

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 Team Leader for the NASA Plankton Aerosol Cloud and ocean Ecosystem (PACE) mission and serves as an expert on numerous 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
<i>Advisor: Harold Mooney. Comparison of Male and Female Function in a Dioecious Shrub</i>				
University of California, Santa Barbara	Santa Barbara, CA	Geography	Ph.D.	2000
<i>Advisor: Raymond Smith. Ocean Color Remote Sensing along Antarctic Peninsula</i>				
Moss Landing Marine Laboratory	Moss Landing, CA	Optical Oceanography	Postdoc	2001-2002
<i>Advisor: Richard Zimmerman. Remote Sensing of Seagrass in Bahamas Banks</i>				
Monterey Bay Aquarium Research Inst.	Moss Landing, CA	Optical Oceanography	Postdoc	2002-2003
<i>Advisor: John Ryan. Imaging Spectroscopy of Blooms in Monterey Bay</i>				

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	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
2006	Best Speaker Award. Ocean Optics Conference. Presentation of Bell Award.

2002 MBARI Postdoctoral Fellow
1999 California Space Grant Fellow
1997 Complex Systems Summer School, Santa Fe Institute
1997 NASA Earth System Science Fellow.

SYNERGISTIC ACTIVITIES

2021- Lead, International Ocean Colour Coordinating Committee (IOCCG) Working Group on Benthic Reflectance Measurements
2021- Member, IOCCG Task Force on Remote Sensing of Marine Litter and Debris
2020- Lead, NASA Plankton Aerosol Cloud and Ocean Ecosystem (PACE) Mission Science and Applications Team
2020- Member, Surface Biology and Geology Mission (SBG) Space-based Imaging Spectroscopy and Thermal pathfindER (SISTER) study
2020- Member, International Science Advisory Team for Australian Aquawatch Mission
2020- Member, Scientific Committee on Ocean Research (SCOR) Working Group C-GRASS coordinating seagrass research.
2019- Chair, International Foresight Workshop. Hyperspectral Data Needs for Discrimination of Phytoplankton Groups. Euromarine.
2019- Member. Remote Sensing & Mapping of Seagrass Expert Workshop. Oxford. Pew Charitable Trust.
2019- Co-Chair. Townhall. Hyperspectral phytoplankton community structure. Ocean Optics.
2019- Member. Ocean Sciences Across the Solar System Working Group. NASA
2018- Member. Alliance for Coastal Technologies. Hyperspectral Imaging of Coastal Waters Working Group.
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 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

SCIENCE TEAM MEMBER

2014-2024 Phytoplankton Aerosol Cloud and ocean Ecosystem (PACE) Satellite Mission. 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 O₂/N₂ Ratio and CO₂ 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

2016-2017 UConn Marine Sciences Diving Program (MSDP) Strategic Plan
2013-2014 Strategic Planning. UConn College of Liberal Arts and Sciences Academic Planning Committee

Promotion, Tenure, and Reappointment (PTR)

2016-2020 Member, Dean's PTR Committee for College of Liberal Arts and Sciences
2013-2014 Chair, Marine Sciences PTR Committee
2012-2013 Member, Marine Sciences PTR Committee

Courses and Curriculum

2012-present Member, College Liberal Arts and Sciences (CLAS) Courses and Curriculum.
2012-present Chair, Department of Marine Sciences Courses and Curriculum
2020-present Member, Ocean Engineering Certificate Committee
2015-2018 Chair, Bachelor of Science Subcommittee for CLAS.

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
2010-2011 Physical Oceanography Assistant Professor

International Evaluation Committees for Faculty Recruitment

2017 University of Bergen Norway
2012, 2015 Norwegian Technical University

UNIVERSITY TEACHING

Courses

2007-2020 MARN 1002/1003. Introduction to Oceanography
2008-2018 MARN 3505/5505. Remote Sensing of Marine Geography (even years)
2016 MARN 4002. Science and the Coastal Environment
2003-2012 MARN 3014. Marine Biology (intermittent)
2006 MARN 260/380. Biological Oceanography
2009,2012 MARN 5898. Light and Photosynthesis in Aquatic Ecosystems

International Teaching

2017 Guest Lecturer, 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

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 (expected 2021)

Postdoctoral scholars: S. Garaba (2015-2018), K. Randolph (2016-2018), B. Russell (2016-2019), F. Henderikx-Freitas (2016-2017)

Associate Advisor

Ph.D. students: A. Branco (2006), H. Brown (2017), M. Fogarty (2018), V. Haynes (2019), H. Frye (pending)

M.S. students: R. Perry (2015), A. Chlus (2015)

International Thesis Review

2020 James Cook University, Australia, Prospectus

2015 Curtin University, Australia, Ph.D.

2019 University of Massachusetts Boston, USA. Ph.D.

2015 University of Tasmania, Tasmania, Ph.D.

2019 University of Gent, Belgium. M.S.

2014 Capetown University, South Africa. Ph.D.

2018 University of Queensland, Australia, Ph.D.

2011 Norwegian Technical University, Norway. Ph.D.

GRANTS

Submitted

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

Current

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 7/1/2020-6/30/2020.

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. 7/1/2020-6/30/2020.

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.

Belgium Science Policy Office (BELSPO). Co-I. "TIMBERS: 3D Turbidity assessment through Integration of MultiBeam Echo-sounding and optical Remote Sensing." \$10K. 08/01/2019-08/01/2021.

NSF; Co-I. "REU Site Mystic Aquarium: Collaborative Research: Investigating the Consequences of Global Change on Marine Animals and their Ecosystem." 03/01/2017 – 02/29/2020.

Past 5 Years

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; 11/169/2014-11/18/2019; 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

Dierssen, H.M., S. Ackleson, K. Joyce, E. Hestir, A. Castagna, S. Lavender, and M. McManus. Submitted. Living up to the Hype of Hyperspectral Aquatic Remote Sensing: Science, Resources and Outlook. *Frontiers*.

Revise and Resubmit

Cause-Nicholson, K. et al. Revise and Resubmit. A compilation of surface imaging algorithms: NASA’s Surface Biology and Geology Designated Observable. *Remote Sensing of the Environment*.

Published

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 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>

Garaba, S. P., & Dierssen, H. M. 2020. Hyperspectral ultraviolet to shortwave infrared characteristics of marine-harvested, washed-ashore and virgin plastics. *Earth System Science Data*, 12(1), 77–86.

*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. Pushing the Limits of Seagrass Remote Sensing in the Turbid Waters of Elkhorn Slough, California. 2019. *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 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.

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- 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.
- 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. H.M. 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, V. Donets, B. Gao, M. Gierach, R. Green, J. Haag, M. Hayman, A. Hills, M. Hoecker-Martínez, S. Honomichl, R. Hornbrook, J. Jensen, R. Li, I. McCubbin, K. McKain, E. Morgan, S. Nolte, J. Powers, B. Rainwater, K. Randolph, M. Reeves, S. Schauffler, M. Smith, K. Smith, J. Stith, G. Stossmeister, D. Toohey, and A. Watt, 2017: The O₂/N₂ Ratio and CO₂ 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

*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 Sens. Environ.* 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.

Brady, P.C., Gilerson, A.A., Kattawar, G.W., Sullivan, J.M., Twardowski, M.S., Dierssen, H.M., Gao, M., Travis, K., Etheredge, R.I., Tonizzo, A. and Ibrahim, A., 2015. Open-ocean fish reveal an omnidirectional solution to camouflage in polarized environments. *Science*, 350(6263): 965-969.

*Russell, B. and H. M. Dierssen. 2015. Use of Hyperspectral Imagery to Assess Cryptic Color Matching in Sargassum Associated Crabs. *Plos One*. 10(9): e1036260. 10.1371/journal.pone.0136260

Dierssen, H.M., *A. Chlus, *B. Russell. 2015. Hyperspectral discrimination of floating mats of seagrass wrack and the macroalgae Sargassum in coastal waters of Greater Florida Bay using airborne remote sensing. *Remote Sens. Environ.* 10.1016/j.rse.2015.01.027

*Randolph, K., H.M. Dierssen, M. Twardowski, A. Cifuentes Lorenzen, C.J. Zappa. 2014. Optical measurements of small deeply-penetrating bubble populations generated by breaking waves in the Southern Ocean. *J. Geophys. Res. Oceans*, 119, doi:10.1002/2013JC009227.

Hill, V., R. C. Zimmerman, W. P. Bissett, D. D. R. Kohler, and H.M. Dierssen. 2014. Evaluating light availability and seagrass biomass and productivity using hyperspectral airborne remote sensing in Saint Joseph's Bay, Florida. *Estuaries and Coasts*. DOI 10.1007/s12237-013-9764-3

Mouroulis, P., B.V. Gorp, R. Green, H.M. Dierssen, D.W. Wilson, M. Eastwood, J. Boardman, B. Gao, D. Cohen, B. Franklin, F. Loya, S. Lundeen, A. Mazer, I. McCubbin, D. Randall, B. Richardson, J.I. Rodriguez, C. Sarture, E. Urquiza, R. Vargas, V. White, K. Yee. 2013. The Portable Remote Imaging Spectrometer (PRISM) coastal ocean sensor: characteristics and first flight results. *Appl. Optics*. 53(7):1363-1380.

Gilerson, A.A., J. Stepinski, A.I. Ibrahim, Y. You, J.M. Sullivan, M.S. Twardowski, H.M. Dierssen, *B. Russell, M.E. Cummings, P. Brady, S.A. Ahmed, and G.W. Kattawar. 2013. Benthic effects on the polarization of light in shallow waters. *Appl. Optics*. 52(36):8685-8705

Siegel, D.A., M.J. Behrenfeld, S. Maritorea, C.R. McClain, D. Antoine, S.W. Bailey, P.S. Bontempi, E.S. Boss, H.M.

Dierssen et al.. 2013. Regional to Global Assessments of Decadal Scale Phytoplankton Dynamics From The SeaWiFS Mission. *Remote Sensing of the Environ.* 135:77-91.

*Hovland, E.K., H.M. Dierssen, A.S. Foerreira, and G. Johnsen. 2013. Dynamics regulating major trends in Barents Sea temperatures and the subsequent effect on remotely sensed particulate inorganic carbon. *Marine Ecol. Progr. Ser.* 484:17-32.

*Aurin, D. and H. M. Dierssen. 2012. Advantages and limitations of ocean color remote sensing in CDOM-dominated, mineral-rich coastal and estuarine waters. *Remote Sensing of the Environ.* 125: 181-197.

Rosa, R., Gonzales, L., H.M. Dierssen, and B. A. Seibel. 2012. Environmental determinants of latitudinal-size trends in cephalopods. *Mar. Ecology Progress Series.* 464: 153-165

Seibel, B. A., A. E. Mass, H.M. Dierssen. 2012. Energetic plasticity underlies a variable response to ocean acidification in the pteropod, *Limacina helicina antarctica*. *PLoS ONE.* 7(4). e30464.

Groundwater, H., M. Twardowski, H. Dierssen, A. Sciandra, S. Freeman. 2012. Determining oceanic particle size distributions and particle composition: a new SEM-EDS protocol with validation and comparison to other methods. *Journal of Atmospheric and Oceanic Technology.* 29. 433-449.

Maas, Amy E., L. E. Elder, H.M. Dierssen, and B. A. Seibel. 2011. The metabolic response of Antarctic pteropods (Mollusca: Gastropoda) to regional productivity: implications for biogeochemical cycles. *Marine Ecol. Progr. Ser.* 441: 129-139.

You, Y., A. Tonizzo, A. Gilerson, M. E. Cummings, P. Brady, J. M. Sullivan, M. S. Twardowski, H. M. Dierssen, S. A. Ahmed, and G. W. Kattawar. 2011. Measurements and simulations of polarization states of underwater light in clear oceanic waters. *Applied Optics.* 50, 4873-4893.

McPherson, M., V.J. Hill, R.C. Zimmerman, and H.M. Dierssen. 2011. The optical properties of Greater Florida Bay: Implications for seagrass abundance. *Estuaries and Coasts.* DOI: 10.1007/s12237-011-9411-9.

Dierssen, H.M. 2010. Perspectives on Empirical Approaches for Ocean Color Remote Sensing of Chlorophyll in a Changing Climate. *Proc. Nat. Acad. Sci.* 107:17073-17078.

*Buonassissi, C., and H.M. Dierssen. 2010. A Regional Comparison of Particle Size Distributions and the Power-law Approximation in Oceanic and Estuarine Surface Waters. *J. Geophys. Res.* 115. C10028. doi:10.1029/2010JC006256.

Dierssen, H.M., R.C. Zimmerman, D. Burdige, and L. Drake. 2010. Benthic ecology from space: optics and net primary production in seagrass and benthic algae across the Great Bahama Bank. *Marine Ecol. Progr. Ser.* 411:1-15. Feature article.

*Aurin, D, H.M. Dierssen, M.S. Twardowski and C.S. Roesler. 2010. Optical complexity in Long Island Sound and implications for coastal ocean color remote sensing, *J. Geophys. Res.*, 115 (C07011), doi:10.1029/2009JC005837.

Dierssen, H.M., R.C. Zimmerman, D. Burdige, and L. Drake. 2009. Potential export of unattached benthic macroalgae to the deep sea through wind-driven Langmuir circulation. *Geophys. Res. Letters.* 36. L04602, doi:10.1029/2008GL036188

Seibel, B.A. and H. M. Dierssen. 2009. Animal function at the heart (and Gut) of Oceanography. *Science.* 323, 343-344.

Dierssen, H.M., R.C. Zimmerman, and D. Burdige. 2009. Optical properties and remote sensing of high turbidity carbonate sediment whittings on the Great Bahama Bank and relationship to Langmuir Circulation. *Biogeosciences.* 6: 1-14.

Rosa, R., Dierssen, H.M., Gonzales, L., and B. A. Seibel. 2008. Large scale diversity patterns of cephalopods in the

Atlantic open ocean and deep-sea. *Ecology*. 89, 3449-3461.

Rosa, R., Dierssen, H.M., Gonzales, L., and B. A. Seibel. 2008. Ecological biogeography of cephalopod mollusks in Atlantic Ocean: Historical and contemporary causes of coastal diversity patterns. *Global Ecol. Biogeography*. 17: 600-610.

Gao, B., M.J. Montes, R. Li, H.M. Dierssen, and C.O. Davis. 2007. An atmospheric correction algorithm for remote sensing of bright coastal waters using MODIS land and ocean channels in the solar spectral region. *IEEE Trans. Geosci. Remote Sens.* 45 (6): 1835-1843.

Dierssen, H.M., Ryan, J., R. Kudela, and R.C. Zimmerman. 2006. Red and black tides: Quantitative analysis of water-leaving radiance and perceived color for phytoplankton, colored dissolved organic matter, and suspended sediments. *Limnol. Oceanogr.* 55 (6):2646-2659.

Carr, M.E. et al. 2006. A comparison of global estimates of marine primary production from ocean color. *Deep Sea Research II*. 53: 741-770.

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Book Chapters

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.

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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Dierssen, H.M. and Randolph, K. 2013. Remote Sensing of Ocean Color. In *Earth System Monitoring*. Ed J. Orcutt. Springer. New York. pp 439-472. DOI: 10.1007/978-1-4614-5684-1.

Dierssen, H.M., and *Randolph, K. 2013. Remote Sensing of Ocean Color. Encyclopedia of Sustainability Science and Technology. Springer-Verlag Berlin Heidelberg. 25 pp.

Johnsen G, Z. Volent, H.M. Dierssen, R. Pettersen, M.V. Ardelan, F. Søreide, P. Fearn, M. Ludvigsen, and M. Moline. 2013. Underwater hyperspectral imagery to create biogeochemical maps of seafloor properties. Chapter 20. In Subsea Optics and Imaging. Ed. J. Watson and O. Zielinski. Woodhead Publishing. DOI : 10.1533/9780857093523.3.508. pp. 508-535.

Dierssen, H.M., J. Acker, S. Bernard, and G. Pitcher. 2008. Hazards: Natural and Man-Made. In Why Ocean Colour? The Societal Benefits of Ocean Colour Technology. Ed. Platt, T., N. Hoepffner, V. Stuart, and C. Brown. International Ocean Color Coordinating Group (IOCCG) Report number 7. p. 83-102.

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Peer-reviewed Conference Proceedings and Databases

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

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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Groundwater, H. M. Twardowski, H.M. Dierssen, A. Sciandre, and S.A. Freeman. A method for determining oceanic particle size distributions and particle composition using scanning electron microscopy coupled with energy dispersive spectroscopy. in Scanning Microscopy 2010, Proceedings of SPIE Vol. 7729 (SPIE, Bellingham, WA 2010), 77290E.

Peloquin, J, C. Swan, N. Gruber, M. Vogt, H. Claustre, J. Ras, J. Uitz, J-C. Marty, R. Barlow, M. Behrenfeld, R. Bidigare, E. Buitenhuis, D. Cummings, H. Dierssen et. al. 2012. The MAREDAT global database of high performance liquid chromatography marine pigment measurements. Earth System Science Data (ESSD) 5: 1179-1214.

Lee, Z., C. Hu, B. Casey, S. Shang, H. Dierssen, and R. Arnone. 2010. Global shallow-water high resolution bathymetry from ocean color satellites. Eos Trans. Amer. Geophys. Un. 91 (46): 429-430.

Trees, C.C., P.W. Bissett, H. Dierssen, D. Kohler, et al. 2005. Monitoring water transparency and diver visibility in ports and harbors using aircraft hyperspectral remote sensing. Photonics for Port and Harbor Security, edited by M.J. DeWeert and T.T. Saito, Proceedings of the SPIE 5780: 91-98.

Dierssen, H. 2000. Ocean color remote sensing of chlorophyll and primary production west of the Antarctic Peninsula. PhD Thesis, University of California, Santa Barbara, Santa Barbara, CA.

Dierssen, H.M., and R.C. Smith. 1997. Estimation of irradiance just below the air-water interface, in Proceedings Ocean Optics XIII, edited by S. Ackleson and R. Frouin, Proc. SPIE Int. Soc. for Opt. Eng., 2963, 204-209.

News Articles

- Dierssen, H.M. 2021. Submitted. Sensing a More Colorful Ocean with NASA's PACE Mission. *Sea Technology*.
- 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>.
- Dierssen, H.M. Remote sensing of coastal habitats. 2013. *SPIE Newsroom*. 16 August 2013. <http://spie.org/newsroom/technical-articles/5060-remote-sensing-of-coastal-habitats?ArticleID=x102807>

INVITED COLLOQUIA

Invited Plenary Talks

- 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
- 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 Seminars

- 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

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- 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.
 - 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.
 - 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.

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- 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.
 - 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.

COMMUNITY OUTREACH

- 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)