Dr. Mark S. Demarest

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ACADEMIC BACKGROUND

EDUCATION

2009 Ph.D. Marine Science, University of California, Santa Barbara

2000 M.S. Biological Sciences, California Polytechnic State University, San Luis Obispo

1997 B.S. Biological Sciences, California State University, Sacramento

TCU APPOINTMENTS AND RANK

2025-Pres. Senior Instructor, Department of Biology, Texas Christian University

2019-2025 Instructor II, Department of Biology, Texas Christian University

2015-2019 Instructor I, Department of Biology, Texas Christian University

PREVIOUS TEACHING AND RESEARCH APPOINTMENTS

2011-2015 Lecturer and Undergraduate Advisor, Department of Biological Sciences, University of North Texas

2007-2011 Instructional Laboratory Supervisor and (2008 onward) Adjunct Professor, Department of Biological Sciences, University of North Texas

2006-2007 Adjunct Professor, Department of Science, North Central Texas College

2000-2007 Graduate Research Assistant, Marine Science Institute and the Institute for Computational Earth System Science, University of California, Santa Barbara

2002-2006 Teaching Assistant, Department of Ecology, Evolution and Marine Biology, University of California, Santa Barbara

1998-2000 Teaching Associate & Assistant, Biological Sciences Department, California Polytechnic State University, San Luis Obispo

HONORS AND AWARDS

2025 College of Science and Engineering nominee for Deans' Award for Teaching

2012-2015 NextGen Faculty Fellow, UNT

2015 Two Thank a Teacher program student recognitions, UNT

2014 Three Thank a Teacher program student recognitions, UNT

2013 College of Arts and Sciences Excellence in Advising Award

2011-2013 Four Thank a Teacher program student recognitions, UNT

2006 Outstanding Student Paper Award, 2006 Ocean Sciences Meeting, American Geophysical Union

2003 ScienceLine Award for Outstanding Contribution to Promoting Science Education in K-12 Schools, UCSB

2000 Biological Sciences Outstanding Graduate Student Award, Cal Poly

TEACHING

** Denotes a team-taught course*

COURSES TAUGHT DIRECTLY

BIOL 10503 Introductory Biology I, TCU, 2015

BIOL 10513 The Diversity of Life: Organisms to Ecosystems (also as Introductory Biology II), TCU, 2016-pres.

BOL 10523* Introduction to Biological Investigation (weekly lecture), TCU, 2022-pres.

BIOL/ENSC 30324 Introduction to Marine Science (also as BIOL 40800 Special Topics in Biology), TCU, 2016-pres.

BIOL 40320* Teaching of Introductory-Level Biology (also as BIOL 40300 & 40310 Teaching of Biology), TCU, 2015-2023

BIOL 50803* Marine Biology of the Tropics, TCU, 2020

BIOL 60111* Graduate Teaching in Biology (also as BIOL 60910), TCU, 2016-pres.

SCIE 20601 Introduction to Pre-Health (for transfer students), TCU, 2024-pres.

UNLF 10211 Introduction to University Life, TCU, 2023-2024

BIOL 1132 Environmental Science, UNT, 2010

BIOL 1135 Environmental Biology Laboratory, UNT, 2008

BIOL 1710 Biology for Science Majors I (also as Principles of Biology I), UNT, 2011-2015

BIOL 1720 Biology for Science Majors II, UNT, 2014-2015

BIOL 2140 Principles of Ecology, UNT, 2010-2014

BIOL 3500 Medical Terminology, UNT, 2010-2015

BIOC 4560/5560 Biochemistry Laboratory (recitation), UNT, (2008-2010)

BIOL 2406 Environmental Biology, NCTC, 2006-2007

CHEM 1413L Chemistry for the Health Sciences: Laboratory, NCTC, 2007

EEMB 142CL Aquatic Methods in Biology, UCSB, 2003-2006

EEMB 149 Mariculture (recitation), UCSB, 2002

BIO 105 General Biology Laboratory, Cal Poly, 1999

BIO 151 Introduction to Biology (laboratory), Cal Poly, 1998-2000

BOT 437 Phycology (laboratory assistant), Cal Poly, 1999

COURSES DIRECTED / SUPERVISED

BIOL 10501* Introductory Biology Lab I, TCU, 2015

BIOL 10511* Introductory Biology Lab II, TCU, 2016-2022

BOL 10523* Introduction to Biological Investigation (laboratory), TCU, 2022-2025

BIOL 3520 Cell Biology Laboratory, UNT, 2007-2011

BIOL 4504 Plant Physiology Laboratory, UNT, 2008-2011

BIOC 3622 Elementary Biochemistry Laboratory, UNT, 2007-2011

BIOC 4560/5560 Biochemistry Laboratory, UNT, 2007-2010

COURSES DEVELOPED AT TCU (new additions to the catalog only)

BOL 10523* Introduction to Biological Investigation

BIOL/ENSC 30324 Introduction to Marine Science

BIOL 50803* Marine Biology of the Tropics

TCU UNDERGRADUATE HONORS PROJECT COMMITTEES

2023 Gemma Goss

2022 Michaela Kelly, Maddie Weincek

2021 Katie Lawton

2020 Courtney Koplyay, Gabby Lamanteer, Lexton Trauffler

TCU GRADUATE THESIS AND DISSERTATION COMMITTEES

2020-2021 Dalton Allen, M.S.

2021-2025 Dalton Allen, Ph.D.

INTERNAL SUPPORT FOR ACADEMIC WORK RECEIVED (INSTRUCTIONAL DEVELOPMENT)

2017 Instructional Development grant ($3550 joint award with Dr. Mike Misamore) for identification of a biological research station for a new course in tropical marine biology, TCU

2012 Next Generation Course Redesign Grant ($7,500 joint award with Dr. Lee Hughes) for blended redesign of BIOL 1720 Biology for Science Majors II, UNT

2011 Learning Enhancement Grant ($5,000) for blended redesign of BIOL 3500 Medical Terminology, UNT

RESEARCH AND CREATIVE ACTIVITY

REFEREED PUBLICATIONS

Demarest, M. S., M. A. Brzezinski, D. M. Nelson, J. W. Krause, J. L. Jones, and C. P. Beucher. 2011. Net biogenic silica production and nitrate regeneration determine the strength of the silica pump in the Eastern Equatorial Pacific. *Deep-Sea Research II* 58: 462-476.

Demarest, M. S., M. A. Brzezinski, and C. P. Beucher. 2009. Fractionation of silicon isotopes during biogenic silica dissolution. *Geochimica et Cosmochimica Acta* 73: 5572-5583.

Brzezinski, M. A., J. L. Jones, C. P. Beucher, M. S. Demarest, and H. L. Berg. 2006. Automated determination of silicon isotope natural abundance by the acid decomposition of cesium hexafluosilicate. *Analytical Chemistry* 78: 6109-6114.

Christiansen, S. C., N. Hedin, J. D. Epping, M. T. Janicke, Y. del Amo, M. Demarest, M. Brzezinski, and B. F. Chmelka. 2006. Sensitivity considerations in polarization transfer and filtering using dipole-dipole couplings: implications for biomineral systems. *Solid State Nuclear Magnetic Resonance* 29: 170-182.

Brzezinski, M. A., J. L. Jones, and M. S. Demarest. 2005. Control of silica production by iron and silicic acid during the Southern Ocean Iron Experiment (SOFeX). *Limnology and Oceanography* 50: 810-824.

Armbrust, E. V., and 44 others (including M. S. Demarest). 2004. The genome of the diatom *Thalassiosira pseudonana*: ecology, evolution, and metabolism. *Science* 306: 79-86.

Coale, K. H., and 47 others (including M. Demarest). 2004. Southern Ocean iron enrichment experiment: carbon cycling in high- and low-Si waters. *Science* 304: 408-414.

NON-REFEREED PUBLICATIONS

Kilburn, C., M. Demarest, and L. Luque. 2025. Biology beyond the lab manual: shifting from formulaic to formative inquiry-based labs. In K. Anderson-Pence & A. Ray, (Eds.). *Proceedings of the 124th annual convention of the School Science and Mathematics Association* 12: 89-98. Fort Worth, TX: SSMA.

Demarest, M. 2025. *Organisms to Ecosystems: Biology Lessons for the Flipped Classroom*. Cognella Active Learning, Solana Beach, California. Online interactive text with optional print add-on (https://titles.cognella.com/organisms-to-ecosystems-2370011865836).

A preliminary edition of this text was published in 2022 under the working title *Biology From Cells to Ecosystems: Lessons for a Flipped Classroom*, and a revised preliminary edition was published in 2023 entitled *From Cells to Ecosystems: Biology Lessons for the Flipped Classroom.*

Demarest, M. S. 2010. *Biochemistry Laboratory Manual: BIOC 3622/4560*. Kendall Hunt Publishing Co., Dubuque, Iowa. 256 pp.

Demarest, M. S. 2010. *BIOL 3520: Cell Biology Laboratory Manual*. Kendall Hunt Publishing Co., Dubuque, Iowa. 276 pp.

Demarest, M. S. 2009. *Investigation of biogenic silica dissolution and silicon cycling in the ocean*. Doctoral dissertation, University of California, Santa Barbara, California. 233 pp.

Demarest, M. S. 2000. *Bacterial community heterogeneity across surface waters of the Pacific Ocean*. Master's thesis, California Polytechnic State University, San Luis Obispo, California. 152 pp.

Unattributed. 2008. 3-part Coastal Upwelling Online Learning Activity for the University of Wisconsin's Satellite Observations in Science Education (SOSE) project, with Dr. Ali Whitmer (https://www.ssec.wisc.edu/sose/cu_activity.html)

CONFERENCE PRESENTATIONS

Kilburn, C., M. Demarest, and L. Luque. 2025. Biology beyond the lab manual: shifting from formulaic to formative inquiry-based labs. Oral presentation, 124th annual convention of the School Science and Mathematics Association, Fort Worth, TX

Demarest, M. S., M. A. Brzezinski, and C. P. Beucher. 2010. Fractionation of silicon isotopes during the dissolution of diatom silica. Eos Trans. AGU, 91(26), Ocean Sci. Meet. Suppl., Abstract PA21A-02. Oral presentation, AGU Ocean Sciences Meeting, Portland, Oregon

Demarest, M. S., M. A. Brzezinski, and D. M. Nelson. 2006. The abundance and net production of biogenic silica along 140°W longitude in the Equatorial Pacific. Eos Trans. AGU, 87(36), Ocean Sci. Meet. Suppl., Abstract OS43D-02. Oral presentation, AGU Ocean Sciences Meeting, Honolulu, Hawaii

Demarest, M., M. Moline, C. Kitts, and A. Schaffner. 2000. Marine prokaryote diversity and spatial scale of community heterogeneity across surface waters of the Pacific Ocean. Oral presentation, ASLO Aquatic Sciences Meeting, Copenhagen, Denmark

OTHER ACTIVITIES

Fall 2018 Presentation, Flipping with iSpring: Converting PowerPoints to interactive online lessons, Koehler Center Teaching and Learning Conversation

SERVICE

SELECTED DEPARTMENTAL SERVICE

2025-pres. Undergraduate Program Coordinator in Biology, TCU

2025-pres. Member, Biology Advisory Committee

2024-2025 Transfer course approver for Biology majors, TCU

2022-2025 Co-chair, Biology Undergraduate Curriculum & Assessment Committee, TCU

2016-2024 Contributor, annual graduate TA orientation & training program, TCU

2016-2022. Chair, Biology Assessment Committee

2011-2015 Faculty Advisor, Department of Biological Sciences, UNT

2012-2015 Member, Biology Undergraduate Scholarships and Curriculum Committee, UNT

Fall 2013 Member, committee to establish tenure and promotion guidelines for Lecturers in Biology, UNT

Sum. 2013 Revised the Biology Core Curriculum documentation for 14 core courses, UNT

Spring 2011 Member, Instructional Laboratory Supervisor Search Committee, UNT

2004-2005 Member, Student Advisory Committee for Marine Science, UCSB

2002-2003 Coordinator, Marine Science Winter Colloquium, UCSB

SELECTED COLLEGE SERVICE

2019-pres. Member (through 2023) and Chair (2024-2026), Pre-Health Professions Institute Advisory Committee, Pre-Health Professions Institute, TCU

2019-pres. Pre-Health & Biology ROTC advisor, Pre-Health Professions Institute, TCU

2018-pres. Pre-Health & Biology transfer advisor, Pre-Health Professions Institute, TCU

2015-pres. Member, Health Professions Advisory Committee (HPAC), Pre-Health Professions Institute, TCU

2022-2025 Member, CSE Honors Research Forum Committee, TCU

2019-2023 Member, Pre-Health Scholarship Committee, Pre-Health Professions Institute, TCU

2011-2015 Member, College of Arts and Sciences Council of Advisors, UNT

2013-2015 Member, College of Arts and Sciences Undergraduate Curriculum Committee, UNT

2013-2015 Member, Pre-Professional Advisory Committee (PPAC), UNT

2011-2015 Biology Faculty Coordinator, College of Arts and Sciences Student Ambassador program, UNT

2011-2012 Biology Faculty Presenter, Eagle Early Alert Program, UNT

2011-2015 Biology Faculty Representative, annual Dean's List receptions, UNT

2011-2015 Biology Faculty Representative, annual President's List receptions, UNT

2011-2015 Biology Faculty Representative, annual Teach North Texas scholarship receptions, UNT

SELECTED UNIVERSITY SERVICE

2025-pres. Member, Faculty Senate

2025-pres. Scribe, Instructional Support and Evaluation Committee / Accommodated Teaching Spaces Consultation Workgroup, Faculty Senate

2024-pres. Member, Intercollegiate Athletics University Committee, TCU

2022-pres. Member, Quantitative and Scientific Reasoning (QSR) Core Curriculum Assessment Committee (MA/NSC), TCU

2021-2024 Member, Undergraduate Council, TCU

2013-2015 Member, Advising System (formerly Advising Technology / Documenting Student Contact) Task Force, UNT

2012-2015 Member, Integrative Studies (formerly General Studies) Faculty Advisory Committee, UNT

2011-2015 Biology Representative, UNT Preview Day (twice annual event), UNT

2002-2005 Graduate Student Association Representative, Alcohol and Other Drug Task Force, UCSB

SELECTED PROFESSIONAL SERVICE

2017 Consultation, Learning Catalytics Walk-through with Expert User meeting
With several product and technology representatives from Pearson to provide feedback on the responseware platform Learning Catalytics

2015 Textbook review: *How Life Works*, 2nd ed. (1 chapter)

2013 Textbook class test: *How Life Works* (all chapters)

2013 Paper review: *The influence of water mass mixing and dissolution processes on the dissolved silicon isotope composition of the Eastern Equatorial Pacific*. Patricia Grasse, Claudia Ehlert, and Martin Frank. (Earth and Planetary Science Letters, manuscript number EPSL-D-13-00083)

2013 Paper review: *Germanium Isotopes and Trace Elements in Diatom Silica: Glacial-Interglacial Records and Constraints on the Oceanic Germanium Isotope Cycle*. Samia Mantoura, Christina L. De La Rocha, Albert Galy, Jennifer C. Latimer, and Aldo Shemesh (Geochimica et Cosmochimica Acta, manuscript number GCA-D-13-00286)

2013 Paper review: *Effects of growth and dissolution on the fractionation of silicon isotopes by estuarine diatoms.* Xiaole Suna, Martin Olofsson, Per S. Andersson, Brian Fry, Catherine Legrand, Christoph Humborg, and Carl-Magnus Mörth. (Geochimica et Cosmochimica Acta, manuscript number GCA-D-13-00818)

2012 Textbook review: *Ecology: An Evolutionary Perspective* (5 chapters)

2010 Paper review: *Quantifying the impact of freshwater diatom productivity on silicon isotopes and silicon fluxes: Lake Myvatn, Iceland*. Opfergelt S., Eiriksdottir E.S., Burton K.W., Einarsson A., Siebert C., Gislason S.R., Halliday A.N. (Earth and Planetary Science Letters, Manuscript Number EPSL-D-10-00959)

2010 Grant application review: Study of chemical composition of biogenic opals and their geological products. Ing. Jiří Mizera and Jan Borovička. Grantová agentura České republiky (Czech Science Foundation)

SELECTED COMMUNITY ACTIVITIES DIRECTLY RELATED TO PROFESSIONAL SKILLS

2012-2017 Poster Judge, Research Appreciation Day, UNT Health Science Center

2011-2013 Member, North Texas Research Symposium Steering Committee (UNT rep.), UNT Health Science Center

Spring 2013: Developed and led a Biology Enrichment Cluster for K-3 students, MST Elementary School, Richardson, TX

Sum. 2011 Prepared and taught a course entitled Cooking with the Sun for Grandparents University outreach program, UNT