–Pb zircon geochronology of Cordilleran granitoids of the Bariloche area, Argentina: *Journal of South American Earth Sciences*, v. 32, p. 508–530, doi: 10.1016/j.jsames.2011.03.011.
- Centeno-García, E., Busby, C., Busby, M., and Gehrels, G., 2011, Evolution of the Guerrero composite terrane along the Mexican margin, from extensional fringing arc to contractional continental arc: *Geological Society of America Bulletin*, v. 123, p. 1776–1797, doi: 10.1130/B30057.1.
- Césari, S.N., Limarino, C.O., Llorens, M., Passalia, M.G., Loinaze, V.P., and Vera, E.I.,

- 2011, Journal of South American Earth Sciences: Journal of South American Earth Sciences, v. 31, p. 426–431, doi: 10.1016/j.jsames.2011.03.012.
- Chernicoff, C.J., Zappettini, E.O., Santos, J.O., McNaughton, N.J., and Belousova, E., 2013, Combined U-Pb SHRIMP and Hf isotope study of the Late Paleozoic Yaminué Complex, Rio Negro Province, Argentina: Implications for the origin and evolution of the Patagonia composite terrane: Geoscience Frontiers, v. 4, p. 37–56, doi: 10.1016/j.gsf.2012.06.003.
- Chew, D.M., Schaltegger, U., Košler, J., Whitehouse, M.J., Gutjahr, M., Spikings, R.A., and Miscovic, A., 2007, U-Pb geochronologic evidence for the evolution of the Gondwanan margin of the north-central Andes: Geological Society of America Bulletin, v. 119, p. 697–711, doi: 10.1130/B26080.1.
- Chew, D.M., Magna, T., Kirkland, C.L., Mišković, A., Cardona, A., Spikings, R., and Schaltegger, U., 2008, Detrital zircon fingerprint of the Proto-Andes: Evidence for a Neoproterozoic active margin?: Precambrian Research, v. 167, p. 186–200, doi: 10.1016/j.precamres.2008.08.002.
- Chiaradia, M., Vallance, J., Fontboté, L., Stein, H., Schaltegger, U., Coder, J., Richards, J., Villeneuve, M., Gendall, I., 2009. U-Pb, Re-Os and 40Ar/39Ar geochronology of the Nambija Au-skarn and Pangui porphyry Cu deposits, Ecuador: implications for the Jurassic metallogenic belt of the northern Andes. Mineralium Deposita, v. 44, p. 371–387.
- Cochrane, R., 2013, U-Pb thermochronology, geochronology and geochemistry of NW South America: Rift to drift transition, active margin dynamics and implications for the volume balance of continents [Ph.D. thesis]: Université de Genève, 209 p.
- Cochrane, R., Spikings, R., Gerdes, A., Ulianov, A., Mora, A., Villagómez, D., Pütlitz, B., and Chiaradia, M., 2014, Permo-Triassic anatexis, continental rifting and the disassembly of western Pangaea: Lithos, v. 190-191, p. 383–402, doi: 10.1016/j.lithos.2013.12.020.
- Coloma, F., Salazar, E. and Creixell, C., 2012. Nuevos antecedentes acerca de la construcción de los plutones Pérmicos y Permo-Triásicos en el valle del río Tránsito, Región de Atacama, Chile. XIII Congreso Geológico Chileno, Antofagasta, p. 330–332.
- Crawford, M.L.L., Klepeis, K.A.A., Gehrels, G., and Isachsen, C., 1999, Batholith emplacement at mid-crustal levels and its exhumation within an obliquely convergent margin: the influence of granite emplacement on tectonics: Tectonophysics, v. 312, p. 57–78.
- Crawford, M.L., Klepeis, K.A., Gehrels, G.E., and Lindline, J., 2009, Mid-Cretaceous–Recent crustal evolution in the central Coast orogen, British Columbia and southeastern Alaska, in Miller, R.B., and Snook, A.W., eds., Crustal Cross-Sections from the Western North American Cordillera and Elsewhere: Implications for Tectonic and Petrologic Processes: Geological Society of America Special Paper 456, p. 97–124.
- Cúneo, R., Ramezani, J., Scasso, R., Pol, D., Escapa, I., Zavattieri, A.M., and Bowring, S.A., 2013, High-precision U–Pb geochronology and a new chronostratigraphy for the Cañadón Asfalto Basin, Chubut, central Patagonia: Implications for terrestrial

- faunal and floral evolution in Jurassic: *Gondwana Research*, v. 24, p. 1267–1275, doi: 10.1016/j.gr.2013.01.010.
- Dahlquist, J.A., and Alasino, P.H., 2012, Primera edad U-Pb en circon usando LA-ICP-MS de un dique traquianandesítico emplazado en el granito tipo a Los Árboles, Sierras Pampeanas Orientales: *Revista de la Asociación Geológica Argentina*, v. 69, p. 296–299.
- Dahlquist, J.A., Pankhurst, R.J., Rapela, C.W., Casquet, C., Fanning, C.M., Alasino, P., and Baez, M., 2006, The San Blas Pluton: An example of Carboniferous plutonism in the Sierras Pampeanas, Argentina: *Journal of South American Earth Sciences*, v. 20, p. 341–350, doi: 10.1016/j.jsames.2005.08.006
- Dahlquist, J.A., Alasino, P.H., and Bello, C., 2013, Devonian F-rich peraluminous A-type magmatism in the proto-Andean foreland (Sierras Pampeanas, Argentina): geochemical constraints and petrogenesis from the western-central region of the Achala batholith: *Mineralogy and Petrology*, v. 108, p. 391–417, doi: 10.1007/s00710-013-0308-0..
- Dalmayrac, B., Laubacher, G., and Marocco, R., 1980, *Géologie des Andes Péruviennes—Caractères généraux de l'évolution géologique des Andes Péruviennes: Travaux et documents de l'office de la recherche scientifique et technique Outre-Mer*, Paris, v. 122, 507 p.
- Damm, W., Pichowiak, S., and Todt, W., 1986, *Geochemie, Petrologie und Geochronologie der Plutonite und des metamorphen Grundgebirges in Nordchile: Berliner geowissenschaftliche Abhandlungen*, v. A 66, p. 73–146.
- Damon, P.E., Shafiqullah, M., and Clark, K.F., 1983, Geochronology of the porphyry copper deposits and related mineralization of Mexico: *Canadian Journal of Earth Sciences*, v. 20, no. 6, p. 1052–1071.
- De Haller, A., Corfu, F., Fontboté, L., Schaltegger, U., Barra, F., Chiaradia, M., Frank, M., and Alvarado, J.Z., 2006, Geology, geochronology, and Hf and Pb isotope data of the Raúl-Condestable iron oxide-copper-gold deposit, central coast of Peru: *Economic Geology*, v. 101, p. 281–310.
- Deckart, K., Hervé, F., Fanning, C.M., Ramírez, V., Calderón, M., and Godoy, E., 2014, U-Pb Geochronology and Hf-O Isotopes of zircons from the Pennsylvanian Coastal Batholith, South-Central Chile: *Andean Geology*, v. 41, p. 49–82, doi: 10.5027/andgeoV41n1-a03.
- Demouy, S., Paquette, J.-L., de Saint Blanquat, M., Benoit, M., Belousova, E.A., O'Reilly, S.Y., García, F., Tejada, L.C., Gallegos, R., and Sempere, T., 2012, Spatial and temporal evolution of Liassic to Paleocene arc activity in southern Peru unraveled by zircon U–Pb and Hf in-situ data on plutonic rocks: *Lithos*, v. 155, p. 183–200, doi: 10.1016/j.lithos.2012.09.001.
- Diakow, L.J., 2006, Geology of the Tahtsa Ranges between Eutsuk Lake and Morice Lake, Whitesail Lake Map Area, West-Central British Columbia: *British Columbia Geological Survey Geoscience Map 2006–5*, scale 1:150,000.
- Ducea, M.N., Gehrels, G.E., Shoemaker, S., Ruiz, J., and Valencia, V.A., 2004, Geologic evolution of the Xolapa Complex, southern Mexico: Evidence from U-Pb zircon

- geochronology: Geological Society of America Bulletin, v. 116, p. 1016–1025.
- Elías-Herrera, M., and Ortega-Gutiérrez, F., 2002, Caltepec fault zone: An Early Permian dextral transpressional boundary between the Proterozoic Oaxacan and Paleozoic Acatlán complexes, southern Mexico, and regional tectonic implications: Tectonics, v. 21, p. 1–19.
- Elías-Herrera, M., Sánchez-Zavala, J.L., and Macías-Romo, C., 2000, Geologic and geochronologic data from the Guerrero terrane in the Tejupilco area, southern Mexico: new constraints on its tectonic interpretation: Journal of South American Earth Sciences, v. 13, p. 355–375.
- Elías-Herrera, M., Ortega-Gutiérrez, F., Sánchez-Zavala, J.L., Macías-Romo, C., Ortega-Rivera, A., and Iriondo, A., 2005, La falla de Caltepec: raíces expuestas de una frontera tectónica de larga vida entre dos terrenos continentales del sur de México: Boletín de la Sociedad Geológica Mexicana, v. 57, p. 83–109.
- Elías-Herrera, M., Sánchez-Zavala, J.L., Ortega-Gutiérrez, F., Iriondo, A., Macías-Romo, C., and Ángeles-Moreno, E., 2007, El margen septentrional del Complejo Xolapa en el área de Zenzontepetl, Oaxaca: restricciones geológicas y geocronológicas para la evolución tectónica del sur de México, in Simposio GeoChortis: La Conexión Chortis-Sur de México en el Tiempo y en el Espacio, abstract GC2007-06P.
- Elías-Herrera, M., Ortega-Gutiérrez, F., Macías-Romo, C., Sánchez-Zavala, J.L., and Solari, L.A., 2011, Colisión oblicua del Cisuraliano-Guadalupiano entre bloques continentales en el sur de México: evidencias estratigráfico-estructurales y geocronológicas, in Simposio en Honor del Dr. Zoltan de Cserna, Libro de resúmenes, Mexico D.F., Instituto de Geología, UNAM, p. 159–164.
- Fackler-Adams, B.N., Busby, C.J., and Mattinson, J.M., 1997, Jurassic magmatism and sedimentation in the Palen Mountains, southeastern California: Implications for regional tectonic controls on the Mesozoic continental arc: Geological Society of America Bulletin, v. 109, p. 1464–1484.
- Fastovsky, D.E., Hermes, O.D., Strater, N.H., Bowring, S.A., Clark, J.M., Montellano, M., and Rene, H.R., 2005, Pre–Late Jurassic, fossil-bearing volcanic and sedimentary red beds of Huizachal Canyon, Tamaulipas, Mexico, in Anderson, T.H., Nourse, J.A., McKee, J.W., and Steiner, M.B. eds., The Mojave-Sonora Megashear hypothesis: development, assessment, and alternatives, Geological Society of America Special Paper 393, p. 401–426.
- Ferrari, L., Bergomi, M., Martini, M., Tunisi, A., Orozco-Esquivel, T., and López-Martínez, M., 2014, Late Cretaceous - Oligocene magmatic record in southern Mexico: The case for a temporal slab window along the evolving Caribbean-North America-Farallon triple boundary: Tectonics, v. 33, p. 1738–1765, doi:10.1002/2014TC003525.
- Friedman, R.M., and Mortensen, J.K., 2002, U-Pb zircon and titanite dating in support of British Columbia Geological Survey regional mapping studies, in Geological Fieldwork 2001: British Columbia Ministry of Energy and Mines Paper 2002–1, p. 135–149.
- Friedman, R.M., Gareau, S.A., and Woodsworth, G.J., 2001, U-Pb dates from the Scotia-Quaal metamorphic belt, Coast Plutonic Complex, central-western British Columbia:

- Geological Survey of Canada Current Research 2001-F9 14, 7 p.
- Gareau, S.A., 1991a, Geology of the Scotia-Quaal Metamorphic Belt, Coast Plutonic Complex, British Columbia [Ph.D. thesis]: Ottawa, Canada, Carleton University, 390 p.
- Gareau, S.A., 1991b, The Scotia-Quaal metamorphic belt: A distinct assemblage with pre–early Late Cretaceous deformational and metamorphic history, Coast Plutonic Complex, British Columbia: Canadian Journal of Earth Sciences, v. 28, p. 870–880.
- Gareau, S.A., Friedman, R.M., Woodsworth, G.J., and Childe, F., 1997, U-Pb ages from the northeastern quadrant of Terrace map area, west-central British Columbia: Geological Survey of Canada Current Research 1997-A, p. 31–40.
- Garza-González, E.C., 2007, Metalogenia del porfido de cobre de Tiámaro, Estado de Michoacán [Ph.D. thesis]: Universidad Nacional Autónoma de México, Mexico, 279 p.
- Gehrels, G., Rusmore, M., Woodsworth, G., Crawford, M., Andronicos, C., Hollister, L., Patchett, J., Ducea, M., Butler, R., Klepeis, K., Davidson, C., Friedman, R., Haggart, J., Mahoney, B., et al., 2009, U-Th-Pb geochronology of the Coast Mountains batholith in north-coastal British Columbia: Constraints on age and tectonic evolution: Geological Society of America Bulletin, v. 121, p. 1341–1361, doi: 10.1130/B26404.1.
- Gehrels, G.E., 2000, Reconnaissance geology and U-Pb geochronology of the west flank of the Coast Mountains between Juneau and Skagway, southeastern Alaska: Geological Society of America Special Papers 343, p. 213–233.
- Gehrels, G.E., 2001, Geology of the Chatham Sound region, southeast Alaska and coastal British Columbia: Canadian Journal of Earth Sciences, v. 38, p. 1579–1599, doi: 10.1139/cjes-38-11-1579.
- Gehrels, G.E., and Boghossian, N.D., 2000, Reconnaissance geology and U-Pb geochronology of the west flank of the Coast Mountains between Bella Coola and Prince Rupert, coastal British Columbia: Geological Society of America Special Papers 343, p. 61–75.
- Gehrels, G.E., McClelland, W.C., Samson, S.D., Patchett, P.J., and Brew, D.A., 1991, U-Pb geochronology of Late Cretaceous and early Tertiary plutons in the northern Coast Mountains batholith: Canadian Journal of Earth Sciences, v. 28, p. 899–911, doi: 10.1139/e91-082.
- Gehrels, G., Valencia, V., and Pullen, A., 2006, Detrital zircon geochronology by laser ablation multicollector ICPMS at the Arizona LaserChron Center, in Olszewski, T. ed., Geochronology: emerging opportunities, The Paleontological Society Short Course v. 12, p. 67–76.
- Gehrels, G., Rusmore, M., Woodsworth, G., Crawford, M., Andronicos, C., Hollister, L., Patchett, J., Ducea, M., Butler, R., Klepeis, K., Davidson, C., Friedman, R., Haggart, J., Mahoney, B., et al., 2009, U-Th-Pb geochronology of the Coast Mountains batholith in north-coastal British Columbia: Constraints on age and tectonic evolution: Geological Society of America Bulletin, v. 121, p. 1341–1361, doi: 10.1130/B26404.1.

- Gilbert, J.C., 2012, Age and Provenance of the Glance Conglomerate, Morita Formation, and Equivalent Strata from U-Pb Geochronology, Southeastern Arizona and Southwestern New Mexico [M.S. thesis]: Las Cruces, New Mexico, New Mexico State University, 181 p.
- Godínez-Urban, A., Lawton, T.F., Molina-Garza, R.S., Iriondo, A., Weber, B., and López-Martínez, M., 2011, Jurassic volcanic and sedimentary rocks of the La Silla and Todos Santos Formations, Chiapas: Record of Nazas arc magmatism and rift-basin formation prior to opening of the Gulf of Mexico: *Geosphere*, v. 7, p. 121–144.
- González-León, C.M., Scott, R.W., Löser, H., Lawton, T.F., Robert, E., and Valencia, V.A., 2008, Upper Aptian-Lower Albian Mural Formation: stratigraphy, biostratigraphy and depositional cycles on the Sonoran shelf, northern México: *Cretaceous Research*, v. 29, p. 249–266, doi: 10.1016/j.cretres.2007.06.001.
- Grosse, P., Söllner, F., Baéz, M.A., Toselli, A.J., Rossi, J.N., de la Rosa, J.D., 2009, Lower Carboniferous post-orogenic granites in central-eastern Sierra de Velasco, Sierras Pampeanas, Argentina: U–Pb monazite geochronology and Sr–Nd isotopes: *International Journal of Earth Sciences*, v. 98, p. 1001–1025.
- Gulbranson, E.L., Montanez, I.P., Schmitz, M.D., Limarino, C.O., Isbell, J.L., Marenssi, S.A., and Crowley, J.L., 2010, High-precision U-Pb calibration of Carboniferous glaciation and climate history, Paganzo Group, NW Argentina: *Geological Society of America Bulletin*, v. 122, p. 1480–1498, doi: 10.1130/B30025.1.
- Haggart, J.W., Diakow, L.J., Mahoney, J.B., Woodsworth, G.J., Struik, L.S., Gordee, S.M., and Rusmore, M., 2006a, Geology, Bella Coola region (NTS 93D/01, /07, /08, /10, /15, and parts of 93D/02, /03, /06, /09, /11, /14, /16, and 92M/15 and /16), British Columbia: Geological Survey of Canada Open-File 5385, and British Columbia Geological Survey Geoscience Map 2006–7, 3 sheets, scale 1:100,000.
- Haggart, J.W., Woodsworth, G.J., and McNicoll, V.J., 2006b, Uranium-lead geochronology of two intrusions in the Southern Bowser Basin, British Columbia: *Geological Survey of Canada Current Research*, v. F2, p. 1–6.
- Haxel, G.B., Wright, J.E., Riggs, N.R., Tosdal, R.M., and May, D.J., 2005, Middle Jurassic Topawa Group, Baboquivari Mountains, south-central Arizona: Volcanic and sedimentary record of deep basins within the Jurassic magmatic arc, in Anderson, T.H., Nourse, J.A., McKee, J.W., and Steiner, M.B., eds., *The Mojave-Sonora megashear hypothesis: Development, Assessment, and Alternatives*: Geological Society of America Special Paper, v. 393, p. 329–357.
- Henry, C.D., McDowell, F.W., and Silver, L.T., 2003, Geology and geochronology of granitic batholith complex, Sinaloa, México: Implications for Cordilleran magmatism and tectonics, in Johnson, S.E., Paterson, S.R., Fletcher, J.M., Girty, G.H., Kimbrough, D.L., and Martín-Barajas, A., eds., *Tectonic evolution of northwestern Mexico and the Southwestern USA*: Geological Society of America Special Papers 374, p. 237–273.
- Hernandez-Pineda, G.A., Solari, L.A., Gómez-Tuena, A., Mendez-Cardenas, D.L., and Perez-Arvizu, O., 2011, Petrogenesis and thermobarometry of the 50 Ma Rapakivi granite-syenite Acapulco intrusive: Implications for post-Laramide magmatism in southern Mexico: *Geosphere*, v. 7, p. 1419–1438, doi: 10.1130/GES00744.1..

- Hervé, F., Pankhurst, R.J., Fanning, C.M., Calderón, M., and Yaxley, G.M., 2007, The South Patagonian batholith: 150 my of granite magmatism on a plate margin: *Lithos*, v. 97, p. 373–394, doi: 10.1016/j.lithos.2007.01.007.
- Hervé, F., Calderón, M., Fanning, C.M., Pankhurst, R.J., and Godoy, E., 2013, Provenance variations in the Late Paleozoic accretionary complex of central Chile as indicated by detrital zircons: *Gondwana Research*, v. 23, p. 1122–1135, doi: 10.1016/j.gr.2012.06.016.
- Hervé, F., Fanning, C. M., Calderón, M., and Mpodozis, C., 2014, Early Permian to Late Triassic batholiths of the Chilean Frontal Cordillera (28°–31°S): SHRIMP U-Pb zircon ages and Lu-Hf and O isotope systematics: *Lithos*, v. 184–187, p. 436–446.
- Iriondo, A., 2001, Proterozoic basements and their Laramide juxtaposition in NW Sonora, Mexico: Tectonic constraints on the SW margin of Laurentia [Ph.D. thesis]: University of Colorado, Boulder, Colorado, 222 p.
- Iriondo, A., McDowell, F.W., 2011, New middle Jurassic U-Pb zircon age for felsic gneiss intercalated with the clastic Plomasas formation in Chihuahua, northern Mexico, in Alcayde, M., Gómez-Caballero, J.A., (eds.), Simposio Dr. Zoltán de Csorna: sesenta años geologizando en México. Libro de resúmenes, México D.F., 14–15 junio 2011: México, Universidad Nacional Autónoma de México, Instituto de Geología, p. 99–100.
- Iriondo, A., Martínez-Torres, L.M., Kunk, M.J., Atkinson, W.W., Jr., Premo, W.R., McIntosh, W.C., 2005, Northward Laramide thrusting in the Quito vac region, northwestern Sonora, Mexico: Implications for the juxtaposition of Paleoproterozoic basement blocks and the Mojave-Sonora megashare hypothesis, in Anderson, T.H., Nourse, J.A., McKee, J.W., Steiner, M.B., eds., The Mojave-Sonora megashare hypothesis: Development, assessment, and alternatives: Geological Society of America Special Paper 393, 631–669.
- Izaguirre, A., 2009, El basamento paleoproterozoico (~1.71–1.68 Ga) Yavapai en el área Mina La Herradura en el NW de Sonora: Sus implicaciones para el desarrollo del arco magmático continental Mesozoico-Cenozoico del NW de México [M.Sc. thesis]: Universidad Nacional Autónoma de México, Centro de Geociencias, Querétaro, 202 p.
- Jara, P., and Charrier, R., 2014, Nuevos antecedentes estratigráficos y geocronológicos para el Meso-Cenozoico de la Cordillera Principal de Chile entre 32° y 32°30'S: Implicancias estructurales y paleogeográficas : *Andean Geology*, v. 41, p. 174–209, doi: 10.5027/andgeoV41n12-a0?7.
- Johnson, S.E., Paterson, S.R., and Tate, M.C., 1999a, Structure and emplacement history of a multiple-center, cone-sheet-bearing ring complex: The Zarza Intrusive Complex, Baja California, Mexico: *Geological Society of America Bulletin*, v. 111, p. 607–619.
- Johnson, S.E., Tate, M.C., and Fanning, C.M., 1999b, New geologic mapping and SHRIMP U–Pb zircon data in the Peninsular Ranges batholith, Baja California, Mexico: evidence for a suture?: *Geology*, v. 27, p. 743–746.
- Johnson, S.E., Fletcher, J.M., Fanning, C.M., Vernon, R.H., Paterson, S.R., and Tate, M.C., 2003, Structure, emplacement and lateral expansion of the San José tonalite

- pluton, Peninsular Ranges batholith, Baja California, México: *Journal of Structural Geology*, v. 25, p. 1933–1957, doi: 10.1016/S0191-8141(03)00015-4.
- Jones, N.W., Lopez, R., and Cameron, K.L., 1995, Linda Vista pluton and latest Permian–Late Triassic orogeny, Las Delicias area, Coahuila, México: *Geological Society of America Abstracts with Programs*, v. 27, p. 388.
- Keppie, J.D., Nance, R.D., Dostal, J., Ortega-Rivera, A., Miller, B.V., Fox, D., Powell, J.T., Mumma, S.A., and Lee, J.K.W., 2004, Mid-Jurassic tectono-thermal event superposed on a Paleozoic geological record in the Acatlán Complex of southern Mexico: hotspot activity during the breakup of Pangea: *Gondwana Research*, v. 7, p. 239–260.
- Kimbrough, D.L., and Moore, T.E., 2003, Ophiolite and volcanic arc assemblages on the Vizcaino Peninsula and Cedros Island, Baja California Sur, México: Mesozoic forearc lithosphere of the Cordilleran magmatic arc, in Johnson, S.E., Paterson, S.R., Fletcher, J.M., Girty, G.H., Kimbrough, D.L., and Martín-Barajas, A, eds., *Tectonic evolution of northwestern Mexico and the Southwestern USA: Geological Society of America Special Papers* 374, p. 43–71.
- Kimbrough, D.L., Smith, D.P., Mahoney, J.B., Moore, T.E., Grove, M., Gastil, R.G., Ortega-Rivera, A., and Fanning, C.M., 2001, Forearc-basin sedimentary response to rapid Late Cretaceous batholith emplacement in the Peninsular Ranges of southern and Baja California: *Geology*, v. 29, p. 491–494.
- Kirsch, M., Keppie, J.D., Murphy, J.B., and Solari, L.A., 2012, Permian–Carboniferous arc magmatism and basin evolution along the western margin of Pangea: geochemical and geochronological evidence from the eastern Acatlán Complex, southern Mexico: *Geological Society of America Bulletin*, v. 124, p. 1607–1628.
- Kirsch, M., Helbig, M., Keppie, J.D., Murphy, J.B., Lee, J.K.W., and Solari, L.A., 2014, A Late Triassic tectono-thermal event in the eastern Acatlán Complex, southern Mexico, synchronous with a magmatic arc hiatus: The result of flat-slab subduction?: *Lithosphere*, v. 6, p. 63–79, doi: 10.1130/L349.1.
- Klepeis, K.A., and Crawford, M.L., 1999, High-temperature arc-parallel normal faulting and transtension at the roots of an obliquely convergent orogen: *Geology*, v. 27, p. 7–10, doi: 10.1130/0091-7613(1999)027<0007:HTAPNF>2.3.CO;2.
- Klepeis, K.A., Crawford, M.L., and Gehrels, G.E., 1998, Structural history of the crustal-scale Coast shear zone north of Portland Canal, southeast Alaska and British Columbia: *Journal of Structural Geology*, v. 20, p. 883–904, doi: 10.1016/S0191-8141(98)00020-0.
- Kohn, M.J., Spear, F.S., Harrison, T.M., and Dalziel, I.W.D., 1995, $^{40}\text{Ar}/^{39}\text{Ar}$ geochronology and P-Tf paths from the Cordillera Darwin metamorphic complex, Tierra del Fuego, Chile: *Journal of Metamorphic Geology*, v. 13, p. 251–270.
- Lancelot, J.R., Laubacher, G., Marocco, R., and Renaud, U., 1978, U/Pb radiochronology of two granitic plutons from the Eastern Cordillera (Peru): extent of Permian magmatic activity and consequences: *Geologische Rundschau*, v. 67, p. 236–243.
- Lawton, T.F., and Molina Garza, R.S., 2014, U-Pb geochronology of the type Nazas Formation and superjacent strata, northeastern Durango, Mexico: Implications of a

- Jurassic age for continental-arc magmatism in north-central Mexico: Geological Society of America Bulletin, B30827.1, doi: 10.1130/B30827.1.
- Lawton, T.F., Gilbert, J.C., and Amato, J.M., 2012, Age of the Jurassic arc system in southern Arizona: Geological Society of America Abstract with Programs, v. 44, p. 23.
- Leggett, W.J., 2009, Stratigraphy, Sedimentology and Geochronology of Lower and Middle Jurassic Rocks Near Rancho San Martin del Rincon, North-Central Sonora, Mexico [M.S. thesis]: Las Cruces, New Mexico, New Mexico State University, 203 p.
- Lipa, V., 2005, Análise estructural do Plutón Abancay e sua importância na evolução tectônica da porção sul de Abancay-Perú [M.Sc. thesis]: UNICAMP, Brasil.
- Litherland, M., Aspden, J.A., Jemielita, R.A., 1994. The metamorphic belts of Ecuador. Overseas Memoir of the British Geological Survey, Nottingham, UK, v. 11, p. 147.
- Mahoney, J.B., Haggart, J.W., Woodsworth, G.J., Hooper, R.L., and Snyder, L.S., 2007a, Geology, Kitlope Lake (east part) (93E/04), British Columbia: Geological Survey of Canada Open-File 5588, and Geoscience British Columbia Map 2007–11–4, 1 sheet, scale 1:50,000.
- Mahoney, J.B., Haggart, J.W., Hooper, R.L., Snyder, L.S., and Woodsworth, G.J., 2007b, Geology, Tsaytis River (93E/05), British Columbia: Geological Survey of Canada Open-File 5587, and Geoscience British Columbia Map 2007–11–3, 1 sheet, scale 1:50,000.
- Mahoney, J.B., Haggart, J.W., Hooper, R.L., Snyder, L.S., and Woodsworth, G.J., 2007c, Geology, parts of Chikamin Mountain and Troitsa Lake (93E/06, 11), British Columbia: Geological Survey of Canada Open-File 5586, and Geoscience British Columbia Map 2007–11–2, 1 sheet, scale 1:50,000.
- Mahoney, J.B., Haggart, J.W., Hooper, R.L., Snyder, L.S., and Woodsworth, G.J., 2007d, Geology, Tahtsa Peak (93E/12), British Columbia: Geological Survey of Canada Open-File 5585, and Geoscience British Columbia Map 2007–11–1, 1 sheet, scale 1:50,000.
- Mahoney, J.B., Hooper, R.L., Gordee, S.M., and Haggart, J.W., 2007e, Geology, Foresight Mountain (93E/03), British Columbia: Geological Survey of Canada Open-File 5386 (revised), and Geoscience British Columbia Map 2006–2, 1 sheet, scale 1:50,000.
- Mahoney, J.B., Gordee, S.M., Haggart, J.W., Friedman, R.M., Diakow, L.J., and Woodsworth, G.J., 2009, Magmatic evolution of the eastern Coast Plutonic Complex, Bella Coola region, west-central British Columbia: Geological Society of America Bulletin, v. 121, no. 9–10, p. 1362–1380, doi:10.1130/B26325.1
- Maksaev, V., 1990, Metallogeny, geological evolution and thermochronology of the Chilean Andes between latitudes 21° and 26° south, and the origin of the major porphyry copper deposits [Ph.D. thesis]: Dalhousie, Dalhousie University, 554 p.
- Maksaev, V., Munizaga, F., Fanning, M., Palacios, C., and Tapia, J., 2006, SHRIMP U-Pb dating of the Antucoya porphyry copper deposit: new evidence for an Early Cretaceous porphyry-related metallogenic epoch in the Coastal Cordillera of

- northern Chile: *Mineralium Deposita*, v. 41, p. 637–644, doi: 10.1007/s00126-006-0091-5.
- Maksaev, V., Munizaga, F., Valencia, V., and Barra, F., 2009, LA-ICP-MS zircon U-Pb geochronology to constrain the age of post-Neocomian continental deposits of the Cerrillos Formation, Atacama Region, northern Chile: tectonic and metallogenic implications: *Andean Geology*, v. 36, p. 264–287.
- Maksaev, V., Almonacid, T.A., Munizaga, F., Valencia, V., McWilliams, M., and Barra, F., 2010, Geochronological and thermochronological constraints on porphyry copper mineralization in the Domeyko alteration zone, northern Chile: *Andean Geology*, v. 37, p. 144–176.
- Maksaev, V., Munizaga, F., and Tassinari, C., 2014, Timing of the magmatism of the paleo-Pacific border of Gondwana: U-Pb geochronology of Late Paleozoic to Early Mesozoic igneous rocks of the north Chilean Andes between 20° and 31°S: *Andean Geology*, v. 41, no. 3, p. 447–506, doi: 10.5027/andgeoV41n3-a01.
- Mancuso, A.C., Chemale, F., Barredo, S.P., Ávila, J., Ottone, E.G., and Marsicano, C., 2010. Age constraints for the northernmost outcrops of the Triassic Cuyania Basin, Argentina: *Journal of South American Earth Sciences*, v. 30, no. 2, p. 97–103. doi:10.1016/j.jsames.2010.03.001.
- Mantilla Figueroa, L.C., Bissig, T., Valencia, V., and Hart, C.J.R., 2013, The magmatic history of the Vetas-California mining district, Santander Massif, Eastern Cordillera, Colombia: *Journal of South American Earth Sciences*, v. 45, p. 235–249, doi: 10.1016/j.jsames.2013.03.006.
- Marocco R., 1978, Un segment E-W de la chaîne des Andes peruviennes: la déflexion d'Abancay. - Etude géologique de la Cordillère orientale et des hauts plateaux entre Cuzco et San Miguel, sud de Pérou (12°30'S à 14°00 S): *Géologie des Andes péruviennes*, Travaux et documents de L'O.R.S.T.O.M., v. 94, 195 p.
- Martens, U.C., Brueckner, H.K., Mattinson, C.G., Liou, J.G., and Wooden, J.L., 2012, Timing of eclogite-facies metamorphism of the Chuacús complex, Central Guatemala: Record of Late Cretaceous continental subduction of North America's sialic basement: *Lithos*, v. 146–147, p. 1–10, doi: 10.1016/j.lithos.2012.04.021.
- Martin, M. W., Clavero, J., and Mpodozis, C., 1999, Late Palaeozoic to Early Jurassic tectonic development of the high Andean Principal Cordillera, El Indio region, Chile (29°–30°S): *Journal of South American Earth Sciences*, v. 12, p. 33–49.
- Martin, M., Pankhurst, R.J., Fanning, C.M., Thomson, S.N., Calderón, M., and Hervé, F., 2001, Age distribution of plutons across the southern Patagonian batholith: New U-Pb data on zircons: Third South American Symposium of Isotope Geology, Pucón, Chile, CD-ROM, SERNAGEOMIN, p. 580–585.
- Martina, F., Viramonte, J.M., Astini, R.A., Pimentel, M.M., and Dantas, E., 2011, Mississippian volcanism in the south-central Andes: New U–Pb SHRIMP zircon geochronology and whole-rock geochemistry: *Gondwana Research*, v. 19, p. 524–534, doi: 10.1016/j.gr.2010.07.004.
- Martínez, A.M.C., 2007. Petrogenesis and evolution of Aburra Ophiolite, Colombian Andes, Central Range [Ph.D. thesis], University of Brasilia, 178 p.

- Martini, M., Ferrari, L., López-Martínez, M., Cerca-Martínez, M., Valencia, V.A., and Serrano-Durán, L., 2009, Cretaceous–Eocene magmatism and Laramide deformation in southwestern Mexico: No role for terrane accretion, in Kay, S.M., Ramos, V.A., and Dickinson, W.R., eds., *Backbone of the Americas: Shallow subduction, plateau uplift, and ridge and terrane collision*, Geological Society of America Memoir 204, p. 151–182.
- Martini, M., Mori, L., Solari, L., and Centeno-García, E., 2011, Sandstone provenance of the Arperos Basin (Sierra de Guanajuato, central Mexico): Late Jurassic–Early Cretaceous back-Arc spreading as the foundation of the Guerrero Terrane: The Journal of Geology, v. 119, p. 597–617, doi: 10.1086/661989.
- Martiny, B., Martínez-Serrano, R.G., Morán-Zenteno, D.J., Macías-Romo, C., and Ayuso, R.A., 2000, Stratigraphy, geochemistry and tectonic significance of the Oligocene magmatic rocks of western Oaxaca, southern Mexico: Tectonophysics, v. 318, p. 71–98.
- Masterman, G.L., 2003, Structural and geochemical evolution of the Rosario Copper - molybdenum porphyry deposit and related copper veins, Collahuasi District, Northern Chile [Ph.D. thesis]: University of Tasmania, Australia, 253 p.
- Mauel, D.J., Lawton, T.F., González-León, C., Iriondo, A., and Amato, J.M., 2011, Stratigraphy and age of Upper Jurassic strata in north-central Sonora, Mexico: Southwestern Laurentian record of crustal extension and tectonic transition: Geosphere, v. 7, p. 390–414, doi: 10.1130/GES00600.1.
- McDowell, F.W., Roldán-Quintana, J., and Connelly, J.N., 2001, Duration of Late Cretaceous–early Tertiary magmatism in east-central Sonora, Mexico: Geological Society of America Bulletin, v. 113, p. 521–531.
- Miller, J.S., Glazner, A.F., Walker, J.D., and Martin, M.W., 1995, Geochronologic and isotopic evidence for Triassic-Jurassic emplacement of the eugeoclinal allochthon in the Mojave Desert region, California: Geological Society of America Bulletin, v. 107, p. 1441–1457.
- Mišković, A., Spikings, R.A., Chew, D.M., Košler, J., Ulianov, A., and Schaltegger, U., 2009, Tectonomagmatic evolution of Western Amazonia: Geochemical characterization and zircon U-Pb geochronologic constraints from the Peruvian Eastern Cordilleran granitoids: Geological Society of America Bulletin, v. 121, p. 1298–1324, doi: 10.1130/B26488.1.
- Montes, C., Guzmán, G., Bayona, G., Cardona, A., Valencia, V., and Jaramillo, C., 2010, Clockwise rotation of the Santa Marta massif and simultaneous Paleogene to Neogene deformation of the Plato-San Jorge and Cesar-Ranchería basins: Journal of South American Earth Sciences, v. 29, p. 832–848.
- Mortensen, J.K., Hall, B.V., Bissig, T., Friedman, R.M., Danielson, T., Oliver, J., Rhys, D.A., Ross, K.V., and Gabites, J.E., 2008, Age and paleotectonic setting of volcanogenic massive sulfide deposits in the Guerrero Terrane of central Mexico: Constraints from U-Pb age and Pb isotope studies: Economic Geology, v. 103, p. 117–140.
- Mukasa, S.B., 1984, Comparative Pb isotope systematics and zircon U-Pb geochronology for the Coastal, San Nicolás and Cordillera Blanca batholiths, Peru [Ph.D. thesis]:

- Santa Barbara, University of California, 362 p.
- Mukasa, S.B., 1986a, Lead isotopic compositions of the Lima and Arequipa segments in the Coastal batholith, Peru: implications for magmagenesis: *Geochimica et Cosmochimica Acta*, v. 50, p. 771–782.
- Mukasa, S.B., 1986b, Zircon U-Pb ages of super-units in the Coastal batholith, Peru: Implications for magmatic and tectonic processes: *Geological Society of America Bulletin*, v. 97, p. 241–254, doi: 10.1130/0016-7606(1986)97<241:ZUAOSI>2.0.CO;2.
- Mukasa, S.B., and Tilton, G.R., 1985a, Zircon U-Pb ages of super-units in the Coastal batholith, Peru, in Pitcher, W.S., Atherton, M.P., Cobbing, E.J., and Beckingsale, R.D., eds., *Magmatism at the plate edge: The Peruvian Andes*: Glasgow, UK, Blackie, p. 203–207.
- Mukasa, S.B., and Tilton, G.R., 1985b, Pb isotope systematics as a guide to crustal involvement in the generation of the Coastal batholith, Peru, in Pitcher, W.S., Atherton, M.P., Cobbing, E.J., and Beckingsale, R.D., eds., *Magmatism at the plate edge: The Peruvian Andes*: Glasgow, UK, Blackie, p. 235–238.
- Munizaga, F., Maksaev, V., Fanning, C.M., Giglio, S., Yaxley, G., and Tassinari, C.C.G., 2008, Late Paleozoic–Early Triassic magmatism on the western margin of Gondwana: Collahuasi area, Northern Chile: *Gondwana Research*, v. 13, p. 407–427, doi: 10.1016/j.gr.2007.12.005.
- Murillo-Muñeton, G., 1994, Petrologic and geochronologic study of Grenville-age granulites and post-granulite plutons from the La Mixtequita area, state of Oaxaca in southern Mexico, and their tectonic significance [M.Sc. thesis]: University of Southern California, 326 p.
- Ortega-Obregón, C., Keppie, J.D., Murphy, J.B., Lee, J.K.W., and Ortega-Rivera, A., 2009, Geology and geochronology of Paleozoic rocks in western Acatlan Complex, southern Mexico: Evidence for contiguity across an extruded high-pressure belt and constraints on Paleozoic reconstructions: *Geological Society of America Bulletin*, v. 121, p. 1678–1694.
- Ortega-Obregón, C., Solari, L.A., Ortega-Gutiérrez, F., and Elías-Herrera, M., 2012, Arc-related intrusions in the Oaxacan Complex: evidence for Early to Late Permian Pacific plate subduction beneath the west central margin of Gondwana: *Geological Society of America Abstracts with Programs*, v. 44, p. 18.
- Ortega-Obregón, C., Solari, L., Gómez-Tuena, A., Elías-Herrera, M., Ortega-Gutiérrez, F., and Macías-Romo, C., 2014, Permian–Carboniferous arc magmatism in southern Mexico: U–Pb dating, trace element and Hf isotopic evidence on zircons of earliest subduction beneath the western margin of Gondwana: *International Journal of Earth Sciences*, v. 103, p. 1287–1300.
- Ortega-Rivera, A., Farrar, E., Hanes, J.A., Archibald, D.A., Gastil, R.G., Kimbrough, D.L., Zentilli, M., López-Martínez, M., Feraud, G., and Ruffet, G., 1997, Chronological constraints on the thermal and tilting history of the Sierra San Pedro Mártir pluton, Baja California, México, from U/Pb, 40Ar/39Ar, and fission-track geochronology: *Geological Society of America Bulletin*, v. 109, p. 728–745, doi: 10.1130/0016-7606(1997)109<0728:CCOTTA>2.3.CO;2.

- Pankhurst, R.J., Millar, I.L., and Hervé, F., 1996, A Permo-Carboniferous U-Pb age for part of the Guanta Unit of the Elqui-Limari Batholith at Río del Tránsito, Northern Chile: *Revista geológica de Chile*, v. 23, p. 35–42.
- Pankhurst, R.J., Weaver, S.D., Hervé, F., and Larrondo, P., 1999, Mesozoic-Cenozoic evolution of the North Patagonian batholith in Aysen, southern Chile: *Journal of the Geological Society, London*, v. 156, p. 673–694.
- Pankhurst, R.J., Rapela, C.W., Fanning, C.M., and Márquez, M., 2006, Gondwanide continental collision and the origin of Patagonia: *Earth-Science Reviews*, v. 76, p. 235–257, doi: 10.1016/j.earscirev.2006.02.001.
- Parada, M.A., Feraud, G., Fuentes, F., Aguirre, L., Morata, D., and Larrondo, P., 2005, Ages and cooling history of the Early Cretaceous Caleu pluton: testimony of a switch from a rifted to a compressional continental margin in central Chile: *Journal of the Geological Society, London*, v. 162, p. 273–287.
- Parada, M.A., Palacios, C., and Lahsen, A., 1997, Jurassic extensional tectono-magmatism and associated mineralization of the El Faldeo polymetallic district, Chilean Patagonia: geochemical and isotopic evidence of crustal contribution: *Mineralium Deposita*, v. 32, p. 547–554.
- Peña-Alonso, T.A., Delgado-Argote, L.A., Weber, B., Velasco-Tapia, F., and Valencia, J.R., 2012, Geology and emplacement history of the Nuevo Rosarito plutonic suite in the southern Peninsular Ranges batholith, Baja California, México: *Revista Mexicana de Ciencias Geológicas*, v. 29, p. 1–23.
- Pérez-Segura, E., González-Partida, E., and Valencia, V.A., 2009, Late Cretaceous adakitic magmatism in east-central Sonora, Mexico, and its relation to Cu-Zn-Ni-Co skarns: *Revista Mexicana de Ciencias Geológicas*, v. 26, p. 411–427.
- Pérez-Segura, E., González-Partida, E., and Roldán-Quintana, J., 2013, Genetic implications of new Sr and Nd isotopic data of the intrusive rocks from the Laramide Arc in Northern Sonora, Mexico.: *Journal of Iberian Geology*, v. 39, doi: 10.5209/rev_JIGE.2013.v39.n1.41755.
- Peryam, T.C., Lawton, T.F., Amato, J.M., González-León, C.M., and Mauel, D.J., 2011, Lower Cretaceous strata of the Sonora Bisbee Basin: A record of the tectonomagmatic evolution of northwestern Mexico: *Geological Society of America Bulletin*, v. 124, p. 532–548.
- Pineda, G. and Calderón, M., 2008. Geología del área Monte Patria-El Maqui, Región de Coquimbo. Servicio Nacional de Geología y Minería, Carta Geológica de Chile, Serie de Geología Básica, 1:100.000, N° 116, 44 p.
- Polliand, M., Schaltegger, U., Frank, M., and Fontboté, L., 2005, Formation of intra-arc volcanosedimentary basins in the western flank of the central Peruvian Andes during Late Cretaceous oblique subduction: field evidence and constraints from U-Pb ages and Hf isotopes: *International Journal of Earth Sciences*, v. 94, p. 231–242, doi: 10.1007/s00531-005-0464-5.
- Poma, S., Zappettini, E.O., Quenardelle, S., Santos, J.O., Koukharsky, M., Belousova, E., and McNaughton, N.J., 2014, Geochemistry, U-Pb SHRIMP zircon dating and Hf isotopes of the Gondwanan magmatism in NW Argentina: petrogenesis and

- geodynamic implications: *Andean Geology*, v. 41, p. 267–292, doi: 10.5027/andgeoV41n2-a01.
- Poole, F.G., William, J.P., Jr, Madrid, R.J., and Amaya-Martínez, R., 2005, Tectonic synthesis of the Ouachita-Marathon-Sonora orogenic margin of southern Laurentia, in Anderson, T.H., Nourse, J.A., McKee, J.W., and Steiner, M.B., eds., *The Mojave-Sonora Megashear Hypothesis: Development, Assessment, and Alternatives*: Geological Society of America Special Papers, v. 393, p. 543–596.
- Premo, W.R. and Morton, D.M., 2014, SHRIMP-RG U-Pb ages of provenance and metamorphism from detrital zircon populations and Pb-Sr-Nd signatures of pre-batholithic metasedimentary rocks at Searl Ridge, north-central Peninsular Ranges batholith, southern California: Implications for their age, origin, and tectonic setting, in Morton, D.M. and Miller F., eds., *Contributions to the Geology of the Peninsular Ranges Batholith, southern California*. Geological Society of America Memoir 211, p. 449–498.
- Premo, W.R., Morton, D.M., and Fanning, C.M., 2014a, U-Pb zircon geochronology of Cretaceous tonalitic plutons in the northern Peninsular Ranges batholith, southern California: Implications for the timing of Late Cretaceous tectonic evolution of the southern California-Baja region, in Morton, D.M. and Miller F., eds., *Contributions to the Geology of the Peninsular Ranges Batholith, southern California*. Geological Society of America Memoir 211, p. 145–180.
- Premo, W.R., Morton, D.M., and Kistler, R.L., 2014b, Age and isotopic systematics of late Cretaceous samples from the greater Los Angeles region: Implications for the types of crust that underlie Los Angeles and their distribution along late Cenozoic fault systems, in Morton, D.M. and Miller F., eds., *Contributions to the Geology of the Peninsular Ranges Batholith, southern California*. Geological Society of America Memoir 211, p. 21–59.
- Ramos-Arias, M.A., and Keppie, J.D., 2011, U-Pb Neoproterozoic–Ordovician protolith age constraints for high- to medium-pressure rocks thrust over low-grade metamorphic rocks in the Ixcamilpa area, Acatlán Complex, southern Mexico: *Canadian Journal of Earth Sciences*, v. 48, p. 45–61.
- Ramos-Velázquez, E., Calmus, T., Valencia, V., Iriondo, A., Valencia-Moreno, M., and Bellon, H., 2008, U-Pb and 40Ar/39Ar geochronology of the coastal Sonora batholith: New insights on Laramide continental arc magmatism: *Revista Mexicana de Ciencias Geológicas*, v. 25, p. 314–333.
- Rapela, C.W., Pankhurst, R.J., Fanning, C.M., and Hervé, F., 2005, Pacific subduction coeval with the Karoo mantle plume: the Early Jurassic Subcordilleran belt of northwestern Patagonia, in Vaughan, A.P.M., and Pankhurst, R.J., eds., *Terrane Processes at the Margins of Gondwana*: Geological Society, London, Special Publications, v. 246, p. 217–239, doi: 10.1144/GSL.SP.2005.246.01.07.
- Ratschbacher, L., Franz, L., Min, M., Bachmann, R., Martens, U., Stanek, K., Stübner, K., Nelson, B.K., Herrmann, U., Weber, B., López-Martínez, M., Jonckheere, R., Sperner, B., Tichomirowa, M., et al., 2009, The North American-Caribbean plate boundary in Mexico-Guatemala-Honduras, in James, K.H., Lorente, M.A., and Pindell, J.L., eds., *The Origin and Evolution of the Caribbean Plate*, London,

- Geological Society of London, v. 328, p. 219–293.
- Ray, G.E., Brown, J.A., Friedman, R.M. and Cornelius, S.B., 1998, Geology of the Nifty Zn-Pb-Ba prospect, Bella Coola district, British Columbia: B.C. Ministry of energy, Mines and Petroleum Resources, Geological Fieldwork 1997, Paper 1998-1, p. 20–28.
- Restrepo, J.J., Ordóñez-Carmona, O., Armstrong, R., and Pimentel, M.M., 2011, Triassic metamorphism in the northern part of the Tahamí Terrane of the central cordillera of Colombia: *Journal of South American Earth Sciences*, v. 32, p. 497–507, doi: 10.1016/j.jsames.2011.04.009.
- Riel, N., Guillot, S., Jaillard, E., Martelat, J.E., Paquette, J.L., Schwartz, S., Goncalves, P., Duclaux, G., Thebaud, N., Lanari, P., Janots, E., and Yuquilema, J., 2013, Metamorphic and geochronological study of the Triassic El Oro metamorphic complex, Ecuador: Implications for high-temperature metamorphism in a forearc zone: *Lithos*, v. 156–159, p. 41–68, doi: 10.1016/j.lithos.2012.10.005.
- Riggs, N.R., Mattinson, J.M., and Busby, C.J., 1993, Correlation of Jurassic eolian strata between the magmatic arc and the Colorado Plateau: New U-Pb geochronologic data from southern Arizona: *Geological Society of America Bulletin*, v. 105, p. 1231–1246, doi: 10.1130/0016-7606(1993)105<1231.
- Rocha-Campos, A.C., Basei, M.A., Nutman, A.P., Kleiman, L.E., Varela, R., Llambias, E., Canile, F.M., and da Rosa, O. de C.R., 2011, 30 million years of Permian volcanism recorded in the Choiyoi igneous province (W Argentina) and their source for younger ash fall deposits in the Paraná Basin: SHRIMP U–Pb zircon geochronology evidence: *Gondwana Research*, v. 19, p. 509–523, doi: 10.1016/j.gr.2010.07.003.
- Rolando, A.P., Hartmann, L.A., Santos, J.O., Fernandez, R.R., Etcheverry, R.O., Schalamuk, I.A., and McNaughton, N.J., 2004, SHRIMP U-Pb zircon dates from igneous rocks from the Fontana Lake region, Patagonia: Implications for the age of magmatism, Mesozoic geological evolution and age of basement: *Revista de la Asociación Geológica Argentina*, v. 59, p. 671–684.
- Romero, D., Valencia, K., Alarcón, P., Peña, D., and Ramos, V.A., 2013, The offshore basement of Perú: Evidence for different igneous and metamorphic domains in the forearc: *Journal of South American Earth Sciences*, v. 42, p. 47–60, doi: 10.1016/j.jsames.2012.11.003.
- Rossel, P., Oliveros, V., Ducea, M.N., Charrier, R., Scaillet, S., Retamal, L., and Figueroa, O., 2013, The Early Andean subduction system as an analog to island arcs: Evidence from across-arc geochemical variations in northern Chile: *Lithos*, v. 179, p. 211–230, doi: 10.1016/j.lithos.2013.08.014.
- Rusmore, M.E., Woodsworth, G.J., and Gehrels, G.E., 2000, Structural history of the Sheemahant shear zone, southwest of Bella Coola, British Columbia, and implications for the Late Cretaceous evolution of the Coast orogen, in Stowell, H.H., and McClelland, W.C., eds., *Tectonics of the Coast Mountains, SE Alaska and Coastal British Columbia*: Geological Society of America Special Paper 343, p. 89–106.
- Rusmore, M.E., Gehrels, G.E., and Woodsworth, G.J., 2001, Southern continuation of the

- Coast shear zone and Paleocene strain partitioning in British Columbia–southeast Alaska: Geological Society of America Bulletin, v. 113, p. 961–975, doi: 10.1130/0016-7606(2001)113<0961:SCOTCS>2.0.CO;2.
- Rusmore, M.E., Woodsworth, G.J., and Gehrels, G.E., 2005, Two-stage exhumation of midcrustal arc rocks, Coast Mountains, British Columbia: Tectonics, v. 24, TC5013, doi: 10.1029/2004TC001750.
- Salazar, E., Arriagada, C., Mpodozis, M., Martínez, F., Peña, M., and Álvarez, J., 2009, Análisis estructural del Oroclino de Vallenar: primeros resultados. XII Congreso Geológico Chileno, Santiago, Chile, v. 3, p. S9-026.
- Saleeby, J.B., 2000, Geochronologic investigations along the Alexander-Taku terrane boundary, southern Revillagigedo Island to Cape Fox areas, southeast Alaska, in Stowell, H.H., and McClelland, W.C., eds., Tectonics of the Coast Mountains in SE Alaska and Coastal British Columbia: Geological Society of America Special Paper 343, p. 107–143.
- Schaltegger, U., Guex, J., Bartolini, A., Schoene, B., and Ovtcharova, M., 2008, Precise U-Pb age constraints for end-Triassic mass extinction, its correlation to volcanism and Hettangian post-extinction recovery: Earth and Planetary Science Letters, v. 267, p. 266–275, doi: 10.1016/j.epsl.2007.11.031.
- Schiuma, M., and Llambías, E.J., 2008, New ages and chemical analysis on Lower Jurassic volcanism close to the Huincul High, Neuquén. Revista de la Asociación Geológica Argentina. Simposio Jurásico de América del Sur, v. 63, p. 644–652.
- Schmidt, K.L., and Paterson, S.R., 2002, A doubly vergent fan structure in the Peninsular Ranges batholith: Transpression or local complex flow around a continental margin buttress?: Tectonics, v. 21, p. 1050, doi: 10.1029/2001TC001353.
- Schütte, P., Chiaradia, M., and Beate, B., 2010, Geodynamic controls on Tertiary arc magmatism in Ecuador: Constraints from U–Pb zircon geochronology of Oligocene–Miocene intrusions and regional age distribution trends: Tectonophysics, v. 489, p. 159–176, doi: 10.1016/j.tecto.2010.04.015.
- Sillitoe, R.H., and Mortensen, J.K., 2010, Longevity of porphyry copper formation at Quellaveco, Peru: Economic Geology, v. 105, p. 1157–1162.
- Snow, J.K., Asmeron, Y., and Lux, D.R., 1991, Permian-Triassic plutonism and tectonics, Death Valley region, California and Nevada: Geology, v. 19, p. 629–632.
- Solari, L.A., Dostal, J., Ortega-Gutiérrez, F., and Keppie, J.D., 2001, The 275 Ma arc-related La Carbonera stock in the northern Oaxacan Complex of southern Mexico: U-Pb geochronology and geochemistry: Revista Mexicana de Ciencias Geológicas, v. 18, p. 149–161.
- Solari, L.A., Torres de León, R., Hernández Pineda, G., Solé, J., Solís-Pichardo, G., and Hernández-Treviño, T., 2007, Tectonic significance of Cretaceous–Tertiary magmatic and structural evolution of the northern margin of the Xolapa Complex, Tierra Colorada area, southern Mexico: Geological Society of America Bulletin, v. 119, p. 1265–1279.
- Solari, L.A., Gómez-Tuena, A., Ortega-Gutiérrez, F., and Ortega-Obregón, C., 2011, The Chuacús Metamorphic Complex, central Guatemala: geochronological and

- geochemical constraints on its Paleozoic–Mesozoic evolution: *Geologica Acta*, v. 9, p. 1–21.
- Solari, L.A., Ortega-Gutiérrez, F., Elías-Herrera, M., Gómez-Tuena, A., and Schaaf, P., 2010, Refining the age of magmatism in the Altos Cuchumatanes, western Guatemala, by LA–ICPMS, and tectonic implications: *International Geology Review*, v. 52, p. 977–998.
- Söllner, F., Gerdes, A., Grosse, P., and Toselli, A.J., 2007, U–Pb age determinations by LA-ICP-MS on zircons of the Huaco granite, Sierra Velasco (NW-Argentina): A long-term history of melt activity within an igneous body: 20. Colloquium on Latin American Earth Sciences Abstract Volume, Kiel, Germany, p. 57.
- Spencer, J.E., Richard, S.M., Gehrels, G.E., Gleason, J.D., and Dickinson, W.R., 2011, Age and tectonic setting of the Mesozoic McCoy Mountains Formation in western Arizona, USA: *Geological Society of America Bulletin*, v. 123, p. 1258–1274, doi: 10.1130/B30206.1.
- Suárez, M., Demant, A., La Cruz, De, R., and Fanning, C.M., 2009, Relationship between volcanism and marine sedimentation in northern Austral (Aisén) Basin, central Patagonia: Stratigraphic, U–Pb SHRIMP and paleontologic evidence: *Journal of South American Earth Sciences*, v. 27, p. 309–325, doi: 10.1016/j.jsames.2008.11.009.
- Suárez, M., La Cruz, De, R., Aguirre-Urreta, B., and Fanning, M., 2010, $^{40}\text{Ar}/^{39}\text{Ar}$ and U–Pb SHRIMP dating of Aptian tuff cones in the Aisén Basin, Central Patagonian Cordillera: *Journal of South American Earth Sciences*, v. 29, p. 731–737, doi:10.1016/j.jsames.2009.11.003.
- Suárez, M., Márquez, M., La Cruz, De, R., Navarrete, C., and Fanning, M., 2014, Cenomanian-? early Turonian minimum age of the Chubut Group, Argentina: SHRIMP U–Pb geochronology: *Journal of South American Earth Sciences*, v. 50, p. 67–74, doi:10.1016/j.jsames.2013.10.008.
- Tornos, F., Velasco, F., Barra, F., and Morata, D., 2010, The Tropezón Cu–Mo–(Au) deposit, Northern Chile: the missing link between IOCG and porphyry copper systems?: *Mineralium Deposita*, v. 45, p. 313–321, doi: 10.1007/s00126-010-0277-8.
- Torres-de León, R., Solari, L.A., Ortega-Gutiérrez, F., and Martens, U., 2012, The Chortis Block–southwestern Mexico connections: U–Pb zircon geochronology constraints: *American Journal of Science*, v. 312, p. 288–313, doi: 10.2475/03.2012.02.
- Valencia, V.A., Barra, F., Weber, B., Ruiz, J., Gehrels, G., Chesley, J., and López-Martínez, M., 2006, Re–Os and U–Pb geochronology of the El Arco porphyry copper deposit, Baja California Mexico: Implications for the Jurassic tectonic setting: *Journal of South American Earth Sciences*, v. 22, p. 39–51, doi: 10.1016/j.jsames.2006.08.005.
- Valencia, V.A., Ducea, M., Talavera-Mendoza, O., Gehrels, G.E., Ruiz, J., and Shoemaker, S., 2009, U–Pb geochronology of granitoids in the north-western boundary of the Xolapa Terrane: *Revista Mexicana de Ciencias Geológicas*, v. 26, p. 189–200.

- Valencia, V.A., Righter, K., Rosas-Elguera, J., López-Martínez, M., and Grove, M., 2013, The age and composition of the pre-Cenozoic basement of the Jalisco Block: implications for and relation to the Guerrero composite terrane: Contributions to Mineralogy and Petrology, v. 166, p. 801–824, doi: 10.1007/s00410-013-0908-z.
- Vallejo, C., Spikings, R.A., Luzieux, L., Winkler, W., Chew, D., Page, L., 2006. The early interaction between the Caribbean Plateau and the NW South American Plate. *Terra Nova*, v. 18, p. 264–269.
- van der Heyden, P., 1989, U-Pb and K-Ar Geochronometry of the Coast Plutonic Complex, 53°N to 54°N, British Columbia, and Implications for the Insular-Intermontane Superterrane Boundary [Ph.D. dissertation]: Vancouver, University of British Columbia, 392 p.
- van der Heyden, P., 2004, Uranium-Lead and Potassium- Argon Ages from Eastern Bella Coola and Adjacent Parts of Anahim Lake and Mount Waddington Map Areas, West-Central British Columbia: Geological Survey of Canada Current Research 2004-A2, 14 p.
- Van der Lelij, R., 2013. Reconstructing North-Western Gondwana with implications for the evolution of the Iapetus and Rheic oceans: A geochronological, thermochronological and geochemical study [Ph.D. thesis]: University of Geneva, Switzerland, no. Sc. 4581, 221 p.
- Varela, R., Basei, M.A.S., Cingolani, C.A., Siga, O., Jr, and Passarelli, C.R., 2005, El basamento cristalino de los Andes norpatagónicos en Argentina: geocronología e interpretación tectónica: *Revista geológica de Chile*, v. 32, p. 167–187, doi: 10.4067/S0716-02082005000200001.
- Varela, A.N., Poiré, D.G., Martin, T., Gerdes, A., Goin, F.J., Gelfo, J.N., and Hoffmann, S., 2012, U-Pb zircon constraints on the age of the Cretaceous Mata Amarilla Formation, Southern Patagonia, Argentina: its relationship with the evolution of the Austral Basin: *Andean Geology*, v. 39, doi: 10.5027/andgeoV39n3-a01.
- Vásquez Illanes, P.S., 2008, Late Triassic to Early Jurassic Plutonism in south Chile (34°–37°S): Its significance for the geodynamic evolution in the transition from Gondwana to Andean orogeny [Ph.D. thesis]: Technische Universität Berlin, 160 p.
- Vega-Granillo, R., Salgado-Souto, S., Herrera-Urbina, S., Valencia, V., Ruiz, J., Meza-Figueroa, D., and Talavera-Mendoza, O., 2008, U-Pb detrital zircon data of the Rio Fuerte Formation (NW Mexico): Its peri-Gondwanan provenance and exotic nature in relation to southwestern North America: *Journal of South American Earth Sciences*, v. 26, p. 343–354, doi: 10.1016/j.jsames.2008.08.011.
- Vega-Granillo, R., Salgado-Souto, S., Herrera-Urbina, S., Valencia, V., and Vidal-Solano, J.R., 2011, Metamorphism and deformation in the El Fuerte region: their role in the tectonic evolution of NW Mexico: *Revista Mexicana de Ciencias Geológicas*, v. 28, p. 10–23.
- Vega-Granillo, R., Vidal-Solano, J.R., and Herrera-Urbina, S., 2012, Island arc tholeiites of Early Silurian, Late Jurassic and Late Cretaceous ages in the El Fuerte region, northwestern Mexico: *Revista Mexicana de Ciencias Geológicas*, v. 29, p. 492–513.
- Vega-Granillo, R., Vidal-Solano, J.R., Solari, L., López-Martínez, M., Gómez-Juárez,

- O.S., and Herrera-Urbina, S., 2013, Geochemical and geochronological constraints on the geologic evolution of the western Sonobari Complex, northwestern Mexico: *Geologica Acta*, v. 11, p. 443–463, doi: 10.1344/105.000002059.
- Vennari, V.V., Lescano, M., Naipauer, M., Aguirre-Urreta, B., Concheyro, A., Schaltegger, U., Armstrong, R., Pimentel, M., and Ramos, V.A., 2014, New constraints on the Jurassic–Cretaceous boundary in the High Andes using high-precision U–Pb data: *Gondwana Research*, v. 26, p. 374–385.
- Vidal, C., Paredes, J., Macfarlane, A., and Tosdal, R., 1995, Geología y metalogenia del distrito minero Parcoy, provincia aurífera de Pataz, La Libertad, in Volumen jubilar Alberto Benavides, Sociedad Geológica del Perú, p. 351–377.
- Villagómez, D., Spikings, R., Magna, T., Kammer, A., Winkler, W., and Beltrán, A., 2011, Geochronology, geochemistry and tectonic evolution of the Western and Central cordilleras of Colombia: *Lithos*, v. 125, p. 875–896, doi: 10.1016/j.lithos.2011.05.003.
- Vinasco, C.J., Cordani, U.G., González, H., Weber, M., and Pelaez, C., 2006, Geochronological, isotopic, and geochemical data from Permo-Triassic granitic gneisses and granitoids of the Colombian Central Andes: *Journal of South American Earth Sciences*, v. 21, p. 355–371.
- Viscarret, P., Wright, J., and Urbani, F., 2009, New U-Pb zircon ages of El Baúl Massif, Cojedes State, Venezuela: *Revisita Técnica de la Facultad de Ingeniería Universidad del Zulia*, v. 32, p. 210–221.
- Weber, B., Cameron, K.L., Osorio, M., and Schaaf, P., 2005, A Late Permian tectonothermal event in Grenville crust of the southern Maya Terrane: U-Pb zircon ages from the Chiapas Massif, southeastern Mexico: *International Geology Review*, v. 47, p. 509–529.
- Weber, B., Iriondo, A., Premo, W.R., Hecht, L., and Schaaf, P., 2007, New insights into the history and origin of the southern Maya block, SE México: U-Pb-SHRIMP zircon geochronology from metamorphic rocks of the Chiapas massif: *International Journal of Earth Sciences*, v. 96, p. 253–269.
- Weber, M., Cardona, A., Valencia, V., García-Casco, A., Tobón, M., and Zapata, S., 2010, U/Pb detrital zircon provenance from late cretaceous metamorphic units of the Guajira Peninsula, Colombia: Tectonic implications on the collision between the Caribbean arc and the South American margin: *Journal of South American Earth Sciences*, v. 29, p. 805–816.
- Willner, A.P., Gerdes, A., and Massonne, H.-J., 2008, History of crustal growth and recycling at the Pacific convergent margin of South America at latitudes 29°–36° S revealed by a U–Pb and Lu–Hf isotope study of detrital zircon from late Paleozoic accretionary systems: *Chemical Geology*, v. 253, p. 114–129, doi: 10.1016/j.chemgeo.2008.04.016.
- Winter, L.S., 2008, The genesis of ‘giant’ copper-zinc-gold-silver volcanogenic massive sulphide deposits at Tambogrande, Perú: age, tectonic setting, paleomorphology, lithogeochemistry and radiogenic isotopes [Ph.D. thesis]: University of British Columbia, Vancouver, 274 p.

- Witt, W.K., Hagemann, S.G., Villanes, C., and Zeng, Q., 2013, New geochronological results and structural evolution of the Pataz gold mining district: Implications for the timing and origin of the batholith-hosted veins: *Ore Geology Reviews*, v. 50, p. 143–170.
- Yañez, P., Patchett, P.J., Ortega-Gutiérrez, F., and Gehrels, G.E., 1991, Isotopic studies of the Acatlán Complex, southern Mexico: Implications for Paleozoic North American Tectonics: *Geological Society of America Bulletin*, v. 103, p. 817–828.
- Zavala-Monsiváis, A., Barboza-Gudiño, J.R., Valencia, V.A., Rodríguez-Hernández, S.E., and García-Arreola, M.E., 2009, Las sucesiones volcánicas pre-Cretácicas en el noreste de México: *GEOS Unión Geofísica Mexicana*, v. 29, p. 53.
- Zavala-Monsiváis, A., Barboza-Gudiño, J.R., Velasco-Tapia, F., and García-Arreola, M.E., 2012, Sucesión volcánica Jurásica en el área de Charcas, San Luis Potosí: Contribución al entendimiento del Arco Nazas en el noreste de México: *Boletín de la Sociedad Geológica Mexicana*, v. 64, p. 277–293.

Figure 1—Detrital zircon ages

- Alsleben, H., Wetmore, P.H., Gehrels, G.E., and Paterson, S.R., 2012, Detrital zircon ages in Palaeozoic and Mesozoic basement assemblages of the Peninsular Ranges batholith, Baja California, Mexico: constraints for depositional ages and provenance: *International Geology Review*, v. 54, p. 93–110.
- Álvarez, J., Mpodozis, C., Arriagada, C., Astini, R., Morata, D., Salazar, E., Valencia, V.A., and Vervoort, J.D., 2011, Journal of South American Earth Sciences: *Journal of South American Earth Sciences*, v. 32, p. 460–476, doi: 10.1016/j.jsames.2011.06.002.
- Augustsson, C., Münker, C., Bahlburg, H., and Fanning, C.M., 2006, Provenance of late Palaeozoic metasediments of the SW South American Gondwana margin: a combined U–Pb and Hf-isotope study of single detrital zircons: *Journal of the Geological Society*, v. 163, p. 983–995.
- Augustsson, C., Rüsing, T., Niemeyer, H., Kooijman, E., Berndt, J., Bahlburg, H., and Zimmermann, U., 2015, 0.3 byr of drainage stability along the Palaeozoic palaeo-Pacific Gondwana margin; a detrital zircon study: *Journal of the Geological Society*, v. 172, p. 186–200.
- Ayala, R.C., Bayona, G.A., Ojeda-Marulanda, C., Cardona, A., Valencia, V., Padrón, C.E., Yoris, F., Mesa-Salamanca, J., and García, A., 2009, Estratigrafía y procedencia de las unidades comprendidas entre el Campaniano y el Paleogeno en la subcuenca de Cesar: aportes a la evolución tectónica del área: *Geología Colombiana*, v. 34, p. 3–34.
- Ayala, R.C., Bayona, G., Cardona, A., Ojeda, C., Montenegro, O.C., Montes, C., Valencia, V., and Jaramillo, C., 2012, The paleogene synorogenic succession in the northwestern Maracaibo block: Tracking intraplate uplifts and changes in sediment delivery systems: *Journal of South American Earth Sciences*, v. 39, p. 93–111, doi: 10.1016/j.jsames.2012.04.005.

- Bahlburg, H., Vervoort, J.D., Frane, Du, S.A., Bock, B., Augustsson, C., and Reimann, C., 2009, Timing of crust formation and recycling in accretionary orogens: Insights learned from the western margin of South America: *Earth-Science Reviews*, v. 97, p. 215–241, doi: 10.1016/j.earscirev.2009.10.006.
- Bande, A., Horton, B.K., Ramirez, J.C., Mora, A., Parra, M., and Stockli, D.F., 2012, Clastic deposition, provenance, and sequence of Andean thrusting in the frontal Eastern Cordillera and Llanos foreland basin of Colombia: *Geological Society of America Bulletin*, v. 124, p. 59–76, doi: 10.1130/B30412.1.
- Barbeau, D.L., Jr., Ducea, M.N., Gehrels, G.E., Kidder, S., Wetmore, P.H., and Saleeby, J.B., 2005, U-Pb detrital-zircon geochronology of northern Salinian basement and cover rocks: *Geological Society of America Bulletin*, v. 117, p. 466–481, doi: 10.1130/B25496.1.
- Barbeau, D.L., Jr., Gombosi, D.J., Zahid, K.M., Bizimis, M., Swanson-Hysell, N., Valencia, V., and Gehrels, G.E., 2009a, U-Pb zircon constraints on the age and provenance of the Rocas Verdes basin fill, Tierra del Fuego, Argentina: *Geochemistry, Geophysics, Geosystems*, v. 10, Q12001, doi: 10.1029/2009GC002749.
- Barbeau, D.L., Jr., Olivero, E.B., Swanson-Hysell, N.L., Zahid, K.M., Murray, K.E., and Gehrels, G.E., 2009b, Detrital-zircon geochronology of the eastern Magallanes foreland basin: Implications for Eocene kinematics of the northern Scotia Arc and Drake Passage: *Earth and Planetary Science Letters*, v. 284, p. 489–503, doi: 10.1016/j.epsl.2009.05.014.
- Barboza-Gudiño, J.R., Zavala-Monsiváis, A., Venegas-Rodríguez, G., and Barajas-Nigoche, L.D., 2010, Late Triassic stratigraphy and facies from northeastern Mexico: Tectonic setting and provenance: *Geosphere*, v. 6, p. 621–640.
- Barboza-Gudiño, J.R., Molina-Garza, R.S., and Lawton, T.F., 2012, Sierra de Catorce: Remnants of the ancient western equatorial margin of Pangea in central Mexico, in Aranda-Gómez, J.J., Tolson, G., and Molina-Garza, R.S., eds., *The Southern Cordillera and beyond: Geological Society of America Field Guide 25*, p. 1–18.
- Boekhout, F., Sempere, T., Spikings, R., and Schaltegger, U., 2013, Late Paleozoic to Jurassic chronostratigraphy of coastal southern Peru: Temporal evolution of sedimentation along an active margin: *Journal of South American Earth Sciences*, v. 47, p. 179–200, doi: 10.1016/j.jsames.2013.07.003.
- Calderón, M., Fildani, A., Hervé, F., Fanning, C.M., Weislogel, A., and Cordani, U., 2007, Late Jurassic bimodal magmatism in the northern sea-floor remnant of the Rocas Verdes basin, southern Patagonian Andes: *Journal of the Geological Society, London*, v. 164, p. 1011–1022.
- Campos-Madrigal, E., Centeno-García, E., Mendoza-Rosales, C., and Silva-Romo, G., 2013, Sedimentología, reconstrucción paleoambiental y significado tectónico de las sucesiones clásticas del Jurásico Medio en el área de Texcalapa, Puebla - Huajuapan de León, Oaxaca: Revisión de las formaciones Ayuquila y Tecomazúchil: *Revista Mexicana de Ciencias Geológicas*, v. 30, p. 24–50.
- Cardona, A., Cordani, U.G., Ruiz, J., Valencia, V.A., Armstrong, R., Chew, D., Nutman,

- A., and Sánchez, A.W., 2009, U-Pb Zircon Geochronology and Nd Isotopic Signatures of the Pre-Mesozoic Metamorphic Basement of the Eastern Peruvian Andes: Growth and Provenance of a Late Neoproterozoic to Carboniferous Accretionary Orogen on the Northwest Margin of Gondwana: *The Journal of Geology*, v. 117, p. 285–305, doi: 10.1086/597472.
- Cardona, A., Valencia, V., Bustamante, C., García-Casco, A., Ojeda, G., Ruiz, J., Saldarriaga, M., and Weber, M., 2010a, Permian to Triassic I to S-type magmatic switch in the northeast Sierra Nevada de Santa Marta and adjacent regions, Colombian Caribbean: Tectonic setting and implications within Pangea paleogeography: *Journal of South American Earth Sciences*, v. 29, p. 784–804, doi: 10.1016/j.jsames.2009.08.012.
- Cardona, A., Valencia, V.A., Bayona, G., Duque, J., Ducea, M., Gehrels, G., Jaramillo, C., Montes, C., Ojeda, G., and Ruiz, J., 2010b, Early-subduction-related orogeny in the northern Andes: Turonian to Eocene magmatic and provenance record in the Santa Marta Massif and Rancheria Basin, northern Colombia: *Terra Nova*, v. 23, p. 26–34, doi: 10.1111/j.1365-3121.2010.00979.x.
- Cardona, A., Montes, C., Ayala, C., Bustamante, C., Hoyos, N., Montenegro, O., Ojeda, C., Niño, H., Ramírez, V., Valencia, V., Rincón, D., Vervoort, J., and Zapata, S., 2012, From arc-continent collision to continuous convergence, clues from Paleogene conglomerates along the southern Caribbean–South America plate boundary: *Tectonophysics*, v. 580, p. 58–87, doi: 10.1016/j.tecto.2012.08.039.
- Centeno-García, E., Busby, C., Busby, M., and Gehrels, G., 2011, Evolution of the Guerrero composite terrane along the Mexican margin, from extensional fringing arc to contractional continental arc: *Geological Society of America Bulletin*, v. 123, p. 1776–1797, doi: 10.1130/B30057.1.
- Chernicoff, C.J., Zappettini, E.O., Santos, J.O., McNaughton, N.J., and Belousova, E., 2013, Combined U-Pb SHRIMP and Hf isotope study of the Late Paleozoic Yaminué Complex, Rio Negro Province, Argentina: Implications for the origin and evolution of the Patagonia composite terrane: *Geoscience Frontiers*, v. 4, p. 37–56, doi: 10.1016/j.gsf.2012.06.003.
- Chew, D.M., Schaltegger, U., Košler, J., Whitehouse, M.J., Gutjahr, M., Spikings, R.A., and Misković, A., 2007, U-Pb geochronologic evidence for the evolution of the Gondwanan margin of the north-central Andes: *Geological Society of America Bulletin*, v. 119, p. 697–711, doi: 10.1130/B26080.1.
- Cochrane, R., 2013, U-Pb thermochronology, geochronology and geochemistry of NW South America: Rift to drift transition, active margin dynamics and implications for the volume balance of continents [Ph.D. thesis]: Geneva, Université de Genève, 209 p.
- Decou, A., Eynatten, von, H., Dunkl, I., Frei, D., and Wörner, G., 2013, Late Eocene to Early Miocene Andean uplift inferred from detrital zircon fission track and U-Pb dating of Cenozoic forearc sediments (15–18°S): *Journal of South American Earth Sciences*, v. 45, p. 6–23, doi: 10.1016/j.jsames.2013.02.003.
- Di Giulio, A., Ronchi, A., Sanfilippo, A., Tiepolo, M., Pimentel, M., and Ramos, V.A., 2012, Detrital zircon provenance from the Neuquén Basin (south-central Andes):

- Cretaceous geodynamic evolution and sedimentary response in a retroarc-foreland basin: *Geology*, doi: 10.1130/G33052.1.
- Dickinson, W.R., and Gehrels, G.E., 2008, Sediment delivery to the Cordilleran foreland basin: Insights from U-Pb ages of detrital zircons in Upper Jurassic and Cretaceous strata of the Colorado Plateau: *American Journal of Science*, v. 308, p. 1041–1082.
- Dumitru, T.A., Ernst, W.G., Wright, J.E., Wooden, J.L., Wells, R.E., Farmer, L.P., Kent, A.J., and Graham, S.A., 2013, Eocene extension in Idaho generated massive sediment floods into the Franciscan trench and into the Tyee, Great Valley, and Green River basins: *Geology*, v. 41, p. 187–190, doi: 10.2475/02.2012.03.
- Encinas, A., Stinnesbeck, W., and Valencia, V.A., 2014, First radiometric age (U-Pb, LA-ICP-MS, on detrital zircons) from the Punta Topocalma Formation: insights on Late Cretaceous marine deposition in central Chile: *Andean Geology*, v. 41, p. 436–445, doi: 10.5027/andgeoV41n2-a078.
- Escalona-Alcázar, F.D.J., Delgado-Argote, L.A., Weber, B., Núñez-Peña, E.P., Valencia, V.A., and Ortiz-Acevedo, O., 2009, Kinematics and U-Pb dating of detrital zircons from the Sierra de Zacatecas, Mexico: *Revista Mexicana de Ciencias Geológicas*, v. 26, p. 48–64.
- Fildani, A., Cope, T.D., Graham, S.A., and Wooden, J.L., 2003, Initiation of the Magallanes foreland basin: Timing of the southernmost Patagonian Andes orogeny revised by detrital zircon provenance analysis: *Geology*, v. 31, p. 1081–1084.
- Fletcher, J.M., Grove, M., Kimbrough, D., Lovera, O., and Gehrels, G.E., 2007, Ridge-trench interactions and the Neogene tectonic evolution of the Magdalena shelf and southern Gulf of California: Insights from detrital zircon U-Pb ages from the Magdalena fan and adjacent areas: *Geological Society of America Bulletin*, v. 119, p. 1313–1336, doi: 10.1130/B26067.1.
- Fuentes, F., DeCelles, P.G., Constenius, K.N., and Gehrels, G.E., 2011, Evolution of the Cordilleran foreland basin system in northwestern Montana, U.S.A.: *Geological Society of America Bulletin*, v. 123, p. 507–533, doi: 10.1130/B30204.1.
- Gehrels, G., and Pecha, M., 2014, Detrital zircon U-Pb geochronology and Hf isotope geochemistry of Paleozoic and Triassic passive margin strata of western North America: *Geosphere*, v. 10, p. 49–65, doi: 10.1130/GES00889.S3.
- Gehrels, G.E., and Stewart, J.H., 1998, Detrital zircon U-Pb geochronology of Cambrian to Triassic miogeoclinal and eugeoclinal strata of Sonora, Mexico: *Journal of Geophysical Research*, v. 103, p. 2471–2487.
- Gillis, R.J., Gehrels, G.E., Ruiz, J., and Gonzalez, L.A.F. de D., 2005, Detrital zircon provenance of Cambrian-Ordovician and Carboniferous strata of the Oaxaca terrane, southern Mexico: *Sedimentary Geology*, v. 182, p. 87–100.
- Godínez-Urban, A., Lawton, T.F., Molina-Garza, R.S., Iriondo, A., Weber, B., and López-Martínez, M., 2011, Jurassic volcanic and sedimentary rocks of the La Silla and Todos Santos Formations, Chiapas: Record of Nazas arc magmatism and rift-basin formation prior to opening of the Gulf of Mexico: *Geosphere*, v. 7, p. 121–144.
- González-León, C.M., Stanley, G.D.J., Gehrels, G.E., and Centeno-García, E., 2005, New data on the lithostratigraphy, detrital zircon and Nd isotope provenance, and

- paleogeographic setting of the El Antimonio Group, Sonora, Mexico, in Anderson, T.H., Nourse, J.A., McKee, J.W., and Steiner, M.B., eds., *The Mojave-Sonora Megashear Hypothesis: Development, Assessment, and Alternatives*, Geological Society of America Special Paper 393, p. 259–282.
- González-León, C.M., Valencia, V.A., Lawton, T.F., Amato, J.M., Gehrels, G.E., Leggett, W.J., Montijo-Contreras, O., and Fernández, M.A., 2009, The lower Mesozoic record of detrital zircon U-Pb geochronology of Sonora, México, and its paleogeographic implications: *Revista Mexicana de Ciencias Geológicas*, v. 26, p. 301–314.
- González-León, C.M., Solari, L., Solé, J., Ducea, M.N., Lawton, T.F., Bernal, J.P., Becuar, E.G., Gray, F., Martínez, M.L., and Santacruz, R.L., 2011, Stratigraphy, geochronology, and geochemistry of the Laramide magmatic arc in north-central Sonora, Mexico: *Geosphere*, v. 7, p. 1392–1418, doi: 10.1130/GES00679.S5.
- Grodzicki, K.R., Nance, R.D., Keppie, J.D., Dostal, J., and Murphy, J.B., 2008, Structural, geochemical and geochronological analysis of metasedimentary and metavolcanic rocks of the Coatlaco area, Acatlán Complex, southern Mexico: *Tectonophysics*, v. 461, p. 311–323.
- Helbig, M., Keppie, J.D., Murphy, J.B., and Solari, L.A., 2012, U-Pb geochronological constraints on the Triassic–Jurassic Ayú Complex, southern Mexico: Derivation from the western margin of Pangea-A: *Gondwana Research*, v. 22, p. 910–927.
- Hervé, F., Fanning, C.M., and Pankhurst, R.J., 2003, Detrital zircon age patterns and provenance of the metamorphic complexes of southern Chile: *Journal of South American Earth Sciences*, v. 16, p. 107–123, doi: 10.1016/S0895-9811(03)00022-1.
- Hervé, F., Calderón, M., Fanning, C.M., Pankhurst, R.J., and Godoy, E., 2013, Provenance variations in the Late Paleozoic accretionary complex of central Chile as indicated by detrital zircons: *Gondwana Research*, v. 23, p. 1122–1135, doi: 10.1016/j.gr.2012.06.016.
- Hinojosa-Prieto, H.R., Nance, R.D., Keppie, J.D., Dostal, J.V., Ortega-Rivera, A., and Lee, J.K.W., 2008, Ordovician and Late Paleozoic–Early Mesozoic tectonothermal history of the La Noria area, northern Acatlán Complex, southern Mexico: Record of convergence in the Rheic and paleo-Pacific Oceans: *Tectonophysics*, v. 461, p. 324–342, doi: 10.1016/j.tecto.2008.06.002.
- Horton, B., Parra, M., Saylor, J., Nie, J., Mora, A., Torres, V., Stockli, D., and Strecker, M., 2010a, Resolving uplift of the northern Andes using detrital zircon age signatures: *GSA Today*, v. 20, no. 7, p. 4–10, doi: 10.1130/GSATG76A.1.
- Horton, B.K., Saylor, J.E., Nie, J., Mora, A., Parra, M., Reyes-Harker, A., and Stockli, D.F., 2010b, Linking sedimentation in the northern Andes to basement configuration, Mesozoic extension, and Cenozoic shortening: Evidence from detrital zircon U-Pb ages, Eastern Cordillera, Colombia: *Geological Society of America Bulletin*, v. 122, p. 1423–1442, doi: 10.1130/B30118.1.
- Jacobson, C.E., Grove, M., Pedrick, J.N., Barth, A.P., Marsaglia, K.M., Gehrels, G.E., and Nourse, J.A., 2011, Late Cretaceous–early Cenozoic tectonic evolution of the southern California margin inferred from provenance of trench and forearc sediments: *Geological Society of America Bulletin*, v. 123, p. 485–506, doi:

- 10.1130/B30238.1.
- Keppie, J.D., Dostal, J., Miller, B.V., Ramos-Arias, M.A., Morales-Gámez, M., Nance, R.D., Murphy, J.B., Ortega-Rivera, A., Lee, J.K.W., Housh, T., and Cooper, P., 2008, Ordovician-earliest Silurian rift tholeiites in the Acatlán Complex, southern Mexico: Evidence of rifting on the southern margin of the Rheic Ocean: *Tectonophysics*, v. 461, p. 130–156.
- Kimbrough, D.L., Smith, D.P., Mahoney, J.B., Moore, T.E., Grove, M., Gastil, R.G., Ortega-Rivera, A., and Fanning, C.M., 2001, Forearc-basin sedimentary response to rapid Late Cretaceous batholith emplacement in the Peninsular Ranges of southern and Baja California: *Geology*, v. 29, p. 491–494.
- Kirsch, M., Keppie, J.D., Murphy, J.B., and Solari, L.A., 2012, Permian–Carboniferous arc magmatism and basin evolution along the western margin of Pangea: geochemical and geochronological evidence from the eastern Acatlán Complex, southern Mexico: *Geological Society of America Bulletin*, v. 124, p. 1607–1628.
- Laskowski, A.K., DeCelles, P.G., and Gehrels, G.E., 2013, Detrital zircon geochronology of Cordilleran retroarc foreland basin strata, western North America: *Tectonics*, v. 32, p. 1027–1048, doi: 10.1002/tect.20065.
- Lawton, T.F., and Bradford, B.A., 2011, Correlation and provenance of Upper Cretaceous (Campanian) fluvial strata, Utah, USA, from zircon U-Pb geochronology and petrography: *Journal of Sedimentary Research*, v. 81, p. 495–512, doi: 10.2110/jsr.2011.45.
- Lawton, T.F., and Molina Garza, R.S., 2014, U-Pb geochronology of the type Nazas Formation and superjacent strata, northeastern Durango, Mexico: Implications of a Jurassic age for continental-arc magmatism in north-central Mexico: *Geological Society of America Bulletin*, B30827.1, doi: 10.1130/B30827.1.
- Lawton, T.F., Bradford, I.A., Vega, F.J., Gehrels, G.E., and Amato, J.M., 2009, Provenance of Upper Cretaceous-Paleogene sandstones in the foreland basin system of the Sierra Madre Oriental, northeastern Mexico, and its bearing on fluvial dispersal systems of the Mexican Laramide Province: *Geological Society of America Bulletin*, v. 121, p. 820–836, doi: 10.1130/B26450.1.
- Lawton, T.F., Barboza-Gudiño, J.R., González-León, C.M., Gray, G.G., Iriondo, A., Leggett, W.J., Peryam, T.C., and Rubio-Cisneros, I.I., 2010, Latest Triassic-Middle Jurassic age of Cordilleran-Nazas arc in Mexico indicated by U-Pb detrital zircon and volcanic-rock ages: *Geological Society of America Abstracts with Programs*, v. 42, p. 345.
- Leier, A.L., and Gehrels, G.E., 2011, Continental-scale detrital zircon provenance signatures in Lower Cretaceous strata, western North America: *Geology*, v. 39, p. 399–402, doi: 10.1130/G31762.1.
- Leier, A.L., McQuarrie, N., Horton, B.K., and Gehrels, G.E., 2010, Upper Oligocene Conglomerates of the Altiplano, Central Andes: The Record of Deposition and Deformation Along the Margin of a Hinterland Basin: *Journal of Sedimentary Research*, v. 80, p. 750–762, doi: 10.2110/jsr.2010.064.
- Mantilla Figueroa, L.C., Bissig, T., Valencia, V., and Hart, C.J.R., 2013, The magmatic

- history of the Vetas-California mining district, Santander Massif, Eastern Cordillera, Colombia: *Journal of South American Earth Sciences*, v. 45, p. 235–249, doi: 10.1016/j.jsames.2013.03.006.
- Martini, M., Ferrari, L., López-Martínez, M., Cerca-Martínez, M., Valencia, V.A., and Serrano-Durán, L., 2009, Cretaceous–Eocene magmatism and Laramide deformation in southwestern Mexico: No role for terrane accretion, in Kay, S.M., Ramos, V.A., and Dickinson, W.R., eds., *Backbone of the Americas: Shallow subduction, plateau uplift, and ridge and terrane collision*, Geological Society of America Memoir 204, p. 151–182.
- Martini, M., Mori, L., Solari, L., and Centeno-García, E., 2011, Sandstone provenance of the Arperos Basin (Sierra de Guanajuato, central Mexico): Late Jurassic–Early Cretaceous back-Arc spreading as the foundation of the Guerrero Terrane: *The Journal of Geology*, v. 119, p. 597–617, doi: 10.1086/661989.
- Mauel, D.J., Lawton, T.F., González-León, C., Iriondo, A., and Amato, J.M., 2011, Stratigraphy and age of Upper Jurassic strata in north-central Sonora, Mexico: Southwestern Laurentian record of crustal extension and tectonic transition: *Geosphere*, v. 7, p. 390–414, doi: 10.1130/GES00600.1.
- Mendoza-Rosales, C.C., Centeno-García, E., Silva-Romo, G., Campos-Madrigal, E., and Bernal, J.P., 2010, Barremian rift-related turbidites and alkaline volcanism in southern Mexico and their role in the opening of the Gulf of Mexico: *Earth and Planetary Science Letters*, v. 295, p. 419–434.
- Michalak, M.J., 2013, Exhumation of the Peruvian Andes—insights from mineral chronometers [Ph.D. thesis]: Los Angeles, University of California, 176 p.
- Morales-Gámez, M., Keppie, J.D., and Norman, M.D., 2008, Ordovician-Silurian rift-passive margin on the Mexican margin of the Rheic Ocean overlain by Carboniferous-Permian periarc rocks: Evidence from the eastern Acatlán Complex, southern Mexico: *Tectonophysics*, v. 461, p. 291–310.
- Morgan, J.R., Kimbrough, D.L., and Grove, M., 2005, Detrital U/Pb zircon ages from the Peninsular Ranges Mesozoic flysch belt of southern and Baja California, in Gonzalez-Yajimovich, O.E., ed., *VII International Meeting on the Geology of the Baja California Peninsula: Ensenada, Baja California, Mexico, Abstracts with Programs*, p. 4.
- Naipauer, M., Morabito, E.G., Marques, J.C., Tunik, M., Vera, E.A.R., Vujovich, G.I., Pimentel, M.P., and Ramos, V.A., 2012, Intraplate Late Jurassic deformation and exhumation in western central Argentina: Constraints from surface data and U–Pb detrital zircon ages: *Tectonophysics*, v. 524–525, p. 59–75, doi: 10.1016/j.tecto.2011.12.017.
- Naipauer, M., Tunik, M., Marques, J.C., Rojas Vera, E.A., Vujovich, G.I., Pimentel, M.M., and Ramos, V.A., 2014, U-Pb detrital zircon ages of Upper Jurassic continental successions: implications for the provenance and absolute age of the Jurassic-Cretaceous boundary in the Neuquén Basin, in Sepúlveda, S. A., Giambiagi, L. B., Moreiras, S. M., Pinto, L., Tunik, M., Hoke, G. D., and Farías, M., eds., *Geodynamic Processes in the Andes of Central Chile and Argentina: Geological Society, London, Special Publications* 399, doi: 10.1144/SP399.1.

- Nie, J., Horton, B.K., Mora, A., Saylor, J.E., Housh, T.B., Rubiano, J., and Naranjo, J., 2010, Tracking exhumation of Andean ranges bounding the Middle Magdalena Valley Basin, Colombia: *Geology*, v. 38, p. 451–454, doi: 10.1130/G30775.1.
- Nie, J., Horton, B.K., Saylor, J.E., Mora, A., Mange, M., Garzzone, C.N., Basu, A., Moreno, C.J., Caballero, V., and Parra, M., 2012, Integrated provenance analysis of a convergent retroarc foreland system: U–Pb ages, heavy minerals, Nd isotopes, and sandstone compositions of the Middle Magdalena Valley basin, northern Andes, Colombia: *Earth-Science Reviews*, v. 110, p. 111–126, doi: 10.1016/j.earscirev.2011.11.002.
- Ocampo-Díaz, Y.Z.E., Talavera-Mendoza, O., Jenchen, U., Valencia, V.A., Medina-Ferrusquia, H.C., and Guerrero-Suastegui, M., 2014, Procedencia de la Formación La Casita y la Arcosa Patula: implicaciones para la evolución tectono-magmática del NE de México entreel Carbonífero y el Jurásico: *Revista Mexicana de Ciencias Geológicas*, v. 31, p. 45–63.
- Oliveros, V., Labbé, M., Rossel, P., Charrier, R., and Encinas, A., 2012, Late Jurassic paleogeographic evolution of the Andean back-arc basin: New constrains from the Lagunillas Formation, northern Chile (27°30'–28°30'S): *Journal of South American Earth Sciences*, v. 37, p. 25–40, doi: 10.1016/j.jsames.2011.12.005.
- Ortega-Flores, B., Solari, L., Lawton, T.F., and Ortega-Obregón, C., 2014, Detrital-zircon record of major Middle Triassic–Early Cretaceous provenance shift, central Mexico: demise of Gondwanan continental fluvial systems and onset of back-arc volcanism and sedimentation: *International Geology Review*, v. 56, p. 237–261, doi: 10.1080/00206814.2013.844313.
- Ortega-Obregón, C., Keppie, J.D., Murphy, J.B., Lee, J.K.W., and Ortega-Rivera, A., 2009, Geology and geochronology of Paleozoic rocks in western Acatlán Complex, southern Mexico: Evidence for contiguity across an extruded high-pressure belt and constraints on Paleozoic reconstructions: *Geological Society of America Bulletin*, v. 121, p. 1678–1694.
- Palacios-García, N.B., and Martini, M., 2014, From back-arc rifting to arc accretion: the Late Jurassic–Early Cretaceous evolution of the Guerrero terrane recorded by a major provenance change in sandstones from the Sierra de los Cuarzos area, central Mexico: *International Geology Review*, v. 56, p. 1377–1394, doi: 10.1080/00206814.2014.938367.
- Pérez-Gutiérrez, R., Solari, L.A., Gómez-Tuena, A., and Valencia, V.A., 2009, El terreno Cuicateco: ¿cuenca oceánica con influencia de subducción del Cretácico Superior en el sur de México? Nuevos datos estructurales, geoquímicos y geocronológicos: *Revista Mexicana de Ciencias Geológicas*, v. 26, p. 222–242.
- Peryam, T.C., Lawton, T.F., Amato, J.M., González-León, C.M., and Mauel, D.J., 2011, Lower Cretaceous strata of the Sonora Bisbee Basin: A record of the tectonomagmatic evolution of northwestern Mexico: *Geological Society of America Bulletin*, v. 124, p. 532–548.
- Pompa-Mera, V., Schaaf, P., Hernández-Treviño, T., Weber, B., Solís-Pichardo, G., Villanueva-Lascurain, D., and Layer, P., 2013, Geology, geochronology, and geochemistry of Isla María Madre, Nayarit, Mexico: *Revista Mexicana de Ciencias*

- Geológicas, v. 30, p. 1–23.
- Premo, W.R., and Morton, D.M., 2014, SHRIMP-RG U-Pb ages of provenance and metamorphism from detrital zircon populations and Pb-Sr-Nd signatures of pre-batholithic metasedimentary rocks at Searl Ridge, north-central Peninsular Ranges batholith, southern California: Implications for their age, origin, and tectonic setting, in Morton, D.M., and Miller F., eds., Contributions to the Geology of the Peninsular Ranges Batholith, southern California: Geological Society of America Memoir 211, p. 449–498.
- Raines, M. K., S. M. Hubbard, R. B. Kukulski, A. L. Leier, and G. E. Gehrels, 2013, Sediment dispersal in an evolving foreland: Detrital zircon geochronology from Upper Jurassic and lowermost Cretaceous strata, Alberta Basin, Canada: Geological Society of America Bulletin, v. 125, B30671.1, doi:10.1130/B30671.1.
- Ramos-Arias, M.A., and Keppie, J.D., 2011, U-Pb Neoproterozoic–Ordovician protolith age constraints for high- to medium-pressure rocks thrust over low-grade metamorphic rocks in the Ixcamilpa area, Acatlán Complex, southern Mexico: Canadian Journal of Earth Sciences, v. 48, p. 45–61.
- Reimann, C.R., Bahlburg, H., Kooijman, E., Berndt, J., Gerdes, A., Carlotto, V., and López, S., 2010, Geodynamic evolution of the early Paleozoic Western Gondwana margin 14°–17°S reflected by the detritus of the Devonian and Ordovician basins of southern Peru and northern Bolivia: Gondwana Research, v. 18, p. 370–384, doi: 10.1016/j.gr.2010.02.002.
- Reitsma, M.J., 2012, Reconstructing the Late Paleozoic - Early Mesozoic plutonic and sedimentary record of south-east Peru: Orphaned back-arcs along the western margin of Gondwana [Ph.D. thesis]: Geneva, Université de Genève, 246 p.
- Riggs, N.R., Barth, A.P., González-León, C.M., Jacobson, C.E., Wooden, J.L., Howell, E.R., and Walker, J.D., 2012, Provenance of Upper Triassic strata in south- western North America as suggested by isotopic analysis and chemistry of zircon crystals, in Rasbury, E.T., Hemming, S.R., and Riggs, N.R., eds., Mineralogical and Geochemical Approaches to Provenance: Geological Society of America Special Paper 487, p. 13–36, doi:10.1130/2012.2487(02).
- Riggs, N.R., Reynolds, S.J., Lindner, P.J., Howell, E.R., Barth, A.P., Parker, W.G., and Walker, J.D., 2013, The Early Mesozoic Cordilleran arc and Late Triassic paleotopography: The detrital record in Upper Triassic sedimentary successions on and off the Colorado Plateau: Geosphere, v. 9, p. 602–613, doi: 10.1016/j.crte.2013.03.004.
- Rubio-Cisneros, I.I., and Lawton, T.F., 2011, Detrital zircon U-Pb ages of sandstones in continental red beds at Valle de Huizachal, Tamaulipas, NE Mexico: Record of Early-Middle Jurassic arc volcanism and transition to crustal extension: Geosphere, v. 7, p. 159–170.
- Sagripanti, L., Bottesi, G., Naipauer, M., Folguera, A., and Ramos, V.A., 2011, U/Pb ages on detrital zircons in the southern central Andes Neogene foreland (36°–37°S): Constraints on Andean exhumation: Journal of South American Earth Sciences, v. 32, p. 555–566, doi: 10.1016/j.jsames.2011.03.010.
- Saylor, J.E., Horton, B.K., Nie, J., Corredor, J., and Mora, A., 2011, Evaluating foreland

- basin partitioning in the northern Andes using Cenozoic fill of the Floresta basin, Eastern Cordillera, Colombia: *Basin Research*, v. 23, p. 377–402, doi: 10.1111/j.1365-2117.2010.00493.x.
- Saylor, J.E., Stockli, D.F., Horton, B.K., Nie, J., and Mora, A., 2012, Discriminating rapid exhumation from syndepositional volcanism using detrital zircon double dating: Implications for the tectonic history of the Eastern Cordillera, Colombia: *Geological Society of America Bulletin*, v. 124, p. 762–779, doi: 10.1130/B30534.1.
- Sepúlveda, F.A., Palma-Heldt, S., Hervé, F., and Fanning, C.M., 2010, Permian depositional age of metaturbidites of the Duque de York Complex, southern Chile: U-Pb SHRIMP data and palynology: *Andean Geology*, v. 37, p. 375–397.
- Sharman, G.R., Graham, S.A., Grove, M., and Hourigan, J.K., 2013, A reappraisal of the early slip history of the San Andreas fault, central California, USA: *Geology*, v. 41, p. 727–730, doi: 10.1130/G34214.1.
- Sharman, G.R., Graham, S.A., Grove, M., Kimbrough, D.L., and Wright, J.E., 2014, Detrital zircon provenance of the Late Cretaceous-Eocene California forearc: Influence of Laramide low-angle subduction on sediment dispersal and paleogeography: *Geological Society of America Bulletin*, B31065.1, doi: 10.1130/B31065.1.
- Silva-Romo, G., Mendoza-Rosales, C.C., Campos-Madrigal, E., Centeno-García, E., and Peralta-Salazar, R., 2015, Early Mesozoic Southern Mexico–Amazonian connection based on U–Pb ages from detrital zircons: The La Mora Paleo-River in the Mixteca Terrane and its paleogeographic and tectonic implications: *Gondwana Research*, v. 28, no. 2, p. 689–701, doi: 10.1016/j.gr.2014.06.005.
- Solari, L.A., Ortega-Gutiérrez, F., Elías-Herrera, M., Gómez-Tuena, A., and Schaaf, P., 2010, Refining the age of magmatism in the Altos Cuchumatanes, western Guatemala, by LA–ICPMS, and tectonic implications: *International Geology Review*, v. 52, p. 977–998.
- Spencer, J.E., Richard, S.M., Gehrels, G.E., Gleason, J.D., and Dickinson, W.R., 2011, Age and tectonic setting of the Mesozoic McCoy Mountains Formation in western Arizona, USA: *Geological Society of America Bulletin*, v. 123, p. 1258–1274, doi: 10.1130/B30206.1.
- Surpless, K.D., and Beverly, E.J., 2013, Understanding a critical basinal link in Cretaceous Cordilleran paleogeography: Detailed provenance of the Hornbrook Formation, Oregon and California: *Geological Society of America Bulletin*, v. 125, p. 709–727, doi: 10.1130/B30690.1.
- Talavera-Mendoza, O., Ruiz, J., Gehrels, G.E., Valencia, V.A., and Centeno-García, E., 2007, Detrital zircon U/Pb geochronology of southern Guerrero and western Mixteca arc successions (southern Mexico): New insights for the tectonic evolution of southwestern North America during the late Mesozoic: *Geological Society of America Bulletin*, v. 119, p. 1052–1065.
- Talavera-Mendoza, O., Ruiz, J., Corona-Chavez, P., Gehrels, G.E., Sarmiento-Villagrana, A., García-Díaz, J.L., and Salgado-Souto, S.A., 2013, Origin and provenance of basement metasedimentary rocks from the Xolapa Complex: New constraints on the Chortis–southern Mexico connection: *Earth and Planetary Science Letters*, v. 369–

- 370, p. 188–199.
- Torres-de León, R., Solari, L.A., Ortega-Gutiérrez, F., and Martens, U., 2012, The Chortis Block--southwestern Mexico connections: U-Pb zircon geochronology constraints: *American Journal of Science*, v. 312, p. 288–313, doi: 10.2475/03.2012.02.
- Tunik, M., Folguera, A., Naipauer, M., Pimentel, M. M., and Ramos, V. A., 2010, Early uplift and orogenic deformation in the Neuquén Basin: constraints on the Andean uplift from U–Pb and Hf isotopic data of detrital zircons: *Tectonophysics*, v. 489, p. 258–273.
- Valencia, V.A., Righter, K., Rosas-Elguera, J., López-Martínez, M., and Grove, M., 2013, The age and composition of the pre-Cenozoic basement of the Jalisco Block: implications for and relation to the Guerrero composite terrane: *Contributions to Mineralogy and Petrology*, v. 166, p. 801–824, doi: 10.1007/s00410-013-0908-z.
- Venegas-Rodríguez, G., Barboza-Gudiño, J.R., and López-Doncel, R.A., 2009, Geocronología de circones detriticos en capas del Jurásico Inferior de las áreas de la Sierra de Catorce y El Alamito en el estado de San Luis Potosí: *Revista Mexicana de Ciencias Geológicas*, v. 26, p. 466–481.
- Weber, M., Cardona, A., Valencia, V., García-Casco, A., Tobón, M., and Zapata, S., 2010, U/Pb detrital zircon provenance from late cretaceous metamorphic units of the Guajira Peninsula, Colombia: Tectonic implications on the collision between the Caribbean arc and the South American margin: *Journal of South American Earth Sciences*, v. 29, p. 805–816.
- Willner, A.P., Gerdes, A., and Massonne, H.-J., 2008, History of crustal growth and recycling at the Pacific convergent margin of South America at latitudes 29°–36° S revealed by a U–Pb and Lu–Hf isotope study of detrital zircon from late Paleozoic accretionary systems: *Chemical Geology*, v. 253, p. 114–129, doi: 10.1016/j.chemgeo.2008.04.016.
- Witt, C., Brichau, S., and Carter, A., 2012, New constraints on the origin of the Sierra Madre de Chiapas (south Mexico) from sediment provenance and apatite thermochronometry: *Tectonics*, v. 31, TC6001, doi: 10.1029/2012TC003141.
- Xie, X., Mann, P., and Escalona, A., 2010, Regional provenance study of Eocene clastic sedimentary rocks within the South America–Caribbean plate boundary zone using detrital zircon geochronology: *Earth and Planetary Science Letters*, v. 291, p. 159–171, doi: 10.1016/j.epsl.2010.01.009.
- Zapata, S., Weber, M., Cardona, A., Valencia, V., Guzmán, G., and Tobón, M., 2010, Provenance of Oligocene conglomerates and associated sandstones from the Siamaná Formation, Serranía de Jarara, Guajira, Colombia: implications for Oligocene Caribbean-South American tectonics: *Geología Colombiana*, v. 27, p. 7–24.

Figure 3—Geochemistry

Allen, C.M., 1989, Petrogenesis of the reversely zoned Turtle pluton, southeastern California [Ph.D. thesis]: Virginia Polytechnic Institute and State University,

- Blacksburg, Virginia, 374 p.
- Allen, E.F., 2007, Crustal contamination effects in central San Bernardino Mountains intrusives, CA [M.Sc. thesis]: Loma Linda University, 131 p.
- Anderson, J.L., and M.C. Rowley, 1981, Synkinematic intrusion of peraluminous and associated metaluminous granitic magmas, Whipple Mountains, California: Canadian Mineralogist, v. 19, p. 83–101.
- Barth, A.P., 1989, Mesozoic rock units in the upper plate of the Vincent Thrust Fault, San Gabriel Mountains, Southern California [Ph.D. thesis]: University of Southern California, 379 p.
- Barth, A.P., 1990, Mid-crustal emplacement of Mesozoic plutons, San Gabriel Mountains, California, and implications for geologic history of the San Gabriel terrane, in Anderson, J.L., ed., The nature and origin of Cordilleran magmatism: Geological Society of America Memoir 174, p. 33–45.
- Barth, A.P., Tosdal, R.M., and Wooden, J.L., 1990, A petrologic comparison of Triassic plutonism in the San Gabriel and Mule Mountains, Southern California: Journal of Geophysical Research, v. 95, p. 20075–20096.
- Barth, A.P., Wooden, J.L., Howard, K.A., and Richards, J.L., 2008, Late Jurassic plutonism in the southwest U.S. Cordillera, in Wright, J.E., and Shervais, J.W., eds., Ophiolites, Arcs, and Batholiths: A Tribute to Cliff Hopson: Geological Society of America Special Paper 438, p. 379–396, doi: 10.1130/2008.2438(13).
- Bateman, P.C., and Chappell, B.W., 1979, Crystallization, fractionation, and solidification of the Tuolumne Intrusive Series, Yosemite National Park, California: Geological Society of America Bulletin, v. 90, p. 465–482, doi: 10.1130/0016-7606(1979)90<465.
- Bateman, P.C., Chappell, B.W., Kistler, R.W., Peck, D.L., and Busacca, A.J., 1988, Tuolumne Meadows Quadrangle, California; analytic data: U.S. Geological Survey Bulletin, 1819, 43 p.
- Beckerman, G.M., 1982, Petrology of the southern portion of the Teutonia Batholith: A large intrusive complex of Jurassic and Cretaceous age in the eastern Mojave Desert [M.Sc. thesis], University of Southern California, 223 p.
- Beckerman, G.M., Robinson, J.P., and Anderson, J.L., 1982, The Teutonia batholith: A large intrusive complex of Jurassic and Cretaceous age in the eastern Mojave Desert, California, in Frost, E.G., and Martin, D.L., eds., Mesozoic-Cenozoic tectonic evolution of the Colorado River region, California, Arizona, and Nevada: San Diego, California, Cordilleran Publishers, p. 205–220.
- Brand, J.H., 1985, Mesozoic alkalic quartz monzonite and peraluminous ponzogranites of the northern portion of the Joshua Tree National Monument, southern California [M.Sc. thesis], University of Southern California, 187 p.
- Burgess, S.D., 2006, Field, geochemical, and geochronologic study of the inner Tuolumne Intrusive Series [M.Sc. thesis], San Jose State University, Paper 2871, 157 p.
- Centeno-García, E., 1994, Tectonic evolution of the Guerrero terrane, western Mexico [Ph.D. thesis]: Tucson, University of Arizona, 224 p.

- Centeno-García, E., and Silva-Romo, G., 1997, Petrogenesis and tectonic evolution of central Mexico during Triassic-Jurassic time: *Revista Mexicana de Ciencias Geológicas*, v. 14, p. 244–260.
- Centeno-García, E., Ruiz, J., Coney, P.J., Patchett, P.J., and Ortega-Gutiérrez, F., 1993, Guerrero terrane of Mexico: Its role in the Southern, Cordillera from new geochemical data: *Geology*, v. 21, p. 419–422.
- Chen, J. H., and Moore, J. G., 1982, Uranium-lead isotopic ages from the Sierra Nevada batholith, California: *Journal of Geophysical Research*, v. 87, p. 4761–4784.
- Chen, J. H., and Tilton, G. R., 1991, Applications of lead and strontium isotopic relationships to the petrogenesis of granitoid rocks, central Sierra Nevada batholith, California: *Geological Society of America Bulletin*, v. 103, p. 439–447.
- Coleman, D.S., Bartley, J.M., Glazner, A.F., and Pardue, M.J., 2012, Is chemical zonation in plutonic rocks driven by changes in source magma composition or shallow-crustal differentiation?: *Geosphere*, v. 8, p. 1568–1587, doi: 10.1130/GES00798.1.
- DePaolo, D.J., 1981, A neodymium and strontium isotopic study of the Mesozoic calc-alkaline granitic batholiths of the Sierra Nevada and Peninsular Ranges, California: *Journal of Geophysical Research*, v. 86, no. B11, p. 10470–10488.
- Economos, R.C., Hanzl, P., Hrdlicková, K., Buriánek, D., Said, L.-O., Gerdes, A., and Peterson, S.R., 2008, Geochemical and structural constraints on the magmatic history of the Chandman Massif of the eastern Mongolian Altay Range, SW Mongolia: *Journal of Geosciences*, v. 53, p. 33–352.
- Economos, R.C., Memeti, V., Paterson, S.R., Miller, J.S., Erdmann, S., and Zak, J., 2010, Causes of compositional diversity in a lobe of the Half Dome granodiorite, Tuolumne Batholith, Central Sierra Nevada, California: *Earth and Environmental Science Transactions of the Royal Society of Edinburgh*, v. 100, p. 173–183, doi: 10.1017/S1755691009016065.
- Elías-Herrera, M., 2003, The real Guerrero Terrane, southern Mexico: new insights from recent studies: *Geological Society of America Abstract with Programs*, paper no. 27-5.
- Elías-Herrera, M., Ortega-Gutiérrez, F., Sánchez-Zavala, J.L., Macías-Romo, C., Ortega-Rivera, A., and Iriondo, A., 2005, La falla de Caltepec: raíces expuestas de una frontera tectónica de larga vida entre dos terrenos continentales del sur de México: *Boletín de la Sociedad Geológica Mexicana*, v. 57, p. 83–109.
- Fox, L.K., and Miller, D.M., 1990, Jurassic granitoids and related rocks of the southern Bristol Mountains, southern Providence Mountains, and Colton Hills, Mojave Desert, California, in Anderson, J.L., ed., *The nature and origin of Cordilleran magmatism: Geological Society of America Memoir 174*, p. 111–132.
- Freydier, C., Lapierre, H., Briqueu, L., Tardy, M., Coulon, C., and Martinez-Reyes, J., 1996a, Volcaniclastic sequences with continental affinities within the Late Jurassic–Early Cretaceous Guerrero intra-oceanic arc (western Mexico): *Journal of Geology*, v. 105, p. 483–502.
- Freydier, C., Martinez, J.R., Lapierre, H., Tardy, M., and Coulon, C., 1996b, The Early

- Cretaceous Arperos oceanic basin (western Mexico). Geochemical evidence for an aseismic ridge formed near a spreading center: *Tectonophysics*, v. 259, p. 343–367.
- Frizzell, V.A., Mattinson, J.M., and Matti, J.C., 1986, Distinctive Triassic megaporphyritic monzogranite: Evidence for only 160 km offset along the San Andreas Fault, southern California: *Journal of Geophysical Research: Solid Earth*, v. 91, p. 14080–14088, doi: 10.1029/JB091iB14p14080.
- Frost, T.P., 1986, The Lamarck Granodiorite, Sierra Nevada, California: Fractionation and Interaction of Mafic and Felsic Magmas [Ph.D. thesis]: Stanford University, 426 p.
- Glazner, A. F., et al. (2008). Chemical variability and the composite nature of dikes from the Jurassic Independence dike swarm, eastern California. IN: *Ophiolites, arcs, and batholiths: a tribute to Cliff Hopson*. J. E. Wright and J. W. Shervais, eds. GSA Special Paper 438: 455–480.
- Herzig, C. T. (1991). Petrogenetic and tectonic development of the Santiago Peak Volcanics, northern Santa Ana Mountains, California. PhD thesis: Riverside, University of California: 376p.
- Hill, R. I., et al. (1988). "San Jacinto intrusive complex: 2. geochemistry." *Journal of Geophysical Research* 93(B9): 10349–10372.
- Hill, R. I. and L. T. Silver (1988). "San Jacinto intrusive complex: 3. constraints on crustal magma chamber processes from strontium isotope heterogeneity." *Journal of Geophysical Research* 93(B9): 10373–10388.
- Kistler, R. W. and D. E. Lee (1989). Rubidium, strontium, and strontium isotopic data for a suite of granitoid rocks from the Basin and Range province, Arizona, California, Nevada, and Utah. USGS Open-File Report 89-199.
- Kistler, R. W., et al. (2014). Pb-Sr-Nd-O isotopic characterization of Mesozoic rocks throughout the northern end of the Peninsular Ranges batholith: Isotopic evidence for the magmatic evolution of oceanic arc-continental margin accretion during the Late Cretaceous of southern California. IN: *Peninsular Ranges batholith, Baja California and southern California*. D. M. Morton and F. K. Miller, eds. GSA Memoir 211: 263–316.
- Miller, C. F. (1977). "Early alkalic plutonism in the calc-alkalic batholithic belt of California." *Geology* 5: 685–688.
- Miller, J. S. and A. F. Glazner (1995). "Jurassic plutonism and crustal evolution in the central Mojave Desert, California." *Contributions to Mineralogy and Petrology* 118: 379–395.
- Miller, D. M. and C. J. Busby, eds. (1995). *Jurassic magmatism and tectonics of the North American cordillera*. Geological Society of America Special Paper 299.
- Morton, D. M. and F. K. Miller, eds. (2014). *Peninsular Ranges batholith, Baja California and southern California*. Geological Society of America Memoir 211.
- Rämö, O. T., et al. (2002). "Geochemistry of Mesozoic plutons, southern Death Valley region, California: Insights into the origin of Cordilleran interior magmatism." *Contributions to Mineralogy and Petrology* 143: 416–437.

Young, E. D., et al. (1992). "Geochemical evolution of Jurassic diorites from the Bristol Lake region, California, USA, and the role of assimilation." Contributions to Mineralogy and Petrology 110: 68-86.