

Jay Quade

Date of Birth: December 13, 1955

Marital Status: married, three children

U.S Citizen

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Education

- 1978 B.S. Geology University of New Mexico
- 1978 Field Camp, Indiana University, Cardwell, Montana; T.A. the following summer
- 1982 M.S. Geology University of Arizona. Thesis topic: Late Quaternary stratigraphy and ground-water discharge history of fine-grained basin deposits in the Las Vegas Valley, Nevada.
- 1990 Ph.D. Geochemistry. University of Utah Thesis topic: Stable carbon and oxygen isotopic composition of modern and ancient soil carbonate as ecologic and paleoclimatic indicators.
- 1991 Post-doctoral fellowship at Australian National University, Canberra. Strontium and carbon isotope tracers and soil carbonates in Australia.

Professional experience

- 1977 Geologist. Utah International, Inc., Mineral Exploration Division, Oregon.
- 1982 Geologist. Phillips Petroleum, Mineral Exploration Division, Alaska.
- 1982-1984 Geologist. Noranda Exploration, Inc., Minerals Division, Nevada.
- 1984-1986 Geologist. Desert Research Institute, Nevada.
- 1986-1989 Geologist. Mifflin and Associates, Inc., Nevada.
- 1992-1998 Assistant Professor and Director of the Desert Laboratory, Tumamoc Hill
- 1998-2002 Associate Professor, University of Arizona
- 2003- Professor, University of Arizona

Fieldwork: *Tertiary -Quaternary stratigraphy:* Nevada and California (1979-98), Arizona (1979-09); *paleohydrologic reconstruction, ground-water discharge settings:* Nevada, California (1979-09); *massive sulfides and epithermal gold deposits:* Oregon (1977), Alaska (1982); *disseminated gold deposits and Paleozoic carbonate rock stratigraphy:* Nevada (1982-84); *low temperature geochemistry (1985-2015):*

Nevada, Pakistan, Nepal, Greece, Turkey, Australia, Chile, Argentina, Bolivia, Ethiopia, Tibet; paleo-lake hydrology (Mongolia, Tibet, Chile, Argentina, western US)

Professional affiliations: American Quaternary Association, Geological Society of America, American Chemical Society.

Current research interests: Geochemical aspects of soils as ecologic and paleoecologic indicators; weathering; radiocarbon dating; stable isotopic and trace element geochemistry of soils and natural waters; fossil springs and paleolakes.

Awards

Academic: Outstanding Faculty Award 2008; Farouk El Baz Award, GSA, 2001; GSA Fellow (2015), AGU Fellow (2015), Geochemical Society Fellow (2017); Lady Davis Fellowship (Hebrew University) (2016); Japan Society for the Promotion of Science Fellowship (U of Tokyo) (2017)

Athletic: Two All-Time Nevada State High School Track Records; Track scholarship, Univ. of New Mexico, four years; Two time NCAA All-American in track, one time NCAA champion (relay)

Publications (Bold = students)

Abbey, A., Hudson, A., Kapp, P., and Quade, J., Recent lake-area increases on the Tibetan Plateau and links to permafrost degradation and climate change. *Arctic and Alpine Research*, in revision.

Grimstead, D., Quade, J., and Stiner, M., Strontium and oxygen isotopic sourcing of archaeofaunal remains from Pueblo Bonito, Chaco Canyon, New Mexico. *Geoarchaeology*, in press.

2015 Cross, M., McGee, D., Broecker, W.S., Quade, J., Shakun, J.D., Cheng, H., Lu, Y., and Edwards, L., 2015. Great Basin hydrology, paleoclimate, and connections with the North Atlantic: a speleothem stable isotope record from Lehman Caves, NV. *Quaternary Science Reviews* 127, 186-198.

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Enzel, Y., Kushnir, Y., Quade, J., Lacustrine-like marsh deposits in Arabia and the impact of the early-middle Holocene Indian and African summer monsoon rains. *Global and Planetary Climate Change* 129, 69-91.

Hudson, A., Quade, J., **Huth, T.,** 2015, Lei, G., Cheng, H., Edwards, R.L., Olsen, J.W., and Zhang, H., Lake-level reconstruction for 12.8-2.3 ka of the Ngangla Ring Tso closed-basin lake system, southwest Tibetan Plateau. *Quaternary Research*, 83, 66-79.

Huth, T., Hudson, A., and Quade, J., 2015, A paleohydrologic reconstruction of early Holocene climate from Baqan Tso in central Tibet. *Quaternary Research*, 83, 80-93.

Huntington, K.W., Saylor, J., Quade, J., Hudson, A., 2015, High late Miocene–Pliocene elevation of the Zhada Basin, southwestern Tibetan Plateau, from carbonate clumped isotope thermometry. *Geological Society of America Bulletin* 127 (i-1), 181-199. doi:10.1130/B31000.1.

Matmon, A., Quade, J., Placzek, C., Fink, D., ASTER Team, Copeland, A., and Nelson, J., 2015. Seismic boulder fields of the Atacama Desert. *Geomorphology*, 231, 28-39.

Quade, J., Clark, A., Mentzer, S., Stiner, M.C., and Ozbasaran, M., 2014, Carbon-14 Dating and Isotopic Composition of Hackberry Endocarps from the Neolithic Site of Aşıklı Höyük, central Turkey. *Radiocarbon* 56 (4) 17-25.

Quade, J., Clark, A., Mentzer, S., Stiner, M.C., and Ozbasaran, M., Carbon-14 A summary of the age of the Neolithic Site of Aşıklı Höyük, central Turkey. *Turkish Journal—need to update.*

Quade, J., Dettinger, M., DeCelles, P., Carrapa, B., Huntington, K., Murray, K., 2015, The Growth of the Central Andes 22-26°S. In: DeCelles, P.G., Ducea, M., Kapp, P., and Carrapa, B., eds., *The Geodynamics of a Cordilleran Orogenic System: The Central Andes of Argentina and northern Chile*. Geological Society of America Memoir 212, 277-308.

Reiners, P.W., Thomson, S.N., Vernon, S.N., Willett, S.D., Zattin, M., Einhorn, J., Gehrels, G., Quade, J., Pearson, D., Murray, K.E., Cavazza, W., 2015, Low-temperature thermochronologic trends across the central Andes, 21°S-28°S. In: DeCelles, P.G., Ducea, M., Kapp, P., and Carrapa, B., eds., *The Geodynamics of a Cordilleran Orogenic System: The Central Andes of Argentina and northern Chile*. Geological Society of America Memoir 212, 215-249.

Simpson, S.W., Kleinsasser, L., Quade, J., Levin, N., McIntosh, W. C., Dunbar, N., and Semaw, S., 2015, Late Miocene hominin teeth from the Gona Paleanthropological Research Project Area, Afar, Ethiopia. *Journal of Human Evolution* 81, 68-82..

Steponaitis, E., Andrews, A., McGee, D., Quade, J., Hsieh, Y-T, Brocker, W.S., Shuman, B.N., Burns, S.J., Cheng, H., 2015. Mid-Holocene drying of the U.S. Great Basin recorded in Nevada speleothems. *Quaternary Science Reviews* 127, 174-185.

2014 Canavan, R. R., Carrapa, B., Clementz, M.T., Quade, J., DeCelles, P.G., and Schoenbohm, L. M., 2014. Early Cenozoic uplift of the Puna Plateau, central Andes, based on stable isotope paleoaltimetry of hydrated volcanic glass. *Geology* 42 (5), 447-450.

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Hudson, A., Olsen, J. and Quade, J., 2014, Radiocarbon dating of interdune paleowetland deposits to

constrain the age of mid-to-late Holocene microlithic artifacts from the Zhongba site, southwestern Qinghai-Tibet Plateau. *Geoarchaeology* 29, 33-46.

Pigati, J.S., Rech, J.A., Quade, J. and Bright, J.A., 2014, Desert wetlands in the geologic record. *Annual Reviews in Earth Sciences* 132, 67-81.

Placzek, C., Granger, D.E., Matmon, A., Quade, J. and Ryb, U., 2014. Geomorphic process rates in the central Atacama Desert, Chile: insights from cosmogenic nuclides and implications for the onset of hyperaridity. *American Journal of Science* 314, 1462-1512.

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2013 **Hudson, A.** and Quade, 2013. J., Long-term east-west asymmetry in monsoon intensification on the Tibetan Plateau. *Geology* 41 (3), 351-354.

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2012 **Breecker, D.O., Payne, A.E., Quade, J., Banner, J.L., Ball, C.E., Meyer, K.W., 2012.** The sources and sinks of CO₂ in caves under mixed woodland and grassland vegetation. *Geochimica et Cosmochimica Acta* 96, 230-246.

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McGee, D., Quade, J., Edwards, L., Broecker, W., Cheng, H., 2012. Lacustrine cave carbonates: novel archives of paleohydrologic change in the Bonneville Basin (Utah, USA). *Earth And Planetary Science Letters* 351-352, 182-194.

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2011 Cartwright, A., Quade, J., Stine, S., Adams, K., Broecker, W., and Cheng, H., 2011. Chronostratigraphy and lake-level changes of Laguna Cari-Laufquén, Río Negro, Argentina. *Quaternary Research* 76, 430-440.

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Fan, M., Quade, J., Dettman, D., and DeCelles, P. G., 2011, Widespread basement erosion during late Paleocene-early Eocene in the Laramide Rocky Mountains inferred from $^{87}\text{Sr}/^{86}\text{Sr}$ ratios of freshwater bivalve fossils. *Geological Society of America Bulletin*, doi:10.1130/B30219.1

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- 2010 Cerling, T. E., Levin, N. E., Quade, J., Wynn, J. G., Fox, D. L., Kingston, J. D., Klein, R. G., Brown, F. H., Paleoenvironment of Aramis, Ethiopia. **Comment to Science** 1105d.
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- 2009 **Leier, A.**, Quade, J., DeCelles, P., and Kapp, P., 2009, Stable isotopic results from paleosol carbonate in south Asia: paleoenvironmental reconstructions and selective alteration. *Earth and Planetary Science Letters* 279, 242-254.
- Placzek, C.**, Quade, J., Betancourt, J., Patchett, J., Rech, J., Latorre, C., Matmon, A., Holmgren, C. and English, N. B., 2009, Climate in the dry, central Andes over geologic, millennial, and interannual timescales. *Annals of the Missouri Botanical Gardens* 96, 386-397.
- Quade, J. and Broecker, W., 2009, Dryland Hydrology in a Warmer World: Lessons from the Last Glacial Period. *Eur.Phys. J. Special Topics* 176, 21-36.
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- Saylor, J. E.**, Quade, J., Dettman, D., DeCelles, P. G., and Kapp, P. A., 2009, The rise and fall of southwestern Tibet: Oxygen and carbon isotopic evidence from the Zhada Basin. *American Journal of Science* 309, 1-42.
- 2008 **Kleinsasser, L.**, Quade, J., McIntosh, W. C., **Levin, N. E.**, Simpson, S. W., and Semaw, S., 2008, Stratigraphy and geochronology of the late Miocene Adu-Asa Formation at Gona, Ethiopia. *in* J. Quade and J. G. Wynn, eds, *The Geology of Early Humans in the Horn of Africa*. Geological Society of America Special Paper 446, p. 33-65.

Levin, N. E., Simpson, S. W., Quade, J., Cerling, T. E., and Frost, S. R., 2008, Herbivore enamel carbon isotope composition and the environmental context of *Ardipithecus* at Gona, Ethiopia, in *in* J. Quade and J. G. Wynn, eds, *The Geology of Early Humans in the Horn of Africa*. Geological Society of America Special Paper 446, p. 215-234.

Ohja, T. P., DeCelles, P. G., Butler, R. F., and Quade, J., Magnetic polarity stratigraphy of the Neogene Siwalik Group and Dumri Formation, Nepal. *Basin Research* doi: 10.1111/j.1365-2117.2008.00374.x.

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Quade, J., **Levin, N.L.,** Simpson, S.W., Butler, R., McIntosh, W., Semaw, S., Kleinsasser, L., Dupont-Nivet, G., Renne, P., and Dunbar, N., 2008, *The Geology of Gona, Ethiopia*, in J. Quade and J. G. Wynn, eds, *The Geology of Early Humans in the Horn of Africa*. Geological Society of America Special Paper 446, p. 1-31.

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2007 Achyuthan, H., J., Quade, J., **Placzek, C.,** and **Roe, L. J.,** 2007, Stable isotopic composition of pedogenic carbonates from the eastern margin of the Thar Desert, Rajasthan, India. *Quaternary International* 162-163, 50-60.

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- 2004 **Biedenbender, S.**, McClaran, M., Quade, J., and Weltz, M. A., 2004, Landscape patterns of vegetation change indicated by soil isotope composition. *Geoderma* 119, 69-83.
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1988 Mifflin, M.D. and Quade, J., 1988, Paleohydrology and hydrogeology of the carbonate rock province of the Great Basin (east-central to southern Nevada): Geological Society of America Geologic Fieldtrip Guide, 77p.

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- Cerling, T. E. and Quade, J., 1992, Mass balance in fluvial paleosols (abstract): Geological Society of America Annual Meeting, Cincinnati, A-228.
- Chase, C. G., Quade, J., Libarkin, J., and Poths, J., 1996, Cosmogenic ^{21}Ne in quartz as a paleoaltimeter. American Geophysical Union (Fall, 1996 Meeting): EOS v. 77 (46), F312.
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- Quade, J., 1987, Regional ground-water discharge patterns in southern Nevada during the late Wisconsin-sedimentary and faunal evidence (abstract): International Union for Quaternary Research Meeting, Ottawa, Canada. Abstr. with programs, p.247
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- Van der Hoven, S. J. and Quade, J., 1994, Sr isotopes as an indicator of the sources of Ca in secondary carbonates in arid soils (abstract): Geological Society of America Annual Meeting, Seattle. Abstr. with programs, v. 26, A-87.

Major Grants >\$20,000

Principal Investigators: Jay Quade

Title: Ground-water discharge environments and groundwater levels in the vicinity of Yucca Mountain

Agency: U.S.G.S. Water Resources Division, Denver

Amount: \$31,000

Start and End Dates: 1.94.- 12.94.

Principal Investigators : Jay Quade

Title: Expansion of C4 grasses in the Americas

Agency: National Science Foundation (Global Climate Change)

Amount: \$117,306

Start and End Dates: Sept. 1, 1993 - August 30, 1995

Principal Investigators: Jay Quade/Peter DeCelles

Title: Erosional Unroofing of the Nepal Himalayas over the past 12 Ma: $^{87}\text{Sr}/^{86}\text{Sr}$ and sedimentary petrological indicators

Agency: National Science Foundation (Geology and Paleontology)

Amount: \$198,304

Start and End Dates: Aug. 1, 1995 - July, 1997

Principal Investigators: Peter Zeitler (Lehigh University) and others

Title: Collaborative Research: Crustal Reworking During Orogeny: An Active System Himalayan Perspective

Agency: National Science Foundation-Continental Dynamics

Amount: \$1,079,639

subcontract \$51,530 to J. Quade for cosmogenic studies of erosion rates at Nanga Parbat

Start and End Dates: January 1, 1995 - Dec. 31, 1998

Principal Investigators: Jay Quade/Bob Webb

Title: Effects of Fire Frequency in Nutrient Budgets of Grasslands in the Borderlands Region

Agency: U. S. Forest Service (Borderlands Ecosystem Management Program)

Amount: \$35,972
Start and End Dates: Jan. 1, 1995 - Dec. 31, 1996
Principal Investigators: Mark Barton/Jay Quade/Steve Leavitt
Title: Technician Support: Gas-Source Mass Spectrometry
Agency: National Science Foundation-Instrumentation and Facilities
Amount: \$115,000
Start and End Dates: June 1, 1995 - May 31, 1998

Principal Investigators : Clem Chase/Jay Quade
Title: Origin and Significance of the Eocene Rocky Mountain erosion surface: Analysis of Digital Topography; Forward Models; Cosmogenic Paleoaltimetry
Agency: NASA
Amount: \$214,986
Start and End Dates: January 1, 1995 - December 31, 1997

Principal Investigators: D. Dettman and J. Quade
Title: The Development of the Asian Monsoon: seasonal isotopic variation in paleorivers in Nepal, 12 to 1 Ma.
Agency: National Science Foundation
Amount: \$64,211
Start and End Dates: June 1, 1995 - May 31, 1996

Principal Investigators : J. Patchett/G. Gehrels/J. Quade
Title: Acquisition of a Multi-collector Mass Spectrometry
Agency: National Science Foundation-Instrumentation and Facilities
Amount : \$405,901 (approx.)
Start and End Dates: Jan. 1, 1996 - Dec. 31, 1996

Principal Investigators: J. Quade, T. Jull, and W. Phillips
Title: Measuring Denudation Rates with Cosmogenic Isotopes
Agency: Los Alamos National Lab—Institute of Geophysics and Planetary Physics
Amount: \$16,500
Start and End Dates: October 1, 1995 - September 30, 1996

Principal Investigators: A. MacFarlane, R. Sorkhrabi, J. Quade
Title: Workshop Request for the 11th Himalaya-Karakorum-Tibet Workshop
National Science Foundation (GEO/EAR/Continental Dynamics)
Amount : \$38,224
Start and End Dates: March 1, 1995 - Aug. 31, 1996

Principal Investigators: T. Jull and J. Quade
Title: Baseline studies of *in situ*-produced ^{14}C in terrestrial materials
Agency: National Science Foundation
Amount: \$199,426 (awarded; amount still under negotiation)
Start and End Dates: June 1, 1997-May 20, 1999

Principal Investigators: J. Quade and P. G. DeCelles

Title: $^{87}\text{Sr}/^{86}\text{Sr}$ record of Himalayan paleorivers during the Neogene: patterns and causes

Agency: National Science Foundation (EAR-9725607)

Amount: \$349,590

Start and End Dates: Jan.1, 1998 - Dec. 31, 1999

Principal Investigators: J. Betancourt and J. Quade

Title: History of the “Absolute Desert” in northern Chile’s Atacama

Agency: National Geographic Society

Amount: \$42,240

Principal Investigators: J. Chesley, J. Ruiz, J. Quade, and P. DeCelles

Title: The Os isotopic record of Himalayan rivers: a new tool for understanding regional Himalayan tectonic history and influence on ocean chemistry.

Agency: National Science Foundation—Earth System History

Amount: \$131,489

Start and End Dates: May 1, 1999-April 30, 2001

Principal Investigators: J. Quade and J. Betancourt

Title: Paleoenvironmental change in the Atacama Desert during the late Quaternary; evidence from middens and paleosprings

Agency: NSF -ESH (EAR-9904838)

Amount: \$258,600

Start and End Dates: Sept. 1, 1999- August 31, 2001

Principal Investigators: D. Dettman, K. Flessa, A. Cohen, J. Quade

Title: Upgrade of a stable isotope mass spectrometer by addition of an automated carbonate preparation device

Agency NSF (EAR-9905887)

Amount: \$58,630

Start and End Dates: August 15, 1999- July 31, 2001

Principal Investigators: N. Lifton, T. Jull, and J. Quade

Title: Continuing Studies of In Situ-Cosmogenic ^{14}C in Terrestrial Materials

Agency: National Science Foundation—Geology and Paleontology

Amount: \$295,716

Start and End Dates: 6/99-6/01

Principal Investigators: J. Quade, D. Dettman

Technician support gas-source mass spectrometry laboratory: phase II

Agency: National Science Foundation—Instrumentation

Amount: \$124,230

Start and End Dates: 7/1/00-6/30/02

Principal Investigators: J. Quade and J. Betancourt (and collaboration with Jon Patchett)

Title: Central Andes Paleoclimate Workshop, and U/Th and ^{14}C dating of Paleolake Shorelines in the Uyuni/Coipasa Basin.

Agency: NSF -Earth System History

Amount: \$50,176

Start and End Dates: Nov. 1, 2000- August 31, 2001

Investigators: R. Butler and J. Quade

Title: *Magnetostratigraphic dating of archeological finds, Gona, Ethiopia*

Agency: National Geographic Society

Amount: \$17,700

Period: 1/1/03-12/31/03

Source of support: NSF-SES-0404823 (Archeometry Program)

Investigators: J. Quade, Tim Jull, Nat Lifton

Title: *Construction of a low-level ^{14}C facility at the University of Arizona*

Amount: \$155,530

Period: 7/1/04-6/30/06

Person-months: 0.0 month

Investigators: J. Betancourt, J. Quade

Title: *Collaborative Research: past and modern variability of summer and winter rainfall on the Pacific slope of the central Andes (Chile)*

Source of support: NSF-ESH-0213657 (Earth Systems History)

Amount: \$124,785

Period: 7/1/02-6/30/05

Person-months: 0.75 month

Investigators: J. Quade , J. Patchett

Title: *Lake-level chronology and climate change in the southern Bolivian Altiplano*

Source of support: NSF-EAR-0207850

Amount: \$205,605

Period: 6/1/02-6/31/05

Person-months: 0.5 month

Investigators: Jay Quade and William McIntosh

Title: *Dating of 4 to 6 million year old hominids from Gona Ethiopia*

Agency: National Geographic Society 7992-06

Amount: \$25,740

Period: 3/6/06-2/28/07

Person-months: 0.0

Investigators: Paul Kapp, Peter DeCelles, Jay Quade, Mike Murphy (UCLA)

Title: *Collaborative Research: Investigation of syncollisional extension and basin development in the high Himalaya*

Source of support: NSF EAR-0438115 (Tectonics Program)

Amount: \$290,708

Period: 1/1/05-12/31/07

Person-months: 0.5 month

Investigators: Jay Quade

Title: *Pluvial lake Studies in the Americas*

Source of Support: COMER foundation

Amount: \$50,000

Period: 08/01/08-07/30/09

Project Location: USA; Argentina

Person-Months/yr: 0.0

Investigators: Jay Quade and John Eiler

Title: *Collaborative Research: Calibrating the Isotopologue-47 Geothermometer in soils*

Source of Support: NSF-EAR 0843104 (Geobiology and low-T Geochem Program)

Amount: \$86,375

Period: 03/01/09 - 06/30/11

Project Location: University of Arizona; CalTech

Person-Months/yr: 0.75 (summer)

Investigators: Sue Beck, Jay Quade, and many others

Title: *CAUGHT: Central Andean Uplift and the Geodynamics of High Topography*

Source of Support: NSF Continental Dynamics (EAR-0907880)

Amount: 688,333(Quade part (~\$20K)

Period: 03/01/09 - 06/30/11

Project Location: Peru/Argentina/Bolivia

Person-Months/yr: 0.5 (summer)

Investigators: Paul Kapp, J. Quade and many others

Title: *The suturing process: Insight from the India-Asia collision zone*

Source of Support: NSF Continental Dynamics (EAR-1008527)

Amount: \$1,890,340 (Quade part (~\$150K)

Period: 07/01/10 – 06/30/14

Project Location: Tibet, USA

Person-Months/yr: 0.75 (summer)

Investigators: Jay Quade in collaboration with David McGee (MIT)

Title: *Collaborative Research: Absolute-dated records of Late Quaternary paleohydrology in the Bonneville Basin, western U.S., from novel cave archives*

Source of Support: NSF Paleo Perspectives on Climate Change, 10-574

Amount: \$205,889

Period: 9/1/11-8/31/14

Project Location: University of Arizona; Utah
Person-Months/yr: 0.75 (summer)

Investigators: Jay Quade
Title: *Global Pluvial lake Studies*
Source of Support: COMER foundation
Amount: \$24,000
Period: 10/01/11-09/30/12
Project Location: USA; Argentina
Person-Months/yr: 0.0