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Dr. Gentemann is a senior scientist at Earth & Space Research, a non-profit research institute based in Seattle, WA and an affiliate of University of Washington. Her research focuses on satellite remote sensing, air-sea interactions, upper ocean physical processes, open data / open science, and artificial intelligence applications to remote sensing data. She has worked on the calibration, radiative transfer modelling, algorithm development, validation, and operational near-real-time distribution of multiple passive microwave sensors (TMI, AMSR-E, AMSR2, WindSAT). Additionally, she also worked on validation of infrared sensors (GOES, MODIS, VIIRS) and development of infrared SST algorithms for the TRMM VIRS instrument. Working as part of the international GHRSSST Science Team, she was responsible for distributing in near-real-time passive microwave SSTs in netCDF4 CF-compliant formats and developing a multi-sensor data fusion algorithm to provide operational high resolution sea surface temperatures. Her recent research involves interdisciplinary science using cloud computing, open source software development, and machine learning for applications and algorithm development using remote sensing data. She has led 3 large academic, governmental, commercial partnerships, coordinating with over 20 scientists on each project, served on and chaired numerous international and national science teams, working groups, and committees.

Experience:

3/2016 – present: Earth & Space Research, Senior Scientist. Remote sensing algorithm development. Research into physical oceanography, upper ocean thermal structure and variability, severe storms, air-sea interactions, multi-sensor SST fusion, biophysical interactions, open data / open science, and artificial intelligence applications in remote sensing data.

2017 - present: University of Washington, Applied Physics Laboratory, Affiliate

2017 - 2018: NASA Jet Propulsion Laboratory, Visiting Scholar

2/1998 – 10/2015: Remote Sensing Systems, Senior Principal Scientist. Calibration, algorithm development, and retrieval validation for passive microwave and infrared radiometers. Research into upper ocean thermal structure and variability, air-sea interactions, multi-sensor SST fusion.

2003 – 2007: University of Miami, Graduate Research Assistant. Research on error characterization, SST data fusion methodologies, and upper ocean thermal structure. Development of a physical model of diurnal warming with Dr. Peter J. Minnett.

1995 – 1998: Scripps Institute of Oceanography, Graduate Research Assistant. Numerical modeling of surface quasi-geostrophic flow over topography with Dr. Rick Salmon.

1991 - 1995 Massachusetts Institute of Technology Undergraduate Research Assistant. Investigated the inverted barometer effect with Dr. Carl Wunsch and Dr. Detlef Stammer.

Education:

2003 - 2007 Ph.D. Meteorology and Physical Oceanography, University of Miami
1995 - 1997 M.S. Physical Oceanography, Scripps Institution of Oceanography
1991 - 1995 B.S. Massachusetts Institute of Technology

Science Teams, Working Groups, Organizing Committees:

National Academies of Sciences, Engineering, and Medicine

Intelligence Science and Technology Experts Group (ISTEG) (2015 – present)
Standing Committee on Earth Science & Applications from Space (CESAS) (2012 – 2018;
Co-Chair 2018 - present)
Committee on a Framework for Analyzing the Needs for Continuity of NASA-Sustained
Remote Sensing Observations of the Earth from Space (10/2013 – 6/2015)
Committee on Best Practices for a Future Open Code Policy for NASA Space Studies
(10/2017-8/2018; Co-Chair)
NOAA Science Advisory Board (SAB): Data Access and Archiving Requirements Working
Group (DAARWG) (2013 – 2018; Chair 2018 - present)
Group for high resolution SST (GHRSSST) Science Team and Advisory Council (2001 – present;
Chair of Advisory Council 2016-2017)
AGU Falkenberg Award Committee (2014 – 2019; Chair 2016 – 2019)
NASA GHRC User Working Group (2014-2015; Chair 2014-2015)
NASA PO.DAAC User Working Group (2006-2013; Chair 2011-2013)
JAXA GCOM-W AMSR2 Science Team (2009 – 2016)
NASA Sea Surface Temperature Science Team (2010-present)
MIT Educational Council (1998-present)
NASA Satellite Ocean Atlas Team (1998-2001)
Organizing Committee 44th International Liege Colloquium on Ocean Dynamics (2011-2012)
Organizing Committee for Pacific Anomaly Workshop (2015-2017)

Awards:

American Geophysical Union 2013 Charles S. Falkenberg Award. *The award is for a “scientist under 45 years of age who has contributed to the quality of life, economic opportunities, and stewardship of the planet through the use of Earth science information and to the public awareness of the importance of understanding our planet.”*

National Oceanographic Partnership Program 2008 Excellence in Partnering Award.
C.Gentemann was the PI on this project. The award is “presented annually to research teams that best demonstrate the partnerships objectives of NOPP, recognizing the project’s commitment to partnering, the success of the partnership effort, and the impact of the partnership on oceanography.”

NASA Group Achievement Award 2001 to the Satellite Ocean Atlas Team, *for outstanding achievement in utilization of multiple observations from space for the study of the global oceans. C. Gentemann was a member of the team.*

AGU 2007 Joint Assembly, Acapulco, Mexico. Outstanding student presentation award.

AGU 2006 Joint Assembly, Baltimore, MD. Outstanding student paper award.

IGARSS 2006 IEEE International Geoscience and Remote Sensing Symposium & 27th Canadian Symposium on Remote Sensing, Denver, CO. Student paper competition finalist.

American Meteorological Society 2005 13th Conference on Satellite Meteorology and Oceanography, Norfolk, VA. Student poster competition: 3rd prize.

Peer Reviewed Publications (35 total):

Corlett, G., et al., Sea Surface Temperature Community White Paper, Marine Frontiers, Ocean Obs 2019. (*in prep*)

Cronin, M., et al., Air-sea fluxes with a focus on heat and momentum, Marine Frontiers, Ocean Obs 2019. (*in prep*)

- Alerskans, E., Høyer, J., and Gentemann, C.L., Construction of a climate data record from PMW measurements. (*in prep*)
- Minnett, P., et al., Half a century of remote sensing of sea surface temperature, *Remote Sensing of the Envir. (in prep)*
- Zhang, H., Beggs, H., Merchant, C. J., Wang, X. H., Majewski, L., Kiss, A. E., et al. (2018). Comparison of SST diurnal variation models over the Tropical Warm Pool region. *J. Geophys. Res. Oceans*, 123, 3467-3488. <https://doi.org/10.1029/2017JC013517>.
- Gentemann, C. L., & Akella, S. (2018). Evaluation of NASA GEOS-ADAS modeled diurnal warming through comparisons to SEVIRI and AMSR2 SST observations. *J. Geophys. Res. Oceans*, 123, 1364–1375. <https://doi.org/10.1002/2017JC013186>.
- Nielsen-Englyst, P., J. L. Høyer, L. Toudal Pedersen, C. L. Gentemann, E. Alerskans, T. Block, and C. Donlon (2018), Optimal Estimation of Sea Surface Temperature from AMSR-E, *Remote Sensing*, 10(2), 229, doi:10.3390/rs10020229.
- Gentemann, C. L., M. R. Fewings, and M. García-Reyes (2016), “Satellite sea surface temperatures along the West Coast of the United States during the 2014–2016 northeast Pacific marine heat wave”, *Geophys. Res. Lett.*, 43, doi:10.1002/2016GL071039.
- Gentemann, C.L. and K.A. Hilburn, “In situ validation of sea surface temperatures from the GCOM-W1 AMSR2 RSS calibrated brightness temperatures”, (2015) *J. Geophys. Res. Oceans*, 120, 3567-3585, doi: 10.1002/2014JC010574.
- Walker, N. D., R. R. Leben, C. T. Pilley, M. Shannon, D. C. Herndon, I.-F. Pun, I.-I. Lin, and C. L. Gentemann (2014), Slow translation speed causes rapid collapse of northeast Pacific Hurricane Kenneth over cold core eddy, *Geophys. Res. Lett.*, 41, 7595–7601, doi:10.1002/2014GL061584
- Gentemann, C. L.,” Three way validation of MODIS and AMSR-E sea surface temperatures”, (2014), *J. Geophys. Res. Oceans*, 119, 2583–2598, doi:10.1002/2013JC009716.
- Woods, S., P.J. Minnett, C.L. Gentemann, D. Bogucki, “Influence of the oceanic cool skin layer on global air-sea CO₂ flux estimates”, (2014), *Rem. Sens. of Enviro.* 145, 15-24.
- Becker, E.A., D.G. Foley, K.A. Forney, J. Barlow, J.V. Redfern, C.L. Gentemann, “Forecasting cetacean abundance patterns to enhance management decisions” (2012), *Endangered Species Research*, 16, 97-112, doi: 10.3354/esr00390.
- Monier, A., R. M. Welsh, C. L. Gentemann, G. Weinstock, E. Sodergren, E. V. Armbrust, J. A. Eisen and A. Z. Worden, “Phytoplankton phosphate uptake and cross domain commonalities in viral-host gene exchanges” (2012), *Environmental Microbiology*, 14, 162-176, doi: 10.1111/j.1462-2920.2011.02576.x.
- Demir, E., S. Sudek, M. Cuvelier, C.L. Gentemann, J. Zehr, A.Z. Worden, “Global distribution patterns of distinct clades of the photosynthetic picoeukaryote *Ostreococcus*” (2011), *ISME Journal*, 5(7), 1095-1107, doi: 10.1038/ismej.2010.209.
- Gentemann, C.L., T. Meissner, and F. J. Wentz, "Accuracy of satellite sea surface temperatures at 7 and 11 GHz" (2010), *Trans. Geosci. Rem. Sens.*, 48(3), 1009-1018, doi: 10.1109/TGRS.20092030322.
- Reynolds, R.W., C.L. Gentemann, G.K. Corlett, “Evaluation of AATSR and TMI satellite SST data” (2010), *J. Clim.*, 21(1), DOI: 10.1175/2009JCLI3252.1.
- Donlon, C. J., K. S. Casey, I. S. Robinson, C. L. Gentemann, R. W. Reynolds, I. Barton, O. Arino, J. Stark, N. Rayner, P. LeBorgne, D. Poulter, J. Vazquez, H. Beggs, D. Llewellyn Jones, P. Minnett, “The GODAE High Resolution Sea Surface Temperature Pilot Project (GHRSSST-PP)” (2009), *Oceanography*, 22(3), 34-45.

- Gentemann, C.L., P.J. Minnett, and B. Ward, "Profiles of Surface Heating (POSH): a new model of upper ocean diurnal warming" (2009), *J. Geophys. Res.*, 114, C07017, doi:10.1029/2008JC004825.
- Gentemann, C.L., P.J. Minnett, J. Sienkiewicz, M. DeMaria, J. Cummings, Y. Jin, J.D. Doyle, L. Gramer, C.N. Barron, K. Casey, and C. Donlon, "The Multi-sensor Improved Sea Surface Temperature (MISST) project" (2009), *Oceanography*, 22(2), 76-87.
- Worden, A.Z., et al., "The genomes of *Micromonas*: global reporters in marine environments" (2009), *Science*, 324(5924), 268-272, DOI: 10.1126/science.1167222.
- Gentemann, C.L., P.J. Minnett, P. LeBorgne, and C.J. Merchant (2008), "Multi-satellite measurement of large diurnal SST warming events", *Geophys. Res. Lett.*, 35, L22602, doi: 10.1029/2008GL035730.
- Kettle, H., C. J. Merchant, M. Filipiak, C. D. Jeffery and C. L. Gentemann (2008), "The impact of diurnal variability in sea surface temperature on the Atlantic sea-air CO₂ flux", *Atmos. Chem. Phys. Discuss.*, 8, 15825-15853.
- Gentemann, C.L. and P.J. Minnett (2008), "Radiometric measurements of ocean surface thermal variability", *J. Geophys. Res.*, 113, C08017, doi:10.1029/2007JC004540.
- Donlon, C. J., et al. (2007), The Global Ocean Data Assimilation Experiment (GODAE) High Resolution Sea Surface Temperature Pilot Project (GHRSSST-PP), *Bulletin of the American Meteorological Society*, 88(8), 1197-1213.
- Horváth, Á. and C. L. Gentemann (2007), Cloud-fraction-dependent bias in satellite liquid water path retrievals of shallow, non-precipitating marine clouds, *Geophysical Research Letters*, 34, doi:10.1029/2007GL030625.
- Dong, S., S. T. Gille, J. Sprintall and C. L. Gentemann (2006), Validation of the Advanced Microwave Scanning Radiometer for the Earth Observing System (AMSR-E) sea surface temperature in the Southern Ocean, *Journal of Geophysical Research*, 111, doi:10.1029/2005JC002934.
- Reynolds, R.W., H.M. Zhang, T.M. Smith, C.L. Gentemann, F.J. Wentz, "Impacts of in situ and additional satellite data on the accuracy of a sea-surface temperature analysis for climate", (2005), *Intern. J. of Climatology*, 25(7), 857-864.
- Gentemann, C.L, F.J. Wentz, C.M. Mears, and D.K. Smith (2004), "In-situ validation of TRMM microwave sea surface temperatures", *J. Geophys. Res.*, 109, C04021.
- Donlon, C. J., L. Nykjaer and C. L. Gentemann (2004), Using sea surface temperature measurements from microwave and infrared satellite measurements, *International Journal of Remote Sensing*, 25(7-8), 1331-1336.
- Reynolds, R. W., C. L. Gentemann and F. J. Wentz (2004), Impact of TRMM SSTs on a climate-scale SST analysis, *Journal of Climate*, 17(8), 2938-2952.
- Gentemann, C.L, C.J. Donlon, A. Stuart-Menteth, F.J. Wentz (2003), "Diurnal signals in satellite sea surface temperature measurements", *Geophysical Research Letters*, 30(3), 1140-1143.
- Stammer, D., F. J. Wentz and C. L. Gentemann (2003), Validation of microwave sea surface temperature measurements for climate purposes, *Journal of Climate*, 16(1), 73-87.
- Donlon, C. J., P. J. Minnett, C. L. Gentemann, T. J. Nightingale, I. J. Barton, B. Ward and M. J. Murray (2002), Towards improved validation of satellite sea surface skin temperature measurements for climate research, *Journal of Climate*, 15(4), 353-369.
- Chelton, D. B., S. K. Esbensen, M. G. Schlax, N. Thum, M. H. Freilich, F. J. Wentz, C. L. Gentemann, M. J. McPhaden and P. S. Schopf (2001), Observations of coupling between

surface wind stress and sea surface temperature in the eastern tropical Pacific, *Journal of Climate*, 14(7), 1479-1498.

- Chelton, D. B., F. J. Wentz, C. L. Gentemann, R. A. D. Szoeké and M. G. Schlax (2000), Satellite microwave SST observations of transequatorial tropical instability waves, *Geophysical Research Letters*, 27(9), 1239-1242.
- Donlon, C. J., C. L. Gentemann and F. J. Wentz (2001), Measuring surface temperature with microwave sensors, *Backscatter*, 12, 37-39.
- Wentz, F. J., P. D. Ashcroft and C. L. Gentemann (2001), Post-launch calibration of the TMI microwave radiometer, *IEEE Transactions on Geoscience and Remote Sensing*, 39(2), 415-422.
- Wentz, F. J., C. L. Gentemann, D. K. Smith and D. B. Chelton (2000), Satellite measurements of sea surface temperature through clouds, *Science*, 288(5467), 847-850.

Non-peer reviewed publications and images:

- National Academies of Sciences, Engineering, and Medicine. 2018. Open Source Software Policy Options for NASA Earth and Space Sciences. Washington, DC: The National Academies Press. <https://doi.org/10.17226/25217>.
- Lee, T., and C. L. Gentemann (2018), Satellite SST and SSS Observations and Their Role to Constrain Ocean Models, in *New Frontiers in Operational Oceanography*, edited by E. P. Chassignet, CreateSpace Independent Publishing Platform, Scotts Valley, CA, pp. 812.
- National Academies of Sciences, Engineering, and Medicine. 2015. Continuity of NASA Earth Observations from Space: A Value Framework. Washington, DC: The National Academies Press. <https://doi.org/10.17226/21789>.
- Gentemann, C. L., F. J. Wentz, M. Brewer, K. A. Hilburn and D. K. Smith. "Passive microwave remote sensing of the ocean: an overview", in *Oceanography from Space, revisited* (2010), edited by V. Barale, J. Gower and L. Alberotanza, Springer, Heidelberg.
- Gentemann, C.L. (2007), "Diurnal warming at the ocean surface", *Meteorology and Physical Oceanography*, Miami, FL, University of Miami, Doctor of Philosophy: 163 pp.
- Cover image Jan 2017 GRL
- Cover image 2010 IEEE Transactions on Geoscience and Remote Sensing
- Earle, S. and L. Glover (2008), *Oceans: An illustrated atlas*, National Geographic, 320p.
- Cover image 2001 IEEE Transactions on Geoscience and Remote Sensing
- Donlon, C.J., K.S. Casey, C.L. Gentemann, et al., "Successes and Challenges for the Modern Sea Surface Temperature Observing System" (2009), *OceanObs 09 community white paper*.
- King, M.D., C.L. Parkinson, K.C. Partington, R.G. Williams (2007), *Our changing planet, the view from space*, Cambridge University Press, 400p.
- Donlon, C. J., P. J. Minnett, I. J. Barton, T. J. Nightingale and C. L. Gentemann, (2001) The character of skin and subsurface sea surface temperature, paper presented at WCRP/SCOR Workshop on Intercomparison and Validation of Ocean-Atmosphere Flux Fields.
- Donlon, C. J., Minnett, P. J., Barton, I. J., Nightingale, T. J., and Gentemann, C. L. (2001), The character of skin and subsurface sea surface temperature, World Meteorological Organization, Geneva, Switzerland.
- Halpern, D., V. Zlotnicki, P. M. Woicheshyn, O. B. Brown, G. C. Feldman, M. H. Freilich, F. J. Wentz, and C. Gentemann. 2000. "An atlas of monthly mean distributions of SSM/I surface wind speed, AVHRR sea surface temperature, TMI sea surface temperature, AMI surface wind velocity, SeaWiFS chlorophyll-a, and TOPEX/POSEIDON sea surface topography

during 1998". Jet Propulsion Laboratory Publication 00-08, 102 p. National Aeronautics and Space Administration, Jet Propulsion Laboratory, California Institute of Technology, 4800 Oak Grove Drive, Pasadena, CA 91109.

Invited Talks:

SFSU 2018, "The changing landscape of science"

IGARSS 2015, "RFI in Microwave Remote Sensing"

AGU 2011 Fall Meeting, "AQUA AMSR-E Sea Surface Temperature"

Oceans from Space 2010, "A review of Passive Microwave Retrievals from Space"

Yale 2008 Department of Geology & Geophysics Colloquium, "Satellite sea surface temperatures"

AGU 2006 Joint Assembly, "Optimally interpolated infrared and microwave sea surface temperatures: The Multi-sensor Improved SST (MISST) Project"

IGARSS 2006 IEEE International Geoscience and Remote Sensing Symposium & 27th Canadian Symposium on Remote Sensing, "Multi-satellite, multi-sensor data fusion: global daily 10 km SSTs from MODIS, AMSR-E, and TMI"

IGARSS 2006 IEEE International Geoscience and Remote Sensing Symposium & 27th Canadian Symposium on Remote Sensing, "In situ observations of diurnal warming in the skin layer"

AMS 14th Conference on Satellite Meteorology, "Multi-sensor Improved Sea Surface Temperatures (MISST) for GODAE"

AGU Ocean Sciences, 2004, "Diurnal warming in satellite sea-surface temperatures"

JCOMM Workshop on Advances in Marine Climatology, 2003, "Diurnal Warming and Climate SST records"

CEOS Meeting, Ocean Sciences, 2003, "Accurate microwave SST retrieval and microwave/infrared blending"

GCOS Workshop on Advances in the Use of Historical Marine Climate Data, 2002, "Advances in Microwave Sea Surface Temperature" and "Towards Improved Validation of Satellite Sea Surface Skin Temperature Measurements for Climate Research"

GODAE Science Team Meeting, 2001, "Microwave SST retrievals from TRMM"

IGARSS, 2001, "Satellite Microwave SST: Accuracy, Comparisons to AVHRR and Reynolds SST, and Measurement of Diurnal Thermocline Variability"

Memberships:

American Geophysical Union (AGU)

American Meteorological Society (AMS)

Institute of Electrical and Electronics Engineers (IEEE)

IEEE Geoscience and Remote Sensing Society

Research Projects: (listed by year started)

2018: Multi-sensor Improved Sea Surface Temperature (SST): Continuing the GHRSSST Partnership and improving Arctic Data. Role: PI.

2017: East Meets West: Dynamic Biogeography of the Subarctic North Pacific. Role: Co-I.

2017: Using SAILDRONE autonomous in situ data for satellite validation and research into upper ocean physics and ecology. Role: PI.

2016: Quantification of Atmospheric Influence on Passive Microwave Observations. Role: external expert consultant.

2015: Improved Spatial Resolution Sea Surface Temperature Fields from AMSR-E. Role: Co-I.
2015: Using satellite data to understand the impact of the Pacific SST anomaly on California's drought. Role: PI.
2014: Continuation of Inter-Calibrated Ocean Products from GCOM-W AMSR2. Role: PI.
2014: Analysis and Mitigation of Atmospheric CrossTalk in VIIRS SST Retrievals. Role: Co-I.
2013: Estimating the effective heat capacity of the ocean. Role: PI.
2010: Storm induced wakes: upper ocean variability. Role: PI.
2010: A Next-generation Integrated Earth System Analysis - Coupling between the Ocean and Atmosphere. Role: Co-I.
2010: Complete Error Characterization of the DISCOVER Earth System Data Records. Role: Co-I.
2010: Multi-sensor Improved Sea Surface Temperature (MISST) for IOOS. Role: PI.
2008: Geophysical retrievals from GCOM-W AMSR2. Role: PI
2008: A NOPP Partnership for Atlantic Meridional Overturning Circulation (AMOC): Focused Analysis of Satellite Data Sets. Role: Co-I.
2007: Diurnal heating of the upper ocean. Role: Co-I.
2006: Integration of the AMSR-E Ocean Products into the Existing Satellite Climate Record. Role: Co-I.
2004: Multi-sensor Improved Sea Surface Temperature (MISST) for GODAE. Role: PI.
2003: Developing an Inner-Core SST Cooling Predictor for use in SHIPS. Role: Co-I.
2003: Intercomparison and error analysis of satellite microwave SST retrievals versus VOS and Buoy observations. Role: Co-I.

Ph.D. Committees:

Xiaofeng Zhu, University of Miami

Yang Lui, University of Miami

Bingkun Luo, University of Miami