

## BIOGRAPHICAL AND BIBLIOGRAPHIC INFORMATION

ADINA PAYTAN

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### EDUCATION

- 1996 Ph.D. Oceanography, Scripps Institution of Oceanography
- 1989 M.S. Earth Sciences Oceanography, Hebrew University, Jerusalem
- 1987 M.S. Science Education, Weizmann Institute of Science, Rehovot
- 1985 B.S. Geology and Biology, Hebrew University, Jerusalem

### PROFESSIONAL EXPERIENCE

- 2009-present Research Scientist, Institute of Marine Sciences, UCSC
- 2007-present Adjunct Scientist, Monterey Bay Aquarium Research Institute
- 2007-2009 Associate Research Scientist, Institute of Marine Sciences, UCSC
- 1999-2007 Assistant Professor, Geological & Environmental Sciences, Stanford University
- 1996-1999 Post Graduate Researcher, Scripps Inst. of Oceanography, UCSD
- 1991-1996 Science Research Assistant, Scripps Inst. of Oceanography, UCSD
- 1993-1994 Teaching Assistant, University of California - San Diego
- 1987-1989 Teaching Assistant, Hebrew University, Jerusalem
- 1980-1988 Tour Guide, Geographical Society and Jewish Agency
- 1986-1987 Education Coordinator of Instruction, Ministry of Education Israel
- 1983-1984 Science Teacher, Ophek Elementary School, Israel

### HONORS AND AWARDS

- 2022 Vernadsky Medal, EGU for Exceptional Contributions to Biogeosciences
- 2020 Fulbright Fellow - Portugal
- 2019 A.G. Huntsman Award for Excellence in the Marine Sciences
- 2019 SCOR Visiting Scholar
- 2019 AGU Celebrate 100 Grant Award
- 2018 Fellow – American Geophysical Union
- 2018 Endowed Biogeochemistry Lecturer – Geochemical Society
- 2017 Fellow – Association of the Sciences of Limnology and Oceanography (ASLO)
- 2017 Keynote Speaker – Inaugural Dorothy Hill Women in Earth Science Symposium
- 2016 Women in Science and Engineering (WiSE) Award - UCSC
- 2015 Dansgaard Award, AGU mid-career Paleoceanography Award
- 2014-15 Lady Davis Fellowship, Hebrew University
- 2014 Fellow - Geochemical Society and European Association of Geochemistry
- 2013 Rachel Carson Lecture AGU
- 2013 Excellence in Research Award - Petersen Foundation
- 2011 COSEE Scientist Making an Impact
- 2011 Honorary Professor, Yucatan Center for Scientific Research (CICY)
- 2009 Mildred Mathias Award as the outstanding proposal in the natural sciences
- 2008 Distinguished Lecturer - Consortium for Ocean Leadership
- 2007 Ellen Weaver Award for Support of Women in Science
- 2006 Aldo Leopold Leadership Fellow
- 2006 Ocean Science Meeting - Plenary Session Speaker
- 2005 NSF CAREER Award

2005 GSA Ingerson Lecture  
 2004 AGU Oceanography Section Early Career Award  
 2002 NASA New Investigator Program in Earth Science Award  
 2000-01 Terman Fellowship, Stanford University  
 1990 Gerson Meerbaum Foundation for Oceanography Award  
 1989 M.S. Graduation Honors, Rectors list, Hebrew University, Jerusalem  
 1987 Golda Meir Fellowship Recipient  
 1983-1985 Deans List and B.Sc. Graduation Honors, Hebrew University Jerusalem

## MEMBERSHIPS IN PROFESSIONAL AND SCHOLARLY ORGANIZATIONS

American Geophysical Union, American Society of Limnology and Oceanography  
 American Geochemical Society, American Association for Advancement of Science  
 American Women in Science, Association for Women Geoscientists

## CURRENT ADVISEES (2 Research associates, 2 post-docs, 6 Ph.D.)

**Current Graduate Student Advisees** Maddison Wood, Gracie Pearsall, James Jacobs, Terra Ganey, Suzanne Stremler, Igor Pessoa

**Current Undergraduate Research Supervision:** Luna Osleger, Lindsay Jones, Casey Vigilia, Lauren Hashman, Madison Reed, Valeria Galindo-Eguiarte, Natalie Hermsillo, Isabella Roberge

**Current Post-Doctoral Fellows:** Ariane Arias-Ortiz, Christina Richardson

**Research Associates:** Barbara Balestra, Susan Pit

## ADVISEES RECEIVING DEGREES (22 Ph.D. and 15 M.S.)

2020 Galen Gorski, Ph.D., UCSC, *Linking hydrologic and biogeochemical cycling of nitrogen across scales: Implications for nutrient and water resource management*  
 2020 Kyle Broach, Ph.D., UCSC, *Late Holocene climate variability and coastal change of the Yucatan Peninsula, Mexico*  
 2020 Kimberly Mayfield, Ph.D., UCSC, *Non-Traditional Stable Isotopes in Land-to-Sea Fluxes*  
 2020 Esra Mescioglu, Ph.D., UCSC, *Bioaerosols: abundance, diversity, and impacts on marine systems*  
 2020 Christina Richardson, Ph.D., UCSC, *A multi-tracer approach to constraining hydrological and biogeochemical processes in aquatic environments of central California*  
 2018 Ana Martinez Fernandez, Ph.D., UCSC, *Impacts of ocean acidification on foraminifera and corals: A field study*  
 2017 Petersen Karen, M.S., UCSC, *Desalination plants – The impacts of brine discharge on coastal ecology and chemistry*  
 2017 Conrad Tracy, Ph.D., UCSC, *Hydrogenetic ferromanganese crusts of the California continental margin*  
 2017 Chia-Te Chien, Ph.D., UCSC, *Impacts of dry atmospheric deposition on aquatic systems – Nutrients, trace metals and lead isotopes*  
 2016 Delphine Defforey, Ph.D., UCSC, *Phosphorus cycling in the deep sub-seafloor biosphere*  
 2015 Alanna Lecher, Ph.D., UCSC, *Submarine groundwater discharge impacts on the coastal zone of Alaska and Central California*

- 2015 Elizabeth Crook, Ph.D., UCSC, *Ocean acidification effects on coral calcification*
- 2013 Nadine Quintana Krupinski, Ph.D., UCSC, *Regional expression of past global climate and anthropogenic effects*
- 2013 Andrea Erhardt, Ph.D., Stanford, *Records of Pb isotopes in refractory minerals and the implications for climatic shifts on glacial/interglacial cycles*
- 2012 Joseph H. Street, Ph.D., Stanford, *Organic geochemical reconstructions of the late Quaternary climate history of the Sierra Nevada*
- 2012 Timothy Lambert, M.S., UCSC, *Towards an understanding of phosphate  $\delta^{18}O$  in the bones and scales of small pelagic fish*
- 2010 Katherine M. Mackey, Ph.D., Stanford, *On the response of marine phytoplankton to changing light and nutrient conditions.*
- 2010 Karen Knee, Ph.D., Stanford, *Inputs of nutrients and pollutants to Hawaiian coastal waters from submarine groundwater discharge.*
- 2008 Elizabeth Griffith, Ph.D., Stanford, *Seawater calcium isotopes and the Cenozoic carbonate depositional history of the oceans.*
- 2007 Tzvetie Erohina, Ph.D., Stanford, *Aspects of the late quaternary paleoenvironmental and paleoceanographic history of Santa Monica basin, Southern California.*
- 2007 Ellen Gray, M.S., Stanford, *Ocean productivity and seawater sulfur isotopic reconstruction over the PETM using marine barite.*
- 2007 Jessica Luo, M.S., Stanford, *Carbon and nitrogen isotopes and trace metal concentrations of zooplankton tows from the Gulf of Aqaba, Red Sea.*
- 2007 Kate Elsbury, M.S., Stanford, *Identifying phosphate and nitrate sources to Lake Erie using a multiple isotope approach.*
- 2006 Scott Wankel, Ph.D., Stanford, *Nitrogen sources and cycling in coastal ecosystems: Insights from a stable isotope approach.*
- 2005 Karen McLaughlin, Ph.D., Stanford, *The oxygen isotopic composition of phosphate in marine and estuarine systems: A tracer for phosphate sources and cycling.*
- 2005 Lynn Asbeck, M.S., Stanford,  *$^{226}Ra$  activity in bivalve shells as a tracer for groundwater input to Elkhorn Slough, California.*
- 2005 Michael Calhoun, M.S., Stanford, *Carbonate and marine barite accumulation rates from sediment cores.*
- 2005 Nick Handler, M.S., Stanford, *Time series investigation of chemical and human health indicators in California coastal watersheds.*
- 2005 Megan Young, Ph.D., Stanford, *Methane cycling and groundwater sources in mangrove-dominated coastal lagoons, Yucatan Peninsula, Mexico.*
- 2005 Kristen Averyt, Ph.D., Stanford, *Strontium and calcium in marine barite: Implications for marine barite formation and seawater chemistry.*
- 2004 Ashley Ivy, M.S., Stanford, *Reconstructing ocean productivity at the C/T boundary using marine barite.*
- 2004 Gaurav Misra, M.S., Stanford, *Hydrogeology of Elkhorn Slough – The role of submarine groundwater discharge.*
- 2003 Gregory Shellenbarger, M.S., Stanford, *Radium isotopes and the Reynolds Transport Theorem – Application at the Gulf of Aqaba.*
- 2003 David Nicholson, M.S., Stanford, *P-status of marine phytoplankton communities in Monterey Bay and San Francisco Bay.*

- 2002 Meagan Eagle, M.S., Stanford, *Tracing organic matter sources in mangrove estuaries utilizing  $\delta^{13}C$ ,  $\delta^{15}N$  and C/N Ratios.*
- 2001 Sarah A. Mearon, M.S., Stanford, *Cretaceous strontium isotope stratigraphy using marine barite.*

### FORMER POST DOCTORAL FELLOWS (16)

- 2020 Michael Tatzel, Ph.D., UCSC, *Testing a new approach to shed light on the dolomite problem - a multi isotope Mg, Ca, and Sr investigation*
- 2019 Nadine Heck, Ph.D., UCSC, *Desalination plants - Impacts on coastal ecology, public perception, and public policy*
- 2019 Joseph Fackrell, Ph.D., UCSC, *Source characterization and biogeochemical consequences of wastewater*
- 2016 Pei-Chuan Chuang, Ph.D., UCSC, *Methane Fluxes from Mangrove Ecosystems.*
- 2013 Kimberly Null, Ph.D., UCSC, *Groundwater Discharge in San Francisco Bay.*
- 2012 Joseph Street, Ph.D., UCSC, *Stable Sr Isotopes in Marine Barite.*
- 2011 Natasha Dimova, Ph.D., UCSC, *Resistivity and Radon for tracking groundwater discharge.*
- 2011 Katherine Mackey, Ph.D., UCSC, *Aerosol impacts on marine ecosystems.*
- 2010 Clifton Buck, Ph.D., UCSC, *Intercalibration for Aerosol Preservation and Analysis.*
- 2010 Cecile Mioni, Ph.D., UCSC, *Toxins in San Francisco Bay.*
- 2008 Griffith Elizabeth, Ph.D., UCSC, *Seawater Calcium Isotope Record over the Paleocene-Eocene Thermal Maximum.*
- 2007 Ying Chen, Ph.D., Stanford, *Mineral dust components in aerosols and their effect on ocean productivity.*
- 2006 John Breier, Ph.D., Stanford, *Groundwater Discharge at Elkhorn Slough.*
- 2006 Robert Feranec, Ph.D., Stanford, *Determining landscape use of Holocene mammals using strontium isotopes.*
- 2004 Kathrine Hoppe, Ph.D., Stanford,  *$\delta^{13}C$  and  $\delta^{18}O$  of bison bones and teeth.*
- 2003 Kristina Faul, Ph.D., Stanford, *Constructing a high resolution S isotope and P accumulation curves at the Late Paleocene thermal Maximum (LPTM).*

### COURSES TAUGHT

- 2022 Marine Biogeochemistry, Faro, Portugal
- 2021 Application of Isotopes in Earth, Ocean, and Environmental Science, CCMAR (2021)
- 2019 Application of Isotopes in Earth Science, India (Fall 2019)
- 2019 Application of Isotopes in Earth Science, Brazil (Fall 2019)
- 2018 Instructor Marine Biogeochemistry Training School, Faro, Portugal
- Instructor at the Urbino Summer School in Paleoclimatology
- 2016 Application of Isotopes in Earth Science, Kiel (Spring 2016)
- HUJI 70667 Stable Isotopes in the Study of Biogeochemical Cycles – Hebrew University Earth Science Departments (Winter 2015)
- OCE 290A Special Topics in Marine Biogeochemistry – Graduate Students International Experience in Coastal Zone Research (Spring and Summer 2015-2017)
- OCE 290A Special Topics in Marine Biogeochemistry – Application of Isotopes to Earth and Environmental Research (Winter 2014)

- OCE 290A Special Topics in Marine Biogeochemistry – Ocean Redox Present and Past (Fall 2012 with Ken Bruland)
- OCE 290A Special Topics in Marine Biogeochemistry - Ocean Acidification (Fall 2011, with Ken Bruland)
- EART 240 Communicating Science (Fall 2008, 2010, 2012, 2014 UCSC)
- Environmental Geology (Winter 2009, 2010 UCSC)
- The Ocean Around Us (Fall 2003-2006, Stanford)
- How to Critically Read and Interpret Scientific Literature (Winter 2002-2006, Stanford)
- Isotopes in Geological and Environmental Science Research (Winter odd years, 2000-2006, Stanford)
- Paleoceanography and Paleoclimatology (Winter even years, 2000-2006, Stanford)
- Marine Chemistry (Spring, 2000-2006, Stanford)
- Secrets in the Mud (Fall, 2000-2004, Stanford)
- The Geosphere (Fall 2000-2005, Stanford)

## RESEARCH SUPPORT

Since 1999 PI or co-PI on research grants totaling >\$22 million in funding to support research and education activities (NSF, NASA, NOAA, Sea Grant, USDA, ACS, NATO, Belmont Forum and more).

- *Coastal Wetland Restoration a Nature Based Decarbonization Multi-Benefit Climate Mitigation Solution*, UC-NL LFRP 2022 Collaborative Research and Training Awards, 4/22-3/25, \$3,600,000
- *GEOPATHs: IN: DIG CAMP - Data in Geosciences: Collaboration and Mentoring Program—Teaming Latinx High School and College Students for Data Use in Geosciences*, NSF-IUSE, \$184,760
- *High frequency water quality monitoring of agricultural drainage in the Sacramento-San Joaquin Delta*, CDFW, 10/2021-12/2024, \$1,446,004
- *Impacts from Sea Level Rise on Wastewater Infrastructure and Vulnerable Communities in Filled Wetlands along San Francisco Bay*, California, California Sea Grant 2/22-1/24, \$100,000
- *Eddy Covariance Tower for Assessing Spatial and Temporal Variability in Subsurface Biogeochemical Processes in Coastal Wetlands and their Impacts on Water Quality*, DoD, 08/2021-07/2022, \$420,360.00
- *Coral Reef Science to Protect Coasts*, 8/21 to 8/26, USGS, \$300,000
- *Developing strategies to minimize the impacts of new desalination facilities on the Gulf of Aqaba ecosystem*, The Middle East Regional Cooperation (MERC) (with Bar-Zeev and others), 1/2021-12/2023, \$497,614
- *Expanding Laser Ablation Capabilities for Element Mapping of Diverse Matrixes at UCSC, and Developing new capabilities for coral analyses using the LA-ICPMS at the MAL*. Packard Endowment, UCSC-IMS (with other IMS PIs), 1/2021-12/2021, \$12,000

- *RAPID: The impact of headwater wildfire burns on the export of materials to the coast*, NSF (with Richardson and Zimmer) 10/2020-9/2021, \$20,000
- *INTERN - Non-Academic Career Resources*, NSF, 6/2020-5/2021, \$55,000
- *Negotiating Ocean Conflicts among Rivals for Sustainable and Equitable Solutions (NoCRISES)*, Belmont Forum – NSF, 10/2020-9/2023, \$420,360
- *Subsurface Biogeochemical Processes in Coastal Wetlands - Impacts on Water Quality*, DOD Army, 7/2020-4/2021, \$60,000
- *30th Goldschmidt Conference – Geochemistry and Society Special Sessions*, NSF-ICER, 6/2020-5/2022, \$32,600
- *Using existing datasets to understand multi-scale changes in and controls on biogeochemistry in the San Francisco Bay and Sacramento-San Joaquin Delta, California*, CA-Sea Grant, 7/2020-6/2022, \$221,659
- *Subsurface Biogeochemical Processes and Wetlands Water Quality*, Packard Endowment, UCSC-IMS, 1/2020-6/2021, \$10,000
- *Collaborative Research: Unlocking the Cenozoic/Cretaceous seawater sulfate record via inclusion of <sup>17</sup>O in marine barite*. NSF-EAR, 1/2020-12/2022, \$194,588
- *GP-IMPACT: GEODES - GEOsciences Diversity, Excellence, and Support Program*, NSF- DUE - IUSE- GEOPATHS-IMPACT, 8/2019-7/2022, \$479,058
- *Developing the capability for Mg isotope analyses at UCSC*, Packard Endowment, UCSC-IMS, 5/2019-4/2020, \$7,400
- *EAGER – Testing a new approach to shed light on the dolomite problem - a multi-isotope Mg, Ca, and Sr investigation*, NSF-EAR, 12/2018-12/2019, \$50,000
- *Urbino Summer School in Paleoclimatology for 2019 United States Graduate Student Participation; Urbino, Italy; July 9-26, 2019*, NSF-P2C2, 12/2018-12/2019, \$68,914
- *IRES Track III - International Research Engagement for Graduate Level Professional Development: Limnology and Oceanography Research Exchange (LOREX)*, NSF-OISE-IRES IGE, 9/2018-8/2021, \$991,229
- *WASTE FEW ULL - Belmont Forum, Sustainable Urbanisation Global Initiative - Food-Water-Energy Nexus (SUGI-FWE Nexus)*, 3/2018-2/2021, Total award 1,478,924 Euro, US component \$370,707 (S. Carter UK PI, Paytan as US Lead PI)
- *Community College Research Internship for Scientific Engagement (CC-RISE)*, NSF-OCE, C-DEBI, 2/2018-1/2019, \$55,000
- *Collaborative Research: Calibration, Validation, and Application of Barium Isotopes in Marine Barite as a Tracer of the Marine Carbon Cycle*, NSF-OCE-MGG, 9/2018-8/2019, \$93,167 (with T. Horner)
- *Collaborative Research: Unlocking the Cenozoic/Cretaceous seawater sulfate record via inclusion of <sup>17</sup>O in marine barite*, NSF-OCE-MGG, 9/2018-8/2019, \$76,424 (with D. Johnston)
- *Spatial and Temporal Variability in Green House Gas Emissions from Coastal Wetlands*, Packard Endowment, UCSC-IMS, 3/2018-2/2019, \$10,000

- *Community College Research Internship for Scientific Engagement (CC-RISE)*, NSF-OCE, C-DEBI, 2/2017-1/2018, \$55,000
- *Source characterization and biogeochemical consequences of wastewater and agricultural C, N, and P inputs to the Sacramento-San Joaquin Delta region*. California Sea Grant Delta Fellows Program, 3/2017-2/2019, \$219,420
- *Quantitative determination of the processes which control sea-spray aerosol properties and composition*. Center for Aerosol Impacts on Climate and the Environment – CAICE, 8/2016-7/2017, \$30,000
- *Coral Acclimation to Future Climate Change - Implications to Coral Conservation*. National Geographic Society, 8/2016-12/2017, \$20,000
- *Community College Research Internship for Scientific Engagement (CC-RISE)*, NSF-OCE, C-DEBI, 2/2016-1/2017, \$50,000
- *Nano-EA Nitrogen Isotopes - Development of a Procedure for Analyzing the Nitrogen Isotopic Composition of Samples with low Nitrogen Concentration*, Packard Foundation, UCSC, 6/16-7/18, \$20,000
- *GLORIA - Global Learning Opportunities for Regional Indian Ocean Adaptation*, NERC, 9/2015-9/2016, \$15,000
- *Coral Nitrogen Isotopes as a Tracer for Historic Nutrient Loading*, NOAA, NOS Office for Coastal Management, 6/15-7/17, \$65,748
- *MRI - Acquisition of a Thermal Ionization Mass Spectrometer in support of the W.M. Keck Facility at the University of California, Santa Cruz*, NSF-EAR, 9/2015, \$540,026 (co-PI with Blackburn, Hourigan and Koch)
- *GOLDSCHMIDT 2015 – Support for Student Participation*, NASA, 8/2015-8/2016, \$13,000
- *Isotopes in Barite as Recorders of Ocean Chemistry- REU Supplement*, NSF-OCE, 9/2015-4/2016, \$8,000
- *C-DEBI – Phosphorus Sources and Cycling in the Deep Biosphere –Fueling Life in the Dark*, NSF-OCE, 9/2014-4/2015, \$15,000
- *Community College Research Internship for Scientific Engagement (CC-RISE)*, NSF-OCE, C-DEBI, 2/2015-1/2016, \$50,000
- *Ocean Acidification in Coastal California over the Last 13,000 years*, Los Alamos National Labs – LDRD, 9/2014-8/2017, \$120,000, (co-PI Julianna Fessenden-Rahn)
- *International Experience in for Students in Coastal Zone Research*, NSF-IRES, 9/2014-8/2017, \$250,000
- *GOLDSCHMIDT 2014 – Support for Student Participation*, NASA, 8/2014-8/2015, \$15,000
- *Community College Research Internship for Scientific Engagement (CC-RISE)*, NSF-OCE, C-DEBI, 2/2014-1/2015, \$45,000
- *Developing the capability for boron isotope analysis at UCSC to enable studying past acidification of California coastal waters* California Sea-Grant, 10/2013-9/2014, \$10,000

- *Assessing the Impact of Agricultural Practices on Phosphorous Availability and Loss Using Oxygen Isotopes of Phosphate in Soil*, USDA-NIFA, 10/2013-9-2016, \$488,344
- *Coastal SEES (Track 1): Brine Discharge from Desalination Plants - Impacts on Coastal Ecology, Public Perception, and Public Policy* NSF-OCE-SEES, 9/2013-8/2016, \$550,842 (co-PIs B. Hadadd and D. Potts)
- *Belmont Forum Collaborative Research: Coastal Vulnerability: Global learning for local solutions: Reducing vulnerability of marine-dependent coastal communities* NSF-ICER, 10/2013-9/2016, \$181,890 (UCSC allocation, co-PI C. Edwards, total award 1.45 million)
- *Biological forcing of the ocean carbonate sink investigated with Ca isotopes in coccoliths and barite accumulation rates* NSF-MGG, 7/2013-6/2014, \$10,000
- *Resolving seawater stable ( $^{88}\text{Sr}/^{86}\text{Sr}$ ) strontium isotope variations and their implications for the global strontium cycle* NSF-MGG, 8/2013-7/2016, \$314,500
- *C-DEBI – Nature of Labile and Refractory Phosphorus Pools Fueling Life in Deep Sub-Seafloor Sediments* - NSF-OCE, 2/2012-1/2014, \$65,000
- *Submarine Groundwater Discharge in Northern Monterey Bay – The Fuel Sustaining the Algal Incubator* California Sea-Grant, 2/2012-1/2014, \$196,243
- *Developments in the understanding of processes in the P cycle: new concepts from the use of isotopic tracers*, NSF-GEO, 1/2012-12/2012, \$41,500
- *Track 1 GeoEd - High School Summer Internship (HSSI) in the Geo-Sciences* NSF-GEO, 1/2012-12/2013, \$134,956
- *C-DEBI – Phosphorus Sources and Cycling in the Deep Biosphere –Fueling Life in the Dark*, NSF-OCE, 10/2011-9/2012, \$50,000
- *EAGER - Subterranean Ground Water Discharge (SGD) in the Arctic as a Source of Atmospheric Methane – A Proof of Concept Study*, NSF-OPP, 2/2011-1/2013, \$260,000
- *Ed-Ventures – Phosphate in Our Waters, Developing a Hands-on Education Kit*, C-MORE, 2/2011-1/2012, \$10,000
- *Enhancing Opportunities for Ocean Acidification Research and Education at the University of California, Santa Cruz*, NOAA, West Coast & Polar Regions Undersea Research Center, 9/2010-8/2011, \$20,000
- *Evaluation of Nutrient Sources and Cycling in Waterbodies*, Agriculture and Agr-Food Canada, 9/2010-3/2011, \$22,216
- *Impact of Low pH Waters on Coral Reef Ecosystems: An In-Situ Look at Ocean Acidification*, NSF-OCE, 9/2010-8/2012, \$262,340
- *Climate Impacts on Soil Phosphorus Availability: Investigation Using Oxygen Isotopes in Phosphate*, NSF-ESP, 9/2010-8/2013, \$458,438
- *Collaborative Research - Taxon-Specific Variability of Organic Matter Production and Remineralization Potential*, NSF-OCE, 4/2010-3/2012, \$154,194
- *Acidification of California coastal waters: A geologic record of natural and anthropogenic pH variability*, UCSC IMS Packard Ocean Science & Technology Endowment, 12/2009-11/2010, \$20,000



- *Testing End-Permian Mass Extinction Scenarios Using Calcium Isotopes*, (with J. Payne) NASA – Exobiology, 07/2009-06/2012, \$230,502
- *Complexity in the coastal ocean*, Monterey Bay Aquarium Research Institute, 06/2009-12/2009, \$17,600
- *Reconstructing climate variability and aridity in the Sierra Nevada, CA, based on isotopic evidence in sediments from Swamp Lake, Yosemite*. NSF- P2C2, 04/2009-03/2011, \$201,053
- *Environmental controls on the distribution of Microcystis in San Francisco Bay, California*, Sacramento Regional County Sanitation District, 05/2009-07/2009, \$23,211.
- *Atmospheric Deposition Impacts on Marine Ecosystems*. NSF- Biological Oceanography, 03/2009-02-2012, \$453,968
- *A Paleotemperature Proxy Record Across the End-Permian Extinction Horizon and Through the Triassic Recovery Interval from Oxygen Isotopes in Conodont Apatite*, American Chemical Society PRF, 03/2009-02/2011, \$100,000
- *Source Identification of Nitrate and Phosphate and Fine Sediments from Highway Runoff*. (with M. Kayhanian). State of California, Department of Transportation (CalTrans), 02/2009-04/2011, \$118,303
- *Submarine groundwater discharge in South and Central San Francisco Bay: Implications for nutrient and trace metal cycling and associated ecological significance*. (with M. Stacy and B. Esser) UC Lab Fees Research Program, 01/2009-12/2010, \$470,000
- *Reconstructing climate variability, aridity and water availability in the Sacramento-San Joaquin watershed based on isotopic evidence in sediments from Swamp Lake Yosemite*. CA Bay-Delta Authority/Sea Grant, 01/2009-12/2010, \$95,351
- *Consequences of Acidification of Californian Coastal Waters: impacts of anthropogenic CO<sub>2</sub> increase and pH decline on nearshore organisms*. (with D. Potts) UCSC IGPP Mini Grant, 01/2008-12/2009, \$7,000
- *Environmental controls on the distribution of harmful algae and their toxins in San Francisco Bay, California*, Bay-Delta Authority/Sea Grant, 09/2008-08/2010, \$164,620
- *GEOTRACES: Intercalibration for Aerosol Preservation and Analysis*. NSF-OCE, 09/2008-08/2010, \$83,575
- *Acidification of California coastal waters: The geological record of natural and anthropogenic pH variability*. (with UCD and UCSB), Coastal Environmental Quality Initiative, 07/2008-2010, \$498,337
- *Subterranean groundwater discharge and coral reef sustainability along the Yucatan Peninsula, Mexico*. 2008 UC MEXUS-CONACYT Collaborative Research Grants. 07/2008-2009, \$25,000
- *Climate variability, drought, and environmental change in the Yucatan Peninsula: A late-Holocene stable isotope record from the Celestun Estuary, Yucatan, Mexico*. 2008 UC MEXUS faculty grants. 07/2008-2009, \$17,500
- *Groundwater Discharge of Mercury to California Coastal Waters*. California Sea Grant, 03/2008-2009, \$29,044

- *Strain specific response of coccolithophors to ocean acidification*. VPUE Faculty Grant for Undergraduate Students Support, 07/2007-09/2008, \$6,750
- *Where Air and Water Meet – Atmospheric Deposition to Pacific Coast Estuaries*. California Sea Grant, 03/2008-2009, \$29,044
- *Oxygen Isotopes in Authigenic Phosphate a Potential Archive for Deep Seawater Temperatures*. NSF-OCE, 08/2007-2008, \$20,000
- *The Fate of Sewage (effluents and biosolids) P in soils – Speciation, Movement, Accumulation, and Fundamental Processes Required for Sustainable Agriculture* (with M. Shenker and P. R. Bloom). Binational Agriculture Research and Development Fund, 09/2007-2010, \$335,000
- *Methodology to Identify the Sources of Nitrogen and Phosphorus in Highway Runoff* (with M. Kayhanian). State of California, Department of Transportation (CalTrans), 09/2006-2008, \$248,911
- *Monitoring natural and anthropogenic-induced pollution in the Gulf of Aqaba*. NATO – Science for Peace 2006-2009, (With Post, Karniely and AlNajjar) Euros. 290,000
- *Characterizing the Oxygen Isotopic Composition of P Sources to Aquatic Ecosystems*. UPS, 10/2006-09/2007, \$30,000
- *Collaborative Research: Se/S in marine barite, a tracer of upper ocean nitrate concentration* (with G. Cutter). NSF 01/2006-2010, \$121,643
- *Determining subterranean groundwater nutrient input to Kaloko Honokohau National Historical Park’s coastal ocean ecosystem* (with E. Grossman). National Parks Service 10/2005-2007, \$49,795
- *Organic matter composition, recycling susceptibility, and the effectiveness of the biological pump - An evaluation using NMR spectra of marine plankton*. DOE 10/2005-2008, \$130,010
- *Land use practices, subterranean groundwater pollution and coral reef sustainability* (with A. Boehm). Mead Foundation. 10/2005-2009, \$102,500
- *Understanding submarine groundwater discharge and its influence on coastal water quality* (with A. Boehm). Sea Grant CA, 09/2005-2008, \$183,693
- *A watershed approach to pollution mitigation in Hanalei Bay* (with C. Berg and C. Field). National Fish and Wildlife Foundation, 09/2005-2007, \$529,134
- *Mineral dust components in aerosols and their effect on ocean productivity* (with M. Jacobson, S. Fendorf, S. Webb and R. Shavelson). EIIP. 07/2005-2007, \$133,380
- *CAREER – A research and education plan in global biogeochemical cycles: Seawater calcium isotopes and carbonate deposition history*. NSF, 05/2005-2010, \$747,286
- *IDEA: Land/ocean biogeochemical observatory of nutrient and carbon cycling* (with S. Monismith and K. Johnson). NSF, 01/2003-12/2008, \$1,770,700
- *Mapping the origin of terrestrial faunal assemblages using strontium isotopes* (with E. Hadly). NSF-EAR, 07/2003-06/2007, \$250,006
- *Novel methods for identifying and quantifying nutrient inputs and cycling in Lake Erie*. NOAA-GLERL, 04/2005-03/2006, \$38,000

- *US Mexico Cooperative Research: Methane fluxes and cycling in mangrove ecosystems.* NSF-INT, 04/2002-02/2006, \$77,090
- *The oxygen isotope ratio of organic phosphorus compounds.* NSF, 11/2003-10/2005, \$78,351
- *A research and education plan in marine biogeochemical cycles: Nutrient dynamics and ecosystem structure in the Gulf of Aqaba-Physical forcing and external nutrient sources.* NASA-NIP, 11/2002-10/2006, \$321,280
- *Ocean carbon sequestration: Organic matter composition, recycling susceptibility, and the effectiveness of the biological pump - An evaluation using NMR spectra of marine plankton.* DOE, 09/2003-08/2005, \$196,930
- *Hydrodynamics and sedimentation in Elkhorn Slough (with S. Monismith).* SIMoN, 08/2002-07/2005, \$270,000
- *The role of hydrodynamics in determining nutrient fluxes to Conch Reef. (with S. Monismith).* NOAA, 06/2003-05/2005, \$61,403
- *Nitrogen transformations in marsh sediments of Elkhorn Slough: A multiple isotope tracer approach.* NOAA, 06/2003-05/2005, \$37,500
- *Phosphorus regeneration in the ocean: An evaluation using P and C NMR and sequential leaching of marine particulate matter.* NSF-OCE, 09/2003-02/2005, \$63,134
- *Reactive phosphorus and barite accumulation rates as paleoproductivity indicators across the Paleocene/Eocene and Eocene/Oligocene boundaries in Pacific sediments from ODP Leg 199.* Texas A&M, 12/2001-10/2004, \$18,227
- *Marine barite accumulation rates and Sr isotope stratigraphy from Shatsky Rise: Implications for paleoproductivity.* Texas A&M - NSF, 10/2001-08/2004, \$26,765
- *The seawater S isotope excursion at the late Paleocene thermal maximum.* NSF, 04/2001-03/2004, \$106,050
- *Seawater Ca isotopes and carbonate deposition history.* NSF-EAR, 09/2002-08/2003, \$23,320
- *Sr/Ca ratios in marine barite: Implications for chemical weathering rates and dissolved fluxes to the ocean.* NSF 08/1999-01/2003, \$178,122
- *Measurement and computation of residence time in shallow coastal lagoon.* UPS, 10/2001-09/2002, \$107,754
- *Hydrodynamic effects on the productivity of a reef ecosystem.* Bio-X, 10/2000-09/2002, \$147,850
- *Reconstruction of ecological habitats using strontium isotopes in bones.* OTL, 09/2001-08/2002, \$40,000
- *Seawater calcium isotopes and carbonate deposition history.* ACS-PRF, 09/2000-08/2002, \$25,000
- *Calcium isotopes in corals: Investigating a new paleo-thermometer.* OTL 09/2000-08/2002, \$25,000

- *Graduate student participation in Ocean Drilling Program, Leg 199.* Texas A&M - NSF., 09/2001-01/2002, \$10,579
- *Graduate student participation in Ocean Drilling Program, Leg 198,* Texas A&M - NSF. 8/2001-11/2001, \$10,866
- *Support for undergraduate research projects at Stanford.* VPUE, 2000-2006, \$42,500

## UNIVERSITY SERVICE

2021-Present	DIG-CAMP program instructor
2019-Present	UCSC GEOPATHS program director
2011-Present	Marine Analytical Laboratories Faculty Committee
2008-Present	Undergraduate Honors Thesis Adviser
2020-Present	Advisor Instituto LAMIR Universidade Federal do Paraná - UFPR
2021	Moderator ARCS Scholar Symposium
2013-2018	CC-RISE Community College Research Internship - Coordinator
2018	Beyond Compliance Faculty Ambassador Program
2015-2017	Lectures and Workshop for GEODES program
2013-2014	Broader Impacts Office UCSC – Faculty Adviser
2008-2014	HSSI - High School Summer Internship Founder and Coordinator
2012-2013	UC MEXUS-CONACYT review committee
2011-2013	UCSC Keck clean lab faculty supervisor
2011-2012	Coordinator – “YO” Residency Summer Camp for High School Students
2011	SACNAS Conference judge and Community Day activity organizer
2010- 2011	Mentor for Pister Scholar
2008	Women in Science and Engineering (WiSE) Dual Career Discussion Panel
2008	Department of Ocean Sciences UCSC Admissions Committee
2008	NSF-AGEP (Alliance for Graduate Education and the Professoriate), UCSC Getting Your Research Published Workshop
2006-2007	I-Earth curriculum development, Stanford
2006-2007	SES Environmental Earth Science Major Curriculum Development, Stanford
2005-2007	Stanford Institute of the Environment - Education Committee, Stanford
2005-2007	Stanford Institute of the Environment - Outreach Committee, Stanford
2005-2007	Teachers of a New Era - Science Discussion Group, Stanford
2005-2007	Panelist - Advice for New Faculty Members Workshop, Stanford
2004-2007	Hass Center Advisory Board, Stanford
2004-2007	Institute for Research on Women and Gender Faculty Committee, Stanford
2004-2007	Academic Advisor for 7 Undergraduate Students in G&ES and ES, Stanford
2003-2007	Ph.D. Committees of 19 Graduate Students, Stanford
2001-2007	Sophomore and Freshmen Adviser (12 advisees, Stanford)
2000-2007	Earth Systems Advisory Board, Stanford
2005	Dean of Admissions Search Committee, Stanford University
2005	School of Earth Science Outreach Coordinator Search Committee, Stanford
2005	Panelists - Science for Students in Humanities or Social Science, Stanford
2004-2005	Inter Disciplinary Program in Earth Sciences Committee, Stanford
2003-2005	Provost Committee for Outreach, Stanford University
2004	Natural Sciences IPER Curriculum Development Committee, Stanford
2004	Graduate Student Funding and Space Committee, Stanford

1999-2004	Ocean Margin Curriculum Development, Stanford
1999-2003	Science/Engineering Teaching Discussion Group, Stanford
2002	Diversity and Mentoring Committee, Stanford
2001-2002	G&ES Undergraduate Program Committee, Stanford
2000	G&ES Infrastructure Committee, Stanford

## SELECT PROFESSIONAL ACTIVITIES

2022-Present	EGU Award Committee
2021-Present	Science Innovation Award Committee, EAG
2020-Present	AGU Fellows Selection Committee
2020-Present	AAAS Section Election Nomination Committee
2018-Present	European Research Council – Advance Proposals Evaluator
2016-Present	European Research Council – Consolidator Proposals Evaluator
2015-Present	Editor G <sup>3</sup>
2019-Present	Editor Marine Geology
2019-Present	Editorial Board - Marine Chemistry
2019-Present	Co-Director Urbino Summer School in Paleooceanography
2018-Present	Coordinator – LOREX Limnology and Oceanography Research Exchange
2021	Evaluation of Severo Ochoa Centres of Excellence and María de Maeztu Units of Excellence Programm
2020	Co-Chair Science Program Goldschmidt 2020, Hawaii
2020	AGU-JpGU joint meeting organizing committee
2003-2019	Associate Editor - Marine Chemistry
2018	Organizing Committee – Goldschmidt 2018, Boston
2018	Expert Team of Evaluators, la Caixa, Spain
2018	External Reviewer – Marine Isotope Geochemistry, Stockholm University
2018	Evaluation Committee, Council of Higher Education, Israel – Ocean Science
2018	Advisory Board American Geophysical Union Education Programs
2018-2021	Award & Fellows Committee American and European Geochemical Societies
2018-2022	Scientific Advisory Board – GEOMAR, Kiel, Germany
2017	Reviewer Clusters of Excellence, German Research Foundation
2017	Organizing Committee – Goldschmidt 2017, Paris
2016	Ocean Science Meeting Co-Chair
2015	Horizon2020 – BASELiNE Earth invited instructor
2010-2015	COSINE and California COSEE – Advisory Board
2006-2014	Associate Editor – Limnology and Oceanography Methods
2014	AGU Meeting Program Committee
2014	Gordon Research Conference Ocean Global Change Biology - Organizer
2014	Goldschmidt 2014 – Scientific Program Committee Co-Chair
2013-2016	AGU Geochemistry Ocean Science Section Secretary
2013	Review Committee – GEOMAR Helmholtz Center for Ocean Research
2012	Local Organizing Committee – Oceans in a High CO <sub>2</sub> World Meeting
2011	Climate Change & Corals Working Group – Consensus Statement
2010	Site Review Committee - NSF Center for Multiscale Modeling of Atmospheric Processes (CMMAP)
2011	Elkhorn Slough National Estuarine Research Reserve – Technical Advisor

2009-2010 American Society Limnology & Oceanography – Program Committee  
 2004 CHRONOS - Geochemical Cycles - NSF Workshop, Invited Participant  
 2001-2004 Elected Geochemical Society Program Committee Representative  
 2002 Program Committee, Spring AGU, Washington DC.  
 2000 Chair Discussion Group on the future of geochemistry in post 2003 drilling

### **SELECT OUTREACH AND EDUCATION ACTIVITIES**

2020-Present SWIMS (Society of Women In Marine Sciences) mentor  
 2018-Present Community of Expert (CoEX) of the ESF-Science Connect  
 2017-Present Skype a Scientist – Participants (matched with 3 teachers)  
 2015-Present AWG Distinguished Lecture Program  
 2014-Present Early Career Program Coordinator – Goldschmidt meetings  
 2020 JpGU – Early Career Workshops  
 2019 Lead Scientist - Region 5 CA Environmental Phenomena Summit  
 2019 AGU Centennial Workshop – Effective Strategies for Teaching Data Literacy  
 2018 American Geophysical Union Education Programs Advisory Board  
 2017 National Geographic Young Explorer Mentor  
 2016 Early Career Program Coordinator – Ocean Science meeting 2016  
 2014-2018 Community College Research Internship (CC-RISE) - Coordinator  
 2000-2014 High School Summer Internship - Founder and Coordinator  
 2000-2010 GeoKids Program – Founder and Coordinator  
 2015 Invited Keynote - Chemical Oceanography Gordon Research Seminar  
 2015 GEODES – Careers in Earth Science Panelist  
 2014 Student and Early Career Program Coordinator Goldschmidt 2014  
 2014 Presenter at Teacher workshops at UCB and MBARI  
 2013 Mentor for minority students and young scientists ASLO 2013  
 2012 Mentoring Committee - International Symposium on the Ocean in a High CO<sub>2</sub>  
 2012 Mentor DISCCRS VII Symposium  
 2011 SACNAS – Conference judge and Community Day activity organizer  
 2011-2012 Coordinator – “YO” Residency Summer Camp for High School Students  
 2010-2019 Expanding your Horizon – Workshops coordinator and presenter  
 2010 Kids Science Challenge, “Water Scientist” participant  
 2009-2010 Ocean Literacy Scope and Sequence Science Reviewer and Advisor  
 2008 Featured “Pulse of the Planet” (KQED) – www.pulseplanet.com  
 2003-2007 Mentoring Co-Chair American Women in Science Association  
 2007 Moderator - Getting Results: The Next Generation of Women Scientists  
 2005 Invited NSF- Sponsored Workshop on Outreach and Education  
 2004 Excite - Science Camp for Middle School Girls - Workshop Coordinator  
 2003 Santa Clara High School GAINS. The Success of Women in Science  
 2003 Workshop Coordinator - Sally Ride Science Festival

### **SELECT TALKS, WORKSHOPS, AND PRESENTATIONS (last 7 years only)**

2022 Invited Presentation at Seminars and Meetings – University of Texas at Austin; Bodega Bay Marine Laboratories; ASLO Ocean Science Meeting, Virtual; Joint Aquatic Sciences Meeting (JASM), Michigan; Gordon Research

- Conference, Marine Biogeochemistry, Barcelona, Spain; European Geophysical Union, Vienna; Marine Biogeochemistry Short Course CCMAR, Portugal; JpGU-AGU Tokyo, Japan; Goldschmidt2022, Hawaii; Presenter Wildlands summer field course program.
- 2021 Invited Presentation at Seminars and Meetings – Arizona State University; Seymour Center LabSide Chats; Scripps Institute of Oceanography; Florida State University; Marine Biogeochemistry Short Course CCMAR, Portugal, JpGU-AGU Tokyo, Japan; Goldschmidt2021, Lyon, University of Florida, AGU2021 NOLA.
- 2020 Invited Presentation at Seminars and Meetings – Harvard University; University of Wisconsin Maddison; Texas A&M; Ocean Science meeting San Diego; IPMA Lisbon, Biogeochemistry Workshop, Faro, Portugal; JpGU-AGU Tokyo, Japan, The Sustainability Research & Innovation Congress, Brisbane Australia; Goldschmidt2020 Geochemistry and Society Theme chair; USAID-sponsored Center of Excellence for Water Communicating Science to the General Public webinar; Northern Kentucky University.
- 2019 Invited Presentation at Seminars and Meetings – NSF: Best practices in International Graduate Student Research Experience; ASLO Meeting Puerto Rico Session and Workshop Chair; UC Berkeley Isotope Group seminar; Yale earth Science Seminar; GFDL Princeton seminar; Helmholtz-Zentrum Potsdam, Germany; Universidade de São Paulo, Sao Paulo, Brazil; JpGU Japan session convener and invited speaker; Dalhousie University, Canada; Umea University Sweden; University of Iceland; USSP instructor Urbino; Goldschmidt Barcelona; BlueCityLab Rotterdam; Panel Presenter World Water Day 2019; Fall 2019 John and Mary Louise Riley Seminar Series, Bodega Bay UC Davis; Geological Institute Paraná University, Brazil, Indian Institute of Science, Bangalore, UC Davis Earth Science.
- 2018 Invited Presentation at Seminars and Meetings – Biogeochemistry Endowed Lecture Goldschmidt; UC Irvine; University of Arizona; Penn-State University; JpGU, Tokyo Japan; ASLO Portland; Instructor Marine Biogeochemistry Workshop, Faro, Portugal; Keynote Speaker Goldschmidt Boston; Discussion Leader Gordon Conference Biogeochemistry, Hong Kong; Instructor Urbino Paleoceanography Summer School; Montefeltro Medal Lecture, Cioppino Conference, Urbino; Oxford University UK; Cambridge University UK; London Paleoclimate Network Meeting; University of Southampton UK; Bristol University UK; Humboldt State University, Earth and Space Sciences Digital Teaching Network workshop
- 2017 Invited Presentation at Seminars and Meetings – Keynote Speaker Inaugural Dorothy Hill Women in Earth Science Symposium; Syracuse University; University of Sao Paulo, Brazil; Aquatic Sciences meeting Hawaii; JpGU-AGU joint meeting, Chiba, Japan; Goldschmidt 2017; Ber-Sheva, Ben Gurion University; Biology Seminar University of Southern California; 2017 Kritzler lecturer at Ohio Northern University (ONU); Pomona College; Reviewer Clusters of Excellence, German Research Foundation; Lecturer Summer School Urbino; Review Panel NIH Coastal Health; AGU Invited speaker.

- 2016 Invited Presentation at Seminars and Meetings – Ocean Science Meeting New Orleans, University of Cape Town South Africa, University of Toronto, UC Riverside, Kyoto University Japan, Université de Toliara, Madagascar, Cornell-Gladstone-Hanlon-Kaufmann distinguished lecture, Come Aboard – DISCO keynote lecture, ERC Consolidator Grant Review panel, AGU San Francisco, invited speaker.
- 2015 Invited Presentation at Seminars and Meetings – Rutgers University, LDEO, Hebrew University, Haifa University, Ben Gurion University, Weizmann Institute, ASLO Granada, Goldschmidt Conference Keynote, Ocean Science UCSC, AGU - Invited, Gordon Research Conference, OCB meeting WHOI - Invited, CSIRO Australia, University of Tasmania, BASELINE Earth Horizon 2020 EU, Workshop Germany, NASA-AMS, European Commission Expert

## PUBLICATIONS

>280 publications, H-index 76, I-10 Index 229, >18,000 citations (Google Scholar).

Papers can be found at <https://paytanlab.sites.ucsc.edu/publications/>

**Peer-Reviewed** - \* indicates a student or post-doc mentored by Paytan

1. **Paytan, A.**, M. Kastner, E.E. Martin, J.D. Macdougall and T. Herbert. 1993. Marine barite as a monitor of seawater strontium isotope composition. *Nature* 366: 445-449.
2. Martin, E.E., J.D. Macdougall, T.D. Herbert, **A. Paytan** and M. Kastner. 1995. Strontium and neodymium isotopic analyses of marine barite separates, *Geochim. Cosmochim. Acta*, 59, 1353-1361.
3. **Paytan, A.** and M. Kastner. 1996. Benthic Ba fluxes in the central equatorial Pacific, implications for the oceanic Ba cycle. *Earth Planet. Sci. Lett.* 142: 439-450.
4. **Paytan, A.**, M. Kastner, and F. Chavez. 1996. Glacial to interglacial fluctuations in productivity in the equatorial Pacific as indicated by marine barite. *Science* 274: 1355-1357.
5. **Paytan, A.**, W.S. Moore, and M. Kastner. 1996. Sedimentation rate as determined by <sup>226</sup>Ra activity in marine barite. *Geochim. Cosmochim. Acta* 60: 4313-4319.
6. **Paytan, A.**, M. Kastner, D. Campbell, and M.H. Thiemens. 1998. Sulfur isotope composition of Cenozoic seawater sulfate. *Science* 282: 1459-1462.
7. Martinez-Ruiz, F., M. Kastner, **A. Paytan**, M. Ortega-Huertas. and S.M. Bernasconi. 2000. Geochemical evidence for enhanced productivity during S1 sapropel deposition in the eastern Mediterranean. *Paleoceanography* 15: 200-209.
8. **Paytan, A.** and K. Arrigo. 2000. The sulfur-isotopic composition of Cenozoic seawater sulfate: Implications for pyrite burial and atmospheric oxygen. *International Geology Review* 42: 491-498.
9. **Paytan, A.** 2000. Sulfate clues for the early history of atmospheric oxygen. *Science* 288: 626-627.
10. **Paytan, A.**, Y. Kolodny, A. Neori, and B. Luz. 2002. Rapid biologically mediated oxygen isotope exchange between water and phosphate. *Global Biogeochemical Cycles* 16: 1-7.
11. **Paytan, A.**, S. \*Mearon, K. Cob and M. Kastner. 2002. Origin of marine barite deposits: Sr and S isotope characterization. *Geology* 30: 747-750.



12. \*Porder, S., **A. Paytan**, and E. A. Hadly. 2003. Mapping the origin of faunal assemblages using strontium isotopes. *Paleobiology* 29: 197-204.
13. \*Mearon, S., **A. Paytan**, and T.J. Bralower. 2003. Cretaceous strontium isotope stratigraphy using marine barite. *Geology* 31: 1518.
14. \*Averyt, K. B., **A. Paytan**, and G. Li. 2003. A precise, high-throughput method for determining Sr/Ca, Sr/Ba, and Ca/Ba ratios of marine barite: Implications for reconstructing seawater Sr and Ca concentrations. *Geochemistry, Geophysics, Geosystems*, 4: 1039.
15. \*Averyt, K. B. and **A. Paytan**. 2003. Empirical partition coefficients for Sr and Ca in marine barite: Implications for reconstructing seawater Sr and Ca concentrations. *Geochemistry, Geophysics, Geosystems* 4: 1043.
16. **Paytan, A.**, B.J. \*Cade-Menun, K. \*McLaughlin and K.L. \*Faul. 2003. Selective phosphorus regeneration of sinking marine particles: evidence from 31P-NMR. *Virtual Journal of Geobiology* 2(6). Available at <http://earth.elsevier.com/geobiology/>.
17. \*Eagle, M., **A. Paytan**, K. R. Arrigo, G. van Dijken, and R. W. Murray. 2003. A comparison between excess barium and barite as indicators of carbon export. *Paleoceanography* 18(0), doi: 10.1029/2002PA000793.
18. González-Muñoz, M.T., B. Fernández-Luque, F. Martínez-Ruiz, K.B. Chekroun, J.M. Arias, M. Rodríguez-Gallego, M. Martínez-Cañamero, C. de Linares, and **A. Paytan**. 2003. Precipitation of barite by *Myxococcus xanthus*: Possible implications for the biogeochemical cycle of barium. *Applied and Environmental Microbiology* 69(9): 5722-5725.
19. Martínez-Ruiz, F., **A. Paytan**, M. Kastner, J. M. González-Donoso, D. Linares, S. M. Bernasconi, and F. J. Jimenez-Espejo. 2003. A comparative study of the geochemical and mineralogical characteristics of the sapropel in the western and eastern Mediterranean. *Palaeogeography, Palaeoclimatology, Palaeoecology* 190: 23-37.
20. **Paytan, A.**, B., \*Cade-Menun, K. \*McLaughlin and K.L. \*Faul. 2003. Selective phosphorus regeneration of sinking marine particles: Evidence from 31P-NMR. *Marine Chemistry* 82: 55-70.
21. Kurtz, A.C., L.R. Kump, M.A. Arthur, J.C. Zachos, and **A. Paytan**. 2004. Early Cenozoic decoupling of the global carbon and sulfur cycles. *Paleoceanography* 18(4) 1090, 10.1029/2003PA000908.
22. \*Porder, S., **A. Paytan**, and P.M. Vitousek. 2004. Erosion and landscape development affect plant nutrient status in the Hawaiian Islands. *Oecologia* 142: 440-449.
23. **Paytan, A.**, M. Lyle, A. Mix, and Z. Chase. 2004. Climatically driven changes in oceanic processes throughout the equatorial Pacific. *Paleoceanography* 19: 4017-4023.
24. Boehm, A.B., G.G. \*Shellenbarger and **A. Paytan**. 2004. Groundwater discharge: Potential association with fecal indicator bacteria in the surf zone. *Environmental Science and Technology* 38: 3558-3566, DOI 10.1021/es035385a.
25. \*Gonneea, M.E., **A. Paytan**, and J.A. Herrera-Silveira. 2004. Tracing organic matter sources and carbon burial in mangrove sediments over the past 160 years. *Estuarine, Coastal and Shelf Science* 61: 211-227.

26. \*Street, J. and **A. Paytan**. 2004. Iron, phytoplankton growth, and the carbon cycle. In *Metal Ions in Biological Systems* (Sigel, A, H. Sigel and R.K.O Sigel, Eds.). Volume 43 Biogeochemical Cycles of Elements, 153-185.
27. \*Averyt, K.B. and **A. Paytan**. 2004. A comparison of multiple proxies for export production in the equatorial Pacific. *Paleoceanography* 19: PA4003.
28. \*McLaughlin K, S. Silva, C. Kendall, H. Stuart-Williams, and **A. Paytan**. 2004. A precise method for the analysis of  $\delta^{18}\text{O}$  of dissolve inorganic phosphate in seawater. *Limnology and Oceanography Methods* 2: 202-212
29. **Paytan, A.**, A. Boehm, and G. \*Shellenbarger. 2004. Bacterial contamination and submarine groundwater discharge - A possible link. *Environmental Chemistry I*: 1-2.
30. **Paytan, A.**, F. Martínez-Ruiz, M. \*Eagle, A. \*Ivy, and S.D. \*Wankel. 2004. Using sulfur isotopes to elucidate the origin of barite associated with high organic matter accumulation events in marine sediments. In *Sulfur biogeochemistry - Past and Present* (Amend, J.P., K.J. Edwards, and T.W. Lyons, Eds.). GSA Special Paper 379, 151-160.
31. **Paytan, A.**, M. Kastner, D. \*Campbell, and M.H. Thiemens. 2004. Seawater sulfur isotope fluctuations in the Cretaceous. *Science* 304: 1663-1665.
32. \*Cade-Menun B. J., C.R. Benitez-Nelson, P. Pellechia, and **A. Paytan**. 2005. Refining phosphorus-31 nuclear magnetic resonance spectroscopy for marine particulate samples: storage conditions and extraction recovery. *Marine Chemistry* 97: 293-306.
33. Lyle, M., N. Mitchell, N. Pisiás, A. Mix, I. Martinez, and **A. Paytan**. 2005. Do geochemical estimates of sediment focusing pass the sediment test in the equatorial Pacific? *Paleoceanography* 20: PA1005.
34. \*Averyt, K.B., M. \*Calhoun, L. \*Schmalz, and **A. Paytan**. 2005. Data report: Carbonate and barite trends across the Eocene/Oligocene boundary at Shatsky Rise, ODP Leg 198. In *Proc. ODP, Sci. Results* (Bralower, T.J., P.I. Silva, and M.J. Malone, Eds.), 198.
35. \*Faul, K.L., and **Paytan, A.**, 2005. Phosphorus and barite concentrations and geochemistry in Site 1221 Paleocene/Eocene boundary sediments. In *Proc. ODP, Sci. Results*, (Wilson, P.A., Lyle, M., and Firth, J.V. Eds.), 199.
36. \*Faul, K.L., **A. Paytan**, and M. L. Delaney. 2005. Phosphorus distribution in sinking organic particulate matter. *Marine Chemistry* 97: 307-333.
37. \*Young, M., M.E. \*Gonneea, J. Herrera-Silveira, and **A. Paytan**. 2005. Export of dissolved and particulate carbon and nitrogen from a mangrove-dominated lagoon, Yucatan Peninsula, Mexico. *International Journal of Ecology and Environmental Sciences* 31(3): 189-202.
38. **Paytan, A.**, G.G. \*Shellenbarger, J.H. \*Street, M.E. \*Gonneea, K. \*Davis, M.B. \*Young, and W.S. Moore. 2006. Submarine groundwater discharge: An important source of inorganic nitrogen to coral reef ecosystems. *Limnology and Oceanography* 51: 343-348.
39. \*Nicholson, D., S. Dyrman, F. Chavez, and **A. Paytan**. 2006. Alkaline phosphatase activity in the phytoplankton communities of Monterey Bay and San Francisco Bay. *Limnology and Oceanography* 51: 874-883.

40. \*McLaughlin, K., **A. Paytan**, C. Kendall, and S.R. Silva. 2006. Oxygen isotopes of phosphatic compounds: Application for marine particulate matter, sediments, and soils. *Marine Chemistry* 98: 148-155.
41. Boehm, A., **A. Paytan**, G.G. \*Shellenbarger, and K.A. \*Davis. 2006. Composition and flux of groundwater from a California beach aquifer: Implications for nutrient supply to the surf zone. *Continental Shelf Research* 26: 269-282.
42. \*Gonneea, M.E. and **A. Paytan**. 2006. Phase associations of barium in marine sediments. *Marine Chemistry* 100: 124-135.
43. \*Shellenbarger, G.G., S.G. Monismith, A. Genin, and **A. Paytan**. 2006. The importance of submarine groundwater discharge to the nearshore nutrient supply in the Gulf of Aqaba (Israel). *Limnology and Oceanography* Volume 51: 343-348.
44. \*Hoppe, K.A., **A. Paytan**, and P. Chamberlain. 2006. Reconstructing grassland vegetation and paleotemperatures using carbon isotope ratios of bison tooth enamel. *Geology* Volume 34: 649-652.
45. \*Wankel, S.D., C. Kendall, C.A. Francis, and **A. Paytan**. 2006. Nitrogen sources and cycling in the San Francisco Bay Estuary: A nitrate dual isotopic composition approach. *Limnology and Oceanography*, Volume 51: 1654-1664.
46. \*Wei, Z., M.J. Moldowan, and **A. Paytan**. 2006. Diamondoids and molecular biomarkers generated from modern sediments in the absence and presence of minerals during hydrous pyrolysis. *Organic Geochemistry* Volume 37: 891-911.
47. \*McLaughlin, K., C. Kendall, S.R. Silva, and **A. Paytan**. 2006. Phosphate oxygen isotope ratios as a tracer for sources and cycling of phosphate in North San Francisco Bay, California. *JGR Biogeochemistry*, Volume 111, G03003, doi:10.1029/2005JG000079.
48. Böhm, F., N. Gussone, A. Eisenhauer, W-C. Dullo, S. Reynaud, **A. Paytan**. 2006. Calcium Isotope Fractionation in Modern Scleractinian Corals. *Geochem. Cosmochim. Acta*, 70/17, 4452-4462, DOI: 10.1016/j.gca.2006.06.1546
49. \*McLaughlin, K., F.P. Chavez, J.T. Pennington, and **A. Paytan**. 2006. A time series investigation of the oxygen isotopic composition of dissolved inorganic phosphate in Monterey Bay, California. *Limnology and Oceanography*, Volume 51, 2370-2379, doi: 10.1016/j.ecss.2006.06.030.
50. \*Chen, Y., J. \*Street, and **A. Paytan**. 2006. Comparison between pure-water- and seawater-soluble nutrient concentrations of aerosols from the Gulf of Aqaba. *Marine Chemistry* 101, 141-152.
51. \*Chase, Z., **A. Paytan**, K.S. Johnson, J. \*Street, Y. \*Chen. 2006. Input and cycling of iron in the Gulf of Aqaba, Red Sea. *Global Biogeochemical Cycles* 20, GB3017, doi:10.1029/2005GB002646.
52. \*Handler, N.B., **A. Paytan**, C.P. Higgins, R.G. Luthy, and A.B. Boehm. 2006. Human development is linked to multiple water body impairments along the California coast. *Estuaries and Coasts* 29, 860-870.

53. \*McLaughlin, K., B.J.\* Cade-Menun, and **A. Paytan**. 2006. The oxygen isotopic composition of phosphate in Elkhorn Slough, California: A tracer for phosphate sources. *Estuarine, Coastal and Shelf Science* 70, 499-506. doi: 10.1016/j.ecss.2006.06.030.
54. \*Mackey, K.R.M., R.G.\* Labiosa, M. \*Calhoun, J.H.\* Street, A. Post, and **A. Paytan**. 2007. Phosphorus availability controls phytoplankton community dynamics and taxon specific nutrient status in the Gulf of Aqaba, Red Sea. *Limnology and Oceanography* Volume 52, 873-885.
55. \*Averyt, K.B., and **A. Paytan**. 2007. Reply to Comment on “Empirical partition coefficients for Sr and Ca in marine barite: Implications for reconstructing seawater Sr and Ca concentrations”. *Geochemistry, Geophysics, Geosystems*, 8, Q01009, doi:10.1029/2006GC001494.
56. **Paytan, A.** and K. \*McLaughlin. 2007. The Oceanic Phosphorus Cycle. *Chemical Reviews*, 107, 563-576.
57. Lyle, M.N., N. Pisias, **A. Paytan**, I. Martinez, and A. Mix. 2007. Reply to the comment by R. Francois et al. on “Do geochemical estimates of sediment focusing pass the sediment test in the Equatorial Pacific?”: Further explorations of <sup>230</sup>Th normalization. *Paleoceanography*, 22, PA1217, doi:10.1029/2006PA001373.
58. Jiménez-Espejo, F.J., F. Martínez-Ruiz, **A. Paytan**, T. Sakamoto, M. Ortega-Huertas, G. Finlayson, K. Iijima, D. Gallego-Torres and D. Fa. 2007. Climate forcing and Neanderthal extinction in Southern Iberia: insights from a multiproxy marine record. *Journal of Quaternary Science Reviews*. 10.1016/j.quascirev.2006.12.013.
59. \*Chen, Y., S.\* Mills, J. Street, D. Golan, A. Post, M. Jacobson and **A. Paytan**. 2007. Atmospheric nutrient concentrations and dry deposition fluxes in the Gulf of Aqaba. *JGR Atmospheres*, 112, Do4309, doi:10.1029/2006JD007858.
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### Peer-Reviewed Invited Publications

1. De La Rocha, C.L. and **A. Paytan.** 2005. Directions in the study of ocean chemistry over the Phanerozoic and its links to geological processes. *Marine Geology* 217: 193-197.
2. \*Yao W., U. Wortmann, **A. Paytan.** 2019. Sulfur isotopes—Use for stratigraphy during times of rapid perturbations. In: Case Studies in Isotope Stratigraphy, Volume 4, 1<sup>st</sup> Edition, Ed: Michael Montenari, Academic Press, **ISBN: [9780128175521](https://doi.org/10.1016/j.epsl.2021.117320)**.

### Non-Reviewed

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- 13 Cochrane, K., Hobday, A., Gasalla, M., Salim, S., **A. Paytan.**, Popoya, K., Razafindrainibe, H. 2018. Reducing vulnerability of marine-dependent coastal communities to climate change. Global understanding and learning for local solutions (GULLS) Brochure. For further information, publications and details on figures, visit <http://www.marinehotspots.org/index.php/featured-projects/gulls>.
- 14 Paytan et al. [The Waste FEW ULL Project \(2022\). Searching for inefficiencies in the food-energy-water nexus. Research Features Earth & Environment; www.researchfeatures.com.](http://www.researchfeatures.com)