

# Heidi Dierssen

Professor, Optical Oceanographer

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## PROFESSIONAL PROFILE

Dr. Dierssen is a professor and optical oceanographer who specializes in developing and using ocean color imagery and data to understand ecological and air-sea processes from seagrasses to whitecaps. She is presently the Science and Applications Team Leader for the NASA Plankton Aerosol Cloud and ocean Ecosystem (PACE) mission and serves as an expert on international advisory and working groups related to hyperspectral aquatic remote sensing and imaging spectroscopy.

## EDUCATION

Stanford University,	Stanford, CA	Biology with Honors	B.S./M.S.	1989
Advisor: Harold Mooney. Comparison of Male and Female Function in a Dioecious Shrub				
University of California, Santa Barbara,	Santa Barbara, CA	Geography	Ph.D.	2000
Advisor: Raymond Smith. Ocean Color Remote Sensing along Antarctic Peninsula				
Moss Landing Marine Laboratory,	Moss Landing, CA	Optical Oceanography	Postdoc	2001-2002
Advisor: Richard Zimmerman. Remote Sensing of Seagrass in Bahamas Banks				
Monterey Bay Aquarium Research Inst.,	Moss Landing, CA	Optical Oceanography	Postdoc	2002-2003
Advisor: John Ryan. Imaging Spectroscopy of Blooms in Monterey Bay				

## APPOINTMENTS

2016-present	Professor, Dept. of Marine Sciences/Geography. University of Connecticut.
2018-2019	Fulbright Scholar & Visiting Scientist, Flanders Marine Institute (VLIZ). Belgium.
2011-2016	Associate Professor. Dept. of Marine Sciences/Geography. University of Connecticut.
2005-2011	Assistant Professor. Dept. of Marine Sciences/Geography. University of Connecticut.
2011-2012	Visiting Professor. Norwegian University of Science and Technology, Trondheim Biological Station, Norway.
2003-2005	Assistant Professor in Residence. Dept. of Marine Science. University of Connecticut.
1999-2000	Visiting Research Scientist. Rosenstiel School for Marine and Atmospheric Science. University of Miami.
1997-2000	NASA Earth System Science Fellow. Institute for Computational Earth System Science. University of California Santa Barbara.

## HONORS AND AWARDS

2020	UConn Provost Award for Excellence in Teaching.
2020	NASA Achievement Award: Coral Reef Airborne Laboratory (CORAL) Mission Team
2020	Elected to the Connecticut Academy of Sciences and Engineering (CASE)
2018	Fulbright Scholar to Belgium. Flanders Marine Institute
2018	NASA Achievement Award: Snow, Water Imaging Spectrometer (SWIS) Instrument Team
2016	University of Connecticut Award for Excellence in Research
2016	NASA Achievement Award: Portable Remote Imaging Spectrometer Mission (PRISM) Instrument Team

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2006 Best Speaker Award. Ocean Optics Conference. Presentation of Bell Award  
2002 MBARI Postdoctoral Fellow  
2000 Complex Systems Summer School. Santa Fe, NM.  
1999 California Space Grant Fellow  
1997 Complex Systems Summer School, Santa Fe Institute  
1997 NASA Earth System Science Fellow

## SYNERGISTIC ACTIVITIES

2020-present Lead, NASA Plankton Aerosol Cloud and Ocean Ecosystem (PACE) Mission Science and Applications Team. Lead the 100+ team members producing aquatic and atmospheric algorithms and products from OCI, SPEXone, HARP2.

2023-present Co-lead. Network for Ocean Worlds (NOW) Annual Retreat: Exploring the Science and Technology of Ocean Worlds Across the Solar System: Missions, technologies and instruments between Earth and Planetary sciences. August 19-24, 2023. Wrigley Marine Science Center Catalina Island, CA.

2021-present Lead, International Ocean Colour Coordinating Committee (IOCCG) Working Group on Benthic Reflectance Measurements. Producing an international consensus report for the community.

2022-present Member, Japan, Ministry of the Environment, Japan (MOEJ). International Expert Working Group on Marine Plastic Monitoring Methods using Remote Sensing Technologies (SmartMLRST)

2021-present Member, IOCCG Task Force on Remote Sensing of Marine Litter and Debris.

2020-present Member, Australia, International Science Advisory Team for Australian Aquawatch Mission to provide near real-time updates and predictive forecasting – a weather service for water quality.

2020-present Member, NASA, Surface Biology and Geology Mission (SBG) Space-based Imaging Spectroscopy and Thermal Mission.

2020-present Member, Scientific Committee on Ocean Research (SCOR) Working Group C-GRASS coordinating seagrass research.

2019-present Member, Ocean Sciences Across the Solar System Working Group. NASA.

2018-present Member/Lead, NASA Advanced Strategic Planning for NASA Ocean Biology and Biogeochemistry.

2023 Member, Science Peer Review Board, NASA Surface Biology and Geology Mission. August 2023.

2021 Member, STEREO III Evaluation: Societal Impact Workshop. Belgium. 10/5/2021.

2018-2022 Member, Alliance for Coastal Technologies. Hyperspectral Imaging of Coastal Waters Working Group.

2019-2020 Chair, International Foresight Workshop. Hyperspectral Data Needs for Discrimination of Phytoplankton Groups. Euromarine Funded.

2019-2020 Member, Remote Sensing & Mapping of Seagrass Expert Workshop. Oxford. Pew Charitable Trust.

2019-2020 Co-Chair. Townhall. Hyperspectral phytoplankton community structure. Ocean Optics.

2019 Panel, Townhall on Marine Litter, ESA Living Planet. Milan.

2015-2017 Chair, NASA Ocean Biology and Biogeochemistry Advance Science Plan Committee for 2017-2027.

2015-2017 Member, Steering Committee and Panel. Belgian Science Policy Office.

2016-2017 Member, NASA Carbon Cycle and Ecosystems Area Priority Science Questions and Measurement Targets Working Group.

2013-2017 Member, IOCCG Committee.

2016-2017 Member, NASA Earth Science Senior Review Subcommittee.

2008-2011 Member, National Academy of Science. Committee on Earth Studies, Space Studies Board.

2008-2010 Chair, International Ocean Optics XX Conference. Anchorage, Alaska.

2009 Member, Naval Research Laboratory. External Review Panel for the Battlespace Environments Focus Area 6.1/6.2 (Ocean Technology) Research Program Stennis Space Center.

2005-2007 Member, NASA Biological Oceanography and Biogeochemistry Advance Plan Working Group

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## SCIENCE MISSION TEAM MEMBER

- 2014-present Phytoplankton Aerosol Cloud and ocean Ecosystem (PACE) Mission Member/Lead. NASA
- 2022-present Surface Biology and Geology (SBG) Satellite Mission Team Member. NASA
- 2018-2021 Surface Biology and Geology (SBG) Algorithm & Aquatic Science Working Groups. NASA
- 2015-2018 Earth Venture Coral Reef Ecosystem (CORAL) Airborne Campaign. NASA.
- 2014-2017 O<sub>2</sub>/N<sub>2</sub> Ratio and CO<sub>2</sub> Airborne Southern Ocean (ORCAS) Experiment. NSF/NASA
- 2015-2017 Snow Water Imaging Spectrometer (SWIS) Hyperspectral Cubesat Mission. NASA
- 2010-2017 Airborne Portable Remote Imaging SpectroMeter (PRISM) Development Team. NASA
- 2010-2014 Multiple University Research Initiative (MURI). Dynamic Camouflage. Office of Naval Research.
- 2007-2016 Hyperspectral Infrared Imager (HyspIRI) Satellite Team. NASA.
- 2007-2009 Southern Ocean Gas Exchange Experiment (SOGasEx). NASA, NOAA.
- 2004-2008 Moderate Resolution Imaging Spectrometer Mission (MODIS). NASA.
- 2001-2002 Coastal Benthic Optical Properties (CoBOP). Naval Research Laboratory. Office of Naval Research.
- 1994-2000 Western Antarctic Peninsula Long Term Ecological Research Project (PAL-LTER). NSF.

## UNIVERSITY SERVICE

### Strategic Planning

- 2021-2022 Chair, Marine Sciences Strategic Planning Committee
- 2016-2017 Member, Marine Sciences Diving Program (MSDP) Strategic Plan
- 2013-2014 Member, Strategic Planning. College of Liberal Arts and Sciences (CLAS) Academic Planning Committee

### Promotion, Tenure, and Reappointment (PTR)

- 2022-present Member, Marine Sciences PTR Committee
- 2016-2021 Member, Dean's PTR Committee for CLAS
- 2013-2014 Chair, Marine Sciences PTR Committee
- 2012-2013 Member, Marine Sciences PTR Committee

### Courses and Curriculum

- 2012-present Chair, Department of Marine Sciences Courses and Curriculum
- 2012-present Member, CLAS Courses and Curriculum
- 2015-present Chair, Bachelor of Science Subcommittee for CLAS
- 2020-2021 Member, Ocean Engineering Certificate Committee
- 2010-2015 Liaison, University Early College Experience (ECE)

### Faculty Search Committees

- 2019-2020 Assistant Professor in Residence. Physics Department
- 2013-2014 Head/Director. Marine Sciences
- 2012-2013 Cluster Hire for 3 Assistant Professors. Marine Sciences
- 2010-2011 Physical Oceanography Assistant Professor. Marine Sciences

### International Evaluation Committees for Faculty Recruitment

- 2017 Biological Oceanographer. University of Bergen Norway
- 2015 Marine Biologist. Norwegian Technical University
- 2012 Marine Biologist. Norwegian Technical University

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## UNIVERSITY TEACHING

### Courses

2008-2023	MARN 3505/5505. Remote Sensing of Marine Geography (Storrs and Avery Point)
2021-2023	MARN 1002E/1003E. Introduction to Oceanography with Environmental Literacy (Avery Point)
2007-2020	MARN 1002/1003. Introduction to Oceanography (Storrs and Avery Point)
2016	MARN 4002. Science and the Coastal Environment (Avery Point)
2003-2012	MARN 3014. Marine Biology (Storrs and Avery Point)
2009,12,15	MARN 5898. Light and Photosynthesis in Aquatic Ecosystems
2007	MARN 210. Coastal Systems Science I (Avery Point)
2006	MARN 260/380. Biological Oceanography (Storrs)

### National/International Teaching

2023	Network for Ocean Worlds (NOW) Annual Retreat: Exploring the Science and Technology of Ocean Worlds Across the Solar System. August 19-24, 2023. Wrigley Marine Science Center, Catalina Island, CA
2017	Guest Instructor, Ocean Optics Summer Bootcamp Univ. Maine. Darling Marine Station, Maine
2016	Instructor, International Ocean Colour Coordinating Group Third Summer Lecture Series in Villefranche, France
2014	Instructor, University Centre of Svalbard (UNIS) for field course on aerosols. Svalbard.
2013	Instructor, University Centre of Svalbard (UNIS) for field course on ocean color. Svalbard.

### Teacher Training Workshops Completed

2021	Less Listening, More Active Participation. UCONN.
2021	Preparing for the Variety of Learners' Needs, Abilities, and Interests with Universal Design for Learning. UCONN
2020	LockDown Browser & Respondus Monitor Training. UCONN.
2020	Using Discussion Boards in Online Teaching. UCONN.
2020	Train the Trainers: Tools & techniques for teaching about Copernicus marine data. EUMETSAT. 30-hour online training course. Certificate 10 July 2020.

## UNIVERSITY SUPERVISION & MENTORING

### Major Advisor

Ph.D. students: D. Aurin (2010), B. Russell (2016), K. Randolph (2015)  
M.S. students: C. Buonassissi (2009), K. Bostrom (2011), M. Mirhakak (2021), G. Trolley (exp. 2023),  
Postdoctoral scholars: S. Garaba (2015-2018), K. Randolph (2016-2018), B. Russell (2016-2019), F. Henderikx-Freitas (2016-2017), J. Turner (2021-2024)

### Associate Advisor

Ph.D. students: A. Branco (2006), H. Brown (2017, EEB), M. Fogarty (2018), V. Haynes (2019), H. Frye (2023, EEB)  
M.S. students: C. Zimmerman (2007, CAHNR), R. Perry (2015), A. Chlus (2015 CAHNR), J. Grzywacz (2021)

### Undergraduate Project Advising

REU Students: D. Zitomer (2024), C. Scrivner (2021), E. Perry Summer (2017)  
Independent Study Projects: W. Huffman (2017), T. Bateman (2015-2016), C. Kunz (2010-2012), B. Ritchie (2009-2010), M. McNichol (2008)

### International/National Thesis Review

2023 University of Laval, Quebec Canada Ph.S.	2019 University of Gent, Belgium. M.S.
2023 Norwegian Technical University, Ph.D.	2018 University of Queensland, Australia, Ph.D.
2021 King Abdullah University of Science & Technology, Saudi Arabia, Ph.D.	2015 Curtin University, Australia, Ph.D.
2021 Norwegian Technical University, Norway, Ph.D.	2015 University of Tasmania, Tasmania, Ph.D.
2020 James Cook University, Australia, Prospectus	2014 Capetown University, South Africa. Ph.D.
2019 University of Massachusetts Boston, USA. Ph.D.	2011 Norwegian Technical University, Norway. Ph.D.

## GRANTS

### Submitted

NASA/National Aeronautics & Space Administration. Lead PI. "PACE SAT: Refinement of the AVW and QWIP algorithms for PACE" 7/1/2024 - 6/30/2027. \$500K.

### Current

NASA/National Aeronautics & Space Administration. Lead PI. "Exploring the role of phytoplankton community composition in air-sea carbon exchange west of the Antarctic Peninsula through field and satellite measurements" \$1.7M. 10/1/23-9/30/26.

NASA/National Aeronautics & Space Administration. Lead PI. "Advancing Remote Sensing of Microplastics on the Surface Ocean." \$520K. 3/1/21-2/29/24.

NASA/National Aeronautics & Space Administration. Lead PI. "PACE Science Team Leader." \$400K 7/1/2020-6/30/2024.

NASA/National Aeronautics & Space Administration. Lead PI. "Quantifying linkages between sea ice, phytoplankton community composition, and air-sea carbon fluxes west of Antarctic Peninsula through field, airborne and satellite measurements." \$900K. 7/1/2020-6/30/2024.

NSF; Co-I. "Research Experience for Undergraduates (REU) Site Mystic Aquarium: Collaborative Research: Investigating the Consequences of Global Change on Marine Animals and their Ecosystem." 03/01/2017 – 02/29/2024.

### Past 5 Years

NASA/National Aeronautics & Space Administration. Collaborator. "Commercial Sensor Evaluation for Detection and Mapping of Snow Algae." 2021.

NASA/National Aeronautics & Space Administration. Co-I. "FINESST: Evaluation of hyperspectral techniques for quantifying taxonomic and functional diversity in coastal and shrubland ecosystems." 9/1/2020-8/31/2023.

NASA/National Aeronautics & Space Administration; "PACE Science Team: Atmospheric Correction over Bright Water Targets with Non-Negligible Radiances in the Near Infrared"; \$431,771; 11/19/2014-11/18/2019; 1 summer month in 2015, 2016, and 2017

NASA/National Aeronautics & Space Administration; "Hyperspectral remote sensing of coral reefs: Assessing the potential for spectral discrimination of coral symbiont diversity" \$232,740; 11/16/2014-11/18/2019; 0.5 summer month in 2016, 2017

NASA/National Aeronautics & Space Administration; "Coral Reef Airborne Laboratory" \$469,517; 08/11/2015-08/11/2019; 0.5 summer month in 2015, 2016, 1 month 2017

## PUBLICATIONS

### Peer-reviewed Journal Articles

*Submitted*

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\*Frye, H., E. Scrivner, B. Russell, Dierssen, H.M., Revise and Resubmit. Methods for quantifying the spectral variation within terrestrial and aquatic datasets and imagery. *Frontiers in Remote Sensing*.  
<http://review.frontiersin.org/review/1279804/0/0>.

Goddijn-Murphy, L., V. Martínez-Vicente, H.M. Dierssen, V. Raimondi, E. Gandini, R. Foster, V. Chirayath. Submitted. Emerging technologies for remote sensing of floating and submerged plastic litter. *Remote Sensing of the Environment*.

*Published*

\*Turner, J.S., Dierssen, H., Schofield, O., Kim, H.H., Stammerjohn, S., Munro, D.R., & Kavanaugh, M. Accepted. Changing phytoplankton phenology in the marginal ice zone west of the Antarctic Peninsula. *Marine Ecology Progress Series*.

Cetinic, I, C.S. Rousseaux, et al. 2024. Phytoplankton composition from sPACE: requirements, opportunities, and challenges. *Remote Sensing of Environment* 302 (2024) 113964. <https://doi.org/10.1016/j.rse.2023.113964>

\*Castagna, A., H.M. Dierssen, L.I. Devriese, G. Everaert, E. Knaeps, and S. Sterckx. 2023. Evaluation of plastic detection algorithms over land and aquatic floating targets from hyperspectral field and airborne data. *Remote Sensing of Environment*. 298: 113834. DOI: 10.1016/j.rse.2023.113834

Dierssen, H.M., M. Gierach, L.S. Guild, A. Mannino, J. Salisbury, S. Schollaert Uz, J. Scott, P.A. Townsend, K. Turpie, M. Tzortziou, E. Urquhart, R. Vandermeulen, and P.J. Werdell. 2023. Synergies between NASA's Hyperspectral Aquatic Missions PACE, GLIMR, and SBG: Opportunities for new science and applications. *Journal of Geophysical Research*. 128(10): e2023JG007574. DOI: 10.1029/2023JG007574

\*Russell, B., Dierssen, H. M. 2023. Underwater Spectral Reflectance Measurements: Reflectance Standard Submersion Factor and its Impact on Derived Target Reflectance. *Applied Optics*. 62: 6299-6306.  
<https://doi.org/10.1364/AO.493709>

Dierssen, H.M., R.A. Vandermeulen, B.B. Barnes, A. Castagna, E. Knaeps, and Q. Vanhellemont. 2022. QWIP: A Quantitative Metric for Quality Control of Aquatic Reflectance Spectral Shape using the Apparent Visible Wavelength. *Frontiers in Remote Sensing*. <https://doi.org/10.3389/frsen.2022.869611>

Chirayath, V., E. Bagshaw, K. Craft, H. Dierssen, D. Kline, D. Lim, M. Malaska, O. Pizarro, S. Purkis, D. Schroeder, P. Sobron, S. Waller, and D. Winebrenner. 2022. Oceans across the solar system and the search for extraoceanic life: Technologies for remote sensing and in situ exploration. *Oceanography* 35(1):54-65,  
<https://doi.org/10.5670/oceanog.2021.416>.

Glass, J.B., H.M. Dierssen, C.R. Glein, B.E. Schmidt, and D.P. Winebrenner. 2022. Defining and characterizing habitable environments in ocean world systems. *Oceanography* 35(1):30-38,  
<https://doi.org/10.5670/oceanog.2021.414>.

\* Castagna, A., Amadei Martínez, L., Bogorad, M., Daveloose, I., Dasseville, R., Dierssen, H. M., Beck, M., Mortelmans, J., Lavigne, H., Dogliotti, A., Doxaran, D., Ruddick, K., Vyverman, W., and Sabbe, K. 2022. Optical and biogeochemical properties of Belgian inland and coastal waters, *Earth Syst. Sci. Data*  
<https://doi.pangaea.de/10.1594/PANGAEA.940240> (dataset).

\*Castagna, A., H. Lavigne, H. M. Dierssen, K. Ruddick, E. Organelli, M. Bogorad, J. Mortelmans, W. Vyverman ,and K. Sabbe. 2021. Optical Detection of Harmful Algal Blooms in the Belgian Coastal Zone: A Cautionary Tale of Chlorophyll c3. *Frontiers in Marine Science*. <https://doi.org/10.3389/fmars.2021.770340>

Dierssen, H.M., S. Ackleson, K. Joyce, E. Hestir, A. Castagna, S. Lavender, and M. McManus. 2021. Living up to the Hype of Hyperspectral Aquatic Remote Sensing: Science, Resources and Outlook. *Frontiers in Environmental Science*. 9, 134. <https://doi.org/10.3389/fenvs.2021.649528>

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\*Milton Brown, H., M. Rubega and H.M. Dierssen. 2021. The light's in my eyes: optical modeling demonstrates wind is more important than sea surface-reflected sunlight for foraging herons. *PeerJ* 9:e12006  
<https://doi.org/10.7717/peerj.12006>

Menden-Deuer, S., W. Slade, and H.M. Dierssen. 2021. Promoting Instrument Development for New Research Avenues in Ocean Science: Opening the Black Box of Grazing. *Frontiers in Environmental Science*, 26  
<https://doi.org/10.3389/fmars.2021.695938>

Cause-Nicholson, K. et al. 2021. NASA's surface biology and geology designated observable: A perspective on surface imaging algorithms. *Remote Sensing of the Environment*. 257: 112349.  
<https://doi.org/10.1016/j.rse.2021.112349>.

Khan, A. L., H. Dierssen, T. Scambos, J. Höfer, and R.R. Cordero. 2021. Spectral Characterization, Radiative Forcing, and Pigment Content of Coastal Antarctic Snow Algae: Approaches to Spectrally Discriminate Red and Green Communities and Their Impact on Snowmelt. *The Cryosphere*. 15, 133-148.

Garcia, R., Z.P. Lee, Barnes, B.B., Hu, C., Dierssen, H.M., Hochberg, E. 2020. Benthic classification and IOP retrievals in shallow water environments using MERIS imagery. *Remote Sensing of the Environment*. 249: 112015.  
<https://doi.org/10.1016/j.rse.2020.112015>

Dierssen, H.M., A. Bracher, V. Brando, H. Loisel, and K. Ruddick. 2020. Data needs for hyperspectral detection of algal diversity across the globe. *Oceanography*. 33: 1. 74-79.

Dierssen, H. M., and \*Garaba, S. P. 2020. Bright Oceans: Spectral Differentiation of Whitecaps, Sea Ice, Plastics, and Other Flotsam, in: *Recent Advances in the Study of Oceanic Whitecaps: Twixt Wind and Waves*, edited by: Vlahos, P., and Monahan, E. C., Springer International Publishing, Cham, 197-208.

\*Castagna, A., S. Simis, H. Dierssen, Q. Vanhellemont, K. Sabbe, and W. Vyverman. 2020. Extending Landsat 8: Retrieval of an orange contra-band for inland water quality applications. *Remote Sensing*. 12(4), 637;  
<https://doi.org/10.3390/rs12040637>

\*Russell, B.J., E. Hochberg, and H.M. Dierssen. 2019. Water Column Optical Properties of Pacific Coral Reefs Across Geomorphic Zones and in Comparison to Offshore Waters. *Remote Sensing*. 11, 1757; doi:10.3390/rs11151757

Dierssen, H.M., K.J. \*Bostrom, A. Chlus, K. Hammerstrom, D. Thompson and Z.P. Lee. 2019. Pushing the Limits of Seagrass Remote Sensing in the Turbid Waters of Elkhorn Slough, California. *Remote Sensing*. 11(14), 1664;  
<https://doi.org/10.3390/rs11141664>

\*Freitas, F. H., and H. M. Dierssen. 2019. Evaluating the seasonal and decadal performance of red band difference algorithms for chlorophyll in an optically complex estuary with winter and summer blooms. *Remote Sensing of the Environment* 231: 111228.

Chowdhary J, Zhai P, Boss E, Dierssen HM, Frouin RJ, Ibrahim AI, Lee Z, Remer LA, Twardowski M, Xu F. 2019. Modeling atmosphere-ocean radiative transfer: A PACE mission perspective. *Frontiers in Earth Science* 7:100.

Frouin RJ, Franz BA, Ibrahim A, Knobelspiesse K, Ahmad Z, Cairns B, Chowdhary J, Dierssen HM, Tan J, Dubovik O. et al. 2019. Atmospheric correction of satellite ocean-color imagery during the PACE era. *Frontiers in Earth Science* 7:145.

Remer LA, Davis AB, Mattoo S, Levy RC, Kalashnikova O, Chowdhary J, Knobelspiesse KD, Xu X, Ahmad Z, Boss E. et al. 2019. Retrieving aerosol characteristics from the PACE mission, Part 1: Ocean Color Instrument. *Frontiers in Earth Science* 7:152.

Remer LA, Knobelspiesse KD, Zhai P-W, Xu F, Kalashnikova O, Chowdhary J, Hasekamp OP, Dubovik O, Wu L, Ahmad Z. et al. 2019. Retrieving aerosol characteristics from the PACE mission, Part 2: Multi-angle and polarimetry. *Frontiers in Environmental Science* 7:94.

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\*Castagna A, Johnson BC, Voss K, Dierssen HM, Patrick H, Germer TA, Sabbe K, Vyverman W. 2019. Uncertainty in global downwelling plane irradiance estimates from sintered polytetrafluoroethylene plaque radiance measurements. *Applied Optics* 58:4497–4511.

Dierssen HM. 2019. Hyperspectral measurements, parameterizations, and atmospheric correction of whitecaps and foam from visible to shortwave infrared for ocean color remote sensing. *Frontiers in Earth Science* 7:14. doi: 10.3389/feart.2019.00014

Hedley, J.D., \*M. Mirhakak, A. Wentworth, H.M. Dierssen. 2018. Influence of three-dimensional coral structures on hyperspectral benthic reflectance and water-leaving reflectance. *Applied sciences*. 8: 2688. doi:10.3390/app8122688

Bender, H. P. Mouroulis, H.M. Dierssen, T. Painter, D. Thompson, C. Smith, J. Gross, R. Green, J. Haag, B. Van Gorp, and E. Diaz. 2018. Snow and Water Imaging Spectrometer (SWIS): Mission and instrument concepts for Earth-orbiting CubeSats. *Journal of Applied Remote Sensing*. JARS 12(4): 180127. doi: 10.1117/1.JRS.12.044001

\*Garaba, S., J. Aitken, S. Boyan, H.M. Dierssen, L. Lebreton, O. Zielinski, and J. Reisser. 2018. Sensing ocean plastics with an airborne hyperspectral shortwave infrared imager. *Environ. Science & Technology*. 52:11699-11707. doi:10.1021/acs.est.8b02855

\*Perry, R., J. Vaudrey, and H.M. Dierssen. 2018. Nutrient dynamics and long range transport of floating seagrass wracks in Greater Florida Bay. *Estuaries and Coastal Shelf Science*. 209:7-17. doi:10.1016/j.ecss.2018.05.006.

Karger F.M. et al. 2018. Satellite Sensor Requirements for Monitoring Essential Biodiversity Variables of Coastal Ecosystems. *Ecological Applications*. doi:10.1002/eap.1682

\*Russell, B.J. and H.M. Dierssen. 2018. Color change in the Sargassum Crab, *Portunus sayi*: Response to diel illumination cycle and background albedo. *Marine Biology* 165(28):1-13. doi:10.1007/s00227-018-3287-1.

Stephens, B., M. Long, R. Keeling, E. Kort, C. Sweeney, E. Apel, E. Atlas, S. Beaton, J. Bent, N. Blake, J. Bresch, J. Casey, B. Daube, M. Diao, E. Diaz, H. Dierssen, et al. 2017: The O<sub>2</sub>/N<sub>2</sub> Ratio and CO<sub>2</sub> Airborne Southern Ocean (ORCAS) Study. 2018. *Bull. Amer. Meteor. Soc.* doi:10.1175/BAMS-D-16-0206.1: 381-402.

\*Fogarty, M.C., M.R. Fewings, A.C. Paget, H.M. Dierssen. 2018. The influence of a sandy substrate, seagrass, or highly turbid water on albedo and surface heat flux. *J. Geophys. Res Oceans*. doi:10.1002/2017JC013378

\*Garaba, S. and H.M. Dierssen. 2018. An airborne remote sensing case study of synthetic hydrocarbon detection using short wave infrared absorption features identified from marine-harvested macro- and microplastics. *Remote Sensing of the Environment*. 205:224-235. doi:10.1016/j.rse.2017.11.023

Hedley, J. \*B. Russell, \*K. Randolph, R.M. Vásquez-Elizondo and H. Dierssen. 2017. Hyperspectral mapping of seagrass leaf area index and species by a physics-based approach: do sensitivity analyses and practical application agree? *Frontiers in Marine Science*. doi: 10.3389/fmars.2017.00362

\*Khan, A., H. Dierssen, J. Schwarz, C. Schmitt, A. Chlus, M. Hermanson, T. Painter, and D. McKnight. 2017. Impacts of coal dust from an active mine on the spectral reflectance of Arctic surface snow in Svalbard, Norway. *J. Geophys. Res. Atmos.* 122(3):1767-1778. 10.1002/2016JD025757

\*Randolph, K, H.M. Dierssen, A. Cifuentes, E. Monahan, W. Balch, and C. Zappa. 2017. Novel methods for optically measuring whitecaps under natural wave breaking conditions. *J. Atmosph. & Oceanic Tech.* 34(3): p. 533-554. DOI: <http://dx.doi.org/10.1175/JTECH-D-16-0086.1>

Brady, P., A. Gilerson, G. Kattawar, J. Sullivan, M. Twardowski, H. Dierssen, and M.E. Cummings. 2016. Response to Comment on "Open-ocean fish reveal an omnidirectional solution to camouflage in polarized environments." *Science*: 353(6299): 552. DOI:10.1126/science.aaf5018



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- \*Russell, B.J., H.M. Dierssen, T.C. LaJeunesse, K.D. Hoadley, M.E. Warner, D.W. Kemp, T.G. Bateman. 2016. Spectral Reflectance of Palauan Reef-Building Coral with Different Symbionts in Response to Elevated Temperature. *Remote Sens.* 8(3); 164-183; doi:10.3390/rs8030164
- Hedley, J. \*B. Russell, \*K. Randolph and H. Dierssen. 2016. A physics-based method for the remote sensing of seagrasses. *Remote Sensing of the Environment* 174: 134-147.
- Dierssen, H.M., G. McManus, A. Chlus\*, D. Qiu, B. Gao, and S. Lin. 2015. Space station image captures a red tide ciliate bloom at high spectral and spatial resolution. *Proc. National Academy Sci.* 112 (48) 14783-14787. [www.pnas.org/cgi/doi/10.1073/pnas.1512538112](http://www.pnas.org/cgi/doi/10.1073/pnas.1512538112).
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#### **Book Chapters**

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Dierssen, H.M. and A.E. Theberge. 2014. Bathymetry: History of Seafloor Mapping. *Encyclopedia of Natural Resources. Volume II: Water and Air.* Taylor & Francis Group. New York. ISBN 9781439852583

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#### **Peer-reviewed Conference Proceedings and Databases**

Garaba, S. P., Castagna, A., Devriese, L. I., Dierssen, H. M., Everaert, G., Knaeps, E., and Sterckx, S. (2021) Spectral reflectance measurements of dry and wet plastic materials, asphalt, concrete klinker from UV-350 nm to SWIR-2500 nm around Spuikom, Belgium. PANGAEA - Data Publisher for Earth & Environmental Science, <https://doi.pangaea.de/10.1594/PANGAEA.937185>.

Dierssen, H.M. 2021. Realizing the potential of hyperspectral remote sensing in coastal and inland waters. IGARSS 2021 - IEEE International Geoscience and Remote Sensing Symposium Article. July. Brussels, Belgium

Garaba, S. P., and Dierssen, H. M. (2017) Spectral reference library of 11 types of virgin plastic pellets common in marine plastic debris. Ecological Spectral Information System (EcoSIS).

Dierssen, H.M. 2013. Overview of hyperspectral remote sensing for mapping marine benthic habitats from airborne and underwater sensors. Ed. P. Mouroulis and T.S. Pagano. Proceedings of SPIE Imaging Spectrometry XVIII. San Diego, CA September, 2013. 8870-21. p. 1-7.

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#### **News Articles**

Phillips, K. 2023. Art Meets Science in 'Floating Points' Exhibition at AVS Gallery at Avery Point. UConn Today. <https://today.uconn.edu/2023/11/art-meets-science-in-floating-points-exhibition-at-avs-gallery-at-avery-point/>

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Aldrich, A. 2021. Science and Art Combine on Microplastics Research Effort. UConn Today.  
<https://today.uconn.edu/2021/06/science-and-art-combine-on-microplastics-research-effort/>

Dierssen, H.M. 2021. Sensing a More Colorful Ocean with NASA's PACE Mission. Sea Technology. March. 62(3): 19-23.

Dierssen, H.M. and G. McManus. 2016. Mesodinium rubrum: An old bug meets new technology. Ocean Carbon and Biogeochemistry News. 9(1): 4-6.

Stuart, V., S. Bernard, and H. Dierssen. 2016. New Technology and Teamwork to Tackle Ocean Color Radiometry. EOS Earth and Space Transactions. 11 January 2016. <https://eos.org/meeting-reports/new-technology-and-teamwork-to-tackle-ocean-color-radiometry>.

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<http://spie.org/newsroom/technical-articles/5060-remote-sensing-of-coastal-habitats?ArticleID=x102807>

## INVITED COLLOQUIA

### Invited Plenary Talks

- Dierssen, H.M. 2023. Coast Guard's Climate Evergreen Strategic Event. 30-31 Aug 2022. Keynote addressing remote sensing and new sensor technology for advancing Coast Guard priorities in a changing world
- Dierssen, H.M. 2022. March 8. Coastal Perspectives Meeting. University of Connecticut. Rethinking the Blue Marble – the Colour of the Sea and Sky. <https://uconn-cmr.webex.com/recording/service/sites/uconn-cmr/recording/103ba775816f103ab9cc0050568fa8a9/playback>
- Realizing the potential of hyperspectral remote sensing in coastal and inland waters. IGARSS 2021 - IEEE International Geoscience and Remote Sensing Symposium Article. July. Brussels, Belgium. 2021
- Ocean World: Overview of Optical Technology. Ocean Carbon and Biogeochemistry Summer Workshop. June 18, 2021.
- Seagrass Monitoring with remote sensing: uncertainty of methods, science needs, future growth. All-Atlantic Summit on Innovation for Sustainable Marine Development and the Blue Economy: Fostering Global Economic Recovery in a Post-pandemic World. October. October 8, 2020
- New Directions in Ocean Color Research, Invited plenary panel, American Meteorological Society, 2019 Joint Satellite Conference, Boston, MA October 3 2019.
- How Green is "Blue Carbon": Optics and Remote Sensing of Coastal Vegetation. Santa Monica College. Distinguished Scientist Lecture Series. 3 March, 2016.
- Assessing Anthropogenic Loss of Blue Carbon in the Coastal Ecosystems. Invited plenary. NASA Carbon Cycle and Ecosystems Joint Science Workshop. 23 April 2015.
- Overview of Hyperspectral Remote Sensing for Mapping Marine Benthic Habitats from Airborne and Underwater Sensors. 2014. Imaging Spectrometry VXIII. SPIE Optics and Photonics. San Diego August 19-21 2013.
- Shedding light on whittings: optics and biogeochemistry. Securing Our Future Initiative (SOFI) Underwater Optics Workshop. 16-17 March 2009. Glasgow, Scotland. Invited International Speaker.
- Parting of the Red Seas. Ocean Optics XVIII. Montreal, Ca. Invited Plenary Talk (45 minutes). Oct. 9, 2006. Voted Best Talk of the Conference.

### Invited Academic Seminars

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- Exploring the need for hyperspectral imagery: A perspective from Long Island Sound. NTNU. Trondheim Norway. 5 September 2023
  - Technology for Exploring Ocean Worlds: Ocean Optics Perspective. NOW Retreat. Catalina Island, CA. 24 August 2023.
  - Advances in Remote Sensing of Microplastics. NASA Ocean Biology and Biogeochemistry Meeting. College Park Maryland, 9 May 2023.
  - Satellite ocean color measurements in the Western Antarctic Peninsula: A retrospective analysis. Rutgers University. Palmer Long Term Ecological Research Project Meeting. April 27, 2023
  - Filling the gap: Hyperspectral lessons from the great wet barnyard of Long Island Sound. Old Dominion University. April 11, 2023
  - Filling the gap: Hyperspectral lessons from the great wet barnyard of Long Island Sound. University of Rhode Island. March 31, 2023
  - Investing in New Sensing Technologies to Assess a Changing Ocean. Coast Guard Academy New London. October 13, 2022
  - Hyperspectral remote sensing from the great wet barnyard of Long Island Sound. University of Southern Mississippi. October 29, 2021
  - Better quantification of the “lungs” of the ocean: Hyperspectral remote sensing from the great wet barnyard of Long Island Sound. University of California Santa Cruz. February 12, 2021
  - Foresight Workshop - Data needs for hyperspectral detection of algal bloom diversity across the globe. Euromarine General Assembly. Piran, Slovenia. January 16, 2020
  - Bright Oceans: Differentiating whitecaps, plastics on the sea surface. University of Connecticut. Geography Department. November 1, 2019
  - Google Earth and Beyond: Interpreting spectral imagery of seagrass, corals and other coastal ecosystems. University of Rhode Island, Graduate School of Oceanography, September 11, 2019
  - Hyperspectral remote sensing of bright surface features: whitecaps and plastics. Flanders Marine Institute. Oostende, Belgium. 13 December 2018
  - Assessing Seagrass Dynamics using Hyperspectral Remote Sensing. University of Sao Paulo, CEBIMar. Brazil. Nov 10 2017
  - The 2017-2027 Advanced Science Plan for NASA’s Ocean Biology and Biogeochemistry Research. NASA Ocean Research Science Team Meeting. Lisbon, Portugal. May 2017
  - Sources of Backscattering in the Southern Ocean. International Ocean Colour Science Meeting. Lisbon, Portugal. May 2017
  - Out of the Box Applications for Hyperspectral Imagery. International Ocean Colour Science Meeting. Lisbon, Portugal. May 2017
  - Backscattering in the Southern Ocean. University of Maryland Baltimore County. April, 2017.
  - Town Hall: Defining Priorities for NASA in Ocean Ecology and Biogeochemistry. 2016 Ocean Sciences Meeting. New Orleans. 25 February, 2016.
  - NASA Hyperwall: Airborne Remote Sensing of Coastal Zone. 2016 Ocean Sciences Meeting. New Orleans. 24 February, 2016.
  - Global Café: Water, Water, Everywhere. Melding Art and Science. University of Connecticut. 23 November, 2015.
  - Using Remote Sensing Methods to Assess Seagrass Ecosystems and Potential Export of “Blue” Carbon. University of Rhode Island. 15 October 2015.
  - Using Remote Sensing Methods to Assess Seagrass Ecosystems and Potential Export of “Blue” Carbon. University of Connecticut. 25 September 2015.

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- Using Remote Sensing Methods to Assess Seagrass Ecosystems and Potential Export of “Blue” Carbon. University of Massachusetts Dartmouth. 16 September 2015
  - Assessing blue carbon from hyperspectral remote sensing. Royal Belgian Institute of Natural Sciences (RBINS). Brussels, Belgium. 1 July 2015.
  - Airborne remote sensing in high latitude systems. International Ocean Colour Meeting. High Latitude Presentation/Panel. 16 June 2015.
  - Airborne hyperspectral instrument PRISM and observations of submerged aquatic vegetation. 2014 Hypsiri Data Product Symposium. 6 June 2014.
  - Using hyperspectral airborne PRISM imagery to map vulnerable coastal salt marsh and seagrass habitats. 2013 Hypsiri Products Symposium. NASA Goddard Space Flight Center. 29 May 2013.
  - Seagrass is always greener: Optical remote sensing of the seafloor. NATO Undersea Research Centre. La Spezia Italy. 13 June 2012.
  - Akvaplan-niva Fram Centre for Climate and the Environment. Tromsø, Norway. 7 May 2012.
  - Institut für Chemie und Biologie des Meeres (ICBM) Carl von Ossietzky Universität Oldenburg. Germany. 28 March 2012.
  - National Oceanography Centre, The Proudman Oceanographic Laboratory, United Kingdom. 13 March 2012.
  - Norwegian University of Science and Technology. Trondheim, Norway. 16 February 2012.
  - Coccoliths versus bubbles: Backscattering in the Southern Ocean. Marine Atmospheric Chemistry Seminar. University of Rhode Island Graduate School of Oceanography. 8 April, 2011.
  - The airborne sensor PRISM. NASA Ocean Color Research Team Meeting. 4-5 May 2009. Invited Presentation.
  - Remote sensing of seagrass. NASA Coastal Habitat Assessment Workshop. Aug. 2008.
  - “Shedding Light” on the Mysterious Bahamian Sediment Whiting. University of Connecticut. Geosciences Colloquium. March 25, 2008.
  - Seeing Red: The Optics of Red and Black Tides. Woods Hole Oceanographic Institution. Marine Biological Laboratory. Colloquium. 8 March 2007
  - Seeing Red: The Optics of Red and Black Tides. University of Southern California. Biology Department. Colloquium. 20 February, 2007.
  - Benthic Ecology from Space. Bigelow Laboratories. Boothbay Harbor, Maine. Seminar. 6 December, 2006.
  - Parting the Red Seas: the Optics of Red Tides. University of Connecticut. Geography Dept., Mar. 17, 2006
  - Parting the Red Seas: the Optics of Red Tides. University of Rhode Island. Biological Sciences, Sept. 2005
  - Parting the Red Seas: the Optics of Red Tides. University of Rhode Island. Graduate School of Oceanography. Feb., 2005.
  - From melt water to red water: New tools for coastal ocean observing Old Dominion University, Ocean, Earth & Atmospheric Sciences, Norfolk, VA, October 7, 2004
  - Whitings and Windrows: Optics of the Bahamas Banks State University of New York Stony Brook, Marine and Atmospheric Sciences, NY, October 1, 2004
  - Benthic Ecology from Space: Remote Sensing of Seagrass from Different Platforms and Scales. Lamont Doherty Earth Observatory, New York, April 23, 2004
  - Benthic Ecology from Space: Remote Sensing of Seagrass from Different Platforms and Scales. University of Rhode Island. Graduate School of Oceanography. January 21, 2004.
  - Multi-platform remote sensing in coastal waters. Pacific Fisheries Laboratory. NOAA. Monterey, CA. March 15, 2002
  - Remote sensing benthic algal in optically shallow waters. Moss Landing Marine Labs. April 13, 2000.
  - SeaWiFS, Sea Ice and Seagrass: Challenges of remote sensing in coastal waters. Naval Postgraduate School. March 8, 2000.

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- SeaWiFS, Sea Ice and Seagrass: Challenges of remote sensing in coastal waters. University of California Santa Cruz. March 7, 2000.
  - Bio-optical properties of Antarctic coastal waters. University of Southern Mississippi, Department of Marine Sciences. April 28, 1999.

#### **PACE Related Invited Talks**

Dierssen, H.M. 2023. May 9. NASA Ocean Color Research Team Meeting. College Park Maryland.

Dierssen, H.M. 2022. April 13. Australia Aquawatch. Overview of PACE mission.

Dierssen, H.M. 2022. April 11. PACE Early Adopters. Challenges and Opportunities of Remote Sensing at the Air-Sea Boundary.

Dierssen, H.M. 2022. March 8. Coastal Perspectives Meeting. University of Connecticut. Rethinking the Blue Marble – the Colour of the Sea and Sky. <https://uconn-cmr.webex.com/recordingservice/sites/uconn-cmr/recording/103ba775816f103ab9cc0050568fa8a9/playback>

Remer, L.A. et al. 2022. February 28. Ocean Sciences Meeting. Remer et al. Why PACE is an atmospheric mission and why it matters to you, an ocean scientist

Dierssen, H.M. et al. 2022. February 28. Invited. Plankton, Aerosol, Cloud and ocean Ecosystem (PACE) hyperspectral mission: Synergies in Data, Science, and Applications. Ocean Sciences Meeting.

Dierssen, H.M. 2022. February 23. Ocean Sciences Joint NASA PACE, SBG, GLIMR Townhall. Opportunities presented by mission synergies.

Dierssen H.M. 2022. January 4. NASA Biodiversity Team Meeting. PACE Mission Overview.

Dierssen, H.M. 2021. December 7. Bright Oceans and Atmospheric Correction. American Geophysical Union Annual Meeting. Hybrid.

Dierssen, H.M. 2021. December 7. Realizing the potential of hyperspectral remote sensing in coastal and inland waters. American Geophysical Union Annual Meeting. Hybrid.

Dierssen, H.M. 2021. October 29. Invited. Hyperspectral remote sensing from the great wet barnyard of Long Island Sound. University of Southern Mississippi.

Dierssen, H.M. 2021. October 28. NASA Ocean Color Research Team (OCRT) Virtual Meeting. PACE SAT overview.

Dierssen, H.M. 2021. July 23. PACE Early Adopters Water Focus Group. Overview of PACE SAT.

Dierssen, H.M. 2021. July 8. Realizing the potential of hyperspectral remote sensing in coastal and inland waters. IGARSS 2021 - IEEE International Geoscience and Remote Sensing Symposium Article. July. Brussels, Belgium. 8 July 2021.

Dierssen, H.M. 2021. June 18. Invited. Ocean World: Overview of Optical Technology. Ocean Carbon and Biogeochemistry Summer Workshop.

Dierssen, H.M. 2021. June 15. 5th SBG Community Webinar. PACE mission overview.

Dierssen, H.M. 2021. February 12. Invited. Better quantification of the “lungs” of the ocean: Hyperspectral remote sensing from the great wet barnyard of Long Island Sound. University of California Santa Cruz. F

Dierssen H.M. 2020. September 23. PACE Applications Workshop. Moderator of Session 4: Connecting with the PACE Research Community

Dierssen, H.M. 2020. Assessing the lungs of the ocean with the Plankton Aerosol Cloud and ocean Ecosystem (PACE) Mission. AGU Fall Meeting. Virtual December 2020.

## **COMMUNITY OUTREACH**

- New London Day. Article. “Avery Point professor leading a team of scientists working on a NASA mission.” By Eric Moser. March 14, 2022.



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- UCONN Today. Article. "Science and Art Combine on Microplastics Research Effort." By Anna Zarra Aldrich. June 3, 2021
  - NBC Connecticut. 6 pm. 4/9/2021. Interview about marine microplastics and PPE. 2021.
  - STEM Mentor for Senior Project Internship. Stonington High School Senior. January-February 2020.
  - STEM Forum for Girls. Stonington High School. Science workshops for girl scouts. November 2, 2019.
  - This is UConn. University of Connecticut Television Commercial. 2016. Featured in the commercial doing ship-based teaching.
  - Aquakids Television Show. 2010. Presented field and laboratory experiments on Light and the Oceans. Aired in Spring 2010.
  - Women in Science Day. 2016. Mystic Aquarium, Connecticut. Hyperspectral imaging technology demonstration to public. July.
  - Third Annual COSEE-TEK Ocean Science & Technology Day (OSTD). 2015. Mystic Aquarium, Connecticut. Presented imaging spectrometry technology to the public.
  - National Ocean Sciences Bowl, Moderator, Quahog Bowl: 2015, 2013, 2011, 2010, 2009, 2008, Otter Bowl: 2002, 2003.
  - COSEE-TEK Teacher Technology Experiences Workshop. 11-12 November 2012, Presentation and Interaction with high school teachers.
  - COSEE-TEK Teacher Ocean Technology Institute (TOTI), Developed 3-day workshop "Hiding in the Light," for high school teachers based on research. 27-31 July, 2011. <http://www.coseetek.net/programs/TTE/LIGHT/>
  - Research presentation to UConn Board of Director's spouses (2008, 2013)
  - Birralee International School. Trondheim, Norway. Presentation to Year 5 on light and oceans. 2012.
  - Westerly Middle School. Westerly, RI. Presentations and optics and polarized light to 6th Grade classes.
  - State Street School. Westerly RI. Math Week. Presentation on math in my career. 2011, 2010
  - Long Island Sound Foundation. Marine Science Day Conference. Annual Presenter (2006, 2007, 2008, 2009, 2010, 2011). Presented remote sensing session to groups of 4-8 graders.
  - Tower Street School, Westerly RI. (2006, 2008). Organized and instructed a day-long Marine Science Field Trip to Avery Point for two Kindergarden classes.
  - John Hopkins Center for Talented Youth Day. Nov 12, 2005. Two hour-long workshops for 8th graders.

## PROFESSIONAL AFFILIATIONS

The Oceanography Society (TOS)

American Geophysical Union (AGU)

American Society of Limnology and Oceanography Society (ASLO)

International Ocean Colour Coordinating Group (IOCCG)