



## Rob Dunbar

W.M. Keck Professor in the School of Earth Sciences, Professor of Oceans, of Earth System Science and Senior Fellow at the Woods Institute for the Environment

 Curriculum Vitae available Online

### Bio

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#### BIO

My research and teaching interests include Climate Dynamics, Oceanography, Marine Ecology, and Biogeochemistry. I am interested in environmental policy directed towards problem-solving. My research group studies global environmental change with a focus on air-sea interactions, tropical marine ecosystems, polar climate, and biogeochemistry. In October, 2001, I became the founding director of the Interdisciplinary Graduate Program in Environment and Resources (now E-IPER), a position I maintained until 2005. In January, 2003, I was appointed the Victoria P. and Roger W. Sant Director of the Earth Systems Program, the largest undergraduate and co-terminal masters program in the School of Earth Sciences, an appointment that ran through 2012. In January, 2004, I was named the J. Frederick and Elisabeth B. Weintz University Fellow in Undergraduate Education in recognition of teaching and mentoring of Stanford undergraduate students. I was awarded the William M. Keck Professorship in 2008, the same year that I moved from the Department of Geological and Environmental Sciences to the newly created Department of Environmental Earth System Science. In 2009, I was elected as a Trustee for the Consortium for Ocean Leadership in Washington D.C. where I am active in promoting the Integrated Ocean Drilling Program and the Ocean Observatories Initiative. I am currently serving as the Chairperson of OL's Board of Trustees. In 2004 I helped start the Palmyra Atoll Research Consortium (PARC) to promote research and conservation of Pacific coral reefs.

#### ACADEMIC APPOINTMENTS

- Professor, Oceans
- Professor, Earth System Science
- Senior Fellow, Stanford Woods Institute for the Environment
- Member, Bio-X
- Faculty Affiliate, Institute for Human-Centered Artificial Intelligence (HAI)
- Senior Fellow, Stanford Woods Institute for the Environment

#### ADMINISTRATIVE APPOINTMENTS

- Lecturer in Earth Sciences, University of California, San Diego, (1979-1980)
- Visiting Assistant Professor of Earth Sciences, University of California, San Diego, (1981-1982)
- Assistant/Associate Professor of Geology, Rice University, (1982-1994)
- Visiting Research Fellow, School of Earth Sciences, Victoria University of Wellington, New Zealand, (1988-1988)
- Visiting Scientist, Geology Department, University of New Mexico, Albuquerque, New Mexico, (1988-1988)
- Master of Baker College, Rice University, (1989-1994)
- Visiting Scientist, National Geophysical Data Center, (1994-1996)
- Professor of Geology and Geophysics, Rice University, (1994-1997)

- Adjunct Professor of Geology and Geophysics, Rice University, (1997-2004)
- Professor of Geological and Environmental Sciences, Stanford University, (1997-2007)
- Senior Fellow Freeman Spogli Institute of International Studies, Stanford University, (1998-2010)
- Associate Chair, Geological and Environmental Sciences, Stanford University, (2000-2004)
- Founding Director, Interdisciplinary Graduate Program in Environment and Resources, Stanford University, (2001-2005)
- Victoria P. and Roger W. Sant Director of the Earth Systems Program, Stanford University, (2003-2012)
- J. Frederick and Elisabeth B. Weintz University Fellow in Undergraduate Education, Stanford University, (2004- present)
- Senior Fellow, Woods Institute for the Environment, Stanford University, (2004- present)
- Professor of Environmental Earth System Science, Stanford University, (2007- present)
- W.M. Keck Sr. Professor of Earth Sciences, Stanford University, (2008- present)
- Trustee, Consortium for Ocean Leadership, (2009- present)
- Adjunct Professor Victoria, University of Wellington, New Zealand, (2010- present)
- Chairman of the Board of Trustees, Consortium for Ocean Leadership, (2013- present)

## **HONORS AND AWARDS**

- Antarctic Service Medal, The United States of America (1988)
- Best Paper Award, Coral Reefs Journal, 1995, International Society for Reef Studies (1996)
- S.T. Lee Lecturer in Antarctic Studies, Victoria University of Wellington, New Zealand (2003)
- J. Frederick and Elisabeth Brewer Weintz University Fellowship, Stanford University (2004)
- W.M. Keck Sr. Professorship in Earth Sciences, Stanford University (2008)
- Richard W. Lyman Award, Stanford University (2009)
- TED Speaker, TED (Technology, Entertainment, Design) (2010)
- SCAR Medal for Excellence in Antarctic Research, Scientific Committee for Antarctic Research (2016)

## **BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS**

- Participant and Writer, Scientific Committee on Antarctic Research Horizon Scan (2014 - present)
- Chair, Board of Trustees, Consortium for Ocean Leadership (2013 - present)
- Committee Member, NAS/NRC Panel on "Future Science Opportunities in the Antarctic and Southern Ocean" (2013 - present)
- Member, Audit Committee, Consortium for Ocean Leadership (2013 - present)
- Invited Speaker, NASA/GISS (2013 - 2013)
- Re-elected to Board of Trustees, Consortium for Ocean Leadership (2012 - present)
- U.S. Member, Science Implementation and Planning Committee, (SIPCOM), Intergated Ocean Drilling Program (2012 - 2014)
- Co-Leader, GSA/UT Austin Geologic Field Trip to Antarctica (2012 - 2013)
- Invited Plenary Speaker, 5th Scientific Committee on Antarctic Research Open Sciences Conference (2012 - 2012)
- Invited participant, US-Korean-Italian Workshop on Time Series Observation in the Ross Sea, Incheon, Korea (2012 - 2012)
- Invited speaker, SETI Institute (2012 - 2012)
- Keynote speaker, Ecopoesis Conference, California College of the Arts (2012 - 2012)
- Keynote speaker, UC Davis Graduate Ecology Symposium (2012 - 2012)
- Member, Past Antarctic Ice Sheet Dynamics (PAIS) development team, Scientific Committee on Antarctic Research (2012 - 2012)
- Member, Coral Reefs and Climate Change Working Group, Center for Ocean Solutions (2011 - present)

- Member, HOLOCLIP project team, European Union (2011 - present)
- Mentor, Jefferson High School Science Teacher, NASA Mentoring Program, Stanford University (2011 - present)
- Chair, Public Policy Committee, Consortium for Ocean Leadership (2011 - 2013)
- Member, Committee on Undergraduate Standards and Policy (C-USP), Stanford University (2011 - 2013)
- Member, Faculty Search Committee for an appointment to “The Douglas Chair”, Stanford University (2011 - 2013)
- Vice-Chair, Board of Trustees, Consortium for Ocean Leadership (2011 - 2013)
- Coordinator, EESS weekly seminar series for Spring, 2012, Stanford University (2011 - 2012)
- Invited Speaker, Northern Illinois University, Livermore Valley Association, Kennedy Middle School (2011 - 2011)
- Session Chair and Keynote Speaker, International Symposium on Antarctic Earth Sciences, Edinburgh (2011 - 2011)
- U.S. Member, Science Planning Committee (SPC), Intergated Ocean Drilling Program (2011 - 2011)
- Member, Working Group on Sea Level Rise and the Pacific Small Island and Developing States, Earth Justice and U.N. Foundation (2010 - present)
- Member, Sample Allocation Committee, IODP Expedition 318 (2010 - present)
- Member, Vice-Provost’s “critical engagement” focus group, Stanford University (2010 - present)
- Chair, Scientific Ocean Drilling Subcommittee, Consortium for Ocean Leadership (2010 - 2013)
- Member, Advisory Board, Haas Center for Public Service, Stanford University (2010 - 2013)
- Member, Freshman and Sophomore Programs Advisory Committee, Stanford University (2010 - 2013)
- Chair, NSF-UNOLS Polar Research Vessel Committee (2010 - 2012)
- Member, New Ship Acquisition and Funding Committee, Consortium for Ocean Leadership (2010 - 2012)
- Mentor of Middle School Science Teacher through NASA Mentoring Program, Stanford University (2010 - 2011)
- Invited Participant, US-Italian Workshop on Time Series Observation in the Ross Sea, Ischia Italy (2010 - 2010)
- Invited Speaker, Victoria University of Wellington, New Zealand, Los Altos Earth Day Event, Bohemian Grove, Steve Schneider Symposium (Monterey), Cal Academy of Arts and Sciences, Ocean Leadership (DC) (2010 - 2010)
- Invited Speaker, TED Mission Blue (2010 - 2010)
- Member, Visiting Review Committee, Ocean Sciences Program, Texas A&M University, Corpus Christi (2010 - 2010)
- Presenter, Woods Institute, Oceans Salon, California Academy of Sciences (2010 - 2010)
- Trustee, Trustee, Consortium for Ocean Leadership (2009 - present)
- Member, Committee of Visitors evaluating Office of Polar Programs at the US National Science Foundation (2009 - 2010)
- Member, Committee of Visitors, Public evaluation of effectiveness of Office of Polar Research, US National Science Foundation (2009 - 2010)
- Member, External Revue Panel, Department of Marine Sciences, University of Otago, Dunedin, New Zealand (2009 - 2010)
- Member, Faculty Search Committee for Director of Center for Ocean Solutions, Stanford University (2009 - 2010)
- Invited Lecturer, Stanford University, IAEA ENSO Workshop, Lima , Peru, ACE Science Conference, Granada, Spain, ANDRILL Workshop, Wellington, New Zealand, SF Exploratorium, Stanford Club of Monterey (2009 - 2009)
- Invited Participant, INVEST Workshop on the Future of Ocean Drilling (2009 - 2009)
- Member, Program Committee, Antarctic Climate Evolution Conference, Granada, Spain (2009 - 2009)
- Member, Visiting Review Committee, Oceanography Department, Texas A&M University, College Station, Texas (2009 - 2009)
- Member, Visiting Review Committee, Department of Marine Sciences, University of Otago, Dunedin, New Zealand (2009 - 2009)
- Participant, McMurdo Ice Shelf Drilling Project Workshop, Wellington, New Zealand (2009 - 2009)
- Speaker, Oceans Forum, Copenhagen Conference on Climate Change (COP-15) (2009 - 2009)
- Chair, Palmyra Atoll Research Consortium Finance Committee (2008 - present)
- Member, Center for Ocean Solutions Management Committee (2008 - present)

- Proponent and Shipboard Participant, Integrative Ocean Drilling Program Expedition 318 to Antarctica (2008 - present)
- Member, Y2E2 Building Management Committee, Stanford University (2008 - 2012)
- Member, Faculty Search Committee in area of Chemical Oceanography, Stanford University (2008 - 2010)
- Member, External Revue Panel, College of Geoscience, Oceanography Department Texas A&M University (2008 - 2009)
- Invited Lecturer, Stanford University, for Stanford Development Office (events in NYC and LA), San Francisco State University, British Antarctic Survey, SCAR-OSC, St. Petersburg, Russia (2008 - 2008)
- Invited Speaker Stanford Admit Weekend, Stanford University (2008 - 2008)
- Invited Speaker, Stanford Parents Day, Stanford University (2008 - 2008)
- Peer Review Team Member, Department of Oceanography, Texas A&M University (2008 - 2008)
- Stanford representative, Consortium for Ocean Leadership (2007 - present)
- Member, Program Committee, 2008 SCAR Open Sciences Congress, St. Petersburg (2007 - 2008)
- Chief Scientist, Deep Sea Coral Collection by Submersibles, RV KOK, Pisces V 2007 | Leader, Coral Coring expedition to Palmyra (2007 - 2007)
- Co-Chief Scientist, Stanford@SEA, RV Robert Seamans (2007 - 2007)
- Expert Panelist, Site visit for Foundation for Research, Science, and Technology review of Crown Research Institutes, New Zealand (2007 - 2007)
- Invited Lecturer, University of Toronto, The Nature Conservancy, Australian National University, Stanford University (2007 - 2007)
- Invited Speaker, Stanford Homecoming (2007 - 2007)
- Invited Speaker, Stanford Admit Weekend, Stanford University (2007 - 2007)
- Member, Woods Institute Research Committee (2007 - 2007)
- Participant, Southern McMurdo Sound ANDRILL Project (2007 - 2007)
- Invited Speaker, Stanford Parents Day, Stanford University (2006 - 2007)
- Member, Search Committee for a faculty hire in Physical Oceanography, Stanford University (2006 - 2007)
- Off-ice designated scientist, ANDRILL McMurdo Ice Shelf Project (2006 - 2007)
- Scientist, Marine Biology, Biogeochemistry, and Ocean Physics, Ross Sea, Antarctica, R/V Nathaniel Palmer (2006 - 2007)
- Faculty Leader, Stanford Travel Study Trip to New Guinea, Stanford University (2006 - 2006)
- Invited Lecturer, U.S. Geological Survey, Hopkins Marine Station, University of Queensland, Australian National University (2006 - 2006)
- Invited Speaker, End of Oil Symposium, Stanford (2006 - 2006)
- Invited Speaker, Stanford Club of San Diego (2006 - 2006)
- Invited Speaker, End of Oil Public Lecture Series, SES, Stanford University (2006 - 2006)
- Keynote Plenary Speaker, SCAR Open Sciences Conference, Hobart, Australia (2006 - 2006)
- Leader, IAEA sampling mission to Raja Ampat archipelago, West Papua, Indonesia (2006 - 2006)
- Leader, Lake coring trip to Lago Fagnano, Tierra del Fuego, Argentina (2006 - 2006)
- Member, American Geophysical Union Program Committee for 2006 Joint Meeting in Baltimore (2006 - 2006)
- Member, Program Committee, 2006 SCAR (Scientific Committee for Antarctic Research) biannual Open Science Conference, Hobart Australia (2006 - 2006)
- Plenary Speaker, SCAR Open Sciences Congress, Hobart (2006 - 2006)
- Scientist, Coral Reef Control Volume Experiment, Heron Island, Australia (2006 - 2006)
- Seminar speaker, Heron Island Marine Station, Australia, and at the University of Queensland, Brisbane, Australia (2006 - 2006)
- Speaker, Stanford Alumni Clubs in San Diego, Los Angeles (2006 - 2006)
- Elected Chair, International Atomic Energy Agency Cooperative Research Project Isotopic Studies of El Nino (2005 - 2014)
- Participant, ANDRILL (Antarctic Drilling) McMurdo Sound Drilling Program (2005 - 2013)
- Co-Chair, Faculty search committee for a new hire in the area of Climate Science, Stanford University (2005 - 2009)

- Chair, Antarctic Research Vessel Oversight Committee (2005 - 2008)
- Member, AGU Program Committee, AGU 2006 Joint Meeting, Baltimore (2005 - 2006)
- Scientist, Marine Biology, Biogeochemistry, and Ocean Physics, Ross Sea, Antarctica, R/V Nathaniel (2005 - 2006)
- Chief Scientist, Deep submersible diving expedition from Samoa to Hawaii (2005 - 2005)
- Co-Chief Scientist, coral coring expedition to Palmyra Atoll, Stanford University (2005 - 2005)
- Faculty Leader, Stanford Travel Study Trip to Antarctica, Stanford University (2005 - 2005)
- Faculty Leader, Stanford Travel Study Trip to Russian Far East, Stanford University (2005 - 2005)
- Invited Participant, East Antarctic Margin Drilling Workshop, Spoleto, Italy (2005 - 2005)
- Invited Speaker, Stanford Club of Wyoming, Stanford Club of Monterey, Stanford Club of Philadelphia (2005 - 2005)
- Invited Testimony, National Academy of Sciences Panel on future U.S. Polar Research Vessel Needs (2005 - 2005)
- Leader, Expedition to Easter Island for coral coring and lake sediment coring (2005 - 2005)
- Co-Chair, Interdisciplinary Grants Committee, Stanford's Institute for the Environment, Stanford University (2004 - 2006)
- Member, Program Committee, 2008 SCAR Open Sciences Congress, Hobart, Australia (2004 - 2006)
- Chair Science Committee, Palmyra Atoll Research Consortium (2004 - 2005)
- Invited Participant, SCAR (Scientific Committee on Antarctic Research) meeting (2004 - 2005)
- Member, Faculty search committee in the area of Paleobiology, Stanford University (2004 - 2005)
- Chief Scientist, Deep submersible diving in the Hawaiian Islands and at Cross Seamount, DSRV Pisces V and RV Kanaloa o Kamaikai (2004 - 2004)
- Faculty Leader, Stanford Travel Study Trip to Alaska, Stanford University (2004 - 2004)
- Invited Participant, SCAR (Scientific Committee on Antarctic Research) meeting, Bremen (2004 - 2004)
- Invited Speaker, Isotopes as climate tracers short course, IAEA, Trieste (2004 - 2004)
- Invited Speaker, International Conference on Isotopes in Environmental Studies, Monaco (2004 - 2004)
- Lecturer, Instituto de Verano, Universidad de Concepcion, Chile (2004 - 2004)
- Member, Palmyra Atoll Consortium Leadership Committee (2003 - present)
- Director, Earth Systems Program, Stanford University (2003 - 2012)
- Faculty Leadership Committee, Stanford Institute for the Environment, Stanford University (2003 - 2009)
- Member, Next Generation Polar Research Vessel Design Committee (2003 - 2008)
- Governor, Joint Oceanographic Institutions, Inc. (2003 - 2007)
- Member, Scheduling Committee, AGU Ocean Sciences Meeting (2003 - 2004)
- Faculty Leader, Stanford Travel Study Trip to Antarctica, Stanford University (2003 - 2003)
- Invited Participant, Scientific Planning Committee, Integrated Ocean Drilling Program transition meeting, Sapporo (2003 - 2003)
- Invited speaker, Holocene Climate Workshop, Eikom, Norway (2003 - 2003)
- Leader, Lake coring team in Patagonia, Stanford University (2003 - 2003)
- Member, Antarctic Research Vessel Oversight Committee (2002 - 2008)
- Member, Scientific Experts Group, IMAGES (2002 - 2008)
- Secretary, Paleoceanography and Paleoclimatology Focus Group, AGU (2002 - 2004)
- Alternate Governor, Joint Oceanographic Institutions (2002 - 2003)
- Chief Scientist, Marine Geology and Geophysics, Antarctic Peninsula, RV L.M. Gould (2002 - 2002)
- Co-convener, IMAGES Southern Ocean Working Group conference, Barcelona, Spain (2002 - 2002)
- Co-convener, IMAGES Southern Ocean Working Group conference II, Barcelona (2002 - 2002)

- Invited Participant, National Science Foundation Earth System History RFP panel, Washington D.C. July (2002 - 2002)
- Invited Participant, Antarctic Climate Evolution Data/Model Integration Workshop, Amherst, MA (2002 - 2002)
- Invited Speaker, Climate Change in the Antarctic Peninsula Workshop, Hamilton, New York (2002 - 2002)
- Invited participant, Conference on U.S. Participation (CUSP) in the Integrated Ocean Drilling Program, Washington D.C. (2002 - 2002)
- Member of review panel, National Science Foundation Integrated Global C cycle (2002 - 2002)
- Member, CEE faculty search committee, Stanford University (2002 - 2002)
- Provost's Lecturer, SUNY Stony Brook (2002 - 2002)
- Scientist, Expedition to Eilat Israel to instrument coral reef for global change studies (2002 - 2002)
- Scientist, Deep submersible diving expedition to the Gulf of Alaska, DSRV Alvin and RV Atlantis (2002 - 2002)
- Director, Interdisciplinary Ph.D. Program in Environment and Resources, Stanford University (2001 - 2005)
- Distinguished Lecture Speaker, Ocean Drilling Program: Portland State University, Columbus State University, SUNY Albany, Duke University, SUNY Stonybrook (2001 - 2002)
- Co-convener, IMAGES Southern Ocean Working Group conference, Bremerhaven, June (2001 - 2001)
- Convener, First ARTS (Annual Records of Tropical Systems) Open Science Meeting, Noumea, New Caledonia, November (2001 - 2001)
- Invited Speaker, ANTOSTRAT symposium, Erice, Italy, September (2001 - 2001)
- Member, Steering Committee, ACE (Antarctic Climate Evolution), a new SCAR project (2001 - 2001)
- Member, American Geophysical Union Paleooceanography and Paleoclimatology Focus Group (2000 - 2008)
- Associate Chair, Geological and Environmental Sciences, Stanford University (2000 - 2004)
- Editor (with Jack Ditullio), American Geophysical Union, Antarctic Research Series monograph on Biogeochemistry of the Ross Sea Shelf (2000 - 2003)
- Member, University Committee on Admissions and Financial Aid, Stanford University (2000 - 2003)
- Elected representative, Academic Senate, Stanford University (2000 - 2002)
- Chief Scientist, PISCO (Paleoenvironmental Investigations of Sediment in the Coastal Ocean), RVIB L.M. Gould, April/May (2000 - 2000)
- Invited Speaker, University of California, Santa Barbara (2 talks); California Institute of Technology; University of California, Berkeley (2 talks), University of Idaho, Joint Global Ocean Flux Study Biogeochemistry Conference in Brest, France (2000 - 2000)
- Invited participant and speaker, International Marine Geosciences Sampling (IMAGES) executive committee meeting, Woods Hole, MA; Shallow Water Drilling Workshop, St. Petersburg, FL; (2000 - 2000)
- Session chair, Paleoclimate (2 sessions) (2000 - 2000)
- Member, Earth Sciences Advisory Council, Stanford University (1999 - 2012)
- Member, Provost's Committee on Environmental Science, Technology and Policy, Stanford University (1999 - 2008)
- Leader, Annual Records of Tropical Systems (International Geosphere Biosphere Program IGBP/PAGES) (1999 - 2003)
- Chair, Ion Microprobe Faculty Search Committee (1999 - 2000)
- Invited Speaker, Gordon Conference on Polar Marine Processes, Ventura; Dean's Seminar Series, School of Earth Sciences, Stanford; Institute for the Study of Planet Earth, University of Arizona, Tuscon; Peninsula Geological Society Seminar Series, Stanford (1999 - 1999)
- Invited participant and speaker, AESOPS Workshop, US Joint Global Ocean Flux Study, Keystone, Colorado, August (1999 - 1999)
- Participant, Marine Geology and Geophysics cruise, Palmer Deep and Antarctic Peninsula, R/V Nathaniel B. Palmer March-April (1999 - 1999)
- Session chair, COMPLEX workshop on the future of Ocean Scientific Drilling, Vancouver, Canada, May (1999 - 1999)
- Academic advisor to 19 Earth Systems students, 3 GES, and 2 IDM undergraduates, Stanford University (1998 - present)
- Chair, Ad-hoc committee on development of Oceans curricular track, Stanford University (1998 - present)
- Director, Stable Isotope Biogeochemistry Lab, Stanford University (1998 - present)
- Member of CESP faculty (Center for Environmental Science and Policy), Stanford University (1998 - 2007)
- Elected alternate representative, electoral unit 2, faculty senate, Stanford University (1998 - 1999)

- Chief Scientist, ROAVERRS (Research on Ocean Atmosphere Variability and Ecosystem Response in the Ross Sea, RVIB N.B. Palmer, October-December, 1998) (1998 - 1998)
- Co-leader, Submerged coral drilling, Galapagos Islands, RV Samba, June, 1998 (1998 - 1998)
- Invited Speaker, American Quaternary Association Annual Meeting, Puerto Vallarta, Mexico; American Geophysical Union/American Society Limnology and Oceanography biennial meeting, San Diego; EastFest '98, Stanford; Stanford Parents Day Lectures; ENRON Corp (1998 - 1998)
- Invited participant, PAGES Open Sciences Meeting, London; Sclerosponges as Paleoclimate indicators workshop, Miami (1998 - 1998)
- Session organizer and chair, History of El Nio, PAGES Pole-Equator-Pole Americas Transect Workshop, Merida, Venezuela (1998 - 1998)
- Lead adviser to 24 M.S. or Ph.D. students, Stanford University (1997 - present)
- Earth Systems Program Steering Committee, Stanford University (1997 - 2012)
- Graduate Student Admissions Committee, G&ES, Stanford University (1997 - 2000)
- Executive Committee member, USSAC, the U.S. National Committee for Ocean Drilling (1997 - 1999)
- Consulting member, search committee, New sedimentology faculty, Lehigh University (1997 - 1998)
- Member, Oceans Faculty Search Committee, SES, Stanford University (1997 - 1998)
- Chief Scientist Positions, ROAVERRS (Research on Ocean-Atmosphere Variability and Ecosystem Response in the Ross Sea), RVIB Palmer; Lake Titicaca piston coring, RV Neecho, May, 1997; Submersible Diving off Hawaii, RV Kaimikai O Kanaloa, DSRV Pisces V, Au (1997 - 1997)
- Invited lecturer, Geophysical Fluid Dynamics Laboratory, Princeton; Princeton University, Department of Geology; Department of Mathematics and Applied Statistics, Rice University, Houston, Texas; Princeton University, Department of Ocean Sciences, UC San Diego (1997 - 1997)
- Invited participant, Workshop on cross-validation of high-resolution climate proxies and instrument records, University of Washington; Warm Climates of the Tropics, International Center for Theoretical - Physics (ICTP), Trieste, Italy (1997 - 1997)
- Leader, Research on Ocean/Atmosphere Variability and Ecosystem Response in the Ross Sea (ROAVERRS) Program (1996 - 2002)
- Member, U.S. Science Advisory Council, Ocean Drilling Program (1996 - 1999)
- Ocean Drilling Program Fellowship Proposal Review Panel, NSF-USSAC (1996 - 1998)
- Co-leader, Annual Records of Tropical Systems Activity (PAGES) (1995 - 1998)
- Member, steering committee, PEP-1 (Pole-Equator-Pole transects) (1995 - 1998)
- Proposal Review Panel, Earth Systems History Program, NSF (1995 - 1997)
- Committee Member, American Geophysical Union, Paleoceanography (1994 - 2000)

## PROGRAM AFFILIATIONS

- Center for Latin American Studies

## PROFESSIONAL EDUCATION

- Ph.D., University of California, San Diego , Oceanography (1981)
- B.S., University of Texas, Austin , Geology (1975)

## LINKS

- Stable Isotope Biogeochemistry Lab: <http://pangea.stanford.edu/research/sibl/>
- Climate Change and Ocean Chemistry: <http://pangea.stanford.edu/research/sibl/>
- Personal Website: <http://dunbar.stanford.edu>

## Research & Scholarship

### CURRENT RESEARCH AND SCHOLARLY INTERESTS

Research

My group specializes in high resolution studies of climatic and oceanic variability during modern times as well as over the past 50 to 12,000 years. Our most productive archives for this work include the skeletons of long-lived corals from the tropics and the deep sea, as well as sediments from lakes and marine environments. We use chemical, isotopic, and morphological measurements of these materials to investigate the timing and rates of change associated with past climate and C cycle excursions. Current field areas include the American Samoa, Antarctica, the Line Islands, Easter Island, Chile, Patagonian Argentina, and Palau. We also collect deep sea corals to better understand their ecology as well as their self-contained records of change in the deep sea. We do this work using deep diving research submersibles in the Gulf of Alaska and the central tropical and north Pacific. We dive with the Hawaii Undersea Research Lab, using their two submersibles Pisces IV and Pisces V. We are currently working on several projects in Antarctica to assess the impacts of climate change on Southern Ocean ecosystems and C-system chemistry. Much of this work focuses on the Ross Sea where we are studying the modern uptake of carbon dioxide by the ocean and the sensitivity of primary production to changes in nutrients, temperature, sea ice cover, and CO<sub>2</sub>. We are also using sediment cores from fjords and shelf basins of East Antarctica and the Antarctic Peninsula to study past and changes in the Antarctic Ice Sheet. My lab participated in the ANDRILL program as shore-based and field-based scientists exploring the history of Antarctic climate at Windless Bight (McMurdo Ice Shelf Drilling) and Southern McMurdo Sound. I am also a proponent and participant on the 2010IODP Expedition 318 to Wilkes Land, Antarctica.

We have recently engaged in an extensive collaboration with colleagues in Civil and Environmental Engineering at Stanford to develop instrumentation and methodologies for directly measuring C system transformations (production/ respiration and calcification/ dissolution) in coastal marine systems. We are instrumenting coral reefs at several Pacific locations as well as a kelp forest in Monterey Bay. In parallel with our studies of field-scale variability in carbon system chemistry we have also been engaged in a series of efforts to understand the controls on carbonate biomineralization in organisms ranging from reef-building corals to clams from the deep sea. We hope that a better understanding of this process leads to better predictions for the impact of global environmental change on marine organisms.

#### Teaching

I teach both undergraduate and graduate courses in climate and global change, geochemistry, oceanography, marine geology, and paleoclimatology. I am particularly intrigued with teaching in the field and have taken over 250 Stanford students to remote locations such as Antarctica and the Line Islands to participate in educational and research expeditions.

#### PROJECTS

- Understanding Coral Reef Resilience to Advance Science and Conservation
- Collaborative Research: Developing a Continuous Reconstruction of Tropical Pacific Climate over the Last 500-700 Years: Analysis of Massive Porites Corals from American Samoa
- Collaborative Research: TRacing the fate of Algal Carbon Export in the Ross Sea (TRACERS)
- Collaborative Research: An Ultra-High Resolution Holocene Climate Record from a Varved Sediment Sequence from the Adelie Coast, Antarctica (IODP Exp 318)
- Holocene Climate Change in Southwestern Patagonia: New Insights from Large Lake Paleolimnology
- Observations and modeling of the C system dynamics at Palmyra Atoll: In support of the development of management strategies for ocean acidification impacts in the tropics
- Research Project - Stanford

## Teaching

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### COURSES

#### 2023-24

- Get to Know Your Oceans: OCEANS 300A (Aut)
- Hacking for Climate and Sustainability: EARTHSYS 213 (Win)
- Planet Ocean: BIO 71, ESS 71, OCEANS 71 (Win)
- Stanford at Sea: BIO 182H, BIO 323H, EARTHSYS 323, ESS 323, OCEANS 182H, OCEANS 323H (Spr)
- The Worst Journey in the World: The Science, Literature, and History of Polar Exploration: EARTHSYS 38N, EPS 38N, ESS 38N (Aut)

#### 2022-23

- "Uttermost Part of the Earth" The Intersection of Nature and the Human Enterprise in Patagonia: OSPGEN 12 (Sum)
- Planet Ocean: BIO 71, ESS 71 (Win)
- The Worst Journey in the World: The Science, Literature, and History of Polar Exploration: EARTHSYS 38N, ESS 38N, GEOLSCI 38N (Win)

#### 2021-22

- Approaching Palau: Preparation and Research Ideation and Development: CEE 40, ESS 40 (Spr)
- Corals of Palau: Ecology, the Physical Environment, and Reefs at Risk: OSPGEN 53 (Sum)
- Planet Ocean: BIO 71, ESS 71 (Win)
- Stanford at Sea: BIOHOPK 182H, BIOHOPK 323H, EARTHSYS 323, ESS 323 (Spr)
- The Worst Journey in the World: The Science, Literature, and History of Polar Exploration: EARTHSYS 38N, ESS 38N, GEOLSCI 38N (Aut)

#### 2020-21

- Coral Reefs of the Western Pacific: Interdisciplinary Perspectives, Emerging Crises, and Solutions: BIO 355, BIOHOPK 355, CEE 363I, ESS 355 (Aut)
- The Worst Journey in the World: The Science, Literature, and History of Polar Exploration: EARTHSYS 38N, ESS 38N, GEOLSCI 38N (Aut)
- Tropical coastal marine ecosystems: data and analysis methods: ESS 14 (Spr)

### STANFORD ADVISEES

#### Doctoral Dissertation Advisor (AC)

Andrew Hennig

#### Master's Program Advisor

Annabelle Davis, Henry Lai, Taylor Ruck, Christopher Shell

#### Doctoral (Program)

Alexy Khrizman

## Publications

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### PUBLICATIONS

- **Remote reef cryptobenthic diversity: Integrating autonomous reef monitoring structures and in situ environmental parameters** *FRONTIERS IN MARINE SCIENCE*  
Steyaert, M., Lindhart, M., Khrizman, A., Dunbar, R. B., Bonsall, M. B., Mucciarone, D. A., Ransome, E., Santodomingo, N., Winslade, P., Head, C. I.  
2022; 9
- **Southern Hemisphere Westerly Winds have modulated the formation of laminations in sediments in Lago Fagnano (Tierra del Fuego, Argentina) over the past 6.3 ka** *BOREAS*  
Vizcaino, A., Jimenez-Espejo, F. J., Dunbar, R. B., Mucciarone, D., Garcia-Alix, A., Neugebauer, I., Ariztegui, D.

2022

- **Beryllium isotope variations recorded in the Adelie Basin, East Antarctica reflect Holocene changes in ice dynamics, productivity, and scavenging efficiency** *QUATERNARY SCIENCE ADVANCES*  
Behrens, B. C., Yokoyama, Y., Miyairi, Y., Sproson, A. D., Yamane, M., Jimenez-Espejo, F. J., McKay, R. M., Johnson, K. M., Escutia, C., Dunbar, R. B.  
2022; 7
- **Limited biogeochemical modification of surface waters by kelp forest canopies: Influence of kelp metabolism and site-specific hydrodynamics** *LIMNOLOGY AND OCEANOGRAPHY*  
Traiger, S. B., Cohn, B., Panos, D., Daly, M., Hirsh, H. K., Martone, M., Gutierrez, I., Mucciarone, D. A., Takeshita, Y., Monismith, S. G., Dunbar, R. B., Nickols, K. J.  
2021
- **Towards an ocean-based large ocean states country classification** *MARINE POLICY*  
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